

File Name **J-M Brake Mechanics Hazards**

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Notes **Dr. George Wright reports on NDSH meeting presenting Selikoff data**

7/5/98:

J-M Brake Mechanics Hazards

- 1) Reports on NIOSH meeting presenting Selikoff data on brake mechanics in July 1975. Dr. G. Wright accepts the risk as demonstrated and concludes with recommendations for warning labels and "an educational program through the unions."
- 2) Reports on subsequent meeting attended by Krebs from General Motors 3/19/76 with Sellkoff and government official re brake hazard study needs.
- 3) Ford letter to Dr. Kotin re Selikoff brake Information (6/2/75).



Johns-Manville

000091
Internal Correspondence

To: Paul Kotin, M. D.

Date: July 23, 1975

From: George W. Wright, M. D.

Copies: file & C

Subject: MEETING ORGANIZED BY DR. JOHN FINKLEA OF NIOSH TO CONSIDER A REPORT BY DR. SELIKOFF AND HIS ASSOCIATES ON THEIR PRELIMINARY FINDINGS WITH RESPECT TO THE ENVIRONMENT AND THE HEALTH OF WORKERS EMPLOYED IN THE REPLACEMENT OF BRAKE LININGS.

The meeting was held in the afternoon of July 21, and those attending are indicated on the attached exhibit. The agenda is also attached.

Dr. Selikoff opened the meeting by stating that their interest in the health of brake lining repair workers arose because of a report of several cases of mesothelioma occurring in auto repair workers. There was some confusion in my mind at first as to whether this was solely from the New York area or a larger population. It later developed that there were 4 and possibly 5 cases that had come to his attention from workers in this trade throughout the United States. He estimated that at least one million men might be thus employed and exposed to asbestos. He repeated several times that in his judgement it was not possible at this point in the development of information to say whether or not this represented an excess risk of mesothelioma but that he thought the observation merited further exploration. He also indicated that he had reviewed this problem with appropriate people at the Ford Motor Company. He then asked Dr. Langer to discuss the nature of the material found in the dust that accumulates in brake drums and which is by customary practice blown off the surface and into the surrounding air at the time that work on the brake drums is being carried out.

Langer opened his comments by saying that others had reported that 30 percent of the asbestos in brake lining is converted by high heat to Forsterite. He indicated that "modifiers" present prevented the formation of Forsterite and he has found Forsterite in brake drum dust only in one instance. The only person I know of who says that the asbestos is converted to Forsterite is Paul Gross. Others say that it is converted to an amorphous and essentially non-fibrous material. Dr. Langer indicated that the residue was not pristine chrysotile fiber but he did not speak about amorphous material. Langer, in addition, said that he

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found pure asbestos fibers. This too has been reported by others in quantities of anything from 1 to 3 percent of the residual dust. He then asked Dr. Rohl to discuss the fiber counts in the dust that was obtained.

It should be indicated that brake drum dust was obtained from cars in taxi repair shops, municipal bus repair shops and I believe some other similar workplaces. Dr. Rohl indicated that studies of the material blown from, or obtained from the brake drum contained fibers in large numbers and these were chrysotile. None of the fibers were more than 0.5 microns long and the bulk were under 0.3 microns. In diameter they varied from 250 to 500 angstroms. On the other hand, he reported that the fiber count varied from 0.4 to 29.0 fibers per ml at the worker breathing zone level where brakes were being cleaned by air jet. It was my understanding that these were fibers that were countable under the OSHA regulations and therefore would be visible with the light microscope and longer than 5 microns. It was not entirely clear to me whether these optically recognizable fibers actually came from the brake drum dust or not. If they did, I have a conflict in reconciling his electron microscope study with his light microscope studies. Rohl also reported that in brushing the brake drums rather than blowing them off the fiber count (OSHA criteria) varied from 1 to 4 per ml, during grinding the fiber count varied between 1 and 5. Most important was the finding that when men were bevelling the brake linings by grinding the counts varied between 20 and 75 fibers per ml. During punching, riveting or sweeping the fiber count varied between 2 and 4 fibers per ml. It is my understanding that other kinds of grinding of the brake lining goes on in the fitting process. Ed Fenner tells me that they do something called "arcing" and this involves direct grinding of the brake lining and is a very dusty job. Rohl also showed data to indicate that there was a very rapid fall off in the level of count as one moved away from the source so that fiber counts 10 or 20 feet more away from the source of origin were lower than 1 fiber per ml and in general were in the neighborhood of 0.2. On some questioning it developed that these shops were what would be considered to be very well run and therefore tend to have lower dust counts than would the average smaller shop. In the pictures that were shown and the comments that were made there was no evidence to indicate that any sort of dust exhaust or suppression systems were in use. I was surprised that no direct reference to extensive data relative to brake drum dust by Lynch, by Jacko et al, by Anderson et al and by Johns-Manville as well as a small study of the work place during brake maintenance by Hickish and Knight was not made by either Langer or Rohl.

