M.T.B

Dr. Ducommun's Remarks

August 4, 1969

PLAINTIFF'S EXHIBIT

DOW-1823

THE LUNG RESPONDS DIFFERENTLY TO DIFFERENT KINDS OF DUSTS. WHAT YOU SPIT OUT OR SEE ON YOUR HANDKERCHIEF DOES NO HARM. WHAT STAYS BEHIND IN THE LUNG MAY OR MAY NOT CAUSE HARM. DEPENDING UPON WHAT IT IS. TO UNDERSTAND THE DISCUSSION REGARDING ASBESTOS, WE WOULD LIKE YOU TO HAVE SOME UNDERSTANDING OF THE BASIC STRUCTURE OF THE LUNG

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HERE IS A SLICE OF ACTUAL NORMAL LUNG TISSUE. THINK OF IT AS BEING SIMILAR TO A SPONGE WITH MANY CELLS EXCEPT THAT IN THE LUNG THERE IS AN AIR TUBE GOING TO EACH AND EVERY ONE OF THE CELLS. THESE CELLS ARE CALLED ALVEOLI AND IT IS HERE WHERE THE GASEOUS EXCHANGE TAKES PLACE. THE AIR TUBES ARE KNOWN AS THE AIR-CONDUCTION SYSTEM OF THE LUNG. THEY BRANCH OUT AS THEY LEAVE THE NOSE AND THROAT BECOMING SMALLER IN SIZE AND LARGER IN NUMBER UNTIL THEY FINALLY REACH THE SMALL CELLS AT THE END. IN THIS PIECE OF LUNG TISSUE YOU CAN SEE CROSS CUTS THROUGH THE VARIOUS SIZES OF AIR TUBES.

IF YOU SPREAD OUT ALL OF THE ALVEOLI WHICH ARE THE EQUIVALENT TO THE CELLS IN THE SPONGE ON A FLAT SURFACE THEY WOULD OCCUPY AN AREA SOMEWHAT BIGGER THAN A BADMINTON COURT AND SLIGHTLY SMALLER THAN A TENNIS COURT. YOU CAN SEE THEN THAT THE LUNG SURFACE HAS A GREATER EXPOSURE TO THE OUTSIDE AIR THAN DOES THE SKIN THE SKIN HAVING AN EXPOSURE AREA OF A FEW SQUARE METERS AT THE MOST.

THE AMOUNT OF DUST YOU BREATHE DEPENDS IN PART ON THE PARTICLE SIZE OF THE DUST. THE RANGE OF SIZE IMPORTANT HERE IS

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ONE-TENTH MICRON IN DIAMETER TO [illegible]. THE LARGER PARTICLES TEND TO BE TRAPPED IN THE UPPER PART OF THE BREATHING SYSTEM WHILE THE SMALLEST PARTICLES TEND TO MOVE IN AND OUT OF THE ALVEOLI WITHOUT BECOMING TRAPPED. THE PARTICLES IN BETWEEN THESE TWO EXTREME SIZES MAY BECOME TRAPPED ANYWHERE FROM THE NOSE AND THROAT TO THE ALVEOLI. THE RATE AND DEPTH OF BREATHING ALSO INFLUENCE DUST EXPOSURE; THE FASTER AND DEEPER YOU BREATH, THE MORE DUST YOU ARE LIKELY TO TAKE INTO YOUR LUNGS.

IN DEALING WITH DUSTS, THE LUNG HAS MANY PROTECTIVE MECHANISMS. THE COUGH REFLEX IS ONE OF THESE AND IS EFFECTIVE IN EXPELLING INHALED DUSTS WHICH IRRITATE THE TUBES OF THE AIR CONDUCTION SYSTEM. THE NOSE AND THROAT WARM AND CLEAN THE AIR OF LARGER PARTICLES BEFORE IT ARRIVES AT THE FIRST BRANCHING OF THE TUBES OF THE AIR CONDUCTION SYSTEM. THE LARGE HAIRS IN THE NOSE ACT AS A FILTER IN STOPPING THE LARGE DUST PARTICLES. IF YOU BREATHE THROUGH YOUR MOUTH RATHER THAN THROUGH THE NOSE, THIS PARTICULAR PROTECTIVE MECHANISM IS BYPASSED AND THEREFORE MOUTH BREATHING SHOULD BE AVOIDED. THE AIR DRAWN INTO THE LUNGS IS PROPERLY HUMIDIFIED IN ADDITION TO BEING WARMED TO PROTECT THE TISSUE FROM INJURY.

