

Available Copies of Speeches at the World Symposium on Asbestos (May 24-27, 1982)

1. ATHERLEY, Gordon
2. CHATFIELD, Eric J.
3. COOPER, W. Clark
4. DERUYTTERE, Andre
5. DOBBERTIN, Sigobrt
6. DUNNIGAN, Jacques
7. DUPERE, Jean
8. ENTERLINE, Philip E.
9. FELBERMAYER, Wolfang
10. FOURNIER, Etienne
11. GORSUCH, Anne M.
12. GRAY, Herb
13. HIGGINSON, John
14. KAGAN, Elliott
15. LANTING, R. W.
16. MARTONIK, Jr., John F.
17. NEUBERGER, Manfred
18. NICHOLSON, William J.
19. PENNEY, Wilfred
20. PREUSS, Peter W.
21. PYE, Andrew M.
22. REITZE, William B.
23. ROBOCK, Klaus
24. ROSS, Malcom
25. SCHMAEHL, Dietrich F. K.

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26. SELIKOFF, Irving J.

27. SIEMIATYCKI, Jack

28. SIMPSON, William J.

29. USHEWOKUNZE, Christopher M.

30. van der REST, Etienne

31. VENKATARAMAN, Nagaswami

32. WAGNER, John C.

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PROGRAMME

WORLD SYMPOSIUM ON ASBESTOS

MAY 24, 25, 26, 27, 1982
Mount-Royal Hotel
MONTRÉAL
Québec, Canada

Sponsored by:

- the Government of Canada
- the Government of Québec
- the Commission of the European Communities

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Programme

Biographical notes and abstracts

MAY 25
Ballroom, 9th floor

8:30am ***Opening remarks***

DUNNIGAN, Jacques (Canada)

Secretary General of the Symposium

8:35am ***Introductory Presentation***

Asbestos — A Controversial Issue



ATHERLEY, Gordon (Canada)

President and Chief Executive Officer
Canadian Centre for Occupational Health and Safety, Hamilton, Ontario

Dr. Atherley was professor of Occupational Medicine and Director of the Environmental, Occupational Health and Safety Unit at the Department of Preventive Medicine and Biostatistics of the University of Toronto before he took on his present appointment as President and Chief Executive Officer of the Canadian Centre for Occupational Health and Safety, in Hamilton. Author of numerous scientific papers and of a book on occupational health and safety. Dr. Atherley has served in various consultant and advisory capacities in the industry, government and private sectors, in the U.K. and Canada.

Abstract

Asbestos is a controversial material: on the one hand, there are the undoubted harmful effects on health arising out of human exposure to asbestos, especially in the workplace, all of which leads some people to urge that asbestos should be extinguished from industrial, commercial, and domestic use. On the other hand, there are the social consequences of such a policy measured in terms of loss of jobs at a time of serious world-wide unemployment, the loss of prosperity of countries and regions with asbestos as a natural resource, and the possibility that the substitutes for asbestos might be themselves dangerous or relatively expensive in terms of the energy costs involved in their production.

Whether asbestos should be counted out totally or allowed to continue to participate in the economies of the nations reflects an issue which, because of its fundamentally social, political, and economic nature, rests with the decision-makers of the communities and nations and definitely not with the international scientific community, as is represented at the symposium. Nevertheless, the decision-makers cannot properly consider the issue let alone decide it, without scientific information having the qualities of trustworthiness, comprehensiveness, comprehensibility, relevance, and usefulness.

In his presentation, Dr. Gordon Atherley will examine these qualities relative to the social, political, and economic issue of asbestos with the intention of highlighting the ethical standards imposed by principled science on scientists seeking to assist the decision-makers to decide this difficult issue.

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SESSION I

8:55am

Asbestos: The Medical Data



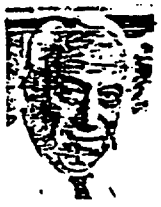
TRUHAUT, René (France), *Chairman*

Director
Centre de Recherches Toxicologiques
Faculté des Sciences Pharmaceutiques et
Biologiques de Paris

Professor Truhaut, who is a Doctor of Science, has dedicated his career to university teaching and to research. His scientific contribution, centered on the problems of analytical or biological toxicology, including problems of chemical carcinogenesis, numbers more than 400 original articles published in French and foreign periodicals, and over 300 general papers. Professor Truhaut is a member of several French and foreign scientific academies and has acted as expert, in France and within the major international health organizations, in the field of toxicity risks resulting from chemical pollution, the environment and the workplace.

9:00am

Asbestos-Related Diseases: An Overall Review



SELIKOFF, Irving (United States)

Director
Environmental Sciences Laboratory
Mount Sinai School of Medicine, New York

Dr. Selikoff is Professor of Medicine and of Community Medicine and Director of the Environmental Sciences Laboratory of the Mount Sinai School of Medicine in New York. Editor-in-Chief of the American Journal of Industrial Medicine and of Environmental Research, Dr. Selikoff is well known for his research and numerous contributions in the field of environmental medicine. Past President of the American College of Toxicology, past President and currently Governor of the New York Academy of Sciences, he is a member of the National Cancer Advisory Board of the National Cancer Institute.

Abstract

Should the use of asbestos be continued? The fact that the Symposium is addressing this question is a measure of our past inadequacies.

When a death of asbestosis was observed in 1900 and recorded in 1906, it could not have been widely known. But it would have been difficult to overlook the serious potential of the dust when the careful clinical studies and surveys in the decade after 1924 found that asbestosis was common among exposed workers, and that deaths could occur. Despite this understanding, the 1930's, 1940's, 1950's went by with few precautions in trades in which there was asbestos exposure. Nor did accumulating scientific knowledge concerning the cancer potential of asbestos increase protective measures until the 1960's and 70's.

There will be debate concerning the dimensions of the disease legacy we now face as the result of our years of failure — exactly how much lung cancer or mesothelioma or gastrointestinal cancer or cancer of the larynx or other cancers, or asbestosis — in shipyards, the construction industry, transport, mines, factories, chemical facilities and refineries, power plants, insulation work or other trades. We will be asked whether levels of 10,000 or 2,000,000 fibers per cubic meter of air (0.01-2.0 f/ml) will protect people in the future, and we will not be able to answer confidently because few measurements were made years ago to correlate with cancer experience since. Still, we'll be able to give the key answer — that there is a "dose-response" for all asbestos disease — the more asbestos, the more risk, the less asbestos, the less risk.

But this discussion will not be able to answer the critical ques-

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tion — should asbestos be continued? — if evidence will not be 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 would avoid all that now can be avoided. To do less than we can will likely prove unacceptable. Even this, however, will be incomplete. Succor and help are needed for those exposed in the past. Surveillance and care must be offered to the victims of past mistakes. Asbestos research should include improved medical management, as well as industrial and commercial measures. Again, we can do no less.

9:30am

Epidemiological Evidence: Exposure-Response, Fibre Type and Industrial Process



McDONALD, John Corbett (Canada)

Professor and Head of the
Institute of Occupational Health and Safety
McGill University, Montréal

Dr. McDonald studied medicine at the University of London, at the London School of Hygiene and Tropical Medicine and at the Harvard University School of Public Health. In addition to his membership in various committees, advisory groups or commissions concerned with problems of public health in general, Dr. McDonald's main professional activities and research publications have evolved around epidemiology and occupational health and safety, either teaching or directing research and laboratories.

Abstract

Since at least the 1964 New York Conference it has been suggested that fibre type and industrial process influence the nature and incidence of disease resulting from asbestos exposure. The 20-30 major epidemiological surveys in the last 15 years have tended to support the view a) that, other things being equal, the risks of asbestos and lung cancer are considerably greater for insulation work and textile manufacture than in the cement or friction-products industries or in mining and milling and b) that malignant mesothelioma has been usually associated with amphibole and seldom with pure chrysotile exposure. There has been much debate on the evidence — inevitably imperfect — for both these contentions and on the extent to which other factors — exposure levels in particular — have indeed been comparable. While it is clear that in experimental animals, fibres of different type but similar dimensions have much the same pathogenicity, various industrial processes could have a major effect on fibre-size distributions, and human anatomical considerations and life span could well explain differences between experimental and epidemiological findings. Unfortunately it is precisely in these areas of reliability of exposure measurements, of quantity, quality and duration, that the epidemiological studies have, for good reasons, been most deficient. The available data will be reviewed in some detail and both the interpretation and implications discussed.

10:00am

The Meaning of a "Threshold", Considerations Applying to Carcinogens in General



HIGGINSON, John (United States)

Senior Scientist
Universities Associated for Research and Education in Pathology Inc., Bethesda, Maryland

Dr. Higginson holds a degree in Medicine from the University of Dublin. For many years and up until recently, he was Director of the International Agency for Research on Cancer (IARC, Lyon). His major research interests have been the study of

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health and disease in different environments and their relation to diet, culture and socio-economic factors. Author and co-author of numerous scientific publications he has served in research councils and institutes, study groups and committees in many countries and in many international health organizations.

Abstract

The background to the controversy that surrounds the term "threshold" in carcinogenesis will be discussed. It is dependent on: 1) Uncertainty as to the definition of "carcinogen" in view of recent recognition of the complexities of multistage carcinogenesis; 2) Recognition that there are many different mechanisms by which exogenous stimuli may produce cancer; 3) Lack of rational or biological methods for extrapolation from animals or in vitro models to man of carcinogenic potency of chemicals; 4) Inability to prove the negative from either epidemiological studies or by extrapolation from animals. Thus the term non-carcinogen is almost impossible to define, and 5) The widespread view that even a single molecule of an initiator may produce cancer.

The implications of recent research on the theoretical existence of a threshold for a carcinogenic-producing stimulus will be discussed and the possibility that both initiators and promoters may be without effect for practical purposes under certain circumstances. It will be suggested that the term "carcinogen" be used in a highly limited sense since certain factors which induce cancer are clearly not carcinogens in the widely understood sense.

10:20am

Carcinogenic Aspects of Asbestos



SCHMAEHL, Dietrich F.K. (Federal Republic of Germany)

Director
Institute of Toxicology and Chemotherapy
German Cancer Research Institute, Heidelberg

Dr. Schmaehl is Professor of Medicine at the University of Heidelberg and, since 1964, Director of the Institute of Toxicology and Chemotherapy, at the German Cancer Research Institute, in Heidelberg. He is a member of numerous national and international commissions, Chairman of the commission "Studies on the carcinogenic risk of humans from air pollution" of the German Ministry of the Interior and Chairman of the Research Council on Smoking and Health. He is editor and co-editor of several scientific journals and has also published extensively in his field of research.

Abstract

Human inhalation of dust containing asbestos fibres enhances the risk of bronchial carcinoma and the risk of mesothelioma of the pleura and the peritoneum. It seems possible that tumor occurrence may also be induced in other organs.

