

1 UNITED STATES DISTRICT COURT
2 FOR THE DISTRICT OF NEW JERSEY

3 GRACE M. GRASSO, :
4 EXECUTRIX OF THE : DOCKET NUMBER
5 ESTATE OF JOHN C. : 78-1562
6 GRASSO, DECEASED, :
7 PLAINTIFF, :
-V- : TRIAL
8 B.F. GOODRICH : VOLUME 3
9 COMPANY. :
10 DEFENDANT. :

COPY

11 BEFORE: THE HONORABLE STANLEY S. BROTMAN,
12 UNITED STATES DISTRICT JUDGE

13 DATE: THURSDAY, JANUARY 22, 1981

14 APPEARANCES:

15
16 MESSRS. BROWN, CONNERY, KULP, WILLE,
17 PURNELL AND GREENE,

18 BY: MICHAEL J. VASSALOTTI, ESQUIRE,
19 ATTORNEYS FOR THE PLAINTIFF.

20 MESSRS. SCHUENEMANN AND GERCKE
21 BY: STEPHEN DUMSER, ESQUIRE,
AND

22 MESSRS. HARVEY, PENNINGTON, HERTING AND
23 RENNEISEN
24 BY: G. WAYNE RENNEISEN, ESQUIRE,
25 ATTORNEYS FOR THE DEFENDANT.

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C E R T I F I C A T E

I, P. LYNNE BELL, A NOTARY PUBLIC
AND CERTIFIED SHORTHAND REPORTER OF THE STATE
OF NEW JERSEY DO HEREBY CERTIFY THAT THE
FOREGOING IS A TRUE AND ACCURATE TRANSCRIPT
OF THE TESTIMONY AS TAKEN STENOGRAPHICALLY BY
AND BEFORE ME AT THE TIME, PLACE AND ON THE
DATE HEREINBEFORE SET FORTH.

I DO FURTHER CERTIFY THAT I AM
NEITHER A RELATIVE NOR EMPLOYEE NOR ATTORNEY
NOR COUNSEL OF ANY OF THE PARTIES TO THIS
ACTION, AND THAT I AM NEITHER A RELATIVE NOR
EMPLOYEE OF SUCH ATTORNEY OR COUNSEL AND THAT
I AM NOT FINANCIALLY INTERESTED IN THIS
ACTION.

P. LYNNE BELL, C.S.R.

NOTARY PUBLIC, STATE OF NEW JERSEY

MY COMMISSION EXPIRES 5/18/81

DATE: JANUARY 22, 1981

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C E R T I F I C A T I O N

I, STEPHEN J. DANER, OFFICIAL
COURT REPORTER FOR THE UNITED STATES DISTRICT
COURT, FOR THE DISTRICT OF NEW JERSEY, DO
HEREBY CERTIFY THAT THE FOREGOING MATTER IS A
TRUE AND ACCURATE TRANSCRIPT OF MY
STENOGRAPHIC NOTES TAKEN AT THE TIME AND
PLACE HEREINBEFORE SET FORTH.



STEPHEN J. DANER, CP, RPR
OFFICIAL U. S. REPORTER

DATE: 1-22-81

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U. S. DISTRICT COURT - CAMDEN, NEW JERSEY

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1 (THE FOLLOWING TAKES PLACE IN OPEN COURT.)

2 THE COURT: ALL RIGHT, BRING
3 THE JURY IN.

4 (THE FOLLOWING TAKES PLACE IN OPEN COURT WITH
5 THE JURY PRESENT.)

6 THE COURT: GOOD MORNING,
7 LADIES AND GENTLEMEN. YOU MAY NOW PROCEED.

8 MR. VASSALOTTI: THANK YOU,
9 YOUR HONOR.

10 YOUR HONOR, BEFORE CALLING
11 OUR NEXT WITNESS, PLAINTIFF MOVES TO MOVE
12 INTO EVIDENCE PLAINTIFF'S EXHIBITS SEVEN,
13 EIGHT AND NINE, WHICH WERE THE CHARTS SHOWING
14 THE RESULTS OF THE TESTIMONY OF PROFESSOR--
15 DAVIDSON AND PESKIN.

16 THE COURT: ANY OBJECTION?.

17 MR. RENNEISEN: YOUR HONOR, I
18 DIDN'T OBJECT TO THEM BEING MARKED. I DON'T
19 OBJECT TO THEM BEING ADMITTED INTO EVIDENCE.
20 AT THIS POINT, I DON'T THINK IT WOULD BE
21 APPROPRIATE TO DECIDE WHAT EVIDENCE THE JURY
22 WOULD TAKE INTO THE JURY ROOM. AND I WOULD
23 LIKE TO RESERVE MY RIGHT TO REVIEW ALL THE
24 EVIDENCE AND MAKE OBJECTIONS TO WHAT THE JURY
25 SEES AT THE END OF TRIAL.

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1 THE COURT: WELL, ARE YOU
2 OBJECTING TO IT BEING MARKED INTO EVIDENCE AT
3 THIS TIME OR NOT? I MEAN, NOW IS THE TIME. IF
4 YOU HAVE OBJECTIONS, WE'LL HEAR YOUR
5 OBJECTIONS?.

6 MR. RENNEISEN: I WOULD LIKE
7 TO MAKE THE OBJECTIONS OUT OF THE HEARING OF
8 THE JURY.

9 THE COURT: YES, OF COURSE.
10 WE'LL DO THAT. BUT, YOU DO HAVE OBJECTIONS?

11 MR. RENNEISEN: YES.

12 THE COURT: LET'S HOLD UP ON
13 THAT, THEN.

14 MR. RENNEISEN: I HAVE NO
15 OBJECTION TO THE WITNESS SEEING IT, YOUR
16 HONOR.

17 MR. VASSALOTTI: IT FORMS THE
18 BASIS OF THE NEXT TWO WITNESSES OPINIONS AND
19 I THINK IT'S IMPORTANT THAT WE GET A RULING.

20 THE COURT: LADIES AND
21 GENTLEMEN, I'LL EXCUSE YOU WHILE WE HEAR
22 COUNSEL ON THIS, PLEASE.
23 (AT WHICH TIME THE JURY LEAVES THE COURTROOM.)

24 THE COURT: I'LL HEAR YOUR
25 OBJECTIONS.

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1 MR. RENNEISEN: YOUR HONOR,
2 THE CHART, I HAVE NO OBJECTION TO THE
3 AUTHENTICITY OF THE CHART. IT IS WHAT IT
4 PURPORTS TO BE. IT IS A SUMMARY OF THE
5 TESTIMONY OF PROFESSOR PESKIN.

6 MY OBJECTION IS IS THAT IT'S
7 A SELECTION OF HIS TESTIMONY. I HAVE NO
8 OBJECTION TO IT BEING USED AS AN EXHIBIT, TO
9 ASSIST WITNESSES AND SO FORTH. BUT THE AT THE
10 CONCLUSION OF THE TRIAL, I DON'T THINK IT'S
11 APPROPRIATE TO TAKE PART OF TESTIMONY AND
12 GIVE IT TO THE JURY AS AN EXHIBIT WHEN IT
13 REALLY ISN'T A DOCUMENT THAT WAS CREATED
14 PRIOR TO TRIAL. IT'S AS THOUGH I WERE TO
15 TAKE STATEMENTS OF DOCTOR PESKIN'S TESTIMONY,
16 MARK THEM AS EXHIBITS AND ASK THAT THEY GO TO
17 THE JURY, WHICH I DON'T THINK IS APPROPRIATE.

18 MR. VASSALOTTI: YOUR HONOR,
19 IN RESPONSE TO THAT, I WOULD SAY UNDER NORMAL
20 CIRCUMSTANCES, MR. RENNEISEN'S OBJECTION
21 MIGHT BE WELL NOTED. BUT, THIS IS NOT A
22 NORMAL, IN THAT THE TESTIMONY THAT WAS GIVEN
23 BY PROFESSOR DAVIDSON AND PROFESSOR PESKIN,
24 THEY MADE SPECIFIC CALCULATIONS THAT OCCURRED
25 AT CERTAIN TIMES AND UNDER CERTAIN CONDITIONS.

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1 I THINK IT WOULD BE -- AND THEY ALSO
2 TESTIFIED THAT THE ENTRIES THAT THEY MADE ON
3 THESE TABLES WERE THE ELEMENTS OF THEIR
4 CALCULATION AND CONCLUSIONS. I THINK IT'S A
5 UNFAIR BURDEN ON THE JURY IN THIS CASE TOO
6 ASK THEM TO REMEMBER HOW MUCH WAS EMITTED IN
7 1970, HOW MUCH WAS EMITTED IN 1971, HOW MANY
8 DAYS DID THE WINDS BLOW IN THE RIGHT
9 DIRECTION IN 1971. I THINK IT WOULD BE A BIG
10 ASSISTANCE TO THE JURY. LET'S TAKE EACH
11 EXHIBIT. LET'S GET THE EXHIBITS.

12 MR. RENNEISEN: I HAVE NINE
13 OF THEM ALREADY.

14 THE COURT: NOW, LET'S TAKE
15 EACH ONE.

16 MR. VASSALOTTI: JUDGE, THIS
17 IS EXHIBIT P-7.

18 THE COURT: YES.

19 MR. VASSALOTTI: THIS IS A
20 TABLE WHICH HAS -- IT'S A TABLE WHICH HAS A
21 COMBINATION OF ENTRIES THAT WERE MADE BY
22 PROFESSOR DAVIDSON WHO CALCULATED THE TOTAL
23 EMISSION OF VINYL CHLORIDE ON AN ANNUAL BASIS
24 FOR EACH OTHER AND THE HOURLY FLOW OR THE
25 HOURLY RATE OF EMISSION OR VINYL CHLORIDE FOR

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1 EACH YEAR AND TESTIFIED TO THAT. IT ALSO HAS
2 TWO OTHER COLUMNS IN WHICH PROFESSOR PESKIN
3 ENTERED HIS FINDINGS ON THE RATE OF EXPOSURE
4 IN THE AREA OF THE GRASSO HOME DURING EACH
5 YEAR IN QUESTION AND THE NUMBER OF HOURS
6 DURING EACH OF THOSE YEARS WHEN THAT RANGE OF
7 EXPOSURE WOULD HAVE BEEN EXPECTED AT THE
8 GRASSO HOME.

9 THE COURT: IS THIS A SUMMARY,
10 REALLY. DOESN'T THAT COME IN UNDER THE
11 SUMMARY EXCEPTION RULE 1006, RULES OF
12 EVIDENCE, TO A CERTAIN EXTENT? I MEAN THERE'S
13 NO QUESTION IT'S HELPFUL TO THE JURY. THE
14 JURY IS IN NO WAY IS GOING TO REMEMBER THAT.
15 AND EVEN IF THEY DID, THERE'S A QUESTION IN
16 MY MIND WHETHER IT'S GOING TO MAKE SENSE.
17 WE'VE HAD A LOT OF PHYSICIAN, A LOT OF REAL
18 EXPERT TESTIMONY, AND WHETHER OR NOT THE JURY
19 IS ABSORBING THAT, I DON'T KNOW. WE HAVE A
20 LOT OF NUMBERS THROWN AT THEM.

21 MR. VASSALOTTI: THAT'S WHY I
22 THINK IT'S IMPORTANT THAT THEY NOT BE
23 HIGHLIGHTED.

24 THE COURT: I SEE NO HARM
25 LETTING THE JURY SEE THIS, WHATEVER PURPOSE

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1 THEY MAY MAKE OF IT. IN MANY INSTANCES, WE
2 HAVE QUESTION MARK SOMETHING ON A CHART AND
3 IT GOES TO THE JURY. IT'S ONLY PART OF THEIR
4 TESTIMONY. OF COURSE, THE JURY IS INSTRUCTED,
5 THEY'RE TO TAKE THE ENTIRE TESTIMONY OF A
6 WITNESS. THEY CAN'T, IN MY OPINION, THEY
7 CAN'T BE EXPECTED TO REMEMBER THESE SERIES OF
8 COMPUTATIONS.

9 MR. RENNEISEN: YOUR HONOR,
10 IT IS A SUMMARY OF THE TESTIMONY. BUT MY
11 PROBLEM IS THAT SOME -- YOU TAKE THIS
12 COLUMN, THE EMISSION DATA, SPECIFICALLY --
13 I'M NOT SURE WHAT TEN TO THE SIXTH IS EITHER,
14 BUT BASICALLY, I THINK THE TESTIMONY WILL
15 AGREE ON THIS PROBLEM. BUT THERE'S
16 SIGNIFICANCE -- THERE WILL BE SIGNIFICANT
17 DIFFERENCES IN THE TESTIMONY --

18 THE COURT: THAT ALWAYS
19 HAPPENS. THAT ALWAYS HAPPENS. IF YOURS
20 DIFFERS FROM THIS, YOU PREPARE A LIKE CHART
21 AND PUT IN YOURSELF.

22 MR. RENNEISEN: WELL, MAY BE

23 --

24 THE COURT: I WANT YOU TO DO
25 THAT.

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1 MR. RENNEISEN: THANK YOU,
2 YOUR HONOR. I MADE MY OBJECTION.

3 THE COURT: YOU ARE OVERRULED.
4 LET'S PUT THEM IN. AS I SAY, WHETHER THE JURY
5 IS ABSORBING THIS, THERE'S A QUESTION IN MY
6 MIND. WE'LL ALLOW IT IN EVIDENCE. THAT'S
7 EXHIBIT 7, 8 AND 9; IS THAT CORRECT.

8 MR. VASSALOTTI: THAT'S RIGHT,
9 YOUR HONOR.

10 THE COURT: MARKED IN
11 EVIDENCE.

12 (AT WHICH TIME THE AFOREMENTIONED EXHIBITS
13 WERE MARKED IN EVIDENCE.
14 (JURY ENTERS THE COURTROOM).

15 THE COURT: EXHIBITS, SEVEN,
16 EIGHT AND NINE ARE ADMITTED INTO EVIDENCE.
17 YOU MAY CALL YOUR NEXT WITNESS.

18 MR. VASSALOTTI: DOCTOR

19 ~~FREDERICK LAUCIUS~~

20 FREDERICK LAUCIUS SWORN

21 DIRECT EXAMINATION BY MR. VASSALOTTI.

22 Q. DOCTOR LAUCIUS, WHAT IS YOUR
23 PROFESSION?

24 A. I'M A PHYSICIAN. I'M A SPECIALIST IN
25 MEDICINE AND A SUBSPECIALIST IN MEDICAL

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1 THE COURT: I'M ONLY ABOUT
2 EIGHT MINUTES OVER MY ALLOTTED TIME TO
3 PRESENT YOU WITH AN OPINION ON YOUR MOTIONS.
4 I GUESS I'M ENTITLED TO EIGHT MINUTES MORE
5 UNDER THESE CIRCUMSTANCES.

