Institute of Occupational and Environmental Health
Montréal, Canada

THE RESEARCH PROJECTS SUPPORTED BY
IOEH
AND THE SCIENTIFIC PUBLICATIONS ORIGINATING FROM THEM

1966 — 1976

Montréal, December 1976

Institute of Occupational and Environmental Health
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1968 - 1976

The Institute of Occupational and Environmental Health was established by the Quebec Asbestos Mining Association in 1966 with the objective of assessing the biological effect of asbestos on the health of the asbestos workers.

The Quebec Asbestos Mining Association has in the past done its share in the field of industrial health and hygiene. The concern of the Quebec asbestos mining companies as to the health of the worker in the chrysotile mining industry included the development and maintenance of preventive industrial measures and the provision of adequate medical services through organized industrial clinics. These were established in the early thirties in Asbestos and in the mid-forties in Thetford Mines and were supported by such consultants and advisors as the Trudeau Laboratory (Saranac Lake, N.Y.) directed by Dr. Leroy U. Gardner, an eminent pathologist and industrial health pioneer, Professor Anthony J. Lanza (New York University) and Professor J. A. Vidal, a Canadian pneumologist.

It was nevertheless becoming evident that new health problems were mounting and this to a point that only the implementation of an adequate long range scientific research program could bring light to the question.Such a research program had to be planned and evolved so that the needed points of comparison all over the world would be investigated, true as it is that asbestos fibre is reaching now into so many varieties of uses and commodities and at the same time becoming more and more of strategic, if not of essential, value to humanity.

Accordingly the QAMA decided it should carry a substantial share of this responsibility and devote much of its resources, time and energy in that direction, being convinced of the vital importance of devising means of eliminating asbestos related health risks not only to persons engaged in the mining of asbestos, but also in the manufacture or use of asbestos containing products.

For this purpose it was necessary to enlist a competent team of research people to investigate, advise, recommend and set in motion a plan of scientific research worldwide in scope. This ambitious scheme has over the past ten years been pursue with the guidance of the Institute of Occupational and Environmental Health and with the objective councelling of its Scientific Committee under the vigorous and enlightened direction of Dr. George Wright, an authority in the field of pulmonary physiology and in occupational pulmonary diseases.

Quebec Asbestos Mining Association.

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and
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PREFACE

George W. Wright, M.D.
Chairman of IOEH Scientific Committee

Preface

The Scientific Committee of the IOEH assumed as its first task in 1966 a survey of (1) what was known about the relationship between occupational, paraoccupational and public exposure to respirable asbestos fibers and the subsequent health of those exposed, (2) what was known concerning the biological effects of asbestos fiber in animal or cell systems, (3) contemporary information about the qualitative and quantitative aspects of ambient air exposures in the workplace. The various publications making up this body of information formed the nucleus of a library of scientific references which has steadily been added to over the ensuing years as new information has become available. This effort, under the able direction of Dr. Premysl Pelnar, the Committee Secretary, has been of inestimable help to us as well as to scientists in all parts of the world who have availed themselves of this source of information. This function is currently recognized by many as a major accomplishment of the IOEH.

On the basis of their own broad experiences with respect to the biological effects of inhaled dusts of various kinds including asbestos, plus the information gleaned from the surveys just mentioned, the original members of the committee met several times over a brief period to define the areas where additional knowledge needed to be developed to produce a more complete understanding of the intricacies of the total problem. These areas were categorized in a broad fashion along these lines. Studies to (1) determine the nature of the biological effects of respirable asbestos under varying conditions of exposure such as those of mining, milling, manufacture and consumer use, (2) arrive at a better understanding of the mechanisms for the biological action of fibers including the facts with respect to deposition, clearance, migration and ultimate fate of inhaled fibers, (3) delineate as accurately as possible the past and current ambient air concentrations of respirable asbestos and coexisting agents to which persons were exposed, (4) evaluate the validity and accuracy of the methods being used in research germane to the above studies and (5) to develop new methods where appropriate.

The ultimate and overriding aim of investigations along these various lines was to provide information bearing on prevention of adverse health effects during the production and use of asbestos and to discover, if possible, means for preventing or minimizing these in persons exposed in the past.

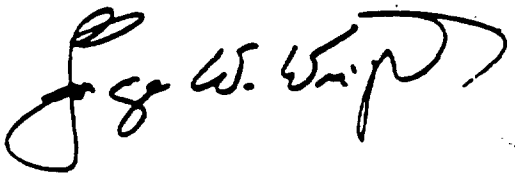
The several months spent in this pursuit was not with the belief that we could support research in all these avenues in a meaningful way. The magnitude of that task could be seen to be enormous and the desired pace of accomplishment beyond the abilities of any one group. Fortunately, other agencies in commerce, government and academia in several parts of the world were, and continue to be, engaged in these manifold pursuits. It was our hope however that the committee's efforts in those first few months would enhance the probability that the resources available to us would be used as economically and expeditiously as possible.

Over the ensuing years, somewhat to our surprise though not wholly unanticipated, it became clear that the multiplicity of specific avenues for research readily recognized by our committee actually exceeded the availability of interested, competent and experienced research personnel and facilities. In spite of these logistic problems, not confined to the experience of our committee, progress has been made. Considering the technical difficulties involved in the pursuit of research in this field, almost insurmountable in some instances, our committee believes a good yield has been forthcoming from the research supported by the IOEH.

A major step forward has been the acquisition of diverse information developed under this and various other programs underway in laboratories throughout the world, to support strongly a conviction that the various health effects of respirable asbestos are dose related, diminishing in severity or frequency with lesser dose. Hence, reduction of total exposure to respirable asbestos lowers the risk and there is reason to believe that an ambient air level tolerable with no excess risk is an achievable goal.

Much remains to be done, the bulk of it requiring long periods of study. During the past eight to ten years exposure data more meaningful in qualitative and quantitative terms have become available. These data plus ongoing measurement of ambient air fiber concentrations and further monitoring of health effects will provide answers in ensuing years to some of the now vexing problems. New technical approaches to estimating past exposures may give us a better understanding of the relationship between currently recognizable health effects and the exposures responsible for them. New techniques of animal and cell system models might be used to arrive at a more complete understanding of the mechanisms of biological effects of fibers. These should be applied. Our committee is of the firm belief that additional studies are very much worthwhile and should be pursued with vigor.

The Scientific Committee takes this opportunity to express appreciation to those individuals and groups who have pursued the research programs set forth in this volume. They have achieved! We also wish to indicate a sincere recognition of the unstinted support from the Executive Committee of the IOEH. Those research programs recommended for initiation by the Scientific Committee without exception have been supported by the Executive Committee.



George W. Wright, M.D.

Survey of the research projects supported by IOEH and of the scientific publications originating from them

1966 — 1976

The Institute of Occupational and Environmental Health IOEH in Montréal was founded in 1966. To the end of 1976 29 research projects was accepted by its Scientific Committee and by its Executive Committee and supported through IOEH by QAMA.* A further 17 proposals for research projects were also processed by IOEH but not recommended for support by Scientific Committee. Four projects which were accepted were later cancelled for various reasons not related to IOEH.

The projects accepted and supported can be divided into the following groups of practical interest :

I. **Studies of comparable epidemiologic experience in the mines** of chrysotile in Canada (projects #1, #10, #27)
of chrysotile in Italy (project #5)
of anthophyllite in Finland (project #7)

II. **Studies of epidemiologic experience in asbestos cement factories**
(projects #8, #16, #25)
and shipyards
(project #5)

III. **Studies of the epidemiology of mesothelioma among the general population**
(projects #2, #19).

IV. **Studies of the physico-chemical state and transformation of fibres during technological steps** from mining to application of products and study of relation thereof to health experience of the exposed workers and to control of dustiness
(projects #3, #11, #15, #18, #22, #23, #26).

V. **Studies of fibre dynamics within the body and of mechanisms of the biological effects of asbestos**
(projects #6, #12, #14, #17, #21, #28, #29).

VI. **Study of specificity of pulmonary rales as early sign of asbestosis.**
(project #24).

In October 1973 IOEH organized an international conference of invited experts on "Fibres for Biological Experiments" in Montréal. Full Proceedings were published as a monograph under the same name by IOEH.

* Québec Asbestos Mining Association

Up to December 1976, 105 scientific articles and books were published which originated from the research projects supported by QAMA or originated from activities organized by IOEH. These publications represent an important portion of the scientific literature on biological effects of asbestos and by their number and high standard indeed contribute a great deal to the current knowledge of the subject.

We present a comprehensive survey of the research projects accepted and supported by QAMA. In them we show the title of the project, the name of the principal investigator, the approved cost and a brief description of the investigation, followed by a list of published documents generated by the project; most of these documents are shown as a copy of IOEH filing cards which contain also a summary and code numbers. The coding system developed by IOEH is attached.

It should be mentioned that a large number of scientific papers resulting from our projects were presented at conferences and some papers are currently in press. These also contributed to the objective scientific knowledge of the subject but they were not included in the present survey.

Premysl V. Pelnar, M.D.
Scientific Secretary

CONTENTS

PROJECT No. 1

[redacted]

Project No. 1

Epidemiological survey of the biological effects of asbestos

OBJECTIVES :

All employees of asbestos mines in Québec to be recorded and ex-employees traced. A random sample of current employees to be examined by a questionnaire and by a series of pulmonary function tests. The latest x-rays of all employees to be reread. The past dust exposure for all employees to be assessed. The mutual relations between exposure to dust, symptoms, radiological changes of the lungs and the impairment of respiratory function to be examined. The cause of death of those who died to be traced and correlated with dust exposure.

Cost : $230,000.

Dr. J. C. McDonald, M.D.,
Department of Epidemiology and Health,
McGill University,
Montréal

(Continued as IOEH #10)

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				2832

DOCUMENT TITLE: BECKLAKE M.R., FOURNIER-MASSEY G.G., McDONALD J.C. & ROSSITER C.E.: LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Relationship of functional to radiographic	
12	changes in Quebec asbestos workers.	
13	Paper presented at Dresden Conference,	
30	Biologische Wirkungen des Asbestes, 1968.	
43	Proceedings published 1973, pp. 207-214.	
60		
70		
81		

1. 842 men from an age-stratified random sample of current employees in the Quebec asbestos mining industry were studied radiologically and by lung function tests.
2. Men with definite but early radiological evidence of asbestosis showed reduction in lung volume and expiratory air flow and of gas diffusion.
3. There was a close correlation between profusion of small irregular radiological opacities and degree of functional impairment. The group with minimal radiological changes showed highly significant differences from the normal group.
4. Diffuse pleural thickening, alone or with accompanying parenchymal changes, was associated with definite loss of function, specially of expiratory flow rates.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3154

DOCUMENT TITLE: Becklake, M.R.; Fournier-Massey, G.G.; McDonald, J.C.; LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC Siemiatycki, J.; & Rossiter	NOTES Rossiter, C.E.
12	Lung Function in relation to radiographic	
13	changes in Quebec Asbestos Workers.	
43	Lecture at International Conference	
60	on Pneumoconiosis, Johannesburg, S.A.	
70	April 23-May, 1969. Proceedings, , pp. 233-239.1970	
81	PUBLISHED IN: Bulletin de physio-pathologie respiratoire, 6 (3): 637-659, Juillet-Septembre 1970	

The relationship between chest x-ray changes and pulmonary function was examined in an age stratified random sample of 1,069 men currently employed in the asbestos industry of Eastern Quebec. In workers whose x-rays showed as yet no evidence whatever of parenchymal disease, vital capacity (VC) and forced vital capacity (FVC) may have been slightly reduced, while in the presence of definite, though minimal, x-ray changes in the pulmonary parenchyma these were the only function measurements to show significant reduction. In addition, VC and exercise minute ventilation appeared to be the most sensitive indicators of the progress of radiological disease. For any given grade of parenchymal disease function was somewhat more impaired when pleural thickening and/or calcification was present. This study suggests that the simple measurement of VC or FVC should therefore be of value in the periodic health examination of the asbestos worker.

pleural at. TAEH 3657

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3657

DOCUMENT TITLE: Becklake, Margaret R., Fournier-Massey, Gisèle, Rossiter, Charles E. & McDonald, J. Corbett

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Lung function in chrysotile asbestos mine	
2	and mill of workers of Quebec.	
8	Archiv. Environ. Health, 24 (6): 401-409, June 1972.	
13	(very similar to IOEH 3154, Ref Book III-D-III)	
43		
60		
70		
81		

Lung function tests were carried out on an age-stratified random sample of 1,015 Quebec asbestos workers whose dust exposure had been estimated from their work history and available dust levels in the industry. In nonsmokers, several function tests distinguished the lower two dust-exposure groups. These were inspiratory capacity, forced vital capacity, and forced expiratory volume in 0.75 second and in 1.0 second. In smokers the same tests were somewhat less sensitive. Any of the tests mentioned appear to be suitable for health surveillance of asbestos-exposed workers, whatever their smoking habits.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				174

DOCUMENT TITLE: Biological effects of asbestos: (Lyon)

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
90	Report of the Advisory Committee on Asbestos cancers to the	
	Director of the International Agency for Research on Cancer.	
	Lyon Conference, Oct. 5 & 6, 1972.	
	Ann. Occup. Hyg. 16 (1): 9-17, 1973 circulated.	
	Also published in Brit. J. Industr. Med. 30 (2):180-186, 1973,	
	IAC booklet, 8 pp. 1973,	
	J-M - Environmental Facts/Asbestos, 7 pp. 1973.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3622
DOCUMENT TITLE	Ducić, S.:			LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
36	Accuracy of causes of death - A comparison with autopsy diagnoses	
37	in series of mesotheliomas and other malignant tumours of the lung.	
38	(L'exactitude des causes de décès - Une comparaison avec les dia-	
73	gnostics à l'autopsie dans une série de mésothéliomes et autres	
70	tumeurs malignes du poumon). COMPLETE TEXTS IN FRENCH & ENGLISH)	
81	Cdn. J. of Public Health, 62: 395-402, Sept/Oct. 1971.	
39		

Summary and conclusions

In a series of 67 autopsy and surgical-pathological diagnoses of malignant mesotheliomas of the pleura and peritoneum, we were able to demonstrate agreement with the certified cause of death in 10 cases (14.7%). In 26, mesothelioma was reported as benign or, even if stated correctly, coded as another tumour. In 31, the real diagnosis and the official cause of death were in disagreement.

Of 56 autopsy cases of primary lung cancer and of 59 metastatic lung tumours, there was agreement with the death certificate in 73.2% and 72.0% of cases respectively, but there were marked discrepancies in a total of 21 (18.1%) cases.

Physicians signing death certificates did not state whether there had been autopsy in 26% cases of mesothelioma and in 14.2% cases of primary and secondary lung tumours.

Disagreements on the diagnosis of mesothelioma shown on a death certificate result not only from the difficulties in making the clinical or pathological diagnosis itself, but because of the lack of unanimity among those issuing certificates of the cause of death as regards the bening or malignant nature of the tumour.

Finally, with the 8th revision of the International Classification of Diseases - especially with the adapted ICDA-8 - we can expect that at least some of the discrepancies will disappear because due to purely medical problems an accurate notification of death from mesothelioma is still difficult.

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				163

DOCUMENT TITLE: Fournier-Massey, Gisèle:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13	THESIS: Pulmonary function in Québec	
70	asbestos workers.	
32	McGill Univ., 168 pp. 1973	
81	CIRCULATED: pp. 105-106 & pp. I-II.	