In the case of asbestos, the pathogenesis of cancer is still unknown despite animal experiments and in-vitro studies, although there exists some knowledge indicating epigenetic mechanisms of oncogenesis. However, it is not known whether there are identical, similar or different processes responsible for the development of bronchial carcinoma and mesothelioma.

For the interpretation of risk extrapolations there should be some consideration of the fact that asbestos differs fundamentally and substantially in two ways from those carcinogens for which so far extrapolation models have been worked out.
1. In all probability, there is no genotoxic mechanism of action.
2. There is a cumulative effect for a certain portion of fibres.
So far, there is no evidence that in the case of epigenetic carcinogens, extrapolation models can accurately predict the effects of small doses from those of large doses, whereas for genotoxic carcinogens this has been repeatedly proved

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through animal experiments. For a number of epigenetic carcinogens, some probable threshold values for the carcinogenetic effects could be established by way of animal experiments and studies of the mode of action.

PANEL 1

10:40am ***Is There a Practicable No-Effect Level for Asbestos?***

TRUHAUT, René (France), *Chairman*

SELIKOFF, Irving (United States); McDONALD, John Corbett (Canada); HIGGINSON, John (United States); SCHMAEHL, Dietrich F.K. (Federal Republic of Germany)



MALTONI, Cesare (Italy)
Professor
Institute of Oncology of Bologna

Dr. Maltoni is Professor of General Pathology and Experimental Oncology and has been directing the Bologna Centre for Prevention and Detection of Tumours and Oncological Research since its foundation. His interests center on problems of environmental and occupational cancers (particularly those associated with industrial agents), the natural history of tumours, and the early detection of cancers and cancer precursors through large mass screening. The results of his research and scientific activities have been reported in more than 220 publications.



WEILL, Hans (United States)
Professor of Medicine
Tulane University, New Orleans

Dr. Weill obtained his M.D. degree from the Tulane University School of Medicine where he is now Professor of Medicine. He is also Director of the Specialized Center of Research on Fibrotic and Immunologic Reactions to the Occupational Environment of the National Heart, Lung and Blood Institute, and Chief of the Pulmonary Diseases Section of the Tulane Medical Center. Dr. Weill has published abundantly in the field of pulmonary diseases associated with occupational and environmental situations such as exposure to silica, asbestos, cotton and coal dusts, air pollutants and irritant gazes. Dr. Weill, who has filled several consultant assignments, was a member of the Task Force on Pathology Standards for Asbestos of the U.S. National Institute of Occupational Safety and Health (NIOSH).



WOITOWITZ, Hans-Joachim (Federal Republic of Germany)
Professor and Head of the Institute and Polyclinic of Occupational and Social Medicine
University of Giessen

Dr. Woitowitz studied medicine at the universities of Marburg and Cologne. He was assistant physician at the Medical University Clinic of the University of Cologne and at the Institute and Polyclinic of Occupational and Social Medicine of the University of Erlangen-Nuremberg and, then, Head of the Institute and Polyclinic of Occupational and Social Medicine of the University of Giessen. He has published numerous scientific papers in his field of research which comprises clinic and epidemiology of occupational diseases, carcinogenic risks and pathophysiology.

12:00noon Lunch

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SESSION II

2:00pm ***Asbestos: Protection in the Workplace***



SAMUELS, Sheldon (United States), *Chairman*

Director
Health, Safety and Environment
American Federation of Labor and Congress of Industrial Organizations

Mr. Samuels was educated at the University of Chicago and trained in environmental health while with the New York State Health Department and the U.S. Public Health Service. He has taught at the State University of New York, the University of Cincinnati, and (currently) at the Mount Sinai School of Medicine, and has lectured in 11 countries on behalf of the Departments of State and Labor. Mr. Samuels helped to found the Workers' Institute for Safety and Health of which he was Acting Director until October 1980. He is a member of the National Cancer Advisory Board, a Contributing Editor of the American Journal of Industrial Medicine and the author of 36 scientific studies.

2:05pm **Problems and Progress in Engineering of Workplace Environment Control in Primary and Secondary Industries; Work Practices; Packaging, Waste Disposal, etc.**



REITZE, William B. (United States)

Chief Environmental Scientist and Vice-President
Johns-Manville Sales Corporation

Mr. Reitze's undergraduate and graduate work was in biological and health sciences, specializing in neuroanatomy and physiology at the Columbia University Medical School. He has published numerous papers in the fields of toxicology, pharmacology, air pollution and industrial hygiene. Mr. Reitze spent several years with the New Jersey State Department of Health in the Air Pollution Control Division prior to joining Johns-Manville where he has served in various health-related functions. His present responsibilities include industrial hygiene, safety, community air pollution, water pollution, solid waste disposal, medical program, and biostatistics and epidemiology.

Abstract

This presentation will deal briefly with the history of dust control measures used in the asbestos mines, mills and manufacturing plants. It will also discuss the present types of dust collectors used in these settings. Included in the presentation will be discussion of other non-engineering methods used to reduce dust when shipping or handling asbestos. And, finally, methods of controlling asbestos dust on construction sites where asbestos-containing materials are installed will be discussed.

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2:20pm **Monitoring the Workplace: Problems and Progress. State-of-the-Art (Automatic Counting Methods) and International Efforts for Standardisation of Methods.**



ROBOCK, Klaus (Federal Republic of Germany)
Professor
Asbest-Institut fur Arbeits- und Umweltschutz

Dr. Robock is the Director of the Asbestos Institute for Occupational and Environmental Safety and Health in the Federal Republic of Germany. He is also Chairman of the Dust Measurement Advisory Panel of the Asbestos International Association and Lecturer at the Institute for Hygiene and Occupational Health, University of Essen. In 1976, he was awarded the Franz-Koelsch Prize for his research in the field of silicosis. His particular interests are in the area of dust measurement, control and biological effects. He has many publications to his credit and has received international recognition for his work on dust problems.

Abstract

Objectives for measuring concentrations of respirable asbestos fibres at workplaces are: 1) to control engineering measures for technical dust suppression; 2) to comply with statutory threshold limit values; 3) to assess dose-response relationships in epidemiological investigations for various asbestos-related diseases with respect to person-related dust exposure.

Description of the development of techniques in measuring asbestos fibre concentrations (thermal precipitator, midget-impinger, gravimetric methods, membrane filter method).

Factors which explain differences of measuring asbestos fibre concentrations are: 1) the change from previously applied methods to the membrane filter method and its fibre counting; 2) the use of different sampling strategies; 3) the different application for evaluation of membrane filters; 4) the use of electron microscope versus the use of light microscope.

Demand to internationally standardize the measuring methods for the determination of asbestos fibre concentrations. This will be the only basis to compare situations at workplaces and the epidemiological findings derived thereof, between various countries. An aide to achieve international comparability is provided by the RTM1 "Reference Method for the Determination of Airborne Asbestos Fibre Concentrations at Workplaces by Light Microscopy" of the Asbestos International Association, which is worked out in detail for the first time. By applying this Reference Method it is feasible to make the results of other methods, previously applied, comparable.

State of the art regarding the application of a new technology to eliminate counting errors — automatic evaluation of membrane filter samples by means of image analysing systems.

2:35pm **Asbestos Disease with Maintenance and Repair**



LILIS, Ruth (United States)
Associate Professor
Department of Community Medicine
Mount Sinaï School of Medicine, New York

After a teaching and research career in occupational medicine at the University of Bucharest, Dr. Lilis joined in 1972 the Department of Community Medicine, Division of Environmental Medicine, of the Mount Sinaï School of Medicine, where she is currently Associate Professor. Dr. Lilis has authored and co-authored many scientific publications in the field of health problems associated with asbestos exposure.

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Abstract

Adverse health effects associated with asbestos exposure are well documented for occupational groups directly exposed to asbestos — asbestos miners, asbestos textile workers, insulation workers. However, the health hazards due to asbestos have not been completely ascertained for those workers who are indirectly exposed in industries where asbestos insulation was used extensively.

Potential asbestos hazards were evaluated in maintenance workers in a large chemical plant and in a group of oil refinery workers.

In both groups, pleural abnormalities were more prevalent (28 and 25 percent respectively) than were the slight parenchymal changes observed (24 and 23 percent, respectively). These findings indicate that radiological evidence of asbestosis is to be found with significant prevalence in chemical plant maintenance workers and in oil refinery workers. The risk of developing severe disabling pulmonary fibrosis seems to be unlikely, since few of the cases had small irregular opacities graded 2/1 or higher. The risk of lung cancer and/or mesothelioma in these workers has yet to be assessed.

Although epidemiologic data on incidence of mesothelioma associated with this pattern of asbestos exposure are not yet available an increasing number of cases are being observed.

Prevention of exposure from such and similar sources is presently receiving increased attention.

2:50pm

Estimates of Occupational Mortality from Past and Projected Exposure to Asbestos



NICHOLSON, William J. (United States)

Associate Professor
Department of Community Medicine
Mount Sinai School of Medicine, New York

Dr. Nicholson received his Ph.D. in Physics from the University of Washington in Seattle. After a few years as Senior Staff Member at the Watson Laboratory of Columbia University, he joined the staff of the Department of Community Medicine at the Mount Sinai School of Medicine, where he is currently Associate Professor. Dr. Nicholson has participated in numerous studies in the field of environmental and occupational problems associated with airborne chemical and particulate irritants, and has authored and co-authored publications in the field of exposure to vinyl chloride, asbestos and other mineral dusts.

Abstract

Not available at printing time.

3:05pm

Problems of Medical Surveillance



COOPER, Clark (United States)

Consultant in Occupational Health, San Francisco

Dr. Cooper obtained his degree in Medicine from the University of Virginia, and holds a Master's degree in Public Health from the Harvard School of Public Health. After serving for some years in the U.S. Public Health Service, he was successively Research Physician, Professor of Occupational Health in Residence and Lecturer at the School of Public Health at the University of California (Berkeley), and is now an independent consultant in occupational health. Member of and consultant in many U.S. state and federal committees on environmental and occupational health, Dr. Cooper has published numerous studies in the field of pulmonary diseases in the mining, smelting and refining industry.

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Abstract

The purpose of asbestos-oriented medical surveillance should be to prevent disease or to minimize its progression and the development of complications. The author will review a program of periodic examination of insulating workers in the western United States, jointly sponsored by management and labor since 1968. Problems to be discussed include: 1) clear definition of objectives; 2) optimum content; 3) frequency; 4) quality control; 5) communication with workers, employers, family, and government; 6) confidentiality of information; 7) inappropriate governmental regulations; and 8) the relative ineffectiveness of intervention.

Indirect medical, psychologic, and epidemiologic benefits will also be described.