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At the request of the Unions Dr. Selikoff also did a preliminary examination of 104 workers currently employed in the places where the dust counts had been made. The men were not selected on the basis of duration or intensity of exposure, some working only once a week where they would be exposed to brake lining operations but the majority of them had worked for between 10 and 20 years. Of the 104, 29 had no direct exposure to asbestos or pulmonary disease but worked in the same area. The data was presented so rapidly that I could not follow all of it but in part at least it is as follows: Of the 64 men known to have direct shop exposure 16 had chest films that were read as category "s or t" small irregular densities with a profusion of 1/0 or more. No controls for the reading were spoken of and I assume that these were read on one occasion by one person. The inference was that these readings constituted "disease" attributable to the exposure. There was no breakdown of how many had profusion readings in excess of 1/0 and thus I have no knowledge about the extent of the changes. Later in the meeting I raised the question of the interpretation of this kind of information. In the absence of controls, there is no way to estimate the influence of bias in this kind of reading. It is obvious that the reader knew the films came from an exposed group and the tendency under these circumstances is to find something in the way of an abnormality. The best way to counteract this bias is to have a group of controls dispersed among the exposed group and have the entire set read "blind". In the absence of this there are two other ways of going at it, neither of which were utilized in these readings. The first of these is to have several readers look at the films independently. The accepted reading is then the one that has the majority of the readers designation. For example, if the majority of the readers class a film as a 1/1 and a minority classify it as a 0/1 the ultimate reading used is 1/1. Some use reading by "consensus" but this is a poor and unacceptable method because usually there is one dominant reader who is able to persuade the others as to what he thinks it is. The other way of going at it is to know what the exposure history is and be able to rank the observed population in terms of intensity of exposure. The films are then read with no knowledge of the intensity of the exposure and the distribution of readings has slightly less bias than otherwise because the least exposure serves as a control for the more heavily exposed. This method is not as good as having multiple readers or actual control films interspersed amongst the films of the population under study. With the information I have I don't know how to interpret their x-ray findings other than to say that the inference that came from them was that all 16 of these

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individuals had disease. The UICC classification is not a diagnostic classification in any sense of the word and serves only an epidemiological purpose. I know of no basis on which one can conclude that people with a reading of 1/0 have actual disease. Additional data was presented along the lines of pulmonary function measurements. The data showed a substantial percentage of those who were directly exposed to have what was called restrictive disease. I don't know what criteria were used for arriving at this designation and hence can't evaluate the finding. If it was based on actually measured total lung volumes, rather than just on vital capacity, then the data has useful meaning. The strong suggestion made by the Sinai group was that in these 104 individuals they had demonstrated the presence of asbestos related disease. Maybe this was not their intention but in contrast to Dr. Selikoff's statement that 4 cases of mesothelioma did not constitute sufficient evidence to incriminate the exposure, nothing was said to the effect that the x-ray and pulmonary function measurements may not have been very sound evidence of disease.

On the basis of these reports from Dr. Selikoff's laboratory several suggestions were forthcoming. First of all there was an inference that Langer's studies had a strong implication that a public health hazard might exist. At the very least the implication both from Langer and from Rohl was that the short fibers found in large numbers in the dust from the brake lining posed a potential threat to health of great magnitude. In my comments I pointed out that there was growing experimental evidence that fibers of lengths under 10 micron did not produce disease in terms of pulmonary fibrosis and very likely did not produce mesothelioma. On this basis I would think the presence of the very short fibers has little or no biological significance until proven otherwise. The longer fibers are quite another matter since they are capable of producing asbestos associated biological effects. In my comments I stated that the observation showing fiber concentrations of 20 to 70 fibers per milliliter in the bevelling operation did not surprise me. In other settings, the grinding of the surface of new brake lining is a known quite dusty process. Depending upon the accumulated duration of exposure in this kind of operation one had every reason to expect that in those who have been doing this for a substantial length of time there would be a risk of pulmonary fibrosis and the other kinds of asbestos associated disease. Even though this might occur only once or twice a week, these high intermittent exposures might have an adverse effect. Since no data in the way of cumulated dosage was presented there is no way in which the risk can be evaluated.