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3362

DOCUMENT TITLE: Fournier-Massey, Gisèle; Becklake, Margaret, R. et al.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13	II. - Epreuves de fonction respiratoire.	
12	Bulletin de Physio-pathologie respiratoire,	
70	6 (3):661-667, 1970.	
60	(II. - Appendix: Tests of respiratory function)	
76	See also 3154)	
81		

GIBBS, G. W.: Comments on standard international methods for evaluation of asbestos dust exposure.
Pernis, B. and Peinar, P.:
Transcript of the Meeting of the Sub-Committee and International Colloquium on Asbestosis, Sardinia, September 24-26, 1970, Montréal 1972, pp. 18, 19, 20.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3507

DOCUMENT TITLE: Gibbs, Graham W. & Lachance, Maurice:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
2	Dust exposure in the chrysotile asbestos	
3	mines and mills of Quebec.	
4	Archiv Environ Health 24: 189-197,	
59	March 1972.	
60		
76	Past and present features in the Quebec chryso-	
81	tile mining and milling environment and methods	
43	used to establish indices of exposure for epidemio-	
53	logical studies are described. Environmental dust	
	concentrations used for calculation of dust exposure	
	indices were derived mainly from systematic midget-	
	impinger samples taken since 1948, and from field	
	surveys made in 1968, using impinger and a vari-	
	ety of other techniques. Though dust levels within	
	the industry fluctuated widely, there was a steady	
	fall from an average of approximately 75 million	
	particles per cubic foot (MPCF) in 1949 to less	
	than 10 MPCF in 1968. Considerable variation in	
	the fiber content of airborne dust in this industry	
	suggests that any safety standard should probably	
	take account of fibrous and nonfibrous components.	

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3918

DOCUMENT TITLE: Gibbs, Graham William & Lachance, Maurice:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Dust-fiber relationships in the Quebec	
2	chrysotile industry.	
3	Arch Environ Health, 28 (2):69-71, Feb. 1974	
69		
76		
81	Epidemiological studies of Quebec	
	chrysotile miners and millers have related	
	various indices of health to dust expo-	
	sure, as measured with the midget im-	
	pinger. The interpretation of these rela-	
	tionships in terms of fiber necessitates	
	the conversion of midget impinger (par-	
	ticle + fiber) counts to membrane filter	
	(fiber) equivalents. An investigation in	
	which 87 side-by-side midget impinger-	
	membrane filter samples were taken at	
	five mines and mills showed that the cor-	
	relation was poor and no single conver-	
	sion factor was justified. Until more de-	
	tailed information on the relationships	
	between midget impinger and membrane	
	filter counts can be obtained, it is recom-	
	mended that safety standards, at least in	
	this industry, should continue to be based	
	on dust counts, for which there is consid-	
	erable epidemiological support, rather	
	than on fiber counts, for which there is no	
	direct evidence.	

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				181

DOCUMENT TITLE: ILO U/C 1971 Internat. Classification, etc.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
12 76	ILO U/C International Classification of Radiographs of the Pneumoconioses. Medical Radiography and Photography, 48 (3): 67-112, 1972. (Published in English, French, German). Circulated: English version pp. 66-76; plus pp. 83-93 & p. 105.	

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				3570

DOCUMENT TITLE: Jodoin, Gilles, Gibbs, G.W., Macklem, P.T., McDonald, J.C. & Becklake, Margaret R.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13 71 76 81	Early effects of asbestos exposure on lung function. Amer. Review of Respiratory Disease, 104 (4): 525-535, Oct. 1971	

In an attempt to define the early effects of asbestos exposure on lung function, detailed studies, including tests of pulmonary mechanics, were made on 24 workers who had normal chest radiographs but whose exposure to asbestos ranged from 6 months to 24 years. The 13 men with greater exposure showed, on the average, a significant 30 per cent increase in the static recoil of the lung when compared with the 11 men with the lesser exposure. In addition, they had smaller vital capacities, evidence of greater regional inhomogeneities of ventilation, and larger maximal mid-expiratory flows, changes in keeping with the presence of a restrictive type of lung disease. By contrast, at any given transpulmonary pressure, peak flow was less in most of the men in the more exposed group, indicating an increased upstream resistance. This suggests that the changes responsible for the increased elastic recoil had a peribronchiolar rather than an alveolar location, in keeping with what has been shown in laboratory animals. The changes in pulmonary mechanics were considered to be early because they occurred in men who had no radiographic evidence of disease or definitive changes in other measurements of lung function. The findings suggest that exposure to asbestos dust is another cause of obstructive disease of small airways.

INDEX/TRACING CARD

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				1139

DOCUMENT TITLE: * McDonald, J.C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70	Research on Asbestos and Health:	
10	A progress Report to Employers and	
36	Employees of the Quebec Asbestos	
38	Mining Industry.	
43	McGill Reporter, 2 (24): p. 18, 10 April 1970	
60		(see IOEH 3234)
81		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3497

DOCUMENT TITLE: * McDonald, J.C.; Becklake, Margaret; Fournier-Massey, Gisèle & Rossiter, C.

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
2	Respiratory symptoms in chrysotile	
11	asbestos mine and mill workers in Quebec	
15		
60	PUBLISHED: Arch Environ Health,	
70	24 (5): 358-363, May 1972	
81		

A standard questionnaire was administered to an age-stratified random sample of 1015 current male employees in the Quebec asbestos mines and mills. The prevalence of bronchitis, defined as persistent cough and phlegm, was related most closely to age and smoking habits but, in non-smokers and light smokers, also to dust exposure. Breathlessness on exercise was related to age and dust exposure but not to smoking.

INDEX TRACING CARD

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				3926

DOCUMENT TITLE: McDonald, J.C.; Gibbs, G.W.; Manfreda, J. & White, F.M.M.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
20	Storage as a factor in disease due to	
25	mineral dusts.	
36	Multiple Factors in the Causation of	
38	Environmentally Induced Disease. -	
40	Chapter 12: 185-201, 1972. (Ed.: DHK Lee/P. Korin, Academic Press)	
50		
81		

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				3042

DOCUMENT TITLE: McDONALD J.C., McDONALD Alison, GIBBS G.W., SIEMIATYCKI J.& ROSSITER C.E.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
2	Mortality in the chrysotile asbestos	
3	mines and mills of Quebec.	
20	Arch Environ Health, 22: 677-686,	
36	June 1971.	
37		
38	Of 11,788 persons born between 1891 and 1920	
43	employed in the Quebec asbestos mining indus-	
60	try, 88.4% were traced. Of these 2,467 (23.6%)	
70	had died. Exposure indexes for each worker were	
81	calculated from job dust levels and duration of	
	employment. The overall mortality was lower than	
	expected for the population of Quebec but in	
	the highest dust category, comprising 5% of the	
	cohort, the age-standardized rate was 28% higher	
	than in the other groups. Respiratory, cardiovas-	
	cular, and malignant disease in equal proportions	
	accounted for the excess. There were 101 deaths	
	from respiratory cancer including three from ma-	
	lignant mesotheliomas, an estimated excess of	
	about 15 deaths. The difference in rates for re-	
	spiratory cancer between those maximally and	
	minimally exposed was fivefold and, though per-	
	haps exaggerated, was apparently determined by	
	accumulated dust exposure and duration of em-	
	ployment.	

INDEX TRACING CARD

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DOCUMENT TITLE * McDonald, J.C.; Rossiter, C.E.: Eyssen, G. & McDonald, A.D.: | LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Mortality in the chrysotile producing	
36	industry of Quebec: A progress report.	
38	Lecture at IV Internat. Conference on	
43	Pneumoconiosis, Sept. 1971 in Bucharest,	
60	pp. 232-237 in Proceedings.	
70		
81		

From the records of all persons ever employed in the Quebec asbestos mines and mills for one month or more a cohort of 11,111 men and 468 women, born 1891—1920, was defined and is being kept under close review. Environmental dust counts and detailed occupational histories have been used to calculate indices of exposure for each employee. At the end of 1969, 3,228 (28 per cent) were known to have died, 125 from lung cancer, 5 from malignant mesothelioma and 32 from pneumoconiosis.
Total mortality continues to be lower than expected from the general population except in a small proportion heavily exposed to dust. Pulmonary fibrosis and respiratory malignancies are the main cause of this excess which seems directly related to the indices of exposure. The implications of these findings and their relation to those observed under other conditions of asbestos exposure will be discussed.

DATE | INDEXED BY | ENTERED BY | PAGE OF | DOCUMENT NO. 3484

DOCUMENT TITLE ROSSITER C.E., BRISTOL L.J., CARTIER P.H., GIBBS G.W., GILSON J., GRAINGER T.R., | LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC SIEMIATYZCKI J.,	SCOPE NOTES SLUIS-CREMER G.K. & McDONALD J.C.:
0	Dust exposure and radiographic appearances	
2	in Quebec asbestos workers.	
12	Lecture XVI Internat. Congress Occup.	
30	Health, Tokio, Sept. 1969. In Proceedings	
31	1971, pp. 205-206.	
70		
81		

In the Quebec asbestos-producing industry dust measurements and annual chest radiographs of employees are available for many years. The estimated exposure for each of 15,000 workers has been related to changes seen in their radiographs using the UICC/Cincinnati classification. There is a clear relation between exposure and the profusion of irregular small opacities. The degree and distribution of pleural thickening are also associated with exposure. Calcified pleural plaques are linked with employment in one particular area but are virtually absent elsewhere.

DATE | INDEXED BY | EDITED BY | PAGE OF | DOCUMENT NO. 3511

DOCUMENT TITLE: ROSSITER C.E., BRISTOL L.J., CARTIER, P.H., GILSON J.G., GRAINGER T.R., SUITS-CREMER G.K. & MCDONALD J.C.:

LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Radiographic changes in chrysotile	
2	asbestos mine and mill workers of Quebec.	
12	Arch Environ Health, 24 (6): 388-400,	
30	June 1972.	
31		
43		
60		
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81		

Radiographic changes in 13,021 employees were assessed in 6,528 men aged 36 to 65. The prevalence of rounded small opacities (category 1/0 or more) rose with increasing dust exposure from 0.5% to 3.4%; that of irregular small opacities (category 1/0 or more), from 2.2% to 17.0%; and that of pleural thickening (grade 1 or more), from 1.4% to 12.3%. Small opacities or pleural changes were seen in 17% of men, but 3.2% had both. At present dust exposure levels, much lower rates can be expected. The prevalence of radiologic changes was higher in the Thetford Mines area than in the Asbestos area. This was shown by pleural changes more than parenchymal changes, and the difference was extreme with pleural calcification which was common in Thetford Mines but virtually absent in Asbestos.

DATE | INDEXED BY | EDITED BY | PAGE OF | DOCUMENT NO. 3607

DOCUMENT TITLE: Sub-Committee on Asbestosis: Work Group of 7 on Airborne Measurements

LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
2	Evaluation of asbestos exposure in the	
3	Working Environment.	
76	Industrial Medicine & Surgery, 41 (1):	
	28-30, January 1972.	
	SUMMARY: A working group of Sub-Committee on	
	Asbestosis presents its international	
	agreement on standard methods.	
	Also published in: Work-Environment-Health, 8(3):71-73, 1971.	
	" " " J. Occup. Health, 14 (7): 560-562, July 1972.	
	" " " La Medicina del Lavoro, 63 (1-2): 1-6,1972.	
	" " " Gigiena i Sanitaria @ 2: 76-79, 1973.	
	" " " Medicina de Empresa 8(3); 248-251,Oct. 1973.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO 3490
DOCUMENT TITLE	UICC (Working Group):			LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
12 69 76	UICC/Cincinnati classification of radiographic appearances of pneumoconiosis. Lecture XVI Internat. Congress Occup. Health, Tokyo, Sept. 1969. pp. 179-181, Proceedings 1971.	

Bohlig, H., Bristol, L. J., Cartier, P., Clarke, W. G., Felson, B., Gilson, J. C., Grainger, T. R., Jacobson, G., Kivuolota, R., McDonald, J. C., Pendergrass, E. P., Rossiter, C. E., Selikoff, I. J. & Sluis-Cremer, G. K., McGill University, Montreal, Canada

Three interested international groups have extended the ILO 1958 Classification by differentiating between the small rounded opacities frequently seen in mineral pneumoconiosis and the small irregular opacities seen in asbestosis and some other pneumoconiosis. The other main extension is the grading, by reference to standard films, of pleural changes. The practicability has been confirmed in 42,000 readings of over 15,000 radiographs from the Quebec asbestos industry. Twelve readers from six countries have also tested the classification on 100 radiographs. Inter- and intra-observer variabilities are similar to those in trials using the ILO Classification.

INDEX TRACING CARD

PROJECT No. 2

Project No. 2

Epidemiological study of primary malignant tumours of the pleura and peritoneum in Canada

OBJECTIVES :

All cases of primary malignant tumours of the pleura and peritoneum that occurred in Canada since 1960 to be registered and two matching control series to be found, one series comprising patients with secondary malignant disease of the lung. Relative importance of previous exposures to 1) asbestos at home and at work, 2) other environmental carcinogen, 3) tobacco smoke to be investigated in the epidemiology of mesothelioma.

Cost $6,940.

Dr. J. C. McDonald, M.D.,
Department of Epidemiology and Health,
McGill University,
Montréal.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO. 3734
DOCUMENT TITLE: Magner, Desmond & McDonald, Alison D.:				LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
38	Malignant mesothelial tumors -	
0	histologic type and asbestos exposure.	
1	New England J. Med., 287 (11): 570-571,	
73	Sept. 14/72	
60	Also published in: Annals of the	
61	Royal College of Physicians and	
63	Surgeons of Canada, 6p. 58, 1973.	
70		
81		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO. 3824
DOCUMENT TITLE: McDonald, Alison D., Magner, Desmond & Eyssen, Gail:				LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
38	Primary malignant mesothelial tumors in Canada, 1960-1968.	
70	A pathologic review by the mesothelioma panel of the	
73	Canadian Tumor Reference Centre.	
81	Cancer, 31 (4): 869-876, April 1973.	

Six pathologists reviewed 119 of 165 cases reported as primary malignant mesothelial tumors, between 1960 and 1968, in a Canadian national survey. Based on histologic observations only, the panel was in favor of the diagnosis in 50%, uncertain in 14%, and against in 36%. This distribution was similar for pleural and peritoneal tumors. In males, the diagnosis was favored more often than in females—61% compared to 26%. Clinical and additional pathologic information changed the pathologists' opinion little. A member of the UK Mesothelioma Panel who reviewed 44 of the 119 cases recorded essentially similar opinions. Subsequently, a further 71 cases were registered between 1968 and 1970, and reviewed pathologically. The 99 cases in all, in which the panel favored the diagnosis of malignant mesothelioma, had been exposed to asbestos slightly more frequently than the rest. Twelve of 26 (46%) tumors classified histologically as mixed were associated with asbestos exposure compared with 8 of 73 (11%) classified as epithelial or mesenchymal.