SESSION III

3:20pm ***Rights and Responsibilities: Perspectives from Science, Industry, Labour and Government***



BEAUDRY, René (Canada), *Chairman*

Juge en chef adjoint
Tribunal du Travail du Québec

Judge Beaudry, who is licenced in Law from the University of Montréal, specialised in labour law practice for several years before becoming a magistrate in 1970. He is a judge of the Québec Provincial Court and Associate Chief Justice of the Tribunal of Labour. As a specialist in occupational health and safety legislation, he has taught in this field at McGill University and at the University of Montréal, and has also participated in numerous seminars and conferences. From June 1975 to October 1976 he presided the Study Committee on salubrity in the asbestos industry which was set up by the Québec government and, more recently, the Inquiry Commission into the Belmoral mine tragedy and on safety conditions in underground mines.

3:25pm Scientific Viewpoint



PETO, Julian (United Kingdom)

Epidemiologist
Imperial Cancer Research Fund
Oxford University

Mr. Peto, who holds a Master of Science degree in Statistics and O.R. from the Imperial College in London, is currently statistician at the Imperial Cancer Research Fund's Cancer Epidemiology and Clinical Trials Unit, at Oxford University. He has published important contributions in the fields of risk assessment and of industrial hygiene standards, and has reported well researched data in the area of dose-response relationships for asbestos-related diseases.

Abstract

The only proper role of the scientist is to provide the estimates of risk on which decision-making is based, and to prevent misrepresentation of these data. Science cannot and should not take any position on the discussion of rights or responsibilities, except to insist that factual claims are well founded. This is an important role, as government, labour and management have all at various times exaggerated the security or danger of asbestos exposure. A scientist who holds strong views on what level of risk is acceptable, what price should be paid to achieve it, and how regulations should be implemented will however be perceived, probably correctly, as too biased to fulfill this role satisfactorily.

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3:40pm

Industry's Viewpoint



VAN DER REST, Étienne (Belgium)

Chairman of the Governing Council
Asbestos International Association

A civil engineer from the Catholic University of Louvain, Mr. van der Rest has been successively Managing Director, Vice-President and Chairman of S.A. Eternit, in Belgium, and sits on the Board of Directors of several companies in Belgium, France, England and the Netherlands. He is Chairman of the Governing Council of the Asbestos International Association and of the Belgian Federation of Asbestos-Cement Industries.

Abstract

The international asbestos industry recognizes that it is dealing with a product which, like other raw materials, can present risks to the health if its handling and use are not properly controlled. From the industry's point of view, however, it would not be sensible for society to be deprived of the exceptional qualities offered by asbestos, especially since asbestos, if used properly, can be made safe for both workers and users. Laws and regulations currently governing the use of the fibre and asbestos-based products ensure the protection of workers and users. In countries where there are still no suitable laws or regulations, the Asbestos International Association itself is encouraging adherence to rigorous standards for dust-emission levels and sensitizing users to safe methods of asbestos use. Adherence to safety standards and reliance on sound technology will ensure that asbestos can continue to be of great value in many applications, such as automobile safety, conduit systems, housing and a wide variety of other uses.

3:55pm

Labour's Viewpoint

MAZZOCHI, Anthony (United States)

International Representative
Oil, Chemical and Atomic Workers International Union

Abstract

Not available at printing time.

4:15pm

Government's Viewpoint

MARTONIK, John F. Jr. (United States)

Deputy Director
Directorate of Health Standards Programs
United States Department of Labor

Mr. Martonik who holds a Master of Science degree in Industrial Hygiene from the University of Pittsburgh, started his career in the U.S. Mining Enforcement and Safety Administration where he developed industrial hygiene inspection techniques for non-coal mines and recommended methods for controlling dust in underground coal mines. Since 1976, he has held various positions in the U.S. Occupational Safety and Health Administration (OSHA), where he is currently Deputy Director of Health Standards Programs, involved with the development and implementation of occupational health enforcement programs.

Abstract

OSHA has the responsibility under the OSHAct for promulgating standards for toxic materials and enforcing those standards. OSHA's existing Asbestos standard promulgated in

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1972 provides for a permissible exposure limit of 2 fibers/cc, using engineering controls when feasible, respirator programs, medical surveillance, monitoring, and hygiene practices. Since this standard was based upon asbestos' noncarcinogenic effects, OSHA will reevaluate it based upon recent information to determine whether the standard is adequate for the protection of worker health. During its reconsideration, OSHA will determine whether a significant risk of material impairment exists to workers exposed to asbestos. If a new standard is needed OSHA will determine whether the remedies prescribed reduce the risk and if the remedies prescribed are feasible and cost effective. OSHA will do this on an industry by industry basis.

PANEL 2

4:30pm ***Are Workers Exposed to Excessive Risk?***

BEAUDRY, René (Canada), *Chairman*

NICHOLSON, William J. (United States); COOPER, W. Clark (United States); PETO, Julian (United Kingdom); VAN DER REST, Étienne (Belgium); MAZZOCHI, Anthony (United States); MARTONIK, John F. Jr. (United States)



STUMPHIUS, Jan (Netherlands)

Managing Director
National Aerospace Medical Centre

Dr. Stumphius holds a Doctorate in Medicine and certificates in X-ray thorax reading, in occupational health, in radiation protection and in aviation medicine. In 1970, he received the Burger Award for his scientific work in occupational health. A member of numerous associations, commissions and advisory committees on occupational health, on asbestos and other mineral fibres, he is the current Managing Director of the National Aerospace Centre in the Netherlands and a member of the Permanent Commission and International Association on Occupational Health.

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MAY 26
Ballroom, 9th floor

SESSION IV

9:00am ***Asbestos and Substitutes***



OTT, Heinrich (CEC), *Chairman*

Principal Scientific Officer
Directorate General for Science, Research and Development
Commission of the European Communities

Dr. Ott studied chemistry and physics at the Ludwig-Maximilians University in Munich, where he received the degree of "Diplom-Chemiker" and his PhD. degree in Science. He was employed for a time in the pharmaceutical industry in Germany and then joined the Commission of the European Communities as Scientific Officer, working at the Joint Research Centre at Ispra (Italy), where he did research in toxicology and radiobiology. In 1973 he was transferred to the Brussels headquarters of the Commission of the European Communities. Within the Environmental Research Programme of the European Communities he assumes responsibilities as principal scientific officer for contract research in toxicology and asbestos, and research coordination.

9:05am **Evolution in the Uses of Asbestos**



PENNEY, Wilfred (United Kingdom)

Director General
Asbestos Information Centre Ltd., London

In addition to a long experience in asbestos-related industries, Mr. Penney was a member of the Environmental Control Committee of the Asbestosis Research Council, U.K., and is currently Chairman of the Asbestos Working Party of the Confederation of British Industry and Director General of the Asbestos Information Centre in London.

Abstract

A look at the evolution of the use of asbestos outlined by the growth of chrysotile asbestos consumption in the U.K. While the existence of asbestos was known for thousands of years, science made it serve mankind from 1873. Several applications were introduced through the industrial revolution and growth continued during the Depression years. Producton soared after the Depression as the economy picked up. From 1940 to 1945, production was directed to essential uses and the war effort, and war equipment and its demands nourished future growth. Post-War development further increased consumption of asbestos, particularly asbestos-cement products. From 1950 to 1960, there was continued progress, with the introduction of new products, new designs, new uses and new production methods.

Increasing competition from alternative materials and the first rumblings of unease on the health aspects of asbestos brought about a temporary recession between 1960 and 1970. These trends continued in the next decade and volumes were reduced after a peak in 1973. Following an explosion of anti-asbestos campaigns, high risk areas and products were withdrawn and prohibitions and controls started to be introduced. Today, marketing efforts are aimed at promoting products that will remain and new uses.

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9:25am

The Feasibility of Substitution



PYE, Andrew M. (United Kingdom)

Associate Editor
Design Engineering
Morgan-Grampian Limited, London

Mr. Pye graduated from the University of Cambridge with a degree in metallurgy and materials science. Joining the Fulmer Research Institute, a consultancy and contract research organization specializing in materials technology, he worked on several projects, including a study of substitute materials for asbestos, a subject on which he has written a number of papers. Subsequently becoming editor of the Fulmer Materials Optimizer, a four-volume materials selection and information system, he joined Morgan-Grampian in 1980, as associate editor of Design Engineering, Britain's leading journal for engineering designers writing principally about recent developments pertaining to engineering materials.

Abstract

This paper is primarily concerned with the potential for the replacement of asbestos in industrial engineering applications which comprise industrial textiles, millboard, high temperature insulation, jointings and seals (including gaskets), friction materials, bearings, electrical insulation and fibre-reinforced plastic composites.

It is recognised that construction industry applications, such as asbestos-cement, insulation boards and sprayed insulation comprise a significant proportion of historical asbestos usage; thus, for completeness, guidance is given on the state-of-the-art substitution potential and sources of further reference.

It is emphasised that the substitution of asbestos containing materials will not be by a single, universal product; rather, each application must be considered individually. The resultant erosion of the supply infrastructure of the user industries evidently leads to cost penalties associated with the use of many substitutes and the dilemma of compromise between performance and cost. This is most apparent with the most arduous of applications. The costs of research and development into new materials and of the acquisition of new or modified processing machinery have, in some cases, to be borne by the user industries.

This paper will not consider the possibility of associated health hazards which may conceivably arise from the use of certain substitute materials, which subject will be dealt with by other speakers.

9:45am

Socio-Economic Impact of Asbestos Use (Cost-Benefit Analysis) with Special Reference to Developing Countries

9:45am



VENKATARAMAN, Nagaswami (India)

Managing Director
Hindustan Ferodo Limited

Mr. Venkataraman, who holds a B.Sc. degree in Engineering (Electrical and Mechanical), has had a lengthy experience with the asbestos industry in India, dating back to 1955 when he joined Asbestos Cement Ltd. As a member of the Indian Standard Institution, he was responsible for drafting most of the specifications for asbestos-cement products now manufactured in India. At Hindustan Ferodo Ltd., which he joined in 1964, Mr. Venkataraman was successively Works Director and Sales Director before being appointed in 1973 to his present position of Managing Director.

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Abstract

Asbestos, with its unique combination of physical and chemical properties, plays a vital role in the growth of key sectors of developing countries. Upwards of 80% of the asbestos is used as a "construction material" for the reinforcement of cement and goes a long way in helping to achieve national goals of providing low cost domestic/industrial shelters, water supply and drainage to urban/rural areas as well as aiding irrigation for agriculture. The balance of asbestos is used in the equally important industrial applications of friction/bearing material, jointings, packing and seals, thermal and electrical insulations and fire protection.

The outlook for asbestos in these countries must be viewed in the context of economies still reeling under the impact of large foreign trade deficits resulting from the oil price hikes of the 1970s on one hand, and the need to commit their limited resources to essential nation building activities on the other.

To be acceptable as a "substitute" for asbestos under these circumstances, a material must have the required combination of mechanical and thermal properties in conjunction with a high chemical inertness and resistance to biodegradation. It should also be available in substantially large quantities at a significantly low material cost, with guarantees of freedom from health hazards.

