PLAINTIFF'S EXHIBIT
MET-841



know whether Dr. Lanza has a paper, or whether he is going to speak extemporaneously but that makes very little difference because when Dr. Lanza speaks on anything, we get a lot of information, in a very pleasant way, and when he is through speaking we know a great deal more than we did when he started. Dr. Lanza. (Applause.)

DR. A. J. LANZA (Metropolitan Life): Mr. Chairman and Gentlemen: It is certainly a very great pleasure to meet with you again. I enjoy these meetings very much; I don't know when I have listened to such a thorough exposition of a subject as that of the previous speaker, and if I may say so, the thorough-going analysis of an industry such as Mr. Edwards has prepared is the sort of thing that we need about a good many industries. Now, I chose that title—Comments on Asbestos—because that's exactly what this is going to be, and while I appreciate the very nice things that the Chairman has said, you are not going to get, I'm afraid, the final word or anything approaching the final word on this particular subject, at this time.

In the latter part of 1930 and the early part of 1931, we made a study of the asbestos industry. That study included the Thetford mines in Quebec and fabricating plants in the United States, and through the courtesy of the various asbestos corporations, I have been given permission to give a summary of that study. First of all, we studied four mines in Thetford—large properties. Asbestos is mined on the open pit or quarry method, holes are dug, blasted, and then a good part of the asbestos is hand picked, right there on the job and loaded into carts. The rest goes into the mills and is crushed, sieved and bagged.

Now, I am going to make this a little bit dogmatic. So far as we could ascertain, there is no dust hazard or asbestos hazard in connection with the actual mining or quarrying operations. There is now, I understand, in operation an underground asbestos mine in Canada and that I know nothing about but in the open pit and quarry work there was no apparent pulmonary hazard.

The crusher houses or mills are, some of them, old wooden buildings and one or two of them are brand new. But in either event they are surrounded by clouds of dust and everybody



who has ever been in Thetford can bear witness to the way in which the dust permeates the landscape. Much to our surprise we found little evidence of pulmonary disease in connection with this occupation. The dust in the crusher house is about 5 per cent asbestos and 95 per cent composed of the country rock. The country rock is of the same chemical nature as the asbestos, that is to say it is largely magnesium silicate but, whereas the asbestos has a crystalline structure, the country rock has an amorphous structure.

Now, whether that has anything to do with the presence or absence of pulmonary disease, I don't know. Suffice it to say that we did not find any marked evidence of pulmonary disease among the men working in the mills, and there were men working there who had been there for fifteen and twenty years.

I was impressed with the fact that Thetford does not present that typical unmistakable picture that you see in a hard rock mining community and which you can't possibly cover up, and that is disability associated with tuberculosis. The death rate in Thetford for tuberculosis is high, but it is no higher than it is in the Province of Quebec as a whole.

We made 156 X-ray examinations in Thetford and these were all men working on the job. Now, just let me say a word in explanation: X-ray technique in connection with these dust diseases of the lungs has got to be very precise and you've got to have absolutely first-class films to interpret them. The pictures that we were able to get in Thetford were not first class, by any means, they were just fair but, as well as we could tell, we found 19 who had what you might call an early or beginning evidence of dust fibrosis of the lungs and 3 were a more moderate or a little bit more advanced; some 22, that is out of the 156, showed some evidence of dust disease of the lungs and these were people working there for a long time.

Now, if you ask me to explain that, I'll tell you that I can't explain it. None of these men seemed to be obviously short-winded, certainly not to the point of disability. I could find, by talking to the doctors in the community, no evidence that there was any appreciable amount of tuberculosis among the asbestos workers. The majority of these men were over thirty years old, and nearly all of them had worked more than ten years, some of them as high as twenty years.

What the effect of inhalation and lodgment of asbestos dust in the lungs might be upon other respiratory diseases, such as influenza and pneumonia, we have no information as yet. The conclusion with respect to this I will give you in connection with the conclusions of the study as a whole.

Now, in the United States, we examined most of the larger properties. The method was the standard method that we always use in making industrial hygiene studies—environmental study of the conditions in the mill or plant, physical examinations of the men and the attempt to correlate those two and draw, on the one hand, conclusions and on the other, recommendations for the improvement of the industry.

We made a great many dust counts in these mills and, in the main, the amount of dust in the air did not seem excessive as judged by the standards or what we had been accustomed to find in making dust counts for silica dust.