INDEX/TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE	OF	DOCUMENT NO. 3879

DOCUMENT TITLE: McDonald, Alison D. & McDonald, J. Corbett:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
38	Epidemiologic surveillance of mesothelioma	
70	in Canada.	
73	Cdn. Med. Ass'n J. 109 (5): 359-362, Sept. 1,1973	
0		
1	Summary: The number of fatal malignant mesotheliomas was ascertained for the period 1960-70 by contacting all pathologists in Canada. The annual incidence was steady between 1966 and 1970 at 1.4 per million population. Of 71 cases registered in 1968-70 and not previously reported, 66% were pleural, 24% peritoneal and the remainder in both sites; 45% of tumours were in women. The diagnosis of mesothelioma was approved by the Canadian Mesothelioma Panel in 59%. Sixty-nine cases were successfully investigated epidemiologically. A history of definite or probable occupational asbestos exposure was found in 30% of male cases compared with 11% of controls, but in none of the female cases or controls. However, among cases, four women and one man had had domestic exposure to dusty clothing of an asbestos worker. Most of the excess occupational exposure was in the manufacture of asbestos products or insulation and little in mining or milling. No case other than those occupationally or domestically exposed had lived within 20 miles of asbestos mines or mills.	
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DATE	INDEXED BY	EDITED BY	PAGE	OF	DOCUMENT NO. 3155

DOCUMENT TITLE: McDonald, A.D.; Harper, A.; El Attar, O.A. & McDonald, J.C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Epidemiology of primary malignant	
1	mesothelial tumours in Canada.	
38	Lecture at International Conference	
36	on Pneumoconiosis, Johannesburg, S.A.	
60	April 23 - May 2, 1969.	
61		
62	Summary of Results: An association with definite or probable	
63	occupational exposure to asbestos was clearly demonstrated, but	
8	only 20% of male cases and one female case had any such contact.	
70	Almost all the excess was in the manufacture and industrial applicati	
81	of asbestos rather than in mining or milling. No association was found with lesser degrees of occupational exposure or residence in asbestos-mining areas, but there was a small excess of possible domestic exposures. The smoking histories in the mesothelial tumour and main control groups were almost identical and unlike those for cases of primary lung cancer.	

PUBLISHED IN: Cancer, 26 (4): 914-919; October 1970.
PROCEEDINGS Internat.Conf. Pneumoconiosis, pp. 197-203, published 1970 (received 1971).

PROJECT No. 3

Project No. 3

Chemical and mineralogical studies of chrysotile asbestos with particular reference to oils and waxes

OBJECTIVES :

Samples of rock and dust to be collected in a carefully controlled manner, pulverized and extracted with organic solvents. The extracts to be examined for polycylic hydrocarbons and other chemical constituents. The aim is to investigate their presence prior to any processing of the rock.

Cost : $17,750.

Dr. J. C. Mcdonald, M.D. &
Dr. G. W. Gibbs, Ph.D.,
Department of Epidemiology and Health,
McGill University,
Montréal.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3236

DOCUMENT TITLE: -Commins, B.T. & Gibbs, G.W.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
8	Contaminating organic material in	
43	asbestos.	
81	The British J. of Cancer, XXIII:358-362,	
82	1969.	

Summary: "Evidence is presented that shows that asbestos contains organic material, some of which arises by contamination when the fibre has been stored in bags made of polythene. The contamination comprises not only the constituents of polythene, but also some of their oxidation products formed when they make contact with asbestos. Some of these products have been identified. It is known that organic material extracted from asbestos is weakly carcinogenic; it is not known however whether the oxidation products of some constituents of polythene are carcinogenic, but the implications of this finding are discussed."

BIV.April 1970

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3040

DOCUMENT TITLE: * Gibbs, Graham:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
	Some Problems Associated with the	
	Storage of Asbestos in Polyethylene	
8	Bags.	
43	McGill Univ. Dept. Epidemiology & Hlth	
81	Ref.Letter to Dr. G.W.W. July 26,1968	
	Published in Amer. Ind. Hy. Ass'n J.	
	30(5): 458-464, Sept. Oct. 1969	

* Samples of milled Canadian chrysotile asbestos, collected and stored in polyethylene bags, were found on extraction with benzene to yield oils in substantially greater quantity and with at least one different constituent from those collected and stored in glass jars. The constituent isolated from the asbestos collected in certain polyethylene bags is yellow and shows a strong absorption band at 421 mμ. Extracts of polyethylene bags do not contain this compound, but the compound is formed on the introduction of asbestos into the bag. The relevance to sample collection for subsequent organic analysis and to animal experiments for tests of carcinogenic activity of samples of asbestos and other substances is discussed.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3402

DOCUMENT TITLE: * Gibbs, G.W.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Qualitative aspects of dust exposure	
2	in the Quebec asbestos mining and milling	
5	industry.	
6	___. - 3rd Symposium on Inhaled Particles,	
7	BaO.H.S. London, Sept. 1970	
8	Proceedings published 1971, pp. 783-799.	
43		
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ABSTRACT - Recent epidemiological studies of workers employed in the Quebec asbestos mining and milling industry have described relationships between dust exposure and indices of health. The quality as well as the quantity of dust to which workers are exposed varies within and between mining operations. This report describes some of these qualitative factors, with particular reference to organic constituents, trace metals, dust mineralogy and radioactivity. Levels of airborne polycyclic aromatic hydrocarbons in mills, and levels of radon daughters in underground mines are both considered too low to play any significant role in the lung cancer mortality in this industry. The trace metal content of commercial fibre varies between mines and airborne trace metal concentrations in three mills investigated were found to exceed levels reported for textile plants. The importance of dust chemistry, physics, and mineralogy in experimental and epidemiological studies of the effects of asbestos is discussed.

D-1

INDEX, TRACING CARD

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3459

DOCUMENT TITLE: Gibbs, Graham W.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
8	Asbestos fibre contamination by storage in	
81	polyethylene bags.	
	Internat. Conf. Pneumoconiosis, Johannesburg,	
	April 23 - May 2, 1969.	
	PROCEEDINGS, pp. 165-169, 1970	
	(no summary).	

DATE	INDEXED BY	EDITED BY	PAGE	OF	DOCUMENT NO.
	A				3410

DOCUMENT TITLE: Gibbs, G.W.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
8	Collection and storage of samples in	
56	organic geochemistry.	
76	Geochimica et Cosmochimica Acta.	
81	34: 629-630. 1970	

DATE	INDEXED BY	EDITED BY	PAGE	OF	DOCUMENT NO.
					3508

DOCUMENT TITLE: Gibbs, G.W. & Hui, Hubert Y.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
5	The organic content of Canadian chrysotile.	
7	American Industrial Hy. Ass. J. 32 (8): 519-528. Aug. 1971	
60		
81		
43		

The organic content of commercially milled Canadian chrysotile was found to range from 8.5 to 20.0 mg per 100 gm, depending on the source and grade of fiber. These yields exceeded those from field specimens in all cases except one, and indicated contamination by mining and milling processes. An elemental analysis showed the organic extracts to contain carbon (81.94 to 86.03%), hydrogen (11.47 to 13.14%), and minor amounts of other elements. Infrared and gas chromatographic examination confirmed n-alkanes to be the major constituents. The concentration of polycyclic aromatic hydrocarbons in milled fiber was considered too low to play an important role in carcinogenesis. The importance and sources of n-alkanes and total organic contamination are discussed.

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
56		
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INDEX, TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO 3509
DOCUMENT TITLE	* Gibbs, Graham W.:			LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
43	Gibbs, Graham W.:	
0	The organic geochemistry of chrysotile	
5	asbestos from the Eastern Townships, Quebec	
7	published in Geochim	
60	Cosmochim Acta. 35(485-502) 1971	
50	(see also #24 Thesis)	
81		

Extractions of selected specimens of chrysotile from the Eastern Townships of Quebec yielded small quantities of organic material. Infrared and gas chromatographic studies indicate the presence of predominantly n-alkanes. These were probably derived by distillation from Precambrian sediments although a magmatic origin is not completely ruled out. Sample collection, handling, methods of analysis and problems associated with such studies of chrysotile are discussed.

B-IV

KEUFFEL & ESSER CO. - MADE IN U.S.A. INDEX/TRACING CARD

PROJECT No. 5

Project No. 5

Epidemiological study on the biological effects of asbestos dust at the Balangero Mine and among the Port of Genoa and LaSpezia Arsenal insulation workers

Epidemiological study of all workers past and present of the chrysotile mine and of a representative cohort of insulation workers from the shipyards and environmental study of their dust exposure.

Objectives are:

1) Does the inhalation of asbestos fibres bear any relationship with: a) the occurence of carcinoma of the lung; and/or b) the occurence of mesothelioma of the pleura and/or the peritoneum?

2) Do people exposed to the inhalation of very low concentrations of asbestos dust, such as workers exposed to concentrations well below any threshold limit or people living in villages in the vicinity of asbestos mines, exhibit an abnormally high incidence of calcified pleural plaques?

3) Do the different types of asbestos behave in the same way in regard to lung cancer, mesothelioma of the pleura and pleural plaques, or is one type of asbestos prevalent among the others as a causative agent?

Cost $85,000.

Dr. Enrico C. Vigliani, M.D.,
Clinica del Lavoro,
Milano, Italy.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				3864

Ghezzi, I., Aresini, G. & Vigliani, E.C.:

LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	The risk of asbestosis in a mine of	
11	chrysotile asbestos (It)	
12	(Il rischio di asbestosi in una miniera di	
13	amianto crisotilo)	
14	La Medicina del Lavoro, 63 (5-6): 189-212, 1972	

tile asbestos.

The Authors have carried out a study of the causes of death and a study of clinical epidemiology on the working population of a mine of chrysotile asbestos in Balangero. In this mine, between 1932 and 1970, 1098 workers have worked for at least one month; of these, 242 were at work on March 31st, 1970. Informations could be obtained in 998 workers, that is 90.8 % of the total population. 270 subjects have died: 6 of these (2.2 %) died from lung cancer. No case of serosal mesothelioma was ascertained. The percentage of lung cancers was not significantly different from that observed in male subjects of the same age, who died in the same period in two towns of the area, where the mine is situated. A clinico-radiological examination and a study of the respiratory function have been carried out in workers at work since more than one year: 29.8 % of 474 subjects showed an X-ray pattern classifiable in categories 1, 2, and 3 of the CINCINNATI classification; the highest percentage of subjects (48.6 %) with abnormal X-ray pattern was observed in the groups at highest risk. 51 subjects showed fibrous changes of the pleura, 10 of which with calcific opacity. The respiratory function test performed were the vital capacity, the maximum expiration volume in one second (VEMS), the alveolo-capillary diffusion at rest and at work (steady state method); half subjects with abnormal X-ray pattern showed a ventilatory inefficiency restrictive in type, while approximately one third showed a damage of alveolo-capillary diffusion. In 14 workers with a completely normal X-ray pattern, an impairment of alveolar-capillary gas diffusion was demonstrated; in at least 5 of these cases, all at high risk, the existence of any other possible pathologic cause, except asbestos exposure, could be ruled out. 25 % of the workers who received physical examination, was found to have chronic bronchitis; no correlation was demonstrated between chronic bronchitis and asbestos exposure. The physical examination showed the existence of fine crepitant rales at the thorax bases in 27 % subjects with abnormal X-ray pattern; the highest percentage of subjects with fine crepitant rales was detected in the group with the highest risk. The finding was present also in 7.5 % of the radiologically normal subjects. On the basis of the clinical and functional data, it seems possible to confirm that an impairment of alveolo-capillary diffusion of gases and the appearance of bibasilar fine crepitant rales can constitute one of the early consequences of exposure to asbestos, even in the absence of pleuro-pulmonary changes radiologically evident.

A-1

INDEX/TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE – OF	DOCUMENT NO. 3586

DOCUMENT TITLE: Ghezzi, I., Maranzana, P. & Zannini, D.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
3	Considerations on asbestosis in Piedmont,	
10	Liguria and Lombardy. (It)	
36	(Considerazioni sull'asbestosi in	
38	Piemonte, Liguria e Lombardia).	
60	Medicina del Lavoro, 62 (2-3):111-119, 1971.	
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Since 1943, when the compulsory insurance against asbestosis was started in Italy, 1530 workers were compensated by I.N.A.I.L. for asbestos pneumoconiosis in Piedmont and in the provinces of Milan, Bergamo and Genoa; out of these, 1205 were still living on March 31st, 1970. The asbestoses of moderate or advanced degree constituted 32 % of the cases; such percentage was higher than 50, if one considered only the workers who had been employed in the textile industry and in dock-yards. Pleural changes, both calcific and not, were radiologically demonstrated in 52 % of asbestotic subjects who had worked in textile mills, while among the former chrysotile miners such changes resulted to be present only in 14 % of the subjects. Out of the 325 dead workers compensated for asbestosis, 165 (57 %) died due to causes directly related to asbestosis (cardio-respiratory insufficiency, tuberculosis, pleural and lung tumours). Pleural and lung tumours were found in 34 subjects, that is 10.5 % of the dead cases; such percentage rose to 26.3 %, if one considered only the 61 autopsied cases, in 16 of whom the presence of a pleural or lung neoplasia was found. The incidence of pleural and lung tumours was maximal (19.5 %) among the former insulation workers, and minimal (2.6 %) among the ex-miners, who had been exposed only to chrysotile; in this last group no pleural mesothelioma was found.

Besides the epidemiologic data, the results are reported of 466 measurements of air dustiness, carried out in as many work places: in 36.3 % of the counts, the asbestos concentration was higher than 12 fibers/ml. The maximal concentration of asbestos was observed in the atmosphere of a textile department (carding).

~~Ref. Book A I, II,III.~~

INDEX/TRACING CARD

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3839

DOCUMENT TITLE	LOCATION
Sartorelli, E., Zedda, S., Aresini, G. & Ghezzi, I.:	

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
12	Respiratory physiopathology of asbestosis (Italian)	
13	(Fisiopatologia respiratoria dell'asbestosi).	
60	La Medicina del Lavoro, 63 (7-8): 269-281, July-Aug. 1972.	
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The results obtained can be summarized as follows. A ventilation insufficiency restrictive in type was observed in 5.6 % subjects of the 1st group, in 10.1 % subjects of the 2nd group and in 31.1 %, 41.9 % and 69.2 % subjects of the 3rd, 4th and 5th group respectively. The finding of a ventilation insufficiency restrictive in type in a non-negligeable percentage of subjects exposed to asbestos, but with chest X-ray findings normal or dubious, seems to indicate the existence in these cases of pulmonary lesions still not detectable radiologically, but that nonetheless have already determined a change in lung elasticity. A ventilatory insufficiency obstructive in type, due to chronic bronchitis with or without lung emphysema, was observed in percentages variable from 11.2 % to 24.2 % according to the group considered. In subjects with a chest X-ray pattern diagnostic of a severe asbestosis, evident changes of the rate ventilation/perfusion (increased respiratory dead space and a-A CO_2 gradient) were often present. A reduction of D_{LCO} at rest and/or at work, below the lowest normal limits (defined from the study of 91 normal male subjects), was observed in 4.6 to 6.4 % subjects of the 1st group, in 9.6 to 19.2 % subjects of the second group and in percentage higher than 20 % (up to 100 %) in the subjects of the 3rd, 4th and 5th group. The finding of pathological values of D_{LCO} both at rest and at work, in a certain number of subjects exposed to asbestos, but without radiological changes or with X-ray changes insufficient for a clear-cut diagnosis of asbestosis, indicated that the pulmonary lesions induced by asbestos can determin evident functional changes of the alveolar-capillary gas exchanges also in a pre-radiological phase. In conclusion, the study of the respiratory function in workers exposed to asbestos offers useful data not only for an evaluation of the functional damage present in the subjects with an asbestosis evident at X-rays, but also for an early diagnosis, and therefore for the prevention of asbestotic pneumoconiosis.