Present day substitutes fall into two major categories: man-made mineral fibres (including glass) and organic fibres. Their costs range from a few times to tens of times the cost of asbestos. Their manufacture is energy intensive. All of them are generally accepted as having a respirable component. Although limited studies on hazard assessment for the man-made mineral fibres have not yet proven them to pose a human cancer risk, the implications from animal studies, where artificial implantation of fine fibres has resulted in the induction of tumors, cannot be ignored. Adequate studies on the hazard assessment of the organic fibre substitutes are still awaited.

10:00am USHEWOKUNZE, Christopher M. (Zimbabwe)



Secretary for Mines
Ministry of Mines

Mr. Ushewokunze completed his university education in the United Kingdom where he received a Master of Law degree from the University of London. He has lectured in law at the United Nations Institute for Namibia and at the University of Zambia. Among his research activities, has been a major study on the mining legal framework of Namibia. Mr. Ushewokunze has acted as legal consultant to the UNCTAD Zimbabwe Project, where he reported on legal aspects of land tenure, mineral production and manufacturing industry in Zimbabwe. He has a number of publications to his credit. Professionally, he is a Barrister at Law and is currently Permanent Secretary at the Ministry of Mines in Zimbabwe.

Abstract

Asbestos, particularly the chrysotile variety, of which Zimbabwe is a major world producer, has important applications in developing countries. These fall into two broad categories: asbestos-cement construction products and the manufacture of sophisticated insulated materials.

Asbestos-cement materials do not rust, corrode or suffer natural decay; they do not require maintenance or subsequent treatment as painting. They are therefore extensively used in housing and industrial building construction, on the one hand and in piping for water supply and sewage disposal, on the other.

The social and economic impact in a country like Zimbabwe commences at the mining and blending stages — where over 11 000 persons are directly employed, the export earnings producing valuable foreign currency, and through to the man-

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ufacturing of the different types of products. In all cases asbestos has and is contributing to the improvement of living conditions of whole social communities in Zimbabwe and among third world populations.

Hazards associated with asbestos use, in its manufactured form appear to be outweighed by economic advantages. However, little research appears to have been carried out in third world countries on the harm, if any, likely to occur to end-users of manufactured asbestos materials.

10:15am

Substitution — A Trade Union View



LEVINSON, Charles (ICEF)

Secretary General
International Federation of Chemical, Energy and General Workers' Unions (ICEF), Geneva

Mr. Levinson holds a doctorate from the University of Paris. Throughout his career in the labour movement, he has held important posts within a number of international organizations. He is currently Secretary General of the International Federation of Chemical, Energy and General Workers' Unions (ICEF), as well as Vice-President of the Supervisory Board of DuPont de Nemours in Germany. He has published several works on trade unionism and industry and, as editor for the ICEF, bulletins and reviews on the chemicals, rubber, paper, energy and pharmaceutical industries and on occupational health.

Abstract

The story of Asbestos is fortunately unique in the evolving annals of industrial disasters. Hopefully, its final chapter is now being written. Already recognised as hazardous to the health of slaves in the papyrus records of ancient Egypt in the era of Ptolemy, Asbestos has exerted an enormous human and social price for its special heat-resistant, friction and reinforcing properties. There is perhaps no other single industrial resource which has had such extensive and intensive consequences on health.

The long latency period between exposure and detectable injury for asbestosis, lung cancer and mesothelioma has been paralleled by an equivalent dormancy in respect of scientific acknowledgement of the evidence of hazard and the application of corrective measures in industry. Debate and disagreement over the issue, in large measure engendered by pressure from economic interests, has seriously obstructed the implementation of objective, medically-based policy. Even allowing for difficulties in establishing absolute standards which are not susceptible to legitimate query, Asbestos policy has consistently tended to reflect the hesitations of the "unproven" statistics rather than the much larger area of the "probable". Despite the overwhelming statistical and clinical data pointing to the hazards of Asbestos, it is not these hazards which have become the basis of policy. Political, economic and industrial considerations have been allowed to divert action into longer term compromises. Public health and social responsibility no longer take the center stage as policy objectives as attempts are made to optimize or to offset profits, investments, job losses and related considerations.

These distorted policy aims have led to a serious, irresponsible and probably malignant Asbestos Policy. The time has come to return the discussion to the health and social predominants. Asbestos must be phased out of industry where possible. Substitutes are already available in a wide range of applications.

Phasing out Asbestos through substitution on the basis of the best technological, scientific and industrial procedures available must become the focus of policy.

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In the interim, immediate attempts must be enjoined, by regulation if necessary, to set emergency threshold levels, to fix product safety standards according to the binding properties of new products and processes, and to launch public information campaigns pointing out that the material is relatively safe or constitutes an acceptable cost-risk if handled intelligently.

10:35am

Health Hazards of Substitutes



WAGNER, John Christopher (United Kingdom)
Pathologist
Pneumoconiosis Unit
Medical Research Council, Penarth, Wales

Doctor of Medicine from the University of Witwatersrand (South Africa), Dr. Wagner pursued a distinguished career as a Research Medical Officer at the South African Pneumoconiosis Research Unit before joining, in 1962, the Medical Research Council's Pneumoconiosis Unit in Penarth (Wales), where he is a member of the Scientific Staff. He is a member of the EEC Panel for Pathology of Asbestosis and Mesothelioma and has been actively involved in several committees, projects and symposia related to that field. Dr. Wagner is the author and co-author of over a hundred scientific publications. His most recent studies relate to the general area of pneumoconiosis and carcinogenesis associated with exposure to mineral dusts.

Abstract

This paper is wrongly titled; the subject is "Possible Risks of Substitutes" as so far no evidence of hazard to man has been established.

However, by considering certain environmental situations and the findings from experimental studies it is possible to draw up guidelines which should reduce these potential hazards.

The fibrous minerals that have been considered as substitutes can be categorized into the following three groups: a) man-made mineral fibres; b) non-commercial asbestos fibres; c) other naturally occurring fibrous minerals, including the zeolites and the fibrous clays.

If it is accepted that the biological effects of all these fibres depended upon their lengths and diameters, then the fact that the erionite fibre in Karain can initiate mesotheliomas could have been predicted once its measurements were known. This has now been confirmed experimentally. Using a crystalline and vitreous classification, the differing effects of intrapleural implantation and inhalation can be explained. In implantation, the fibres are deposited directly into the pleural cavity, whereas, following inhalation, the fibres have to pass a series of natural barriers. Although crystalline and amorphous (vitreous) fibres may appear similar at the time of administration and thus act in the same manner if injected, after passing the normal barriers in the respiratory tract the crystalline fibres may split up into thousands of smaller fibres, while the vitreous fibres may have disintegrated into non-fibrous particles and, therefore, become inactive.

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PANEL 3

10:55am ***Should Asbestos be Replaced?***

OTT, Heinrich (CEC), *Chairman*

PENNEY, Wilfred (United Kingdom); PYE, Andrew M. (United Kingdom); VENKATARAMAN, Nagaswami (India); USHEWOKUNZE, Christopher M. (Zimbabwe); LEVINSON, Charles (ICEF); WAGNER, John Christopher (United Kingdom)



BLUZAT, Roger (France)

Consultant à la Direction de la Recherche
Saint-Gobain-Pont-à-Mousson

Professor Bluzat is a Doctor of Science. He is a Research Associate at the University of Paris-Sud and acts as a consultant for the Research Department of Saint-Gobain-Pont-à-Mousson.

VELASQUEZ, Joseph (United States)

Workers Institute for Safety and Health
Washington, D.C.

12:00noon Lunch

SESSION V

1:30pm ***Risks Associated with Non-Occupational Exposure***



HICKMAN, John Roy (Canada), *Chairman*

Director
Bureau of Chemical Hazards
Department of National Health and Welfare

Mr. Hickman is the Director of the Bureau of Chemical Hazards in the Environmental Health Directorate of the Canadian Department of National Health and Welfare. He received his Master of Science degree in Pharmacology and Medical Biochemistry at the University of Birmingham. Since joining the Department of National Health and Welfare, he has held a number of senior positions related to toxicology and environmental health. Over the years, he has also acted as adviser and consultant on food irradiation and drinking water quality for international organizations such as the International Atomic Energy Agency, the World Health Organization, the Organization for Economic Co-operation and Development, and the Food and Agriculture Organization.

1:35pm Levels of Exposure of the General Population from Natural Sources



ROSS, Malcolm (United States)

Research Mineralogist
United States Geological Survey

Mr. Ross holds a Master's degree in Physical Chemistry and a Ph.D. degree in Geology. His professional activities relate to mineralogy, petrology and crystal chemistry of uranium minerals, clay minerals, talcs, micas, chain silicates especially amphiboles and pyroxenes, and lunar minerals. He specializes in the use of x-ray and electron diffraction equipment in crystal structure analysis, and is presently engaged in assessing the

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relationships between human exposure to mineral particulates and the incidence of disease, particularly in regard to fibrous minerals. He has written numerous papers and abstracts in the fields of mineralogy, petrology, crystal structure analysis and environmental science.

Abstract

An examination will be made of the important commercial asbestos mining localities of the world with particular emphasis on the most common asbestos minerals: chrysotile, crocidolite and amosite. The less common asbestos minerals, anthophyllite, tremolite and actinolite, have been mined sporadically, the only major production being the mining of anthophyllite in Finland. Dust levels at the commercial asbestos mines and mills have beeen very high until recently. The best measurements of dust levels were done in the towns of Thetford Mines and Absestos in the Province of Québec. The sampling data give good evidence of the levels necessary to protect the miner and miller as well as the other residents who were non-occupationally exposed to chrysotile asbestos. There is a much larger question as to what the dust levels were in amosite and crocidolite mines and at what levels the amosite and crocidolite miners are protected.

An examination will also be made of other hard-rock mining operations such as the mining of gold, iron ore, talc, vermiculite, copper, wollastonite, zeolites and chromite. The gangue minerals associated with the ores from which these commodities are extracted often include minerals that are similar to or identical to commercial asbestos, as well as other minerals considered by some to be asbestos-like. Some asbestos minerals, particularly chrysotile, appear as natural background in many water supplies and in some geographic areas such as Colinga, California.

The detection or lack of detection of asbestos-related diseases in various mining and residential populations reviewed give a good idea of risks associated with occupational as well as non-occupational exposure to the various asbestos dust.

1:55pm

Levels of Exposure of the General Population from Industrial Activities (Demolition and Wastes) and Buildings



LANTING, R. W. (Netherlands)

Senior Scientist
TNO Research Institute for Environmental Hygiene

Mr. Lanting graduated from the State University of Leiden with a Master's degree in Structural Geology and Geophysics. His main professional activities have been in the field of metrology of air pollutants and air pollution by particles, especially fibres. He participated in several international studies aimed at the harmonization and standardization of measurement methods and wrote several publications on measurement techniques for gaseous air pollutants. Mr. Lanting is a consultant for the European Commission DG11 in matters of air pollution by the asbestos-processing industries and is responsible for the analytical section of the Atmospheric Pollution Division of the TNO Research Institute for Environmental Hygiene.

