

FRIDAY, AUGUST 4, 1995 8:20 A.M.

2 THE COURT: ALL RIGHT. LET THE RECORD SHOW WE'RE  
3 GATHERED OUTSIDE THE PRESENCE OF THE JURY.

4 SORRY I'M LATE, FOLKS. WE HAD A CONSTRUCTION  
5 COMMITTEE MEETING THIS MORNING AT 7:30, SO I WAS THERE A  
6 LITTLE BIT LONGER THAN I THOUGHT I WOULD.

7 MR. HARLEY: ARE YOU ON SCHEDULE?

8 THE COURT: OH, YES. WE DON'T HAVE ANY MONEY FOR  
9 FURNITURE, BUT WE'RE ON SCHEDULE.

10 MR. OHLEMEYER: YOUR HONOR, WHAT WE HAVE THIS  
11 MORNING IS MR. HALLGREN IS HERE WITH HIS DRAWER FULL OF  
12 PHOTOGRAPHIC NEGATIVES.

13 WE HAVE FILED PREVIOUSLY AND THE PLAINTIFFS  
14 RESPONDED WITH A MOTION SEEKING TO EXCLUDE TESTIMONY AND  
15 ADMISSION OF THOSE PHOTOMICROGRAPHS.

16 SIMPLY STATED, MR. HALLGREN TOOK CIGARETTES OF  
17 UNDETERMINATE COMPOSITION AND TESTED THEM IN A WAY THAT IS  
18 NOT SUBSTANTIALLY SIMILAR TO THE WAY PEOPLE SMOKED, AND THEN  
19 SOMEBODY, INCLUDING MR. HALLGREN, TOOK PHOTOGRAPHS OF  
20 PORTIONS OF THAT SMOKE AS IT WAS ANALYZED UNDER AN ELECTRON  
21 MICROSCOPY WITH PARTICULAR RESPECT TO THE PHOTOGRAPHS  
22 MR. HARLEY WOULD LIKE TO ADMIT.

23 THE RECORD DEMONSTRATES THAT MR. HALLGREN DID NOT  
24 PREPARE THOSE SAMPLES, DID NOT DO THE MICROSCOPY ON THOSE  
25 SAMPLES AND CANNOT SAY WITH ANY REASONABLE CERTAINTY OR EVEN  
26 PROBABILITY THAT THEY FAIRLY AND ACCURATELY DEPICT WHAT THEY  
27 ARE PURPORTED TO DEPICT.

28 THE COURT: HALLGREN WAS FULLAM'S ASSISTANT.

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1 MR. HARLEY: RIGHT. WAS THERE THROUGHOUT AND RAN  
2 THE FOUR SAMPLES OF WHAT WE USED, A COUPLE OF PICTURES. I'M  
3 GOING TO USE PICTURES FROM OTHER SAMPLES, TOO. HE CAME IN  
4 AND DID TWO OF THE SAMPLES, FULLAM DID TWO OF THE SAMPLES;  
5 BUT THEY WORKED TOGETHER, THEY SET UP THE EXPERIMENT.

6 HE CAN DESCRIBE HOW THE EXPERIMENT WAS SET UP. HE  
7 DESCRIBES HOW AN ELECTRON MICROSCOPY WORKS, THAT THE  
8 PICTURES TAKEN ON AN ELECTRON MICROSCOPY ARE THE PICTURES OF  
9 THE SCREEN. GIVEN THAT THE MICROSCOPE IS WORKING PROPERLY  
10 AT THE TIME, THERE'S NO WAY TO GET A PICTURE OF SOMETHING  
11 THAT'S NOT THERE.

12 THIS IS A RECORDING DEVICE AND IT'S CONSISTENT WITH  
13 OTHER RESULTS THEY GOT THAT LOOKS LIKE WHAT YOU WOULD EXPECT  
14 IT TO LOOK LIKE. HE CAN LAY ALL OF THAT FOUNDATION.

15 AND THEN THE PLATES MADE, THE PLATES LABELED BY  
16 DR. FULLAM, DR. FULLAM'S HANDWRITING IS KNOWN TO HIM. HE  
17 RECOGNIZES IT, IT'S A BUSINESS RECORD, THEY ARE STORED,  
18 MAINTAINED, AND HE FOUND THEM WHERE THEY WERE EXPECTED TO  
19 BE.

20 THE COURT: WAIT. LET'S TAKE THESE OBJECTIONS ONE  
21 AT A TIME.

22 YOU SAY THAT THE CIGARETTES USED BY FULLAM AND  
23 HALLGREN ARE OF UNKNOWN ORIGIN.

24 MR. HARLEY: THAT'S --

25 THE COURT: DIDN'T WE HAVE SOME LETTERS YESTERDAY  
26 SAYING THAT PARMELE WAS SENDING BOXES?

27 MR. OHLEMEYER: NO. THE ORIGIN IS KNOWN, YOUR  
28 HONOR, IT'S THE COMPOSITION. THERE'S NO FOUNDATION THAT

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1 THOSE ARE SUBSTANTIALLY SIMILAR OR MANUFACTURED TO ANY OF  
2 THE SPECIFICATIONS OF THE CIGARETTES THAT WERE SOLD DURING  
3 THAT TIME PERIOD.

4 MR. HARLEY: I --

5 THE COURT: WELL, DIDN'T FULLAM'S LETTERS SAY HE WAS

6 SENDING KENT CIGARETTES?  
7 MR. HARLEY: REGULAR KENT'S.  
8 THE COURT: REGULAR KENT'S. THAT'S ITEM TWO IN ONE  
9 OF THOSE LETTERS.  
10 MR. OHLEMEYER: THAT'S CORRECT.  
11 MR. HARLEY: THAT'S CORRECT.  
12 THE COURT: ALL RIGHT. THAT'S SUFFICIENT  
13 FOUNDATION.  
14 WHAT'S THE OTHER OBJECTION?  
15 MR. OHLEMEYER: THE SAMPLES ARE THAT THEY WERE  
16 PREPARED, THE CIGARETTES WERE SMOKED IN A METHOD THAT IS NOT  
17 SUBSTANTIALLY SIMILAR TO THE WAY PEOPLE SMOKE.  
18 MR. HALLGREN WILL TESTIFY THEY PUT THEM IN A TUBE,  
19 RAN A VACUUM, SMOKED THEM DOWN TO NOTHING, AND DOES NOT KNOW  
20 HOW MANY CIGARETTES THEY USED TO COLLECT THE SAMPLE WHICH  
21 THEY ANALYZED.  
22 THE COURT: SO THAT THE EXTRACTION OF ANY FIBERS IN  
23 THE EXPERIMENT WOULD NOT SUBSTANTIALLY -- WOULD NOT BE  
24 SUBSTANTIALLY SIMILAR TO THE WAY A SMOKER WOULD EXTRACT  
25 FIBERS OF ANY --  
26 MR. OHLEMEYER: YES, YOUR HONOR.  
27 MR. HARLEY: NUMBER ONE, WITH THAT, IT GOES TO THE  
28 WEIGHT, YOUR HONOR. NUMBER TWO, THIS IS AN EXPERIMENT  
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1 CHARGED BY LORILLARD, DONE AT THEIR DIRECTION, AND THE  
2 METHODOLOGY AND RESULTS ACCEPTED BY THEM AFTER THIS  
3 METHODOLOGY IS DONE.  
4 THEY SEND MORE CIGARETTES FOR SIMILAR TESTING.  
5 THERE WAS NO OBJECTION AT THE TIME THAT THIS IS REPRESENTED  
6 AND THIS IS THE INFORMATION THAT LORILLARD HAD AT THE TIME.  
7 IF THEY HAVE SOMEONE TO COME IN AND SAY OR THERE'S A  
8 RECORD TO SAY WE DISCARDED THIS INFORMATION BECAUSE WE  
9 THOUGHT IT WAS USELESS, BUT -- ALL OF THE CORRESPONDENCE  
10 INDICATES BASED ON THIS INFORMATION THEY REPEATEDLY SAID OUR  
11 FILTERS ARE RELEASING FIBERS AND WE NEED TO TEST NEW FILTERS  
12 WITH PREPARATIONS AND OTHER THINGS TO STOP THIS RELEASE.  
13 THE COURT: WELL, YOU ARE INTRODUCING THE EVIDENCE  
14 TO SHOW TWO THINGS: ONE, THAT KENT CIGARETTE FILTERS  
15 RELEASE FIBERS UNDER THESE TEST CONDITIONS.  
16 MR. HARLEY: RIGHT. AND WAS --  
17 THE COURT: AND KENT KNEW IT.  
18 MR. HARLEY: AND LORILLARD KNEW IT.  
19 THE COURT: LORILLARD KNEW IT.  
20 AND THE LETTERS FROM PARMELE TO FULLAM THAT I  
21 REMEMBERED YESTERDAY COMPLIMENTED FULLAM --  
22 MR. HARLEY: RIGHT.  
23 THE COURT: -- ABOUT HIS EXPERIMENTS AND SEEMED NOT  
24 TO RAISE ANY OF THE ISSUES NOW BEING RAISED AS TO  
25 DISSIMILARITY.  
26 SO THAT AT LEAST, FOR THE PURPOSE OF SHOWING THAT  
27 KENT KNEW WHATEVER THE TEST RESULTS SHOW AND THOUGHT THAT  
28 THAT WAS VALUABLE TO THEM, IT GOES TO THE ISSUE OF NOTICE  
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1 AND RECKLESS DISREGARD.  
2 MR. OHLEMEYER: TWO SENTENCES ON THAT, YOUR HONOR.  
3 THE COURT: WHAT?  
4 MR. OHLEMEYER: THESE MAY HAVE BEEN THE MOST  
5 PERFECTLY DESIGNED, PERFECTLY EXECUTED LAUDED AND EMBRACED  
6 EXPERIMENTS; BUT THERE'S STILL NO SHOWING IN FACT THE  
7 SHOWING WAS CONTRARY TO THE WAY -- THAT IS DISSIMILAR TO THE  
8 WAY PEOPLE SMOKE. THAT'S THE THRESHOLD RELEVANCE QUESTION  
9 TO BE ANSWERED, NOT A WEIGHT SUFFICIENCY QUESTION.  
10 THE COURT: ON THE PRODUCT LIABILITY AND ALSO BOTH

11 ON --

12 MR. HARLEY: WELL, IT STILL GOES TO THEIR KNOWLEDGE.  
13 I MEAN, IT STILL GOES TO THE ISSUE OF THEY REPEATEDLY SAID  
14 THEY BELIEVED THESE, NUMBER ONE.

15 THE COURT: PARDON ME.

16 BUT ISN'T THE FAILURE OF KENT TO RAISE ANY OBJECTION  
17 AS TO THE METHODOLOGY, SOME EVIDENCE THAT THEY WERE  
18 SATISFIED, THAT THIS WAS VALUABLE SCIENCE TO THEM, AND IT  
19 WOULDN'T BE VALUABLE UNLESS THE CIGARETTES WERE USED IN THE  
20 WAY THEY USED THEM?

21 OBJECTION OVERRULED.

22 MR. MCELANEY: YOUR HONOR, THERE IS A LETTER IN  
23 WHICH KENT SAYS THAT THESE RESULTS MAKE NO SENSE.

24 MR. HARLEY: HOLLINGSWORTH & VOSE SAYS.

25 THE COURT: NO, HOLLINGSWORTH & VOSE SAYS.

26 MR. MCELANEY: NO, YOUR HONOR. PARMELE WRITES TO  
27 KNUDSON AND SAYS THEY DON'T MAKE ANY SENSE, AND KNUDSON  
28 WRITES BACK AND SAYS IT DOESN'T MAKE ANY SENSE, AND PARMELE

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1 SAYS IT WOULD BE ADVISABLE NOT TO SEND ANY MORE TO THEM.

2 THE COURT: THAT GOES TO THE WEIGHT, NOT TO THE  
3 ADMISSIBILITY, THE SUFFICIENT SIMILARITY FROM THE  
4 EXPERIMENTS TO ISSUES RELEVANT IN THIS CASE, BECAUSE OF THE  
5 DEFENDANTS ACCEPTANCE AND LAUDING OF THE EXPERIMENTS.

6 OBJECTION OVERRULED.

7 ALL RIGHT. WHAT'S NEXT? THAT'S IT?

8 MR. OHLEMEYER: THAT'S IT.

9 THE AUTHENTICITY OBJECTION HAS BEEN BRIEFED, YOUR  
10 HONOR, AND I KNOW HOW YOU FEEL ON THAT.

11 THE COURT: I ALREADY RULED ON THE '94 CASE, AND I  
12 DID FIND IT SUFFICIENT AND AUTHENTIC TO COME IN.

13 MR. MCELANEY: COULD I JUST MAKE THAT CLEAR? AND I  
14 DON'T WANT TO BELABOR IT.

15 BUT MR. HARLEY'S STATEMENTS THAT WHATEVER YOU PUT  
16 UNDERNEATH THE ELECTRON MICROSCOPE IS WHAT'S GOING TO SHOW  
17 UP IN THE PHOTOMICROGRAPH IS JUST LIKE SAYING WHATEVER YOU  
18 POINT THE CAMERA AT WILL SHOW UP IN THE PICTURE.

19 MR. HARLEY: NO.

20 MR. MCELANEY: THE POINT IS YOU HAVE THIS  
21 PHOTOMICROGRAPH IN A LOOSE ENVELOPE THAT MR. HALLGREN DID  
22 NOT LOOK AT, AT THE TIME.

23 SO HE'S NOT IN A POSITION TO SAY THAT  
24 PHOTOMICROGRAPH IS FROM THE KENT EXPERIMENT, EXCEPT AS HE  
25 PIECES TOGETHER THE EVIDENCE, BECAUSE HE DIDN'T LOOK, HE  
26 DIDN'T PUT IT IN THE ELECTRON MICROSCOPY AND HE DIDN'T LOOK  
27 INTO THE ELECTRON MICROSCOPE AND SEE IT THERE.

28 THAT'S ONE.

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1 THE COURT: SO THERE'S NO FOUNDATION LAID THAT THE  
2 PHOTOGRAPHS SUBSTANTIALLY REPRESENTS THE CONDITIONS THAT  
3 WERE OBTAINED AT THE TIME THE PHOTOGRAPH WAS TAKEN?

4 MR. HARLEY: IT IS --

5 THE COURT: THAT'S YOUR POINT?

6 MR. MCELANEY: YES.

7 MR. HARLEY: NUMBER ONE, THAT'S NOT HOW -- YOU DON'T  
8 POINT IT JUST ANYWHERE. THIS IS A FIXED POINT CAMERA. IT  
9 ONLY POINTS ONE PLACE. YOU DON'T DIRECT IT, IT'S DIRECTED  
10 AT WHAT'S BEING SHOWN ON THAT FLUORESCENT SCREEN, IN 1954,  
11 AND THAT'S A PICTURED THAT'S CAPTURED OF THE PICTURE AT THAT  
12 TIME. IT'S A CAMERA ATTACHED TO THE MICROSCOPE.

13 AND THIS IS WHERE WE GET --

14 MR. MCELANEY: EXCUSE ME. CAN I INTERRUPT YOU FOR  
15 JUST ONE SECOND?

16 MR. HARLEY: YES.  
17 MR. MCELANEY: JUST ONE THING. THAT'S THE POINT.  
18 HE DIDN'T POINT THE ELECTRON MICROSCOPE ON IT; HE WOULD HAVE  
19 POINTED IT, I WOULD AGREE WITH YOU. IF HE SAID I TOOK THE  
20 SAMPLE AND PUT IT IN THE ELECTRON MICROSCOPE AND THEN I  
21 SNAPPED THE PICTURE, YOU'RE RIGHT; BUT HE DIDN'T DO THAT.  
22 MR. HARLEY: BUT HE KNOWS WHAT THE TECHNIQUE WAS AND  
23 THESE PARTICULAR PHOTOGRAPHS ARE LABELED IN DR. FULLAM'S  
24 HANDWRITING AS BEING THAT OF A REGULAR BUSINESS PHOTOGRAPH.  
25 THESE ARE WHAT THEY USE UPON TO RELY UPON IN CONDUCTING  
26 THEIR REGULAR BUSINESS. WE'LL LAY ALL OF THAT FOUNDATION.  
27 WHAT YOU ARE SAYING IS THAT MAYBE THERE'S SOME  
28 QUESTION OF TRUSTWORTHINESS. BUT THESE ARE, NUMBER ONE,

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1 AUTHENTICATED ANCIENT DOCUMENTS THAT APPEAR TO BE WHAT THEY  
2 ARE, AND THEY ARE JUST LIKE ALL THE OTHER PHOTOGRAPHS THAT  
3 WERE TAKEN AT OR ABOUT THE SAME TIME. THEY LOOK LIKE WHAT  
4 YOU WOULD EXPECT TO FIND, IT ISN'T LIKE YOU CAN POINT IT AT  
5 SOMETHING ELSE AND GET A MISTAKE. I MEAN, THIS IS SILLY.

6 I MEAN, THAT YOU CAN'T GET A PICTURE OF AN ASBESTOS  
7 FIBER BY -- I MEAN, THERE'S NO EVIDENCE THEY WERE TESTING  
8 ANY OTHER ASBESTOS FIBER, THERE'S NO EVIDENCE OF  
9 CONTAMINATION, THERE'S NOTHING. I MEAN ....

10 THE COURT: THESE ARE MATTERS YOU CAN DEAL WITH ON  
11 CROSS-EXAMINATION. OBJECTION OVERRULED.

12 ALL RIGHT. LET'S GO.

13 (THE FOLLOWING PROCEEDINGS WERE HELD IN OPEN COURT.)

14 THE COURT: GOOD MORNING, LADIES AND GENTLEMEN.  
15 SORRY WE'RE A LITTLE BIT LATE, BUT WE HAD CONSTRUCTION  
16 MEETING FOR THE NEW COURTHOUSE THIS MORNING, AND YOU'LL ALL  
17 BE GLAD TO KNOW THAT WE ARE ON TIME, UNDER BUDGET, AND IT  
18 WILL BE BUILT. IT'S GOING TO BE A LOT MORE COMFORTABLE FOR  
19 YOU NEXT TIME.

20 ALL RIGHT. LET'S GO ON.

21 MR. HARLEY: YOUR HONOR, AFTER THE JURY WAS EXCUSED  
22 YESTERDAY, PLAINTIFF'S EXHIBIT 30 WAS ADMITTED, I BELIEVE.

23 THE COURT: CORRECT.

24 MR. HARLEY: AND THAT'S A LETTER OF DECEMBER 1,  
25 1954, FROM DR. PARMELE TO DR. KNUDSON AT HOLLINGSWORTH &  
26 VOSE COMPANY, DECEMBER 1, 1954. IT'S EVEN SMALLER TYPE.

27 "DR. KNUDSON:

28 "WE HAVE FINALLY RECEIVED A REPORT FROM DR. ERNEST  
ERIC L. THRONE, CSR/RPR (415) 764-0538 842

1 FULLAM, THE ELECTRON MICROSCOPIST IN SCHENECTADY, COVERING  
2 THE FIRST 18 SAMPLES OF EXPERIMENTAL KENT CIGARETTES WITH  
3 WHICH WE FURNISHED HIM. IT OCCURS TO US THAT YOU MAY BE  
4 INTERESTED IN RECEIVING A SUMMARY OF DR. FULLAM'S FINDINGS.

5 "BY WAY OF EXPLAINING THE ATTACHED TABLE, PERMIT US  
6 TO STATE THAT DR. FULLAM HAS WORKED OUT A TECHNIQUE WHEREBY  
7 HE IS ABLE TO ROUGHLY ESTIMATE QUANTITATIVELY DIFFERENCES  
8 BETWEEN DIFFERENT LOTS OF CIGARETTES WITH RESPECT TO THE  
9 AMOUNT OF ASBESTOS PARTICLES COMING OVER IN THE SMOKE. IN  
10 OTHER WORDS, HE SMOKES SEVERAL CIGARETTES SELECTED FROM EACH  
11 SAMPLE AND PASSES THE SMOKE INTO A SMALL ACETONE TRAP. HE  
12 THEN CENTRIFUGES THIS ACETONE IN SUCH A MANNER AS TO THROW  
13 OUT AND SEPARATE ANY SUSPENDED SOLID PARTICLES. FROM THIS  
14 CONGLOMERATION OF SOLID MATERIAL, HE QUANTITATIVELY REMOVES  
15 A SMALL FRACTION TO SPREAD OVER HIS SPECIMEN SCREENS. AFTER  
16 THE SCREENS ARE SO PREPARED, HE THEN SCANS THEM WITH HIS  
17 ELECTRON MICROSCOPE, COUNTING THE NUMBER OF MESHES IN HIS  
18 SCREENING THAT HE HAS TO LOOK AT BEFORE FINDING A SINGLE  
19 PARTICLE OF ASBESTOS. THUS, AND SINCE EVERYTHING UP TO THIS  
20 POINT IS AT LEAST AT LEAST SEMIQUANTITATIVE, THE SMOKE

21 CONTAINING THE LEAST AMOUNT OF ASBESTOS REQUIRES SCANNING OF  
22 THE HIGHEST NUMBER OF SCREEN MESHES, OR INVERSELY, WHEN HE  
23 ONLY NEEDS TO LOOK AT A FEW MESHES TO FIND A PARTICLE OF  
24 ASBESTOS, IT FOLLOWS THAT SUCH SMOKE IS THE MOST HEAVILY  
25 CONTAMINATED WITH ASBESTOS PARTICLES. IN THE ATTACHED TABLE  
26 WE HAVE ARRANGED THE 18 SAMPLES COVERED IN HIS REPORT IN THE  
27 ORDER OF QUALITY, THE BEST SAMPLE BEING FIRST, AND THE WORST  
28 SAMPLE LAST. THE TABLE ALSO INCLUDES A BRIEF DESCRIPTION OF  
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1 HOW THE PARTICULAR SAMPLE IN QUESTION WAS PREPARED.

2 "WE HAVE CAREFULLY STUDIED THE DATA IN QUESTION AND  
3 MUST ADMIT THAT IT MAKES VERY LITTLE SENSE. WE PRESUME THAT  
4 YOU WILL AGREE. AS A MATTER OF FACT, IT MAKES SO LITTLE  
5 SENSE THAT WE SOMEWHAT QUESTION THE ADVISABILITY OF SENDING  
6 HIM ADDITIONAL SAMPLES WHICH HAVE BEEN ACCUMULATED IN RECENT  
7 WEEKS. WE FEEL THIS WAY PARTICULARLY SINCE IT IS OUR  
8 INTENTION TO ELIMINATE THE USE OF ASBESTOS IN THE VERY NEAR  
9 FUTURE. HOWEVER, IF IT WERE NOT FOR THE MONEY INVOLVED, IT  
10 MIGHT BE INTERESTING TO GO AHEAD AND SUBMIT ADDITIONAL  
11 SAMPLES IN QUESTION IN ORDER TO ACQUIRE A BACKGROUND OF  
12 INFORMATION WHICH SOMEDAY IN THE FUTURE MIGHT BE USEFUL.

13 ANY COMMENT WHICH YOU MAY CARE TO MAKE REGARDING  
14 THIS ABOVE WILL BE WELCOME."

15 THEN ATTACHED IS A TABLE WITH THE SAMPLE NUMBER, A  
16 DESCRIPTION OF THE SAMPLE, AND THEN THE NUMBER OF SCREENS OR  
17 FIELDS DEFINED, ONE PARTICLE OF ASBESTOS THAT WAS COUNTED.

18 YOUR HONOR, PLAINTIFF NOW CALLS DOCTOR (SIC) OR  
19 MR. DOUGLAS HALLGREN.

20 THE COURT: ALL RIGHT. MR. HALLGREN.  
21 TESTIMONY OF

22 DOUGLAS HALLGREN,

23 CALLED AS A WITNESS ON BEHALF OF THE PLAINTIFFS, AND BEING  
24 DULY SWORN, TESTIFIED AS FOLLOWS:

25 THE CLERK: PLEASE STEP FORWARD AND RAISE YOUR RIGHT  
26 HAND.

27 DO YOU SOLEMNLY SWEAR THAT THE TESTIMONY YOU ARE  
28 ABOUT TO GIVE WILL BE THE TRUTH, THE WHOLE TRUTH, AND

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1 NOTHING BUT THE TRUTH, SO HELP YOU GOD?

2 THE WITNESS: I DO.

3 THE CLERK: COULD YOU PLEASE STATE YOUR NAME AND  
4 SPELL IT FOR THE REPORTER?

5 THE WITNESS: DOUGLAS HALLGREN, H-A-L-L-G-R-E-N.

6 THE CLERK: THANK YOU.

7 MR. HALLGREN, HAVE A SEAT.

8 DIRECT EXAMINATION

9 BY MR. HARLEY, COUNSEL ON BEHALF OF PLAINTIFFS:

10 Q. GOOD MORNING, MR. HALLGREN.

11 A. GOOD MORNING.

12 Q. MR. HALLGREN, WOULD YOU PULL THAT MICROPHONE DOWN?

13 A. (WITNESS COMPLIED.)

14 Q. MR. HALLGREN, WHERE DO YOU LIVE?

15 A. I LIVE IN [DELETED].

16 Q. MR. HALLGREN, WHERE WERE YOU BORN AND RAISED?

17 A. I WAS BORN [DELETED], 1930, GREW UP IN THE  
18 MT. VERNON, NEW YORK, AND AFTER WE WERE MARRIED MOVED TO  
19 SCHENECTADY, SARATOGA COUNTY AREA.