6 THIS IS THE COURT'S
7 DETERMINATION WITH RESPECT TO THE DEFENDANT'S
8 MOTIONS THAT WERE MADE PRIOR ON THE LUNCHEON
9 RECESS.

10 THIS IS A WRONGFUL DEATH
11 SURVIVAL ACTION BASED ON THE DEATH OF
12 PLAINTIFF'S DECEDENT, WHICH DEATH -- WHICH
13 DEATH ALLEGEDLY RESULTED FROM THE EMISSION OF
14 NOXIOUS VINYL CHLORIDE FUMES FROM A PLANT
15 OWNED AND OPERATED BY DEFENDANT AND LOCATED
16 APPROXIMATELY ONE POINT SEVEN MILES FROM THE
17 DECEDENT'S HOME.

18 PLAINTIFF SEEKS COMPENSATORY
19 AND PUNITIVE DAMAGES BASED ON THREE THEORIES
20 OF RELIEF: STRICT LIABILITY, NUISANCE AND
21 NEGLIGENCE. CURRENTLY BEING CONSIDERED BY THE
22 COURT IS DEFENDANT'S MOTION FOR A DIRECTED
23 VERDICT RAISED UPON THE CONCLUSION OF
24 PLAINTIFF'S CASE. THAT'S RULE OF CIVIL
25 PROCEDURE 50(A).

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1 THE STANDARD FOR GRANTING A
2 MOTION FOR DIRECTED VERDICT IS A STRIDENT ONE.
3 BECAUSE GRANTING SUCH A MOTION DEPRIVES A
4 PARTY OF THE OPPORTUNITY TO HAVE FACTUAL
5 QUESTIONS DECIDED BY THE JURY, THESE MOTIONS
6 MUST BE CLOSELY SCRUTINIZED AND SPARINGLY
7 GRANTED. SEE WILKIN V. SUNBEAM CORPORATION,
8 AT PAGE 347, TENTH CIRCUIT, 1967, CERT.
9 DENIED, 389 U.S. 973, DECIDED IN 1968.

10 A MOTION FOR A DIRECTED
11 VERDICT SHOULD BE DENIED WHENEVER THERE IS
12 SUFFICIENT EVIDENCE UPON WHICH A REASONABLE
13 JURY COULD POSSIBLY DELIVER A VERDICT FOR THE
14 NON-MOVING PARTY. SEE GENERALLY WRIGHT AND
15 MILLER, 9 FED. PRAC. & PROC., SECTION 2524.
16 THE COURT OF APPEALS FOR THE THIRD CIRCUIT
17 HAS RECENTLY EXPRESSED THE STANDARD FOR A
18 DIRECTED VERDICT AS FOLLOWS:

19 "WHEN YOU MUST EXAMINE THE
20 RECORD IN A LIGHT MOST FAVORABLE TO THE
21 PLAINTIFF AND REVIEW THE SPECIFIC EVIDENCE IN
22 THE RECORD AND ALL INFERENCES REASONABLY
23 CAPABLE OF BEING DRAWN THEREFROM. WE MUST
24 DETERMINE WHETHER, AS A MATTER OF LAW, THE
25 RECORD IS CRITICALLY DEFICIENT OF THAT

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1 MINIMUM QUANTUM OF EVIDENCE FROM WHICH A JURY
2 MIGHT REASONABLY AFFORD RELIEF. IF THE
3 EVIDENCE IS OF SUCH CHARACTER THAT REASONABLE
4 MEN IN THE IMPARTIAL EXERCISE OF THEIR
5 JUDGMENT MAY REACH DIFFERENT CONCLUSIONS, THE
6 CASE SHOULD BE SUBMITTED TO THE JURY."

7 SINCE A DIRECTED VERDICT
8 MOTION DEPRIVES A PARTY OF JURY FACT
9 DETERMINATION, IT SHOULD BE GRANTED SPARINGLY
10 AND CIRCUMSPECTLY. "NEVERTHELESS, THE FEDERAL
11 COURTS DO NOT FOLLOW THE RULE THAT A
12 SCINTILLA OF EVIDENCE IS ENOUGH. THE QUESTION
13 IS NOT WHETHER THERE IS LITERALLY NO EVIDENCE
14 SUPPORTING THE PARTY AT WHOM THE MOTION'S
15 DIRECTED BUT WHETHER THERE IS EVIDENCE UPON
16 WHICH THE JURY COULD PROBABLY FIND A VERDICT
17 FOR THAT PARTY." PATZIG V. O'NEILL, 557 F.2D
18 841 AT PAGE 854, THIRD CIRCUIT, 1978,
19 CITATIONS DELETED. THIS IS AN OPINION OF
20 JUDGE GARTH, JOINED BY CHIEF JUDGE SEITZ AND
21 JUDGE BROTMAN. IT'S WHEN I SAT ON THE
22 CIRCUIT.

23 WITH THIS STANDARD IN MIND,
24 WE TURN TO THE SUBSTANCE OF DEFENDANT'S
25 MOTION. DEFENDANT ARGUES THAT THE PLAINTIFFS

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1 CASE IS CRITICALLY DEFICIENT WITH RESPECT TO
2 EVIDENCE NECESSARY TO SUPPORT THE SEVERAL
3 CAUSES OF ACTION. PLAINTIFF HAS RAISED CLAIMS
4 FOR RELIEF BASED ON VARIOUS LEGAL THEORIES:
5 STRICT LIABILITY, NEGLIGENCE AND NUISANCE. WE
6 WILL EXAMINE THESE CLAIMS IN THE EVIDENCE IN
7 SUPPORT OF THEM.

8 PLAINTIFF'S CLAIM FOR RELIEF
9 BASED ON STRICT LIABILITY HAS TWO ASPECTS:
10 FIRST, PLAINTIFF ASSERTS THAT DEFENDANT IS
11 STRICTLY LIABLE FOR THE PROXIMATE RESULTS OF
12 THE HAZARDOUS ACTIVITY IT IS CONDUCTING;
13 SECONDLY, PLAINTIFF ARGUES THAT SHE HAS A
14 RIGHT TO RECOVER BASED ON SECTION 402(A) OF
15 THE RESTATEMENT OF TORTS. ALTHOUGH SECTION
16 402(A) HAS BEEN ADOPTED IN NEW JERSEY,
17 PLAINTIFF'S CLAIM BASED DIRECTLY ON THAT
18 SECTION IS WITHOUT MERIT. SECTION 402(A)
19 IMPOSES LIABILITY UPON, AND I QUOTE, "ONE WHO
20 SELLS ANY PRODUCT IN A DEFECTIVE CONDITION,
21 UNREASONABLY DANGEROUS TO THE USER OR
22 CONSUMER." THAT LANGUAGE SIMPLY DOES NOT
23 APPLY HERE, WHERE PLAINTIFF'S ACTION IS BASED
24 ON HARMFUL EFFECTS ALLEGEDLY RESULTING FROM
25 DEFENDANT'S RELEASE OF BYPRODUCTS INTO THE

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1 ATMOSPHERE. WE ARE SIMPLY NOT DEALING WITH A
2 DEFECTIVE PRODUCT IN THIS CASE. THAT IS NOT
3 TO SAY, HOWEVER, THAT PLAINTIFF DOES NOT HAVE
4 A CLAIM FOR RELIEF BASED ON STRICT LIABILITY
5 IN TORT. ON THE CONTRARY, PLAINTIFF DOES HAVE
6 SUCH A CLAIM. ONE OF THE OLDEST BRANCHES OF
7 STRICT LIABILITY THEORY IN EXISTENCE LONG
8 BEFORE PRODUCTS LIABILITY WAS EVEN A GLIMMER
9 IN THE EYE OF THE PLAINTIFF'S BAR, WAS THE
10 DOCTRINE THAT ~~PERSONS MAY BE HELD STRICTLY~~
11 ~~LIABLE FOR HAZARDOUS ACTIVITIES CONDUCTED ON~~
12 ~~THEIR PROPERTY THAT ARE THE PROXIMATE CAUSE~~
13 ~~OF ANOTHER PERSON'S INJURIES. SEE RYLANDS V.~~
14 ~~FLETCHER, NOT RECITING THE CITATIONS.~~

15 AS THE EXCHEQUER CHAMBER HELD
16 IN THAT CASE -- AND THAT WAS AN 1865 CASE
17 -- "WE THINK THAT THE TRUE RULE OF LAW IS
18 THAT THE PERSON WHO FOR HIS OWN PURPOSES
19 ~~BRINGS ON HIS LAND AND COLLECTS AND KEEPS~~
20 ~~ANYTHING LIKELY TO DO MISCHIEF IF IT ESCAPES,~~
21 ~~MUST KEEP IT IN AT HIS PERIL, AND IF HE DOES~~
22 ~~NOT DO SO, AND IF HE DOES NOT SO -- IF HE~~
23 ~~DOES NOT DO SO, IS PRIMA FACIE ANSWERABLE FOR~~
24 ~~ALL THE DAMAGE WHICH IS THE NATURAL~~
25 ~~CONSEQUENCE OF ITS ESCAPE."~~

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1 THIS ANCIENT DOCTRINE RETAINS
2 VALIDITY TODAY AND PLAINTIFF HAS PRESENTED
3 SUFFICIENT EVIDENCE TO PRESENT A CLAIM FOR
4 RELIEF FOUNDED ON THIS GROUND TO THE JURY.
5 THIS CLAIM IS ONE BASED ON ARE YOU STRICT
6 LIABILITY AND DOES NOT REQUIRE A
7 DEMONSTRATION OF ANY CULPABILITY ON THE PART
8 OF DEFENDANT. IN ADDITION, ALTHOUGH WE HAVE
9 HELD THAT PLAINTIFF DOES NOT HAVE A CAUSE OF
10 DIRECTION DIRECTLY BASED ON SECTION 402(A),
11 WE AGREE WITH PLAINTIFF THAT THE PRINCIPLES
12 APPLICABLE TO 402(A) CLAIMS ARE APPLICABLE IN
13 THIS CONTEXT. AT LEAST TWO NEW JERSEY COURTS
14 HAVE COME TO A SIMILAR CONCLUSION. SEE
15 DEPARTMENT OF TRANSPORTATION V. PSC; IT'S A
16 LAW DIVISION CASE, 1980, I DON'T HAVE THE
17 EXACT CITATION. I DON'T THINK IT'S BEEN
18 REPORTED YET. CITY OF BRIDGETON V. B.P. OIL
19 COMPANY, 146 N.J. SUPER 1169 LAW DIVISION,
20 1976.

21 WE FEEL CONFIDENT THAT WHEN
22 THE TIME COMES FOR THE SUPREME COURT OF NEW
23 JERSEY TO CONSIDER THE MATTER, IT WILL ARRIVE
24 AT A SIMILAR RESULT. THUS, ALTHOUGH
25 PLAINTIFF'S 402(A) CLAIM SHALL BE STRICKEN,

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1 THE STRICT LIABILITY CAUSE OF ACTION IS VALID.
2 PLAINTIFF HAS CLEARLY PRESENTED SUFFICIENT
3 EVIDENCE TO RAISE A JURY QUESTION WITH
4 RESPECT TO THE FACTUAL MATTERS RELEVANT TO
5 THIS CLAIM.

6 NEXT, WE CONSIDER PLAINTIFF'S
7 CLAIM BASED ON NUISANCE. HERE, TOO, WE FIND
8 THAT PLAINTIFF HAS PRESENTED FACTS SUFFICIENT
9 TO SURVIVE A MOTION FOR A DIRECTED VERDICT.
10 THE STANDARDS APPLICABLE UNDER NEW JERSEY LAW
11 ARE ESSENTIALLY THOSE OF THE RESTATEMENT (2D)
12 OF TORTS. THE PARTIES DO NOT DISPUTE THIS.

13 HOWEVER, DEFENDANT'S VIGOROUSLY ARGUES THAT
14 ITS ACTIONS WERE NEITHER INTENTIONAL NOR
15 UNREASONABLE, AND THAT THERE IS NECESSITY
16 EVIDENCE IN THE RECORD SUFFICIENT TO SUPPORT
17 A FINDING ON THE CONTRARY. THIS ARGUMENT IS
18 WITHOUT MERIT. WHAT CONSTITUTES AN

19 INTENTIONAL INVASION IS DEFINED BY THE
20 RESTATEMENT SECTION 825 AS FOLLOWS, AND WE
21 QUOTE: ["AN INVASION OF ANOTHER INTERESTS IN
22 THE USE AND ENJOYMENT OF LAND OR AN
23 INTERFERENCE WITH THE PUBLIC RIGHT IS
24 INTENTIONAL IF THE ACTOR, A, ACTS FOR THE
25 PURPOSE OF CAUSING IT; OR, B, KNOWS THAT THE

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1 RESULTING OR IS SUBSTANTIALLY CERTAIN TO
2 RESULT FROM HIS CONDUCT." THIS SECTION IN NO
3 WAY DEPARTS FROM THE GENERAL RULE GOVERNING
4 INTENTIONAL TORTS WHICH HOLDS THAT THE
5 CRITICAL QUESTION IS WHETHER THE ACTION WAS
6 INTENTIONALLY TAKEN. IT IS IRRELEVANT THAT
7 THERE IS NO EVIDENCE IN THE RECORD THAT
8 DEFENDANT INTENDED TO CAUSE HARM. THE SOLE
9 RELEVANT FACT IS THAT THERE IS CONSIDERABLE
10 EVIDENCE OF RECORD THAT DEFENDANT
11 DELIBERATELY AND REGULARLY EMLTTED
12 SIGNIFICANT QUANTITIES OF VINYL CHLORIDE GAS
13 INTO THE ATMOSPHERE WITH THE SURE KNOWLEDGE
14 THAT THE GAS WOULD DISPERSE OVER THE
15 SURROUNDING AREA. THAT EVIDENCE IS SUFFICIENT
16 TO SATISFY THE INTENT STANDARD OF RESTATEMENT
17 SECTIONS 822 AND 325.