Abstract

Contamination of the environment by asbestos fibres continues from the point of extraction of the fibre, through the manufacturing process and the product use to the moment of ultimate disposal as waste.

Owing to its persistence in the environment, asbestos fibres can be detected virtually everywhere in the atmosphere.

An inventory and quantification of the most important emission sources resulting from the technical use of asbestos is pre-

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sented. Estimates of these emissions indicate that the contribution of the manufacturing industries to the levels of asbestos fibres in the general environment is only small compared to the emission occurring during the lifetime of the asbestos-containing product.

These emissions are caused by processes like finishing operations in the consumer industries, wear and weathering of finished products, renovation and demolition of structures containing asbestos, transportation and disposal of waste.

Renovation, demolition and waste disposal are typical operations where through unawareness of the presence of asbestos fibres high exposure levels can be expected for the nearby population.

From the total quantity of asbestos still present in structures and installations, it may be expected that the operations mentioned will remain a significant source of environmental pollution for a long time.

Concentration levels measured will be discussed and compared with other industrial activities.

In the European countries, roughly 60% of the asbestos consumed is used in the construction of buildings. Sprayed asbestos has been applied very frequently prior to the prohibition of these operations enforced in most countries now. This material, mainly used in public buildings and offices may become a significant pollution problem for the occupants of such places. High exposure levels have been found in schools and swimming pools where much activity occurs. Especially children, through their long life span, run a greater risk of being affected by carcinogens with a long latent period. However, no firm conclusions can be drawn yet from the present data on levels of exposures.

2:15pm **Levels of Exposure of the General Population from Consumer Products**

2:15pm PREUSS, Peter W. (United States)

Associate Executive Director for Health Sciences
United States Consumer Product Safety Commission

Dr. Preuss holds a Ph.D. degree in Botany and Biochemistry from Columbia University. As Associate Executive Director for Health Sciences in the Consumer Product Safety Commission, he has the responsibility for the implementation of the Chemical Hazards Program which focuses mainly on the assessment of exposure, hazards and risks associated with chemicals in consumer products. Other functions include the supervision of the Health Sciences Laboratory, compliance testing of safety packaging and health support to all other hazard programs of the Commission. Dr. Preuss is also the CPSC representative on the National Cancer Advisory Board and Chairman's alternate to the Executive Committee of the National Toxicology Program.

Abstract

Not available at printing time

2:35pm FELBERMAYER, Wolfgang (Austria)

Head of the
Institute for Environmental Protection
and Clean Air

Abstract

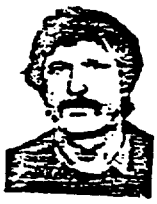
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2:55pm **Health Effects on the General Population**

2:55pm DOBBERTIN, Sigobrt (Federal Republic of Germany)



Environmental Agency
Ministry of the Interior

Dr. Dobbertin studied veterinary medicine with special interest in microbiology. After graduation, he was employed at the Institute for Food Sciences and received his certificate as a Veterinarian for Hygiene of Food. In 1975, he joined the Environmental Agency, an Office of the Ministry of the Interior. He heads the section responsible for the "Effects of Pollutants on Man". His particular interest is the problems of carcinogenetic substances in the environment.

Abstract

In the presentation the following facts are summarized: 1) The environmental pollution with asbestos is increasing in the most industrialized countries; 2) Scientific basis for the existence of a threshold value is not available for asbestos or other carcinogens; 3) These two aspects allow the conclusion: There is an asbestos-caused tumor risk for the general population. The difficulties in risk extrapolation and risk assessment are described and some points of view are discussed about the existence of threshold values. Furthermore critical aspects to the problem of mesothelioma and the causes are made in the presentation. The necessity of more influence of preventive medicine in environmental protection policy is emphasized and at least a selection of agreements between industry and government in the Federal Republic of Germany is reported.

3:10pm ENTERLINE, Philip E. (United States)



Professor of Biostatistics
University of Pittsburgh

Professor Enterline holds a Ph.D. degree in Demography and is currently Professor of Biostatistics at the University of Pittsburgh. He has served in a number of positions in the U.S. Public Health Service, where he was at one time Chief of the Morbidity and Health Statistics Branch, and later Chief of the Biometrics and Social Studies Branch, Occupational Health. Dr. Enterline has published many scientific publications in the general field of occupational disease hazards and in the estimation of health risks among coal, fibrous glass, asbestos, chemical and refinery workers.

Abstract

Aside from exposures to asbestos in occupational settings there is good evidence that nearly everyone in the general population has exposures from the environment. This is a review of the evidence for such exposures, the magnitude of these exposures and the most likely effects on cancer incidence. For malignant mesotheliomas direct evidence of a general population effect is used while for other cancers effects are extrapolated from dose-response data in occupational settings. The evidence for these dose-response relationships is reviewed, along with several mathematical models used to describe these data. Estimates are made of the proportion of cancer attributed to asbestos exposures in the population, classified by the nature of these asbestos exposures.

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3:25pm SIEMIATYCKI, Jack (Canada)



Recherches Bio-Médicales
Institut Armand-Frappier, Montréal

Dr. Siemiatycki holds a Master of Science degree in Statistics and a Ph.D. degree in Epidemiology from McGill University. After completion of a post-doctoral fellowship at the International Agency for Research on Cancer in Lyon (IARC), Dr. Siemiatycki joined the staff of Montréal's Institut Armand-Frappier where he is currently Associate Professor of Epidemiology. His main areas of research and publications are in the field of epidemiological methodology, especially in the assessment of occupational risk factors.

Abstract

While risks to health among asbestos-exposed workers is well-documented, there is concern that non-occupational exposures may also carry excess risks. The populations residing in the asbestos-mining towns of Asbestos and Thetford Mines are thought to be highly exposed to air- and water-borne asbestos. A study based on death certificates was undertaken to compare mortality rates from selected causes in these towns with those in comparable-sized towns of Québec not so exposed.

In the period 1966-77, males in the asbestos-mining areas experienced excess rates of respiratory cancer (SMR=1.5), GI tract cancer (SMR=1.1) and other respiratory diseases (SMR=1.3), whereas females experienced SMRs below 1.0 for all causes examined except GI tract cancer (SMR=1.1). Few of the females residing in these towns but many of the males had been occupationally exposed to asbestos.

Since the decedent's occupation is not recorded on death certificates, it was not possible to determine whether the apparent excesses among males can simply be explained by the fact that a substantial number were occupationally exposed. This will be discussed.

3:40pm Family Contact Exposure

ANDERSON, Henry A. (United States)

Chief, Section of Environmental and Chronic Disease Epidemiology
State of Wisconsin Division of Health

After a distinguished research and teaching career in the Department of Community Medicine and the Environmental Sciences Laboratory of the Mount Sinai School of Medicine in New York, Dr. Anderson, who holds a M.D. degree from the University of Wisconsin Medical School, is currently Chief, Section of Environmental Epidemiology of the State of Wisconsin Division of Health. He has published the results of many scientific studies in the field of health problems related to exposure to various airborne irritants, especially in dairy farmers, asbestos and chemical workers.

Abstract

Environmental asbestos pollution from industrial sources was not anticipated to pose any significant health hazard to the general public. Beginning with Wagner's report in 1960 and later Newhouse's report in 1964, it became apparent that a health hazard could occur in the neighborhoods of asbestos factories and in the households of asbestos workers. Over 50 pleural and peritoneal mesotheliomas have been reported among household contacts of asbestos exposed workers.

Radiographic evidence of parenchymal and pleural fibrosis and calcification have also been reported with a greater prevalence among such environmentally asbestos exposed populations. Beginning in 1973, the Environmental Sciences Laboratory of the Mount Sinai School of Medicine in New York began a clinical and mortality survey of all household contacts of 1,664

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workers employed for varying periods of time from 1941-54 in a factory producing amosite asbestos products. Concurrent with the clinical surveillance program, a comparison group of 326 individuals was selected, matched for sex, age and geographic area of residence. Clinical examinations and chest x-rays are available on 771 of the household contacts of the asbestos factory workers.

Overall, 35% of the household contacts had one or more radiographic abnormalities associated with asbestos exposure compared to 5% of the comparison group. The presence of radiographic abnormalities in the study cohort was statistically significantly associated with clinical abnormalities observed, duration of index workers employment and length of time since onset of first household exposure.

It is essential that clinicians become aware of the possible significance of radiographic evidence of parenchymal or pleural fibrosis in the absence of an occupational asbestos exposure and seek possible environmental exposure. The individual should be notified of the existence of the abnormality.

PANEL 4

3:55pm ***Is the General Population at Risk from Cancer Due to Asbestos Exposure?***

HICKMAN, John Roy (Canada), *Chairman*

ROSS, Malcolm (United States); LANTING, R.W. (Netherlands); PREUSS, Peter W. (United States); FELBERMAYER, Wolfgang (Austria); DOBBERTIN, Sigobrt (Federal Republic of Germany); ENTERLINE, Philip E. (United States); SIEMIATYCKI, Jack (Canada); ANDERSON, Henry A. (United States).



FISCHER, M. (Federal Republic of Germany)

Institute for Water, Soil and Air Hygiene
Federal Office of Health, Berlin

Dr. Fischer holds a PhD. degree in Physics from the Freie University of Berlin. He has done research on the theory of electromagnetic waves and plasmas, and on systems theory of resource problems (environment, energy and raw materials). Since 1978, he has been at the Institute for Water, Soil and Air Hygiene in Berlin to build up a new sub-section in human ecology. His present activities are centered around the risk assessment of cancerogeneous substances in the environment and the development of minimization strategies.



HIGGINS, Ian T.T. (United States)

Professor of Epidemiology
School of Public Health
University of Michigan

Dr. Higgins is Professor of Epidemiology and Professor of Environmental and Industrial Health at the School of Public Health of the University of Michigan. His vast expertise and numerous publications in the field of occupational and environmental studies are mainly related to the epidemiology and pathology of respiratory diseases. Over the years, Dr. Higgins has acted as consultant and expert on numerous national committees; having served on the Sub-Committee on Epidemiology of the Safe Drinking Water Committee of the National Academy of Sciences he is currently a member of the Epidemiological Task Force for Health Effects Studies of the Environmental Protection Agency, as well as of the Committee on Toxicology of the National Academy of Sciences.

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NEUBERGER, Manfred (Austria)

Associate Director
Institute of Environmental Hygiene
University of Vienna

Dr. Neuberger is a specialist in Internal Medicine and Hygiene. He is Associate Professor of Hygiene and Preventive Medicine and Associate Director of the Institute of Environmental Hygiene of the University of Vienna. His main interests lie with epidemiologic and experimental air pollution research, occupational and environmental toxicology and prevention programs. Dr. Neuberger acts as a consultant for the Austrian Workmen's Compensation Insurance. He has several scientific publications to his credit, notably a book on new approaches to risk estimation of air pollutants.