ANOTHER VERY IMPORTANT PROTECTIVE MECHANISM THE LUNG HAS IS A SLIMY COATING CALLED THE MUCOUS BLANKET WHICH CONTAINS MANY HAIR-LIKE PROJECTIONS CALLED CILIA. THESE CILIA CONSTANTLY SWEEP UPWARD IN UNISON CARRYING INHALED DUST PARTICLES TO THE NOSE AND THROAT WHERE THE PARTICLES ARE SWALLOWED, SPIT OUT,

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OR BLOWN OUT THROUGH THE NOSE INTO YOUR HANDKERCHIEF. THIS SELF CLEANSING SYSTEM WORKS TWENTY-FOUR HOURS A DAY AND IS VERY EFFICIENT.

NOW SOME DUSTS ARE CONSIDERED NUISANCE DUSTS. THIS MEANS THAT NO MATTER WHAT THE QUANTITY OF DUST YOU BREATHE, THE LUNG IS CAPABLE OF CLEARING ITSELF OF THE DUST. NUISANCE DUSTS DO NOT CAUSE DISEASE AND THEY ARE NOT RETAINED IN THE LUNG IN SIGNIFICANT QUANTITIES. OTHER DUSTS ARE RETAINED IN THE LUNGS BUT CAUSE NO SIGNIFICANT CHANGES AND THE LUNGS CONTINUE TO FUNCTION AS THEY NORMALLY WOULD. FOR EXAMPLE, ONE OF THESE WOULD BE IRON DUST.

ON THE OTHER HAND, THERE ARE DUSTS WHICH ARE HARMFUL TO THE LUNG. [redacted] YOU HAVE ALL HEARD OF SILICOSIS, IT IS INTERESTING THAT WE DO NOT KNOW WHY THEY DO INJURY TO THE LUNG EXCEPT THAT THEY DO. DIFFERENT FORMS OF SILICA PRODUCE DIFFERENT DEGREES OF SILICOSIS AND SOME FORMS DO NOT PRODUCE ANY DISEASE AT ALL.

WITH THAT AS A BACKGROUND, LET US NOW TALK ABOUT ASBESTOS. ASBESTOS IS A MATERIAL WHICH IS FOUND IN NATURE AND IS MADE UP OF A GROUP OF FIBROUS MINERALS. IT'S CHEMICAL COMPOSITION VARIES THERE ARE MANY KINDS OF ASBESTOS BUT AT LEAST FOUR ARE USEFUL IN INDUSTRY. THESE ARE BLUE AFRICAN ASBESTOS AND RED AFRICAN ASBESTOS MINED CHIEFLY IN SOUTH AFRICA AND TWO KINDS OF WHITE ASBESTOS, ONE OF WHICH IS MINED MAINLY IN EUROPE (ANTHROPHOLITE).

ASBESTOS HAS BEEN ASSOCIATED WITH A LUNG DISEASE WHICH WE CALL ASBESTOSIS. ASBESTOSIS WAS FIRST RECOGNIZED AS AN INDUSTRIAL

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DISEASE AT THE TURN OF THE CENTURY AND IS A SCARING CONDITION OF THE LUNGS WHICH IS PROGRESSIVE AND INTERFERES WITH THE EFFECTIVE EXCHANGE OF GASSES ACROSS THE PULMONARY MEMBRANE. THE ASBESTOS FIBERS ARE STIFF AND THEY SEEM TO MECHANICALLY IRRITATE THE LUNGS; THOSE THAT REMAIN IN THE LUNGS BECOME COATED WITH PROTEIN AND IRON SALTS. OUR PRESENT INDUSTRIAL HYGIENE STANDARD OF FIVE MILLION PARTICLES PER CUBIC FOOT APPEARS TO ADEQUATELY PROTECT AGAINST THE DEVELOPMENT OF ASBESTOSIS. THERE HAVE BEEN NO CASES OF ASBESTOSIS IN OUR PIPE COVERERS.

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OUR PIPE COVERERS ARE EXPOSED TO VARING AMOUNTS OF ASBESTOS DURING THE COURSE OF THEIR WORK AND AS YOU KNOW, WE HAVE RECENTLY UNDERTAKEN TO MEASURE THEIR EXPOSURE. AS MR. DEGESERO HAS POINTED OUT TO YOU, THE EXPOSURE LEVELS OF 4.9 MILLION PARTICLES PER CUBIC FOOT INDOORS AND 4.2 MILLION PARTICLES PER CUBIC FOOT OUTDOORS ARE WITHIN THE PRESENT STANDARD ESTABLISHED BY THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS AND UP TO THIS POINT WOULD HAVE BEEN CONSIDERED A SAFE STANDARD. IN FACT, IT IS STILL THE STANDARD USED BY MOST OF INDUSTRY. HOWEVER, THERE ARE MANY PEOPLE WHO FEEL THIS LEVEL IS TOO HIGH AND WILL HAVE TO BE LOWERED TO THE PROPOSED NEW STANDARD OF 2 MILLION PARTICLES PER CUBIC FOOT SCHEDULED TO TAKE EFFECT IN ABOUT TWO YEARS.