20 Q. AND ARE YOU ACTIVELY EMPLOYED OR RETIRED?

21 A. I'M ACTIVELY EMPLOYED IN MY OWN BUSINESS.

22 Q. OKAY.

23 AND OVER THE YEARS, WHAT HAS BEEN YOUR PRIMARY  
24 BUSINESS OR OCCUPATION?

25 A. MY PRIMARY BUSINESS WAS ELECTRON MICROSCOPY.

26 Q. WHEN DID YOU START DOING ELECTRON MICROSCOPY AND  
27 WHERE DID YOU DO IT?  
28 A. I STARTED IN 1954, WORKED FOR ERNEST F. FULLAM,  
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1 INC., FOR TEN YEARS; AND AFTER THAT, I WILL WORKED FOR  
2 DUDLEY OBSERVATORY, UP UNTIL 1978, WHERE I DID ELECTRON  
3 MICROSCOPY.  
4 Q. AND DOUGLAS OBSERVATORY (SIC) WAS --  
5 A. DUDLEY.  
6 Q. WHAT WAS WHAT?  
7 A. DUDLEY OBSERVATORY.  
8 Q. WHAT WAS THAT?  
9 A. AN ASTRONOMICAL OBSERVATORY. AND OUR FIELD OF  
10 INTEREST WAS TO STUDY MICROMETEORITES. THESE ARE EXTREMELY  
11 SMALL PARTICLES WHICH COME IN -- THAT ARE SIMILAR TO THE  
12 FALLING, SHOOTING STARS THAT ONE SEES AT NIGHT, EXCEPT THAT  
13 THE PARTICLES WE WERE LOOKING AT WERE VERY, VERY MUCH  
14 SMALLER.  
15 Q. AT ONE TIME, YOU INDICATED YOU WORKED FOR THE FULLAM  
16 LABORATORIES?  
17 A. THAT'S CORRECT.  
18 Q. AND WHEN DID YOU BEGIN THERE?  
19 A. SOMETIME IN THE SPRING OF 1954.  
20 Q. OKAY.  
21 A. LATE APRIL, MAY, EARLY JUNE. SOMETIME IN MAY IS  
22 PROBABLY THE MOST ACCURATE; I DON'T REMEMBER THE PRECISE  
23 DATE.  
24 Q. OKAY.  
25 AND HOW LONG DID YOU WORK AT THE FULLAM  
26 LABORATORIES?  
27 A. ABOUT TEN YEARS.  
28 Q. AND WHEN YOU STARTED, WERE YOU FULL- OR PART-TIME?  
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1 A. I WAS PART-TIME.  
2 Q. AND DID YOU EVENTUALLY BECOME FULL-TIME?  
3 A. YES, I DID.  
4 Q. WHEN DID YOU BECOME FULL-TIME?  
5 A. IN 1955.  
6 Q. AND, MR. HALLGREN, HOW MANY EMPLOYEES WERE THERE AT  
7 THE FULLAM LABORATORIES IN 1954?  
8 A. JUST ONE. IT WAS I.  
9 Q. OKAY. WHO ELSE WORKED THERE?  
10 A. ERNIE FULLAM, THE OWNER OF THE LABORATORY.  
11 Q. AND HOW LONG HAD THE LABORATORY BEEN IN EXISTENCE  
12 WHEN YOU STARTED?  
13 A. TWO YEARS.  
14 Q. AND SO IT WAS JUST THE TWO OF YOU THERE?  
15 A. THAT'S CORRECT.  
16 Q. WHAT DID THIS LABORATORY DO?  
17 A. IT DID CONSULTING WORK IN LIGHT AND ELECTRON  
18 MICROSCOPY.  
19 Q. DID THE LABORATORY HAVE AN ELECTRON MICROSCOPE?  
20 A. YES, IT DID.  
21 Q. WHERE WAS THIS LABORATORY LOCATED?  
22 A. IT WAS LOCATED IN THE BASEMENT OF MR. FULLAM'S HOME.  
23 Q. OKAY.  
24 HAD IT BEEN FINISHED OR WAS THIS JUST AN OPEN --  
25 A. OH, NO. HE HAD BUILT THE HOUSE WITH THE  
26 ANTICIPATION THAT HE WAS AT SOME POINT GOING TO HAVE A  
27 LABORATORY IN HIS BASEMENT.  
28 Q. OKAY. THIS WAS A FULLY FINISHED --  
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1 A. IT WAS A FULLY FINISHED BASEMENT. THE ELECTRON

2 MICROSCOPE WAS A FAIRLY TALL PIECE OF EQUIPMENT AND IT  
3 REQUIRED THAT THE CEILING BE EXTRA HIGH. AND WHEN HE  
4 DESIGNED THE HOUSE, HE HAD THE BASEMENT ADDED, I THINK, 12  
5 OR 18 INCHES HIGHER THAN NORMAL SO THAT HE COULD ACCOMMODATE  
6 AN ELECTRON MICROSCOPE.

7 Q. AND WAS IT FURNISHED, AND MAINTAINED, AND CLEANED  
8 LIKE A REGULAR LABORATORY?

9 A. OH, YES. IT WAS SET UP TO DO MICROSCOPY.

10 Q. AT THAT TIME WHAT KIND OF ELECTRON MICROSCOPE, IN  
11 1954, WAS THERE?

12 A. THAT WAS AN RCAEMU2E ELECTRON MICROSCOPE.

13 Q. AND DID YOU KNOW HOW TO OPERATE THAT MICROSCOPE?

14 A. I LEARNED WHILE WORKING WITH ERNIE FULLAM.

15 Q. DID YOU OPERATE IT DURING 1954?

16 A. YES, I DID.

17 Q. AND CAN YOU DESCRIBE WHAT AN ELECTRON MICROSCOPE,  
18 PARTICULARLY THIS RCA MICROSCOPE IS AND HOW IT OPERATED?

19 A. ALL RIGHT.

20 AN ELECTRON MICROSCOPE IS ANALOGOUS TO A LIGHT  
21 MICROSCOPE IN MANY WAYS. EVERYBODY IS SOMEWHAT FAMILIAR  
22 WITH A LIGHT MICROSCOPE IN THAT YOU HAVE A SERIES OF GLASS  
23 LENSES WHICH WILL TAKE A LIGHT PATH COMING FROM THE SAMPLE  
24 AND EITHER ENLARGE OR CONTRACT IT IN A SERIES OF STEPS TO  
25 CREATE AN ENLARGED IMAGE. AS YOU LOOK THROUGH THE EYEPIECE,  
26 THE EQUIVALENT IN THE ELECTRON MICROSCOPE IS A SERIES OF  
27 MAGNETIC COILS.

28 WE START OUT WITH A FILAMENT AT THE TOP OF THE

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1 MICROSCOPE WHICH EMITS ELECTRONS. THAT'S OUR LIGHT. THE  
2 ELECTRONS THEN ARE PASSED ACROSS THE HIGH VOLTAGE. IN OUR  
3 CASE, IT WAS 50,000 VOLTS. AND THE HIGH VOLTAGE THEN DRIVES  
4 THE ELECTRONS DOWN THE COLUMN OF THE MICROSCOPE.

5 AS IT GOES THROUGH THE COLUMN OF THE MICROSCOPE IT  
6 WILL PASS THROUGH A LENS, AND THE LENS IN THE ELECTRON  
7 MICROSCOPE IS A COIL OF WIRE, AND INSIDE THE CENTER OF THIS  
8 COIL IS A SHAPED PIECE OF IRON. AND BY CONTROLLING THE  
9 SHAPE OF THE IRON, YOU CONTROL WHAT IS KNOWN AS THE MAGNETIC  
10 FIELD SO THAT YOU ARE MAKING AN ELECTROMAGNET, ESSENTIALLY.

11 MAYBE IN SCHOOL, YOU TOOK A PIECE OF WIRE, WRAPPED  
12 IT AROUND A NAIL, PASSED A CURRENT THROUGH IT AND YOU MADE  
13 AN ELECTROMAGNET. WELL, IF YOU DO IT IN THE SHAPE OF A  
14 COIL, YOU CAN VERY CAREFULLY CONTROL THE SHAPE OF THE  
15 ELECTRIC OR THE MAGNETIC FIELD. WITH A SERIES OF THESE  
16 COILS, THEN BECOME LIKE A SERIES OF GLASS LENSES.

17 SO YOU HAD THE FILAMENT AT THE TOP EMITTING OUR  
18 LIGHT, IF YOU WILL, AND THEN YOU PUT YOUR SPECIMEN IN THERE.  
19 THE ELECTRONS GO THROUGH, THE ELECTRONS INTERACT WITH THE  
20 SPECIMEN, AND THEN AN IMAGE IS FORMED DOWN ON A FLUORESCENT  
21 SCREEN LIKE A LITTLE BIT OF A TELEVISION SCREEN.

22 Q. IN 1954, IT WASN'T REALLY LIKE A TELEVISION SCREEN?

23 A. WELL, IT'S A PHOSPHORUS SCREEN, AND BASICALLY A  
24 TELEVISION SCREEN IS A PHOSPHORUS SCREEN.

25 Q. YOU HAD A BLACK AND WHITE IMAGE AT THAT TIME?

26 A. YES, BLACK AND WHITE IMAGE. ACTUALLY "GREEN"; BUT  
27 THAT'S ALL RIGHT.

28 SO YOU END UP GETTING THE IMAGE ON THE SCREEN. AND

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1 WHEN YOU WANT TO RECORD THAT IMAGE, YOU MOVE THIS PHOSPHORUS  
2 SCREEN OUT OF THE WAY AND ALLOW THE ELECTRONS TO STRIKE A  
3 PHOTOGRAPHIC NEGATIVE, AND THEN YOU CAN PRINT AND DEVELOP  
4 THE NEGATIVE, AND THEN YOU HAVE A RETAINED IMAGE OF THE  
5 OBJECT THAT YOU ARE LOOKING AT.

6 IT SHOULD BE POINTED OUT THAT SINCE THESE ARE

7 ELECTRONS HAVE VERY LIMITED PENETRATING POWER, THEN YOU HAVE  
8 TO PREPARE YOUR SPECIMEN IN WAYS WHICH ARE SUITABLE FOR THE  
9 ELECTRONS TO GO THROUGH, WHICH GENERALLY MEANS THAT THE  
10 SAMPLE HAS TO BE VERY, VERY THIN. WE WOULD USE PLASTIC  
11 FILMS THAT ARE MUCH THINNER THAN A THOUSANDTH OF AN INCH,  
12 VERY, VERY THIN FILMS.

13 Q. EXPLAIN TO US A LITTLE BIT ABOUT THE SAMPLE AND THE  
14 GRIDS THAT ARE USED.

15 A. ALL RIGHT.

16 SINCE THE FILM THAT YOU ARE USING IS VERY THIN, IT'S  
17 NOT SUBSTANTIAL ENOUGH TO BE SELF-SUPPORTING. SO WHAT WE  
18 USE WERE EIGHTH INCH DIAMETER COPPER GRIDS. VISUALIZE A  
19 WINDOW SCREEN, AND THEN YOU REDUCE THE SIZE OF THE WIRES TO  
20 THE POINT WHERE EACH LITTLE HOLE IN THE SCREEN IS  
21 APPROXIMATELY FOUR THOUSANDTHS OF AN INCH ACROSS, GIVE OR  
22 TAKE THE DIAMETER OF A HAIR. AND THESE HOLES APPEAR IN THIS  
23 LITTLE EIGHTH INCH DIAMETER GRID AT THE RATE OF 200 HOLES  
24 PER INCH. SO IN AN EIGHTH INCH DIAMETER GRID, WE END UP  
25 WITH ABOUT 200 HOLES.

26 Q. AND WHO MADE THESE FILTERS THAT WERE USED AT THE  
27 FULLAM LABORATORY?

28 A. THE GRIDS?

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1 Q. YES, THE GRIDS.

2 A. WELL, THE GRIDS WE PURCHASED FROM A MAN IN  
3 ENGLAND --

4 Q. OKAY.

5 A. -- BUT WE PREPARED THE FILMS OURSELVES.

6 Q. AND WHEN YOU SAY "YOU PREPARED THE FILMS  
7 YOURSELVES," WAS THERE ANY CARE TAKEN TO MAKE SURE THEY WERE  
8 PURE AND NOT CONTAMINATED?

9 A. YES, THAT WAS ESSENTIAL. IT WAS ESSENTIAL THAT WE  
10 HAD CLEAN MATERIALS THAT WOULD NOT INTRODUCE ANY FOREIGN OR  
11 EXTRANEOUS MATERIAL INTO THE SAMPLE. AND IT WAS OUR  
12 STANDARD PROCEDURE TO MAKE A BATCH OF FILMS TO BE USED AS A  
13 GENERAL SUBSTRATE, AND WE WOULD CHECK THEM TO MAKE SURE THEY  
14 WERE GOOD.

15 Q. NOW, YOU MENTIONED GLASS PLATES WHERE YOU COULD  
16 ACTUALLY MAKE A PHOTOGRAPHIC PLATE FROM THE IMAGE THAT WAS  
17 BEING CREATED BY THESE ELECTRONS; IS THAT CORRECT?

18 A. YES, THAT'S CORRECT.

19 Q. AND WAS THAT DONE IN THE FULLAM LABORATORIES?

20 A. YES.

21 Q. AND WAS THERE A STANDARD PROCEDURE OF WHAT TO DO  
22 WITH THOSE PLATES ONCE THEY WERE CREATED?

23 A. OH, YES.

24 FOR RECORD KEEPING PURPOSES, THE MICROSCOPE IN THOSE  
25 DAYS DID NOT PROVIDE ANY EXTRA IMPRINTED MATERIAL ON THE  
26 PLATE, AND SO YOU SIMPLY HAD A 2 X 10 INCH PLATE DIVIDED  
27 INTO FIVE, TWO INCH IMAGE SECTIONS.

28 AND WHAT WE WOULD DO IS TAKE OUR PICTURE AT VARIABLE

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1 MAGNIFICATIONS. YOU COULD CHANGE THE MAGNIFICATION IN THE  
2 ELECTRON MICROSCOPE BY CHANGING THE STRENGTH OF THE CURRENT  
3 IN THE COILS. AND SO THEN IT WAS NECESSARY TO RECORD THE  
4 MAGNIFICATION SETTING THAT WAS USED TO PRODUCE EACH IMAGE.  
5 SO THAT WOULD BE RECORDED ON AN ENVELOPE, WHICH WAS THE

6 CARRIER FOR THE PLATE AFTER IT WAS FINISHED.

7 Q. OKAY.

8 AND WAS THIS THE PROCEDURE YOU AND DR. FULLAM BOTH  
9 FOLLOWED IN 1954?

10 A. OH, YES.

11 Q. AND WERE THOSE ENVELOPES WITH THE PLATES INSIDE THEN



12 KEPT IN A REGULAR STORAGE PLACE?  
13 A. YES.  
14 MR. OHLEMEYER: OBJECTION, YOUR HONOR. THE QUESTION  
15 IS VAGUE AS TO TIMING.

16 THE COURT: ALL RIGHT.  
17 DO YOU WANT TO WITHDRAW THE QUESTION AND PUT IT TO  
18 HIM AGAIN?

19 BY MR. HARLEY: Q. ALL RIGHT.  
20 IN 1954, WAS THERE A PROCEDURE THAT AFTER THE  
21 ENVELOPE AND PLATE HAD BEEN CREATED FOR STORING THESE AND  
22 KEEPING THEM IN ONE PLACE?

23 A. YES, THERE WAS.

24 Q. AND WHERE WAS THAT IN 1954?

25 A. IT WAS KEPT IN A FILING CABINET.

26 Q. OKAY.

27 AND THESE ARE SPECIALLY TO FIT THE GLASS PLATES A  
28 SPECIAL TYPE OF FILE CABINET?

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1 A. IT WAS A FILE CABINET THAT UNIQUELY FIT THE PLATES;  
2 THEY WERE 2 X 10 INCH PLATES.

3 Q. AND WERE THOSE PLATES, FROM 1954, MAINTAINED OVER A  
4 PERIOD OF TIME?

5 MR. OHLEMEYER: OBJECTION, YOUR HONOR, AGAIN, AS TO  
6 TIMING.

7 MR. HARLEY: WELL, I'LL REPHRASE THE QUESTION.

8 BY MR. HARLEY: Q. HOW LONG DID YOU STAY WITH THE  
9 FULLAM LABORATORIES?

10 A. I WAS THERE THROUGH -- WELL, INTO THE EARLY PART OF  
11 1964.

12 Q. OKAY.

13 AND WHILE YOU WERE THERE, WERE THE PLATES GENERATED  
14 THROUGHOUT THAT PERIOD OF TIME AND RETAINED IN ESSENTIALLY  
15 THE SAME MANNER YOU JUST DESCRIBED?

16 A. YES.

17 Q. AND WHERE WERE THE FILES KEPT?

18 A. WHILE THE CONSULTING BUSINESS WAS ACTIVE, THE FILES  
19 WERE MAINTAINED WITHIN THE LABORATORY AREA.

20 Q. OKAY.

21 AND WOULD YOU RECOGNIZE THOSE FILES AND PLATES FROM  
22 THE 1954 ERA, IF YOU WERE TO SEE THEM AGAIN?

23 A. YES.

24 Q. OKAY. AND DO YOU RECOGNIZE YOUR OWN HANDWRITING?

25 A. YES.

26 Q. AND DO YOU RECOGNIZE DR. FULLAM'S HANDWRITING FROM  
27 1954 TIME PERIOD?

28 A. YES.

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1 Q. NOW, IN ADDITION TO CREATING PHOTOGRAPHIC PLATES  
2 WHICH RECORD THE IMAGE, AN ELECTRON MICROSCOPE DOES  
3 SOMETHING ABOUT CREATING A DIFFRACTION; IS THAT CORRECT?

4 A. YES.

5 Q. IS THAT AN ANALYSIS OF THE SUBSTANCE, THE IMAGE; IS  
6 THAT CORRECT?

7 A. YES.

8 Q. CAN YOU EXPLAIN THAT GENERALLY, AND THEN I'LL ASK  
9 YOU SPECIFICALLY ABOUT THE 1954 MICROSCOPE.

10 A. ALL RIGHT.

11 IN ADDITION TO BEING ABLE TO PRODUCE A VISUAL IMAGE  
12 THAT YOU CAN RECOGNIZE WHEREIN YOU CAN RECOGNIZE THE  
13 PHYSICAL STRUCTURE OF A PARTICLE OR SOME OBJECT, THE  
14 ELECTRON MICROSCOPE CAN ALSO BE USED TO DO ELECTRON  
15 DIFFRACTION.

16 AND "ELECTRON DIFFRACTION" IS A WAY OF OBTAINING

17 WHAT ONE MIGHT CALL A FINGERPRINT OF A CRYSTALLINE  
18 MATERIALS. "CRYSTALLINE MATERIALS" ARE THOSE MATERIALS  
19 WHERE ATOMS ARE ARRANGED IN AN ORDERLY FASHION.

20 AND IF YOU ALLOW THE ELECTRON BEAM TO STRIKE THIS  
21 CRYSTALLINE MATERIAL IN A PARTICULAR MANNER, YOU CAN PRODUCE  
22 A DIFFRACTION PATTERN. AND A "DIFFRACTION PATTERN" CONSISTS  
23 OF A SERIES OF SPOTS. AND BY MEASURING THOSE SPOTS, ONE CAN  
24 OBTAIN INFORMATION ABOUT THE MATERIAL WHICH YOU ARE  
25 EXAMINING.

26 Q. OKAY.

27 NOW, IN A MODERN ELECTRON MICROSCOPE, CAN THAT BE  
28 DONE PRETTY PRECISELY?

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1 A. YES, IT CAN.

2 Q. AND FAIRLY EASILY?

3 A. YES, MUCH MORE EASILY THAN WE COULD DO IT AT THAT  
4 TIME.

5 Q. WAS THAT A MORE DIFFICULT PROCESS IN 1954?

6 A. YES, IT WAS.

7 Q. AND EXPLAIN WHY IT WAS DIFFICULT AND DIFFERENT IN  
8 1954, WITH THE RCA MICROSCOPE BEING USED AT THE FULLAM  
9 LABORATORIES?

10 A. ALL RIGHT.

11 THERE WERE TWO REASONS. ONE WAS THE PRECISION WITH  
12 WHICH THE SPECIMEN WAS INSERTED INTO THE MICROSCOPE. THE  
13 SPECIMEN HOLDER WAS NOT SO PRECISE THAT ONE HAD ABSOLUTELY  
14 REPETITIVE POSITIONING OF OUR LITTLE SUPPORT GRID.

15 SO IF THE GRID WAS BUCKLED UP A LITTLE BIT OR  
16 BUCKLED DOWN A LITTLE BIT, YOU CHANGED THE DISTANCE UP AND  
17 DOWN WITHIN THE LENS AND THAT HAD A SIGNIFICANT AND  
18 MEASURABLE EFFECT ON THE CALIBRATION CONSTANT FOR THE  
19 MICROSCOPE, WHICH WAS NEEDED IN ORDER TO MAKE A QUANTITATIVE  
20 MEASUREMENT.

21 THE SECOND LIMITATION OF THE MICROSCOPE IS THAT THE  
22 SPECIMEN COULD ONLY SIT IN A FIXED PLANE AND IT COULDN'T BE  
23 TILTED.

24 AS I MENTIONED WITH THE ELECTRON DIFFRACTION  
25 PATTERN, IT WAS NECESSARY TO HAVE THE CORRECT ORIENTATION OF  
26 THE PARTICLE WITH REGARD TO THE ELECTRON BEAM, WHEREAS YOU  
27 COULD HAVE A KNOWN CRYSTALLINE MATERIAL, PASS A BEAM THROUGH  
28 IT, AND GET NO PATTERN WHATEVER. IF YOU HAD THE ABILITY TO

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1 ROTATE THE PATTERN, SAY, TEN DEGREES OR FIVE DEGREES OR OF  
2 SOME VALUE, THEN YOU MIGHT GET A PATTERN.

3 SO IN OUR CASE, IN THAT MICROSCOPE, IT WAS A "HIT OR  
4 MISS" SITUATION AS TO WHETHER WE WOULD SEE A PATTERN AND THE  
5 COMPLETENESS OF THE PATTERN.

6 Q. OKAY.

7 IS A COMPLETE PATTERN NECESSARY IN ORDER TO  
8 RECOGNIZE SUBSTANCES?

9 A. IT CAN BE.

10 Q. OKAY.

11 AND, ALSO, WHEN YOU SAY YOU CAN RECOGNIZE CERTAIN  
12 CRYSTALLINE MATERIALS USING ELECTRON MICROSCOPE, WOULD THAT  
13 INCLUDE ASBESTOS?

14 A. YES, IT WOULD.

15 Q. NOW, IN 1954, WERE YOU INVOLVED WITH ANY PROJECTS AT  
16 THE FULLAM LABORATORIES INVOLVING KENT CIGARETTES?

17 A. YES, WE WERE.

18 Q. I'M GOING TO SHOW YOU WHAT'S BEEN PREVIOUSLY MARKED  
19 AS PLAINTIFF'S EXHIBIT -- SORRY, YOUR HONOR.

20 THE CLERK: DO YOU WANT TO LOOK AT MY LIST OR YOUR  
21 LIST?

22 MR. HARLEY: YES.  
23 (PAUSE IN PROCEEDINGS.)  
24 MR. HARLEY: ALL RIGHT. EXHIBIT 25. I'M JUST GOING  
25 TO PUT IT UP ON THE SCREEN.  
26 HAVE YOU SEEN THAT BEFORE?  
27 A. YES, I HAVE.  
28 Q. THIS IS A LETTER DATED JULY 20, 1954, TO DR. FULLAM.  
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1 NOW, IN THIS --  
2 MR. OHLEMEYER: YOUR HONOR, MAY I ASK A WITNESS A  
3 QUESTION FOR THE PURPOSE OF OBJECTION?  
4 THE COURT: ALL RIGHT. DO YOU WANT TO VOIR DIRE THE  
5 WITNESS?  
6 GO AHEAD.  
7 VOIR DIRE EXAMINATION  
8 BY MR. OHLEMEYER, COUNSEL ON BEHALF OF DEFENDANT LORILLARD:  
9 Q. MR. HALLGREN, THE FIRST TIME YOU SAW THAT LETTER WAS  
10 SOMETIME AFTER 1990; ISN'T THAT RIGHT?  
11 A. THAT'S CORRECT.  
12 MR. OHLEMEYER: THANK YOU, YOUR HONOR.  
13 MY OBJECTION WOULD BE THEN THERE'S NO TESTIMONY FROM  
14 THIS WITNESS ABOUT THIS PIECE OF EVIDENCE THAT IS NECESSARY.  
15 THAT THE LETTER SPEAKS FOR ITSELF.  
16 THE COURT: THERE'S NO QUESTION PENDING TO THIS  
17 WITNESS BASED ON THIS LETTER YET.  
18 STATE YOUR QUESTION.  
19 OBJECTION OVERRULED.  
20 DIRECT EXAMINATION (CONTINUED)  
21 BY MR. HARLEY, COUNSEL ON BEHALF OF PLAINTIFFS:  
22 Q. MR. HALLGREN, I'M ASKING YOU TO LOOK AT THE SECOND  
23 PARAGRAPH WHERE IT SAYS THAT SAMPLES ONE, TWO, THREE, AND  
24 FOUR, FIVE PACKAGES OF VARIOUS CIGARETTES ARE BEING  
25 DELIVERED FOR TESTING.  
26 DO YOU SEE THAT?  
27 A. YES.  
28 Q. WERE YOU INVOLVED IN AN EXPERIMENT, IN 1954, SUCH AS  
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1 IS DESCRIBED ON THESE FOUR SAMPLES OF CIGARETTES?  
2 MR. OHLEMEYER: SAME OBJECTION, YOUR HONOR. THE  
3 WITNESS HASN'T INDICATED HE NEEDS THIS EXHIBIT TO REFRESH  
4 HIS RECOLLECTION OR ASSIST HIS TESTIMONY.  
5 THE COURT: IT'S JUST PART OF THE QUESTION BEING PUT  
6 TO HIM. OBJECTION OVERRULED.  
7 YOU MAY ANSWER.  
8 THE WITNESS: YES.  
9 BY MR. HARLEY: Q. DO YOU RECALL THOSE  
10 EXPERIMENTS?  
11 A. YES, I DO.  
12 Q. AND CAN YOU DESCRIBE WHAT WAS DONE IN THOSE  
13 EXPERIMENTS?  
14 AND IF IT WOULD HELP TO DRAW A PICTURE, SO THE JURY  
15 CAN VISUALIZE IT, FEEL FREE. THERE'S A MARKER AND AN EASEL.  
16 FIRST OF ALL, DID YOU HELP SET UP THIS EXPERIMENT?  
17 A. THE BASIC PROCEDURE HAD BEEN SET UP BY ERNIE FULLAM  
18 BEFORE I CAME.  
19 Q. OKAY.  
20 BUT WERE YOU INVOLVED IN SETTING UP THE EQUIPMENT  
21 AND DOING THE ACTUAL TESTING?  
22 A. YES.  
23 Q. AND DID YOU TEST SOME OF THE SAMPLES THAT ARE LISTED  
24 IN THAT LETTER, EXHIBIT 25?  
25 A. YES.  
26 Q. DO YOU REMEMBER WHICH SAMPLES YOU TESTED AND WHICH

27 DR. FULLAM TESTED?  
28 A. I CAN'T QUOTE THAT RIGHT OFF THE TOP OF MY HEAD.  
ERIC L. THRONE, CSR/RPR (415) 764-0538 858  
1 Q. OKAY.  
2 A. I CAN --  
3 Q. WOULD LOOKING AT THE PHOTOGRAPH OR THE EXHIBIT, DOES  
4 THAT HELP YOU KNOW WHETHER --  
5 A. NO.  
6 Q. OKAY.  
7 A. I HAVE -- THERE IS ANOTHER MEANS.  
8 Q. OKAY. WE'LL GET TO THAT.  
9 A. RIGHT.  
10 Q. YOU HAVE THE ACTUAL PHOTOGRAPHS THAT WERE GENERATED  
11 DURING THESE EXPERIMENTS?  
12 A. YES.  
13 Q. AND SOME HAVE YOUR HANDWRITING AND SOME HAVE  
14 DR. FULLAM'S HANDWRITING?  
15 A. THAT'S CORRECT.  
16 Q. NOW, WERE YOU PRESENT WHEN THE EXPERIMENTS WERE  
17 DONE?  
18 A. YES.  
19 Q. OKAY.  
20 AND, EVENTUALLY, ONE PERSON HAS TO DO THE ELECTRON  
21 MICROSCOPY; IS THAT CORRECT?  
22 A. THAT'S CORRECT.  
23 Q. IT'S NOT A TWO-MAN JOB?  
24 A. ACTUALLY, INTERESTINGLY AT THIS POINT, WE OFTEN  
25 WORKED TOGETHER --  
26 Q. OKAY.  
27 A. -- AND DID LOOK OVER EACH OTHER'S SHOULDERS.  
28 Q. OKAY.  
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1 NOW, BECAUSE HE'S TEACHING YOU, IS THAT THE REASON?  
2 A. IN SOME PART. AND OFTENTIMES WE WORKED TOGETHER ON  
3 THINGS AND DISCUSS WHAT WE WERE SEEING.  
4 Q. OKAY. NOW, CAN YOU DISCUSS THE ACTUAL EXPERIMENT OF  
5 COLLECTING SMOKE, AS DESCRIBED IN EXHIBIT 25?  
6 A. YES.  
7 MAY I PREFACE THIS WITH A COMMENT OF WHAT WE WERE  
8 CHARGED WITH DOING?  
9 Q. YES.  
10 MR. OHLEMEYER: OBJECTION, YOUR HONOR.  
11 BY MR. HARLEY: Q. I WILL ASK A QUESTION.  
12 MR. HALLGREN, WHAT WAS YOUR UNDERSTANDING OF THE  
13 PURPOSE OF THE EXPERIMENT AND WHAT YOU WERE DOING AT FULLAM  
14 LABORATORY?  
15 MR. MCELANEY: OBJECTION.  
16 MR. OHLEMEYER: OBJECTION, YOUR HONOR. HEARSAY.  
17 MR. HARLEY: HE'S A PARTICIPANT IN THE EXPERIMENT.  
18 THE COURT: YOU ARE ASKING HIS PERSONAL KNOWLEDGE OF  
19 WHAT HE SET OUT TO DO?  
20 MR. HARLEY: RIGHT. DOES IT MATTER WHERE HE HEARD  
21 IT FROM? NO.  
22 THE COURT: OBJECTION OVERRULED.  
23 GO AHEAD.  
24 BY MR. HARLEY: Q. WOULD YOU EXPLAIN WHAT THE  
25 PURPOSE OF THE EXPERIMENT WAS?  
26 A. THE CHARGE THAT WE HAD WAS TO --  
27 MR. MCELANEY: OBJECTION, YOUR HONOR.  
28 MR. OHLEMEYER: OBJECTION, YOUR HONOR. THAT  
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1 QUESTION IS OBJECTIONABLE.  
2 THE COURT: WELL, HE'S NOT ANSWERING YOUR QUESTION.