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MAY 27
Ballroom, 9th floor

SESSION VI

8:30am ***The Direction of Research: Present and Future***



HARINGTON, John Sullivan (South Africa), *Chairman*

Head of the Cancer Research Department
National Cancer Association of South Africa

Dr. Harington obtained his Ph.D. degree from the London School of Hygiene and Tropical Medicine, and was awarded the degree of Doctor of Science (D.Sc.) by the University of London for his published work on the biological effects of silica dust and asbestos fibres, his studies on experimental carcinogenesis and in the field of epidemiological and aetiological aspects of human cancer. Dr. Harington is currently Head of the Cancer Research Department of the National Cancer Association of South Africa. His studies have centered on the physico-chemical aspects of mineral fibres and the relationships with their biological activity.

8:35am **Physico-Chemical Modification of Asbestos in End-Use Products**



DERUYTTERE, André (Belgium)

Head of the Physical Metallurgy Section
University of Leuven

Dr. Deruyttere graduated in Civil Metallurgical Engineering from the University of Leuven and received his Ph.D. (Metallurgy) from the University of Sheffield, U.K. He is Head of the Physical Metallurgy Section at the University of Leuven, where he has also occupied the position of Dean of the Faculty of Applied Sciences, Chairman of the Department of Metallurgy and member of the University's Board of Directors. He participates in many scientific commissions and societies; among others, he is a member of the Commission fo. Metallurgy and Applied Chemistry of the Belgian National Foundation for Scientific Research, Vice-Chairman of the National Committee for Planning and Control of the Steel Industry and a member of the Commission for Applied Research of the National Council for Scientific Policy. Dr. Deruyttere has received a number of prestigious scientific awards and has over 70 publications to his credit.

Abstract

The modern techniques which are available in materials research laboratories permit a thorough study of the characteristics and properties of asbestos-cement dust and a comparison with virgin asbestos dust.

This is illustrated by an investigation which, although limited in scope and time, shows that interesting and worthwile conclusions can be reached. The results of this investigation have already been published, but it may be justified to expose them again to the very broad audience of a World Symposium, in the hope that others will be encouraged to continue and expand the work so as to reach more complete and more definitive conclusions.

Total dust samples produced by machining commercial asbestos-cement products have been collected at the machines in the production plant. The granulometry of the samples has been determined. The composition of the

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granulometric fractions has been analyzed by X-ray diffraction. The asbestos content is smaller in the fine than in the coarse dust fractions. Microscopic examination has shown that only about 10% of the particles of respirable size are "optically pure" asbestos fibres. An examination with scanning and transmission electron microscopes equipped with X-ray spectrometers has shown that even the optically pure fibres in asbestos-cement dust are usually covered with small calcium containing particles. However, dust from autoclaved products contains more non-coated fibres. The dissolution kinetics and the absorption of carcinogens from tobacco smoke show that asbestos-cement dust behaves more like cement than like pure asbestos. Therefore the general conclusion can be drawn that results obtained from studies on pure asbestos should not be automatically applied to asbestos-cement dust, because it is clear that there are notable differences between the two kinds of dust.

8:50am **Modification of Asbestos Fibres: Biological Considerations**



DUNNIGAN, Jacques (Canada)

Directeur général

Institut de recherche et de développement sur l'amiante, Sherbrooke, Québec

Dr. Dunnigan was successively Assistant Vice-Dean for Research and Director of the Research Programme on Asbestos at the University of Sherbrooke, before he took on his present appointment as Director General of IRDA. A member of many advisory research committees for the Governments of Canada and Québec, and the author of many publications, Dr. Dunnigan's current research activities are in the field of the mechanism of action of fibrous particles at the cellular level.

Abstract

Proposed in the early seventies, "Stanton's hypothesis" stated that the biological effects of asbestos fibres depend on dimension and durability rather than physico-chemical properties. Since then, an overwhelming body of data published by many scientists from laboratories around the world, which are reviewed today, indicate that chemical surface properties are now considered an important determinant in the mechanism of action of fibrous materials, including asbestos, at the cellular level.

If indeed surface chemistry of fibrous materials is an all important factor of cell toxicity and resulting pathogenicity, it follows that: 1) Fibrous particles which may be released from finished products may well be physico-chemically different from the original fibres. These "modified" fibres may then display altered biological properties. This phenomenon should be taken into account in the process of regulation-making in the use of composite finished products containing fibrous materials; 2) Regulations concerning the use of finished products are not scientifically supported, if arrived at by extrapolation of biological and/or epidemiological data obtained after exposure to pure, unmodified fibres; 3) Efforts to chemically modify asbestos fibres in view of altering the biological and/or technological properties should be pursued.

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9:05am

Surface Characteristics and Biological Properties of Minerals



LANGER, Arthur M. (United States)

Environmental Sciences Laboratory
Mount Sinaï School of Medicine, New York

Dr. Langer holds a Ph.D. degree in Mineralogy from Columbia University. He is currently Associate Director of the Environmental Sciences Laboratory and Head of the Physical Sciences Section of the Environmental Sciences Laboratory at the Mount Sinaï School of Medicine in New York. An expert in the physico-chemical aspects of mineral dusts and the relationships with their biological reactivity, Dr. Langer has acted as consultant on several national and international commitees and has also co-authored many publications in the general field of asbestos characterization and measurement.

Abstract

Not available at printing time

9:20am

Prospects for New Methods of Analysis and Measurement of Fibres in Environmental Samples



CHATFIELD, Eric J. (Canada)

Head of the Electron Optical Laboratory
Ontario Research Foundation

Dr. Chatfield obtained his Ph.D. in Colloid Science from Cambridge University in the United Kingdom. From 1958 to 1968 he was on the scientific staff at the Atomic Weapons Research Establishment, Aldermaston, where he performed studies on mixed alkali metal-plutonium aerosols. Since 1968 he has been Head of the Electron Optical Laboratory of the Department of Applied Physics at the Ontario Research Foundation, where measurements of asbestos in air and water have formed a large part of his activities. He has numerous technical presentations and publications to his credit.

Abstract

Routine measurements of asbestos fibre concentrations in the workplace are made by collection of the airborne dust on membrane filters which are examined by phase contrast microscopy (PCM). This technique is not specific for the detection of asbestos fibres, but the assumption is made that all particles which have aspect ratios greater than 3:1 are asbestos. In the general environment, the assumption cannot be made that all elongated particles encountered in either air or water samples are asbestos, since asbestos usually forms a minor proportion of the total number of such particles. The requirement for identification of the fibres therefore leads to the use of transmission electron microscopy (TEM) for measurements of asbestos in environments outside of the workplace. Both the phase contrast optical and the transmission electron microscopy techniques are based on manual fibre counting, and are therefore subject to the limitations of counting statistics and operator subjectivity. Consequently, inter-laboratory comparisons have usually yielded variable results over a wide range of values.

In the search for more accurate and reliable methods for measurement of asbestos fibre concentrations at the levels normally encountered, two new techniques have been investigated. For workplace atmosphere samples, a scanning electron microscope (SEM) has been interfaced with a computer to perform automatic fibre counting. The system applies constant criteria for the enumeration of all fibres, including the individual fibres within fibre aggregates. The system also

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determines the chemical composition of each fibre so that non-asbestos particles can be rejected from the fibre count.

Magnetic alignment of asbestos fibres, first reported by Timbrell, forms the basis of the second approach to the measurement problem. A new system has been constructed which is capable of detecting 0.2 ng of chrysotile and 1 ng of crocidolite. The fibres are suspended in a liquid which is placed in a rotating magnetic field. Measurements are then made of the intensity of light scattered by the suspension. Since the system is not based on fibre counting, precise measurements are possible in short periods of time.

9:35am

Critical Appraisal of *in vitro* and *in vivo* Assessment of Biological Effects of Fibrous Materials



BIGNON, Jean (France)

Service de Pneumologie
Centre Hospitalier Intercommunal
University of Paris Val de Marne

Professor Bignon holds a Doctorate in Medicine and a Doctorate in Science (Histology) from the University of Paris. He is Professor of Respiratory and Environmental Pathology and of Occupational Medicine at the Créteil Faculty of Medicine. Dr. Bignon is also Director of the Laboratoire de recherches sur les affections respiratoires et environnement (research laboratory on respiratory diseases and the environment), and Scientific Director of the Laboratoire d'études des particules inhalées de la DASS (laboratory of characterization of inhaled particles). He participates as an expert in numerous working groups and commissions, including within the Commission of the European Communities (Toxicology, Environment, Asbestos).

Abstract

During the past ten years, several laboratories have developed different test systems in order to evaluate the biological responses induced by mineral dusts and particularly by asbestos.

1. *Short term in vitro systems* will be reviewed critically. The biological significance of each type of tests (hemolysis, enzymes release by macrophages, effects on proliferative cells in culture, mutagenesis tests on mammalian cells...) will be discussed in relation to inflammation, mutagenesis or cancerogenesis. Different in vitro responses are observed according to *fibre types*, the significance of which will be discussed in relation to the physico-chemical characteristics of the fibres.

2. *Animal experiments* represent the *reference method* for studying the fibrogenic and cancerogenic effects of different types of fibres. Inhalation exposure seems the most suitable method for extrapolating an adverse effect to human beings. However simpler methods, such as intrapleural or intraperitoneal injection of mineral dusts, are useful for testing the biological properties of modified asbestos and new types of asbestiform fibres or synthetic fibres, of which only small amounts are available. The animal data are necessary in order to validate the in vitro results.

3. *Other experimental methods* have to be investigated in order to study the synergism between asbestos fibres and other carcinogens (radiation, tobacco, benzo-a-pyrene) and to shorten the duration of animal experiments (by using in vivo-in vitro methods for instance).

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PANEL 5

9:55am **Questions and comments from the floor**

HARINGTON, John Sullivan (South Africa), *Chairman*

DERUYTTERE, André (Belgium); DUNNIGAN, Jacques (Canada); LANGER, Arthur M. (United States); CHATFIELD, Eric J. (Canada); BIGNON, Jean (France); MALTONI, Cesare (Italy)



BECK, Ernst Gehrard (Federal Republic of Germany)

Director of the Institute of Hygiene
Giessen University

Professor Beck is Director of the Hygiene Institute and Medical Ecology Centre, at the Justus-Liebig University in Giessen. His numerous research publications relate to the general fields of environmental hygiene and cell toxicology, especially on the subject of the biological effects of airborne mineral particles.



RILEY, George W. (Canada)

Research Manager
Mineral Processing Laboratory, CANMET
Energy, Mines and Resources Canada

Mr. Riley is a Mining Engineering graduate from the Camborne School of Mines (U.K.). Prior to joining the Canadian Department of Energy, Mines and Resources in 1964, he was involved for 10 years with the asbestos industry, particularly in the area of processing. As Manager of the Mineral Processing Laboratory he is concerned with the processing, utilization, properties, characterization, identification and evaluation of metallic and non-metallic minerals, mineral wastes, ceramics and construction materials of mineral origin. Mr. Riley is active in many technical committees, including the Canadian Advisory Committees for the International Standards Organization, and is Coordinator of the Canada/EC Asbestos Fibre Definition and Fibre Measurement Techniques Program.