18 SECTION 822 ALSO REQUIRES,
19 HOWEVER, THAT THE ACTIONS BE UNREASONABLE.

20 THIS TERM IS DEFINED BY SECTION 326 AS

21 FOLLOWS: "UNREASONABLENESS OF INTENTIONAL
22 INVASION. AN INTENTIONAL INVASION OF

23 ANOTHER'S INTEREST IN THE USE AND ENJOYMENT

24 OF LAND IS UNREASONABLE IF, THE GRAVITY OF

25 THE HARM OUTWEIGHS THE UTILITY OF THE ACTOR'S

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1 CONDUCT OR, B, THE HARM CAUSED BY THE CAUSED
2 BY THE CONDUCT IS SERIOUS AND THE FINANCIAL
3 BURDEN OF COMPENSATING FOR THIS AND SIMILAR
4 HARM, THE OTHERS WOULD NOT MAKE THE
5 CONTINUATION OF THE CONDUCT NOT FEASIBLE."

THE RELEVANT STANDARD IS THAT OF SUBSECTION B;
IT IS CLEAR THAT THE HARM IN THIS MATTER WAS
EXTREMELY SERIOUS. IN ADDITION, THERE IS
CONSIDERABLE EVIDENCE IN THE RECORD, MUCH OF
IT BROUGHT OUT BY DEFENDANT, THAT THE
OCCURRENCE OF THIS DISEASE IS RARE, &
PARTICULARLY WITH RESPECT TO PERSONS IN THE
POSITION OF THIS DECEDENT WHO DID NOT WORK IN
THE PLAINTIFF'S PLANT AND WAS NOT DIRECTLY
EXPOSED TO THE GAS. THUS, THE FINANCIAL
BURDEN OF COMPENSATING THE SMALL NUMBER OF
PLAINTIFFS WHO MAY INCUR INJURY OR DEATH AS A
RESULT OF THE OPERATION OF POLYVINYLCHLORIDE
PLANTS WILL NOT MAKE THE CONTINUATION OF THE
CONDUCT NOT FEASIBLE. THEREFORE, THIS

21 ACTIVITY COULD BE FOUND UNREASONABLE BY A
22 REASONABLE JURY. AS IT ALSO COULD BE FOUND TO
23 BE AN INTENTIONAL ACTIVITY, THE NUISANCE
24 CLAIM CLEARLY PRESENTS A JURY QUESTION.

25 A JURY QUESTION IS ALSO

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1 RAISED WITH RESPECT TO THE CAUSE OF ACTION
2 BASED ON NEGLIGENCE. ~~THE ESSENCE OF~~
3 ~~PLAINTIFFS' ARGUMENT IN THIS REGARD IS THAT~~
4 ~~THERE WAS SUFFICIENT EVIDENCE OF THE POSSIBLE~~
5 ~~TOXIC AND CARCINOGENIC QUALITIES OF VINYL~~
6 ~~CHLORIDE TO IMPOSE UPON DEFENDANT A MAJOR~~ *jury*
7 ~~MANUFACTURER IN THE INDUSTRY, THE DUTY TO DO~~ *question*
8 ~~RESEARCH INTO THE DANGEROUS ASPECTS OF THIS~~ *on negligence*
9 ~~CHEMICAL.~~ ALTHOUGH DEFENDANT MAY NOT HAVE
10 BEEN NEGLIGENT, GIVEN THE STATE OF THE
11 KNOWLEDGE IN THE PERIOD IN QUESTION,
12 PLAINTIFF HAS PRESENTED SUFFICIENT EVIDENCE
13 TO RAISE A JURY QUESTION ON THIS ISSUE.
14 ACCORDINGLY, DEFENDANT'S MOTION FOR DIRECTED
15 VERDICT WILL BE DENIED WITH RESPECT TO THE
16 CLAIMS SOUNDING IN NEGLIGENCE, NUISANCE AND
17 STRICT LIABILITY IN TORT. WITH RESPECT TO THE
18 CLAIM BASED DIRECTLY ON SECTION 402(A) OF THE
19 RESTATEMENT OF TORTS SECOND, DEFENDANT'S
20 MOTION WILL BE GRANTED.

21 A SOMEWHAT DIFFERENT ANALYSIS
22 MUST BE APPLIED TO THE MOTION TO DIRECT A
23 VERDICT WITH RESPECT TO THE CLAIM FOR
24 PUNITIVE DAMAGES. TO PREVAIL ON HER CLAIM FOR
25 PUNITIVE DAMAGES, PLAINTIFF MUST MEET A

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1 RIGOROUS STANDARD. SEE, FOR EXAMPLE, ROGINSKY
2 V. RICHARDSON-MERRELL, INC., 339 87 F.2D, 832
3 SECOND CIRCUIT, 1967; THOMAS V. AMERICAN
4 CYSTOSCOPE MAKERS, INC., 414 F. SUPP. 255
5 EASTERN DISTRICT OF PENNSYLVANIA, 1976. UNDER
6 NEW JERSEY LAW, WHICH GOVERNS THIS DIVERSITY
7 ACTION, AN AWARD OF PUNITIVE DAMAGES IS ONLY
8 APPROPRIATE WHEN THE WRONGDOERS' CONDUCT IS
9 ESPECIALLY EGREGIOUS. FIRST NATIONAL STATE
10 BANK V. COMMERCE FEDERAL SAVINGS, 455 F.
11 SUPP., 454, PAGE 470-471 DISTRICT OF NEW
12 JERSEY, 1973, QUOTING LEIMGRUBER V. CLARIDGE
13 ASSOCIATES, 73 N.J. 450 AT PAGE 454, DECIDED
14 IN 1977

15 THE NEW JERSEY SUPREME COURT
16 ENUNCIATED THE APPLICABLE PRINCIPLES IN
17 DI GIOVANNI V. PESSEL, 55 N.J. 138, DECIDED
18 1970 AND I QUOTE: "SOMETHING MORE THAN MERE
19 COMMISSION OF A TORT IS ALWAYS REQUIRED FOR
20 PUNITIVE DAMAGES. THERE MUST BE CIRCUMSTANCES
21 OF AGGRAVATION OR OUTRAGE SUCH AS SPITE OR
22 MALICE OR A FRAUDULENT OR EVIL MOTIVE ON THE
23 PART OF THE DEFENDANT OR SUCH A CONSCIOUS AND
24 DELIBERATE DISREGARD OF THE INTERESTS OF
25 OTHERS THAT HIS CONDUCT MAY BE CALLED WILLFUL

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1 ~~OR WONTON. LACKING THIS ELEMENT, MERE~~
2 ~~NEGLIGENCE, HOWEVER GROSS, IS GENERALLY HELD~~
3 ~~NOT TO BE ENOUGH. THE DI GIOVANNI CASE AT~~
4 PAGE 90 QUOTING PROSSER ON TORTS, SECTION TWO,
5 SECOND EDITION, 1975. SEE ALSO FISHER V. VOLZ,
6 AT PAGE 347, THIRD CIRCUIT, 1974.

7 THUS, THE DI GIOVANNI COURT
8 ADOPTED THE FOLLOWING STANDARD: AN ACT TO
9 GIVE RISE TO A RIGHT TO PUNITIVE DAMAGE MUST
10 BE ACTUATED BY ONE, ACTUAL MALICE, WHICH IS
11 NOTHING MORE OR LESS THAN INTENTION AGO
12 WRONGDOING, AN EVIL MINDED ACT, OR TWO AN
13 ACT ACCOMPANIED BY A WONTON AND WILLFUL
14 DISREGARD OF THE RIGHTS OF ANOTHER. 55 N.J.
15 191 QUOTING LA BRUNO V. LAWRENCE, 64 N.J.
16 SUPER. 570, 575 APPELLATE DIVISION, 1960,
17 CERTIFICATION DENIED, 34 N.J. 323, 1961.

18 THUS, IN ANALYZING THE MOTION
19 FOR A DIRECTED VERDICT INSOFAR AS IT PERTAINS
20 SOLELY TO THE CLAIMS FOR PUNITIVE DAMAGES, WE
21 MUST CONSIDER WHETHER THERE IS EVIDENCE IN
22 THE RECORD ON WHICH ANY REASONABLE JURY COULD
23 FIND EITHER ACTUAL MALICE OR WONTON AND
24 WILLFUL DISREGARD OF THE RIGHTS OF ANOTHER ON
25 THE PART OF GOODRICH. THE RECORD BEFORE US IN

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1 A. I AM.

2 Q. COULD YOU GIVE US A SUMMARY OF YOUR
3 EDUCATIONAL BACKGROUND IN THE MEDICAL FIELD?

4 A. I GRADUATED IN MEDICINE IN LONDON IN
5 1950, HAVING QUALIFIED BEFORE THAT AS A
6 PHYSIOLOGIST. I SPENT SEVERAL YEARS IN THE
7 ARMY AS A PATHOLOGIST. I THEN WORKED IN
8 LONDON UNIVERSITY TEACHING MEDICINE,
9 PATHOLOGY AND TOXICOLOGY AND ALSO DOING
10 RESEARCH IN AREAS OF CANCER. I CAME TO THIS
11 COUNTRY IN 1960 TO HARVARD AND WORKED AT THE
12 CHILDREN'S CANCER RESEARCH FOUNDATION IN
13 BOSTON ON PROBLEMS OF ENVIRONMENTAL TOXICOLOGY:
14 THAT IS AGAIN THE TOXIC EFFECT OF CHEMICALS
15 IN AIR, FOOD AND WATER AND WAS ALSO A
16 PATHOLOGIST AT HARVARD MEDICAL SCHOOL.

17 I WENT TO CASE WESTERN
18 RESERVE MEDICAL SCHOOL IN CLEVELAND WHERE I
19 HAD A CHAIR IN HUMAN ECOLOGY AND MOVED TO
20 CHICAGO IN 1976.

21 Q. AND THAT IS WHERE YOU WORK NOW, IN
22 CHICAGO?

23 A. THAT IS CORRECT.

24 Q. DOCTOR, HAVE YOU RECEIVED ANY AWARDS
25 FOR YOUR MEDICAL OR RESEARCH WORK?

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1 A. *Royal* YES. I RECEIVED A VARIETY AWARDS IN
2 THE WORLD ARMY MEDICAL CORP.

3 Q. THAT'S IS IN THE BRITISH ARMY?

4 A. BRITISH ARMY. I'VE ALSO RECEIVED
5 SOCIETY OF TOXICOLOGY. IT'S AN AWARD IN THIS
6 COUNTRY IN 1969, SOCIETY -- SOCIETY OF
7 TOXICOLOGY ACHIEVEMENT AWARD AND A VARIETY
8 OTHER PROFESSIONAL SCHOLARSHIP AND
9 DISTINCTION.

10 Q. WHAT IS TOXICOLOGY?

11 A. TOXICOLOGY IS THE SCIENCE OF ADVERSE
12 EFFECTS, THE STUDY OF ADVERSE EFFECTS
13 GENERALLY IN RELATION TO THE EFFECTS OF
14 CHEMICALS.

15 Q. AND YOU MENTIONED THAT YOUR PRIMARY
16 INTERESTS AS A PHYSICIAN WAS STUDYING THE
17 TOXIC AND CANCER CAUSING EFFECTS OF CHEMICALS
18 IN THE ENVIRONMENT?

19 A. THAT IS CORRECT.

20 Q. AND IN THE WORK PLACE AS WELL?

21 A. YES.

22 Q. DOCTOR, HAVE YOU SERVED ON ANY
23 GOVERNMENT COMMITTEES OR WORKED WITH ANY
24 GOVERNMENT AGENCIES AS A CONSULTANT OR ACTED
25 AS A CONSULTANT TO ANY OTHER ORGANIZATIONS

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1 RELATED TO YOUR WORK IN THE FIELD OF
2 TOXICOLOGY AND ENVIROMENTAL AND OCCUPATIONAL
3 MEDICINE?

4 A. YES. I SERVE AS A CONSULTANT TO THE
5 UNITED STATES CONGRESS, THE SENATE COMMITTEE
6 OF PUBLIC WORKS FOR SEVERAL YEARS.

7 Q. WHEN WAS THAT?

8 A. ABOUT 1969 TO ABOUT 1974, SOMETHING
9 LIKE THAT.

10 AND VARIOUS OTHER
11 CONGRESSIONAL COMMITTEES ON SUBSEQUENT
12 OCCASIONS SINCE THEN. I'VE CONSULTED
13 EXTENSIVELY AND ACTED AS AN EXPERT WITNESS
14 FOR THE ENVIROMENTAL PROTECTION AGENCY IN
15 PROCEEDINGS RELATING TO CANCER CAUSING
16 PESTICIDES AND ACTIONS TAKEN TO REMOVE THESE
17 FROM THE MARKET. I'VE ALSO CONSULTED AND
18 ACTED AS AN EXPERT WITNESS FOR THE
19 OCCUPATIONAL SAFETY AND HEALTH COMMISSION
20 -- THAT GOES THE PART OF THE DEPARTMENT OF
21 LABOR THAT HAS AUTHORITY AND JURISDICTION ON
22 PROBLEMS OF WORKERS HEALTH AND PUBLISHED
23 SAFETY AND HAVE INTERESTS IN THIS CONNECTION,
24 I WAS ON A COMMITTEE ESTABLISHED IN 1973 BY
25 THE DEPARTMENT OF LABOR TO EXAMINE THE

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BFG09767

1 QUESTION OF STANDARD SETTING FOR CANCER
2 CAUSING CHEMICALS IN THE WORK PLACE. AND I'VE
3 ALSO SERVED AS CONSULTANT AND EXPERT IN OTHER
4 AGENCIES, INCLUDING THE NATIONAL INSTITUTE OF
5 HEALTH. OCCASIONS, I'VE SERVED ON AN ADHOC
6 BASIS AS CONSULTANT TO LABOR, TO THE AFL-CIO,
7 I'VE ALSO SERVED AS CONSULTANT TO INDUSTRIES
8 THAT HAVE ASKED FOR MY SERVICES IN CONNECTION
9 WITH PROBLEMS IN THE WORK PLACE.