THERE ARE TWO OTHER LUNG DISEASES WE ARE CONCERNED ABOUT THAT APPEAR TO BE ASSOCIATED WITH EXPOSURE TO LOWER LEVELS OF ASBESTOS THAN THAT WHICH CAUSES CLASSICAL ASBESTOSIS.

ONE IS A VERY RARE TUMOR CALLED A MESOTHELIOMA WHICH DEVELOPS FROM THE CELLS LINING THE CHEST AND ABDOMINAL CAVITIES. SOME RESEARCH WORKERS FEEL THIS DISEASE IS ASSOCIATED ONLY WITH EXPOSURE TO THE BLUE AFRICAN ASBESTOS, BUT THIS POINT IS NOT CLEAR: THE OTHER TYPES MAY CAUSE IT ALSO.

THE OTHER DISEASE IS LUNG CANCER WHICH YOU KNOW HAS BEEN ASSOCIATED WITH HEAVY SMOKING. IT HAS BEEN THOUGHT THAT HIGH EXPOSURE TO ALL TYPES OF ASBESTOS DUSTS OVER LONG PERIODS OF TIME INCREASED THE RISK OF LUNG CANCER. RECENTLY IT HAS BEEN REPORTED THAT THERE IS AN INCREASED RISK OF THIS DISEASE IN WORKERS WHO SMOKE AND MAY BE EXPOSED TO SOMEWHAT LOWER LEVELS OF ASBESTOS DUST. SMOKING SHOULD BE PARTICULARLY DISCOURAGED AMONG ASBESTOS WORKERS. SMOKING TENDS TO DESTROY THE HAIR-LIKE CELLS IN THE MUCOUS BLANKET THUS DEFEATING ONE OF THE LUNG'S MOST IMPORTANT DUST CLEARING MECHANISMS. IF SMOKING IS STOPPED THE CILIA GROW BACK AGAIN.

EVEN THOUGH THE NEW STANDARD OF 2 MILLION PARTICLES PER CUBIC FOOT HAS NOT GONE INTO EFFECT, WE FEEL THAT WE SHOULD START NOW TO MEET THIS NEW STANDARD BEFORE IT BECOMES OFFICIAL. THIS WILL MEAN SOME INCONVENIENCE TO THOSE OF YOU WHO WORK WITH ASBESTOS AND IT WILL REQUIRE THE USE OF PROPER PROTECTION AT TIMES AS WELL AS MUCH MORE CAREFUL HANDLING OF THE MATERIAL. IT MAY ALSO REQUIRE THE USE OF SUBSTITUTE MATERIALS OTHER THAN ASBESTOS.

FIBERGLAS WHICH YOU HAVE HEARD MENTIONED [redacted] BRIEFLY BY

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MR. DEGESERO IS ONE POSSIBLE SUBSTITUTE FOR ASBESTOS. SOME PEOPLE HAVE ACCUSED IT OF PRESENTING A PULMONARY HAZARD. FIBERGLAS DOES CAUSE ITCHING OF THE SKIN AND PRICKLING. IT CAN CAUSE SOME NOSE AND THROAT IRRITATION BUT ALL THE LITERATURE REVEIWED PARTICULARLY OF THE IMPARTIAL INVESTIGATORS IN THE FIELD, THOSE OF DR. GEORGE WRIGHT AND DR. PAUL GROSS INDICATES THAT THERE IS ABSOLUTELY NO PULMONARY HAZARD WHATEVER, AND DR. GROSS IS PRESENTLY SUGGESTING THAT FIBERGLAS BE CLASSIFIED AS AN INERT DUST, ONE OF THE NUISANCE DUSTS.

IT IS OUR FEELING THAT THIS IS IN THE BEST INTEREST OF THE HEALTH OF THE PIPE COVERING GROUP AND THAT THE RECOMMENDATIONS MADE BY MR. DEGESERO WILL HAVE TO BE ACTED UPON.

AND NOW BACK TO JACK.

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