SÉBASTIEN, Patrick (France)

Materials Engineer
Laboratoire d'études des particules inhalées, Paris

Dr. Sébastien has been specializing for 10 years in the metrology of inorganic particles (including asbestos) in relation with the study of their effects on health. His doctoral thesis in engineering was on the theme of The Biometry of Inhaled Particles. From 1972 until April 1982, he has worked in Paris at the Laboratoire d'études des particules inhalées (laboratory for the study of inhaled particles) and is now with the Institute of Occupational Health and Safety at McGill University.

10:30am **Resistance and Immunological Status in the Pathology Related to Asbestos Exposure**



KAGAN, Elliott (United States)

Associate Professor of Pathology
Department of Pathology
Georgetown University

Dr. Kagan holds a degree in Medicine from the University of Witwatersrand (South Africa). He was for four years Head of the Department of Immunology at the National Research Institute for Occupational Diseases of the South African Medical

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Research Council. He then joined the staff of the American National Red Cross Blood Program and later taught pathology at the School of Medicine at the Georgetown University Medical Center in Washington. He is currently Director of the Hematologic Immunopathology Division at the Georgetown University Hospital. Dr. Kagan's research activities are centered primarily on immunological aspects of occupational lung disorders.

Abstract

The fibrogenic and carcinogenic properties of asbestos fibers are now well recognized, yet there is still considerable debate regarding the mechanisms whereby asbestos evokes its biological effects. There is a body of evidence which indicates that constitutional factors may determine an individual's susceptibility to asbestos-related disease. Among these host determinant factors, the immune system may play a pivotal role. Striking manifestations of immune derangement have been described in asbestos workers. These include: a) defective expression of cell-mediated immunity (cutaneous anergy, impairment of lymphoproliferative responses and of lymphokine generation); b) decreased numbers of circulating T lymphocytes; c) hyperactive B cell function (elevated immunoglobulin levels and an increased frequency of non-organ-specific autoantibodies). These abnormalities may results from a loss of suppressor cell immunoregulatory influences as a consequence of asbestos exposure. Since many facets of immunological function are genetically modulated by immune response (Ir) genes residing within the major histocompatibility complex, immunogenetic studies should prove useful probes of host susceptibility status in different categories of asbestos-exposed populations. The use of sophisticated immunological probes to detect persons "at risk" of developing asbestos-related cancers has tremendous advantages for both labor and industry. Such studies could provide a "ray-of-hope" for the earliest detection of disease in asbestos workers. The potential cost benefit to industry could be substantial, in terms of the prevention of lost worker-hours and the circumvention of compensation claims.

10:50am

Tissue Burden Studies



POOLEY, Frederick David (United Kingdom)
Reader in Mineral Processing
Department of Mineral Exploitation
University College, Cardiff, Wales

Dr. Pooley holds a Ph.D. degree in Mineral Engineering from the University of Wales. He is currently a Reader in Mineral Processing at the Department of Mineral Exploitation, University College in Cardiff. Also, he is the author and co-author of studies on the identification and quantification of mineral fibres in airborne dusts and biological tissues.

Abstract

Collection of information concerning the fibrous mineral content of tissue samples is extremely important as epidemiological, pathological and biological studies can be more readily interpreted with the knowledge of the mineral types, fibre numbers and sizes contained in such samples.

In any study of tissue for its asbestos mineral content, facilities for observing, identifying and quantifying the various mineral fibres must be available. There are many studies recorded in the literature which although well intentioned were performed with inadequate preparation methods and analytical facilities. The results obtained were therefore limited and often misleading, sometimes adding confusion rather than clarity on the subject of asbestos-related diseases.

The sophistication of studies of lung tissue has been closely linked over the past 15 years with improvements and developments in analytical equipment and methods. It is now

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generally accepted that reliable results of asbestos burdens in lung tissue can only be obtained using the most modern designs of analytical transmission electron microscopes. There are very few studies reported in the literature which have been produced employing such equipment, and in many the number of tissue specimens examined have not been sufficient to allow any general conclusions to be drawn.

Future studies will no doubt be involved with confirmation of the data on fibre types and levels in tissues that have already been obtained, while further studies of selected cases to examine factors such as fibre translocation will be performed. It is probable that the mineral matter in tissues other than fibres will also be quantified as this has been an entirely neglected area.

11:10am

Epidemiologic Significance of Asbestos Fibres in Lung Tissue



McDONALD, Alison A. (Canada)
Directeur de programme
Institut de recherche en santé et en sécurité du travail, Montréal

Dr. Alison McDonald is a medical graduate from the University of London and did post graduate studies at the London School of Hygiene and Tropical Medicine. She has long been on the staff of McGill University. She was Professor in the Department of Epidemiology and Health when, for a brief period (1978-1981), she joined the St-Mary's Hospital Medical School in London, as Professor and Head of the Department of Epidemiology. Dr. McDonald is currently Program Director at the Institut de Recherche en Santé et Sécurité du Travail (a research institute on occupational safety and health), in Montréal.

Abstract

Advances in electron microscopy have enabled investigators to identify the physico-chemical nature and dimensions of single mineral fibres, and to estimate the numbers present in a given dry weight of tissue. Although mainly restricted to studies post-mortem, this technique is clearly of great potential value in estimating, for epidemiological purposes, past exposures to inspired mineral fibres.

Earlier studies of coated fibres (ferruginous bodies) have not contributed much to our understanding of asbestos-related disease, because coating varies with mineral type and length of fibre, and not only asbestos fibres are coated. Some correlation between uncoated asbestos fibre counts made with the light microscope and lesser degrees of asbestosis has been reported. However, the proportion of light-visible fibres varies between 1% and 10% of those seen by electron microscope.

Recently, electron-microscopic analyses of lung tissue have been made in a single laboratory of two substantial case-control series of malignant mesothelioma: one from North America and the other from the United Kingdom. Both series gave similar results: the quantity of chrysotile fibres was similar in cases and controls, but much larger quantities of amosite and crocidolite fibres were found in cases than in controls.

The interpretation of these findings depends on the retention and movement within the lungs of inspired asbestos fibres, and on physical and chemical changes which may occur. Experimental and epidemiological studies suggest that chrysotile fibre bundles tend to divide longitudinally into smaller bundles or into separate fibrils. The latter fragment into shorter fibrils and are then found in greater quantity in peripheral rather than central areas of the lungs. In addition, leaching of chrysotile appears to occur whereas amphibole fibres seem to remain unchanged. Further study of the behaviour of asbestos fibres in the lungs and other tissues is urgently required.

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11:25am **Study of Professional Groups and Epidemiological Data in France**



FOURNIER, Étienne (France)
Professor of Clinical Toxicology
University of Paris VII

Dr. Fournier is Professor of Legal Medicine and Toxicology and Professor of Clinical Toxicology at the Lariboisière-Saint-Louis Faculty of Medicine, University of Paris VII, where he was at one time Dean. He is also President of the Conseil supérieur de la prévention des risques professionnels (superior council for the prevention of occupational hazards) and acts as expert on toxicology in the Specialized Advisory Committee to the Secretariat of the European Communites.

Abstract

Epidemiological studies conducted in France between 1979 and 1982 covered the following points: 1) Study of the entire working population currently employed in the industries studied (6,000 workers). Detailed examination of the medical files in co-operation with the plant doctors, paired reading of the X-ray files, establishing and sanctioning classification of pleural and pulmonary radiological abnormalities and codification. Verification by direct pleural study of a control group; 2) Study of an entire regional population (826) working in asbestos-cement, ascertaining the causes of death, processing data, making correlations and verifying the conclusions; 3) Study of two working populations (in asbestos-cement and industrial asbestos fibres) by means of intensive functional respiratory tests. Research into correlations with the length of time in the job, the probable intensity of exposure and the exogenous aggression factor. That group constitutes one of the largest samples now being studied (1,077 persons) in the area of functional respiratory tests; 4) Study of the control groups of workers in the engineering industry (350). Verification of the studies conducted on lung X-ray photographs, functional respiratory tests and morbidity statistics; 5) Comparison of the results with the recent statements on occupational diseases among asbestos workers, the probable incidence of mesothelioma in France and the excessive mortality of occupational origin associated with asbestos; 6) Probable consequences on human health from prolonged exposure to asbestos dust determined after establishing the duration of periods of employment and the probable intensity of exposure.

PANEL 6

11:40am **Questions and comments from the floor**

HARINGTON, John Sullivan (South Africa), *Chairman*

KAGAN, Elliott (United States); POOLEY, Frederick David (United Kingdom); McDONALD, Alison A. (Canada); FOURNIER, Étienne (France)



OTTO, Herbert (Federal Republic of Germany)
Director
Department of Pathology
Municipal Hospital, Dortmund

Dr. Otto is the Director of the Department of Pathology at the Municipal Hospital in Dortmund. His specialty is in the area of lung-pathology. At Dortmund, Dr. Otto maintains the Mesothelioma Register for the Federal Republic of Germany. He has over 200 publications to his credit, and has published two books in his field.

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WHITWELL, Francis (United Kingdom)
Consultant Pathologist
Department of Pathology
Broadgreen Hospital, Liverpool

Dr. Whitwell is a consultant pathologist in Liverpool at the Broadgreen Hospital and the Regional Cardio-Thoracic Surgical Centre and a member of the Research Committee of the Asbestosis Research Council. His main research interests are centered on pulmonary pathology, including bronchiectasis, tumourlets of the lung, histopathology of lung cancer, pleural mesothelioma and asbestos. His most recent publications are on the asbestos-fibre content of lungs in patients with mesothelioma, lung cancer and other diseases and on the histopathology of lung cancer in workers with asbestosis.

12:15pm **Lunch**

SESSION VII

1:45pm ***Legislative Perspectives***



SAUVÉ, Robert (Canada), *Chairman*
Président-directeur général
Commission de la santé et de la sécurité du travail du Québec

Mr. Sauvé holds a Master's degree in Law from the University of Montréal, a Master's degree in Public Administration from the American University, Washington, and a post-graduate degree in Law from the London School of Economics and Politics. After having been successively technical counsel, regional director and secretary general of the Confederation of National Trade Unions, Mr. Sauvé joined the Québec Department of Labour and Manpower where he was Assistant Deputy Minister and then Deputy Minister. Appointed to the Québec Provincial Court in 1971, he sat at the Tribunal of Labour and later was appointed President of the Judicial Services Commission, then President of the Québec Workmen's Compensation Board. Since 1980, he is President and Director General of the Québec Occupational Safety and Health Commission.