3 HE'S SAYING WHAT HE WAS TOLD TOO, RIGHT?  
4 MR. HARLEY: OKAY.  
5 THE COURT: NOW, THAT, AS FAR AS I COULD SEE, IS NOT  
6 BEING INTRODUCED FOR THE TRUTH OF THE MATTER ASSERTED --  
7 MR. HARLEY: NO.  
8 THE COURT: -- SIMPLY WHAT HIS MARCHING ORDERS WERE.  
9 MR. HARLEY: UNDERSTOOD.  
10 MR. MCELANEY: YOUR HONOR, I HATE TO BELABOR THE  
11 POINT, BUT I THINK IT IS BEING OFFERED PRECISELY FOR THE  
12 TRUTH, AND THAT'S THE OBJECTION.  
13 I'LL INSTRUCT THE JURY TO DISREGARD IT FOR THE TRUTH  
14 OF THE MATTER ASSERTED. THIS EVIDENCE ONLY GOES TO THE  
15 QUESTION OF WHAT THIS GENTLEMAN, MR. HALLGREN, SET OUT TO  
16 DO.  
17 WELL, WHY IS IT IMPORTANT, WHAT HE SET OUT TO DO?  
18 THE QUESTION IS WHAT HE DID.  
19 MR. HARLEY: YES. I'LL REPHRASE THE QUESTION.  
20 BY MR. HARLEY: Q. GOING TO EXHIBIT 25,  
21 MR. HALLGREN, THE LETTER STATES: "UNDER SEPARATE COVER, WE  
22 ARE SENDING YOU 20 PACKAGES OF KENT CIGARETTES. THEY ARE AS  
23 FOLLOWS . . . , AND THERE'S A DESCRIPTION OF THE FOUR SAMPLES."  
24 "WE WILL APPRECIATE IT VERY MUCH IF YOU WILL OBSERVE  
25 THE RELATIVE AMOUNTS OF MINERAL FIBERS IN THE SMOKE FROM  
26 THESE FOUR LOTS, FOLLOWING THE SAME GENERAL TECHNIQUE WHICH  
27 YOU USED IN THE INVESTIGATION PRIOR TO THIS."  
28 DO YOU SEE THAT INSTRUCTION?  
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1 A. YES.  
2 Q. CAN YOU DESCRIBE THE TECHNIQUE THAT WAS USED TO  
3 ACCOMPLISH WHAT WAS INSTRUCTED IN THAT LETTER?  
4 MR. OHLEMEYER: OBJECTION.  
5 MR. MCELANEY: OBJECTION.  
6 BY MR. HARLEY: Q. FIRST OF ALL, DID YOU CONDUCT  
7 AN EXPERIMENT TO COLLECT THE SMOKE AND DETERMINE THE AMOUNT  
8 OF MINERAL FIBER RELEASED IN THE SMOKE, IF ANY?  
9 A. YES, WE DID.  
10 Q. OKAY.  
11 AND CAN YOU DESCRIBE THE TECHNIQUES USED IN THAT  
12 EXPERIMENT?  
13 A. YES, I CAN.  
14 Q. WOULD YOU PLEASE DO THAT?  
15 A. ALL RIGHT.  
16 THE PROBLEM WAS TO COLLECT ANY MINERAL FIBERS THAT  
17 WERE COMING FROM THE FILTER SO THAT WE COULD GET THEM INTO A  
18 FORM WHERE WE COULD LOOK AT THEM IN THE ELECTRON MICROSCOPE.  
19 SO THE PROBLEM WAS THEN TO SMOKE THE CIGARETTES IN A  
20 WAY AS CLOSELY PROXIMATING A PERSON SMOKING A CIGARETTE AS  
21 POSSIBLE. AND THE WAY WE ACCOMPLISHED THAT WAS TO TAKE A  
22 DEVICE KNOWN AN "ASPIRATOR PUMP," WHICH IS A DEVICE THAT IS  
23 CONNECTED TO A WATER SUPPLY.  
24 MR. MCELANEY: YOUR HONOR, I APOLOGIZE FOR  
25 INTERRUPTING. I WOULD MOVE TO STRIKE THE TESTIMONY TO THIS  
26 POINT. I THINK THE QUESTION, AS YOUR HONOR SUGGESTED, WAS,  
27 "WHAT DID YOU DO?"  
28 THE COURT: HE'S EXPLAINING WHAT HE DID.  
ERIC L. THRONE, CSR/RPR (415) 764-0538 862  
1 MR. HARLEY: I THINK --  
2 MR. MCELANEY: AT THIS POINT, HE HASN'T GOTTEN TO  
3 THAT. IT'S ALL HEARSAY --  
4 MR. HARLEY: IT'S NOT.  
5 MR. MCELANEY: -- FROM A MAN THAT'S BEEN AT THIS  
6 LABORATORY FOR ALL OF A MONTH.  
7 THE COURT: COUNSEL, IF YOU WANT TO ARGUE THE

8 EVIDENCE, THERE WILL BE A TIME WHEN IT'S SUBMITTED. AT THIS  
9 POINT, EXHIBIT 25 HAS TOLD HIM WHAT TO DO. THAT'S IN  
10 EVIDENCE.

11 THE NEXT QUESTION IS, "WHAT DID YOU DO TO ACCOMPLISH  
12 THE TASK GIVEN YOU BY EXHIBIT 25 IN EVIDENCE?" HE'S NOW  
13 SAYING WHAT HE DID --

14 MR. MCELANEY: YOUR HONOR --

15 THE COURT: -- WHICH IS TO COLLECT THE MINERAL  
16 FIBERS COMING FROM THE FILTER. AND TO DO THAT, HE'S  
17 EXPLAINING THAT HE SET UP A PROCEDURE TO CAPTURE THE SMOKE  
18 IN A MANNER AS CLOSELY AS POSSIBLE TO THE MANNER IN WHICH A  
19 HUMAN SMOKES A CIGARETTE.

20 MR. MCELANEY: YOUR HONOR, HE SAID HE DIDN'T SEE  
21 EXHIBIT 25 UNTIL SOMETIME AFTER 1990.

22 MR. HARLEY: YOUR HONOR, IT DOESN'T MAKE ANY  
23 DIFFERENCE.

24 THE COURT: IT DOESN'T MATTER WHEN HE SAW IT. AFTER  
25 1990, YOU CAN BRING IT OUT ON CROSS-EXAMINATION. THE  
26 QUESTION IS WHAT HE DID --

27 MR. MCELANEY: WHAT HE DID.

28 THE COURT: -- BACK IN 1954, AND TO EXPLAIN WHAT HE  
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1 DID. HE IS TELLING YOU. YOU WILL HAVE A CHANCE TO  
2 CROSS-EXAMINE HIM.

3 MR. MCELANEY: ALL RIGHT.

4 THE WITNESS: YOU HAVE THE WATER SUPPLY. AND,  
5 ACTUALLY, THE ASPIRATOR PUMP IS A STRANGE LOOKING THING WITH  
6 A ZIGZAG PATH. AND AS YOU RUN WATER THROUGH THIS DEVICE, IT  
7 ACTUALLY PULLS IT, CREATES A VACUUM IN THIS LITTLE SIDEARM  
8 FLASK.

9 THEN IF WE TAKE AND CONNECT THIS FLASK TO ANOTHER  
10 FLASK HERE WITH A PIECE OF HOSE, IF WE CONNECT THIS TO A --  
11 WELL, THAT'S NOT A FANCY FLASK THERE -- BUT WE HAVE THIS  
12 HOSE COMING IN HERE CREATING A VACUUM. THE FLASK IS FILLED  
13 WITH ACETONE.

14 NOW, COMING OUT OF THE OTHER SIDE OF THE FLASK --  
15 WHOOPS -- THIS IS BELOW THE LEVEL OF THE ACETONE. WE HAVE  
16 ANOTHER TUBE, AND WE COME OVER HERE TO THE SIDE, AND THEN IN  
17 HERE WE PLACE A CIGARETTE.

18 BY MR. HARLEY: Q. EXCUSE ME. MAY I ASK A  
19 QUESTION?

20 IN THE FLASK, THE ASPIRATOR PUMP, WHEN WORKING, WILL  
21 CREATE A VACUUM?

22 A. YES. AS YOU RUN WATER THROUGH THE ASPIRATING PUMP,  
23 YOU CREATE A VACUUM.

24 BY THE WAY, THERE'S A STOPPER HERE. SO IT'S ALL  
25 SEALED.

26 SO YOU HAVE A TWO-HOLE STOPPER HERE AND YOU ARE  
27 CREATING A VACUUM ABOVE THAT. SO THE VACUUM THEN CAUSES A  
28 REDUCTION IN PRESSURE HERE AND THAT WILL CAUSE THE AIR TO

ERIC L. THRONE, CSR/RPR (415) 764-0538 864  
1 FLOW THROUGH THE CIGARETTE, DOWN, AND BUBBLE THROUGH THE  
2 ACETONE AND THEN BACK OUT, RIGHT, AND JUST STOP IN THERE.

3 Q. OKAY.

4 NOW, WHAT'S THE PURPOSE OF THE ACETONE?

5 A. THE ACETONE WAS THERE TO DISSOLVE THE TARS --

6 Q. OKAY.

7 A. -- THAT WOULD NORMALLY COME OUT IN THE SMOKING  
8 PROCESS --

9 Q. WELL --

10 A. -- AND TO CAPTURE ANY SOLID MATERIALS COMING ALONG  
11 WITH THAT SMOKE.

12 Q. SO THE ACETONE WOULD HOLD ANY SOLID MATERIAL COMING

13 OUT OF THE SMOKE?  
14 A. THAT'S CORRECT.  
15 Q. OKAY.  
16 NOW, WAS THIS JUST A CONTINUOUS VACUUM, SO THAT THE  
17 CIGARETTE IS SMOKED DOWN ALL AT ONCE?  
18 A. NO. NO.  
19 WHAT WE COULD DO IS -- THIS IS A RUBBER HOSE AT THIS  
20 POINT HERE. AND WHAT YOU COULD DO WOULD BE TO PINCH THE  
21 RUBBER HOSE AND THEN CONTROL THE FLOW. AND THE OBJECT WAS  
22 TO ALLOW THE CIGARETTE TO BURN AT ABOUT THE SAME RATE THAT A  
23 PERSON WOULD SMOKE, SO YOU WOULDN'T SIMPLY HAVE A CONTINUOUS  
24 FLOW AND HAVE THE CIGARETTE JUST BURN IN A VERY, VERY RAPID  
25 FASHION, AND SO WE WOULD PULSE IT.  
26 AND, BY THE WAY, THE VACUUM WAS MORE THAN ADEQUATE  
27 TO CAUSE THIS TO BURN VERY RAPIDLY, IF WE WANTED TO.  
28 MR. OHLEMEYER: OBJECTION, YOUR HONOR. MOVE TO  
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1 STRIKE. NONRESPONSIVE.  
2 THE COURT: OVERRULED.  
3 GO AHEAD.  
4 THE WITNESS: OKAY.  
5 SO WE WOULD CONTROL THE FLOW BY PINCHING THE VACUUM  
6 SOURCE, HOLDING OFF THE VACUUM SOURCE, ACTUALLY WORKED THE  
7 TIP OF THE CIGARETTE A LITTLE BIT TO SIMULATE A PERSON'S  
8 MOUTH HOLDING THE CIGARETTE.  
9 AND THEN IN THIS WAY, WE WOULD SMOKE SEVERAL  
10 CIGARETTES -- THE PRECISE NUMBER, I DON'T RECALL, SOMETHING  
11 LIKE THREE -- AND WE ACCUMULATED ALL THE MATERIALS IN THE  
12 ACETONE.  
13 Q. OKAY.  
14 SO THAT'S HOW YOU SMOKED THE CIGARETTES, CORRECT?  
15 A. THAT'S RIGHT.  
16 Q. NOW, YOU HAVE GOT SMOKE FROM SEVERAL CIGARETTES  
17 COLLECTED IN A VOLUME OF ACETONE?  
18 A. THAT'S CORRECT.  
19 Q. DID YOU KNOW PRECISELY HOW MUCH ACETONE WAS IN  
20 THERE?  
21 A. I CAN'T TELL YOU HOW MUCH WAS IN THERE, BUT WE USE  
22 THE SAME AMOUNT EVERY TIME.  
23 Q. OKAY. NOW, I HAVE A QUESTION.  
24 WHEN YOU SET THIS EXPERIMENT UP TO SMOKE, WHAT  
25 EFFORTS, IF ANY, WERE MADE TO CLEAN THE FLASK AND THE HOSE  
26 AND THE OTHER COMPONENTS OF THE APPARATUS?  
27 A. WELL, ANYTHING THAT WOULD CONTAIN PARTICLES COMING  
28 FROM THE SYSTEM WOULD BE THOROUGHLY RINSED AND CLEANED  
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1 BEFORE EACH ONE RUN.  
2 Q. NOW, AFTER YOU HAVE GOT THE ACETONE, WHAT DO YOU DO  
3 WITH IT TO GET IT READY TO PUT UNDER THE ELECTRON  
4 MICROSCOPE?  
5 A. OKAY. AT THIS POINT, ANY SOLID MATERIAL THAT HAS  
6 BEEN BROUGHT OVER WITH THE SMOKE WOULD BE IN SUSPENSION IN  
7 THE ACETONE.  
8 SO WE TOOK THE TARRY LIQUID WHICH LOOKED LIKE STRONG  
9 TEA AT THIS POINT, PUT IT INTO A CENTRIFUGE TUBE WHICH IS  
10 LIKE A TEST TUBE AND THEN YOU PUT IT IN A CENTRIFUGE AND  
11 SPIN IT VERY RAPIDLY.  
12 Q. NOW, MR. HALLGREN, YOU PUT ALL THE MATERIAL IN THERE  
13 OR JUST A PORTION OF IT?  
14 A. A PORTION OF IT. AND IT WOULD BE THOROUGHLY MIXED  
15 TO GET A REPRESENTATIVE PORTION.  
16 Q. OKAY.  
17 A. YOU THEN SPIN IT AND THIS WOULD CAUSE THE HEAVIER

18 MATERIALS TO GO TO THE BOTTOM OF THE CENTRIFUGE TUBE. THEN  
19 YOU COULD POUR OFF THE ACETONE. AND, ACTUALLY, THEN WHAT WE  
20 PUT IN WAS A SECOND LIQUID OF DIOXANE AND RESUSPENDED THE  
21 MATERIAL AND THEN CENTRIFUGED IT AGAIN IN THE DIOXANE, AND  
22 THEN PUT A SOLUTION OF 20 PERCENT ALCOHOL IN WATER AND THEN  
23 CENTRIFUGED IT A THIRD TIME.

24 Q. WHAT WAS THE PURPOSE OF THESE THREE DIFFERENT  
25 WASHES?

26 A. THE ACETONE AND DIOXANE ARE MIXABLE, THAT IS, THEY  
27 WILL MIX TOGETHER SO YOU COULD SEPARATE THE TAR FROM THE  
28 DIOXANE, AND THEN THE DIOXANE AND THE ALCOHOL WATER SOLUTION

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1 ARE ALSO MIXABLE. IF YOU HAD TRIED TO GO STRAIGHT FROM  
2 ALCOHOL TO THE ACETONE AND WATER IT WOULD NOT HAVE WORKED.  
3 SO IT WAS SIMPLY AN IMMEDIATE STEP TO MAKE EVERYTHING  
4 COMPATIBLE.

5 Q. TO GET ALL THE TARS?

6 A. TO SEPARATE THE TARS FROM THE SOLIDS.

7 Q. OKAY.

8 A. THE TARS WOULD HAVE DEFINITELY INTERFERED WITH THE  
9 QUALITY OF THE IMAGE THAT YOU PRODUCED UNDER THE ELECTRON  
10 MICROSCOPE.

11 Q. OKAY.

12 THEN YOU HAVE THIS MATERIAL THAT'S BEEN WASHED WITH  
13 THESE THREE SOLUTIONS; IS THAT CORRECT?

14 A. RIGHT. RIGHT. AND THAT HAS BEEN CENTRIFUGED. AND  
15 WE NOW END UP WITH A VERY SMALL AMOUNT OF LIQUID AT THE  
16 BOTTOM OF THE CENTRIFUGE TUBE.

17 THEN YOU CAN TAKE A VERY THIN MEDICINE DROPPER, A  
18 PIPETTE, MICROPIPETTE, IF YOU'D LIKE, AND WITHDRAW A VERY  
19 SMALL AMOUNT, AND THEN PLACE A DROP -- I'M SORRY, BACKTRACK  
20 ONE STEP.

21 WHEN WE ENDED UP WITH JUST THE RESIDUAL AMOUNT OF  
22 LIQUID, WE WOULD MIX IT UP BY BUBBLING IT WITH THE PIPETTE  
23 TO REDISPERSE THE FIBERS OR PARTICLES, WHATEVER THE MATERIAL  
24 THAT WAS THERE IN THE LIQUID. THEN YOU TAKE A DROP OF THAT  
25 LIQUID, PUT IT ON A FILM-COATED GRID AS THE TYPE THAT I  
26 MENTIONED, ALLOW THAT TO DRY, AND THEN YOU COULD LOOK AT IT  
27 IN THE ELECTRON MICROSCOPE.

28 Q. OKAY.

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1 AND THEN WHEN IT WAS EXAMINED UNDER THE ELECTRON  
2 MICROSCOPE, THESE FOUR SAMPLES WERE ALL EXAMINED IN THE SAME  
3 WAY?

4 A. YES.

5 Q. OKAY.

6 AND YOU FOLLOWED THAT TECHNIQUE IN THE SAMPLES YOU  
7 DID?

8 A. YES.

9 Q. AND AS FAR AS YOU KNOW, DR. FULLAM FOLLOWED THE SAME  
10 TECHNIQUE FOR HIS?

11 A. THAT'S CORRECT.

12 Q. AND THOSE WERE PICKS THEN TAKEN DURING THE  
13 EXAMINATION OF THESE COLLECTED MATERIALS?

14 A. YES, OF REPRESENTATIVE PARTICLES.

15 Q. OKAY. AND WERE PLATES MADE?

16 A. YES.

17 Q. OKAY.

18 AND WERE THE PLATES PUT IN ENVELOPES AND RECORDED?

19 A. YES, THEY WERE.

20 Q. OKAY.

21 NOW, HAVE YOU GATHERED SOME PLATES --

22 A. I HAVE.



23 Q. -- AND BROUGHT THEM WITH YOU TODAY?  
24 A. I HAVE.  
25 Q. HOW LONG HAVE YOU HAD THESE PLATES IN YOUR  
26 POSSESSION?  
27 A. IN MY POSSESSION?  
28 Q. YEAH.  
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1 A. IN MY POSSESSION FOR THE LAST COUPLE OF YEARS.  
2 Q. AND WHERE DID YOU GET THEM FROM?  
3 A. FROM THE FULLAM LABORATORY.  
4 Q. AND DO YOU RECOGNIZE THEM?  
5 A. ABSOLUTELY.  
6 Q. AND WERE THESE THE PLATES CREATED IN 1954, IN THE  
7 VARIOUS KENT EXPERIMENTS THAT WERE DONE?  
8 A. YES, THEY WERE.  
9 Q. AND CAN YOU JUST PULL ONE UP TO LET THE JURY SEE  
10 WHAT YOU ARE TALKING ABOUT WHEN YOU SAY A GLASS PLATE?  
11 A. (WITNESS COMPLIED.)  
12 YOU CAN SEE THERE ARE FIVE SQUARES WITH AN IMAGE.  
13 Q. AND, MR. HALLGREN, YOU SAID THERE'S WRITING ON THE  
14 ENVELOPE TO IDENTIFY THEM.  
15 WHERE IS THE WRITING ON THE ENVELOPE?  
16 A. THE WRITING IS ACROSS THE TOP OF THE ENVELOPE.  
17 Q. OKAY.  
18 IT'S JUST HANDWRITTEN WITH A PEN; IS THAT CORRECT?  
19 A. JUST HANDWRITTEN WITH A PEN.  
20 Q. AND WHAT DOES IT SAY ON THAT WRITING?  
21 A. ON THIS PARTICULAR ONE IT SAYS -- IT GIVES THE DATE  
22 OF FEBRUARY 17, 1954, AND IT SAYS SILICATES FROM KENT  
23 FILTER, UNSMOKED ON FORMVAR, ON "F," MEANING "FORMVAR,"  
24 WHICH WAS THE SUBSTRATE MATERIAL ON THE GRID, AND IT GIVES  
25 SOME NUMBERS WHICH INDICATE THE MAGNIFICATION AND A LETTER  
26 WHICH INDICATES THE SAMPLE HOLDER THAT WAS USED.  
27 Q. OKAY.  
28 SO IS THAT THE STANDARD PROCEDURE OF RECORDING THE  
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1 INFORMATION FOR ANY PLATE?  
2 A. IT IS.  
3 Q. NOW, WAS THAT THE PROCEDURE ONLY USED FOR KENT  
4 SAMPLES OR ....  
5 A. NO, IT'S THE BASIC PROCEDURE WE USE FOR RECORDING  
6 ALL INFORMATION RELATIVE TO SAMPLES.  
7 Q. WERE YOU DOING WORK FOR OTHER PEOPLE AT THIS TIME?  
8 A. OH, YES.  
9 Q. WAS THIS LABORATORY BUSY IN 1954?  
10 A. YES.  
11 Q. OKAY. AND YOU CAN PUT THAT ONE AWAY.  
12 A. ALL RIGHT.  
13 Q. NOW, YOU HAVE MADE -- THERE HAVE BEEN PHOTOGRAPHIC  
14 PRINTS MADE OF ALL THE KENT RELATED PLATES; IS THAT CORRECT?  
15 A. THAT'S CORRECT.  
16 Q. AND THOSE HAVE BEEN --  
17 THE COURT: PARDON ME. DID YOU SAY "UNSMOKED" OR  
18 "SMOKED"?  
19 THE WITNESS: THIS WAS "UNSMOKED," THIS PARTICULAR  
20 ONE.  
21 MR. HARLEY: YES. THAT'S FEBRUARY 1954.  
22 THE COURT: YOU HAVE NOT DESCRIBED HOW YOU GOT  
23 ANYTHING OUT OF AN "UNSMOKED CIGARETTE." YOU ONLY DESCRIBED  
24 SOMETHING OF WHAT YOU GOT OUT OF A "SMOKED CIGARETTE."  
25 THE WITNESS: THAT'S CORRECT.  
26 YOUR HONOR, MAY I EXPLAIN?  
27 MR. HARLEY: YOUR HONOR, WE'RE GOING TO GET INTO

28 THAT LATER.

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1 BY MR. HARLEY: Q. IS THERE SOMETHING KNOWN AS  
2 "CONTROLS" IN ELECTRON MICROSCOPY --

3 A. YES.

4 Q. -- OF KNOWN SAMPLES OF WHAT YOU ARE GOING TO LOOK  
5 AT?

6 A. YES.

7 Q. WILL YOU PLEASE EXPLAIN THAT CONCEPT?

8 A. THE VARIETY OF MATERIALS THAT ONE CAN ENCOUNTER IN  
9 STARTING TO EXAMINE THINGS IS EXTREMELY BROAD. AND IN  
10 MICROSCOPY, IN GENERAL, YOU TRY TO WORK WITH REFERENCE  
11 MATERIALS THAT ARE "KNOWN."

