FILE NAME: Uniroyal (UNIR)

DATE: 1965 Dec

DOC#: UNIR002

DOCUMENT DESCRIPTION: Excerpt - Conference Proceedings - Biological Effects of Asbestos

THE NEW YORK ACADEMY OF SCIENCES

(Founded in 1817)

BOARD OF TRUSTEES

J. JOSEPH LYNCH, S. J., *Chairman of the Board*

Class of 1962-1965

HILARY KOPROWSKI — HARDEN F. TAYLOR — G. W. MERCK

Class of 1963-1966

W. STUART THOMPSON — EDMUND J. BLAKE, JR. — HUGH CULLMAN

Class of 1964-1967

HENRY C. BRECK — LEON SHIMKIN — LOWELL WADMOND

Class of 1965-1968

GORDON Y. BILLARD — FREDERICK A. STAHL — BORIS PREGEL

EMERSON DAY, *President of the Academy*
J. JOSEPH LYNCH, S.J., *Past President*
CHARLES W. MUSHETT, *Past President*
EUNICE THOMAS MINER, *Executive Director*

SCIENTIFIC COUNCIL, 1965

EMERSON DAY, *President*
JACOB FELD, *President-Elect*

J. J. BURNS, *Vice-President* — MINORU TSUTSUI, *Vice-President*

ANDRES FERRARI, *Recording Secretary* — ROSS F. NIGRELLI, *Corresponding Secretary*

Elected Councilors

RHODES W. FAIRBRIDGE	1963-1965	L. WILLIAM MAX
ALBERT S. GORDON	1964-1966	WALTER E. TOLLES
N. HENRY MOSS	1965-1967	H. CHRISTINE REILLY

EUNICE THOMAS MINER, *Executive Director*

SECTION OF BIOLOGICAL AND MEDICAL SCIENCES
GABRIEL G. NAHAS, *Chairman* — HERMAN COHEN, *Vice-Chairman*

DIVISION OF ANTHROPOLOGY
JEROME BRIGGS, *Chairman* — ANNEMARIE DE WAAL MALEFIJT, *Vice-Chairman*

DIVISION OF INSTRUMENTATION
CARL BERKLEY, *Chairman* — E. E. SUCKLING, *Vice-Chairman*

DIVISION OF MICROBIOLOGY
EUGENE L. DULANEY, *Chairman* — EUGENE R. L. GAUGHRAN, *Vice-Chairman*

DIVISION OF PSYCHOLOGY
JOSEPH F. KUBIS, *Chairman* — VIRGINIA STAUDT SEXTON, *Vice-Chairman*

DIVISION OF ENVIRONMENTAL SCIENCES
IRVING J. SELIKOFF, *Chairman* — E. CUYLER HAMMOND, *Vice-Chairman*

SECTION OF CHEMICAL SCIENCES
EMIL J. MORICONI, *Chairman* — ROBERT ROUSE, *Vice-Chairman*

DIVISION OF BIOCHEMISTRY
PAUL GREENGARD, *Chairman* — BERT N. LA DU, JR., *Vice-Chairman*

DIVISION OF ORGANOMETALLIC CHEMISTRY
WILLIAM J. CONSIDINE, *Chairman* — MINORU TSUTSUI, *Vice-Chairman*

DIVISION OF POLYMER SCIENCE
FRANCIS MICHELOTTI, *Chairman* — E. H. IMMERGUT, *Vice-Chairman*

SECTION OF GEOLOGICAL SCIENCES
LEWIS G. WEEKS, *Chairman* — BRUCE C. HEEZEN, *Vice-Chairman*

SECTION OF PHYSICAL SCIENCES
MORRIS H. SHAMOS, *Chairman* — BERNARD KRAMER, *Vice-Chairman*