1:50pm A View of the USA Approach to Environmental Regulations — Special Reference to Asbestos



GORSUCH, Anne M. (United States)
Administrator
United States Environmental Protection Agency

Mrs. Gorsuch received a Law degree from the University of Colorado Law School in 1964. She began her public career as Assistant District Attorney in Jefferson County, Colorado, and later became Deputy District Attorney in Denver. In 1975, Mrs Gorsuch joined the Corporate Law Department of Mountain Bell, where she remained until her appointment in 1981 to her present post of Administrator of the U.S. Environmental Protection Agency (EPA). Before her appointment, she served two consecutive terms in the Colorado House of Representatives where she was responsible for the introduction of 21 bills and sponsored legislation on air pollution control. She was also Chairman of a number of House Committees, notably the Interim Committee on Hazardous Waste.

Abstract

As Administrator of the Environmental Protection Agency (EPA), my primary responsibility is to carry out President

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Reagan's commitment to protect public health and the environment. Also, there is a parallel responsibility to keep EPA in step with the Administration as a whole; carrying out environmental responsibilities in a manner that supports other major goals, including controlling inflation; expanding the economy; creating new jobs; increasing domestic energy production; restraining federal spending; and easing the burden of government regulation. In short, EPA seeks the most cost-effective approach to issues under our jurisdiction.

The Agency was formed 11 years ago to consolidate the federal government's environmental programs. The major laws that EPA administers suggest the scope of the Agency's responsibilities. These statutes include the Clean Water Act, Clean Air Act, Safe Drinking Water Act, Toxic Substances Control Act, and Federal Insecticide, Fungicide, and Rodenticide Act.

As you may know, regulatory reform underlies almost every aspect of EPA's work. Presently, our nation's asbestos control program falls under the authority of a several EPA offices and other agencies throughout the government. Regulations applying to asbestos have been promulgated under several different statutes which are administered by six different agencies. We are now examining these regulations to see if they are cost-effective. The issues are complex, but with the assistance of symposia like this one and the use of good science and sound public policy, I am confident that we will protect the public health without being unduly burdensome.

2:05pm

Harmonisation of EEC Legislation

HUNTER, William J. (CEC)
Principal Administrator
Health and Safety Directorate
Commission of the European Communities

Dr. Hunter began his career in occupational health by working in large manufacturing concerns. He joined the Commission of the European Communities in 1974, where he was initially involved with the establishment of criteria documents setting out the exposure effect relationships for several pollutants — asbestos amongst them. He then became involved with the action programme of the European Communities on safety and health at work, and was instrumental in the setting up of the CEC Asbestosis and Mesothelioma Panels and with the drawing up of the Commission's proposals on asbestos.

Abstract

Asbestos is the focus of attention from public opinion throughout the Member States of the European Community. This attention has already led to several initiatives being taken by the Council of Ministers, acting on proposals from the Commission, by the European Parliament, and by the Economic and Social Committee.

In the Council resolution of 1978 on an action programme of the European Communities on safety and health at work, asbestos is named as a toxic substance for which exposure limits and other specific requirements are to be established (OJ C165 of 11/7/1978). One of the first Directives dealing with asbestos was adopted on 27 November 1980 on the protection of workers from the risks related to chemical, physical and biological agents at work (OJ L327 of 3/12/1980). This Directive also provides for an individual Directive to be drawn up on asbestos, which the Commission proposed to the Council on 26 September 1980 (OJ C262 of 9/10/1980). The Commission has also submitted to the Council a Proposal for a Council Directive relating to restrictions on the marketing and use of asbestos (OJ C78 of 28/3/1980).

As regards environmental protection the Commission is currently examining with national experts, a proposal for a convention with the asbestos industry on emissions from asbestos

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factories. The Commission is also continuing its studies and research on asbestos, as a back up to legislation. A study which has recently been completed contains a directory of hitherto unpublished studies on asbestos, together with a directory of research and documentation centres having an interest in asbestos.

Concerning the initiatives of the European Parliament and the Economic and Social Committee, Parliament expressed its opinion on asbestos in the form of a "Resolution on the health hazards of asbestos" which was adopted on 16 December 1977 (OJ C6 of 9/1/1978). The Economic and Social Committee gave its opinion on asbestos in a "Study on health and environmental hazards arising from the use of asbestos" which was adopted on 21-22 February 1979.

All of these initiatives have had as one of their main aims the reduction of exposure to asbestos, thereby reducing the risks of developing asbestos-related disease.

2:20pm

What Should Be the Rationale for Regulations on Asbestos?



SIMPSON, William J. (United Kingdom)
Chairman
Health and Safety Commission

Mr. Simpson has had a lifetime's experience in the occupational health and safety field. He was a member of the Flixborough Court of Inquiry and, since 1974, has been the Chairman of the Health and Safety Commission which is responsible for developing policy over the whole field of occupational health and safety in Great Britain. Also, he is the Chairman of the Advisory Committee on Asbestos and Vice-President of the Construction Health and Safety Group and of the Institute of Industrial Safety Officers. He is the author of the book "Labour, the Unions and the Party" published in 1973.

Abstract

The regulatory rationale must of course be commensurate with the dangers from asbestos fibres.

We know that asbestos is dangerous to health in certain circumstances and that some kinds of asbestos fibre are more dangerous than others. We know that cancer is the disease which kills some of those who are over-exposed but that other asbestos-related diseases can be disabling.

Substitution is an obvious consideration and this is dealt with separately in the Symposium.

Control limits: If asbestos is to continue in use then regulations would require control limits.

Again pertinent questions arise: a) What would be an acceptable control limit? b) How would it be counted and over what period of exposure? c) Do we need differing control limits for different fibres? d) Do we need a common international counting system? e) Is there a role for codes of practice for the methods of control? f) Is there a link to any other substance that would give guidance to what system of controls might be acceptable? g) Will the control philosophy for asbestos provide a charter for the control of all carcinogens?

General public: Although there is as yet no proven hazard to the general public in the ambient environment there are possible hazards in buildings to those involved and those in the vicinity of the demolition of premises, boiler houses, factories, etc. which have installations containing blue asbestos and chrysotile asbestos.

Other control measures may be apposite in such cases and also in respect of any goods such as "Do it yourself" articles sold to the consumer.

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2:40pm

Industry's Viewpoint



DUPÉRÉ, Jean (Canada)

Président

Lac d'Amiante du Québec, Ltée

Mr. Dupéré is President and Chief Executive Officer of Lac d'Amiante du Québec, Ltée, a major producer of asbestos fibre which operates two mines in the Thetford Mines region of the Province of Québec. He is also a member of the Canadian Bar and of the Québec Bar. He is the current President of the Québec Asbestos Mining Association and of the Institute of Occupational and Environmental Health, Chairman of the Health and Safety Committee of QAMA, and a director of the Institut de Recherche et de Développement sur l'Amiante and of the Mining Association of Canada.

Abstract

Government legislation and regulations must accurately reflect the present possibilities and limits of the safe use of asbestos. They must also take into account the progress made in developing new technology, tools and techniques, which has completely transformed the conditions under which asbestos is processed, handled, transported and used. These changes, connected with the elimination of friable products, now permit airborne emissions of asbestos fibres in the work environment to be minimized and also permit the emission of asbestos dust from products to be neutralized, thereby reducing health risks for both workers and users.

The establishment of standards and regulations for asbestos must be based on the most rigorous scientific data and subjected to periodic reviews that take into account the generally accepted results of scientific and medical research. Insofar as the optimal elimination of risks affecting health is the primary objective, the requirements applied to asbestos must be imposed with equal rigor on synthetic fibres and any other substitute product.

Efforts aimed at optimally reducing risks to the health of workers and users, within the limits of what is physically possible, must include the close and continuous cooperation of the main parties involved, namely, public administrative bodies, the scientific and medical communities, the workers and the industry in general.

At the same time, mechanisms for consultation and coordination must be introduced to encourage harmonization of international legislation and regulations governing asbestos and its use. In countries where such laws and regulations are not in effect, it is necessary to conduct an information and sensitization campaign with the appropriate authorities to encourage them to institute the same kind of standards and practices used in countries that already have laws and regulations governing the safe use of asbestos.

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2:55pm **Labour's Viewpoint**



MIRER, Franklin E. (United States)

Director
Health and Safety Department
UAW International Union

Dr. Mirer is Director of the Health and Safety Department of the United Automobile Workers International Union. He has been on the staff of the UAW since 1975 as an industrial hygienist. Dr. Mirer served on the ILO Panel of Experts on the Safe Use of Asbestos in Geneva, October 1981. Prior to coming to work for the UAW, Dr. Mirer was a Research Fellow in Toxicology at the Harvard School of Public Health. He holds a Ph.D. in Organic Chemistry from Harvard University.

Abstract

Not available at printing time

PANEL 7

3:10pm ***To What Extent are Regulations and Legislation in Accord with the Present Scientific Knowledge?***
and
What Should be the Pattern for Future Legislation and Regulations?

SAUVÉ, Robert (Canada), *Chairman*

GORSUCH, Anne M. (United States); HUNTER, William J. (CEC); SIMPSON, William J. (United Kingdom); DUPÉRÉ, Jean (Canada); MIRER, Franklin E. (United States)



JUTEAU, Laurier (Canada)

Professeur
Département du Génie minéral
École Polytechnique, Montréal

Mr. Juteau was an engineer in private industry before joining the teaching staff of Montréal's École Polytechnique, where he is now Professor in the Department of Mineral Engineering and was, for six years, Director of the Department of Mining Engineering. He has participated as expert and consultant in Canadian foreign missions and in several study committees, including the one instituted by the Québec government to look into the question of salubrity in the asbestos industry. Author of many technical reports in the field of mining, Mr. Juteau co-signed the report on the State of Research on Asbestos and the Modalities of its Development, commissioned by the QAMA to the Centre de développement technologique (technological development centre) of Montréal's École Polytechnique.



LAURENT, Jean-Luc (France)

Ingénieur des mines
Service de l'Environnement industriel
Ministère de l'Environnement

Mr. Laurent is Assistant Director for Industrial Environmental Services at the Ministry of the Environment in France. He is a graduate Mining Engineer and in his present capacity is primarily concerned with problems related to the prevention of industrial pollution by asbestos.

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POCCHIARI, Francesco (Italy)

Director General
Istituto Superiore di Sanità

Professor Pocchiari, who holds university degrees in Chemistry and Pharmacy, was involved for many years in research at the Laboratory of Biological Chemistry of the Istituto Superiore di Sanità and is currently Director General of this Institute. He is also an active member of many national and international committees and working groups in public health, including the European Medical Research Councils where he is the representative from Italy. Professor Pocchiari is also currently Vice-President of the European Science Foundation.



TRINK, Claude Emmanuel (France)

Ingénieur des mines
Service de l'Environnement industriel
Ministère de l'Environnement

A graduate of the École Polytechnique and a Mining Engineer, Mr. Trink has been since 1977 Assistant to the Chief of the Industrial Environmental Services at the Directorate for Pollution Prevention of the French Ministry of the Environment.

4:30pm ***Closing Remarks***

DUNNIGAN, Jacques (Canada)

Secretary General of the Symposium

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