12 WHEN YOU ARE LOOKING FOR AN "UNKNOWN," YOU THEN TRY  
13 TO GET A SAMPLE WHOSE ORIGIN IS KNOWN TO YOU, EXAMINE THAT  
14 IN THE MICROSCOPE; AND THEN WHEN YOU GET TO THE LOOKING FOR  
15 THE UNKNOWN SAMPLE, YOU WILL HAVE A VISUAL RECOLLECTION OF  
16 WHAT WAS ON THE ORIGINAL SAMPLE SO THAT YOU CAN COMPARE IT  
17 WITH THE UNKNOWN SAMPLE.

18 Q. AND FOR THE SUMMER OF 1954 EXPERIMENTS WITH KENT  
19 CIGARETTES, DID YOU HAVE SOME KNOWN SAMPLES OF THE KNOWN  
20 MATERIALS YOU WERE LOOKING FOR?

21 A. YES. BY COINCIDENCE, THE PLATE THAT I PULLED OUT  
22 HAPPENED TO BE A REFERENCE PLATE.

23 Q. OKAY.

24 AND WHAT ARE THOSE, WHEN YOU SAY -- WILL YOU  
25 DESCRIBE WHAT THE "REFERENCE SAMPLE" WAS?

26 A. THE REFERENCE SAMPLE WAS ASBESTOS PARTICLES  
27 EXTRACTED FROM A KENT FILTER PRIOR TO ITS HAVING BEEN  
28 SMOKED.

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1 Q. OKAY.

2 AND THERE ARE ALSO PICTURES OF THOSE; IS THAT  
3 CORRECT?

4 A. YES.

5 THE COURT: SO THE REFERENCE PLATE THAT YOU SHOWED  
6 THE JURY IS NOT THE RESULT OF EXPERIMENTS YOU DESCRIBED?

7 THE WITNESS: NO.

8 THE COURT: IT DOESN'T INDICATE WHAT WOULD HAPPEN,  
9 NECESSARILY, OR AT ALL WITH SOMEONE SMOKING A CIGARETTE?

10 THE WITNESS: THAT'S CORRECT. IT'S JUST COINCIDENCE  
11 THAT I GRABBED IT.

12 BY MR. HARLEY: Q. OKAY.

13 NOW, I'M GOING TO SHOW YOU WHAT'S BEEN MARKED AS  
14 PLAINTIFF'S EXHIBITS 33 AND 32. WE'LL START WITH 32.

15 CAN YOU JUST IDENTIFY WHAT THAT IS?

16 A. THIS IS AN ELECTRON MICROGRAPH OF PARTICLES  
17 EXTRACTED FROM SAMPLE NUMBER TWO, IN THE EXHIBIT THAT YOU  
18 SHOWED A FEW MINUTES AGO.

19 Q. THAT WAS FROM EXHIBIT 25?

20 A. THAT WAS FROM EXHIBIT 25.

21 AND THIS IS THE NUMBER TWO SAMPLE IN THAT SERIES.

22 Q. SO THAT'S BEEN IDENTIFIED IN THE LETTER, I BELIEVE,  
23 AS "REGULAR KENT'S"?

24 A. THAT'S CORRECT.

25 Q. AND THIS IS A -- IT'S A REGULAR TYPE BLACK AND WHITE  
26 PHOTOGRAPH THAT'S BEEN CREATED FROM THE PLATE?

27 A. THAT'S CORRECT.

28 Q. AND DOES IT FAIRLY AND ACCURATELY REPRESENT WHAT WAS

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1 ON THAT PLATE?

2 A. YES, IT DOES.

3 THE COURT: YOU SAID "EXTRACTED."

4 EXTRACTED PURSUANT TO THIS METHOD --  
5 THE WITNESS: THAT'S CORRECT.  
6 THE COURT: -- OR PURSUANT TO THE METHOD SHOWN ON  
7 THAT, THAT YOU USED BEFORE?  
8 THE WITNESS: THIS IS BY THE SMOKING TECHNIQUE THAT  
9 I DESCRIBED.  
10 THE COURT: ALL RIGHT.  
11 BY MR. HARLEY: Q. SO THIS SMOKING TECHNIQUE WAS  
12 USED ON THE FOUR SAMPLES FROM THAT WERE SUBMITTED IN  
13 EXHIBIT 25?  
14 A. THAT'S CORRECT.  
15 Q. AND THIS PARTICULAR PICTURE, EXHIBIT 32, IS FROM  
16 PARTICLES RELATED TO SAMPLE TWO OF EXHIBIT 25?  
17 A. THAT'S CORRECT.  
18 Q. AND PLAINTIFF'S EXHIBIT 33, WHAT IS THAT?  
19 A. THIS IS ANOTHER SAMPLE OF PARTICLES EXTRACTED FROM  
20 THE SAME SAMPLE, NUMBER TWO.  
21 Q. OKAY. ARE THERE DATES ON THOSE?  
22 A. YES, THERE ARE.  
23 Q. WHAT ARE THE DATES?  
24 A. THE DATES ARE JULY 29, 1954.  
25 Q. AND DOES IT -- THE INFORMATION THAT'S TYPED AT THE  
26 BOTTOM OF THEM, WHERE DID THAT INFORMATION COME FROM?  
27 A. THERE ARE A COUPLE OF PIECES OF INFORMATION. THE  
28 FIRST THING YOU SEE IS "45-2."  
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1 THE COURT: ON WHICH?  
2 THE WITNESS: ON BOTH OF THESE EXHIBITS, YOUR HONOR.  
3 BY MR. HARLEY: Q. EXHIBIT 33 IS WHAT HE'S  
4 TALKING ABOUT RIGHT NOW.  
5 THE WITNESS: ALL RIGHT. IT'S THE SAME FOR BOTH OF  
6 THEM.  
7 EXHIBIT 32, THE FIRST THING IT SAYS IS 45-2, AND  
8 THAT REFERS TO PLATE NUMBER 45. THAT NUMBER WAS NOT ON  
9 THESE PLATES WHEN THE PLATES WERE TAKEN FROM THE FILE IN THE  
10 FIRST PLACE.  
11 WHEN I GOT THE PLATES OUT OF THE ORIGINAL FILE, THEY  
12 WERE NOT IN A NUMERICAL ORDER, AND I PUT AT THE BOTTOM OF  
13 THE ENVELOPE SO AS TO NOT TO CONFUSE THE ORIGINAL MATERIAL  
14 AT THE TOP OF THE ENVELOPE, AN ARBITRARY NUMBER IN  
15 CHRONOLOGICAL ORDER.  
16 ALMOST ALL OF THE PLATES WERE DATED; A COUPLE OF  
17 THEM WERE NOT. AND THE ONES THAT WERE NOT DATED, I PUT  
18 CLOSEST TO WHERE I FOUND THEM.  
19 FOR INSTANCE, IF I HAD A PLATE THAT WAS DATED  
20 JUNE 15, AND I FOUND A BLANK PLATE COMING AFTER IT, I  
21 ASSUMED THAT SOMEBODY HAD JUST NOT PUT THE DATE ON THAT AND  
22 I PUT THAT IN THE NEXT NUMERICAL ORDER.  
23 Q. BUT YOU DID NOT PUT THE DATE ON?  
24 A. BUT I DID NOT PUT A DATE ON.  
25 SO THIS 45-2 REFERS TO THE SECOND EXPOSURE ON THAT  
26 PLATE.  
27 Q. OKAY.  
28 A. THEN ITS NUMBER.  
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1 Q. WAS THAT ON THE ENVELOPE?  
2 A. THAT WAS ON THE ENVELOPE, AND THE DATE WAS ON THE  
3 ENVELOPE, KENT SILICATES. AND THE 15,000-X AT THE BOTTOM IS  
4 THE ENLARGEMENT OF THE PICTURES AS SEEN IN THIS PHOTOGRAPH.  
5 Q. AND WAS THAT INFORMATION ON THE ENVELOPE?  
6 A. NO, IT WAS NOT; BUT INFORMATION FOR DERIVING THE  
7 NUMBER WAS ON THE ENVELOPE.  
8 Q. OKAY.

9           THERE WAS INFORMATION ON THE ENVELOPE BY WHICH YOU  
10 KNEW WHAT THE ENLARGEMENT RATIOS WERE?  
11 A.        THAT'S CORRECT.  
12 Q.        OKAY.  
13           THE SAME OR SIMILAR INFORMATION --  
14 A.        EXACTLY THE SAME.  
15 Q.        -- IS ON EXHIBIT 32?  
16 A.        EXACTLY THE SAME.  
17 Q.        AND THE DATE OF JULY 29, 1954, WAS ON THE ORIGINAL  
18 ENVELOPE --  
19 A.        THAT'S CORRECT.  
20 Q.        -- FOR THE PLATE?  
21 A.        THAT'S CORRECT.  
22 Q.        AND THE NUMBER "2," KENT SILICATES, WAS ALSO ON THE  
23 ENVELOPE FROM 1954?  
24 A.        YES.  
25           AND FROM THERE IT SAYS 45-4. SO THAT WAS THE FOURTH  
26 EXPOSURE ON THE PLATE RATHER, SECOND AS WE HAVE HERE.  
27 Q.        SO BOTH EXHIBIT 32 AND 33 CAME FROM THE SAME PLATE;  
28 IS THAT CORRECT?  
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1 A.        THAT'S CORRECT.  
2 Q.        AND THESE ARE SAMPLES OF SOME OF THE PHOTOGRAPHS  
3 THAT WERE TAKEN; IS THAT CORRECT?  
4 A.        THAT'S CORRECT.  
5           MR. HARLEY: YOUR HONOR, I MOVE INTO EVIDENCE  
6 EXHIBITS 32 AND 33, SO I CAN SHOW THEM TO THE JURY.  
7           MR. OHLEMAYER: FOR THE REASONS PREVIOUSLY STATED,  
8 YOUR HONOR.  
9           THE COURT: OBJECTION OVERRULED.  
10          THEY ARE IN EVIDENCE.  
11          (PLAINTIFF'S EXHIBIT 32 & 33 WERE ADMITTED INTO  
12 EVIDENCE.)  
13          MR. HARLEY: OH. I NEED TO HAVE HER LABEL THEM.  
14          YOUR HONOR, I'M GOING TO PUT -- WE HAD HIGH GRADE  
15 COPIES MADE. I'M GOING TO SUBSTITUTE COPIES FOR 32 AND 33.  
16 THIS IS EXHIBIT 33 AND THIS IS 32.  
17          (PAUSE IN PROCEEDINGS.)  
18          BY MR. HARLEY: Q. NOW, ON EXHIBIT 33, WHICH I AM  
19 SHOWING TO THE JURY, CAN YOU DESCRIBE WHAT WAS SEEN THERE?  
20 A.        YOU ARE SEEING A CLUSTER OF ASBESTOS FIBERS.  
21 Q.        AND CAN YOU TELL US BY EXAMINING THIS PHOTOGRAPH  
22 WHAT THE SIZE IS IN MICRONS?  
23 A.        YES, I CAN.  
24 Q.        CAN YOU EXPLAIN TO US HOW YOU CAN DO THAT?  
25 A.        WELL, IF I KNOW THE ENLARGEMENT OF THE PRINT AS WE  
26 SEE IT AND BY MAKING A MEASUREMENT, I CAN THEN DETERMINE  
27 WHAT THE SIZE OF THE PARTICLE IS.  
28 Q.        OKAY. AND WHAT'S THE MEASUREMENT OF THE ACTUAL  
            ERIC L. THRONE, CSR/RPR (415) 764-0538       877  
1 PICTURE?  
2 A.        YES --  
3 Q.        OKAY.  
4 A.        -- IF I MEASURE THIS PICTURE.  
5 Q.        AND YOU HAVE A RURAL THERE?  
6 A.        I DO HAVE A SCALE. IT TURNS OUT THAT THE UNIT OF  
7 MEASURE THAT WE USE IN SCIENTIFIC MEASURE IS IN THE METRIC  
8 SYSTEM AND THE UNIT IS THE MICRON WHICH IS A THOUSANDTH OF A  
9 MILLIMETER.  
10          SO THAT AT 15,000 TIMES MAGNIFICATION, ONE MICRON  
11 WOULD THEN BE 15 MILLIMETERS IN SIZE. SO IF WE HAD A  
12 SPHERE, ONE MICRON IN DIAMETER, IT WOULD APPEAR TO BE 15  
13 MILLIMETERS IN DIAMETER ON THIS PHOTOGRAPH. SO IF I MEASURE

14 THIS RIGHT NOW, IT TURNS OUT TO BE JUST ABOUT THREE  
15 MILLIMETERS.

16 SO THE WIDTH OF THIS FIBER, OR A BUNDLE OF FIBERS,  
17 IS ABOUT TWO-TENTHS OF A MICRON.

18 Q. ALL RIGHT.

19 A. AND THE LENGTH, THE PARTICLE IS CUT OFF AT THE  
20 BOTTOM. AND FOR PRACTICAL PURPOSES, IT'S ESSENTIALLY 15  
21 CENTIMETERS LONG, AND THAT TRANSLATES TO ABOUT A TEN MICRON  
22 LONG PARTICLE.

23 Q. THE LENGTH OF THE PHOTOGRAPHIC WINDOW?

24 A. IS APPROXIMATELY TEN MICRONS.

25 Q. OKAY.

26 IT'S JUST BEEN ENLARGED MANY TIMES; IS THAT CORRECT?

27 A. THAT'S RIGHT.

28 Q. AND EXHIBIT 32, WHAT DO WE SEE THERE?

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1 A. WE SEE A NUMBER OF PARTICLES, SOME OF WHICH ARE  
2 SEPARATED FROM EACH OTHER, SOME OF THEM ARE BOUND TOGETHER,  
3 AND SOME OF THEM ARE LARGER THAN TWO-TENTHS OF A MICRON IN  
4 DIAMETER, AND SOME OF THEM ARE SMALLER.

5 Q. MR. HALLGREN, THESE ARE LABELED SILICATES?

6 A. YES.

7 Q. WHY ARE THEY CALLED SILICATES?

8 A. THE PROJECT, WHEN IT GOT STARTED, WAS KNOWN  
9 INTERNALLY WITHIN OUR OPERATION AS KENT SILICATES. IT WAS  
10 THE STUDY OF KENT SILICATES.

11 THE COURT: PARDON ME.

12 MR. HALLGREN, YOU SAID IT SHOWS A NUMBER OF  
13 PARTICLES.

14 ARE YOU ABLE TO IDENTIFY WHAT KIND OF PARTICLES THEY  
15 ARE, YOU KNOW, WHAT SUBSTANCE?

16 THE WITNESS: I CAN SAY THAT THESE ARE ASBESTOS  
17 PARTICLES.

18 THE COURT: ALL RIGHT.

19 BY MR. HARLEY: Q. AND WHY ARE THEY LABELED  
20 "SILICATES"?

21 A. WE USE THE TERM SILICATES BECAUSE -- FRANKLY, I  
22 DON'T KNOW WHY WE STARTED WITH SILICATES. WE KNEW THEY WERE  
23 ASBESTOS, BUT WE CALLED THEM "SILICATE PARTICLES."

24 Q. OKAY.

25 A. BUT WE KNEW THAT THE ASBESTOS IS SILICATE. AND WE  
26 USED THE TERM SILICATES FROM THE VERY BEGINNING OF THE  
27 PROJECT. BUT IT WAS INTERCHANGEABLE IN OUR MIND. IT DIDN'T  
28 MAKE ANY DIFFERENCE, WE KNEW IT WAS ASBESTOS.

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1 Q. OKAY.

2 NOW, YOU MENTIONED AND I THINK YOU ACTUALLY PULLED  
3 OUT A REFERENCE SAMPLE FROM FEBRUARY 17, 1954; IS THAT  
4 CORRECT?

5 A. YES.

6 Q. AND I'M GOING TO SHOW YOU WHAT'S BEEN MARKED AS  
7 PLAINTIFFS EXHIBIT 34?

8 A. UH-HUH.

9 Q. CAN YOU IDENTIFY THAT?

10 A. YES. THESE ARE ASBESTOS PARTICLES THAT ERNIE FULLAM  
11 EXTRACTED FROM THE KENT FILTER PRIOR TO ITS HAVING BEEN  
12 SMOKED TO USE AS A REFERENCE TO.

13 MR. MCELANEY: OBJECTION, YOUR HONOR. I MOVE TO  
14 STRIKE ON THE LACK OF FOUNDATION. IF I HEARD CORRECTLY,  
15 THIS WAS FEBRUARY OF '54, MONTHS BEFORE MR. HALLGREN  
16 REPORTED TO WORK AT THE LABORATORY.

17 THE COURT: NO PERSONAL KNOWLEDGE OF WHAT HE DID.  
18 OBJECTION SUSTAINED.

19 BY MR. HARLEY: Q. MR. HALLGREN --  
20 THE COURT: THAT WILL GO OUT.  
21 BY MR. HARLEY: Q. -- YOU HAD REFERENCE SAMPLES  
22 FOR PURPOSES OF YOUR WORK IN THE SUMMER AND LATE FALL OF  
23 1954, WERE IDENTIFIED AND REFERENCED KENT ASBESTOS; IS THAT  
24 CORRECT?  
25 MR. MCELANEY: OBJECTION, YOUR HONOR. HEARSAY.  
26 THE COURT: WELL, HE DOESN'T HAVE ANY PERSONAL  
27 KNOWLEDGE AS TO HOW REFERENCE SAMPLES IN FEBRUARY 1954 WERE  
28 PREPARED. HE WASN'T WORKING THERE. THAT'S YOUR POINT?  
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1 MR. MCELANEY: PRECISELY, YOUR HONOR.  
2 THE COURT: OBJECTION SUSTAINED.  
3 BY MR. HARLEY: Q. ARE -- FIRST OF ALL, I HAVE TO  
4 ESTABLISH A FOUNDATION.  
5 WERE THERE, IN 1954, FOR YOUR PURPOSES OF SCIENTIFIC  
6 WORK, REFERENCE SAMPLES?  
7 A. YES.  
8 MR. MCELANEY: OBJECTION.  
9 MR. HARLEY: WELL, IT'S PRELIMINARY. YOU HAVE TO GO  
10 A STEP AT A TIME.  
11 MR. MCELANEY: NO. NO. THE ONLY QUESTION YOU ASKED  
12 HIM ABOUT FEBRUARY '54.  
13 MR. HARLEY: NO, IN THE SUMMER OF '54 FOR YOUR WORK.  
14 MR. MCELANEY: SO WE'LL STRIKE THAT ONE.  
15 BY MR. HARLEY: Q. IN '54, WHEN YOU WERE DOING  
16 YOUR WORK ON THE KENT SAMPLES, DID YOU HAVE REFERENCE  
17 SAMPLES TO HELP YOU?  
18 A. YES.  
19 Q. WERE THE REFERENCE SAMPLES, PLATES CREATED IN THE  
20 ORDINARY COURSE -- WERE THEY A PART OF THE BUSINESS RECORDS  
21 OF FULLAM LABORATORIES IN JUNE OF 1954?  
22 A. YES.  
23 Q. AND WERE REFERENCE SAMPLES --  
24 MR. MCELANEY: OBJECTION, YOUR HONOR. I WOULD MOVE  
25 TO STRIKE THE QUESTION AS COMPOUND. I DIDN'T UNDERSTAND  
26 WHAT HE WAS ASKING, WHETHER THEY WERE CREATED IN THE  
27 ORDINARY COURSE OF BUSINESS, IF THEY WERE -- OF COURSE, IT  
28 REQUIRES A QUESTION AS TO WHEN.  
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1 MR. HARLEY: WELL, I'M GETTING THERE.  
2 THE COURT: ALL RIGHT. I THINK IT'S CLEAR THAT  
3 THESE SAMPLES OCCURRED BY PERSONS OTHER THAN THESE  
4 GENTLEMAN.  
5 MR. HARLEY: RIGHT.  
6 THE COURT: HE DOESN'T HAVE ANY KNOWLEDGE AS TO HOW  
7 THEY WERE CREATED.  
8 MR. HARLEY: BUT, YOUR HONOR --  
9 THE COURT: HE CAN'T VERY WELL SAY THEY WERE CREATED  
10 IN THE ORDINARY COURSE OF BUSINESS AND KEPT BY THE EMPLOYER  
11 FOR USE IN THE LABORATORY IF HE DOESN'T KNOW, IF HE WASN'T  
12 THERE AT THE TIME.  
13 OBJECTION WELL-TAKEN.  
14 MR. HARLEY: WELL, I DISAGREE WITH THAT. I THINK  
15 THAT THAT FOUNDATION CAN BE LAID WITH HEARSAY.  
16 THE COURT: WHAT'S THE SOURCE OF HIS KNOWING HOW  
17 THEY WERE CREATED?  
18 MR. HARLEY: HEARSAY. AND I THINK THE INFORMATION  
19 FOR FOUNDATIONAL PURPOSES -- YOU CAN USE THAT HEARSAY FOR  
20 LAYING A FOUNDATION, FOR A BUSINESS RECORD EXCEPTION.  
21 THE COURT: WHAT DO YOU SAY ABOUT THAT?  
22 MR. MCELANEY: YOUR HONOR, I THINK THAT'S A NEW  
23 EVIDENCE RULE IF THAT'S THE CASE.

24 MR. HARLEY: WELL ....

25 THE COURT: WELL, WE'RE GOING TO TAKE OUR 15 MINUTE

26 BREAK A LITTLE BIT EARLY, BECAUSE I WANT TO THINK ABOUT THIS

27 FOR A SECOND AND WE'LL SEE YOU BACK HERE AT 10:15.

28 THE COURT: COURT IS ADJOURNED. 10:15, BECAUSE I

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1 HAVE A CALL AT 10:00 O'CLOCK AND WE'LL TAKE A HALF HOUR

2 BREAK.

3 (RECESS.)

4 (PROCEEDINGS HELD IN CHAMBERS.)

5 MR. HARLEY: YOUR HONOR, I WOULD LIKE TO MAKE CLEAR

6 WHAT I AM ATTEMPTING TO DO, BECAUSE I THINK THERE'S A LOT OF

7 CONFUSION GOING ON HERE.

8 THE COURT: WELL, THERE'S BEEN AN OBJECTION TO THE

9 SUBMISSION OF THE FEBRUARY 17, 1954, REFERENCE PLATE ON THE

10 GROUNDS THAT NO PROPER FOUNDATION HAS BEEN LAID UNDER THE

11 BUSINESS RECORDS AND EVIDENCE ACT, SECTION 1271 OF THE

12 EVIDENCE CODE. AND THE OBJECTION IS ON THE GROUNDS THAT

13 THIS WITNESS CANNOT TESTIFY AS TO ITS MODE OF PREPARATION

14 BECAUSE HE WASN'T THERE WHEN IT WAS PREPARED. HE HAS NO

15 PERSONAL KNOWLEDGE.

16 AND THE SECOND GROUND IS THAT HE'S NOT ANOTHER

17 "UNQUALIFIED WITNESS," BECAUSE HE WASN'T EMPLOYED AT THE

18 TIME THAT THE PLATE WAS MADE, NOR WAS HE IN A POSITION OF

19 AUTHORITY SO THAT HE CAN RESPOND WHAT THE BUSINESS PRACTICES

20 WERE.

21 THERE ARE CASES THAT SAY THAT DIRECTORS OF BLOOD

22 TESTING FACILITIES OR EVEN WITH THE LOTTERY CAN TESTIFY AS

23 TO BUSINESS RECORDS, ALTHOUGH NOT MADE BY THEM, SO LONG AS

24 THEY WERE MADE WHEN EMPLOYEES UNDER THE DIRECTOR OTHER

25 SUPERVISORY OFFICER WAS PRESENT OR WAS ON-THE-JOB SO HE CAN

26 TESTIFY AS TO THE MODES OF PREPARATION.

27 (A) HALLGREN WAS A SUBORDINATE TO FULLAM; (B) NOT ON

28 THE PROPERTY WHEN THE PLATE WAS MADE. SO, TECHNICALLY, I

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1 THINK THE OBJECTION IS WELL-TAKEN.

2 MR. HARLEY: OKAY. WELL, I WANT TO DEFER THAT,

3 BECAUSE I THINK WE'RE TRYING TO DO SOMETHING THAT ISN'T

4 NECESSARY. WHAT I ASKED HIM WAS DID HE USE A REFERENCE

5 CONTROL WHEN THEY WERE DOING THEIR TESTING OF THE FOUR

6 SAMPLES SENT TO HIM IN 1954.

7 THE COURT: HE COULD HAVE DONE THAT THROUGH THE

8 ENCYCLOPEDIA BRITANNIA OR ANYPLACE ELSE.

9 MR. HARLEY: RIGHT. HE SAID THIS IS MY REFERENCE OF

10 PLATE OF CONTROL. HE'S IDENTIFYING THAT THIS IS WHAT THEY

11 USE AS A REFERENCE. THEY USE THE PICTURE; THEY DON'T USE

12 THE SAMPLE THEY USE THE RETAINED PLATE. I MEAN, THAT'S

13 THEIR RECORD FOR SAMPLE PURPOSES.

14 THE COURT: BUT HE'S BASING HIS TESTIMONY THAT THIS

15 IS ASBESTOS BECAUSE USING THE REFERENCE, I CAN TELL IT'S

16 ASBESTOS. AND REFERENCE MATERIAL IS HEARSAY, BUT IT'S THE

17 TYPE OF HEARSAY WHICH EXPERTS IN THE FIELD NORMALLY USE IN

18 ARRIVING AT THEIR OPINIONS.

19 MR. HARLEY: LET'S GO ON.

20 I THINK HE CAN TELL IT'S ASBESTOS FOR A VARIETY OF

21 REASONS, NOT JUST THE REFERENCE; BUT HE'S JUST SHOWING THIS

22 AS A THE REFERENCE.

23 SECONDLY, THOSE PLATES AND THE PICTURES DERIVED FROM

24 THEM ARE CLEARLY ANCIENT DOCUMENTS. I MEAN, THEY WERE

25 CREATED IN 1954, AND THE IDENTIFYING MATERIAL ON THEM WAS

26 CREATED IN 1954, AND PEOPLE HAVE RELIED ON THEM AS ANCIENT

27 DOCUMENTS SINCE THAT TIME.

28 I MEAN, HE RELIED ON THEM FOR BEING WHAT THEY ARE.

1 THE COURT: WELL, THIS ANCIENT DOCUMENT IS NOT  
2 SOMETHING THAT COMES UP EVERY MUNDANE TRIAL.

3 MR. MCELANEY: TO SAY NOTHING OF ANCIENT  
4 PHOTOGRAPHS.

5 THE COURT: WELL, PHOTOGRAPHS ARE AREN'T DOCUMENTS.  
6 SO LET ME TAKE A LOOK AT ANCIENT DOCUMENTS.

7 WHAT'S THE SECTION?

8 MR. HARLEY: I THINK AFTER I GET MY --

9 THE COURT: "1331: EVIDENCE OF A STATEMENT IS NOT  
10 MADE INADMISSIBLE BY THE HEARSAY RULE IF THE STATEMENT IS  
11 CONTAINED IN A WRITING MORE THAN 30 YEARS OLD, AND A  
12 STATEMENT HAS BEEN SINCE GENERALLY ACTED UPON AS TRUE BY  
13 PERSONS HAVING AN INTEREST IN THE MATTER."