It was quite clear that the Union representatives expect a study of this category of workers to be made by

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Dr. Selikoff's group. Mr. Cefalo of the Machinists Union made the blunt statement that if funds were not available he could promise that they could become available. Whether this meant from Union sources or from the influence of the Unions on the Government was not clearly stated .

As you know I had to leave before the meeting ended and I don't know what the upshot of the matter was. I asked myself the question; what is to be gained by mounting a complete epidemiologic study based on observation of these workers and the environment of their workplace. If the question is solely whether or not asbestos has the propensity to produce a biological reaction along the lines we already know I would say that making this study would be a very poor use of Dr. Selikoff's and his co-workers time and of expenditure of tax payers money. We already have that kind of information and nothing in the presentation of the afternoon indicated that the exposure in this group was appreciably different from that which has been reported in other occupational groups. If adequate information can be obtained then two questions might be approached. There is the implication fostered primarily by Dr. Selikoff's group that short asbestos fibers (<5 μ long) produce all of the known biological effects in workers substantially exposed. They have taken this attitude on the basis primarily that short fibers are found in the lungs at autopsy and therefore must be the cause of the disease. On the basis of animal experimentation others do not accept the hypothesis that fibers shorter than 5 to 10 microns in length have biological capacity. There appears to be a reluctance on the part of the Selikoff group to accept the inferences of the experimental animal data. The difficulty of looking to human exposure for resolution of the question is obvious. Those groups exposed occupationally, at least in studies up to the present, are exposed to a mixture of long and short fibers and there is thus no way of separating the affects of short versus those caused by long fiber. Not even autopsy data will help in this respect since long fibers are subject to shortening by fracture with a passage of time. If a group exposed only to the dust from the brake drums as described by Langer and Rohl could be separated out and looked at in terms of their mortality and morbidity experience then a study of the brake lining workers population would be eminently worth while. If this cannot be done and the exposures are mixed, the population will be of no use for examining the effects of short fibers versus long fibers. Another question might be looked at by studying this group. There still remains a question in the minds of some as to whether or not the 2 fiber per cc level in the ambient air (OSHA standard) is adequate to protect the workers who are exposed throughout a lifetime. If Dr. Selikoff's group can reconstruct the exposure histories of these workers in a manner that will give a ranking of

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the workers in terms of intensity and duration of exposure then a study of the relationship between this ranking and the biological effects would be useful. If this cannot be done and if the population cannot be divided into those exposed solely to short fibers and those exposed to either solely long fibers or a combination of short and long fibers then I see nothing to be learned from an extensive study of this population that is not already known. To be sure, the employees in this trade might want an assessment of the potential hazards and this kind of information might be used in persuading both the employers and employees to create a safe work place. I think this can be done by utilizing knowledge already existing with respect to biological effects and relating it to a thorough survey of the environment with respect to the level of asbestos fibers in the various kinds of jobs being done in this category of employment.

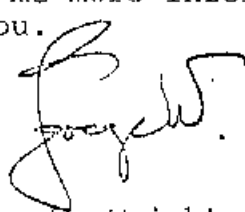
It seems to me that Dr. Selikoff's group constitutes a resource that should husband its time and facilities. I would hope they would not embark on a study except in those areas where something useful could be obtained. I think that a thorough investigation into the environment could be thought of as useful study on the basis of what is now known. In fact, under the regulations set forth by OSHA the employers should already have developed that information. The regulations require that when employees handle materials in processes through which they might be exposed to the inhalation of asbestos fibers certain environmental and physical examination requirements must be satisfied. I would think this would be the most useful avenue to pursue since the requirements under OSHA are quite clear cut. I don't know at this time what can be anticipated in the way of reconstructing exposure histories or in dividing the population into the two groups with the respect to length of fiber. On the basis of past experience I would not be very hopeful that this could be accomplished with a degree of accuracy permitting any conclusions from a biological survey to be drawn.