DIVISION OF BIOPHYSICS
ROSALYN YALOW, *Chairman* — IRA PULLMAN, *Vice-Chairman*

DIVISION OF ENGINEERING
I. B. LASKOWITZ, *Chairman* — JULIAN D. TEBO, *Vice-Chairman*

DIVISION OF MATHEMATICS
AUBREY W. LANDERS, *Chairman* — CHARLES LEWIS, S.J., *Vice-Chairman*

SECTION OF PLANETARY SCIENCES
HAROLD L. STOLOV, *Chairman* — RICHARD M. SCHOTLAND, *Vice-Chairman*

The Sections and Divisions hold meetings regularly, one evening each month, during the academic year, October to May, inclusive. All meetings are held at the building of The New York Academy of Sciences, 2 East Sixty-third Street, New York, New York 10021.

Conferences are also held at irregular intervals at times announced by special programs.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES

VOLUME 132, ART. 1 PAGES 1-766

December 31, 1965

Editor HAROLD E. WHIPPLE

Associate Editor PAUL E. VAN REYEN

BIOLOGICAL EFFECTS OF ASBESTOS*

Conference Cochairmen

I. J. SELIKOFF J. CHURG

CONTENTS

*This series of papers is the result of a conference entitled *Biological Effects of Asbestos* held by The New York Academy of Sciences on October 19, 20, and 21, 1964 and supported in part by grant No. OH-00192-01 from the National Institutes of Health, Bethesda, Md.

The Future

The asbestos textile industry in the U.K. is continuously striving to improve its dust control methods and this is being done both individually by the Companies concerned and also on an industry basis through the Engineering Committee of the Asbestosis Research Council. In T.B.A. Co. Ltd., a number of investigations are proceeding now including the total enclosure of a carding machine and the ventilation of beaming machines (a yarn preparatory stage before weaving); the results of this work will be made freely available to the Engineering Committee whose function is to examine and develop methods of dust control in asbestos textile processes and to make recommendations for improvements. Visits are made by the engineers of each company to the plants of the others so that this is a real and live collaboration. The aim of all this work is to eliminate as far as is humanly possible the dust hazard in the asbestos textile factories in the U.K. and, at least as far as they are concerned, to make the subject of this monograph, "Biological Effects of Asbestos," a matter of pure academic interest.

References

1. MEREWETHER, E. R. A. & C. W. PRICE. 1930. Report on effects of asbestos dust on the lungs and dust suppression in the asbestos industry. H. M. Stationery Office. London, England.
2. REPORT ON CONFERENCES BETWEEN EMPLOYERS AND INSPECTORS CONCERNING METHODS FOR SUPPRESSING DUST IN ASBESTOS TEXTILE FACTORIES. 1931. H.M. Stationery Office. London, England.
3. BAMBLIN, W. P. 1959. Dust control in the asbestos textile industry. Ann. Occup. Hyg. **2**: 54.
4. GAZE, R. Private communication.

DISCUSSION

J. C. GILSON (*Pneumoconiosis Research Unit, Glamorgan, Wales*): I have a slight uneasy feeling about this meeting and it is a feeling I always have when attending this type of meeting, because I feel that it is really a form of the chicken and the egg. Everybody is unwilling to start using a particular method of counting or a particular instrument because they say we do not know whether it is the one that is the best. You never know unless you start using one consistently for a period of time, and observing the people whose environment you are measuring with a particular instrument. And it seems to me quite hopeless to go on expecting that some curious process which is quite undefined — perhaps the expectation that some animal experiments will somehow provide the philosopher's stone — will enable you to decide which instrument you should use.

Surely, the way to start is to choose a method at some time. I do not really think that any major change has been made in the last 30 years. If a decision had been made to make systematic measurements 30 years ago, with almost any instrument, you would by now, in fact, have got quite a long way to getting a dose-response relationship in this industry. I think Dr. Roach's suggestion that you should use, therefore, a gravimetric sampler of respirable dust has enormous merits because it does enable you to use it in many places where you cannot use any other kind of instrument.