A study of the respiratory function was carried out in 724 male subjects exposed to inhalation of asbestos dust (workers of a mining company of chrysotile in Piedmont; insulators; workers engaged in the production of asbestos-cement, of asbestos textiles or of car brakes and friction clutch discs). In all subjects the vital capacity, VEMS and D_{LCO} at rest (steady state method) were determined. In some cases it was measured the residual volume, the resistances of the airways (body pletismographyc), of respiratory dead space, of arterio-alveolar CO- gradient and also of D_{LCO} at work on a cyclergometer. The subjects were subdivided into 5 groups on the basis of the chest X-ray pattern (UICC classification, Cincinnati): 1st group with X-ray pattern 0/0 or 0/1 and with asbestos exposure less than 10 years (average exposure 5.7 years); 2nd group with X-ray pattern 0/0 or 0/1 and with asbestos exposure longer than 10 years (average exposure 21.2 years); 3rd group with X-rays 1/0 or 1/1; 4th group with X-rays 1/2, 2/1 or 2/2; 5th group with X-rays 2/3, 3/2 or 3/3.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				2870

DOCUMENT TITLE: Vigliani, Enrico:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
20	Fibrogenesis. The fibrogenic response	
21	to asbestos.	
29		
43	OAMA 2nd Antigua Conference IV:	
44	151-167, Nov. 22, 1967	
45	Medicina del Lavoro 59(6-7):401-	
48	410, 1968	
73		
85		

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				3333

DOCUMENT TITLE: Vigliani, Enrico C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
2	Criteria for determination of MAC	
3	of silica and asbestos in the air. (It.)	
40	(Criteri per la determinazione delle	
43	concentrazioni massime tollerabili di	
45	silice e amianto nell'aria).	
48	Med. Lavoro, 60 (2):85-89, Feb. 1969.	
85	(List # 4)(Engelhard Mineral & Chem.)	

The paper given at the International Congress of Hygiene and Preventive Medicine in Rome, 1968, describes in some detail the Italian hygienic norm for prevention of silicosis:

$$R = \frac{q\,N}{5000}\left(1 + \frac{2}{1+q}\right)$$

where R = hazard of pneumoconiosis

q = % of free silica in dust

N = number of particles <5 micron in 1 cc of air

Otherwise it summarizes knowledge of the date on measurement of dustiness in various countries and particularly on the problems connected with evaluating and measuring hazard of asbestos exposure.

INDEX/TRACING CARD

DATE	INDEXED BY	ENTERED BY	PAGE — OF	DOCUMENT NO
				3091

DOCUMENT TITLE: Vigliani, E.C.: LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70	Asbestos Exposure and its Results in Italy.	
60	La Medicina del Lavoro, 60(5):325-330, May 1969.	
61	(paper read at 2nd International Conference	
63	on Pneumoconiosis, Johannesburg, April 1969).	
62	SUMMARY: Of 307 deaths among asbestosis compensation cases in four	
36	Italian provinces, 31.6% died of asbestosis, 10.8% of cancer of	
38	lung and pleura. A minority of subjects were autopsied, and these	
85	subjects exhibited a higher mortality from asbestosis, 42.4%, and	
	lung and pleura cancers, 27.1%. The author comments that the	
	"number of lung tumors found at necropsy is rather high." Four	
	types of asbestos workers were studied; miners, textile and friction	
	products, asbestos-cement, and insulation workers. "Mining	
	has the lowest and insulation the highest incidence of tumors of	
	the lung." A study on dockyard workers is also under way. Prelimi-	
	nary findings among this group indicate: "No significant difference	
	in the incidence (9.4%) of tumors of the lung was seen between	
	workers with continuous and intermittent exposure to asbestos."	

	PROCEEDINGS Internat. Conf. Pneumoconiosis, pp. 192-196,	
	published 1970.	

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3091

DOCUMENT TITLE: Vigliani, E.C.; Ghezzi, I.; Maranzana, P. & Pernis, B.: LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
36	Epidemiological Study of asbestos	
38	workers in Northern Italy.	
60	La Med. del Lavoro 59 (8-9):481-485,	
43	Aug.Sept. 1968	
61		
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31		
70		
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SUMMARY

During the period 1943-1967, 288 workers (209 men and 79 women), compensated by the INAIL for asbestosis, died in Piedmont, Liguria and Lombardy. Thirty two workers had been engaged in asbestos mining, 161 in manufactures (asbestos-textile, brake and friction products), 60 in the production of asbestos-cement, and 35 in insulation works. Out of the 288 dead workers, 28 (10 %) died from a lung tumour or from a mesothelioma of the pleura, 36 from neoplasias at other sites, 93 from cardio-respiratory disease complicating asbestosis, 22 from tuberculosis, 81 from other causes; in 28 cases the death cause could not be determined. In 56 cases the autopsy was performed; among these cases, lung and pleura tumours constituted the 23 %. The percentage of lung tumours among the male asbestotics was approximately twice that observed among the inhabitants of Milan, Turin and Pavia, and approximately 8 times higher than that of silicotic patients who died in the same period. Among the 32 miners, who had been exposed only to chrysotile, the incidence of lung tumours resulted to be 3.1 %, lower than that observed among other categories of asbestos-workers (textile and friction products, asbestos-cement) and among the insulators.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				2934

DOCUMENT TITLE: * Vigliani, E.C. & Pernis, B.: Maranzana, P., Chezzi, T.

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70	Epidemiological Study of Asbestos Workers	
60	in Northern Italy.	
61	Lecture #37 -2nd International Conf.	
10	Biological Effects Asbestos, Dresden,	
~~12~~	April 1968	
31		
42	Proceedings published 1973, pp. 147-150	
85		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3838

DOCUMENT TITLE: Zanardi, S., Lerza, P. & Russo, L.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Clinical and radiological problems	
11	concerning asbestosis (Italian)	
12	(Problemi di clinica e radiologia dell'asbestosi)	
30	La Medicina del Lavoro, 63 (7-8):257-268, July-Aug. 1972	
31		
33		(English abs PVP)
36		
38		
37	One of the most serious problems concerning asbestosis is certainly that of early clinical and radiological diagnosis. The Authors therefore aim to bring a contribution to the subject by reporting and discussing the semeiological findings obtained in numerous cases of relatively early asbestosis (700 cases of asbestosis at first observation found among almost 3000 workers of the naval industry). The clinical aspects considered include subjective symptoms, physical signs, chest X-ray findings, functional and laboratory findings. Moreover, the availability of a second group of patients followed-up for a long time (70 asbestosis patients alive and periodically controlled for 50 to 18 years), as well as of a third group of dead asbestosis cases (32 cases controlled at autopsy) enable the Authors to bring a further contribution to the knowledge of the clinical course and prognosis of this pneumoconiosis, both in its typical evolution and in the evolution modified by the various complications.	
63		
70		
85		
X		

INDEX/TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE — OF	DOCUMENT NO.
				3866

DOCUMENT TITLE: Zannini, D., Bogetti, B. & Ottenga, F.:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
3	The risk and prevention of asbestosis	
4	in shipyard works (Italian)	
10	(Il rischio e la prevenzione dell'	
12	asbestosi nelle lavorazioni navali)	
30	La Medicina del Lavoro, 63 (5-6):	
31	221-244, 1972	
36		
38		
63		
70		
85		

Since the first few reports of cases of asbestosis among workers engaged in insulation jobs by means of asbestos aboard ships in building or repair, the risk of pneumoconiosis in such workers has revealed so far more and more severe, and has involved also other groups of workers of the naval industry, in whom, in the last years, pleural or pulmonary lesions are found more and more frequently. Of no minor concern is the increasing frequency of pleural or pulmonary tumours among the same workers. The actual diffusion of such diseases can be related not only to a more systematic medical checkup of the workers, but also to the more and more intensive use of asbestos in the last 30 years. In fact asbestos is used aboard not only for the insulation of engines, but also for the thermic and acustic insulation of all ship structures, both by means of panels, and by spray. Almost all people working aboard ships in building and repair are therefore exposed to the inhalation of asbestos, as it has been demonstrated also by the cases studied at the Institute of Occupational Medicine in Genoa, and by the conimetric findings. It is therefore required a resolute organization of the preventive measures, which consist both in substituting asbestos with other materials, and in reducing the ambient dustiness, in using individual protection measures for the workers directly or indirectly exposed to the risk, in organizing the work aboard, in instructing the personnel, in studying the ambient dustiness.

INDEX TRACING CARD

PROJECT No. 6

Project No. 6

The cellular basis of the biological effects of asbestos

Study of morphological and biochemical changes of macrophages and fibroblasts cultured in vitro in the presence of well defined particles of asbestos, such as: chrysotile, amosite, crocidolite, anthophyllite, tridimite, and in each of them long fibres and very finely divided particles separately. Whenever indicated the in vitro experiments to be expanded by suitable studies on experimental animals.

Cost : $45,000.

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Università degli studi di Genova,
Via Balbi 5,
Genoa, Italy.

(Continues as IOEH #17)

DATE	INDEXED BY	ENTERED BY	PAGE — OF	DOCUMENT NO
				3862

DOCUMENT TITLE: Governa, M. & Pernis, B.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
20	Biological effects of asbestos (It)	
25	(Azioni biologiche dell'amianto)	
27	La Medicina del Lavoro, 63 (5-6):	
120	161-178, 1972	
36		
69.		(English abs. PVP)
72		
73		
85		

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				3884

DOCUMENT TITLE: Governa, M. & Rosanda, C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
21	A histochemical study of the asbestos	
20	body coating.	
85	Brit. J. Industr. Med. 29 (2):154-159, 1972	

Governa, M., and Rosanda, C. (1972). *Brit. J. Industr. Med.*, 29, 154-159. A histochemical study of the asbestos body coating. Asbestos bodies after iron extraction were tested by histochemical methods for mucopolysaccharides. The results of the reactions suggest that acid mucopolysaccharides are present in the coating of most bodies. During the formation of the bodies acid mucopolysaccharides might act as a matrix for iron deposition on the coating.

X

INDEX, TRACING CARD

DATE | INDEXED BY | EDITED BY | PAGE OF | DOCUMENT NO 3863

DOCUMENT TITLE

Governa, M. & Rosanda, C.:

LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC
21	The mechanism of formation of
72	asbestos bodies (Italian)
85	(Meccanismo di formazione dei
	corpuscoli dell' asbesto)
	La Medicina del Lavoro, 63 (5-6):
	179-188, 1972

From the results of the most recent studies on the mechanism of formation of asbestos bodies, it seems that one can conclude, according to SUZUKY and CHUBO (1969), that asbestos bodies are the terminal product of a biological process which occurs in the macrophage, which has phagocytosed a mineral fiber: within the lysosome the fiber would be covered with the coating of organic substances.

In this report, the results are presented of a series of experimental studies, from which it is possible to propose an alternative mechanism of asbestos bodies formation.

By an *in vitro* experiment in an acellular system, previous observations have been confirmed, according to which the formation of asbestos bodies is possible without the active intervention of cells: in fact, asbestos bodies have been obtained by incubating chrysotile fibers in sterile saline solution containing albumin, hyaluronic acid and ferritin.

By histochemical studies on the coating of human asbestos bodies, it has been demonstrated that the inner layer is composed by proteins mixed with haematoidin and ferric iron; above this, there is hyaluronic acid, finally covered by an outer layer containing ferric iron.

Histochemical studies on the substances which deposit themselves on the asbestos present in experimental granulomata from carrageenan, have demonstrated the high affinity of asbestos for haematoidin& hyaluronic acid and iron. In fact, already in the initial phases of granulation tissue formation, all these substances had stratified themselves on asbestos fibers. These were coated, even though they were free in the tissue ground substance, and were not phagocytosed within the macrophages.

Hyaluronic acid is a physiological extracellular component of the ground substance

of the connective tissue. Haematoidin is also a substance usually extracellular, present in the connective tissue interstitium as a consequence of past haemorrhages; from this can be found free in the connective tissue ground substance in areas where an inflammatory process is occurring.

One can therefore suppose the hypothesis that asbestos bodies might be found in the lung interstitium, even when without the intervention of macrophages.

In connection, it must be kept in mind that the membrane of alveolar macrophages is rich in acid mucopolysaccharides and that haematoidin can be found within the macrophages themselves. one can suppose two mechanisms of formation of asbestos bodies: the shorter fibers, completely phagocytosed by macrophages, would represent the core of intracellular asbestos bodies, while the longer fibers, which are not phagocytosed by the macrophages would give rise to asbestos bodies which are formed outside the cells, on the ground substance and connective tissue.

DOCUMENT NUMBER

DATE | INDEXED BY | EDITED BY | PAGE OF | DOCUMENT NO 3785

DOCUMENT TITLE

Governa, M. & Vadala, C. Rosanda:

LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
21	Histochemical demonstration of hematoidin	
73	in the innermost layers of human asbestos	
85	body coating.	
	Int. Arch. Arbeitsmed. 30 (4): 273-282, 1972	

Summary. The well-known histochemical reactivity of asbestos bodies has been modified by treatment with iron extracting solutions and enzymes. Asbestos bodies did not exhibit any more Prussian blue positivity after treatment with iron extracting solutions, but showed a toluidine blue metachromasia due to hyaluronic acid. The same bodies, treated before with iron removing solutions and digested with testicular hyaluronidase, were not toluidine blue metachromatic, but exhibited again a Perls positivity. Then these same bodies became again Perls negative after a second iron extraction, and showed instead a positive hematoidin reaction. The diameter of the same body appeared progressively smaller after each treatment. Moreover the hematoidin positive layer had been so digested by trypsin that asbestos fibres were at least optically naked.

These findings suggest that during the development of asbestos body coating, first proteins, hematoidin and ferric iron are deposited over asbestos fibres; subsequently hyaluronic acid is laid around the first layer, and finally other ferric iron particles impregnate the hyaluronic acid molecules.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3869

DOCUMENT TITLE: Governa, M. & Vadalà, Rosanda:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
43	Histochemical study of asbestos fibre	
24	coating in experimental carrageenin	
28	granulomas	
72	British J. Industr. Med., 30 (3): 248-252, 1973	
85		

To study the composition of asbestos body coating, asbestos particles present in experimental carrageenin granulomas were tested histochemically for mucopolysaccharides, ferric and ferrous iron, haemoglobin, and haematoidin. The stains were applied on microscopical sections both untreated and treated with iron-extracting solutions and/or enzymes. The results indicate that asbestos is rapidly coated with haematoidin, ferric iron, a[illegible] hyaluronic acid.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3140

DOCUMENT TITLE: Parazzi, Elena; Pernis, B.; Secchi, G.C. & Vigliani, E.C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
43	Studies on 'in vitro' cytotoxicity	Also in Proceedings Internat.
44	of asbestos dusts.	Conf. on Biological Effects
72	La Medicina del Lavoro, 59 (10): 561-	of Asbestos, Dresden,
8	576, Oct. 1968.	April 1968, published 1973
85		pp. 74-81

The cytotoxic action of different types of asbestos dusts on guinea pig macrophages cultured «in vitro» was studied. This was done through investigation of the production of lactic acid, the loss of fluorochromasia, and the release into the culture medium of enzymes belonging to different intracellular structures — cytoplasma and lysosomes - from macrophages cultured «in vitro» and treated with chrysotile and crocidolite dusts. The results obtained using the three methods listed show that both types of asbestos possess a marked cytotoxic action for macrophages: this action is evidenced by a reduced production of lactic acid in the treated cultures, by a rapid loss of fluorochromasia in the cells, and by a marked release in the culture medium of lactate dehydrogenase, which is an enzyme belonging to the cytoplasmatic fraction of the cells. Crocidolite exerts a more marked cytotoxic action than chrysotile and an even greater action than a tridymite dust used as a comparison.

Experiments made using separately the particulate and fibrous fractions of the two above mentioned types of asbestos showed a high toxicity of the fibrous fraction and a moderate damaging action of the particulate fraction: the different toxicities for the macrophages of the two types of asbestos used in this investigation might therefore be attributed to a greater richness in fibres of the crocidolite or to some properties of these fibres. Pre-treatment of the asbestos dusts with PVPNO or EDTA did not reduce the cytotoxic action: the authors are therefore inclined to believe that the cytotoxic action is connected with the physical characteristics of the dusts rather than with the chemical characteristics.