14 MR. HARLEY: AND WHAT I AM SAYING IS THAT THE  
15 WRITING IDENTIFYING WHAT THIS IS, IS MORE THAN 30 YEARS OLD,  
16 AND HE IS A PERSON WITH AN INTEREST, AND IT'S WHETHER IT'S  
17 CORRECT OR NOT AND RELIED ON IT BOTH AT THE TIME AND SINCE  
18 THEN AS BEING TRUE.

19 THE COURT: AND SECTION 250 DEFINES WRITING AS  
20 "HANDWRITING, TYPEWRITING, PHOTOPRINT, PHOTOGRAPHING, AND  
21 ANY OTHER MEANS OF RECORDING UPON ANY TANGIBLE THING, ANY  
22 FORM OF COMMUNICATION OR REPRESENTATION, INCLUDING LETTERS,  
23 WORDS, PICTURES..." ET CETERA.

24 SO WHY ISN'T THIS AN ANCIENT WRITING?

25 MR. MCELANEY: YOUR HONOR, THE SECOND CONDITION,  
26 THAT IT HAS BEEN GENERALLY ACTED UPON AS TRUE BY PERSONS  
27 HAVING INTEREST IN THE MATTER, THAT CANNOT BE FULFILLED.  
28 THIS WITNESS TESTIFIED, FIRST, THERE'S NO TESTIMONY THAT HE

1 USED IT AFTER 1954.

2 THE COURT: SUPPOSE THEY USED IT IN 1954. ALL HE  
3 HAS TO TESTIFY TO IS WE USE THIS AS A REFERENCE WHEN  
4 CHECKING WHAT WE GOT IN THE SMOKING TEST TO SEE IF IT LOOKED  
5 LIKE ASBESTOS.

6 HE'LL SAY THAT IN A NEW YORK MINUTE, WON'T HE?

7 MR. OHLEMAYER: BUT THAT'S DIFFERENT THAN SAYING HOW  
8 THAT WAS PREPARED. I MEAN, IF HE'S NOT GOING TO SAY THAT,  
9 THAT'S A DIFFERENT ISSUE.

10 MR. HARLEY: NO, HE'S NOT GOING TO SAY HOW IT WAS  
11 PREPARED.

12 THE COURT: HE CAN'T SAY HOW IT WAS PREPARED; HE  
13 WASN'T THERE.

14 MR. HARLEY: BUT IT'S LABELED AS SILICATES FROM AN  
15 UNSMOKED FILTER.

16 MR. MCELANEY: SEE, THAT'S THE PROBLEM. HE DOESN'T  
17 KNOW WHAT IT IS. IT SAYS KENT SILICATE ON IT. AND YOU HAVE  
18 A MAN WHOSE TESTIMONY IS EVERYTHING THAT THEY TESTED WAS  
19 EXPERIMENTAL WITH THE POSSIBLE EXCEPTION OF THIS REGULAR  
20 KENT THING. AND THE PHRASE "KENT SILICATE" HAS NO MEANING,  
21 UNLESS HE CAN TELL US WHAT IT MEANS, AND HE CAN'T TELL US  
22 WHAT IT MEANS WITHOUT HEARSAY.

23 THE COURT: HE'S ALREADY TESTIFIED THAT HE AND  
24 FULLAM USED "SILICATE" AND "ASBESTOS" INTERCHANGEABLY.

25 MR. MCELANEY: WHEN HE STARTED, CERTAINLY, IN JUNE  
26 OR MAY OF 1954, HE CAN SAY WHAT WAS USED THEN. BUT HE  
27 SHOULDN'T BE ABLE TO SAY WHOEVER WROTE THAT CRYPTIC  
28 EXPRESSION, "KENT SILICATE," IN FEBRUARY OF '54, MEANT.

1 MR. HARLEY: WELL, I THINK THAT'S FOR THE JURY TO  
2 DETERMINE.

3 THE COURT: AS LONG AS HE TESTIFIES THAT HE USED  
4 THIS AS A REFERENCE TOOL BACK THEN IN 1954, TO DETERMINE



5 WHAT THE INDIVIDUAL PHOTOGRAPHS SUCH AS 33 AND 32 WERE IN  
6 COMPARING ONE TO THE OTHER, THEN I THINK IT QUALIFIES UNDER  
7 1331, BECAUSE IT'S A WRITING MORE THAN 30 YEARS OLD USED BY  
8 A PERSON THEREOF, AND IT HAS THE TRUSTWORTHINESS WHICH  
9 ANCIENT DOCUMENTS HAVE FOR PURPOSES OF A HEARSAY OBJECTION.

10 ALL YOU HAVE TO DO IS ASK HIM, DID HE USE IT BACK  
11 THEN AND CHECKING, YOU KNOW, WHAT HE HAD IN THE 32 THROUGH  
12 33.

13 MR. MCELANEY: THE PROBLEM WITH THAT, OF COURSE, IS  
14 THAT HE COULDN'T POSSIBLY ANSWER THAT QUESTION WITHOUT  
15 RELYING UPON THE HEARSAY, THE VERY HEARSAY ISSUE THAT'S AT  
16 EVIDENCE.

17 THE COURT: BUT THERE'S NO HEARSAY.

18 PARDON ME. LET ME BE PRECISE.

19 IT IS HEARSAY, NO QUESTION. IT IS HEARSAY AND IT'S  
20 ADMISSIBLE HEARSAY UNDER 1331.

21 MR. MCELANEY: IF IT WAS GENERALLY. SEE, THE  
22 PROBLEM, THE SECOND CONDITION GENERALLY IMPACTED UPON IS  
23 TRUE. HE CAN'T LOOK AT THAT GLASS PLATE AND SAY THAT WAS  
24 THE REFERENCE PLATE BECAUSE THERE ARE NO MARKINGS ON THE  
25 PLATE. WHAT HE HAS TO DO IS LOOK AT THE ENVELOPE THAT THE  
26 PLATE IS IN AND SAY IF I ACCEPT AS TRUE THIS, THEN THIS IS  
27 IN FACT THE PLATE I USED.

28 MR. HARLEY: WHAT?

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1 THE COURT: IF HE SAYS -- WE DON'T KNOW WHAT HE IS  
2 GOING TO SAY. BUT IF HE SAYS WE PERIODICALLY CHECKED  
3 AGAINST REFERENCE PLATES TO SEE WHAT WE HAD COMING OUT OF A  
4 VACUUM BOTTLE OF THE ACETONE PROCESS, THESE ARE THE  
5 REFERENCE PLATES WE USED, END OF STORY.

6 LET'S GO.

7 (THE FOLLOWING PROCEEDINGS WERE HELD IN OPEN COURT.)

8 THE COURT: ALL RIGHT. GO AHEAD.

9 DIRECT EXAMINATION (CONTINUED)

10 BY MR. HARLEY, COUNSEL ON BEHALF OF PLAINTIFFS:

11 Q. MR. HALLGREN, GOING BACK PLAINTIFFS EXHIBIT 34,  
12 WHICH HAS BEEN MARKED FOR IDENTIFICATION.

13 WOULD YOU JUST, AGAIN, IDENTIFY IT BY DATE AND YOUR  
14 INDEX NUMBER?

15 A. THIS IS PLATE NINE AND IT'S THE FIRST EXPOSURE ON  
16 THE PLATE. AND IT INDICATES THAT IT'S SILICATES FROM KENT  
17 FILTERS, UNSMOKED FORMVAR, AND IT WAS MADE ON FEBRUARY 17 OF  
18 1954.

19 Q. NOW, DOCTOR, OR MR. HALLGREN, YOU TESTIFIED EARLIER  
20 THAT THERE WERE REFERENCE SAMPLES AVAILABLE TO HELP YOU  
21 IDENTIFY PARTICULATES IN THE KENT SMOKE?

22 A. YES.

23 Q. AND WAS THIS GROUP OF PHOTOGRAPHS THAT YOU HAVE  
24 MARKED AS BEING ON PLATE NINE, SOME OF THOSE REFERENCED?

25 A. YES. THOSE PLATES WERE AVAILABLE FOR REFERENCE  
26 DURING THE TIME I WAS WORKING.

27 Q. AND WERE YOU USING THEM?

28 A. YES.

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1 Q. AND THIS IS WHAT YOU RELIED, THIS IS ONE OF THE  
2 PHOTOGRAPHS YOU RELIED ON AS A REFERENCE SAMPLE?

3 A. THAT'S RIGHT.

4 MR. HARLEY: I'D MOVE THE ADMISSION OF EXHIBIT 34.

5 THE COURT: 34 IS ADMITTED.

6 (PLAINTIFF'S EXHIBIT 34 WAS MARKED FOR  
7 IDENTIFICATION.)

8 BY MR. HARLEY: Q. NOW, WE HAVE MARKED AND  
9 ADMITTED THREE PHOTOGRAPHS SO FAR; IS THAT CORRECT?

10 A. YES.  
11 MR. HARLEY: I'D LIKE TO ASK THAT THIS JUST BE  
12 MARKED FOR IDENTIFICATION PURPOSES, BECAUSE WE HADN'T GIVEN  
13 IT A NUMBER. SO IT WOULD BE ....  
14 (PLAINTIFF'S EXHIBIT 55 WAS MARKED FOR  
15 IDENTIFICATION.)  
16 BY MR. HARLEY: Q. PLAINTIFF'S EXHIBIT 55.  
17 THERE ARE A NUMBER OF PLATES THERE UNDER THE KENT  
18 CATEGORY; IS THAT CORRECT?  
19 A. YES, THAT'S CORRECT.  
20 Q. SPREADING FROM FEBRUARY -- COVERING FROM WHAT PERIOD  
21 OF TIME?  
22 A. FROM APPROXIMATELY EARLY FEBRUARY OR LATE JANUARY UP  
23 THROUGH NOVEMBER OF '54.  
24 Q. OKAY.  
25 AND THERE HAVE BEEN COPIES AND PRINTS MADE OF ALL OF  
26 THOSE?  
27 A. THAT'S CORRECT.  
28 Q. NOW, WHAT WERE YOU TAKING PICTURES OF?  
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1 A. WE WERE TAKING PICTURES OF THE ASBESTOS PARTICLES.  
2 Q. OKAY. AND OF THE VARIOUS TESTS YOU RAN?  
3 A. THAT'S CORRECT.  
4 Q. AND IN THERE -- I JUST HAD MARKED PLAINTIFF'S  
5 EXHIBIT 55 FOR IDENTIFICATION.  
6 THESE ARE JUST XEROX COPIES OF THOSE PRINTS; IS THAT  
7 CORRECT?  
8 A. THAT IS CORRECT.  
9 Q. THERE'S APPROXIMATELY, ALTOGETHER, 200 PHOTOGRAPHS?  
10 A. YES.  
11 Q. MR. HALLGREN, WERE YOU IN THE COURTROOM WHEN I READ  
12 PLAINTIFF'S EXHIBIT 30, THE LETTER FROM DR. PARMELE TO  
13 DR. KNUDSON OF DECEMBER 1, '54, WITH AN ATTACHMENT ABOUT --  
14 A. YES, I WAS.  
15 Q. ARE YOU FAMILIAR WITH THE EXPERIMENTS WHICH RESULTED  
16 IN THOSE COUNTS?  
17 A. YES.  
18 Q. DID YOU PARTICIPATE IN THOSE?  
19 A. YES, I DID.  
20 Q. WOULD YOU DESCRIBE BASICALLY THE TECHNIQUES USED IN  
21 THAT EXPERIMENT?  
22 A. IN AN ATTEMPT TO RANK THE VARIOUS SAMPLES THAT WE  
23 WERE EXAMINING, WE CAME UP WITH A PROCEDURE WHEREBY WE TOOK  
24 A COUNT OF THE NUMBER OF OPENINGS ON OUR LITTLE EIGHTH INCH  
25 DIAMETER SCREENS THAT WE WOULD HAVE TO LOOK AT BEFORE WE  
26 CAME TO A PARTICLE.  
27 SO THAT YOU MIGHT BE SCANNING ALONG IN A SAMPLE AND  
28 GO THROUGH FOUR OPENINGS BEFORE YOU FOUND A PARTICLE. AND  
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1 WHAT YOU WOULD END UP DOING IS GOING THROUGH THE SAMPLE,  
2 ACCUMULATING INFORMATION. AND IF YOU LOOKED AT 300 SCREEN  
3 OPENINGS AND FOUND FIVE PARTICLES, THEN YOU HAD ONE IN 60.  
4 AND THAT'S THE BASIS FOR THOSE NUMBERS.  
5 Q. OKAY.  
6 AND DID YOU HAVE STANDARD COUNTING TECHNIQUES FOR  
7 PARTICLES UNDER THE ELECTRON MICROSCOPE IN YOUR LAB IN THE  
8 FULLAM LABORATORY AT THAT TIME IN '54?  
9 A. PART OF THE STANDARD TECHNIQUE SHOULD BE UNDERSTOOD  
10 AS AN INTERPRETATION OF WHAT WE WERE LOOKING FOR.  
11 Q. OKAY.  
12 A. WE WERE ASSUMING THAT WE'D ESSENTIALLY A UNIFORM  
13 DISPERSION OF INDIVIDUAL PARTICLES. SO WE WERE LOOKING TO  
14 COUNT THE INDIVIDUAL PARTICLES AS WE WENT ALONG.

15 Q. OKAY.  
16 NOW, WHEN YOU DID THAT, WOULD YOU IGNORE ANYTHING AS  
17 YOU WERE COUNTING?

18 A. YES. WE RECORDED IN THE GROUP OF PICTURES SOME  
19 LARGE CLUSTERS OF ASBESTOS FIBERS. AND INASMUCH AS WE WERE  
20 EXPECTING THESE TO HAVE BEEN A UNIFORM INDIVIDUAL PARTICLES  
21 DISPERSED ON OUR SAMPLE, WE WOULD HAVE IGNORED THE CLUSTERS  
22 AS BEING AN ANOMALY, SOMETHING THAT HAD NOT BEEN  
23 RESUSPENDED, SO YOU WERE GETTING A DISTORTED EFFECT.

24 THAT WAS OUR INTERPRETATION AT THIS TIME.

25 MR. HARLEY: OKAY. I'M GOING TO ASK THESE BE MARKED  
26 PLAINTIFF'S EXHIBITS 53 AND 54.

27 (PLAINTIFF'S EXHIBITS 53 & 54 WERE MARKED FOR  
28 IDENTIFICATION.)

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1 MR. MCELANEY: YOUR HONOR, I DIDN'T HEAR THE LAST  
2 SENTENCE. COULD I HAVE IT READ BACK?

3 THE COURT: WOULD YOU READ THE ANSWER TO COUNSEL,  
4 PLEASE?

5 (PAUSE IN PROCEEDINGS.)

6 BY MR. HARLEY: Q. MR. HALLGREN, I'M GOING TO  
7 SHOW YOU WHAT'S BEEN MARKED PLAINTIFF'S EXHIBITS 53 AND 54.  
8 I'LL SHOW YOU PLAINTIFF'S EXHIBIT 53.

9 WITHOUT SAYING WHAT'S IN THE PHOTOGRAPH, CAN YOU  
10 IDENTIFY IT?

11 A. IT'S A CLUSTER OF PARTICLES.

12 Q. FROM WHAT DAY?

13 A. IT'S FROM THE NOVEMBER 9, 1954, GROUP, KENT  
14 SILICATES, NUMBER THREE.

15 Q. OKAY.

16 A. OF SAMPLE NUMBER THREE IN THAT SERIES.

17 Q. IN THAT FALL SERIES?

18 A. THAT'S RIGHT.

19 Q. AND WHAT'S PLAINTIFF'S EXHIBIT 54?

20 A. THIS IS A SIMILAR CLUSTER OF PARTICLES.

21 Q. AND WHAT'S THE DATE AND THE PLATE NUMBER?

22 A. IT'S NOVEMBER 3, 1954, AND IT'S PLATE NUMBER THREE,  
23 AND IT WAS SAMPLE NUMBER FIVE.

24 Q. SO THIS IS KENT SILICATE NUMBER FIVE?

25 A. THAT'S RIGHT. KENT SILICATES NUMBER FIVE, AND THE  
26 OTHER WAS KENT SILICATES NUMBER 13.

27 Q. AND DO THESE TWO PICTURES, EXHIBITS 53 AND 54,  
28 ACCURATELY DEPICT WHAT WAS ON THE PLATES THAT CORRESPONDED

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1 TO THEM.

2 A. YES, THEY DO.

3 Q. AND THE PLATES WERE CREATED ON THE DATES INDICATED  
4 ON THESE PHOTOGRAPHS?

5 A. THAT'S CORRECT.

6 Q. ALL RIGHT.

7 MR. HARLEY: MOVE THE ADMISSION OF PLAINTIFF'S  
8 EXHIBITS 53 AND 54.

9 MR. OHLEMAYER: OBJECTION, YOUR HONOR. RELEVANCE  
10 AND FOUNDATION.

11 THE COURT: OBJECTION OVERRULED. IN EVIDENCE

12 (PLAINTIFF'S EXHIBITS 53 & 54 WERE ADMITTED INTO  
13 EVIDENCE.)

14 BY MR. HARLEY: Q. NOW, ON PLAINTIFF'S  
15 EXHIBIT 53, WHICH IS KENT SAMPLE, NUMBER 13, IS THIS WHAT  
16 YOU MEAN BY A CLUSTER?

17 A. YES, IT IS.

18 Q. NOW, WHEN YOU SAW SOMETHING LIKE THIS UNDER THE  
19 MICROSCOPE, WOULD YOU HAVE COUNTED IT IF YOU HAD REACHED IT

20 IN COUNTING YOUR MESHES? WHAT WOULD YOU HAVE DONE WHEN YOU  
21 REACHED THIS?

22 A. WE WOULD HAVE IGNORED IT, BECAUSE IT APPEARED TO BE  
23 AN ANOMALY IN THE TECHNIQUE. AS I SAY, OUR ASSUMPTION WAS  
24 THAT WE HAD RESUSPENDED ALL THE PARTICLES AND THEN SPREAD  
25 THEM OUT IN A UNIFORM WAY.

26 IF YOU WERE TO COUNT THAT AS A SINGLE PARTICLE IT'S  
27 ACTUALLY NOT ACCURATE AND YOU DON'T KNOW HOW THAT WOULD HAVE  
28 AFFECT IT IF IT HAD BEEN SPREAD OUT. IT WAS A DIFFICULTY IN

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1 THE TECHNIQUE.

2 Q. WERE YOU ABLE, AT THE TIME, TO ACCOUNT FOR WHAT  
3 CAUSED CLUSTERS LIKE THIS IN YOUR SAMPLES?

4 A. AT THAT TIME, NO.

5 Q. YOU JUST ACCEPTED THEM AS AN ANOMALY?

6 A. THAT'S CORRECT.

7 Q. SIMILARLY, PLAINTIFF'S EXHIBIT 54, WOULD YOU HAVE  
8 ACCOUNTED FOR SOMETHING LIKE THAT?

9 A. THE SAME APPLIES.

10 Q. EVEN THOUGH THERE'S A CLEAR IDENTIFIED PARTICLE  
11 THERE?

12 A. SURE.

13 MR. OHLEMEYER: OBJECTION.

14 BY MR. HARLEY: Q. WELL, I'LL REPHRASE IT.

15 IN THIS PICTURE, THERE IS A RATHER DISTINCTIVE SPEAR  
16 SHAPED BLACK OBJECT RUNNING IN THE MIDDLE OF THE PHOTOGRAPH.

17 DO YOU SEE THAT?

18 A. ON THE LEFT THERE, YES.

19 MR. OHLEMEYER: SAME OBJECTION.

20 THE COURT: OVERRULED.

21 BY MR. HARLEY: Q. AND WHAT IS THAT?

22 A. WHAT IS THAT? I DON'T KNOW. THE ROUNDED MATERIAL  
23 COULD BE A BIT OF -- WELL, IT'S NOT LIKELY TO BE TAR,  
24 BECAUSE IT'S WELL-DEFINED. IT'S SOME BIT OF A CONTAMINANT  
25 THAT GOT IN.

26 Q. AND WHAT'S THIS AS IT RUNS RIGHT HERE?

27 A. THAT'S AN ASBESTOS FIBER.

28 Q. EVEN THOUGH YOU KNEW IT TO BE AN ASBESTOS FIBER, YOU

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1 WOULDNT COUNT IT?

2 A. IN THE CONTEXT OF BEING INVOLVED WITH THE CLUSTER,  
3 WE WOULD NOT HAVE COUNTED IT.

4 Q. NOW, AT THE TIME YOU WERE TESTING THIS GROUP OF  
5 SAMPLES SENT IN THE FALL OF 1954, WERE THE SAMPLES  
6 IDENTIFIED FOR YOU AS TO WHAT THE DIFFERENCE WAS BETWEEN  
7 THEM?

8 A. NO. TO MY RECOLLECTION, ALL WE HAD WAS A SERIES ONE  
9 THROUGH 17, 17 OR 18, WHATEVER IT WAS, IN THAT GROUP.

10 Q. OKAY. IN PLAINTIFF'S EXHIBIT 30 ON THE CHART,  
11 THERE'S SOME DESCRIPTION.

12 FOR INSTANCE, IT SAYS UNDER SAMPLE 13, PLASTICA  
13 1E10, ROLE FOUR, RODS HEATED IN OVEN. (SIC)

14 DO YOU SEE THAT KIND OF DESCRIPTION?

15 A. YES, I DO.

16 Q. DID YOU HAVE ANY OF THAT INFORMATION?

17 A. TO MY RECOLLECTION, WE DID NOT HAVE THAT  
18 INFORMATION.

19 Q. OKAY.

20 NOW, INsofar AS YOU WERE AWARE IN 1954, DID YOU  
21 RECEIVE ANY INFORMATION CRITICIZING WHAT YOU HAD DONE AT THE  
22 TIME?