We have heard earlier today that obviously the risks, taking the whole industry at the present time, lie very largely in the insulation workers. I cannot see how you would expect to be able to use a Royco instrument. I am not certain that Dr. Roach suggested you should, but, clearly, we need some instrument that has a very wide applicability throughout the whole industry.

C. G. ADDINGLEY (*British Belting and Asbestos Ltd., Cleckheaton, England*): I would just like to make one point. Dr. Roach said that in Britain mention is made of a safe limit of four fibers per milliliter, and that this is lower than the American limit. I would like to say that this is the first time that any limit has been specifically stated as far as the United Kingdom industry is concerned. We do not believe there is any safe limit. We have our ideas as to how low we can get and we are always striving to get right down to zero. We also have our ideas about the American limit of 5 million particles per cu. ft. as a safe limit. We know that there is no scientific basis for that limit whatever, and I think that if Dr. T. Hatch had been here he would have agreed with that, because it has been taken up with him in the past. Therefore, I would like it to be clearly understood that we do not accept four fibers per cc. as a safe maximum limit in the asbestos industry.

JOHN WELLS (*U.S. Rubber Co., Newnan, Ga.*): I would like to briefly

review the work that we have undertaken. The asbestos textile mill in Hogansville has been producing textile products since 1941. In 1941, using the Midget Impinger, dust counts were begun at many stations, many times a week and have continued to be obtained for some 23 years. During this time two people have done all the dust counting. The person who is now doing it was trained by the person who used to do it. I should say we do not know what we are counting. We are counting everything we get in the chamber, but we are counting in the same manner.

When this program started we hoped to get some meaningful results. In order to do that, we averaged out the number of counts that were obtained at each station during the year in terms of million of particles per cubic foot and multiplied them by the years. In so doing we arrived at a figure which we called million particles per cu. ft. years, and we did this with each worker, many of whom we have been able to follow.

We constructed a scattergram in which we placed on the ordinate the years of exposure, and on the abscissa the million particles per cu ft. years. Using this as a baseline (for whatever meaningfullness it had), when we got to a period of some 50 to 60 million particles per cu ft. years, we began to find people with pulmonary asbestosis. As the million particle per cu. ft. years mounted, we began getting more patients with pulmonary asbestosis.

In terms of what has been considered a safe dust count in the area, we started out with a theory — because everybody said it was so — that 5 million particles per cubic foot was a safe figure. Our own conclusion, as we began seeing what was happening in our own process, was that the only safe amount of asbestos dust exposure was zero and that the efforts in terms of achieving that lay basically in engineering, and, secondly, in education. But as far as a safe level of asbestos dust is concerned, our own conclusion in Hogansville, Ga., is that there is no safe level. The safe level is nil and anything above the safe level represents certain risk.

S. A. ROACH (*University of London, London, England*): I should like to say that the standards which we mentioned, four fibers per milliliter or 5 million particles per cu. ft., are simply standards, although I hope I did not use the word "safe." These are standards which are actually used, although they are not ever expressed as being safe standards. A further standard has been mentioned of 50 to 60 million particles per cu ft. years. I suppose this is the equivalent of some 2 million particles per cu ft. concentration. This would be another standard which might be used but it is not necessarily a perfectly safe level of dust.

L. SILVERMAN (*Harvard U., Boston, Mass.*): I have had some experience in specific uses of asbestos; in particular the asbestos tile industry which is a major consumer of asbestos fiber. With just a few simple applications of control such as switching from jute bags which were shaken out by the worker to be shipped back to the plant to paper bags which retain the

moisture in the fiber, and then from that to full gondola cars with vacuum conveying systems, the total dust exposure of the bag-opening operation has been eliminated. The dust counts that were present when the jute bags were used and shaken were reduced by a factor of something like 10 by going to the paper bags, and then, when automated conveying operation was installed, it was eliminated. Incidentally, so was the worker.