DATE	INDEXED BY	EDITED BY	PAGE - OF	DOCUMENT NO. 3087
DOCUMENT TITLE				LOCATION

Parazzi, E.; Secchi, G.C.; Pernis, B. & Vigliani, E.:

KEY CODE	KEY WORD OR CHARACTERISTIC
120	Studies on the Cytotoxic Action of
40	Silica Dusts on Macrophages in Vitro
72	Arch Environ Health 17 (6):850-859,
85	Dec. 1968
91	

SCOPE NOTES

Summary

Experiments were performed in order to investigate the site of cellular damage induced by silica particles in vitro to peritoneal guinea pig macrophages.

The release into the culture medium of cell sap enzymes, lactate and aldolase, and of the dehydrogenase lysosomal enzymes, acid phosphatase and ribonuclease, as indicators of lesions to different cellular structures, was followed. Loss of fluorochromasia from cells, as evidence of damage to the cellular membrane, was also studied; with this method it is possible to elucidate the early modifications of macrophages treated with silica particles.

When the interaction between quartz active groups and the cellular membrane was prevented by coating the particles with serum, a delayed release of enzymes was observed.

These observations suggest that when silica is added to macrophage cultures in vitro, it interacts with the external cellular membrane and that the first cellular lesion occurs at this site. Further damage might then be inflicted by the liberation of lysosomal enzymes.

INDEX, TRACING CARD

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				3587

DOCUMENT TITLE: Pernis, B. & Castano, P.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
43	The effect of asbestos on cells in vitro (It).	
44	(Effetto dell'asbesto sulle cellule	
72	in vitro).	
8	Medicina del Lavoro, 62 (8-9): 120-129,	
85	Feb. March, 1971.	
74		
		(English abstract PVP)

Experiments have been carried out to investigate the effect of different asbestos dusts (crocidolite and chrysotile) on long term cultures (more than 6 weeks) of mouse peritoneal macrophages. Some cultures were treated with ferritin with the aim of testing the possible formation of asbestos bodies *in vitro*. Finally trials with silica in the same culture conditions have been made as controls. The preliminary results indicate that in optimal culture conditions asbestos is not cytotoxic. Such data are discussed with reference to the contrasting results previously obtained, and to the effect of silica. Moreover the problem of the effect of asbestos in vivo and the problem of asbestos body formation is briefly discussed.

B-III-2.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				2981

DOCUMENT TITLE: Pernis, B. & Vigliani, E.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
72	In Vitro and In Vivo Studies on the	
43	Efects of Asbestos Fibres on Macro-	
44	phages.	
45	Lecture #17-2nd Internat. Conf. Bio.	
48	Effects Asbestos, Dresden, April 1968	
40		
120		
85		

PROJECT No. 7

Project No. 7

Anthophyllite asbestosis in Finland

OBJECTIVES :

1. Clinical picture of anthophyllite asbestosis (fibrosis of the lungs) to be investigated in a cohort of past and present workers of Finnish anthophyllite mines and mills. Differences from the classical asbestosis in radiological picture, speed of development, frequency of simultaneous findings of pulmonary fibrosis with pleural plaques, cause of death, etc. to be explored.

2. Prevalence of pleural plaques and calcifications in the general population to be investigated in correlation with the environmental conditions.

3. Prevalence of all signs of asbestos exposure to be investigated in a cohort of construction workers.

Cost : $42,000.

Dr. Leo Noro, M.D.,
Institute of Occupational Health,
Haartmaninkatu 1,
Helsinki 25, Finland.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3779

DOCUMENT TITLE: * Ahlman, K.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
40	Industrial pulmonary disease in Finland.	
84	Scand. J. Resp. Diseases (Suppl.) 63: 101-104, 1968.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3500

DOCUMENT TITLE: Ahlman, Kaj; & Siltanen, Faro:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
63	~~Exposure of insulation workers to~~	
70	~~asbestos dust.~~	
10	Work-Environment-Health, 8 (1):1-5, 1971.	
30		
31		
2	~~(no summary)~~	
43		
45		
48		
84		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				4226

DOCUMENT TITLE: Ahlman, K.; Partanen, T.J.; Rintala, E.; Wiikeri, M.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
48	Anthophyllite mining and milling as	
60	a cause of asbestosis	
70		
10	Biological Effects of Asbestos	
84	IARC Scientific Publications No. 8	
	(IARC - Lyon, France, October 1972)	
	pp. 165-168	

SUMMARY

Clinical and epidemiological data concerning occupational exposure to anthophyllite asbestos are reported. The data base is a cohort of 1249 individuals with exposure at an anthophyllite mine and mill since 1963, 105 of whom are known cases of asbestosis. Results and the progress of different phases of the project are illustrated and discussed. A picture of a dangerous working environment arises, with heavy health risks, especially for workers with long-lasting exposures.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3106

DOCUMENT TITLE: Laamanen, Arvo:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
1	The use of snow samples in air pollution	
3	studies.	
84	Work-Environment-Health 5 (1):42-50,	1968.
76		

In our investigation of air pollution in Finland we have measured the distribution of different impurities in the environment of some point and area sources by primarily using the snow sampling method. The snow sampling method is easily applicable in estimating deposit levels and is especially useful in sparsely populated areas, although we have demonstrated that, under circumstances where there are similar criteria for evaluation, we can also use the method that we have developed in densely populated areas as well.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3650

DOCUMENT TITLE: Laamanen, Arvo:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
1	Calcium, magnesium, iodide, fluoride,	
8	chloride, sulphate, and nitrate concentrations	
56	in drinking water in the surroundings of	
60	an asbestos quarry.	
48	Report from the Institute of Occupational Health, (Helsinki)	
84	No. 72: 5 pages, 1 fig., 7 tables, March 1972.	
	(Also published under No. 162).	
6		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				162

DOCUMENT TITLE: Laamanen, Arvo:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
6	Reports from the Institute of Occupational	
8	Health, Helsinki, Finland.	
84	No. 72: 5 pages, 1 fig., 8 tables, March 1972	
	(Also published under No. 3650)	
1		
56		
60		
49		

DATE	INDEXED BY	ENTERED BY	PAGE - OF	DOCUMENT NO.
				2947

DOCUMENT TITLE: * Meurman, L. & Kiviluoto, R.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
36	Retrospective prospective study of	
37	anthophyllite asbestos workers in Finland.	
48	Lecture #34-2nd Int. Conf. Bio. Effects	
70	of Asbestos, Dresden, April 1968	Proceedings published 1971 pp.135-138
84	The mortality from all causes of Finnish asbestos miners is briefly discussed.	
60	Similar paper presented at International Conf. on Pneumoconiosis, Johannesburg, S.A. April-May/69,	
	This very brief paper presents refined data similar to that presented by the same authors at Dresden in 1968. The mortality rate from lung cancer is 3-5 times higher than the expected, but the authors pointedly note that incidence of GI cancer is normal and there were no cases of mesothelioma.	
	Johannesburg PROCEEDINGS, pp. 190-191, in 1970.	

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				2887

DOCUMENT TITLE: Noro, Leo:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Occupational and "Non-occupational"	
1	Asbestosis in Finland.	
3	Amer. Industrial Hygiene Assoc. J.	
10	29: 195-201, May-June 1968	
12		
31		
21		
38		
48		
60		
61		
70		
84		
36		

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				3216

DOCUMENT TITLE: *Noro, L.

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70	Epidemiology of Asbestos - Related Diseases.	
10	-- Presented at Internat.	
36	Congress on Occup. Hlth, Tokyo, Sept. 1969	
38	Proceedings published 1971, pp. 207-209.	
84		

In some thousands of operations and jobs the workers are exposed to asbestos dust. Facts concerning the health effects in the mining and asbestos industries are well known, but other occupational groups have not yet been studied enough. Improved dust control has diminished the number of classical asbestosis cases, but the late results, such as malignant tumors, have entered into the focus of research. Smoking, the increasing amount of air pollutants, and other potential environmental carcinogenic agents, however, complicate epidemiological studies among workers and the general population exposed to small amounts of asbestos.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				2560

DOCUMENT TITLE: *Noro, Leo, Ahlman, Kaj; Laamanen, Arvo & Vikeri, M.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Asbestose als Berufskrankheit in	
48	Finnland.	
4	Int. Archiv fur Gewerbepathologie und	
59	Gewerbehygiene 22: 179-184 , 1966.	
17		
60		
63		
2		
84		

Zusammenfassung

Die Produktion von Anthophyllit-Asbest in Finnland liegt gegenwärtig bei 15000 t im Jahr. Mehr als 1200 Arbeiter sind beruflich Asbeststaub ausgesetzt. Zusätzlich zu technischer Staubverhütung sind in den letzten 10 Jahren verstärkt medizinische Arbeitsuntersuchungen durchgeführt worden und ungefähr 4000 Röntgenaufnahmen in Verbindung mit periodischen Untersuchungen gefertigt worden. Bis jetzt wurden 195 Asbestosefälle im Verlaufe von 30 Jahren diagnostiziert, 148 davon in der Asbestindustrie und 35 unter Isolierern. In der Asbestindustrie lag die Zeit, die die Arbeiter dem Asbeststaub ausgesetzt waren, in 69 Fällen zwischen 2 und 15 Jahren und in 49 Fällen bei weniger als 11 Jahren. In der zuletzt erwähnten Beschäftigung arbeiteten 8 Personen länger als 35 Jahre, ohne Pneumokoniose zu bekommen. Die Situation fordert mehr Aufmerksamkeit in bezug auf die technische und medizinische Kontrolle in Asbestwerken.

DATE	INDEXED BY	ENTERED BY	PAGE - OF	DOCUMENT NO. 2726
DOCUMENT TITLE				LOCATION

* Noro, Leo, Ahlman, Rintala and al:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70		
48	Epidemiology of anthophyllite asbestosis.	
0	Prelinary results. (1967)	
60		
61		
10	Lecture Dresden Conference - Proceedings	
12	published 1973, pp. 130-135	
31		

32 The Institute of Occupational Health has until now collected in Finland 144 cases of asbestosis
13 in the asbestos industry - insulators excluded. Industrial hygiene studies from recent years
34 show that the dust exposure has been rather heavy in some jobs, especially in the quarry and
84 mill, but the situation is improving. During the last 30 years approx. 380 workers have been exposed to anthophyllite asbestos in the quarry and mill during more than one year. One half of this group has died, asbestosis has been diagnosed in 1/4. 111 present workers and 24 retired workers (total 135) have been studied roentgenologically and clinically. In 37 cases, of which 12 were new, X-ray changes indicating occupational asbestosis have been found, 18 being in stage 0 - I, 12 in I, 5 in II and 2 in III.

In the asbestosis cases the age, exposure, history of smoking, pneumoconiosis, production of phlegm, shortness of breath and abnormal lung function tests were significally greater than in the non-asbestosis group. Comparing the self-reported symptoms (phlegm and shortness of breath) with the ordinary male rural population and lumberjacks at the same age, these symptoms were more frequent among workers exposed to asbestos dust. The study is continuing with more detailed X-ray and ultrasonic echograph and other examinations.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO 3789
DOCUMENT TITLE				LOCATION

Nurminen, Markku:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
36	A study of the mortality of workers	
37	in an anthophyllite asbestos factory	
38	in Finland.	
42	Work-Environment-Health, 9: 112-118, 1972	
48		
60		
70		
84		

Nurminen, M. Work-environm.-hlth 9 (1972) 112—118. A study of the mortality of workers in an anthophyllite asbestos factory in Finland. A cohort study of 1030 workers employed at an anthophyllite asbestos mining factory is described. It extends the information about asbestos related disease at this factory which was previously available only for workers with severe exposure. The cohort was defined as the workers with a minimum exposure of three months who had started employment at any time between 1936 and 1966 and the main analysis was of mortality up to the end of 1968. The hazards of exposure to anthophyllite asbestos dust are indicated by the main results of this mortality study: 1. The cohort of workers was found to have excess overall mortality accounted for by cancer of the lung, bronchus and trachea, respiratory tuberculosis, and other respiratory diseases. 2. Asbestosis (as an underlying or contributing cause) was mentioned on the death certificate of every fifth deceased member of the cohort. 3. The mortality from lung cancer among anthophyllite asbestos workers with a minimum exposure of three months was in certain age groups over three times that expected.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				2957

DOCUMENT TITLE: * Siltanen, Eero:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
3	Measurement of asbestos dust.	
84	Nordisk Arbeidsmedisinsk Möte På.	
	Fagernes 28 - 30.11.1968 (pp. 1-2)	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3409

DOCUMENT TITLE: Siltanen, Eero:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
3	Comparison of asbestos dust measurements	
43	by counting particle and mass concentrations	
44	and mass concentrations with different	
45	methods (Ger.)	
48	Vergleich einiger Methoden zur Massen -	
60	und teilchenkonzentrationsbestimung bei	
61	der messung von asbeststaub.	
62	Staub - Reinhalt. Luft 30 (10): 436-439, Oct. /70	
76	(English abstract H. Bohlig & P.V. Pelnar)	
84		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3885

DOCUMENT TITLE: Taskinen, Eero, Ahlman, Kaj & Wiikeri, Matti:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
25	Current hypothesis of the lymphatic	
29	transport of inspired dust to the parietal pleura.	
40	Chest, 64 (2): 193-196, Aug. 1973	
73		
84		

In the light of a case report, we will describe a hypothesis of the lymphatic transport mechanism of inhaled dust particles to the parietal pleura. The autopsy of a molder who had been employed for 41 years in iron foundries showed heavy mixed-dust pneumoconiosis. In the parietal pleura there were black linear streaks following the course of intercostal arteries. These formations were microscopically interpreted as periarterial lymphangitis and fibrosis caused by the dust. According to our hypothesis, the dust particles have been transported from the lungs via the lymphatic vessels partly in retrogression. The mechanism is supposed to be the same in the transport of small asbestos particles causing pleural plaques.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				3159

DOCUMENT TITLE: * Viikeri, M.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
30	Ultrasound Examination of Pleural Plaques:	
31	experimental, pathologic and clinical	
76	studies.	
72	Supplement 301 to Acta Radiologica,	
12	62pp., Discussion of May 1970, Helsinki.	
84	Circulated: Front page and pages 55 and 56.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3031

DOCUMENT TITLE: Viikeri, M., Jääskeläinen, J. & Tahtie:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Ultrasonic Examination of Pleural	
12	Thickenings and Calcifications in	
30	Occupational Asbestosis.	
31	Dis. Chest, 54(1):17-20, July 1968	
71		
76		
84		
15		

The roentgenologic diagnosis of occupational asbestosis is based upon typical pulmonary fibrosis and anteriorly detected pleural calcifications, which appear much later than parenchymal changes. Therefore, a definite diagnosis usually demands a long observation period. We used ultrasonic A- and B-mode methods to examine pleural changes in nine occupational asbestosis patients and five normal persons. In normal persons the parietal pleura was shown as a thin, sharp line when the B-mode method of examination was used. Roentgenographically observed calcifications were easily detected and distinguished from the normal pleura by this examination. It is noteworthy that similar echo peaks were seen in A-mode examinations in lateral and posterior pleura, where roentgenograms did not reveal pleural calcifications, and their size could be traced well with the B-mode examination. Thus it is possible to find early pleural changes, which, in our opinion, are connected with occupational asbestosis. Diagnosis could be made earlier without a long observation time.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3036

DOCUMENT TITLE: * Viikeri, M.; Jääskeläinen, J. & Tahti, E.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
12	Ultrasonic examination in Occupational	
30	Asbestosis.	
31	Scand. J. clin. Lab. Invest. 21,	
76	Suppl. 101, 105, 1968	
84		

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO 3089
DOCUMENT TITLE Viikeri, M.; Jääskeläinen, J. & Tähti, E.:				LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
12	Early detection of pleural thickenings	
30	and calcifications determined by	
31	ultra sound.	
76	Work-Environment-Health 5 (1):68-72, 1968	
84		

SUMMARY

The thoracic wall of ten asbestosis patients was examined by ultrasonic A- and B-mode examinations to determine the existence of pleural calcifications and thickenings. Roentgenographically observed calcifications were found in seven patients. In the ultrasonic examinations distinct changes were observed at these places. In addition, pleural thickenings were recognized also posteriorly where they had not been seen in the roentgenograms. Ultrasonic examinations seem to offer possibilities for improving the early diagnosis of pleural changes.