Several other points arose from this meeting that seemed to me to be important. First of all, insofar as I can learn, labeling of brake lining materials in a way that would inform the user and the worker of the inherent hazard related to the various ways in which the material might be handled has not been a common practice if done at all. I would hope this would be corrected at once. Mr. Sam Meyers of the United Auto Workers Local 259, showed posters his group have developed, warning of the possible effects of brake lining handling on health. He also made constructive remarks during the meeting. It seems clear that some mechanism must be found for alerting all workers in this trade to the potential hazards and the need to join

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with the employers in finding ways to work safely. An educational program through the Unions as well as the employers should be mounted as quickly as possible. Since this trade may involve only a few people in a given place and presumably is not totally unionized I believe this may be a matter of considerable magnitude. The discussions of this particular afternoon demonstrate as well as anything I know the obligation on the part of manufacturers to know where their products containing potentially toxic material go and the way in which they are used. In those circumstances where a hazard can be created by the use of the product a means of informing the worker must be found. At the very least this should be labelling and in all probability it should be a joint educational effort on the part of the workers organizations and the employers and the producers. Unfortunately labelling is often times either ignored or loses its impact with the passage of time. For this reason more persistent and active methods should be found for accomplishing the purpose. In view of the nature of the problem and the fact that the current OSHA regulations should have brought it to the fore I was surprised that no representative of OSHA was present. Representatives of EPA were present even though their concern would be expected to be less at this point than should be true for OSHA.

I regret that I was unable to attend the meeting beyond 3:40. I will call Dr. Finklea and see if he can give me more information and if so I will transmit this to you.



George W. Wright, M. D.
GWW/bek



Johns-Manville

Internal Correspondence

To: Paul Kotin, M.D.

Date: March 22, 1976

From: G. W. Wright, M.D.

Copies:

Subject: MEETING WITH NIOSH AND OTHERS IN REGARD TO STUDIES IN THE
BRAKE LINING OPERATIONS (NOT MANUFACTURE) HELD IN
CINCINNATI ON FRIDAY, MARCH 19, 1976

A list of the attendees will be furnished together with a summary of the meeting sometime in the near future. Those present were members of NIOSH along with representatives of the brake lining manufacturing industry and also major users of brake linings. In addition, Dr. Selikoff was present. There were no union representatives. John Marsh represented Raybestos Manhattan and there were two men who represented another maker of brake linings. There was a lawyer (?) who represented the industrial hygiene and safety group of J. C. Penney and Dr. Krebs (General Motors) represented the large users of brake linings.

Selikoff repeated what he had presented before as indicating the need for a rather large-scale study of the brake lining mechanics population. His interest appeared to be along the lines of (1) an industrial hygiene examination of all kinds of workplaces in order to learn what the conditions actually are today. (He agreed that it would not be probable that they could reconstruct exposure histories from the past.) He thought that this information would provide grounds on which to choose cohorts for mortality studies sometime in the very near future. (2) He thought that there was enough known now about the various kinds of operations to permit cohorts to be chosen for study by X-ray and pulmonary function measurement at the present time. (3) He thought that any kind of mortality studies should be delayed until the information obtained from item (1) was finished. I am not entirely sure that I have given you the exact meaning of what he said since he spoke rather in generalities. When I asked him what the specific questions were to which these studies would be addressed, he said they were roughly as follows. First, an attempt to learn what the conditions are at the present moment, especially with regard to various kinds of work practices. Second, he thought the morbidity study would give an understanding of the magnitude of the problem and therefore would dictate the magnitude of the response necessary. Third, he is interested in knowing what the mortality pattern is because this would likewise indicate whether there is a problem and what needs to be done about it. On direct questioning, he appeared to agree that any effort at looking for dose-response relationships would be out-of-the-question from what he knew at the present time.

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When I was asked what I thought the program might be, I said the following. First, I thought it was of the greatest importance to make a very careful study of the environment in terms of coexisting materials and asbestos fibers (with a strong effort to actually identify the nature of the fibers) and at the same time to make a scrupulous, detailed study of work practices as they represent the industrial hygiene findings. On this basis, in a relatively short period of time, work practices could be developed that would give the greatest likelihood and perhaps even guarantee compliance with current OSHA standards in the workplace.

Second, I thought it would be of the utmost importance to try to structure a cohort of individuals exposed solely to the inhalation of dust from the brake drums and free of any exposure to unaltered long asbestos fibers such as commonly occurred in these places in the past as a result of grinding new brake linings and sanding them in place. My interest in this was because the material from the brake drum dust is first of all the material that goes to the question of a public health hazard and second, because it comprises a short fiber population and hence would shed light on the controversy between those who think short fibers are hazardous and those who think they are not.