23 A. NO.

24 Q. AND WERE REPORTS CREATED ABOUT THESE EXPERIMENTS

25 DURING 1954?  
26 A. YES.  
27 Q. WHAT DID THE REPORTS CONCLUDE?  
28 A. THE REPORTS WOULD HAVE CONSISTED OF A REPRESENTATIVE  
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1 GROUP OF PHOTOMICROGRAPHS, A SUMMARY OF THE NUMERICAL DATA  
2 THAT WE HAD OBTAINED FROM THE ANALYSIS, AND THEN SOME  
3 DESCRIPTIVE COMMENTS THAT WOULD HAVE RELATED ANY ANOMALIES  
4 OR UNUSUAL OBSERVATIONS THAT WE HAD MADE IN THE SYSTEM. IT  
5 WOULD ALSO HAVE HAD A FEW LINES OF SUMMARY TO INDICATE THAT  
6 WE WERE FOLLOWING THE SAME PROCEDURE THAT WE HAD STARTED.  
7 IF THERE HAD BEEN ANY CHANGE IN THE PROCEDURE --  
8 THERE WASN'T ANY, TO MY RECOLLECTION, WE USED THE SAME  
9 PROCEDURE ALL THE WAY THROUGH -- ANY UNUSUAL FACET COULD  
10 HAVE BEEN INCLUDED IN THE REPORT.  
11 Q. AND HAVE YOU BEEN ABLE TO FIND COPIES OF THOSE  
12 REPORTS?  
13 A. NO.  
14 Q. MR. HALLGREN, THESE ASBESTOS FIBERS YOU HAVE  
15 IDENTIFIED IN THE PHOTOGRAPHS --  
16 A. UH-HUH.  
17 Q. -- IS THERE ANY POSSIBILITY THEY COULD BE  
18 CONTAMINATED?  
19 A. EXCEEDINGLY UNLIKELY.  
20 Q. WHY DO YOU SAY THAT?  
21 A. WELL, AS MUCH AS WE THINK THAT THE SCANNING -- THAT  
22 THE TRANSMISSION ELECTRON MICROSCOPE IS CAPABLE OF SEEING  
23 SUCH MINUTE QUANTITIES OF MATERIAL, IN THE REAL WORLD  
24 GETTING EXTRANEIOUS MATERIAL ONTO ONE OF OUR SPECIMEN GRIDS  
25 IS A LOT MORE DIFFICULT THAN IT APPEARS TO BE ON THE  
26 SURFACE.  
27 Q. OKAY.  
28 WAS CARE TAKEN WITH THE GRIDS, WERE THEY KEPT  
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1 COVERED?  
2 A. OH, YES.  
3 Q. THE AIR IN THE LABORATORY ITSELF, IT'S IN A  
4 BASEMENT.  
5 DID YOU HAVE LOOSE ASBESTOS IN THE BASEMENT?  
6 A. NO.  
7 MR. MCELANEY: OBJECTION, YOUR HONOR. FOUNDATION.  
8 BY MR. HARLEY: Q. WELL, LET'S PUT IT THIS WAY.  
9 THE COURT: THAT'S SUSTAINED. THE ANSWER IS  
10 STRICKEN.  
11 BY MR. HARLEY: Q. WERE YOU ABLE TO IDENTIFY ANY  
12 SOURCE OF LOOSE ASBESTOS IN THE BASEMENT THAT YOU WERE AWARE  
13 OF?  
14 MR. MCELANEY: OBJECTION. FOUNDATION.  
15 THE COURT: WHAT FOUNDATION DO YOU WISH?  
16 MR. MCELANEY: WHETHER HE EVER LOOKED, YOUR HONOR,  
17 WHETHER HE DID ANY TEST TO TRY TO DETERMINE IT.  
18 THE COURT: WELL, THE ONLY QUESTION -- YOU CAN DO  
19 THAT ON CROSS-EXAMINATION. BUT THE QUESTION IS, DOES HE  
20 RECOGNIZE ASBESTOS WHEN HE SEES IT AND ASBESTOS CARRYING  
21 MATERIALS WHEN HE SEES IT.  
22 THE OBJECTION IS SUSTAINED. YOU MAY ASK HIM AGAIN.  
23 BY MR. HARLEY: Q. ARE YOU ABLE TO RECOGNIZE  
24 INSULATION MATERIALS AND ASBESTOS-CONTAINING INSULATION  
25 MATERIALS?  
26 A. YES.  
27 Q. WERE THERE ANY SUCH IN THE BASEMENT?  
28 A. NO.  
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1 Q. WERE THERE INSULATED PIPES IN THE BASEMENT?  
2 A. OH, THERE WERE INSULATED PIPES. BUT THE POINT IS  
3 THAT WE WERE SENSITIVE TO CONTAMINATION AS PART OF OUR WORK.  
4 AND HAD OUR BLANK GRIDS THAT WE USED AS THE SUBSTRATES BEEN  
5 CONTAMINATED, WE WOULD HAVE RECOGNIZED WE HAD A PROBLEM.  
6 AND WE DIDN'T HAVE THAT PROBLEM ON OTHER SAMPLES  
7 THAT ALSO UTILIZED THESE SAME GRIDS WHICH HAD TOTALLY  
8 DIFFERENT SHAPED PARTICLES, WHERE THERE WOULD NOT BE A  
9 CONFUSION BETWEEN IF WE HAD AN ASBESTOS CONTAMINATION WHEN  
10 WE'RE LOOKING AT AN ASBESTOS SAMPLE. IT'S DIFFICULT TO TELL  
11 THE CONTAMINANT FROM THE SAMPLE.  
12 BUT IF YOU ARE LOOKING AT IRON OXIDE PARTICLES AND  
13 YOU HAD ASBESTOS PARTICLES MIXED IN WITH IT, YOU'D SEE IT  
14 AND RECOGNIZE IT VERY QUICKLY.  
15 Q. WELL, WERE YOU TESTING NON-ASBESTOS CONTAINING  
16 MATERIALS DURING THE 1954 TIME PERIOD?  
17 A. CERTAINLY.  
18 Q. THESE WEREN'T YOUR ONLY PROJECTS?  
19 A. OH, NO.  
20 Q. DURING THAT 1954 TIME PERIOD IN THE SAMPLES THAT YOU  
21 TESTED, ARE YOU AWARE OF ANY SAMPLE WHICH TURNED UP WITH  
22 ASBESTOS IN IT WHERE YOU DIDN'T EXPECT IT?  
23 A. NO.  
24 Q. AND HOW MANY SAMPLES WERE RUN DURING THAT PERIOD OF  
25 TIME?  
26 A. I DON'T KNOW. DOZENS. I CAN'T TELL YOU PRECISELY.  
27 Q. OKAY.  
28 WELL, WHEN YOU RUN A SAMPLE, YOU ONLY LOOK AT ONE  
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1 PIECE OR DO YOU MAKE MULTIPLE --  
2 A. OH. NO, ALWAYS MULTIPLES.  
3 Q. OKAY.  
4 AND AFTER 1954, THE LABORATORY STAYED IN THE SAME  
5 PLACE?  
6 A. UP UNTIL 1959 OR 1960.  
7 Q. OKAY.  
8 UP UNTIL THAT PERIOD OF TIME, DURING THAT SIX-YEAR  
9 TIME PERIOD, ARE YOU AWARE OF ANY TIME OF ANY SAMPLE TESTED  
10 WHERE ASBESTOS WAS IDENTIFIED WHERE IT WASN'T EXPECTED?  
11 A. NO.  
12 Q. WAS THERE EVER A PROBLEM IN THAT LABORATORY WITH  
13 ASBESTOS CONTAMINATION WHILE IT WAS LOCATED IN THE BASEMENT  
14 OF MR. FULLAM'S HOUSE?  
15 A. NO.  
16 Q. YOU ALSO INDICATED THAT THERE WAS THIS DIFFRACTION  
17 ANALYSIS UNDERTAKEN; IS THAT CORRECT?  
18 A. THAT'S CORRECT.  
19 Q. NOW, YOU SAID WITH THIS OLDER MACHINE IT WAS A  
20 DIFFICULT PROCESS TO UNDERTAKE, AS I RECALL.  
21 AM I CORRECTLY PARAPHRASING?  
22 A. YES.  
23 Q. DOES THAT MEAN THE PHOTOGRAPHS WERE UNRELIABLE?  
24 A. IT MEANT THAT THE INFORMATION THAT COULD BE DERIVED  
25 FROM THE PHOTOGRAPHS WAS LIMITED.  
26 Q. BUT ARE THE PICTURES, IN ANY WAY, DISTORTED OR  
27 ANYTHING BECAUSE OF THE LIMITATIONS OF THE MACHINE?  
28 A. THEY ARE NOT DISTORTED, NO.  
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1 Q. OKAY.  
2 YOU STILL SEE IN THE PHOTOGRAPH WHAT YOU ARE  
3 SUPPOSED TO SEE?  
4 A. YES. OH, YES.  
5 Q. THE DIFFRACTION IS WHERE THE LIMITATION IS?

6 A. DIFFRACTION REQUIRES A QUANTITATIVE ANALYSIS. YOU  
7 HAVE TO MAKE NUMERICAL MEASUREMENTS IN ORDER TO INTERPRET  
8 THE PATTERN --  
9 Q. OKAY.  
10 A. -- AND THAT REQUIRES A BUILT IN CAMERA CONSTANT FOR  
11 THE ANALYSIS. YOU MUST KNOW THE CAMERA CONSTANT BEFORE YOU  
12 CAN DETERMINE THE DIFFRACTION PATTERN. THAT REQUIREMENT  
13 ISN'T THERE FOR THE LOOKING AT AN IMAGE OF PARTICLES.  
14 Q. ARE THERE DIFFRACTION RECORDS LEFT FOR THESE KENT  
15 SAMPLES?  
16 A. YES.  
17 Q. OKAY. YOU HAVE LOOKED AT THEM?  
18 A. YES.  
19 Q. ARE THEY USEFUL IN IDENTIFYING WHAT IS IN THE  
20 SAMPLE?  
21 A. THE ONLY USE THAT WE MADE OF THE ELECTRON  
22 DIFFRACTION PATTERNS WAS TO USE IT AS AN EXTRA MEASURE OF  
23 CONTROLLED OR CAUTION, IF YOU WILL, TO BE SURE THAT WE WERE  
24 LOOKING AT CRYSTALLINE MATERIALS AS OPPOSED TO ANY  
25 FIBERGLASS.  
26 THERE WAS FIBERGLASS INSULATION IN THE BUILDING, BUT  
27 WE HAD NOT ENCOUNTERED IT. BUT IT WAS AN EXTRA CAUTION,  
28 BECAUSE THE FIBERGLASS WOULD NOT GIVE A DIFFRACTION PATTERN,  
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1 WHEREAS THE ASBESTOS WOULD GIVE A DIFFRACTION PATTERN.  
2 SO FROM TIME TO TIME, WE DID CHECK THEM TO CONFIRM  
3 THAT WE WERE LOOKING AT CRYSTALLINE MATERIALS.  
4 Q. AND IN THE KENT SAMPLES, DID YOU EVER FIND ANY  
5 EVIDENCE OF FIBERGLASS PRESENT?  
6 A. NO.  
7 Q. ARE THE DIFFRACTION PATTERNS, WERE THEY SUFFICIENT  
8 FOR YOU TO BE ABLE TO IDENTIFY THE TYPE OF ASBESTOS THAT  
9 WERE IN THE SAMPLES?  
10 A. NO, WE DID NOT ATTEMPT TO.  
11 MR. MCELANEY: I'M SORRY. NO?  
12 MR. HARLEY: DID NOT ATTEMPT TO.  
13 BY MR. HARLEY: Q. WERE THEY OF SUFFICIENT  
14 QUALITY THAT THEY COULD HAVE BEEN USED FOR THAT PURPOSE AS  
15 CREATED?  
16 A. WE DID NOT GO TO THE TROUBLE OF ESTABLISHING THE  
17 CAMERA CONSTANT, THE CALIBRATION CONSTANT, SO I DON'T  
18 BELIEVE THAT.  
19 UNLESS SOMEBODY WENT THROUGH AN AWFUL LOT OF  
20 MANIPULATION AND ATTEMPTED TO EXTRAPOLATE AND FIND  
21 RELATIONSHIPS BETWEEN THE LINES, THEY ARE NOT EASILY  
22 IDENTIFIED.  
23 Q. WAS THERE ANY ATTEMPT IN ANY OF THE EXPERIMENTS TO  
24 QUANTIFY THE AMOUNT OF ASBESTOS RELEASED ON A FIBER PER CC  
25 BASIS?  
26 A. NO.  
27 Q. OKAY.  
28 DO YOU KNOW IN LOOKING AT HINDSIGHT WITHOUT THE  
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1 REPORTS, WHAT VOLUME OF AIR WAS ACTUALLY PUT THROUGH THIS  
2 PROCEDURE?  
3 A. NO.  
4 Q. THIS TECHNIQUE?  
5 A. NO.  
6 Q. NO.  
7 WERE YOU ABLE TO DETERMINE AT THE TIME THE SOURCE OF  
8 THE ASBESTOS THAT WAS SEEN ON THE ELECTRON MICROGRAPHS,  
9 WHERE DID THAT COME FROM?  
10 A. IT HAD TO COME FROM THE FILTER.

11 MR. MCELANEY: OBJECTION, AND MOTION TO STRIKE, YOUR  
12 HONOR.

13 THE COURT: ON WHAT GROUNDS?

14 MR. MCELANEY: FOUNDATION.

15 THE COURT: PERSONAL KNOWLEDGE?

16 MR. MCELANEY: PERSONAL KNOWLEDGE AND NO EVIDENCE  
17 THAT HE EVEN ATTEMPTED TO DO THAT.

18 THE COURT: THAT'S FOR CROSS-EXAMINATION.  
19 OBJECTION OVERRULED.

20 MR. HARLEY: NO FURTHER QUESTIONS.

21 THE COURT: ALL RIGHT.

22 CROSS-EXAMINATION

23 BY MR. OHLEMEYER, COUNSEL ON BEHALF OF DEFENDANT LORILLARD:

24 Q. GOOD MORNING, MR. HALLGREN.

25 A. GOOD MORNING, MR. OHLEMEYER.

26 Q. WE HAVE MET BEFORE?

27 A. YES, WE HAVE.

28 Q. IN FACT, MR. AND MRS. FULLAM INTRODUCED ME TO YOU A  
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FEW YEARS AGO?

1 A. THAT'S CORRECT.

2 Q. AND SET UP A MEETING SO THAT WE COULD GET TOGETHER  
3 AND TALK ABOUT THE WORK THAT MR. FULLAM DID FOR LORILLARD?

4 A. WE BOTH DID, YES.

5 Q. AND I HAVE ACTUALLY VISITED YOU IN YOUR HOME; IS  
6 THAT RIGHT?

7 A. THAT'S CORRECT.

8 Q. AND THE REASON I CAME WAS BECAUSE YOU TOOK THOSE  
9 PLATES AND MADE PHOTOGRAPHS FOR ME?

10 A. THAT'S RIGHT.

11 Q. I REMEMBER SOMETHING ABOUT YOUR DOG, BUT I JUST  
12 CAN'T REMEMBER WHAT IT WAS THAT WAS SO INTERESTING.

13 A. THE BIG AFGHAN.

14 Q. YES.

15 AND IN FACT YOU ALSO MADE SOME PRINTS FOR ME OF SOME  
16 DIFFRACTION PATTERNS?

17 A. ALL OF THE DIFFRACTION PATTERNS.

18 Q. BECAUSE AT THE TIME, YOU ACTUALLY DID TAKE SOME  
19 DIFFRACTION PATTERNS?

20 A. OH, YES.

21 Q. AND CURRENTLY YOU ARE RETIRED, BUT WORKING AS A  
22 WOODWORKER?

23 A. YEAH.

24 Q. AND YOU ARE NOT HERE TODAY PURSUANT TO SUBPOENA OR  
25 ANYTHING LIKE THAT?

26 A. THAT'S CORRECT.

27 Q. MR. HARLEY HAS FLOWN YOU AND YOUR WIFE OUT?  
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1 A. THAT'S CORRECT.

2 Q. AND THE FULLAM BUSINESS WAS A CONSULTING BUSINESS?

3 A. THAT'S RIGHT.

4 Q. AND STILL IS TODAY?

5 A. NO.

6 Q. OH. THEY HAVE --

7 A. NO. THE CONSULTING ASPECT OF THE COMPANY HAS BEEN  
8 DISCONTINUED AS OF TWO OR THREE YEARS AGO.

9 Q. AND NOW THEY SELL HARDWARE?

10 A. YES, THAT'S CORRECT.

11 Q. SCIENTIFIC HARDWARE?

12 A. THAT'S CORRECT.

13 Q. BACK IN THE FIFTIES, THERE WERE A NUMBER OF  
14 CONSULTING BUSINESSES AVAILABLE FOR BUSINESSES TO DO  
15 DIFFERENT TYPES OF THINGS IN TERMS OF OBSERVATION OR



16 IDENTIFICATION OF THEIR PRODUCTS.  
17 MICROSCOPY WAS ONE EXAMPLE OF THE CONSULTING  
18 BUSINESS IN THE FIFTIES?  
19 A. YES.  
20 Q. THERE WERE PHOTOSPECTROSCOPIC CONSULTANTS?  
21 A. YES. ALL RIGHT. THERE ARE VARIOUS ANALYTICAL  
22 CONSULTING FIRMS.  
23 Q. YEAH.  
24 AND IN THE FIFTIES, JUST AFTER THE WAR, A LOT OF  
25 BUSINESSES WERE INTERESTED IN USING THESE NEW SCIENTIFIC  
26 TECHNIQUES TO ANALYZE THEIR PRODUCTS?  
27 A. YES.  
28 Q. AND DURING THAT TIME THERE WAS NOTHING UNUSUAL ABOUT  
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1 A COMPANY COMING TO A CONSULTANT AND SAYING WE'D LIKE YOU TO  
2 DO SOME WORK FOR US, BUT WE'D LIKE YOU TO KEEP IT  
3 CONFIDENTIAL?  
4 A. YES. TRUE.  
5 Q. AND THAT'S BECAUSE PEOPLE IN COMPETITIVE BUSINESSES  
6 DON'T WANT THEIR COMPETITORS TO KNOW WHAT THEY ARE DOING?  
7 A. CORRECT.  
8 MR. HARLEY: OBJECTION. CALLS FOR SPECULATION.  
9 THE COURT: OBJECTION OVERRULED.  
10 BY MR. OHLEMEYER: Q. IN THE FIFTIES, THERE WERE  
11 A COUPLE OF FIRMS LIKE FULLAM, ONLY A COUPLE OF FIRMS LIKE  
12 FULLAM DOING CONSULTING WORK WITH ELECTRON MICROSCOPY?  
13 A. THAT'S CORRECT.  
14 Q. ONE OF THEM WAS MR. FULLAM?  
15 A. RIGHT.  
16 Q. ONE OF THEM WAS A WOMAN NAMED ALTHEA REVERE?  
17 A. THAT'S CORRECT.  
18 Q. AND THEIR REALLY WAS ONLY ONE OTHER PRIVATE  
19 CONSULTANT AT THAT TIME DOING --  
20 A. BILL LADD.  
21 THE COURT: WHAT WAS THE LAST NAME?  
22 THE WITNESS: LADD, L-A-D-D.  
23 BY MR. OHLEMEYER: Q. YOU ARE AWARE OF THE FACT,  
24 MR. HALLGREN, THAT LORILLARD HIRED TWO OF THOSE THREE  
25 OUTFITS --  
26 A. YES, I AM.  
27 Q. -- AS CONSULTANTS?  
28 AND ACTUALLY, THOUGH, MR. FULLAM WAS SOMEWHAT OF A  
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1 PIONEER IN THE BUSINESS?  
2 A. THAT'S RIGHT.  
3 Q. WELL-RESPECTED?  
4 A. VERY.  
5 Q. GOOD AT WHAT HE DID?  
6 A. YES.  
7 Q. AND LORILLARD ACTUALLY WORKED WITH MR. FULLAM INTO  
8 THE LATE 1950'S, EARLY 1960'S ON SOME OTHER PROJECTS?  
9 A. THAT'S CORRECT. NOT INTO -- I THINK THE LAST ONE  
10 WAS '59.  
11 Q. ALL RIGHT.  
12 NOW, IN 1954, YOU AND MR. FULLAM WERE WORKING IN THE  
13 BASEMENT OF HIS HOME?  
14 A. CORRECT.  
15 Q. AND THE LABORATORY WASN'T BUILT UNTIL SOME TIME  
16 LATER?  
17 A. THAT'S RIGHT. THE NEW LABORATORY.  
18 Q. THE NEW LABORATORY.  
19 AND THAT'S IN SCHENECTADY?  
20 A. NEAR THE AIRPORT.

21 Q. WHERE WE MET?  
22 A. RIGHT.  
23 Q. AND BEFORE HE BUILT THAT LABORATORY, HE WAS DOING  
24 CONSULTING WORK --  
25 A. YES.  
26 Q. -- OUT OF HIS HOME?  
27 A. YES.  
28 Q. AND YOU ALSO HAD THE HARDWARE BUSINESS GOING AT THAT  
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1 TIME --  
2 A. YES.  
3 Q. -- OUT OF HIS HOME; IS THAT RIGHT?  
4 A. THAT'S CORRECT.  
5 Q. AND HE HAD A MACHINE SHOP IN HIS HOME TO MAKE  
6 EQUIPMENT FOR THOSE HARDWARE SALES?  
7 A. THAT'S CORRECT.  
8 Q. AND THEY ACTUALLY BUILT THE HARDWARE IN THE HOME?  
9 A. A LOT OF IT, YEAH.  
10 Q. NOW, THERE WAS A HEATING SYSTEM IN THE HOME?  
11 A. YES.  
12 Q. AND AS WE SIT HERE TODAY, AT THE TIME NEITHER YOU  
13 NOR MR. FULLAM DID ANY ANALYSIS OF ANY OF THE COMPONENTS OF  
14 HEATING SYSTEM TO SEE IF THERE WAS ASBESTOS CONTAINING  
15 MATERIALS?  
16 A. THAT'S CORRECT.  
17 Q. YOU DIDN'T ANALYZE THE CEILING TILES IN THE BASEMENT  
18 TO SEE IF THERE WAS ASBESTOS IN THE CEILING TILES?  
19 A. THAT'S CORRECT.  
20 Q. DO YOU KNOW WHETHER MR. FULLAM HAD A GRANITE  
21 FOUNDATION IN THAT HOUSE?  
22 A. IT WAS CEMENT BLOCK.  
23 Q. OKAY.  
24 DID YOU EVER ANALYZE THE FLOOR TILES IN THAT  
25 LABORATORY TO SEE IF THEY CONTAINED ASBESTOS PRODUCTS?  
26 A. NO.  
27 Q. AND DID YOU EVER DO ANY AIR SAMPLING IN THE BASEMENT  
28 TO SEE IF IT CONTAINED ASBESTOS?  
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1 A. INDIRECTLY.  
2 Q. BUT YOU NEVER TOOK AIR SAMPLES --  
3 A. WELL --  
4 Q. -- AIR BLANKS TO SEE IF THERE WAS ASBESTOS IN THE  
5 AIR?  
6 A. WELL, INDIRECTLY. BUT AS I MENTIONED, WE CREATED  
7 THE SUBSTRATES TO USE FOR VARIOUS EXPERIMENTS INCLUDING THE  
8 LORILLARD. AND HAD THERE BEEN AIRBORNE CONTAMINANTS, THEY  
9 WOULD HAVE DEPOSITED -- HAD THERE BEEN AIRBORNE CONTAMINANTS  
10 OF SUFFICIENT QUANTITY TO CAUSE A PROBLEM IN AN ANALYSIS, IT  
11 WOULD HAVE SHOWN UP ON THE BLANK RIDGE WHICH HE CHECKED FROM  
12 TIME TO TIME.  
13 Q. WELL, WHEN YOU DID THAT EXPERIMENT OF THE ONE YOU  
14 DREW FOR US --  
15 A. RIGHT.  
16 Q. -- YOU DIDN'T RUN A CONTEMPORANEOUS BLANK AS YOU DID  
17 THE EXPERIMENTS?  
18 A. NO.  
19 Q. AND WHAT I MEAN BY THAT -- I DON'T WANT TO INTERRUPT  
20 YOU -- BUT WHAT I MEAN BY THAT IS, YOU DIDN'T TAKE A HOSE  
21 AND JUST RUN AIR THROUGH IT AS OPPOSED TO CIGARETTE SMOKE  
22 INTO THE FLASK AND COLLECT THE STUFF?  
23 A. RIGHT.  
24 Q. AND LOOK AT IT TO SEE IF THERE WAS ANYTHING IN THE  
25 AIR?

26 A. THAT'S CORRECT.  
27 Q. AND THAT'S CALLED A "BLANK" OR A "CONTEMPORANEOUS  
28 CONTROL"?

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1 A. RIGHT.  
2 Q. AND LABORATORIES USE CONTROLS LIKE THAT TO ACCOUNT  
3 FOR THINGS THAT MIGHT BE IN THE AIR OR EXTRANEIOUS TO THE  
4 EXPERIMENT?  
5 A. IF YOU ARE CONCERNED WITH THEM.  
6 Q. NOW, OVER THE YEARS, THE FULLAM LABORATORY HAS DONE  
7 CONSULTING WORK FOR A NUMBER OF DIFFERENT COMPANIES?  
8 A. YES.  
9 Q. EVEN WHILE YOU WERE WORKING WITH MR. FULLAM IN THE  
10 BASEMENT, HE WAS DOING WORK FOR OTHER COMPANIES?  
11 A. OH, YES.  
12 Q. COMPANIES LIKE ASBESTOS CORPORATION LIMIT,  
13 JOHNS-MANVILLE, AND OTHER COMPANIES?  
14 A. YES.  
15 Q. MR. FULLAM ALSO DID WORK FOR COMPANIES LIKE GENERAL  
16 DYNAMICS AND JOHNSON & JOHNSON?  
17 MR. HARLEY: OBJECTION. VAGUE TO AS TO TIME.  
18 THE COURT: OBJECTION SUSTAINED.  
19 BY MR. OHLEMEYER: Q. DURING THE TIME YOU WERE  
20 WORKING WITH MR. FULLAM IN THE FIFTIES, HE WAS DOING WORK  
21 FOR GENERAL DYNAMICS AND JOHNSON & JOHNSON?  
22 A. YES.  
23 MR. HARLEY: OBJECTION. RELEVANCE IN TERMS OF  
24 CONTAMINATION.  
25 THE COURT: OBJECTION SUSTAINED.  
26 I THINK THE TIME FRAME OF 1954 THROUGH NOVEMBER OF  
27 1954 IS THE QUESTION.  
28 MR. OHLEMEYER: I'LL MOVE ON, YOUR HONOR.

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1 BY MR. OHLEMEYER: Q. WHEN YOU WERE WORKING WITH  
2 MR. FULLAM IN 1954, YOU HAD A FULL-TIME JOB?  
3 A. YES.  
4 Q. AND YOU WOULD COME OVER TO THE FULLAM'S HOUSE A  
5 COUPLE OF NIGHTS A WEEK TO HELP HIM WITH HIS WORK?  
6 A. THAT'S CORRECT.  
7 Q. HE WAS MORE OR LESS TRAINING YOU TO --  
8 A. YES.  
9 Q. -- TO USE SOME OF THIS EQUIPMENT?  
10 YOU WERE INTERESTED IN ELECTRON MICROSCOPY?  
11 A. YES.  
12 Q. DID MR. FULLAM HAVE A DAY JOB, AT THE TIME?  
13 A. NO.  
14 Q. AND HE HAD BEEN DOING SOME WORK FOR LORILLARD BEFORE  
15 YOU ARRIVED?  
16 A. THAT'S CORRECT.  
17 Q. AND BACK IN THE FIFTIES -- LET ME BACK UP FOR A  
18 MINUTE.  
19 THE CORRESPONDENCE THAT MR. HARLEY HAS SHOWN YOU  
20 TODAY --  
21 A. YES.  
22 Q. -- THAT CORRESPONDENCE CAME FROM LORILLARD'S FILES.  
23 IS THAT YOUR UNDERSTANDING?  
24 A. THAT'S MY UNDERSTANDING.  
25 Q. IT DIDN'T COME FROM MR. FULLAM'S FILES?  
26 A. THAT'S CORRECT.  
27 Q. OKAY.  
28 AND YOU DON'T RECALL EVER HAVING SEEN THAT

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1 CORRESPONDENCE AT THE TIME YOU WERE WORKING WITH MR. FULLAM?

2 A. I CAN'T RECALL WHETHER WE HAD ANY OF THE SPECIFIC  
3 LETTERS, NO, DOWN IN THE LAB.

4 Q. YOU DIDN'T TALK WITH ANYBODY AT LORILLARD, AT THE  
5 TIME?

6 A. NO.

7 Q. ARE YOU FAMILIAR WITH THE TERM "BLIND CONTROL"?

8 A. YES.

9 Q. WHAT'S A BLIND CONTROL?

10 A. A BLIND CONTROL IS A TECHNIQUE THAT IS USED WHEN YOU  
11 WANT TO DOUBLE-CHECK YOUR ANALYST TO FIND OUT WHETHER HE IS  
12 BEING ACCURATE OR NOT.

13 AND YOU MAY GIVE HIM, FOR INSTANCE, TWO IDENTICAL  
14 SAMPLES AND CALL ONE "SAMPLE NUMBER ONE" AND THE OTHER  
15 "SAMPLE NUMBER TWO," AND ASK HIM IF HE SEES ANY DIFFERENCE  
16 BETWEEN THE TWO OF THEM. IF HE DOESN'T SEE ANY DIFFERENCE  
17 IN IT, HE HAS A LITTLE ERROR IN HIS TECHNIQUE.

18 SO THAT'S A BLIND CONTROL.

19 Q. MR. FULLAM DIDN'T PARTICULARLY LIKE BLIND CONTROLS?

20 A. NO.

21 Q. OKAY.

22 BUT YOU, AS WE SPEAK TODAY, YOU DON'T KNOW WHETHER  
23 LORILLARD EVER SENT MR. FULLAM ANY BLIND CONTROLS?

24 A. NO. WE DON'T KNOW THAT.

25 Q. AND THE WORK YOU DID FOR LORILLARD, WAS WORK ON  
26 THINGS THAT LORILLARD SENT TO MR. FULLAM?

27 A. THAT'S CORRECT.

28 Q. MR. FULLAM NOR YOU EVER WENT OUT AND BOUGHT  
ERIC L. THRONE, CSR/RPR (415) 764-0538 911  
1 CIGARETTES OFF THE SHELF AND TESTED THEM?