INDEX/TRACING CARD

PROJECT No. 8

Project No. 8

A study of the health effects related to asbestos exposure in workers of the industry and other residents of New Orleans

OBJECTIVES :

Phase I : All employees of a Johns-Manville plant and a National Gypsum plant manufacturing asbestos-cement goods to be examined by a questionnaire on occupational and respiratory history, by a physical examination, by PA. and two oblique chest X-rays and by spirometry and transfer factor measurements. Additional physiological measurements to be done in those with abnormal clinical or radiological findings. **Past employees** to be traced and the cause of death to be investigated in those who died. Attempts to be made to assess the past dust exposure and current measurement done in the plants to be utilized.

Phase II : Plans for community investigation of risk of malignancy in individuals outside the plants to be prepared during the first year for the later realization.

Cost : $291,380

Dr. Hans Weill, M.D. &
Dr. Morton Ziskind, M.D.,
Tulane Medical School
Section of Pulmonary Diseases,
New Orleans, Louisiana.

(Continues as IOEH #16)

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4229

DOCUMENT TITLE: Enterline, P.E.; Weill, H.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Asbestosis in asbestos cement workers	
70		
62	Biological Effects of Asbestos	
80	IARC Scientific Publications No. 8	
	(IARC - Lyon, France, October 1972)	
	pp. 179-183	

SUMMARY

The asbestos cement industry consumes the bulk of the world's output of asbestos. Workers in this industry are exposed to silica and asbestos, and they develop both asbestosis and silicosis in numbers related to their total dust exposure. It is estimated that radiographic changes of 2,1 category or above appear after a total dust exposure of 1000 mppcf-months. Asbestosis appears to be less of a problem in the asbestos cement industry than in other asbestos products industries, possibly because the former is growing more rapidly and its work force has had less dust exposure. Both chrysotile and crocidolite asbestos are used, with the latter confined almost entirely to asbestos cement pipe. Cement pipe workers appear to have a great excess in respiratory cancer but little asbestosis, whereas other cement workers have a modest excess in respiratory cancer but a considerable amount of asbestosis.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3906

DOCUMENT TITLE: * Waggenspack, Carmel:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
62	A mortality study of former employees	
70	of two asbestos-cement products manufacturing	
76	companies.	
80	Proposal for a doctoral dissertation	
	submitted to Dept. Epidemiology, Tulane Univ.July 1973, 32 pp.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3925

DOCUMENT TITLE: * Weill, Hans:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13	Pulmonary function testing in industry.	
76	J. Occup. Medicine, 15 (9): 693-699,	
80	Sept. 1973.	

Summary

As a result of the increasing number of demonstrated or potential occupational inhalant exposures which may adversely affect lung function, tests to detect impaired pulmonary function should become a part of the health surveillance program in many industries. In order to further this objective, I have tried to provide some answers to the questions: What must the pulmonary function test do and what will it tell us? How can we extend the information obtained from simple spirometry? What additional tests should be considered? Who should perform the tests and with what equipment? What are the problems in analysis and interpretation of results? And, finally, under what circumstances might inhalation provocative testing and development of a mobile function unit be considered?

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3797

DOCUMENT TITLE: Weill, H. Waggenspack, C., Bailey, W., Ziskind, M. & Rossite

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Radiographic and physiologic patterns	
40	among workers engaged in manufacture	
42	of asbestos cement products.	
43	J. Occup. Med. 15 (3): 248-252, March 1973	
44		
12		
13		
62		
70		
80		

PROJECT No. 10

Project No. 10

Continued epidemiological research relating to the effects of asbestos on man

(Continuation of IOEH #1)

OBJECTIVES :

1) **Cohort Study.** Observation of causes of death in the present cohort of workers of asbestos mines who were born 1891-1920 to be prolonged up to 1972 to see causes of additional about 100 deaths expected until then.
2) **Mesothelioma Survey.** All cases from Ontario and Québec which occur until 1973 to be investigated epidemiologically. Additional about 25 cases a year can be expected in these provinces.
3) **Clinical Study.** Standard examination of chest radiogram, two simple tests of pulmonary function (vital capacity and ventilation rate on exercice) and a questionnaire of respiratory symptoms to be introduced and their reliability and their relative efficiency to be evaluated.
4) **Etiology of pleural plaques** to be investigated by a) case control inquiries, b) chemical and mineralogical examination of plaque material, c) geological studies of mines where the plaques occur, d) review of dust radiograms from population groups also elsewhere in Canada as prompted by the results of the inquiries above.
5) **Further Radiological Studies.** Development of abnormality in individual workers to be correlated with exposures to fibres with the aim to establish a maximum allowable dust concentration.

Dr. J. C. McDonald, M.D.,
Department of Epidemiology,
McGill University,
Montréal, Canada

Cost : $474,700.

(Continues as IOEH #27)

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4204

DOCUMENT TITLE: *Becklake, M.R.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13	Lung function,	
81	Conference on:	
	Biological Effects of Asbestos	
	IARC Scientific Publications No. 8	
	(IARC - Lyon, France, October 1972)	
	pp. 31-39 in Proceedings published	
	1973.	

SUMMARY

The biological effects of asbestos exposure on lung function may be measured by a variety of techniques depending on the purpose for which the measurements are to be made.

If the purpose is to study an asbestos-exposed population with a view to defining whether or not a health hazard exists, it is appropriate to measure VC or IC alone or together with RV, and D_{Lco} (SB) (transfer factor).

If the purpose is health-surveillance, VC, IC or FVC appear to be the most satisfactory measurements; although it is likely (and remains to be tested) that measurements reflecting the state of the small airways will be most sensitive to the earliest effects of asbestos dust exposure.

If the purpose is descriptive, i.e., to document the patho-physiological changes which characterise asbestosis in its various stages, any or all of the many available tests for the study of overall or regional lung function may be used.

If the purpose is to evaluate the effect of pulmonary malfunction due to asbestos exposure on the overall function of the individual, a detailed study of adaptation to progressively increasing exercise loads is called for:

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				4283

DOCUMENT: BECKLAKE, Margaret R., FOURNIER-MASSEY, Gisèle & BLACK Robert:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
8	Lung function profiles in the chrysotile	
13	asbestos mines and mills of Quebec.	
43	CHEST, 69 (2):303, Feb. 1976 Supplement	
60		
70		
81		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4297

DOCUMENT TITLE: BECKLAKE, Margaret R.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13	Introduction.	
70	Bulletin de physio-pathologie	
76	respiratoire, 533-535, Juillet-Sept. 1970.	
81		

DATE	INDEXED BY	EDITED BY	PAGE - OF	DOCUMENT NO
				4341

DOCUMENT TITLE: BECKLAKE Margaret R.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
90	Asbestos-related diseases of the	
81	lung and other organs: their	
	epidemiology and implications for	
	clinical practice.	
	American Review of Respiratory	
	Disease, 114 (1):187-227, 1976.	

INDEX TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3355

DOCUMENT TITLE: Fournier-Massey, Gisèle:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
90	Etude épidemiologique dans l'industrie	
70	de l'Amiante des Cantons de l'Est (Fr.)	
43	An epidemiological study of the asbestos	
10	industry of the Eastern townships.	
36	L'Union Médicale du Canada, 98 (11):	
60	1946-1949, Nov. 1969.	
81		

As part of an international study on the biological effects of asbestos, the Department of Epidemiology and Health of McGill University in conducting a research study in the asbestos industry of the Eastern Townships. A description of the project is given. This retrospective and prospective study attempts to define the causes of death and the state of health of the workers in terms of respiratory questionnaire, industrial history, chest radiograph and respiratory function.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3717

DOCUMENT TITLE: Gibbs, Graham W.: LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
31	The epidemiology of pleural calcification.	
3	Doctoral Thesis, McGill University, pp. 208-224, 1972.	
10		
12	(Whole thesis in books section)	
36		
37		
38		
42		
43		
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56		
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INDEX TRACING CARD

<u>Brief Summary of Results</u>: Reports of pleural calcification from various countries and the role of calcium in tumour formation were reviewed and dust exposure indices used for epidemiological studies of Quebec miners and millers described. Calcified pleural plaques were essentially hydroxyapatite with minor carbonate and probably formed by a nucleation process. In a study of Quebec chrysotile miners and millers, definite pleural calcification was concentrated in men exposed mainly to rock dust and employed in a small group of mines in Thetford Mines. This geographical distribution was discussed in relation to local geology and dust exposure and the most probable aetiological agents were talc, mica and breunnerite. Pleural calcification was not due to chest infection or injuries, place of residence or employment in other industries.

The mortality of persons with definite calcification was similar to that of other employees of similar birth date and total dust exposure and the study showed no association between definite pleural calcification and primary malignant mesothelial tumours.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3918

DOCUMENT TITLE: GIBBS, Graham William & LACHANCE, Maurice:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Dust-Fibre relationships in the	
2	Quebec Chrysotile Industry.	
3	Arch Environ Health, 28(2): 69-71,	
69	Feb. 1974.	
76		
81		

Epidemiological studies of Quebec chrysotile miners and millers have related various indices of health to dust exposure, as measured with the midget impinger. The interpretation of these relationships in terms of fiber necessitates the conversion of midget impinger (particle + fiber) counts to membrane filter (fiber) equivalents. An investigation in which 87 side-by-side midget impinger-membrane filter samples were taken at five mines and mills showed that the correlation was poor and no single conversion factor was justified. Until more detailed information on the relationships between midget impinger and membrane filter counts can be obtained, it is recommended that safety standards, at least in this industry, should continue to be based on dust counts, for which there is considerable epidemiological support, rather than on fiber counts, for which there is no direct evidence.

INDEX TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4048

DOCUMENT TITLE: * GIBBS, Graham W.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
90	Chrysotile asbestos and environmental	
43	health.	
60	Lecture at Pacific Northwest Inter-	
81	national Section of the Air Pollution	
	Control Ass'n Meeting, Nov. 21-23, 1971.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO 4222
DOCUMENT TITLE * Gibbs, G.W.; Du Toit, R.S.J.:				LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
1	Environmental data in mining	
60	Conference on:	
3	Biological Effects of Asbestos	
43	IARC Scientific Publications No. 8	
44	(IARC - Lyon, France, October 1972)	
45	pp. 138-144 in Proceedings published	
8	1973.	
56		
81		
83		
85		
88		

SUMMARY

(not provided by authors)

Mining and milling environments are probably the only ones where the effects of the various asbestos fibre types may be studied separately, although exposure is often to other materials as well. Comparisons are made between the mining and milling environments of asbestos producers throughout the world, and the current status of dust measurements and dust control are described.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO 4163
DOCUMENT TITLE * Liddell, F.D.K.:				LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70	Occupational Mortality in Relation	
43	to Exposure (Letter to the Editor)	
76		
60	Arch. Environ. Health, Vol. 30, No.	5
81	May 1975 - pp. 266-267	

DATE	INDEXED BY	EDITED BY	PAGE	DOCUMENT NO
			of	4224

DOCUMENT TITLE: * McDonald, J.C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Asbestosis in chrysotile mines and	
70	mills.	
60	Conference on:	
43	Biological Effects of Asbestos	
81	IARC Scientific Publications No. 8	
85	(IARC - Lyon, France, October 1972)	
88	pp. 155-159 in Proceedings published	
	1973.	

SUMMARY

The results of epidemiological surveys of chrysotile production workers in Quebec, Italy and Cyprus appear to be reasonably compatible. Information from the USSR, Rhodesia and South Africa is not at present comparable, but there is nothing to suggest that experience in these countries is likely to have been very different. The data therefore seems sufficient to justify the conclusion that if the risk of clinically significant disease is to be kept below 1% for a working life of 50 years, workers in this industry should not be exposed to dust concentrations of more than 2 mppcf. Further studies are needed to confirm this estimate and to determine whether there is any valid fibre equivalent.

INDEX TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4230

DOCUMENT TITLE: McDonald, J.C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
36	Cancer in chrysotile mines and mills	
37	Conference on:	
38	Biological Effects of Asbestos	
60	IARC Scientific Publications No. 8	
43	(IARC - Lyon, France, October 1972)	
81	pp. 189-194 in Proceedings	
85	published 1973.	
88		
83		
180		
70		

SUMMARY

Evidence for a link between malignant disease and occupational exposure in the chrysotile producing industry is not strong, despite the fact that men dying now were exposed for many years to much higher dust concentrations than prevail today. More results would of course be useful, and no doubt research methods can be improved: nevertheless, the investigation of chrysotile miners and millers has been on a larger scale than that of other asbestos workers and generally with much more information on levels of exposure. The results appear to show that there is a modest increase in respiratory and probably gastro-intestinal cancer in this industry, most serious in those who have been heavily exposed over long periods. This hazard would probably not be detectable at exposure levels below about 200 mppcf-years, i.e., 50 years at 4 mppcf. The fibre equivalent for this figure has not been established, and Quebec data indicate that it may be difficult to arrive at any single conversion factor.

The link with malignant mesothelioma is also weak and there is no evidence of an association with peritoneal tumours. Chrysotile-related tumours are too few to permit any firm conclusion on exposure-response. The fact that in Canada there have been cases of mesothelioma found after occupational and domestic but not purely neighbourhood exposure suggests that the low dust levels prevailing in mining communities have not been sufficient to cause the disease.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4387

DOCUMENT TITLE: McDONALD J.C.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
4	Problems in the determination of	
43	safety standards for asbestos-	
44	exposed workers.	
45	Hefte zur Unfallheilkunde, Heft 126:	
81	603-607, 1976.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO 4386

DOCUMENT TITLE: McDONALD J.C. & BECKLAKE M.R.:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
3	Asbestos-related disease in Canada.	
8	Hefte zur Unfallheilkunde, Heft 126:	
10	521-535. 1976.	
12		
13		
36		
38		
43		
60		
70		
81		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO 3919

DOCUMENT TITLE: McDonald, J.C.; Becklake, M.R.; Gibbs, G.W.; McDonald, A.D. & Rossiter, C.E.

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
11	The health of chrysotile asbestos	
12	mine and mill workers of Quebec.	
13	Arch Environ Health, 28 (2): 61-68, Feb. 1974	
14		
0		
2		
36		
43		
69		
60		
70		
81		
x		

The results of studies of respiratory symptoms and function, roentgenographic changes, and mortality in relation to dust exposure in the Quebec chrysotile industry, which has employed some 28,000 workers, are brought together and their implications for control examined.

Breathlessness on exercise, diminished inspiratory capacity, parenchymal and pleural changes, and respiratory disease mortality were related to dust exposure and to each other. Respiratory cancer was also related to dust exposure. The overall excess of deaths from respiratory cancers, including five with malignant mesothelioma, was at most 50% above expectation, based on age-specific rates for Quebec and the mining region.