Briefly, the process in these mills is this: the asbestos comes down in bags from Canada and is run through pug mills for about five minutes. It is then shoveled into openers, similar to those used in textile mills. From the openers the asbestos is put on vibrating tables or screens, and in this process, the long fibres are separated from the short fibres. The short fibres are taken out and are sold as such and go into the making of asbestos cement and other preparations in connection with the building industry. The long fibres are retained and those are mixed with cotton, and the process is exactly the same as it is in a cotton mill, that is to say, the cotton is also put into openers and the cotton and the asbestos are then passed through mixing pickers, and from there they are carded, spun and woven.

After going into the mixing pickers, the material is sprinkled with mineral oil, for the purpose of holding the cotton and the asbestos fibres together and, undoubtedly, that helps very considerably to cut down the amount of dust floating in the air. Now, the dust varied as between the plants; in some plants they used more oil and there was less dust in the air; while in other places, oiling didn't seem to be as efficiently done and there was more dust in the air. As you know, to try to apply dust suction, or dust control apparatus, to textile machinery is difficult and vexatious, and while there has been some success with it, in the main my impression was that it would be upon sprinkling and keeping the material moist that we would have to rely for controlling the dust. In some of the plants, as in cotton mills, they used artificial humidification in spinning and weaving.



When we came to examine the men in the fabricating plants, the story was a little different. Here again we just picked men out at random and examined them—and by examination I mean not only physical examination but an X-ray—and amongst those employees of the fabricating plant we found plenty of evidence of pulmonary involvement. Here, again, we were hampered by the difficulty in getting good films but, fortunately, near one plant we found a town that had a first-class roentgenologist and in this one place we did get a series of very fine films. We took fifty men at random from that plant and pretty nearly all of them showed definite evidence of pulmonary fibrosis. All in all, in this study of the plants, we made 126 X-ray films.

Now of those 126, 63, approximately one-half of them, showed definite early fibrosis; 4 were a little bit more advanced, and the remaining 59 doubtful or negative. There were all men working daily on an eight-hour shift; the majority of them were over thirty years of age and their exposure was not less than five years and as high as fifteen years. There was not apparent among these people any urgent short-windedness, so far as I could see, no disability. Ten of these 126 showed evidence of healed tuberculosis. Now you understand, of course, that if you examine any large body of men or women, many will show typical old healed scars in the apices of the lungs. The majority of us here would probably show something of the sort. So in that respect, the asbestos workers ran true to form.

Of those ten that had healed or inactive tubercular scars, three had no evidence of any dust involvement of the lungs. We found one case of active tuberculosis, but this individual had no evidence of any dust disease of the lungs, so there was no way of linking up his tuberculosis with his occupation.

Here, again, we talked to the doctors in the communities and found out that asbestos workers apparently do not have tuberculosis to any unusual degree. One community was very

favorable for study because it was rather isolated, had a homogeneous population, there was little migration in or out of the community, and the mill had been there for a good many years. I inquired particularly of the local physicians whether they saw any appreciable amount of tuberculosis in the community and they said, "No, we have not."

Inasmuch as the British authorities had reported several cases of asbestosis with tuberculosis, and one or two of them had made the statement in their publications that asbestosis predisposed to tuberculosis, the same as silica does, we were anxious to verify that as far as possible, and I turned then to the claims under our group insurance experience to see if that would throw any light. Of course, you realize that the exposure wasn't large enough to make any dogmatic statements; the total exposure amounted to slightly over 7,000 life years.

There were 36 death claims and 10 total and permanent disability claims. Altogether, of the 36 death claims, 6 had died of tuberculosis. Of the 10 total and permanent disability claims, 8 had died, according to the death certificates, of tuberculosis. But when I came to look into those—and I ran down every one of them, with one or two exceptions—the apparent deduction, namely, that there was a high percentage of tuberculosis causing death and disability, was proved erroneous. On analyzing the 6 death claims, I found that one was a stenographer and typist in the office, and another was an official, while a third was a watchman, none of whom ever came into contact with dust or just coincidentally.

When I came to the eight total and permanent disability claims that were alleged to be due to tuberculosis, I found out that when these men had been examined, the doctor had taken X-ray films, he had seen markings in the chest, and not being familiar with asbestosis or other forms of pneumoconiosis, he said, "You've got tuberculosis," and that happens, you will understand, not infrequently. Just the other day, in Indianapolis, a doctor in charge of a sanatorium in North Carolina read a paper on asbestosis and I asked him how he came into contact with it. "Well," he said, "the local doctors saw markings in X-ray films of the chest and thought they had tuberculosis and sent them to the County sanatorium; but they haven't got tuberculosis."