2 A. NO.

3 Q. A COUPLE OF OTHER QUESTIONS, MR. HALLGREN, ON  
4 DIFFRACTION PATTERNS.

5 A. UH-HUH.

6 Q. AND I KNOW THIS IS A CRUDE ANALYSIS.  
7 BUT IF YOU LOOKED AT A TENNIS BALL AND AN ORANGE  
8 UNDER A CERTAIN MICROSCOPE, THEY BOTH LOOK ROUND?

9 A. YES.

10 Q. AND THE DIFFRACTION ANALYSIS --

11 A. UH-HUH.

12 Q. -- IS WHICH HELPS YOU DETERMINE WHICH ONE IS A  
13 TENNIS BALL AND WHICH ONE IS AN ORANGE?

14 A. THAT'S RIGHT.

15 Q. AND ALTHOUGH YOU SAID IT WAS SOMEWHAT CUMBERSOME AT  
16 THE TIME, THAT TECHNOLOGY EXISTED IN YOUR LABORATORY AT THE  
17 FULLAM'S IN 1954?

18 A. YES.

19 Q. NOW, IN 1954, NEITHER YOU NOR MR. FULLAM WERE  
20 CIGARETTE SMOKERS?

21 A. THAT'S CORRECT.

22 Q. AND MR. FULLAM DEvised THAT TECHNIQUE TO SMOKE THOSE  
23 CIGARETTES BEFORE YOU STARTED HELPING HIM WITH THESE  
24 EXPERIMENTS?

25 A. THAT'S CORRECT.

26 Q. AND IT'S YOUR UNDERSTANDING THAT SOME OF THE  
27 CIGARETTES THAT LORILLARD SENT TO MR. FULLAM TO BE ANALYZED  
28 WERE EXPERIMENTAL CIGARETTES?  
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1 A. OH, YES.

2 Q. AND TO PREPARE THE SAMPLE MATERIAL, YOU WOULD LOOK  
3 AT UNDER THE MICROSCOPE, YOU WOULD SMOKE THREE, FOUR, FIVE,  
4 MAYBE EVEN SIX CIGARETTES?

5 A. SOME SMALL NUMBER.

6 Q. BUT YOU DON'T REMEMBER HOW MANY?

7 A. NO.  
8 Q. AND THERE WAS NOT A WRITTEN PROTOCOL THAT TOLD YOU  
9 HOW MANY TO USE AND HOW TO SMOKE THEM?  
10 A. OH, NO, NO. IT WASN'T A WRITTEN PROTOCOL, BUT WE  
11 HAD A NUMBER. WHAT THAT NUMBER WAS, I DON'T RECALL AT THIS  
12 TIME, AT THIS DATE.  
13 Q. AND THERE WASN'T A WRITTEN PROTOCOL TO TELL YOU HOW  
14 MUCH OF THAT SOLUTION FROM THE FLASK TO PREPARE FOR THE  
15 MICROSCOPE?  
16 A. AGAIN, THE SAME THING. WE HAD ESTABLISHED  
17 QUANTITIES THAT WOULD BE USED AT EACH STEP IN THE PROCEDURE.  
18 IT WAS JUST THE TWO OF US WORKING, AND THERE WASN'T ANY REAL  
19 NEED TO HAVE A NORMAL WRITTEN PROTOCOL. WE KNEW WE WERE  
20 GOING TO HAVE SO MANY CC'S AT THIS STEP, AND SO FORTH, AND  
21 SO ON.  
22 Q. YOU TRIED TO DO THE SAME THING --  
23 A. EXACTLY.  
24 Q. -- FROM TIME TO TIME?  
25 A. EXACTLY.  
26 Q. YOU DON'T RECALL HOW MANY CIGARETTES OR HOW MUCH  
27 MATERIAL YOU USED, YOU JUST TRIED TO USE THE SAME AMOUNT  
28 EACH TIME?  
ERIC L. THRONE, CSR/RPR (415) 764-0538 913  
1 A. THAT'S RIGHT. SO I CAN'T TELL YOU WHAT THE NUMBER  
2 WAS, BUT I KNOW THEY WERE DONE THE SAME WAY.  
3 Q. AND YOU DON'T KNOW HOW STRONG THE VACUUM WAS THAT  
4 RAN THE AIR THROUGH THERE?  
5 A. THE POINT THERE WAS THAT IT WAS TO CAUSE THE  
6 CIGARETTE TO BURN IN THE SAME MANNER THAT ONE WOULD SEE A  
7 PERSON SMOKING A CIGARETTE.  
8 Q. AND YOU DON'T KNOW HOW MANY PUFFS WERE ACTUALLY  
9 TAKEN ON EACH CIGARETTE?  
10 A. NO, I CAN'T TELL YOU THAT.  
11 Q. YOU DON'T KNOW HOW LONG IT TOOK TO SMOKE EACH  
12 CIGARETTE?  
13 A. NO, I CAN'T REMEMBER THAT.  
14 Q. OKAY.  
15 AND THEN ONCE YOU GET THE SOLUTION IN THE FLASK --  
16 A. UH-HUH.  
17 Q. -- AND YOU CALL THAT EHRLENMEYER FLASK?  
18 A. EHRLENMEYER.  
19 Q. NOTHING TO DO WITH OHLEMEYER?  
20 A. NO OHLEMEYER'S, NO.  
21 Q. YOU TOOK THAT SOLUTION AND YOU AGITATED IT SOMEHOW?  
22 A. RIGHT.  
23 Q. AND THEN YOU HAD TO REDISPERSE IT, KIND OF MIX IT UP  
24 SO YOU COULD --  
25 A. WELL, WE HAD THE EXTRACTION TECHNIQUE WITH THE  
26 CENTRIFUGE, SEVERAL STEPS IN SEPARATING THE TAR MATERIAL  
27 FROM THE SOLID MATERIAL IN THE LIQUID.  
28 Q. OKAY.  
ERIC L. THRONE, CSR/RPR (415) 764-0538 914  
1 WHAT ENDED UP IN THAT FLASK TO BEGIN WITH WAS  
2 EVERYTHING THAT WOULD HAVE BEEN IN THE CIGARETTE SMOKE?  
3 A. CIGARETTE AND ANYTHING THAT WAS EXTRACTED FROM THE  
4 FILTER.  
5 Q. YEAH.  
6 OR ANYTHING THAT WAS DRAWN THROUGH THE CIGARETTE  
7 WHEN YOU DID THE EXPERIMENT?  
8 A. PROBABLY NOTHING COMING FROM THROUGH THE CIGARETTE.  
9 OTHERWISE, THE FILTER WOULD'N'T HAVE BEEN VERY EFFECTIVE.  
10 Q. BUT YOU DIDN'T DO A BLANK TO DETERMINE WHETHER  
11 ANYTHING CAME THROUGH THE CIGARETTE, THROUGH THE FILTER AND

12 INTO THE FLASK?  
13 A. THAT'S CORRECT. BUT IT WAS AGAIN HIGHLY IMPROBABLE  
14 THAT ANYTHING OF ANY CONSEQUENCE WOULD COME THROUGH THE  
15 FILTER.  
16 Q. WHEN YOU GOT TO THE POINT YOU FINALLY LOOKED UNDER  
17 THE MICROSCOPE, YOU HAD PHYSICALLY SEPARATED EVERYTHING ELSE  
18 THAT WOULD HAVE BEEN IN THE CIGARETTE SMOKE, EXCEPT ANY  
19 INORGANIC MATERIAL?  
20 A. THAT'S RIGHT.  
21 Q. YOU NEVER LOOKED AT CIGARETTE SMOKE, PER SE?  
22 A. NOT IN THIS EXPERIMENT.  
23 Q. OKAY.  
24 AND ALL YOU DID FROM EXPERIMENT TO EXPERIMENT WAS  
25 COMPARE, AS OPPOSE TO COUNT WHAT YOU SAW?  
26 A. WELL, NO, WE DID COUNT. WE DID A COUNTING  
27 TECHNIQUE, YOU KNOW. IT SHOWS UP IN THE HOLLINGSWORTH &  
28 VOSE CORRESPONDENCE.

ERIC L. THRONE, CSR/RPR (415) 764-0538 915

1 Q. THAT'S PLAINTIFF'S EXHIBIT 30, IS WHAT YOU ARE  
2 REFERRING TO?  
3 A. "30," YES. SO AS AN EXAMPLE --  
4 Q. OF WHAT YOU DID?  
5 A. -- THE KIND OF NUMERICAL DATA THAT WE OBTAINED.  
6 MR. OHLEMEYER: MAY I APPROACH THE WITNESS, YOUR  
7 HONOR?  
8 THE COURT: YES.

9 BY MR. OHLEMEYER: Q. EXCUSE ME FOR A MINUTE,  
10 MR. HALLGREN. I'M GOING TO DRAW SOMETHING BACK HERE AND  
11 THEN ASK YOU SOME QUESTIONS.

12 I HAVE DRAWN A PICTURE ON THE EASEL HERE,  
13 MR. HALLGREN, AND WHAT I AM TRYING TO DEPICT WITH THE CIRCLE  
14 IN THE GRIDS ARE THE SCREENS THAT YOU USED TO PREPARE YOUR  
15 SAMPLES.

16 A. VERY GOOD.  
17 Q. VERY CRUDE?  
18 A. OH, IT'S EXCELLENT.  
19 Q. AND AM I CORRECT THAT WHAT YOU DID WAS ONCE YOU PUT  
20 THIS MATERIAL ON THOSE SCREENS ---  
21 A. UH-HUH.  
22 Q. -- YOU PUT IT IN THE MICROSCOPE?  
23 A. RIGHT.  
24 Q. AND THEN YOU HAD SOME PLAN AS TO WHICH DIRECTION YOU  
25 WERE GOING TO GO, BUT YOU WOULD LOOK AND COUNT HOW MANY OF  
26 THOSE OPENINGS YOU WOULD NEED TO PASS BEFORE YOU SAW  
27 SOMETHING IN ONE OF THOSE SQUARES?  
28 A. THAT'S CORRECT.

ERIC L. THRONE, CSR/RPR (415) 764-0538 916

1 Q. OKAY.  
2 AND IN FACT, IN PLAINTIFF'S EXHIBIT 30, THE 18  
3 SAMPLES ARE RANKED UNDER THE COLUMN THAT SAYS NUMBER OF  
4 SCREEN FIELDS EXAMINED TO FIND ONE PARTICLE OF ASBESTOS?  
5 A. UH-HUH.  
6 Q. AND, FOR EXAMPLE, THE ONE AT THE TOP, YOU HAD TO GO  
7 THROUGH 55 OF THEM?  
8 A. THAT'S RIGHT.  
9 Q. AND THEN YOU SAW A PARTICLE?  
10 A. THAT'S RIGHT.  
11 Q. AND THEN YOU WOULD GO ON TO THE NEXT SAMPLE?  
12 A. THAT'S NOT CLEAR. WE DON'T HAVE ANY RECORD TO SAY  
13 EXACTLY WHAT HAPPENED AFTER THAT. IT'S JUST UNLIKELY THAT  
14 WE WOULD HAVE STOPPED AT A SINGLE PARTICLE, BECAUSE THAT  
15 REALLY WOULDN'T BE STATISTICALLY MEANINGFUL.  
16 I'M SURE WE MUST HAVE EVEN IN THE MOST DILUTE

17 PARTICLE, MOST DILUTE SAMPLES MUST HAVE GONE ON; BUT WE  
18 DON'T HAVE ANY SPECIFIC EVIDENCE AND I DON'T HAVE AN  
19 ABSOLUTE RECOLLECTION.

20 Q. AND BUT YOU REMEMBER BEING ASKED ABOUT THAT IN APRIL  
21 OF 1991 IN THE DEPOSITION?

22 A. IN THE DEPOSITION, WHAT DID I SAY THEN?

23 Q. WELL, LET ME ASK YOU IF YOU REMEMBER THIS QUESTION  
24 AND THIS ANSWER.

25 MR. OHLEMEYER: YOUR HONOR, IF YOU WOULD LIKE A  
26 TRANSCRIPT --

27 MR. HARLEY: WELL, CAN I TAKE A LOOK AT IT?

28 MR. OHLEMEYER: IT'S PAGE 25, LINE 17.  
ERIC L. THRONE, CSR/RPR (415) 764-0538 917

1 THE COURT: TO WHAT?

2 MR. OHLEMEYER: "26," LINE 21.

3 MR. HARLEY: "26."

4 MR. OHLEMEYER: PAGE 25, LINE 17 THROUGH PAGE 26,  
5 LINE 21.

6 BY MR. OHLEMEYER: Q. DO YOU REMEMBER THIS  
7 QUESTION?

8 MR. HARLEY: EXCUSE ME.

9 THE COURT: MR. HARLEY, DO YOU HAVE AN OBJECTION?

10 MR. HARLEY: I OBJECT TO THIS. THERE'S NOTHING  
11 INCONSISTENT.

12 THE COURT: ALL RIGHT.  
13 OBJECTION SUSTAINED.

14 BY MR. OHLEMEYER: Q. MR. HALLGREN, HOW BIG IS  
15 THAT SCREEN THAT WE'RE TALKING THE ABOUT?

16 A. AN EIGHTH OF AN INCH IN DIAMETER.

17 Q. HOW MANY OPENINGS ARE ON IT?

18 A. APPROXIMATELY 200.

19 Q. AND YOU DON'T NO HOW MUCH OF THAT GRID IN ANY  
20 PARTICULAR SAMPLE YOU ACTUALLY LOOKED AT?

21 A. NO, I DON'T.

22 Q. OKAY.

23 AND WHEN YOU SAW SOMETHING IN ONE OF THOSE OPENINGS,  
24 YOU DIDN'T ROUTINELY DO ANY DIFFRACTION OR SELECTED AIR OF  
25 DIFFRACTION TO IDENTIFY IT AS A CRYSTALLINE OR  
26 NONCRYSTALLINE STRUCTURE?

27 A. NO, NOT ALL THE TIME. SOMETIMES WE DID.

28 Q. OKAY.  
ERIC L. THRONE, CSR/RPR (415) 764-0538 918

1 AND YOU INFER THAT WHAT YOU SAW THAT WAS CRYSTALLINE  
2 WAS ASBESTOS, BECAUSE IT WAS YOUR UNDERSTANDING THAT THERE  
3 WAS A MINERAL IN THE FILTER MATERIAL, ASBESTOS?

4 A. THAT'S CORRECT.

5 Q. OKAY.

6 YOU DIDN'T DO ANY OTHER ADDITIONAL TESTS TO IDENTIFY  
7 THE CHEMICAL NATURE OF ANY STRUCTURES YOU SAW?

8 A. NO, THERE WERE NO OTHER TESTS AVAILABLE TO US IN THE  
9 MICROSCOPE AT THAT TIME OTHER THAN DIFFRACTION.

10 Q. OKAY.

11 AND FOR DEMONSTRATIVE PURPOSES, MAY I HAVE A COUPLE  
12 OF THOSE PLATES THE ENVELOPES?

13 A. SURE. ANY PARTICULAR ONES?

14 Q. IT DOESN'T MATTER. JUST TWO IS ALL THAT I NEED.  
15 THESE GLASS PLATES ARE ESSENTIALLY PHOTOGRAPHIC  
16 NEGATIVES; IS THAT CORRECT?

17 A. THAT'S CORRECT.

18 Q. AND THEY ARE IN AN ENVELOPE THAT HAS NO SEAL ON IT?

19 A. THAT'S CORRECT.

20 Q. AND THE ONLY WAY THAT YOU CAN DETERMINE WHAT THESE  
21 PICTURES REPRESENT IS BY REFERENCE TO THE WRITING ON THE

22 ENVELOPE?  
23 A. THAT'S CORRECT.  
24 Q. AND IN SOME CASES YOU KNOW THAT THIS IS YOUR  
25 WRITING, AND IN SOME CASES YOU KNOW IT'S MR. FULLAM'S  
26 WRITING?  
27 A. THAT'S CORRECT.  
28 Q. AND IF IT'S MR. FULLAM'S WRITING, THAT MEANS HE'S  
ERIC L. THRONE, CSR/RPR (415) 764-0538 919  
1 THE ONE THAT ACTUALLY LOOKED AT THE IMAGE UNDER THE  
2 MICROSCOPE, NOT YOU?  
3 A. MOST PROBABLY.  
4 Q. AND --  
5 A. THERE MAY HAVE BEEN SOME CASES WHERE WE WERE WORKING  
6 TOGETHER AND I WROTE WHILE HE DID IT, BUT BY AND LARGE WHAT  
7 YOU SAID IS CORRECT.  
8 Q. AND THESE PLATES WERE IN A DRAWER IN A FILE  
9 CABINET --  
10 A. THAT'S CORRECT.  
11 Q. -- AT THE FULLAM LABORATORIES?  
12 A. RIGHT.  
13 Q. AND YOU LEFT THE FULLAM LABORATORIES IN ABOUT 19 --  
14 A. '64.  
15 Q. -- '64.  
16 AND THEN YOU WENT BACK A FEW YEARS AGO AND FOUND  
17 THESE IN A FILE CABINET?  
18 A. THAT'S CORRECT.  
19 Q. BUT IN A DIFFERENT LOCATION THAN WHERE THEY WERE YOU  
20 LEFT IN 1964?  
21 A. IT WAS IN A STORAGE BUILDING.  
22 Q. AND, MR. HALLGREN, IF I LEFT THE ROOM WITH THESE TWO  
23 AND PUT THIS ONE IN THIS ENVELOPE, AND THIS ONE IN THIS  
24 ENVELOPE, ASSUMING THAT THE MAGNIFICATION CORRESPONDED ON  
25 THE OUTSIDE, THERE'D BE NO WAY TO TELL WHETHER THEY HAD BEEN  
26 SWITCHED?  
27 A. VERY PROBABLY CORRECT.  
28 MR. OHLEMEYER: THOSE ARE ALL THE QUESTIONS I HAVE.  
ERIC L. THRONE, CSR/RPR (415) 764-0538 920  
1 THE COURT: ALL RIGHT.  
2 WE'LL SWITCH REPORTERS, NOW.  
3 ///  
4 ///  
5 ///  
6 ///  
7 ///  
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1 AUGUST 4, 1995

11:00 A.M.

2 MR. OHLEMEYER: ARE YOU READY, YOUR HONOR?

3 THE COURT: YES.

4 DOUGLAS HALLGREN

5 DIRECT EXAMINATION IN PROGRESS:

6 MR. OHLEMEYER:

7 Q. MR. HALLGREN, LET ME HAND YOU WHAT HAS BEEN  
8 MARKED AND ADMITTED INTO EVIDENCE AS PLAINTIFF'S 30. I  
9 PUT A POST-IT NOTE ON THE SENTENCE I WOULD LIKE TO DIRECT  
10 YOUR ATTENTION TO.

11 IN THE LETTER DR. PARMELE IS WRITING TO  
12 MR. HAROLD KNUDSON?

13 A. YES.

14 Q. A STATEMENT IS MADE IN THERE DESCRIBING THE  
15 PROTOCOL TECHNIQUE THAT MR. FULLAM USED?

16 A. UH-HUH?

17 Q. "AFTER SCREENS ARE SO PREPARED," HE, APPARENTLY  
18 REFERRING TO MR. FULLAM, "THEN SCANS THEM WITH THE  
19 ELECTRON MICROSCOPE, COUNTING THE NUMBER OF MESHES IN HIS  
20 SCREENING THAT HE HAS TO LOOK AT BEFORE FINDING A SINGLE  
21 PARTICLE OF ASBESTOS."

22 IS THAT CONSISTENT WITH YOUR RECOLLECTION OF  
23 WHAT IT WAS YOU WERE DOING WHEN YOU LOOKED AT THOSE GRIDS?

24 A. YES, ONLY THING I'D ADD, I WOULD BE SURPRISED  
25 IF ANY RECORD COULD BE FOUND THAT SHOW THAT WE QUIT WITH A  
26 SINGLE PARTICLE.

27 I AM SURE THAT WE MUST IN THE VERY, IN THE VERY  
28 MUST HAVE LOOKED AT MORE THAN ONE.

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1 MR. OHLEMEYER: WELL, NOW, YOUR HONOR, I  
2 WOULD LIKE, AGAIN, TO ASK THE WITNESS ABOUT THE  
3 DEPOSITION.

4 YOUR HONOR, PLEASE LOOK ON PAGE 27.

5 THE COURT: SAME PAGE.

6 MR. OHLEMEYER: SAME PAGE, SAME LINE, YOUR  
7 HONOR. BUT, LOOK AT --LOOK AT THE NEXT QUESTION  
8 AND ANSWER FOLLOWING THAT.

9 THE COURT: YES. I DON'T SEE ANY  
10 INCONSISTENCY, THEREFORE, IT IS, HEARSAY.  
11 OBJECTION SUSTAINED.

12 MR. OHLEMEYER: THANK YOU, YOUR HONOR.  
13 THANK YOU, MR. HALLGREN.

14

15 CROSS-EXAMINATION

16 MR. MCELANEY:

17 Q. GOOD MORNING MR. HALLGREN, HOW ARE YOU?

18 A. FINE.

19 Q. LITTLE HOTTER BACK IN NEW YORK?

20 A. A LOT HOTTER. THANK YOU FOR GETTING US OUT  
21 HERE TO SAN FRANCISCO.

22 Q. IS THAT MRS. HALLGREN IN THE BACK?

23 A. IT IS.

24 Q. YOU WERE BORN IN 1930?

25 A. THAT'S CORRECT?

26 Q. SO WHEN YOU WENT TO WORK FOR MR. FULLAM, YOU  
27 WERE 23?

28 A. THAT'S CORRECT.

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1 Q. YOU HAVE DESCRIBED YOUR PRIMARY OCCUPATION ON  
2 DIRECT TESTIMONY AS BEING AN ELECTRON MICROSCOPIST, IS

3 THAT CORRECT?  
4 A. YES.  
5 Q. YOU RETIRED FROM THAT OCCUPATION IN '78?  
6 A. WELL, I DIDN'T RETIRE FROM IT.  
7 Q. SINCE THEN YOU'VE BEEN DOING CUSTOM WOOD  
8 WORKING?  
9 A. YES.  
10 Q. ELECTRON MICROSCOPY WORK WENT AWAY?  
11 A. THAT'S CORRECT.  
12 Q. WHEN YOU WERE 23, YOU WENT TO WORK AT  
13 MR. FULLAM'S LAB, YOU WERE NOT AN ELECTRON MICROSCOPIST?  
14 A. I HAD BEEN IN X-RAY DIFFRACTION.  
15 Q. AND MR. FULLAM MADE YOU AN ELECTRON  
16 MICROSCOPIST?  
17 A. THAT IS CORRECT.  
18 Q. HE IS RESPONSIBLE FOR YOUR CAREER, CORRECT?  
19 A. THAT'S CORRECT.  
20 Q. AT THE TIME YOU WENT TO WORK FOR HIM, YOU HAD  
21 AN ASSOCIATES DECREE BECAUSE YOU HAD COMPLETED TWO YEARS  
22 OF COLLEGE?  
23 A. THAT'S CORRECT.  
24 Q. THAT WAS IN MECHANICAL TECHNOLOGY?  
25 A. THAT'S CORRECT.  
26 Q. HE ENCOURAGED YOU TO GO TO SCHOOL, GET A  
27 BACHELORS?  
28 A. THAT'S CORRECT.

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1 Q. YOU WORKED IT SO THAT YOU COULD WORK FULL TIME  
2 AT GENERAL ELECTRIC?  
3 A. AU --  
4 Q. LET ME BACK TRACK. WHEN YOU STARTED IN, I  
5 THINK YOU SAID APRIL, MAYBE MAY, MAYBE JUNE?  
6 A. RIGHT.  
7 Q. PICKED ONE OF THE PARTS, A LONG TIME AGO?  
8 A. RIGHT.  
9 Q. IT WAS A BIG EVENT GOING TO WORK FOR HIM,  
10 RIGHT?  
11 A. YES. THAT WAS PART-TIME.  
12 Q. EXACTLY, AT THAT POINT. SO, LET'S PICK A DAY,  
13 SAY MAY, MAY OF '54, YOU WERE WORKING FOR GENERAL ELECTRIC  
14 BUT WENT TO WORK PART-TIME FOR MR. FULLAM?  
15 A. THAT'S CORRECT?  
16 Q. YOU WORKED IN HIS BASEMENT LABORATORY 2 OR 3  
17 NIGHTS A WEEK?  
18 A. CORRECT.  
19 Q. YOU WORKED 07:00 TO 10:00, 07:00 TO 11:00?  
20 A. SOMETHING LIKE THAT.  
21 Q. 20 HOURS?  
22 A. LITTLE MORE.  
23 Q. SO, AT THAT TIME YOU MET HIM BECAUSE YOU WERE  
24 WORKING TOGETHER AT GENERAL ELECTRIC BEFORE HE QUIT TO SET  
25 UP HIS LAB?  
26 A. THAT'S RIGHT.  
27 Q. YOU STARTED WORKING PART-TIME, THEN I THINK YOU  
28 SAID YOU WORKED FOR ALMOST A YEAR PART-TIME BEFORE YOU

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1 STARTED WORKING FOR HIM FULL TIME?  
2 A. THAT'S CORRECT.  
3 Q. AT THAT POINT YOU, OF COURSE, HAD NO SCHOOLING  
4 IN ELECTRON MICROSCOPY?  
5 A. THAT IS CORRECT.  
6 Q. SO IT IS FAIR TO SAY THAT, WELL, OBVIOUSLY THE  
7 WORK THAT, YOU MADE SOME REFERENCE TO AS HAVING BEEN DONE

8 BY MR. FULLAM IN FEBRUARY OF '54, YOU HAD PLAYED NO PART  
9 IN THAT?  
10 A. THAT'S RIGHT.  
11 Q. ANY INFORMATION YOU HAVE NECESSARILY WOULD HAVE  
12 COME FROM MR. FULLAM ON THAT?  
13 A. THAT'S CORRECT.  
14 Q. NOW, THE WORK YOU DID IN ASSISTING HIM IN JULY  
15 OF '54, YOU WERE A VERY BRAND NEW NOVICE ELECTRON  
16 MICROSCOPIST, RIGHT?  
17 A. I ACTUALLY WORKED ON THE JUNE SERIES AS WELL.  
18 Q. OF COURSE.  
19 A. YES.  
20 Q. MY POINT BEING WHEN YOU STARTED IN JUNE --  
21 A. THAT'S WHAT I WAS DOING.  
22 Q. -- UNTIL JULY, YOU WERE STILL QUITE NEW AT THIS  
23 ELECTRON MICROSCOPIST BUSINESS?  
24 A. THAT'S RIGHT.  
25 Q. NOW, AND THE LORILLARD PROJECT WAS GOING ON  
26 WITH OTHER PROJECTS AT THE SAME TIME?  
27 A. THAT IS CORRECT.  
28 Q. MR. FULLAM WAS WORKING FULL TIME IN THAT

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1 BASEMENT ON LORILLARD AND OTHER PROJECTS?  
2 A. WELL, HE WASN'T WORKING FULL TIME BECAUSE THERE  
3 WASN'T THAT MUCH WORK COMING IN AT THAT POINT.  
4 Q. BUT HE WAS --  
5 A. IT WAS THE ONLY WORK HE WAS DOING.  
6 Q. HE HAD LEFT GENERAL ELECTRIC?  
7 A. HE HAD LEFT GENERAL ELECTRIC.  
8 Q. IF THERE WAS WORK TO BE DONE ON THE LORILLARD  
9 PROJECT OR ANY OTHER CLIENT PROJECT HE COULD DO IT DURING  
10 THE DAY TIME WHEN YOU WERE NOT THERE?  
11 A. THAT'S RIGHT.  
12 Q. YOU ASSISTED HIM WHEN YOU CAME IN?  
13 A. YES.  
14 Q. HE ENCOURAGED YOU TO COME TO WORK FULL TIME?  
15 A. THAT IS RIGHT.  
16 Q. ENCOURAGED YOU TO GO BACK TO SCHOOL AND GET A  
17 BACHELORS AND YOU DID?  
18 A. THAT'S RIGHT.  
19 Q. THEN YOU WORKED UNTIL 1964.  
20 A. THAT'S RIGHT.  
21 Q. THEN YOU LEFT HIS LAB AND WENT TO WORK FOR  
22 ANOTHER?  
23 A. FOR DOUGLAS OBSERVATORY.  
24 Q. BUT YOU REMAINED FRIENDLY WITH MR. FULLAM.  
25 A. IN DEED.  
26 Q. MRS. HALLGREN WORKED WITH MR. FULLAM TOO,  
27 RIGHT?  
28 A. WHEN I WAS THERE.