If safety standards are set, they should be based on epidemiological evidence. From these data for the chrysotile producing industry of Quebec, a resonable figure, based on a 1% risk of acquiring clinically significant disease, would lie between 2 to 4 million particles per cubic foot, calculated for a working life of 50 years. In the absence of epidemiological findings based on fiber counts and lack of a satisfactory means of conversion, particle counts should continue to be used for control in this industry.

INDEX TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				1276

DOCUMENT TITLE: McDONALD, J. Corbett & SELIKOFF, I.J.: — LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	L'état actuel des recherces sur	
60	l'amiantose. Des résultats parfois	
70	différents.	
80	The two research groups on asbestos	
81	hazards.	
	Le Devoir, May 31 & The Gazette,	
	June 2, 1975.	

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3330

DOCUMENT TITLE: ; UICC Committee (A cooperative study): — LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
12	UICC/Cincinnati Classification of	
76	the Radiographic Appearances of	
	Pneumoconioses. SPECIAL REPORT .	
	Chest, 58 (1):57- 67, July 1970.	SUMMARY ON VERSO

<u>rief Summary of Results</u>: Three interested groups - The UICC Working Party, the U.S. Public Health Service Group of Radiologists, and a McGill University epidemiologic group - met in Cincinnati in November 1967. Agreement was achieved on a proposed new classification which is an extension of the International Labour Organization (ILO) 1958 scheme.

With a well-designed reading sheet, the classification was found easy to use by six readers from four countries in 16,000 radiographs from a survey of asbestos miners and mill workers in Quebec. The variation within the same observers was tested and found to be reasonably small. The variation between observers was tested in a study of 100 radiographs read by 12 readers from six countries. The results indicate that the classification should be satisfactory for many epidemiologic purposes.

The classification is known as the UICC/Cincinnati Classification of the Radiographic Appearances of Pneumoconioses.

D III.

INDEX TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE 9F	DOCUMENT NO
				4014

CURRENT TITLE: WHITE Franklin M.M., SWIFT, Joanne & BECKLAKE, Margaret R.:

LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Rheumatic complaints and pulmonary	
12	response to chrysotile dust inhalation	
34	in the mines and mills of Québec.	
43	Cdn. Medical Ass'n Journal. 111:	
60	(6): 533-535, Sept. 21, 1974.	
70		
81		

Summary: In 1967-68 an age-stratified random sample of 1068 current workers in Quebec asbestos mines and mills was surveyed. Questions concerning rheumatic complaints were included in a modified MRC questionnaire used at that time, and on this basis a rheumatic severity gradient was devised. No relationship could be detected between rheumatic complaints and pulmonary radiologic response to chrysotile dust exposure, despite implications in the literature that such a relationship might exist.

INDEX TRACING CARD

PROJECT No. 11

Project No. 11

A chemical and mineralogical study of insulation material

OBJECTIVES :

a) The nature of the insulation material used now and in the past in Canada and in the U.S. to be investigated and samples to be examined for mineralogical and chemical composition.

b) Samples of insulation material from old boilers and heating systems to be obtained and examined for mineralogical and chemical composition.

Changes to be sought between a) and b).

Cost : $52,000.

Dr. Graham W. Gibbs, Ph. D.,
Department of Epidemiology and Health,
McGill University,
Montréal, Canada.

PROJECT No. 12

Project No. 12

Identification and quantitation of fibrous dust and ferruginous bodies in lungs of autopsied adults

OBJECTIVES :

Lungs to be obtained from autopsies of persons:

1) not occupationally exposed to asbestos whose life has been spent chiefly in urban areas,
2) not occupationally exposed to asbestos whose life has been spent chiefly in rural areas,
3) occupationally exposed to asbestos with asbestosis,
4) occupationally exposed to asbestos without asbestosis.

Fibre counts and ferruginous bodies counts to be made in the lungs and compared in order to determine whether there is any relationship between asbestos related disease and fibre content of the lungs.

This one year study should test feasibility of method available to authors.

Cost : $19,921.

Dr. Paul Gross, M.D. &
Dr. R. T. P. deTreville, M.D.,
Industrial Health Foundation,
5231 Centre Avenue,
Pittsburgh, Pa. 15232, U.S.A.

DATE	ENTERED BY	EDITED BY	PAGE - OF	DOCUMENT NO 3749
DOCUMENT TYPE				LOCATION

Gross, P., Davis, J.M.G., Harley, R.A. Jr., Cralley, L.J. &

KEY CODE	KEY WORD OR CHARACTERISTIC	deTreville, RT SCOPE NOTES
1	Asbestos: identification of fibrous	
21	particles in lungs.	
25	J. Occup. Med. 14 (10):757-759, 1972.	
43		
76		
71		
80		

Summary

Because of proven nonspecificity, ferruginous bodies are not necessarily indicative of inhaled asbestos fibers. Of the methods useful in identifying asbestos fibers, electron diffraction and microprobe analysis, while more definitive, have proved excessively laborious and expensive. A newly developed, rapid screening method for asbestos vs. nonasbestos fibers has proved to be practical and economical in our use. In addition, with this method the form of asbestos, chrysotile, which represents 95% of the asbestos used in this country, can be identified; it is recognized readily by the unique tubular structure of its fibrillar units. Besides asbestos, inorganic fibers found in human lungs may consist of glass, rock wool, or ceramic aluminum silicate. Fibrous fragments of diatoms have also been identified. The ashes of plants and their derivatives—leaves, wood, paper, and coal—contain mineral fibers of respirable size which find their way into and remain in the lungs.

Methods of quantitating the fibers in lung sediments are described and results in a small series of lungs are summarized. On the average, 75% of all fibers were shorter than 5 μm and about 14% of the short fibers were chrysotile. The biological significance of the asbestos content in lungs of people not occupationally exposed to asbestos is briefly discussed.

Supported in part by US Public Health Service grant CPE 70-107

DATE	INDEXED BY	ENTERED BY	PAGE	OF	DOCUMENT #
X					3796

DOCUMENT TITLE: GROSS, Paul, DAVIS, John M.G., HARLEY, Russell A. (Jr.) & deTREVILLE, Robert T.P. — LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
25	Lymphatic transport of fibrous dust from	
27	the lungs.	
0	J. of Occup. Med. 15 (3): 186-189, March 1973	
1		
43		
46		
52		
71		
80		

The concentrations of inhaled mineral dust and mineral fibers in the lungs and satellite lymph nodes of 30 people were determined and tabulated. Fiber concentrations ranging from nearly four to more than 125 million per gram of dry tissue were found in satellite lymph nodes. Approximately six per cent of all E-M-size fibers were identified as chrysotile. Although 94% of the fibers remained unidentified, cogent reasons are given for not believing that a significant portion of them are man-made nor either amosite or crocidolite, and for considering two other probable identities. No correlation was found between fiber concentration in lymph nodes and lung nor was there any correlation between the fiber concentration in lymph nodes and concentration of mineral dust in either lung or lymph nodes.

X

INDEX TRACING CARD

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3872

DOCUMENT TITLE: GROSS, Paul & HARLEY, Russel.A.: — LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
20	The locus of pathogenicity of	
43	asbestos.	
44	Archiv Environ Health,27 (4):240-249,	
45	October 1973.	
56		
72		
80		

Documented experimental evidence, as well as the results of preliminary experiments, are presented which indicate a reduction in pathogenicity as the polyfilamentous arrangement of asbestos dust particles is replaced by a monofilamentous structure. On the basis of this evidence, it is proposed that the locus of pathogenicity of asbestos dust particles resides in their polyfilamentous structure.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				3934

DOCUMENT TITLE: Gross, Paul; Harley, Russell A.; Davis, John M.G. & Cralley, Lewis J.: — LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Mineral fiber content of human lungs	
1	Amer. Indust. Hy. Ass'n J.: 35 (3):	
25	148-151. March 1974.	
43		
56		
73		
74		
76		
80		

Mineral fibers in the lungs of 13 Pittsburghers and 10 Charlestonians as well as of 7 workers exposed to asbestos dust have been quantitated, and the methodology has been described in some detail. Although wide variations in fiber concentration were found in people of the same sex and of the same community, the average concentration of optically visible pulmonary mineral fibers of Pittsburghers was about seven times as high as that of Charlestonians. The average pulmonary concentration of optically visible fibers in people not occupationally exposed to asbestos was about 8.7% of the average concentration of optically visible fibers in asbestotic lungs. From 54 to 71% of the E.M-size fibers were less than 5 μm long. Of the E.M-size mineral fibers in the lungs of people not occupationally exposed to asbestos, an average of 6.8% were identifiable as chrysotile.

DATE	INDEXED BY	EDITED BY	PAGE — OF	DOCUMENT NO
				3992
DOCUMENT TYPE				LOCATION

GROSS, Paul:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
37	Is short-fibered asbestos dust a	
38	biological hazard?	
56	Archives of Environmental Health,	
72	29 (2): 115-117, August 1974.	
80		

Contrary to the determination that the finer the quartz dust, the greater its pathogenicity; the pathogenicity of the finest asbestos dust has been shown to be negligible.

It has been the finding of research laboratories in Germany, England, South Africa, and the United States that short-fibered asbestos, dust, ie, less than 5_{μ} in length, is incapable of causing fibrosis or cancer. This finding, in conjunction with the failure of different laboratories in the United Kingdom and in this country to discern abnormalities following prolonged asbestos feeding to rats, should lead to the abandonment of the present concept that maintains that mesotheliomas and gastrointestinal cancers arise from the ingestion of asbestos dust cleared from the lungs.

These negative results should also allay the alarm that has been raised as a result of the finding of ultramicroscopic mineral fibers in certain beverages and drinking water.

INDEX TRACING CARD

PROJECT No. 14

Project No. 14

Fibre shape and biological activity

OBJECTIVES :

19 samples of fibres (glass, microquartz and asbestos) of various lengths and diameters to be tested for carcinogenicity in groups of 50 hamsters each. The tests are designed to disclose whether carcinogenicity of fibrous particles is dependent on some critical shape, independent of chemical composition, and thus controllable by a general principle.

Cost : $276,000.

Dr. William E. Smith, M.D.,
Director - Health Research Institute,
Fairleigh Dickinson University,
Madison, N.J. 07940 - U.S.A.

DATE	INDEXED BY	FILED BY	PAGE OF	DOCUMENT NO
DOCUMENT DATE				230
	Smith, William E.; Hubert, Doras D.;			LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
38	The Intrapleural Route as a Means	
72	for Estimating Carcinogenicity	
43		
44	Reprint from: Experimental Lung	
45	Cancer Carcinogenesis and Biossays	
56	Springer-Verlag - Berlin 1974	
74	pp. 92-101	
80		

ABSTRACT

Intrathoracic tumors have been reported from several laboratories after intrapleural injection of various preparations of mineral substances into experimental animals. Application of information from such studies to problems of pulmonary carcinogenesis involves consideration of whether tumors so induced arise from mesothelial cells of the pleura or from other cells of the lungs or thoracic cage. Another question stems from the fact that direct introduction of test substances into the pleural space does not reproduce natural routes of exposure to inhaled carcinogens, however, the intrapleural route may serve a useful role as a convenient screening procedure in comparison to laborious, repeated intratracheal injections or the large space requirements of inhalation exposures.

In experiments with hamsters exposed to a variety of preparations of asbestiform and other minerals, we have given each animal only a single intrapleural injection. Multiple injections present undesirable variables, since early granulomatous responses to a single injection entail variations in deposition of subsequent injections.

After single intrapleural injection of hamsters, we have seen upward of 80 animals with intrathoracic tumors spreading along pleural surfaces in a manner characteristic of mesotheliomas. For purposes of this paper, these tumors will be designated as mesotheliomas, although we were able to trace their derivation from the mesothelium only in rare cases, most of the tumors being too large to identify their precise origin.

Data from these experiments show that tumor response to chrysotile, amosite, and crocidolite is related to dose. Tumors regarded as mesotheliomas arose in response to preparations of chrysotile containing numerous fibers visible by optical microscopy but not in response to preparations in which the great majority of fibers were visible only by electron microscopy.

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO.
				3831

DOCUMENT TITLE: Smith, William E.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
8	Asbestos, talc and nitrites in relation	
37	to gastric cancer.	
50	Amer. Indust. Hyg. J.: pp. 227-228, May 1973	
46		
72		
80		no summary
9		
X		

INDEX, TRACING CARD

PROJECT No. 15

Project No. 15

Fibre diameter of dust in mining, milling, manufacturing and insulation operations

OBJECTIVES :

A preliminary study to be carried out of the asbestos fibre diameters of airborne dust to which workers are exposed to a) mining and milling, b) textile manufacturing and c) insulation work.

Five samples to be collected at each of at least 3 locations in each of a), b) and c).

All samples to be examined using a scanning electron microscope and the diameter and length of fibres to be measured.

Results to be interpreted in the light of available epidemiological information.

Cost : $18,830.

Dr. G. W. Gibbs, Ph. D.,
Department of Epidemiology and Health,
McGill University,
Montréal, Canada.

(Continues as IOEH #22)

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				4257

DOCUMENT TITLE: GIBBS, G.W.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Fibre release from asbestos garments.	
2	Ann. Occup. Hyg. 18: 143-149, 1975	
3		
64		
74		
81		

Abstract—The concentrations of airborne fibres (> 5 μm) in the breathing zones of workers wearing asbestos safety garments were measured using the membrane filter method. At plant 1 where men wore asbestos coats, hoods and mittens, concentrations of fibres ranged from 0·3 to 5·0 fibres/cm³ and the 8 hr time-weighted concentrations from 0·1 to 1·1 fibres/cm³. At plant 2 where hoods, coats, mittens and leggings were worn, concentrations of airborne fibres ranged from 9·9 to 26·2 fibres/cm³ and the 8 hr time-weighted average concentration was 4·7 fibres/cm³. Counts of fibres collected on Nuclepore filters and examined by scanning electron microscopy showed that the concentrations of fibres > 5 μm in length represented 2·3–32 per cent of the total airborne fibre. The difference between the quantities of fibre released from the garments at the different plants was probably related to the methods or materials used in garment manufacture. The results showed that there is a need to identify and to reduce the release of fibre from asbestos safety garments currently supplied to protect persons working in hot environments.

INDEX/TRACING CARD

PROJECT No. 16

Project No. 16

Study of the health effects related to asbestos exposure in workers of the industry and other residents of New Orleans 2nd phase

(Continuation of IOEH #8)

1) Analysis of data collected in previous study (IOEH #8) :
   a) correlation of clinical features with radiographic changes and pulmonary function;
   b) relationship of pulmonary function and total dust exposure;
   c) relationship of smoking and radiographic changes and pulmonary function.

2) A study of mortality in 8,000 previously employed workers in the two asbestos cement factories.

3) Follow-up examinations (in three-yearly intervals) of the 300 men aged 40-59 from the original study group (IOEH #8).

Cost : $270,000

Dr. Hans Weill, M.D. &
Dr. Morton Ziskind, M.D.,
Tulane Medical School
Section of Pulmonary Diseases,
New Orleans, La.

(Continues as IOEH #25)

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4033

DOCUMENT TITLE: ROSSITER, Charles E. & WEILL, Hans:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
13	Ethnic differences in lung function	
64	evidence for proportional differences.	
76	International J. of Epidemiology,	
80	3 (1): 55-61, 1974	
	(same as preprint 3907)	
91		

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO.
				4046

DOCUMENT TITLE: ROSSITER, Charles E. & WEILL, Hans:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
0	Synergism between dust exposure and	
8	smoking: an artefact in the statistical	
13	analysis of lung function.	
76	Bulletin de Physio-pathologie Respira-	
80	toire, 10: 717-725, 1974.	