Third, I thought that since only chrysotile has been used in the brake linings in the automotive industry, a study of this industry might give an opportunity to look at industrial use of chrysotile in pure form (insofar as asbestos is concerned). I suggested doing this only in regard to mesothelioma, however. I indicated that I would give low priority to any health studies in this population other than a look at mesothelioma. I also indicated that I didn't think there was any chance to structure a study that would shed light on dose-response relationships and therefore I would have no reason to support any large-scale medical studies.

It is of considerable interest that Dr. Kraft raised a serious question as to whether NIOSH should have anything to do in the way of further studies and whether or not it wasn't primarily the task of OSHA. He thought this, particularly, since their resources were extremely small. I got the impression that he thought that if anything was done by them it would be along the line of industrial hygiene and work practice studies. Selikoff responded by saying that it was the responsibility of NIOSH to make the kinds of studies that he proposed and that if they didn't have enough money to do it they should say so. He expounded on this at rather great length.

Dement indicated that in the environment of the workplace the fibers were almost solely of the less than 5-microns-in-length variety.

Dr. Krebs indicated that in their automotive shops they now do no arcing or grinding or sanding of the replacement brake shoes and that the only source of fiber in the air would come from the removal of the wheels and the cleaning-out of the brake drums. These comments he said applied primarily

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to passenger automobiles. He indicated that in contrast, in the truck and off-the-road kind of vehicle there still was a considerable amount of manipulation of the new replacement brake lining. His comments about the modern methods of replacing brake lining by shoes that did not need arcing or grinding was fully supported by the man from J. C. Penney and from the two industry groups that manufacture brake linings. The man from J. C. Penney gave a rather interesting account of their practices. He indicated that they had by rather intensive study developed work practices that would guarantee zero exposure to asbestos fiber if they were followed. He also indicated that the biggest problem was with the older employees who were used to doing it in another way and did not take kindly to the newer methods of work.

There were a number of other discussions of considerable interest but these can wait until the summary comes from NIOSH.

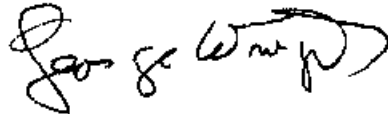
I did not come away with any strong understanding of what the program would be. I think there will be considerable pulling and hauling between the views of Dr. Kraft who appeared interested primarily in getting on with the job of producing the data needed to bring all of these kinds of operations into compliance with OSHA's standards and the desire of Dr. Selikoff to have his group embark on a large-scale health study of the current working population. I neglected also to indicate that Dr. Selikoff would like to do a large-scale study of the fibers to be found in the dust residue of lungs. He is under the impression that this would give a good picture of past exposure and permit some ability to differentiate between work practices and perhaps also predict what is going to happen to workers some years down-the-line. I voiced concern about this approach since I thought fibers would undergo change after entering and staying in the body for any length of time and I would mistrust the lung residues as being representative of the actual exposure or of the immediate post-exposure period (perhaps one year) when the biological phenomena are taking place.

It is of some interest that Dr. Selikoff indicated his laboratory had found asbestos and asbestos bodies in the sputum of persons long after they had no longer been exposed to asbestos. This doesn't seem to jibe with his often-expressed view that asbestos, when inhaled, remains in the lung forever.

There was a great deal of discussion about whether or not a cohort exposed solely to the residue of brake friction (short fibers) could be structured. Dr. Selikoff seemed to think it could be and insisted that even if it couldn't be perfectly done it could be done to some degree. I objected strongly because I felt that this would only cloud the issue. We had a rather lengthy exchange on the difficulty of structuring precise experiments when human beings are involved and past exposures are being looked at. He seemed to think that it was perfectly all right to go ahead with studies

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that were not well-structured and then afterwards they would argue about what the studies meant. I didn't say so, but all I could think was that this is exactly what they had been doing for years. Insofar as I am concerned, if they look at something that is called a short-fiber-exposed or brake-drum-dust-only cohort that is anything less than that (namely, still exposed to some dust containing some long fibers), if disease is found in that cohort they will insist that it is the short fibers and not the long fibers that are responsible.

A handwritten signature in black ink, appearing to read "George W. Wright". The signature is stylized with a large, sweeping initial "G" and a long, horizontal stroke extending to the right.

George W. Wright, M.D.