10 Q. DOCTOR, HAVE YOU WRITTEN ANY
11 ARTICLES THAT HAVE BEEN PUBLISHED IN ANY
12 SCIENTIFIC OR MEDICAL JOURNALS?

13 A. APPROXIMATELY 250 ARTICLES I'VE
14 WRITTEN IN -- WHICH HAVE APPEARED IN
15 SCIENTIFIC JOURNALS. I'M AN AUTHOR OF 34 OR
16 35 BOOKS.

17 Q. WELL, HAVE ANY OF THOSE ARTICLES
18 -- LET'S STICK WITH THOSE FOR AWHILE --
19 OR THE BOOKS DEALT WITH ISSUES ARE CANCER OR
20 CANCER CAUSING CHEMICALS?

21 A. I WOULD SAY THE MAJORITY, THE GREAT
22 MAJORITY OF MY WRITINGS HAVE BEEN IN THE
23 AREAS OF CANCER, CANCER IN HUMANS, CANCER
24 CAUSATION, EXPERIMENTAL STUDIES IN ANIMALS
25 AND THE REGULATORY IMPLICATIONS OF THESE

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BFG09768

1 SCIENTIFIC FINDINGS.

2 Q. HAVE YOU, IN FACT, ENGAGED IN
3 CLINICAL RESEARCH CANCER CAUSING CHEMICALS?

4 A. I'VE DONE VERY EXTENSIVE STUDIES IN
5 ANIMALS ON CERTAIN CARCINOGENICS, EFFECTS OF
6 CHEMICAL, THAT IS THE ABILITY OF CHEMICALS TO
7 INDUCE IN ANIMALS AND ALSO SUSCEPTIBILITY.

8 Q. NOW, DOCTOR, YOU'VE MENTIONED YOU'VE
9 WRITTEN -- I THINK YOU SAID FOUR BOOKS THAT
10 DEALT WITH THE SUBJECT -- WELL, DO THEY DEAL
11 WI THE SUBJECT OF CANCER AND CANCER-CAUSING
12 CHEMICALS?

13 A. WELL, LET'S TRY TO REMEMBER. THE
14 FIRST BOOK WAS ON THE GENETIC HAZARD FROM
15 PESTICIDES, WHICH REALLY ISN'T DIRECTLY
16 RELATED TO CANCER, BUT THIS IS ANOTHER SET OF
17 HAZARDS. THESE ARE HAZARDS FROM EXPOSURE TO
18 PESTICIDES.

19 ANOTHER BOOK WAS ON THE NON-
20 PSYCHIATRIC EFFECTS, HAZARDOUS EFFECTS OF
21 DRUGS OF ABUSE, THE ABILITY OF DRUG ABUSE TO
22 PRODUCE BIRTH DEFECTS, CANCER, GENETIC
23 ABNORMALITIES. I'VE ALSO WRITTEN TWO VOLUMES
24 ON CONSUMER PRODUCT SAFETY, THE WHOLE
25 QUESTION OF HAZARD OF CONSUMER PRODUCTS,

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1 AMONG OTHERS, REFERENCE TO THE AN ABILITY OF
2 PRODUCTS TO PRODUCE CANCER. THE RECENT BOOK
3 OF ONE IS ON THE -- IT WAS TITLED THE
4 POLITICS OF CANCER, WHICH DISCUSSES THE
5 SCIENCE OF CANCER. I HAD RANGE OF RELATED
6 PROBLEMS OF CANCER CAUSING CHEMICALS IN THE
7 ENVIRONMENT IN AIR, WATER FOOD AND THE WORK
8 PLACE AND DRUGS. I THINK THOSE ARE THE MAJOR
9 BOOKS WHICH I CAN RECALL.

10 Q. NOW, DOCTOR, IN YOUR WORK AS A
11 MEDICAL DOCTOR -- PHYSICIAN, SPECIALIZING
12 IN THE TOXIC AND CANCER CAUSING EFFECTS OF
13 CHEMICALS, HAVE YOU BECOME FAMILIAR WITH A
14 DISEASE AS ANGIOSARCOMA OF THE LIVER?

15 A. YES.

16 Q. WHAT IS ANGIOSARCOMA OF THE LIVER?

17 A. IT IS A MALIGNANT DISEASE OR CANCER
18 IN A GENERAL SENSE OF THE WORD. IT ISN'T A
19 TRUE CANCER, BECAUSE IT AFFECTS PARTICULAR
20 NON-EPITHELIAL CELLS IN THE BODY. IN THE
21 LAYMEN'S SENSE OF THE WORD, YOU CAN CALL IT A
22 CANCER OF BLOOD FORMING CELLS WHICH CAN OCCUR
23 IN DIFFERENT PARTS OF THE BODY, BUT IN
24 PARTICULAR IN THE LIVER, WHICH IS THE --
25 PERHAPS THE COMMONEST SIGHT OF WHICH IT HAS

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1 BEEN NOTED.

2 Q. WELL, IS THAT A COMMON FORM OF
3 CANCER. I'M A LAYMAN. I'M GOING TO CALL IT
4 CANCER?

5 A. NO, IT'S A VERY RARE FORM OF CANCER.

6 Q. TO YOUR KNOWLEDGE, DOCTOR, ARE THERE
7 ANY KNOWN CAUSES OF ANGIOSARCOMA OF THE LIVER
8 THAT HAVE BEEN GENERALLY ACKNOWLEDGED OR
9 ACCEPTED IN THE MEDICAL COMMUNITY?

10 A. YES, I THINK IT'S FAIR TO SAY THERE
11 ARE FOUR RECOGNIZED CAUSES. THE FIRST IS
12 VINYL CHLORIDE, THE SECOND ARE ARSENIC
13 COMPOUNDS, THE THIRD IS THORIUM DIOXIDE OR
14 THORAS AND THE FOUR ARE ANTIBIOTIC STEROIDS.

15 Q. NOW, YOU MENTIONED, DOCTOR, THAT
16 VINYL CHLORIDE IS ACCEPTED AS A PROBABLE
17 CAUSE OF ANGIOSARCOMA OF THE LIVER. IS THAT
18 THE GAS USED IN THE MANUFACTURER OF PVC? ARE
19 YOU FAMILIAR WITH THE PVC INDUSTRY?

20 A. YES, YES.

21 Q. AND VINYL CHLORIDE IS USED IN THE
22 MANUFACTURE OF PVC?

23 A. CORRECT.

24 Q. DOCTOR, ARE YOU FAMILIAR WITH THE
25 -- STRIKE THAT.

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1 WHEN DID IT BECAME --
2 STRIKE THAT, ALSO.

3 IN THIS CASE, DOCTOR, B.F.
4 GOODRICH COMPANY, I BELIEVE, IS TAKING THE
5 POSITION THAT IT WASN'T UNTIL THE VERY END OF
6 1973 OR THE BEGINNING OF 1974 THAT THEY
7 REALIZED THAT THERE WAS ANY CONNECTION
8 BETWEEN VINYL CHLORIDE AND ANGIOSARCOMA OF
9 THE LIVER. ARE YOU FAMILIAR WITH THE
10 SCIENTIFIC AND MEDICAL EVIDENCE IN RESEARCH
11 THAT LED TO THE CONCLUSION THAT VINYL
12 CHLORIDE WAS THE CAUSE OF CANCER AND
13 ANGIOSARCOMA OF THE LIVER BEFORE THAT TIME?

14 A. COULD I ASK YOU TO REPHRASE THAT,
15 BECAUSE --

16 MR. RENNEISEN: I'D LIKE TO
17 OBJECT TO THE QUESTION.

18 THE COURT: I'M GOING TO
19 SUSTAIN THE OBJECTION. LET'S ASK THE QUESTION.
20 LET'S NOT --

21 MR. VASSALOTTI: I'M SORRY,
22 YOUR HONOR.

23 THE COURT: GET TO THE
24 QUESTION AND LET'S NOT HAVE ANY STATEMENT.
25 BY MR. VASSALOTTI:

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BFG09772

1 Q. ARE YOU FAMILIAR WITH THE
2 DEVELOPMENT OF SCIENTIFIC AND MEDICAL
3 EVIDENCE IN RESEARCH THAT LED TO THE
4 CONCLUSION THAT VINYL CHLORIDE IS A CAUSE OF
5 ANGIOSARCOMA OF THE LIVER?

6 A. YES.

7 Q. ARE YOU ABLE TO TRACE THE
8 DEVELOPMENT OF THAT LITERATURE FOR US HERE?

9 A. YES. I WOULD ALSO LIKE TO INCLUDE IN
10 THIS TRACING A VERY BRIEF STATEMENT OF
11 EFFECTS OTHER THAN CANCER INDUCED BY VINYL
12 CHLORIDE, WHICH I THINK IT WOULD BE HELPFUL
13 TO THE COURT'S UNDERSTANDING OF THIS ISSUE,
14 IF I MAY.

15 Q. OKAY.

16 A. I'LL --

17 MR. RENNEISEN: YOUR HONOR, I
18 WOULD OBJECT. I THINK COUNSEL SHOULD ASK
19 QUESTIONS AND THE WITNESS SHOULD ANSWER THE
20 QUESTIONS. THAT'S THE WAY --

21 THE COURT: I'M GOING TO
22 ALLOW HIM TO INCLUDE THAT. OVERRULED. LET'S
23 PROCEED.

24 A. LET ME LIST BRIEFLY THE CHRONOLOGY
25 OF INFORMATION THAT DEVELOPED BEFORE 1974

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BFG09773

1 WHEN IT FIRST PUBLISHED RECOGNITION OF THE
2 CANCER HAZARD OF VINYL CHLORIDE IN THE WORK
3 PLACE WERE KNOWN, AND I'LL DIVIDE MY ANSWER
4 INTO TWO CLASSES. FIRST OF ALL, INFORMATION
5 KNOWN WITH RESPECT TO ANIMAL STUDIES AND
6 SECONDLY, INFORMATION KNOWN WITH RESPECT TO
7 HUMAN DATA.

8 THERE'S VERY EXTENSIVE
9 LITERATURE GOING BACK TO 1930 ON THE EFFECTS
10 OF VINYL CHLORIDE IN ANIMAL STUDIES AND AS
11 EARLY AS 1930, THERE WERE REPORTS IN THE
12 LITERATURE THAT VINYL CHLORIDE HAD VERY HIGH
13 CONCENTRATIONS, FIVE PERCENT CONCENTRATIONS,
14 COULD PRODUCE ACUTE TOXICITY IN ANIMALS.
15 SUBSEQUENT TO THAT, FROM ABOUT 1930 ON WARD,
16 FROM 1930 TO 1950, THERE WERE SEVERAL
17 PUBLICATIONS, AGAIN CONFIRMING THE ACUTE
18 TOXICITY -- THAT'S THE ABILITY OF HIGH
19 CONCENTRATION OF VINYL CHLORIDE TO KILL --
20 AND IT WAS SHOWN THAT A CONCENTRATION OVER
21 FIVE PERCENT, IT WOULD PRODUCE NARCOSIS, IT
22 WOULD PRODUCE CARDIAC ARREST, AND PULONARY
23 EDEMA, THE LUNGS WOULD BECOME FULL OF FLUID.
24 FROM ABOUT 19 -- FROM ABOUT 1949 ONWARD,
25 THERE WERE A SERIES OF PUBLICATIONS,

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1 PREDOMINANTLY IN THE EUROPEAN LITERATURE, AND
2 IT WAS KNOWN THAT VINYL CHLORIDE COULD
3 PRODUCE A WIDE RANGE OF EFFECTS IN ANIMALS,
4 DEGENERATIVE EFFECTS IN THE LIVER,
5 DEGENERATIVE KIDNEY CHANGES, TOO. AND BY THE
6 EARLY SIXTIES, IT WAS ALSO SHOWN THAT VINYL
7 CHLORIDE PRODUCED A TOXIC EFFECT ON BLOOD
8 VESSELS AND ALSO ON BONE, TOO.

9 Q. WHAT WAS THAT?

10 A. A TOXIC EFFECT ON BLOOD VESSELS,
11 CALLED ANGIOFIBROSIS AND ALSO AN EFFECT ON
12 BONE, THE LINING OF BONE, CALLED THE
13 PERIOSTEUM.

14 IN 1970, AN ITALIAN
15 PATHOLOGIST CAME OVER TO THIS COUNTRY AND
16 PRESENTED A PAPER AT THE INTERNATIONAL CANCER
17 CONGRESS IN HOUSTON, SHOWING THAT VINYL
18 CHLORIDE INDUCED CANCER IN RATS. THIS IN 1970
19 WAS THE FIRST PUBLISHED AND OPEN INFORMATION
20 ON THE CANCER CAUSING ABILITY OF VINYL
21 CHLORIDE.

22 Q. WHO WAS IT, THE RESEARCHER WHO MADE
23 THOSE FINDINGS?

24 A. HIS NAME WAS VIOLA. HE WAS AN
25 EMPLOYEE OF ITALIAN INDUSTRY CALLED SULVATE

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1 INDUSTRIES LIMITED IN ITALY.

2 SUBSEQUENT TO VIOLA'S
3 FINDINGS, THESE -- THIS INFORMATION WAS
4 CONFIRMED AND EXTENDED BY ANOTHER ITALIAN
5 PATHOLOGIST CALLED MATALONI, WHO BY 1972, BY
6 AUGUST -- OR BY THE FALL OF 1972, HAD
7 CONFIRMED AND EXTENDED THESE FINDINGS,
8 ALTHOUGH INFORMATION ON THIS WAS NOT MADE
9 AVAILABLE UNTIL 1974, THE SAME DAY THAT THERE
10 WAS THE PUBLISHED ANNOUNCEMENT OF THE
11 OCCURRENCE OF THE CANCER IN THE B.F. GOODRICH
12 WORKERS. THAT VERY BRIEFLY IS THE STATEMENT
13 OF IT IN ALL LITERATURE.

14 AS FAR AS THE HUMAN STUDIES
15 ARE CONCERNED, THE EARLY LITERATURE ON THIS,
16 VERY INTERESTINGLY, IS EUROPEAN. THERE WERE
17 VERY LITTLE IN THE WAY OF AMERICAN STUDIES
18 PUBLISHED ON THE HUMAN EFFECTS OF VINYL
19 CHLORIDE.