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1 Q. EVEN SHE HELPED RUN HIS MAIL ORDER BUSINESS?  
2 A. WE ACTUALLY RAN THE MAIL ORDER HARDWARE  
3 BUSINESS FROM OUR HOME FOR HIM.  
4 Q. AND MR., IS DR. FULLAM STILL ALIVE?  
5 A. YES.  
6 Q. BUT HE HAD A STROKE OR SOMETHING?  
7 A. HE HAS HAD A STROKE.  
8 Q. YOU ARE ONE OF THE FEW PEOPLE WHO STILL SORT OF  
9 COMMUNICATE WITH HIM  
10 A. WELL, IT WOULD BE VERY DIFFICULT FOR HIM TO  
11 COMMUNICATE IN COURT WHERE YOU ARE TRYING TO GET QUESTIONS  
12 OUT UNDER SOME PRESSURE. HE CAN COMMUNICATE BUT WITH

13 DIFFICULTY.

14 Q. IN FACT A COUPLE OF YEARS AGO WHEN THERE WAS  
15 SOME TALK OF GETTING A DEPOSITION OF DR. FULLAM,  
16 DR. FULLAM DID PHONE THE LAB PEOPLE AND ASK YOU TO  
17 SUBSTITUTE FOR HIM, RIGHT?

18 A. THAT'S CORRECT.

19 Q. BECAUSE YOU ARE CLOSE WITH HIM, YOU AGREED TO  
20 DO IT?

21 A. THAT'S CORRECT.

22 Q. THAT IS WHAT BRINGS YOU HERE TODAY?

23 A. YES.

24 Q. AND YOU RESIST PRETTY DRAMATICALLY THAT THE  
25 FULLAM LAB WAS CONTAMINATED, DON'T YOU?

26 A. YES.

27 Q. BUT YOU DIDN'T, YOU DIDN'T WEAR LAB COATS,  
28 RIGHT? THAT WASN'T THE STYLE IN THE 50'S?

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1 A. NO.

2 Q. YOU DIDN'T HANDLED MATERIALS WITH GLOVES?

3 A. NO, WASN'T NECESSARY.

4 Q. YOU CERTAINLY DIDN'T THINK IT WAS OR ELSE YOU  
5 WOULD HAVE, RIGHT?

6 A. THAT'S RIGHT?

7 Q. IN JUNE, IN FAIRNESS, IN JUNE OF '54 YOU  
8 FRANKLY DIDN'T KNOW TOO MUCH ABOUT CONTAMINATION AS AN  
9 ELECTRON MICROSCOPIST, FAIR?

10 A. FAIR.

11 Q. YOU DID KNOW HOWEVER THAT CEILING TILES MADE IN  
12 THE 50'S HAD CONTAINED ASBESTOS?

13 MR. HARLEY: OBJECTION, LEADING, ALSO  
14 VAGUE.

15 THE COURT: HE IS LEADING HIM. THIS IS  
16 CROSS-EXAMINATION. HE CAN ACCEPT OR REJECT THE  
17 PROPOSAL PUT IN HIS MOUTH BY THE QUESTION.  
18 OBJECTION IS OVERRULED.

19 MR. MCELANEY:

20 Q. DID YOU KNOW THE CEILING TILE CONTAINED  
21 ASBESTOS?

22 A. I DON'T KNOW THAT I KNEW THAT CEILING TILES  
23 CONTAINED ASBESTOS.

24 Q. YOU KNEW THAT, DID YOU KNOW THE FLOOR TILE  
25 CONTAIN ASBESTOS?

26 A. YES, I DID KNOW THAT.

27 Q. YOU KNEW SOME HEAT INSULATION HAD SOME  
28 ASBESTOS, WAS MADE OF ASBESTOS?

Page 930

1 A. YES.

2 Q. DID YOU KNOW THAT SOME CEMENT CONTAINED  
3 ASBESTOS?

4 A. CEMENT, I DON'T KNOW THAT I WAS AWARE OF --

5 Q. DID YOU KNOW THAT THE AIR CONTAINS ASBESTOS?

6 A. YES.

7 Q. YOU KNOW THAT NOW?

8 A. YES.

9 Q. DID YOU KNOW IT IN JUNE OF '54?

10 A. AU, I, I WILL PASS ON THAT.

11 Q. CAN'T REMEMBER?

12 A. UM, WELL, I DON'T KNOW THAT I KNEW IT OR DIDN'T  
13 KNOW IT AT THIS TIME.

14 Q. THAT'S WHAT I MEAN?

15 A. YES.

16 Q. OKAY. DID YOU KNOW THAT WATER CONTAINS  
17 ASBESTOS, AGAIN, BACK IN JUNE OF '54?

18 A. NO.  
19 Q. NOW, YOU DON'T REMEMBER WHAT OTHER PROJECTS  
20 DR. FULLAM WAS WORKING ON IN JUNE AND JULY OF '54?  
21 A. SPECIFICALLY?  
22 Q. RIGHT.  
23 A. NO, I CAN'T TELL YOU SPECIFICALLY, NO.  
24 Q. YOU DON'T REMEMBER SPECIFICALLY WHAT OTHER  
25 PROJECTS YOU WERE WORKING ON AT THAT TIME EITHER FOR THE  
26 FULLAM LAB?  
27 A. RIGHT.  
28 Q. YOU DON'T REMEMBER HOW MUCH TIME YOU SPENT ON

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1 THE LORILLARD PROJECT?  
2 A. I COULD, I COULD GIVE AN ESTIMATE.  
3 Q. A GUESS?  
4 A. HUH?  
5 Q. A GUESS?  
6 A. I WOULD SAY THAT ACTUALLY MOST OF THE WORK WE  
7 DID AT NIGHT. HE OFTEN WORKED IN THE EVENINGS BY HIMSELF;  
8 BUT WE PROBABLY PUT IN, FROM JUNE TO JULY THROUGH THOSE  
9 TWO SERIES, 30, 40 HOURS, PROBABLY.  
10 Q. THAT'S THE TWO OF YOU?  
11 A. PROBABLY IN THAT, YES, IN THAT BALLPARK, YES,  
12 IN THAT BALLPARK.  
13 Q. NOW, THE LETTERS REFER TO MR. PARMELE. YOU  
14 REMEMBER TALKING TO MR. PARMELE?  
15 A. I NEVER TALKED TO DR. PARMELE.  
16 Q. DR. KNUDSON, YOU NEVER SPOKE TO HIM?  
17 A. NO.  
18 Q. YOU NEVER SPOKE TO ANYBODY AT LORILLARD FOR  
19 THAT MATTER?  
20 A. RIGHT.  
21 Q. THE SAMPLES THAT YOU RECEIVED FROM LORILLARD  
22 YOU WOULD RECEIVE IN THE MAIL --  
23 A. THAT'S, YES.  
24 Q. -- TO MR. FULLAM'S HOUSE?  
25 A. YES.  
26 Q. THEN THEY WERE TOOK TO THE BASEMENT PRESUMABLY?  
27 A. RIGHT.  
28 Q. AS YOU SAY, SOME CLIENTS OR LOTS OF CLIENTS

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1 LIKE TO SEND BLIND SAMPLES TO THE LABORATORY, SAMPLE ONE,  
2 NO NAME?  
3 A. OR CALL TWO SAMPLES THE SAME NUMBER OR THE SAME  
4 TWO, DIFFERENT NUMBERS, COMMON PRACTICE.  
5 Q. SOMETHING, HOWEVER, THAT I THINK YOU SAID  
6 DR. FULLAM DID NOT LIKE?  
7 A. THAT'S CORRECT. HE PREFERRED TO HAVE THE  
8 CUSTOMER BE STRAIGHT, UP FORWARD AND THEN HE WOULD TAKE AN  
9 OPEN MIND AND DO IT OBJECTIVELY.  
10 Q. OKAY. LAST COUPLE OF QUESTIONS. COULD YOU  
11 UNFLIP THE CHART PLEASE?  
12 A. SURE.  
13 Q. THIS WAS THE WAY YOU GOT MATERIAL TO ANALYZE,  
14 WHATEVER WAS SENT TO YOU BY LORILLARD, IS THAT CORRECT?  
15 A. THAT'S CORRECT.  
16 Q. THEN YOU TOOK THAT MATERIAL, THE SMOKE, IF YOU  
17 WILL --  
18 A. UH-HUH.  
19 Q. -- PUT IT THROUGH SEVERAL STEPS, IS THAT  
20 CORRECT?  
21 A. THAT'S CORRECT.  
22 Q. THE FIRST STEP EVEN BEFORE YOU GET TO THAT, BY

23 TAKING THE SMOKE THROUGH THE ACETONE YOU HAVE EFFECTED THE  
24 SMOKE, RIGHT, BECAUSE ONE OF THE PURPOSES OF THE ACETONE  
25 IS TO DISSOLVE THE TAR?

26 A. THAT'S RIGHT.

27 Q. IF YOU HAD SOMETHING THAT CAME OUT OF THAT  
28 CIGARETTE THAT WAS IN A BALL OF TAR THAT, YOU WOULD SAY

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1 THAT THE ACETONE WOULD DISSOLVE THAT?

2 A. YES.

3 Q. THAT IS IN FACT WHAT YOU WANTED TO DO?

4 A. THAT'S CORRECT.

5 Q. THEN YOU WOULD CENTRIFUGE IT?

6 A. THAT'S RIGHT.

7 Q. THEN AGAIN YOU BREAK UP WHATEVER IS THERE,  
8 BREAK UP WHAT, THE PARTICLES?

9 A. YOU ARE NOT BREAKING UP THE PARTICLES.

10 Q. YOU ARE TRYING TO SEPARATE?

11 A. YOU ARE ONLY TRYING TO SEPARATE.

12 Q. THEN YOU USED THAT LIQUID SUBSTANCE TO --

13 A. THAT'S RIGHT.

14 Q. THEN CENTRIFUGE THEN AGAIN?

15 A. THAT'S RIGHT?

16 Q. AND YET A THIRD TIME?

17 A. THAT IS CORRECT.

18 Q. AND THAT'S WHAT YOU ANALYZED?

19 A. THAT'S CORRECT.

20 MR. MCELANEY: THANK YOU. MR. HALLGREN.

21 THE COURT: ANYTHING FURTHER?

22

23 CROSS-EXAMINATION

24 MR. HARLEY: YES, JUST A FEW QUESTIONS.

25 Q. MR. HALLGREN, EXHIBIT 30 HAS TWO, ONE  
26 HANDWRITTEN, ONE TYPED SUMMARY OF RESULTS. YOU EVER SEEN  
27 THOSE BEFORE?

28 A. YES, I HAVE SEEN THEM.

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1 Q. EITHER ONE OF THOSE CREATED AT FULLAM?

2 A. NO.

3 Q. I WILL ASK YOU TO ASSUME THAT THE KENT SOLD IN  
4 1954, REGULAR KENT HAD IN THE FILTER CELLULOSE, CRAPE  
5 PAPER, COTTON, CROCIDOLITE ASBESTOS, CELLULOSE ACETATE.

6 COTTON, CRAPE PAPER, CROCIDOLITE, CELLULOSE  
7 ACETATE, ANY OF THOSE MATERIALS BE CONFUSED WITH ASBESTOS  
8 UNDER AN ELECTRON MICROSCOPE?

9 A. NO, NOT AT ALL, GROSSLY DIFFERENT.

10 Q. HOW ABOUT ANY MATERIAL CONTAINED IN ORGANIC  
11 TOBACCO?

12 A. UNLESS IT WAS SOME FIBROUS PARTICLE THAT  
13 HAPPENED TO BE IN THERE AND HAPPENED TO PASS ALL THE WAY  
14 THROUGH, IT WOULD HAVE TO HAVE BEEN A CONTAMINANT OF THE  
15 TOBACCO. A NATURAL PORTION OF THE TOBACCO WOULD NOT BE  
16 CONFUSED WITH ASBESTOS.

17 Q. TOBACCO ITSELF?

18 A. TOBACCO ITSELF COULD NOT BE CONFUSED WITH, WITH  
19 ASBESTOS.

20 Q. NOTHING CREATED DURING THE BURNING OF TOBACCO  
21 ITSELF.

22 A. THAT'S CORRECT.

23 Q. IT IS THEORETICALLY POSSIBLE THAT A PIECE OF  
24 TOBACCO MIGHT HAVE AN ASBESTOS FIBER ON IT?

25 A. OH, SURE.

26 Q. YOU WERE ASKED TO EXAMINE IT UNDER YOUR  
27 MICROSCOPE?

28 A. YES.

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1 Q. THERE ARE TRANSMISSION ELECTRON MICROSCOPES AND  
2 SCAN ELECTRON MICROSCOPES?

3 A. RIGHT.

4 Q. WHICH WAS YOURS?

5 A. THAT WAS A TRANSMISSION MICROSCOPE.

6 Q. THE SCANNING MICROSCOPE HADN'T BEEN INVENTED  
7 YET?

8 A. ACTUALLY TURNS OUT THE OTHER WAY AROUND BUT IN  
9 ALL PRACTICE SCREENS, THIS SCAN MICROSCOPE WAS NOT YET AT  
10 WORK, A WORKING TOOL.

11 Q. YOU MADE A DISTINCTION UNDER QUESTIONING JUST  
12 COMPLETED BY MR. MCELANEY THAT YOU SEPARATED THE PARTICLES  
13 AND THEN YOU SAID BUT YOU DIDN'T BREAK THEM UP. WHAT  
14 DISTINCTION WERE YOU DRAWING?

15 A. WELL, I AM SAYING THAT, IF WE HAVE VERY LONG  
16 PARTICLES AS WE HAVE SEEN IN THE MICROGRAPHS, I DON'T  
17 BELIEVE THAT THESE PARTICLES WERE TO ANY EXTENT BROKEN IN  
18 THE CENTRIFUGATION PROCESS, PARTICLES STAYED INTACT AS  
19 THEY HAD COME OUT OF THE FILTER.

20 Q. WHEN YOU SAY SEPARATED, ARE YOU SAYING SEPARATE  
21 THEM FROM THE SOLUTION AND OTHER MATERIALS?

22 A. THAT'S RIGHT, SEPARATE THEM FROM THE TAR AND  
23 THE SOLUTION?

24 Q. MR. HALLGREN, AFTER LEAVING FULLAM LABORATORY  
25 DID YOU EVER DO ANY WORK IN AN ENVIRONMENT WHERE  
26 CONTAMINATION WAS OF PRIOR CONCERN?

27 A. OH, YES, ABSOLUTELY.

28 Q. DID YOU LEARN AND TRAIN ABOUT WHAT OUR STERILE  
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1 ENVIRONMENT, WHAT, DECONTAMINATION AND ALL THAT?

2 A. YES.

3 Q. WHERE DID YOU DO THAT?

4 A. DID THAT AT DOUGLAS OBSERVATORY.

5 Q. WHY?

6 A. WE WERE COLLECTING VERY SMALL PARTICLES,  
7 MICROBITS, RIGHT. THESE ARE PARTICLES THAT RANGE IN SIZE  
8 FROM A FEW TENTHS OF A MICRON TO MAY BE A FEW MICRONS, IF  
9 WE WERE LUCKY.

10 THE POINT IS, WE HAD TO TRY TO COLLECT THESE  
11 PARTICLES USING HIGH ALTITUDE BALLOON AND SOUNDING ROCKETS  
12 AND WE WERE VERY VERY SENSITIVE TO ANY KIND OF  
13 CONTAMINATION.

14 WE HAD TO CREATE SOME STRAINS WHICH WERE TOTALLY  
15 CLEAN AND WHICH COULD BE USED IN A VERY ROUGH ENVIRONMENT  
16 AND YET COME UNCONTAMINATED IN SUCH A WAY THAT WE COULD  
17 RELY ON THE DATA THAT WE WERE TRYING TO EXTRACT FROM THE  
18 GRID.

19 WE WERE USING A SMALL GRID, SAME SMALL GRID THAT  
20 WE USED FOR LORILLARD IN OUR EXPERIMENTS.

21 Q. IT IS THE GRID THAT HAS GOT CONTAMINATED, IS  
22 THAT CORRECT?

23 A. THE GRID, THE FILM ON THE GRID REALLY.

24 Q. EVEN WITH USING THAT EXPERIENCE ON THE BASIS OF  
25 HINDSIGHT AND LOOKING BACK, IN 1954 WAS THERE  
26 CONTAMINATION IN THESE SAMPLES IN THE KENT CIGARETTES?

27 A. BASED ON MY SUBSEQUENT EXPOSURE EXPERIENCE, I  
28 FEEL THAT THE PROCEDURES THAT WE WERE USING IN 1954 WERE

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1 TOTALLY ADEQUATE TO THE LEVELS OF CLEANLINESS THAT WERE  
2 REQUIRED TO DO THE LORILLARD JOB.

3 Q. CAN YOU STATE WITH ANY CONFIDENT OR DID YOU

4 STATE WITH ANY CONFIDENT THAT THOSE ARE CONTAMINATED, THAT  
5 IS, IN 1954, THAT THE SAMPLES IN 1954 WERE NOT  
6 CONTAMINATED WITH ASBESTOS?

7 MR. MCELANEY: THE --

8 THE COURT: MR. MCELANEY, YOU HAVE AN  
9 OBJECTION?

10 MR. MCELANEY: YES, YOUR HONOR, THE FORM OF  
11 THE QUESTIONS IS IMPROPER.

12 THE COURT: NOT TO ME. IS IT TO YOU?

13 MR. MCELANEY: ALSO, VAGUE.

14 THE WITNESS: NO. I HAVE NO DOUBT THAT THE  
15 SAMPLES IN 1954 WERE NOT CONTAMINATED.

16 MR. HARLEY: THANK YOU, MR. HALLGREN. I  
17 THINK THAT IS ALL THE QUESTIONS I HAVE.

18 THE COURT: ANYTHING FURTHER?

19

20 REDIRECT EXAMINATION

21 MR. OHLEMEYER: THREE QUESTIONS. THE  
22 MINUTE I SAY THAT, I WILL TRY TO ASK FOUR AND  
23 YOU WOULDN'T LET ME.

24 Q. THE WHOLE CONCEPT OF THE X-RAY DIFFRACTION WE  
25 HAVE BEEN TALKING ABOUT MR. HALLGREN --

26 A. UH-HUH.

27 Q. -- AND SPECIFICALLY WITH REFERENCE TO, FOR  
28 EXAMPLE, PLAINTIFF'S 34, X-RAY DIFFRACTION, ELECTRON --

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1 A. ELECTRON.

2 Q. ELECTRON DIFFRACTION IS A PROCESS OR A, THE  
3 TECHNIQUE THAT ALLOWS YOU, LET ME BACK UP.

4 MY FIRST QUESTION, YOU CAN LOOK AT THIS AND  
5 FIGURE OUT WITHIN LIMITS WHETHER THIS IS A CRYSTALLINE  
6 STRUCTURE, A FIBER STRUCTURE OR COTTON, CELLULOSE OR  
7 SOMETHING LIKE THAT?

8 A. YES.

9 Q. IT IS, ELECTRON DIFFRACTION, X-RAY DIFFRACTION  
10 THAT ALLOWS YOU TO FIGURE OUT WHAT KIND OF  
11 CRYSTALLINE STRUCTURE THIS IS?

12 A. IF THE PATTERN IS GOOD, YOU CAN IDENTIFY THE  
13 SPECIFIC CHEMICAL COMPOUND.

14 Q. SO, THAT LETS YOU DETERMINE WHETHER THIS IS  
15 ASBESTOS AS OPPOSED TO ANOTHER MINERAL?

16 A. YES.

17 Q. WHAT TYPE OF ASBESTOS IT MIGHT BE?

18 A. YES.

19 Q. AND THAT IS SOMETHING THAT WAS NOT DONE  
20 ROUTINELY ON THESE SAMPLES?

21 A. NO.

22 Q. MY LAST QUESTION IS CONTAMINATION --

23 A. UH-HUH.

24 Q. -- OR EXTRANEIOUS MATERIAL IN THIS ANALYSIS --

25 A. UH-HUH.

26 Q. -- CAN OCCUR IN YOUR SAMPLE?

27 A. YES.

28 Q. IT CAN OCCUR AS THE WAY THAT YOU, RESULTS OF

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1 THE WAY YOU PREPARE YOUR SAMPLE?

2 A. YES.

3 Q. AND IT CAN OCCUR AS A RESULT OF THE, IT CAN  
4 OCCUR IN THE EQUIPMENT YOU ARE USING TO DO YOUR  
5 EXPERIMENT?

6 A. YES.

7 MR. OHLEMEYER: THANK YOU.

8 THE WITNESS: THE QUESTION IS, "DOES"?



9 THE COURT: ANYTHING FURTHER MR. MCELANEY?  
10 MR. MCELANEY: NO, YOUR HONOR.  
11 THE CLERK: JUST A MINUTE, YOUR HONOR.  
12 THE COURT: OH, WE HAVE A QUESTION.  
13 MR. HARLEY: YOUR HONOR, WHILE YOU ARE  
14 LOOKING AT THAT, I WOULD LIKE TO HAVE PERMISSION  
15 TO MARK THE DRAWING OF, BY, MR. HALLGREN'S  
16 DRAWN.  
17 THE COURT: I DON'T SEE ANY REASON WHY THIS  
18 QUESTION CAN'T BE ASKED. (COUNSEL LOOKING AT  
19 QUESTION SUBMITTED BY A JUROR.)  
20 MR. HARLEY: MARKED AS PLAINTIFF'S EXHIBIT  
21 56 FOR IDENTIFICATION WHICH IS THE HAND DRAWING  
22 OF MR. HALLGREN OF THE SAMPLING TECHNIQUE USED  
23 IN 1954.  
24 MR. OHLEMEYER: NO OBJECTION.  
25 THE COURT: OKAY.  
26 WHEREUPON DRAWING OF MR. HALLGREN  
27 WAS MARKED PLAINTIFF'S EXHIBIT NO  
28 56 FOR IDENTIFICATION ONLY.

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1 MR. HARLEY: WELL, I WILL MOVE IT INTO  
2 EVIDENCE.  
3 THE COURT: ANY OBJECTION TO IT BEING IN  
4 EVIDENCE.  
5 MR. MCELANEY: NO, YOUR HONOR.  
6 MR. OHLEMEYER: NO.  
7 THE COURT: IN EVIDENCE.  
8 WHEREUPON PLAINTIFF'S EXHIBIT NO.  
9 56 PREVIOUSLY MARKED FOR  
10 IDENTIFICATION WAS RECEIVED INTO  
11 EVIDENCE  
12 THE COURT: THERE BEING NO OBJECTION TO THE  
13 JUROR QUESTION, MARK IT AS COURT'S EXHIBIT NEXT  
14 IN ORDER.  
15 THE CLERK: EXHIBIT NUMBER TWO.  
16 WHEREUPON JUROR QUESTION WAS  
17 MARKED COURT'S EXHIBIT NO 2 FOR  
18 IDENTIFICATION ONLY.  
19 THE COURT: MR. HALLGREN, OTHER THAN THE  
20 EXPERIMENTS FOR LORILLARD, DID YOU EVER USE THE  
21 ASPIRATOR AND ACETONE FLASK ARRANGEMENTS SHOWN  
22 IN THE DIAGRAM FOR CREATING GRIDS TO BE STUDIED  
23 UNDER THE ELECTRON MICROSCOPE.  
24 THE WITNESS: NO. THIS TECHNIQUE WAS USED  
25 STRICTLY FOR THE LORILLARD PROBLEM. IT WAS  
26 UNIQUELY TAILORED TO THE PROBLEM THAT WE HAD FOR  
27 LORILLARD.  
28 THE COURT: THAT ANSWERS YOUR QUESTION,

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1 MA'AM.  
2 A JUROR: THANK YOU VERY MUCH.  
3 THE COURT: ALL RIGHT. THANK YOU. WHAT  
4 ARE YOU GOING TO DO WITH THE BOX? REMAINS IN  
5 YOUR POSSESSION, NOT GOING TO BE MARKED IN FOR  
6 EVIDENCE.  
7 THE WITNESS CAN BE EXCUSED.  
8 MR. HARLEY: YES.  
9 THE COURT: THE WITNESS CAN EXCUSED FOR ALL  
10 PURPOSES?