ABSTRACT

In a group of workers exposed to a dust hazard, cigarette smokers had worse lung function than non-smokers. This difference increased with increasing dose of dust or duration of exposure. The obvious inference is that cigarette smoking increased the response to the dust exposure, but this may be an artefact.

For many indices of lung function, changes with age are greater in cigarette smokers than in non-smokers. To correct lung function for age differences, predictive equations are used, but these are usually regression relations calculated from a group of subjects including both smokers and non-smokers. Thus the predicted change with age lies between the actual average changes for smokers and non-smokers.

Consider, for example, the forced expiratory volume which declines with age, the decline being greater in smokers than non-smokers. The values for non-smokers will tend to be above the predicted, with the difference increasing with age. For smokers the opposite effect will occur. If dust exposure has an effect on the forced expiratory volume the effect will usually be to reduce it, so that in smokers, lung function is reduced relative to the predicted both because of smoking and because of the dust exposure. As total or duration of dust exposure is correlated with age, the reduction will be greater for the more heavily exposed subjects. For non-smokers, lung function is increased relative to predicted by non-smoking and reduced by the exposure hazard.

INDEX, TRACING CARD

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				4191

DOCUMENT TITLE: Weill, H.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
70	Epidemiologic Methods in the	
76	Investigation of Occupational Lung	
80	Disease (Editorial)	
	American Review of Respiratory	
	Disease, Vol. 112, No. 1, July 1975	
	pp. 1-6	

INDEX, TRACING CARD

PROJECT No. 17

Project No. 17

Relationship between asbestos and tissues

(Continuation of IOEH #6)

OBJECTIVES :

A. Mechanism of coating in formation of the asbestos body to be studied :

1) in the lungs from patients with asbestosis;
2) in tissues of animals exposed to asbestos and various other dusts;
3) in cell cultures of fibroblasts and macrophages;
4) in vitro systems incubating asbestos and various other dusts with substances present in asbestos body coating.

B. Studies on the relationship between the asbestos content of the lungs and the degree of fibrosis:
To be examined:

1) lungs from workers exposed to asbestos inhalation with and without fibrotic lesions;
2) lungs from comparable non-exposed populations;
3) tissues from experimental animals exposed to asbestos and to various other dusts;
4) fibroblasts cultured in vitro with asbestos and various other dusts.

Cost : $45,000.

Dr. Benvenuto Pernis, M.D.,
Instituto di Medicina del Lavoro
della Università di Genova,
16132 Genova, Italy

PROJECT No. 18

Project No. 18

A factor to convert total airborne dust concentrations using the midget impinger technique to fibre counts as recorded by membrane filter method

(In progress)

At 20 locations at each participating asbestos mine a minimum of 5 duplicate samples of airborne dust will be collected using side by side millipore membrane filters and midget impingers. These at least 1,800 samples will be counted at McGill and by participating members of the industry. Simultaneously the total and respirable mass concentration of dust will be determined using Hexlet and/or MRE samplers. Objectives are :

1) The calculation of a conversion factor, to convert midget impinger counts to membrane filter fibre counts;

2) the description of observer variation in counting fibres using the membrane filter or total dust using the midget impinger techniques.

3) Measurement of total and "respirable" airborne dust mass concentrations in the mines and mills to examine their relationship, if any, to particle and fibre counts.

Cost : $37,375.

Dr. G. W. Gibbs, Ph.D.,
Department of Epidemiology and Health,
McGill University,
Montréal, Canada.

PROJECT No. 19

Project No. 19

Epidemiological study of mesothelioma in U.S.A.

OBJECTIVES :

1) **Ascertainment of fatal cases of mesothelioma by getting an answer from every pathologist as to whether or not he has made such diagnosis during the previous year.**
2) **Visits by M.D. to every pathologist who reports a case to review the case and to select a control case.**
3) **A field survey in which Public Health Nurses obtain occupational and residential histories for cases and controls.**
4) **Pathological review by the U.S. mesothelioma panel.**

Cost : $59,800.

Dr. Alison McDonald, M.D.,
Department of Epidemiology,
McGill University,
Montréal, Canada.

PROJECT No. 21

PROJECT No. 22

Project No. 22

Further studies of the physical parameters of airborne fibres in various industries

(Continuation of IOEH #15)

(In progress)

Airborne samples of dust will be collected at each of the 20 locations with asbestos exposure in various trades in America, South Africa and Finland for which important epidemiologic studies exist. The samples will be analysed with objectives:

1) To ascertain the diameters, lengths, mass and aspect ratios of the fibres in various occupations.

2) To relate these physical parameters of airborne dust to the health experience of workers in respective occupations.

3) To explore the relationship between concentrations of fibres visible by light-microscope and fibres of electron-microscopic size in various occupations.

Cost : $76,278.

Dr. G.W. Gibbs, Ph.D.,
Department of Epidemiology and Health
McGill University
Montréal, Canada.

DATE	INDEXED BY	EDITED BY	PAGE OF	DOCUMENT NO
				4161
DOCUMENT TITLE	Gibbs, G.W.; Hwang, C.Y.:			LOCATION

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
56	Physical Parameters of Airborne	
60	Asbestos Fibres in Various Work	
61	Environments - Preliminary Findings	
62		
63	American Industrial Hygiene	
43	Association Journal, Vol. 36, No. 6	
44	June 1975 - pp. 459-466	
45		
2		
3		
74		
76		
81		

The results of a pilot investigation to describe the physical parameters, length, aspect ratio, mass and shape of airborne fibres in a variety of industries producing processing and handling chrysotile, amosite and crocidolite are described. Samples of airborne dust were collected on nuclepore membrane filters and examined by scanning electron microscopy. The diameters and lengths of airborne fibres collected during the dumping of raw amosite at an asbestos products plant were greater than those of fibres collected during the application of amosite insulation. Chrysotile fibres collected in the carding area of an asbestos textile plant also tended to have smaller diameters than fibres collected in the dryer and bagging areas of an asbestos mill. The measurements of fibre dimensions indicate that the degree of protection afforded a worker by optical counts using the membrane filter technique is likely to depend on variety of asbestos and stage of processing. Preliminary results are not in conflict with experimental data suggesting that asbestosis might be related to the mass of airborne dust and primary malignant mesothelial tumors to exposure to fibres in a specific range of fibre diameter and length.

INDEX TRACING CARD

PROJECT No. 23

Project No. 23

Differential pH analysis of chrysotile : pilot study its application for measurement of dustiness at working places

(In progress)

OBJECTIVES :

1. A To determine accuracy of the method on known mixtures of pure chrysotile and inert matrix.
   B To analyze dust specimens supplied by QAMA to determine the minimum specimen quantity required.
   C Search for interferences such as brucite.

2. (1) Continuous pH determination during HCl attack at high temperature in aqueous suspension using a recording pH meter and automatic burette.

2. (2) Analysis of titrated solutions by atomic absorption.

Cost : $1,000.

MM. J. C. Roy and C. Barbeau
Université Laval
Département de Chimie
Québec, Canada

PROJECT No. 24

Project No. 24

Nature and specificity of the rales found in workers exposed to asbestos

(In progress)

Part A 1. Study, by objective sound recording and analysis, of the nature of the rales heard on the chest of persons exposed to asbestos. Attempt to determine whether these rales are unique as compared to similar breath sounds found in other diseases.

Part A 2. Quantitative study of the observer variability in assessing rales from patients with asbestosis and in distinguishing them from similar sounds found in other diseases.

Part B. Development of efficient system for collection of breath sounds data in industrial surveys.

Cost : $64,650.

Dr. Raymond L. H. Murphy Jr.
Faulkner Hospital
Boston, Mass., U.S.A. 02130

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				4289

DOCUMENT TITLE: MURPHY Raymond L.H.:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Human factors in chest auscultation.	
11	Human Factors in Health Care, 5:	
76	73-88, 1975. (no summary)	
80		

DATE	INDEXED BY	ENTERED BY	PAGE OF	DOCUMENT NO
				4323

DOCUMENT TITLE: HOLFORD Stephen Kent:

LOCATION:

KEY CODE	KEY WORD OR CHARACTERISTIC	SCOPE NOTES
10	Lung sound analysis in the diagnosis	
11	of pulmonary asbestosis.	
76	THESIS: 115 pp. - CIRCULATED - Front	
80	page & Abstract, February 1976.	

INDEX TRACING CARD

PROJECT No. 25

Project No. 25

A study of the health effects of dust exposure in the manufacture of asbestos cement and other asbestos-containing construction products PHASE III

(In progress)

(Continuation of IOEH #16)

A. Continuing analysis of cross-sectional data on X-ray and dust exposure in slightly less than 900 workers, currently employed or recently retired in early 1970.

B. Longitudinal study of a cohort of currently employed workers. The cohort will be re-examined in 1976 and 1977 in order to obtain clinical, radiographic and physiologic indices of any adverse biologic response. These data will be correlated with ongoing and future characterization of the plant environment in order to establish current correlative information.

C. Mortality study.

D. Differences in health effects resulting from chrysotile and crocidolite exposure.

E. Environmental characterization. Exposure characterization in this industry by correlating total dust measurement with fiber counts.

Cost: $215,427

Dr. Hans Weill
Professor of Medicine
Tulane University School of Medicine
New Orleans, Louisiana
U.S.A.

PROJECT No. 26

Project No. 26

The reduction of airborne asbestos fibre concentrations in industry using charged and uncharged water aerosols

(In progress)

Asbestos clouds will be generated in the laboratory exposure chamber and water fogs, charged and uncharged, will be applied to the clouds. Effects of a variety of water fogs on concentration of dust clouds composed of fibres of various lengths and diameters are tested.

Cost : $46,190.

Drs. Gibbs and C. Fengler
Occupational Health and Safety Unit
Institute for Mineral Industry Research
Mont St-Hilaire, Qué.

PROJECT No. 27

Project No. 27

Fibre exposure, mortality, and radiographic changes in the Québec chrysotile production industry

(In progress)

(Continuation of IOEH #10)

Study I. Mortality and radiological study of the mining population of "a posteriori" type in order to estimate the relative risks of the various fibre concentrations. All men 45-64 and employed 30 years and more will be involved.

Study II. Study of mortality related to previous clinical signs and symptoms ("a priori" study). Over 1,300 men who had radiograms, function tests and questionnaire in 1967-1968 and about 5,000 men born 1891-1920 whose radiograms were read in 1967 will be involved.

Study III. Study of difference of effect of slip fibres and cross fibres. Radiograms of men employed "purely" in one of three selected mines will be investigated.

Cost : London $241,000
Montréal $ 57,075

Docteur J. C. McDonald
TUC Centenary Institute of Occupational Health
London School of Hygiene and Tropical Medicine
London, England
and
Dr. G. W. Gibbs
Occupational Health and Safety Unit
Institute for Mineral Industry Research
Mont St. Hilaire, Qué.

PROJECT No. 28

Project No. 28

Interrelationships between the haemolytic effect of fibrous minerals in vitro and their effect on the alveolar macrophage and their fibrogenicity in vivo

(In progress)

1) Quantitative measurements of haemolytic activity of the various fibrous materials.

2) Feasibility study of the material obtained by broncho-pulmonary lavage following application of asbestos with the aim to see whether measurement of protein and lactate dehydrogenase can give information on acute damage to macrophages still in the lung or whether disturbance of the kinetics of the macrophage system or enzyme release can be seen in vivo as sign of delayed cytotoxicity.

3) Quantitative determination of pulmonary fibrosis as related to dose of fibres and their clearance rate.

Cost : £19,200.

Dr. A. Morgan
Environmental and Medical Sciences Division
B 551
Aere Harwell
Oxfordshire, England

PROJECT No. 29

Project No. 29

Distribution of particulate material in the rat lung following administration by inhalation and by single and multiple intratracheal instillations

(In progress)

(Continuation of IOEH #21)

Both fibrous and non-fibrous material are used radioactively tagged for the above study in animals killed immediately after application and at later times. Also effect of dust load on clearance of the material from the lungs is studied.

Cost : £45,200

Dr. A. Morgan
Environmental and Medical Sciences Division
B 551
Aere Harwell
Oxfordshire, England

Expenditures incurred by the Institute of Occupational and

No. Project	Authorized	1966	1967	1968	
1 McDonald	$230,000	$46,000	$81,400	$68,375	
2 McDonald	6,940	—	—	6,940	
3 McDonald-Gibbs	17,750	—	—	9,250	
4 Dumont	11,266	—	—	6,000	
5 Vigliani	85,000	—	—	4,555	
6 Pernis	45,000	—	—	9,412	
7 Noro	42,000	—	—	5,257	
8 Tulane Univ.	291,380	—	—	—	
9 Beattie	3,291	—	—	—	
10 McDonald	474,700	—	—	—	
Addendum #1	10,000	—	—	—	
Addendum #2	38,270	—	—	—	
11 Gibbs	52,000	—	—	—	
12 Ind. Health Fdn	19,921	—	—	—	
13 Vigliani	49,220	—	—	—	
14 Smith	276,000	—	—	—	
15 Gibbs	18,830	—	—	—	
16 Tulane Univ.	270,000	—	—	—	
17 Pernis	45,000	—	—	—	
18 Gibbs	37,375	—	—	—	
19 McDonald (Mrs.)	59,800	—	—	—	
20 Green	33,345	—	—	—	
21 Morgan	£ 48,400	—	—	—	
	$ 111,320	—	—	—	
22 Gibbs	76,278	—	—	—	
23 Roy-Barbeau	1,000	—	—	—	
24 Murphy	64,650	—	—	—	
25 Tulane Univ.	215,427	—	—	—	
26 Gibbs-Fengler	46,190	—	—	—	
27 McDonald-Gibbs	298,075	—	—	—	
28 Morgan	£ 19,200	—	—	—	
	$ 34,560	—	—	—	
29 Morgan	£ 45,200	—	—	—	
	$ 81,360	—	—	—	
Sub-Total	$3,045,948	$46,000	$81,400	$109,789	$
Gathering & Distribution of Scientific data, operating costs, etc		113,157	161,338	153,766	
GRAND TOTAL		$159,157	$242,738	$263,555	$

APPENDIX

LIST OF CODE NUMBERS USED IN IOEH DOCUMENTATION

I. Environmental Data

0. Exposure to asbestos - occupational
1. Exposure to asbestos - non-occupational
2. Exposure classified as to magnitude or type.
3. Dust Counts
4. Dust Control
5. Cancerogenetic hydrocarbons acting with asbestos
6. Metals acting with asbestos
7. Solvents acting with asbestos
8. Other impurities or compounds acting with asbestos
9. Exposure to asbestos by ingestion

II. Clinical Data on Asbestosis

10. Manifest clinical asbestosis
11. Findings in physical examination
12. Radiological findings
13. Pulmonary function findings
14. Classification
15. Differential diagnosis
16. Women and asbestosis
17. Occupational health care of patients with asbestosis

III. Pathological Data

20. Anatomical findings in asbestosis
21. Ferruginous bodies in the lungs
22. Ferruginous bodies in sputum
23. Ferruginous bodies in lymph nodes
24. Ferruginous bodies elsewhere in the body
25. Asbestos fibres and dust in the lungs
26. Asbestos fibres and dust in sputum
27. Asbestos fibres and dust in lymph nodes
28. Asbestos fibres and dust elsewhere in the body
29. Fate of asbestos fibre
120. Phagocytosis of asbestos