20 ONE OF THE VERY EARLY
21 IMPORTANT PAPERS WAS A RUSSIAN PAPER IN 1949,
22 WHICH SHOWED THAT EXPOSURE TO VINYL CHLORIDE
23 COULD PRODUCE CHRONIC HEPATITIS -- THAT'S
24 TOXIC EFFECT IN THE LIVER, GASTRITIS, SKIN
25 IRRITATION, AND THIS WAS SHOWN IN A GROUP OF

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1 73 RUSSIAN WORKERS. AND THIS WAS SUBSEQUENT
2 TO THAT:

3 IN 1957, IT WAS SHOWN THAT AT
4 LEVELS LOWER THAN RUSSIAN STANDARDS -- THE
5 RUSSIAN STANDARD THEN WAS ABOUT 390 PARTS PER
6 MILLION -- THAT IT WAS SHOWN AT LEVELS
7 BELOW THAT THAT VINYL CHLORIDE WOULD PRODUCE
8 TOXIC EFFECTS KNOWN AS TOXIC ANGIONEUROPATHY.

9 Q. WHAT IS THAT?

10 A. IT MEANS AN IRRITANT EFFECT OF BLOOD
11 VESSELS AND NERVES TO THE BLOOD VESSELS.

12 IN THE SAME YEAR, IT WAS
13 SHOWN THAT VINYL CHLORIDE WOULD PRODUCE
14 RAYNAUD'S DISEASE. RAYNAUD'S DISEASE IS A
15 DISEASE WHICH IS RECOGNIZED IN LAY TERMS BY
16 HANDS GOING VERY COLD AND BECOMING NUMB AND
17 GOING VERY COLD AND THE SKIN BECOMING WHITE.
18 AND THIS WAS ASSOCIATED WITH SOME BONEY
19 CHANGES KNOWN AS ACROOSTEOLYSIS. BY 1953, A
20 CHARACTERISTIC PICTURE HAD EMERGED OF THE
21 TOXIC EFFECTS OF -- OF VINYL CHLORIDE AND
22 THIS WAS WELL SUMMARIZED, AGAIN, IN A FOREIGN
23 PUBLICATION BY SUCIO, S-U-C-I-O, IN 1953,
24 WHERE IT WAS SHOWN THAT VINYL CHLORIDE
25 PRODUCED HEPATITIS, SPLENOMEGALY, A BIG

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BFG09777

1 SPLEEN, DERMATITIS, IRRITATION OF THE SKIN,
2 RAYNAUD'S DISEASE, WHICH WE'VE TALKED ABOUT
3 ALREADY, GUT UP DISTURBANCE, CENTRAL NERVOUS
4 SYSTEM DISTURBANCES AND THIS WAS VERY WELL
5 DESCRIBED, AS I SAY, IN 1963. THREE YEARS
6 LATER IN A BELGUIM PUBLICATION, THERE WAS A
7 FURTHER CONFIRMATION OF VINYL CHLORIDE
8 PRODUCED ACROOSTEOLYSIS THAN RAYNAUD'S
9 DISEASE, AND BY 1970, 1972, IT WAS SHOWN THAT
10 A DOSE RESPONSE EFFECT COULD BE PRODUCED; IN
11 OTHER WORDS, OVER THE HIGH CONCENTRATIONS OF
12 VINYL CHLORIDE, THE WORST THESE DISEASES --
13 THE WORST THE DISEASE, THE WORST WERE THE
14 INCIDENCES OF THE DISEASE AND THE WORST WERE
15 THE SYMPTOMS. AND IT WAS SHOWN THEY WERE
16 PRODUCED OVER A RANGE OF 35 TO 800 PARTS PER
17 MILLION AND THE DIFFICULTY WAS EVEN NOTED AT
18 LEVELS OF 40 PARTS PER MILLION.

19 NOW, COMING CLOSER TO --

20 Q. DOCTOR, LET ME INTERRUPT YOU FOR A
21 SECOND.

22 ALL THESE PUBLICATIONS AND
23 ARTICLES THAT YOU REFER TO, WERE THESE
24 ARTICLES GENERALLY AVAILABLE IN MEDICAL
25 LITERATURE TO PERSONS WHO MAY HAVE BEEN

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BFG09778

1 INTERESTED IN FINDING OUT ABOUT THE TOXICITY
2 OR EFFECTS OF VINYL CHLORIDE?

3 A. CERTAINLY. THESE ARTICLES WERE
4 PUBLISHED IN THE OPEN SCIENTIFIC LITERATURE
5 AND ANYBODY WHO HAD ANY INTEREST AT ALL IN
6 THIS ISSUE COULD HAVE HAD ACCESS TO THIS
7 MATERIAL

8 NOW, THERE ARE SOME OTHER
9 INTERESTING POINTS. PRIOR TO -- WELL, LET
10 ME JUST GO BACK ON THAT FOR ONE MOMENT.

11 PRIOR TO 1971, EIGHT CASES OF
12 CANCER OF THE LIVER HAD BEEN NOTED IN VINYL
13 CHLORIDE WORKERS. EIGHT CASES OF CANCER OF
14 THE LIVER HAD BEEN NOTED IN VINYL CHLORIDE,
15 POLYVINYLCHLORIDE WORKERS PRIOR TO 1971. ONE
16 OF THESE HAD OCCURRED IN SWEDEN, SEVEN
17 OCCURRED IN THE UNITED STATES, THREE OF WHICH
18 WERE IN B.F. GOODRICH. ALL THESE EIGHT CASES
19 WERE SUBSEQUENTLY REDIAGNOSED AS ANGIOSARCOMA.
20 IT IS OF INTEREST THAT ONE OF THESE THREE
21 CASES OCCURRED IN A B.F. GOODRICH WORKER WHO
22 IN 1965 HAD RECEIVED WORKMEN'S COMPENSATION
23 FOR TOXIC HEPATITIS BUT HAD BEEN RETURNED TO
24 WORK SUBSEQUENTLY.

25 NOW, OVER AND ABOVE THESE

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1 EIGHT CAUSES OF LIVER CANCER IN VINYL
2 CHLORIDE WORKERS WHICH HAD OCCURRED PRIOR TO
3 1975, THERE'S SOME OTHER INTERESTING
4 INFORMATION ON THE CANCER-CAUSING EFFECTS OF
5 VINYL CHLORIDE IN HUMANS. DOCTOR MATALONI IN
6 1959 HAD DEMONSTRATED MALIGNANT TYPE CELLS IN
7 THE SPUTUM OF VINYL CHLORIDE WORKERS. IN
8 OTHER WORDS, ONE WAY OF DIAGNOSING LUNG
9 CANCER, EFFECTIVELY IF YOU'RE TRYING TOO PICK
10 IT UP AT AN EARLY STAGE, TO GET SOMEBODY TO
11 SPIT INTO A LITTLE POT. YOU GET THE SPUTUM,
12 YOU LOOK IN THE CELLS AND BY LOOKING AT THE
13 CELLS YOU CAN TELL WHETHER THEY'RE CANCER
14 TYPE CELLS OR NOT. ANIMALS IN 1959, HAD
15 ALREADY SHOWN THAT THERE WAS A HIGH INCIDENCE
16 OF CANCER LIKE CELLS IN THE SPUTUM OF VINYL
17 CHLORIDE WORKERS. INTERESTINGLY ENOUGH, THIS
18 INFORMATION WAS NOT MADE AVAILABLE IN THE
19 OPEN SCIENTIFIC LITERATURE UNTIL 1975. SO, IT
20 IS -- TO SUMMARIZE, I WOULD SAY THAT THERE
21 WAS EXTENSIVE EVIDENCE OF TOXIC EFFECTS OF
22 VINYL CHLORIDE, BOTH IN ANIMALS AND IN HUMANS,
23 PRIOR TO 1974, THE BULK OF THIS LITERATURE ON
24 THE CHRONIC TOXIC EFFECTS COMING FROM THE
25 EUROPEAN LITERATURE. BUT THERE WERE ALSO VERY

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1 CLEAR INDICATIONS OF ITS CARCINOGENICITY AS
2 EVIDENCED BY THE VIOLA PAPER IN 1970, THE
3 EIGHT CASES OF LIVER CANCER WHICH HAD
4 OCCURRED IN THIS COUNTRY AND IN SWEDEN, WHICH
5 WERE SUBSEQUENTLY DIAGNOSIED AS ANGIOSARCOMA,
6 AND PERHAPS LESS ACCESSIBLE WERE THE FINDINGS
7 OF MATALONI, THE TWO KINDS OF FINDINGS OF
8 MATALONI, ONE, THE EXPERIMENTAL CONFIRMATION
9 OF THE CANCER-CAUSING EFFECTS IN ANIMALS AND
10 THE MALIGNANT CELLS IN SPUTUM.

11 HOWEVER, I SHOULD MENTION
12 THAT MATALONI'S INFORMATION ON THE CANCER-
13 CAUSING EFFECT OF VINYL CHLORIDE IN ANIMALS,
14 WHICH AS I INDICATED BEFORE, HAD BEEN
15 OBTAINED BY THE FALL OF 1972, WAS
16 COMMUNICATED TO THE AMERICAN INDUSTRY, TO THE
17 MANUFACTURING CHEMISTS' ASSOCIATION.

18 MR. RENNEISEN: OBJECTION,
19 YOUR HONOR, UNLESS THERE'S EVIDENCE IT WAS
20 COMMUNICATED TO B.F. GOODRICH COMPANY. HE
21 SAID IT WASN'T MADE AVAILABLE TO THE PUBLIC.
22 AND IT'S GROSS HEARSAY AS TO --

23 THE COURT: WELL, THIS HAS
24 BEEN AN EXPERT IN THE FIELD. I'M GOING TO
25 ALLOW IT. I'M GOING TO ALLOW IT.

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1 MR. VASSALOTTI: YOUR HONOR,
2 I MIGHT FURTHER ADD --

3 MR. RENNEISEN: THE JUDGE HAS
4 RULED. I DON'T THINK IT'S TIME FOR COUNSEL
5 TO MAKE A SPEECH. I OBJECT.

6 BY MR. VASSALOTTI:

7 Q. DOCTOR, YOU MENTIONED THAT PROFESSOR
8 MATALONI'S FINDINGS WERE COMMUNICATED TO AN
9 ORGANIZATION CALLED THE MANUFACTURING
10 CHEMISTS ASSOCIATION?

11 A. THAT IS CORRECT.

12 Q. AND WHEN WHAT WAS THAT?

13 A. LET ME GIVE YOU THE DETAILS OF THIS.

14 IN AUGUST, 1972, THE
15 MANUFACTURING CHEMISTS' ASSOCIATION -- THAT
16 IS, THE TRADE LOBBY, THE ASSOCIATION IN THIS
17 COUNTRY THAT REPRESENTS THE CHEMICAL INDUSTRY
18 -- ENTERED INTO AN UNDERSTANDING WITH A
19 CONSORTIUM OF AMERICAN-EUROPEAN INDUSTRIES.

20 MR. RENNEISEN: YOUR HONOR, I
21 OBJECT. THIS IS SIMPLY NOT MEDICAL EXPERT
22 TESTIMONY.

23 THE COURT: I'M GOING TO
24 SUSTAIN THE OBJECTION. IT'S GONE A LITTLE BIT
25 TOO FAR.

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1 BY MR. VASSALOTTI:

2 Q. IF YOU COULD, DOCTOR EPSTEIN, JUST
3 LIMIT YOURSELF TO THE DEVELOPMENT OF
4 KNOWLEDGE REGARDING --

5 A. FINE. BY OCTOBER, '72, MATALONI HAD
6 CONFIRMED -- HAD REPEATED THE KIND OF
7 STUDIES THAT VIOLA HAD DONE AND HAD SHOWN
8 EFFECTS AT LOWER CONCENTRATIONS AND ON A
9 WIDER RANGE OF ORGANS.

10 Q. WHAT CONCENTRATIONS, WHAT LEVELS OF
11 EXPOSURES DID HE TEST?

12 A. MATALONI WENT DOWN TO THE HUNDRED
13 P.P.M. KIND OF BALLPARK LEVEL AND HAD, IN
14 FACT, LEVELS WERE FOUND, CONCENTRATIONS --
15 MATALONI'S SUBSEQUENT STUDIES HAD, IN FACT,
16 DEMONSTRATED CARCINOGENIC EFFECTS DOWN TO ONE
17 PART PER MILLION IN SUBSEQUENT STUDIES OF
18 MATALONI. BUT BY '72, EFFECTS IN THE HUNDRED
19 PARTS PER MILLION HAD BEEN DEMONSTRATED. AND
20 THIS INFORMATION FIRST BECAME AVAILABLE IN
21 JANUARY, 1974, THE SAME DAY AS THERE WAS A
22 THE PUBLIC ANNOUNCEMENT BY B.F. GOODRICH ON
23 THE OCCURRENCE OF FOUR CANCERS IN ITS WORKERS
24 IN THE LOUISVILLE -- FOR ANGIOSARCOMAS IN
25 THE LIVER IN WORKERS IN ITS B. F. GOODRICH

21109041

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1 PLANT, IN ITS PLANT IN LOUISVILLLE, KENTUCKY.

2 Q. DOCTOR, YOU'VE MENTIONED ANIMAL
3 TESTS WERE DONE. DID THAT INCLUDE TESTS ON
4 RATS? IS THAT WHAT MATALONI AND VIOLA DID?

5 A. VIOLA'S STUDIES WERE ON RATS.
6 MATALONI STUDIES WERE MORE EXTENSIVE. THEY
7 INCLUDED MICE, RATS, HAMSTERS AND THEY WERE A
8 VERY, VERY EXTENSIVE SET OF STUDIES.

9 Q. WHAT'S THE SIGNIFICANCE OF THE
10 MEDICAL FIELD AND PARTICULARLY IN THE FIELDS
11 OF CANCER-CAUSING CHEMICALS OF ANIMAL TESTS
12 IN THE STUDIES?

13 A. IT'S GENERALLY ACCEPTED BY ALL
14 AUTHORITIES IN THE FIELD THAT TESTS IN
15 ANIMALS AFFORD A PROPER METHOD OF PREDICTING
16 WHETHER A CHEMICAL IS LIKELY TO INDUCE CANCER
17 IN HUMANS. AND TESTS IN ANIMALS FOR THIS
18 REASON ARE STANDARD METHODS OF FINDING
19 WHETHER A CHEMICAL IS LIKE TO BE CARCINOGENIC
20 OR OTHERWISE AND THE METHODOLOGY FOR CANCER
21 TESTING IN ANIMALS ARE FAIRLY WELL DEVELOPED
22 AND HAVE BEEN SO WELL DEVELOPED FOR DECADES.
23 THERE'S A WIDE RANGE OF EXPERT, BODIES
24 NATIONALLY AND INTERNATIONALLY THAT HAVE
25 UNEQUIVOCALLY CONCLUDED THAT INFORMATION

21109042

BFG09784

1 DERIVED FROM WELL DEVELOPED ANIMAL TESTS GIVE
2 YOU A REAL PREDICTION AS TO THE LIKLIHOOD OF
3 WHETHER A CHEMICAL WOULD INDUCE CANCER IN
4 HUMANS OR NOT.