Of these 8 who were certified for total and permanent disability purposes as being tuberculous, I think only 2 possibly had tuberculosis and, of course, you would expect in any group of industrial workers to find some cases of tuberculosis.

These findings coincide with the experimental laboratory findings at Saranac, in dealing with experimental animals, namely, that exposure to asbestos dust does not influence a tuberculosis one way or another—it neither predisposes to nor aggravates tuberculosis as does silica.

It is, of course, possible that further study may prove otherwise but as far as we could ascertain, there did not seem to be any connection between asbestos exposure and tuberculosis. As all of you know, where you have a community with a major silica hazard, you cannot conceal the numerous cases of tuberculosis that you see around. But I got an entirely different clinical picture in the asbestos communities.

If you now ask me—what does asbestos do, I am not certain that I can tell you because, after all, a couple hundred films, some of them of rather dubious quality, is not a great deal to go on. But we do know this, that occasionally, asbestos cases die. There are five or six, I think, on record now, and they die, apparently, because of heart failure. One thing that impressed us in our films was that a number of these asbestos workers, even when they did not have any symptoms, did have big hearts. What the conclusion from that is, I don't know.

Let me give you a summary of our conclusions:

That exposure to asbestos dust may produce a pulmonary fibrosis which is detectable by the X-ray and which can be distinguished from silicosis;

That it does, apparently, sometimes cause a heart enlargement;

That it does not carry with it increased susceptibility to tuberculosis;

That, so far as this study was concerned, there was no marked evidence of disability;

That there is no information as to the effect of asbestos on other respiratory diseases and that we don't know nearly

enough about it to try to formulate any dust count standards. (Applause.)

CHAIRMAN DAVIES: Perhaps Dr. Lanza didn't give us the final word, but he certainly gave us just about all there is to know on the subject at this time. If anyone has any questions to ask, now is the time to bring them up.

The Wednesday Morning Session of the Occupational Committee adjourned for luncheon at twelve-thirty o'clock.

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## OCCUPATIONAL COMMITTEE MEETING
## WEDNESDAY AFTERNOON SESSION

**November 15, 1933**

. . . The afternoon session of the Occupational Committee was called to order by Mr. Harold Davies, presiding, at two o'clock. . . .

CHAIRMAN DAVIES: Gentlemen, I think we had better get down to business, because the afternoon schedule includes at least one general discussion, which may or may not take up considerable time; so, without further ado, we will start our program. The next paper to be heard is on the Operation of Mercury Boilers. I am sure that most of us will welcome any information we can get as to the hazards which may be associated with the use of mercury. We have another old friend of ours to give us the story on mercury boilers and to discuss the potential hazards. Mr. Stratton has had a better opportunity to observe this new phase of industry than any of the rest of us and, as usual, he has been willing to do the necessary work. Mr. Stratton. (Applause.)

MR. REUEL C. STRATTON (Travelers Insurance Co.): Mr. Chairman, Gentlemen: Instead of complimenting me, I think I should thank the Committee, particularly the proponent of this investigation, for giving me such an easy job, first, because the number of men exposed in the United States is



practically negligible and, second, the cost of such installations is, at present, so prohibitive that there are very few mercury boiler installations in the world, let alone in the United States. The development along this line will be so slow that you will be able to keep pace with it readily.

There are two mercury boiler installations operating at present. The original mercury boiler was installed at the South Meadows plant of the Hartford Electric Light Company in 1923, and the other plant is operating at Kearney, New Jersey. I am informed that the installation at Schenectady has not as yet been completed and is not running.

Incidentally, the plant at the South Meadows station of the Hartford Electric Light Company, I have been through on several occasions and am, more or less, familiar not only with its development but also with its present operating condition.

Having been in Schenectady a year ago this last June, I met the scientist who was more or less intimately connected with the development of the mercury boiler principle and I wrote to him, Mr. W. L. R. Emmet, of the General Electric Company at Schenectady to obtain his experience in the development of the mercury process and received a reply a portion of which I quote:

"In applications of this process which have been made or planned, all parts containing mercury under pressure or where leakage could occur, have been put inside of enclosures that men did not have to enter. These enclosures have by connection to the stack connections, been constantly held at pressures below the atmosphere. With such arrangements, no mercury vapor or liquid can get into places where people work.

"If through carelessness in repair work or otherwise, mercury is exposed in hot places outside of these enclosures, men might be affected.

"In all of our extensive developmental and experimental work over many years, we have had no serious or very definite case of mercury poisoning and I think that the conditions about such plants will generally be far less dangerous in the matter of mercury poisoning than they are in the average chemical laboratory, where mercury is often very carelessly handled and scattered about.