GWW/sk



JUN 10 1975

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Ford Motor Company

The American Road
Dearborn, Michigan 48121

June 2, 1975

Paul Kotin, M.D.
Health, Safety & Environment Department
Johns-Manville Corporation
Greenwood Plaza
Denver, Colorado 80217

Dear Paul:

At our meeting with Irv Selikoff two weeks ago, he reviewed in general terms the results of physical examinations conducted on the first "100 or so" individuals who have done brake maintenance and repair work for a number of years. He mentioned again that a physician in California and another physician in Boston had told him about four cases of mesothelioma they had seen in brake maintenance and repair men in the past year, but he did not know any of the details of these cases. He told us that when the details had been gathered he would share that information and his own data with us by sending the information to me.

Your note reminded me that I had not kept in touch with you as I promised I would, but I had intended to send all of this information to you when I received it from Irv. You may be sure that I will do this.

Best personal regards.

Sincerely,

A handwritten signature in dark ink, appearing to read "Duane".

Duane L. Block, M.D.

Subject: Meeting at Mount Sinai Hospital Relative to NIOSH Contract for Investigation of Health Hazards in Brake Lining Repair Shops

On Tuesday, January 5, 1978 Mr. R. H. Mereness of the Asbestos Information Association called to advise that there was to be a meeting in Dr. Selikoff's office at Mount Sinai Hospital with NIOSH representatives as regards the progress of their contract for a study of the health hazards in brake lining repair shops for those exposed to asbestos. It was suggested that I attend this session. Mr. Mereness indicated that he had talked with, or would be talking with, several representatives of industry suggesting that they attend. Also he indicated that representatives from New York City auto dealers and municipal unions would be attending. These would be in addition to individuals from Mount Sinai and NIOSH. I attended this meeting on January 5, 1978 at the Basic Service Building, 10 # 101 Street, mezzanine floor, at 2:00 P.M. in Dr. Selikoff's office.

In attendance were the following:

I. J. Selikoff, Mount Sinai Hospital	W. Nicholson, Mt. Sinai Hospital
A. B. Smith, NIOSH	
P. L. Johnson, NIOSH	
F. Panzer, Tobacco Institute	
James Ducke, Municipal District 7, New York City	
J. H. Marsh, Raybestos-Manhattan Inc.	
G. R. Chase, Johns-Manville Corporation	
R. H. Mereness, Asbestos Information Association	
B. J. Iwarsson, Abex Corporation	
D. E. Stone, Bendix Corporation	
I. H. Weaver, Raybestos-Manhattan, Inc.	
E. W. Drislane, Friction Materials Standards Institute	

In the report read by Dr. Nicholson little was heard from NIOSH. Dr. Selikoff made some statements concerning mesothelioma that he stated had been encountered from those exposed in brake repair service. I believe that Mr. Marsh pointed out that there was no documentation or history of these alleged cases of mesothelioma from those exposed to brake service repair. Dr. Selikoff mentioned a Manheim study which pointed the finger at friction materials because of the Raybestos-Manhattan plant. Mr. Marsh pointed out that crocidolite and amosite were used at the Manheim plant at the time of the study in question. He also indicated that a study of the Charleston plant where there was no crocidolite had not been reported on by NIOSH.

Mr. Marsh questioned the description of the work which called for a study of the feasibility of locating a cohort of brake lining repair workers occupationally exposed to short fibers only. It was indicated that this was a seemingly impossible task (locating a cohort exposed to short fibers who would not have also have been exposed to fibers longer than five microns).

The type of shops that were to be examined were discussed and it was pointed out that New York City maintenance shops could not be considered typical. Shops such as Sears, Montgomery Wards, J.C. Penney and others would be considered far

more typical than the truck brake repair shop. In these shops there should be little or no grinding, drilling or other machining of friction materials. One recommendation that almost everyone could endorse was that there should be no machining where possible in the brake repair shops. Materials could be purchased ready for installation on just about all vehicles. Exceptions to this would be in the heavy duty shops where there will always be some tailoring of blocks for oversize usage.

The entire session was controlled by Drs. Selikoff and Nicholson and there was no input from NIOSH. The main input from industry was that selection of shops should be typical shops, and it was not proper to classify New York City maintenance shops as typical. It was also stated by the union representative that there is a lack of knowledge as to how many brake repair garages and workers there are in the Municipal system, and it appeared a little difficult to know how many people are actually exposed to asbestos in these shops.

The foregoing is a matter of record.

E. W. Drislane
Executive Director