5 Q. DOCTOR, DOES THE MEDICAL LITERATURE
6 OR STATE OF THE MEDICAL ART AT THE PRESENT
7 TIME ESTABLISH HOW VINYL CHLORIDE CAUSES
8 CANCER?

9 A. THE ANSWER IS NO, AND IT'S ALSO
10 CLEAR TO SAY THAT WE DON'T KNOW THE MECHANISM
11 OF ACTION OF ANY CHEMICAL CARCINOGEN. YOU CAN
12 DESCRIBE SOME OF THE EFFECTS OF A CHEMICAL
13 CARCINOGEN, THAT IT PRODUCES A DISTURBANCE OF
14 THIS METABOLIC SYSTEM, THIS BIOCHEMICAL
15 SYSTEM, THIS IMMUNOLOGICAL SYSTEM, BUT WE
16 DON'T KNOW THE MECHANISM OF ACTION OF
17 CARCINOGENS, INCLUDING VINYL CHLORIDE.

18 WE KNOW MANY THINGS ABOUT THE
19 OCCURRENCE OF THE -- HOW THE CARCINOGENIC
20 PROCESS DEVELOPS, BUT WE DON'T KNOW THE
21 MECHANISM.

22 Q. DOCTOR, HAVE ANY OF THE MEDICAL OR
23 SCIENTIFIC STUDIES DONE TO DATE SHOWN THAT
24 THERE IS ANY SAFE LEVEL OF VINYL CHLORIDE
25 EXPOSURE TO WHICH A HUMAN COULD BE EXPOSED?

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BFG09785

1 A. LET ME ANSWER THAT IN TWO PARTS:

2 FIRSTLY BY SAYING THAT IT IS THE CONSENSUS
3 OF THE INFORMED SCIENTIFIC COMMUNITIES THAT
4 WE DON'T KNOW OF ANY WAY OF SETTING SAFE
5 LEVELS FOR CHEMICAL CARCINOGENS AND THERE'S
6 OVERWHELMING EVIDENCE IN LITERATURE TO
7 SUPPORT THIS. WE JUST DON'T KNOW OF ANY SAFE
8 WAY. AND THE SAME OBTAINS AS FAR AS VINYL
9 CHLORIDE IS CONCERNED

10 WITH VINYL CHLORIDE, HOWEVER,
11 OVER AND ABOVE THE VERY GENERAL STATEMENT
12 THAT WE DON'T KNOW OF ANY WAY OF SETTING SAFE
13 LEVELS FOR SAFE LEVELS FOR CHEMICAL
14 CARCINOGENS, I SHOULD POINT OUT THAT WE HAVE
15 EXTENSIVE INFORMATION ON THE FACT THAT VINYL
16 CHLORIDE CAN PRODUCE CARCINOGENIC EFFECTS AT
17 LOW CONCENTRATIONS. NOW, WHEN I SAY LOW
18 CONCENTRATIONS, I HAVE TO EXPLAIN WHAT I MEAN
19 BY LOW CONCENTRATIONS. ONE PART PER MILLION
20 MAY SOUND VERY LITTLE INDEED. ONE PART PER
21 MILLION IS ABOUT 2,000 MICROGRAMS PER CUBIC
22 METERS, WHICH MEANS IF YOU WANT TO TRANSLATE
23 ONE PART PER MILLION IN TERMS OF NUMBER OF
24 MOLECULES YOU BREATHE IN EVERY BREATH OF AIR,
25 WE'RE TALKING ABOUT -- NOT MILLIONS OF

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BFG09786

1 ~~MOLECULES, NOT BILLIONS, WE'RE TALKING ABOUT~~
2 ~~MORE THAN QUADRILLIONS OF MOLECULES.~~

3 NOW, AS I SAID BEFORE, WE
4 HAVE EXTENSIVE EVIDENCE ON THE
5 CARCINOGENICITY OF VINYL CHLORIDE AT LOW
6 CONCENTRATIONS AND LET ME, IF I MAY, BRIEFLY
7 SUMMARIZE THIS FOR YOU.

8 Q. COULD YOU, DOCTOR?

9 A. FIRST OF ALL, IN THE OVERWHELMING
10 MAJORITY OF CARCINOGENS OF THE TESTS THAT
11 HAVE BEEN SHOWN ON VINYL CHLORIDE IN ANIMALS,
12 CANCER-CAUSING EFFECTS HAVE BEEN DEMONSTRATED
13 AT THE LOWEST LEVEL TESTED. LET'S SAY 50
14 PARTS PER MILLION WAS THE LOWEST LEVEL TESTED.
15 CANCER CAUSING EFFECTS WERE DEMONSTRATED AT
16 THAT. THAT DOESN'T MEAN TO SAY THAT 50 PARTS
17 PER MILLION IS A SAFE LEVEL -- THERE'S NO
18 SUCH THING AS A SAFE LEVEL. THAT SIMPLY MEANS
19 THAT 50 PARTS WAS THE LOW TEST DOSE TESTED.

20 HOWEVER, MATALEONI HAS DONE
21 ~~EXPERIMENTS IN WHICH HE HAS FOUND THE~~
22 ~~INDICATION OF CANCER OF THE BREAST IN RATS AT~~
23 ~~ONE POINTS PER MILLION.~~ WITH INTERMITTENT
24 EXPOSURE OVER A YEAR. WITH INTERMITTENT
25 EXPOSURE OF RATS TO LEVELS OF VINYL CHLORIDE

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BFG09787

1 AT ONE PART PER MILLION, HE HAS DEMONSTRATED
2 CANCER INDUCED BY VINYL CHLORIDE. OVER AN AND
3 ABOVE THIS, WE ALSO KNOW THAT YOU DON'T NEED
4 ~~VERY LONG AND SUSTAINED EXPOSURES TO VINYL~~
5 ~~CHLORIDE TO GET CANCER. AS LITTLE AS ONE~~
6 ~~HOURLY EXPOSURE IS ENOUGH TO GIVE YOU CANCER.~~

7 Q. HAS THERE BEEN ANY RESEARCH IN THAT
8 REGARD, DOCTOR?

9 A. YES. THERE IS A VERY EXTENSIVE STUDY
10 BY THE CONSUMER PRODUCTS SAFETY COMMISSION
11 THAT SHOWS THAT ONE HOUR EXPOSURE OF ANIMALS
12 TO VINYL CHLORIDE WILL PRODUCE CANCER-CAUSING
13 EFFECTS. AND THE SAME DOCUMENT FROM THAT
14 CONSUMER PRODUCTS SAFETY COMMISSION WARNS
15 EXPLICITLY OF THE DANGERS OF SPILLS OF VINYL
16 CHLORIDE BECAUSE ONE EXPOSURE AS SHORT AS AN
17 HOUR CAN PRODUCE THESE EFFECTS. SO, ALREADY
18 WE HAVE SEEN WITHOUT REVIEWING THE WIDE RANGE
19 OF ANIMAL TEST ON -- ON THE CARCINOGENIC
20 EFFECTS OF VINYL CHLORIDE, WE'VE SEEN ONE
21 POINT ONE, THE LOWEST LEVEL TESTED SO FAR.
22 ONE PART PER MILLION, CANCER CAUSING EFFECTS
23 WERE INDUCED BY VINYL CHLORIDE. TRUE, CANCER
24 CAUSING EFFECTS WERE CAUSED BY AS SHORT A
25 PERIOD OF AN HOUR.

21109046

BFG09788

1 LET'S EXAMINE THAT.

2 Q. DOCTOR, IS THERE ANY INDICATION --
3 WE'VE BEEN TALKING ABOUT ANIMALS OF THESE
4 LOWER LEVELS. IS THERE ANY MEDICAL LITERATURE
5 WHICH INDICATES THAT HUMANS ARE AT RISK OF
6 DEVELOPING CANCER, AND ANGIOSARCOMA OF THE
7 LIVER IN PARTICULAR, FROM THESE LOW LEVELS OF
8 VINYL CHLORIDE EXPOSURE?

9 A. YES, --

10 MR. RENNEISEN: YOUR HONOR, I
11 OBJECT TO THE QUESTION. I DON'T THINK AT RISK
12 IS WHAT WE'RE TALKING ABOUT HERE.

13 THE COURT: WHY DON'T YOU
14 REPHRASE YOUR QUESTION.
15 BY MR. VASSALOTTI:

16 Q. ~~DOCTOR, IS THERE ANY MEDICAL~~
17 ~~EVIDENCE TO INDICATE THAT HUMANS EXPOSED TO~~
18 ~~LOW LEVEL CONCENTRATIONS OF VINYL CHLORIDE~~
19 ~~CAN DEVELOP AND DO DEVELOP CANCER AND~~
20 ~~PARTICULARLY ANGIOSARCOMA OF THE LIVER?~~

21 A. YES, THERE IS SUCH EVIDENCE.

22 Q. CAN YOU DESCRIBE --

23 A. ~~AND THE EVIDENCE RELATES TO TWO~~
24 ~~TYPES OF STUDY. TWO LINES OF STUDY. THE~~
25 ~~FIRST ARE THE OCCUPATIONAL STUDIES IN THE~~

21109047

1 ~~WORK PLACE. THE SECOND ARE STUDIES IN THE~~
2 ~~COMMUNITY, PEOPLE WHO LIVE CLOSE TO PLANTS.~~

3 ~~AND LET ME FIRST~~ OF ALL DISCUSS THE EVIDENCE
4 FOR THE CARCINOGENICITY OF VINYL CHLORIDE IN
5 THE WORKPLACE AT LOW LEVELS OF EXPOSURE.

6 NOW, I SHOULD EXPLAIN THAT
7 THERE'S THREE KINDS OF PROCESSES IN WHICH A
8 WORKER IN THE -- IN THE VINYL CHLORIDE,
9 POLYVINYLCHLORIDE PLASTIC INDUSTRY IS
10 ASSOCIATED, THE FIRST IN THE MANUFACTURE OF
11 VINYL CHLORIDE. VINYL CHLORIDE IS A SMALL
12 BUILDING BLOCK WHICH WHEN STRUNG TOGETHER
13 FORMS LONG CHAINS CALLED POLYVINYLCHLORIDE.
14 SO, IN THE PROCESS, THE WORKER CAN BE EXPOSED
15 TO VINYL CHLORIDE WHEN HE MAKES THE VINYL
16 CHLORIDE, THAT'S ONE; TWO, WHEN THE VINYL
17 CHLORIDE IS COOKED IN A PRESSURE POT, WHEN
18 THE SMALL MOLECULES ARE STRUNG TOGETHER TO
19 FORM POLYVINYL CHLORIDE, AND WHEN YOU MAKE
20 THE VINYL CHLORIDE AND WHEN YOU MAKE THE
21 POLYVINYLCHLORIDE, LEVELS OF EXPOSURE CAN BE
22 VERY HIGH, CAN BE PARTICULARLY IF WORK
23 PRACTICES ARE BAD.

24 THERE'S A THIRD KIND OF
25 EXPOSURE --

21109048

BFG09790

1 MR. RENNEISEN: YOUR HONOR, I
2 DON'T LIKE TO KEEP OBJECTING. BUT I WAS UNDER
3 THE IMPRESSION THAT HE WAS TELLING US ABOUT
4 HOW PEOPLE CAN GET CANCER FROM LOW LEVELS AND
5 HE'S JUST TOLD US ABOUT HIGH LEVELS.

6 MR. VASSALOTTI: YOUR HONOR,
7 I THINK HE'S DESCRIBING -- AND I DON'T WANT
8 TO PUT WORDS IN YOUR MOUTH, DOCTOR -- THE
9 DIFFERENCE IN EXPOSURE LEVELS.

10 MR. RENNEISEN: THAT WASN'T
11 THE QUESTION THEN. I ASK THAT THE ANSWER BE
12 STRICKEN AND THAT QUESTION BE ASKED.

13 THE COURT: I'M GOING TO
14 ALLOW IT. I THINK THE JURY SHOULD HEAR THIS
15 BACKGROUND. WE HAVE AN EXPERT. YOU HAVE NOT
16 OBJECTED TO HIS QUALIFICATIONS. THE COURT
17 FINDS HIM WELL QUALIFIED. THE COURT WILL
18 ALLOW THIS. IT BEARS EXACTLY ON THE ISSUES IN
19 THIS CASE.

20 THE WITNESS: THE THIRD KIND
21 OF EXPOSURE IS THE EXPOSURE WHERE LEVELS ARE
22 LOW. AND WHEN YOU TAKE THE POLYVINYL RESIN
23 AND YOU WORK ON IT, YOU MAKE PHONOGRAPHS, YOU
24 MAKE PLASTIC. THAT IS WHAT WE CALL
25 FABRICATION. SO, I'M MAKING DISTINCTIONS

21109049

1 BETWEEN TWO KINDS OF EXPOSURES TO VINYL
2 CHLORIDE.

3 THE VERY LOW LEVELS, WHEN YOU
4 TAKE THE VINYL -- THE PRODUCT, THE
5 POLYVINYLCHLORIDE PRODUCT AND MAKE THINGS
6 LIKE RECORDS OR WHAT HAVE YOU OR GARDEN HOSE,
7 AND WHEN YOU FABRICATE -- WHEN YOU
8 FABRICATE THE POLYVINYLCHLORIDE, THE LEVELS
9 OF VINYL CHLORIDE ARE VERY LOW, COMPARED TO
10 WHAT THEY ARE WHEN YOU EITHER MANUFACTURE THE
11 VINYL CHLORIDE OR WHEN YOU HANDLE THE
12 POLYVINYLCHLORIDE. OKAY.

13 SO, THE RELEVANCE OF ALL THIS
14 IS AS FOLLOWS: IN THE POLYVINYLCHLORIDE
15 FABRICATION, LEVELS OF VINYL CHLORIDE
16 EXPOSURE ARE LOW AND THERE WAS A STUDY BY THE
17 NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND
18 HEALTH IN 1978 WHICH DID A SURVEY OF
19 FABRICATING PLANTS, EVERY VINYL CHLORIDE
20 FABRICATING PLANT, IN WHICH THEY SHOWED THE
21 LEVEL OF VINYL CHLORIDE IN THE FABRICATING
22 PLANT, RANGED FROM THE NONDETECTABLE --
23 THEY WERE SO LOW YOU COULDN'T PICK THEM UP TO
24 A MAXIMUM OF ABOUT TWO PARTS PER MILLION.
25 OKAY. SO, WE'RE DEALING NOW WITH AN INDUSTRY,

21109050

BFG09792

1 THE POLYVINYLCHLORIDE FABRICATION INDUSTRY IN
2 WHICH THE LEVELS OF VINYL CHLORIDE EXPOSURE
3 IS DEMONSTRABLY LOW. LET US NOW EXPERIENCE
4 THE EXPERIENCE IN THIS INDUSTRY TO SEE WHAT
5 IS THE EFFECT AND YOU'LL GET SOME INDICATION
6 THERE.

7 WE FIND, FIRST OF ALL, IN A
8 PLANT IN CONNECTICUT IN PUBLICATION CHRISTINE,
9 1974, TWO ANGIOSARCOMAS OF THE LIVER WERE
10 DESCRIBED IN 1974. ONE OF THESE CASES WASN'T
11 EVEN A WORKER, HE WAS AN ACCOUNTANT, NOT
12 LIKELY TO BE TOOLING AND FABRICATING THE
13 STUFF ALL DAY LONG. SO, IN THESE PLANTS WHERE
14 LEVELS OF EXPOSURE ARE LOW, TWO ANGIOSARCOMAS
15 ARE DESCRIBED, INCLUDING ONE ACCOUNTANT.

16 WHAT ELSE DO WE FIND? IN A
17 PUBLISHED TEXT BY BAXTER IN 1947, AN
18 ANGIOSARCOMA OF THE WORKER IN A
19 POLYVINYLCHLORIDE FABRICATOR. WHAT ELSE DO WE
20 FIND?

21 COULD I TROUBLE YOU FOR A
22 DROP OF WATER, PLEASE?

23 WHAT ELSE DO WE FIND? IN
24 ANOTHER STUDY, IN A BRITISH PLANT, BY BAXTER,
25 WE FIND -- WE FIND AN EXAMPLE OF CANCER OF

21109051

BFG09793

1 THE STOMACH IN A GROUP OF ABOUT 700
2 FABRICATORS, CANCER OF ANOTHER SITE. AND
3 FINALLY, WE FIND IN A SERIES OF 17
4 POLYVINYLCHLORIDE PLANTS LOOKED AT IN THIS
5 COUNTRY, AN EXCESSIVE CANCERS OF VARIOUS
6 SITES, GUTS, LUNG, LYMPHATIC SYSTEM AND
7 BREAST. SO, MY SECOND LINE OF EVIDENCE --
8 I'VE ALREADY TOLD YOU ABOUT THE HUMAN DATA,
9 THE ANIMAL DATA. THE SECOND LINE OF EVIDENCE
10 RELATES TO THE OCCUPATIONAL DATA IN WHICH
11 ANGIOSARCOMAS AND OTHER MALIGNANCIES ARE
12 DESCRIBED IN WORKERS EXPOSED TO WHAT COULD IN
13 THIS CONTEXT BE CALLED RELATIVELY LOW LEVELS.

14 LET US NOW LOOK AT A THIRD
15 TYPE OF PIECE OF INFORMATION IN EVIDENCE;
16 THAT IS, COMMUNITY CANCER. COMMUNITY CANCER
17 --

18 Q. WHAT DO YOU MEAN BY COMMUNITY CANCER,
19 DOCTOR?

20 A. FINE. WHAT I MEAN BY COMMUNITY
21 CANCERS ARE CANCERS OCCURRING IN RESIDENTS
22 WHO LIVE IN -- PEOPLE LIVING IN CLOSE
23 PROXIMITY TO VARIOUS INDUSTRIES. AND THERE'S
24 A GROWING BODY OF INFORMATION SUGGESTING --
25 SUGGESTING IS PERHAPS NOT A SUFFICIENTLY

21109052

BFG09794

1 STRONG STATEMENT -- INDICATING THAT
2 PROXIMITY OF RESIDENTS TO CERTAIN INDUSTRY IS
3 WHAT WE CALL IN THE TRADE A RISK FACTOR. IT
4 PUTS YOU AT EXCESS RISK OF DEVELOPING CANCER.
5 AND THE BASE FOR THIS STARTED IN -- WITH A
6 PUBLICATION OF SOME MAPS BY THE NATIONAL
7 CANCER INSTITUTE, WHICH SHOWED -- AND THESE
8 WERE -- WOULD SHOW THAT IN CERTAIN PARTS OF
9 THIS COUNTRY, YOU HAD HIGH LEVELS, LIVING
10 ENCOUNTERS IN CERTAIN PARTS OF THIS --
11 THERE WERE VERY HIGH LEVELS OF CANCER AS
12 COMPARED TO OTHER PARTS OF THE COUNTRY. AND
13 THESE AREAS WERE THE HIGHLY INDUSTRIALIZED
14 NORTHEAST. AND IT'S NOT OVERALL CANCER
15 MORTALITY RATES, BUT IT'S CANCER FOR A WIDE
16 RANGE OF SITES. AND THESE STUDIES HAVE BEEN
17 AMPLIFIED AND VARIOUS STUDIES SHOWING AGAIN
18 IN CERTAIN PARTS OF AMERICA, IN CERTAIN
19 STATES IN CERTAIN COUNTIES, THERE ARE EXCESS
20 RATES OF CANCER. BEFORE I GET INTO THAT --
21 AND IN SOME OF THESE INSTANCES, THERE HAVE
22 BEEN WHAT WE CALL MONITORING STUDIES. THE AIR
23 HAS BEEN SAMPLED AND IT HAS BEEN SHOWN THAT
24 THE INDUSTRIES CONCERNED IN THESE AREAS WHERE
25 YOU HAVE HIGH LEVELS OF CANCER HAVE BEEN

21109053

BFG09795

1 PUTTING OUT CHEMICALS, CARCINOGENS INTO THE
2 AIR OF THE LOCAL COMMUNITIES. BUT LET US
3 RETURN NOW TO THE ANGIOSARCOMA.

4 THERE ARE EIGHT DOCUMENTED
5 CASES OF COMMUNITY ANGIOSARCOMA; THAT IS,
6 PEOPLE GETTING ANGIOSARCOMA, LIVING IN THE
7 VICINITY OF VINYL CHLORIDE --
8 POLYVINYLCHLORIDE PLANT. EIGHT CASES, WITH
9 MR. GRASSO, THAT'S NINE. LET'S TALK ABOUT THE
10 EIGHT CASES FIRST.

11 IN 1974, CHRISTINE REPORTED
12 ANGIOSARCOMA OF THE LIVER IN SOMEBODY LIVING
13 TWO MILES AWAY FROM A POLYVINYL CHLORIDE
14 PLANT IN CONNECTICUT. AND THIS WAS A MAN OF
15 AGE -- WHO DIED AT THE AGE OF 73 AND HE
16 LIVED -- INCIDENTALLY, HE DIED IN 1957. AND
17 HE LIVED TWO MILES AWAY FROM A PLANT IN
18 CONNECTICUT. AND THIS PLANT WAS A FABRICATING
19 PLANT; THEREFORE, LESS LIKELY TO PUT OUT
20 LARGE CONCENTRATIONS OF PVC. IN THIS SAME
21 PLANT WHERE THIS MAN LIVED IN, THERE WAS
22 ANOTHER OCCUPATIONAL CASE OF ANGIOSARCOMA, A
23 WORKER IN THIS PLANT ALSO DIED OF
24 ANGIOSARCOMA.

25 CHRISTINE ALSO DESCRIBED

21109054

BFG09796

1 ANOTHER CASE NEAR ANOTHER PLANT IN
2 CONNECTICUT.

3 Q. DOCTOR, LET ME INTERRUPT YOU FOR A
4 SECOND. YOU'RE TALKING ABOUT A REFERENCE TO
5 CHRISTINE. IS THAT AN AUTHOR OF A MEDICAL
6 ARTICLE?

7 A. YES, THAT'S AN AUTHOR OF A
8 SCIENTIFIC PUBLICATION WHICH I HAVE WITH ME
9 AND CAN MAKE AVAILABLE.

10 Q. BUT THESE ARE MATERIALS --

11 A. THIS IS PUBLISHED IN THE OPEN
12 LITERATURE. THERE WERE EIGHT INDICATIONS OF
13 ANGIOSARCOMA PUBLISHED IN THE OPEN SCIENTIFIC
14 LITERATURE AND LET ME, BEFORE GOING INTO THE
15 DETAILS, MAKE TWO POINTS ABOUT THEM: THAT
16 THESE PEOPLE ALL LIVED IN LESS THAN TWO MILES
17 -- OF THESE EIGHT CASES, THEY ALL LIVED
18 LESS THAN TWO MILES FROM THE PLANT -- FROM
19 THE PLANT, AND IN TWO OF THESE CASES, THE
20 LATENCY PERIOD WAS BRIEF, SIX YEARS IN ONE,
21 LIKE MR. GRASSO, AND EIGHT YEARS IN ANOTHER.

22 Q. DOCTOR, WE'LL GET TO THE LATENCY
23 PERIOD IN A MOMENT. RIGHT NOW LET'S TALK
24 ABOUT THE EVIDENCE OF THE DEVELOPMENT OF
25 ANGIOSARCOMA IN RELATIVELY LOW LEVELS OF

21109055

1 EXPOSURE?

2 A. WELL, WE'RE TALKING NOW ON THE THIRD
3 LINE OF EVIDENCE, NAMELY THE ACCOUNTS OF
4 ANGIOSARCOMAS IN COMMUNITY RESIDENTS, THIS
5 REPRESENTING THE THIRD LINE OF EVIDENCE FOR
6 THE ACCOUNTS OF ANGIOSARCOMAS AT LOW LEVELS
7 OF VINYL CHLORIDE EXPOSURE. I'VE ALREADY
8 MENTIONED TWO CASES.

9 THE THIRD CASE WAS DESCRIBED
10 BY BAXTER IN 1970, A MAN OF 61, WHO DIED IN
11 1970 WHO HAD LIVED FOR SIX YEARS NEAR A PLANT
12 AND IN THIS SAME PLANT WHICH HE LIVED NEAR,
13 THERE WAS ALSO A CASE OF A WORKER WHO DIED OF
14 ANGIOSARCOMA OF THE LIVER.

15 IN A PAPER BY BRADY IN 1977,
16 THERE WERE A TOTAL OF FIVE CASES OF WOMEN WHO
17 LIVED CLOSE TO PLANT. THE FIRST ONE DIED IN
18 1965. SHE LIVED LESS THAN A MILE FROM A PLANT.
19 THE SECOND WAS A WOMAN OF 45 WHO LIVED LESS
20 THAN A MILE FROM THE PLANT. THE THIRD WAS A
21 WOMAN OF 31 WHO LIVED A THIRD OF A MILE FROM
22 THE PLANT. THE FOURTH WAS A WOMAN OF 62 WHO
23 LIVED A THIRD OF A MILE FROM THE PLANT. AND
24 THE FIFTH WAS A WOMAN OF 31 WHO LIVED ABOUT
25 POINT ONE MILES FROM A PLANT. I SHOULD

21109056

BFG09798

1 MENTION THAT TWO OF THESE CASES, THE BAXTER
2 CASE, LIVED SIX YEARS, HAD ONLY SIX YEARS
3 EXPOSURE, WAS A SIX YEAR RESIDENT AND THE
4 BRADY CASE WAS AN EIGHT YEAR RESIDENT.

5 NOW, IN ADDITION TO THE
6 ANGIOSARCOMAS OCCURRING AS A COMMUNITY CANCER,
7 WE ALSO HAVE TWO OTHER KINDS -- WE ALSO
8 HAVE TWO OTHER REPORTS OF VINYL CHLORIDE
9 ASSOCIATED OR INDUCED CANCER IN COMMUNITY
10 RESIDENTS. AND THE PARTICULAR INTEREST OF
11 THESE IS AS FOLLOWS: THESE WERE BRAIN TUMORS.

12 NOW, WE KNOW THAT VINYL
13 CHLORIDE PRODUCES CANCER IN A WIDE RANGE OF
14 ORGANS AND VINYL CHLORIDE IS RECOGNIZED BY
15 THE INTERNATIONAL AGENCY FOR RESEARCH ON
16 CANCER AND VARIOUS OTHER GROUPS AS BEING WHAT
17 WE CALL A MULTI-SYSTEM CARCINOGEN FOR
18 PRODUCING CANCER IN A WIDE RANGE OF ORGANS,
19 NOT ONLY ANGIOSARCOMA OF THE LIVER BUT
20 PRODUCING CANCER OF THE LUNG, IN THE BRAIN
21 AND OTHER SITES.

22 NOW, IN THESE TWO COMMUNITY
23 CANCERS I'M TALKING ABOUT, NAMELY A STUDY BY
24 EANFANTI IN 1975, AN EXCESS IN BRAIN TUMORS
25 WAS DEMONSTRATED IN RESIDENTS IN OHIO

BFG09799

2109057

1 COMMUNITIES WHERE VC PVC PLANTS WERE LOCATED.
2 IN THE SAME YEAR, A STUDY WAS -- A CANADIAN
3 STUDY WAS PUBLISHED OF EXCESSIVE BRAIN TUMORS
4 OF PEOPLE LIVING IN A CANADIAN COUNTY NEAR A
5 VC PVC PLANT. THAT, VERY BRIEFLY, IS THE
6 EVIDENCE FOR THE CARCINOGENICITY AT WHAT
7 MAYBE CALLED LOW LEVELS, ALTHOUGH I WOULD PUT
8 QUOTATION MARKS AROUND THE WORD LOW.

9 Q. NOW, DOCTOR, IN DEALING WITH CANCER
10 CAUSING AGENTS LIKE VINYL CHLORIDE,, THE TERM
11 LATENCY PERIOD HAS COME UP IN THIS CASE AND
12 YOU JUST MENTIONED IT YOURSELF. WHAT DOES
13 LATENCY PERIOD MEAN?

14 A. THE LATENCY PERIOD IS REALLY THE
15 TIME FROM THE FIRST EXPOSURE TO A TOXIC OR
16 CANCER CAUSING CHEMICAL TO THE DATE OF
17 DIAGNOSIS OR DEATH FROM A PARTICULAR ADVERSE
18 EFFECT. NOW, THERE ARE OTHER WAYS OF DEFINING
19 LATENCY PERIOD, BUT I THINK THIS IS PROBABLY,
20 FOR THE CONTEXT -- FOR OUR CONTEXT,
21 PROBABLY THE MOST EFFECTIVE AND BEST
22 DEFINITION.

23 Q. DOCTOR, HAS THE MEDICAL RESEARCH
24 LITERATURE DETERMINED OR SUGGESTED THAT A
25 CERTAIN MINIMUM LATENCY PERIOD IS REQUIRED

21109058

BFG09800

1 FOR THE DEVELOPMENT OF ANGIOSARCOMA IN
2 PERSONS EXPOSED TO VINYL CHLORIDE?

3 A. WELL, IN GENERAL, I THINK IT'S FAIR
4 TO SAY THAT THE AVERAGE LATENCY PERIOD IN THE
5 LITERATURE FOR ANGIOSARCOMA IS SOMEWHAT IN
6 THE RANGES OF ABOUT 20 YEARS, SOMEWHERE IN
7 THAT KIND OF BALLPARK, 20 YEARS.

8 HOWEVER, THERE ARE REPORTS, A
9 WIDE RANGE OF REPORTS, OF ANGIOSARCOMAS AND
10 OTHER VINYL CHLORIDE INDUCED CANCER WITH
11 LATENCIES UNDER TEN YEARS.

12 Q. YOU'VE ALREADY MENTIONED, I THINK,
13 TWO OF THEM IN THE COMMUNITY CANCER CASES.

14 A. THAT IS CORRECT. LET ME JUST VERY
15 BRIEFLY RUN THROUGH THESE TEN -- THESE
16 REPORTS ON VINYL CHLORIDE INDUCED CANCER,
17 ANGIOSARCOMAS, UNDER TEN YEARS.

18 Q. AND AGAIN BEFORE YOU START, THESE
19 REPORTS THAT YOU'LL BE REFERRING TO ARE
20 MATERIALS THAT HAVE BEEN OUT IN THE PUBLIC
21 LITERATURE?

22 A. YES. IN 1975, THE ENVIRONMENTAL
23 PROTECTION AGENCY IN A PUBLIC DOCUMENT,
24 REFERRED TO TWO ANGIOSARCOMAS, ONE IN AN
25 ITALIAN WORKER, VINYL CHLORIDE WORKER, WHOSE

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BFG09801

1 LATENCY PERIOD WAS SIX YEARS, SIX YEARS, THE
2 SAME AS MR. GRASSO; THE SECOND WAS AN
3 ANGIOSARCOMA IN A BRITISH WORK WITH A LATENCY
4 OF EIGHT YEARS. THE THIRD CASE IS CHRISTINE'S
5 CASE IN 1974; THAT IS, THE ACCOUNTANT WHO
6 WORKED IN A FABRICATING PLANT WHO HAD A
7 LATENCY OF TEN YEARS.

8 THE NEXT IS A CASE I
9 MENTIONED ALREADY, THE ANGIOSARCOMA OF THE
10 LIVER, WHO HAD A LATENCY OF SIX YEARS. THIS
11 WAS A RESIDENT WHO LIVED LESS THAN HALF A
12 MILE FROM A VC PVC PLANT. THE NEXT CASE WAS
13 AGAIN A LIVER CANCER WITH A LATENCY PERIOD OF
14 EIGHT YEARS, PUBLISHED BY BRADY IN 1977, WHO
15 WAS A RESIDENT A THIRD OF A MILE AWAY FROM A
16 VC PVC PLANT IN NEW YORK.

17 OVER AND ABOVE THESE LIVER
18 ANGIOSARCOMAS, THE LIVER CANCER, WHICH IS
19 ANOTHER KIND OF MALIGNANCY OF THE LIVER WHICH
20 IS DIFFERENT FROM ANGIOSARCOMA BUT IS LETHAL
21 TODAY, WAS REPORTED IN A WORKER IN A BRITISH
22 VC PVC PLANT WITH A LATENCY OF NINE YEARS,
23 ANOTHER WAS IN THE SAME PAPER BY FOX AND
24 COLLIER, A CANCER OF THE LUNG IN A WORKER IN
25 THE BRITISH PLANT WITH A LATENCY OF NINE

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BFG09802

1 YEARS. IN THE SAME PAPER, ALSO CANCER OF THE
2 PANCREAS IN LESS THAN TEN YEARS IN A WORKER
3 IN A BRITISH PLANT. FINALLY, TWO BRAIN
4 CANCERS, A BRAIN CANCER IN A WORKER IN THE
5 UNITED STATES, VINYL CHLORIDE WITH A LATENCY
6 OF THREE YEARS, WAXWEILLER IN 1975. AND
7 FINALLY, A WORKER IN A SWEDISH PLANT WITH A
8 LATENCY OF LESS THAN ONE YEAR.

9 Q. DOCTOR, HAS BRAIN CANCER BEEN LINKED
10 WITH VINYL CHLORIDE?

11 A. IT MOST CERTAINLY HAS.

12 Q. DOCTOR, ARE YOU FAMILIAR WITH --
13 AS A PHYSICIAN AND A RESEARCHER, ARE YOU
14 FAMILIAR WITH THE ABILITY OF LUNGS TO BREATHE
15 IN PARTICLES OF VARIOUS SIZES?

16 A. YES, I WOULDN'T CLAIM PARTICULAR
17 EXPERTISE OF AREAS OF RESPIRATORY PHYSIOLOGY,
18 BUT I'M CONVERSANT WITH SOME ELEMENTS OF THE
19 FIELD.

20 Q. DOCTOR, IF A PERSON WAS EXPOSED TO
21 ATMOSPHERE HAVING WITHIN IT PVC DUST
22 PARTICLES WITHIN A SIZE RANGE OF ONE TO TEN
23 MICRONS -- DO YOU KNOW WHAT A MICRON IS?

24 A. YES.

25 Q. WOULD THOSE PARTICLES BE RESPIRABLE,

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BFG09803

1 WOULD THEY ENTER INTO A PERSONS LUNGS?

2 A. SURE. THE SMALLER THE PARTICLE, --
3 CERTAINLY, WHEN YOU REACH MORE THAN -- WHEN
4 YOU REACH TEN MICRONS AND ABOVE, THE
5 PARTICLES TEND TO BE IRRESPIRABLE. THE LOWER
6 YOU GO, THE GREATER THE ABILITY OF THE LUNG
7 TO RETAIN THESE PARTICLES, SO THE LOWER, THE
8 SMALLER THE PARTICLE, JUNK MORE RESPIRABLE IT
9 IS WITHIN THIS RANGE.

10 Q. AND WOULD THEY BE -- ONCE RESPIRABLE,
11 WOULD THESE SMALL PARTICLES -- WOULD ANY OF
12 THESE SMALL PARTICLES BE SUBJECTED TO BE
13 RETAINED OR ENTRAPPED IN THE LUNG?

14 A. YES. AND THERE ARE VARIOUS STUDIES
15 ON THE EFFECTS OF POLYVINYLCHLORIDE PARTICLES
16 IN THE LUNG. THERE HAVE BEEN A WHOLE SERIES
17 OF PUBLICATION SHOWING THAT POLYVINYLCHLORIDE
18 CAN PRODUCE GRANULOMATOUS CHANGES IN THE LUNG
19 AND THERE ARE VARIOUS PUBLICATIONS ON THE
20 ABILITY OF PARTICLESS TO PRODUCE THESE
21 CHANGES IN THE PARTS QUITE APART FROM
22 INFORMATION THAT WE HAVE ON ITS
23 CARCINOGENICITY, ON THE CARCINOGENIC EFFECTS
24 OF POLYVINYLCHLORIDE.

25 THE COURT: I THINK WE'LL

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BFG09804

1 TAKE OUR NOON RECESS, LADIES AND GENTLEMEN.
2 BE BACK HERE AT 1:30.

3 (AT WHICH TIME THE JURY
4 LEAVES THE COURT ROOM.).

5 THE COURT: WE WILL STAND IN
6 RECESS UNTIL 1:30

7 (LUNCHEON RECESS).

8 THE COURT: PLEASE CONTINUE.

9 MR. VASSALOTTI: THANK YOU,
10 YOUR HONOR.

11 BY MR. VASSALOTTI:

12 Q. DOCTOR, YOU WERE NOT IN THE COURT
13 THIS MORNING WHEN I READ A HYPOTHETICAL FACT
14 SITUATION TO DOCTOR LAUCIUS, WERE YOU?

15 A. NO.

16 Q. DOCTOR, IN THAT CASE, I'LL HAVE TO
17 ASK YOU TO ASSUME THE FOLLOWING FACTS WITH
18 REGARD TO THIS CASE: FIRST THAT MR. JOHN
19 GRASSO WAS BORN ON DECEMBER 27, 1927 AND THAT
20 UP UNTIL HIS LAST ILLNESS IN MAY OF 1976,
21 THERE WAS NO HISTORY, MEDICAL HISTORY OF
22 CANCER OR LIVER DISEASE IN MR. GRASSO, AND
23 THAT ALSO, THERE WAS NO HISTORY OF CANCER OR
24 LIVER DISEASE IN EITHER OF HIS PARENTS OR HIS
25 BROTHERS OR SISTERS. I FURTHER ASK YOU TO

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1 ASSUME THAT MR. GRASSO BEGAN WORKING AT THE
2 DUPONT CHAMBERSWORKS IN DEEPWATER, NEW JERSEY
3 IN APPROXIMATELY 1947 AND THAT EXCEPT FOR
4 PERIODS WHEN HE WAS LAID OFF FROM THAT
5 FACILITY, HE WORKED THERE UNTIL MAY OF 1976;
6 AND THAT IN THAT EMPLOYMENT AT THE DUPONT
7 CHAMBERSWORKS, HE DID NOT WORK WITH ARSENIC
8 OR ARSENIC COMPOUNDS OR WITH VINYL CHLORIDE.
9 DURING THE PERIODS THAT HE WAS LAID OFF FROM
10 THE DUPONT CHAMBERSWORKS, HE HELD SUCH JOBS
11 AS WORKING AT AN GROCERY STORE, AN AUTO PARTS
12 SALESMAN, A GAS STATION ATTENDANT, A
13 CONSTRUCTION LABORER, AN AUTO MECHANIC AND A
14 SHEET METAL WORKER. I ASK YOU TO FURTHER
15 ASSUME THAT DURING THE YEARS OF 1970 THROUGH
16 1975, MR. GRASSO WAS AWAY FROM HIS HOME
17 APPROXIMATELY 50 TO 55 HOURS PER WEEK;
18 THEREFORE, HE WAS AT HOME OR IN THE AREA OF
19 HIS HOME APPROXIMATELY -- OR OVER 50
20 PERCENT OF THE TIME DURING THOSE YEARS.

21 IN ADDITION, I ASK YOU TO
22 ASSUME THAT IN FEBRUARY OF 19 -- BETWEEN
23 FEBRUARY OF 1973 AND SEPTEMBER OF 1973, MR.
24 GRASSO WAS AT HOME VIRTUALLY ALL THE TIME, AS
25 HE WAS RECUPERATING FROM CORONARY ARTERY

BFG09806

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1 BYPASS SURGERY. I FURTHER ASK YOU TO ASSUME
2 THAT DURING THE PERIOD OF MARCH OF 1970
3 THROUGH DECEMBER, 1975, MR. GRASSO LIVED
4 APPROXIMATELY ONE POINT SEVEN MILES FROM A
5 PVC PRODUCTION PLANT OWNED AND OPERATED BY
6 THE B.F. GOODRICH COMPANY. DURING THOSE YEARS,
7 IT HAS BEEN ESTIMATED THAT THAT PVC PLANT
8 EMITTED BETWEEN THE ONE POINT FOUR AND FOUR
9 POINT THREE POUNDS OF VINYL CHLORIDE INTO THE
10 ATMOSPHERE. AND IT'S BEEN FURTHER ESTIMATED
11 THAT DURING THOSE YEARS THAT THE PVC PLANT
12 ALSO EMITTED INTO THE ATMOSPHERE AMOUNTS OF
13 PVC DUST PARTICLES THAT RANGED IN SIZE
14 BETWEEN ONE AND TEN MICRONS AND THAT SUCH PVC
15 DUST PARTICLES CONTAINED ENTRAPPED UNREACTED
16 VINYL CHLORIDE IN LEVELS RANGING FROM 40
17 PARTS PER MILLION UP TO 2,000 PARTS PER
18 MILLION.

19 IT HAS BEEN FURTHER ESTIMATED
20 THAT DURING THE YEARS 1970 THROUGH 1975, THAT
21 THERE EXISTED LEVELS OF VINYL CHLORIDE IN THE
22 AIR AND AROUND THE GRASSO HOME AND THAT THOSE
23 LEVELS HAVE BEEN ESTIMATED TO RANGE FROM ONE
24 POINT ONE PARTS PER MILLION TO 28 PARTS PER
25 MILLION, AND THAT THESE LEVELS OF VINYL

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BFG09807

1 CHLORIDE AT OR AROUND THE GRASSO HOME WERE .
2 PRESENT FOR A TOTAL OF 1,508 HOURS OF
3 CONDITIONS WHEN THE WIND WAS FAVORABLE TO
4 BRING THOSE MATERIALS THERE DURING THE YEARS
5 IN QUESTION.

6 FURTHER, ON -- IN HAZE OR
7 POLLUTION CONDITIONS, THE LEVEL OF EXPOSURE
8 AT THE GRASSO HOME RANGED AS HIGH AS FROM TEN
9 TO 90 PARTS PER MILLION.

10 FINALLY, DOCTOR, IN ADDITION
11 TO THOSE EXPOSURES OR THOSE LEVELS OF
12 EXPOSURE AT THE AREA OF THE GRASSO HOME,
13 THERE WERE IN ADDITION SHORT PERIODS OF TIME
14 DURING THE YEARS IN QUESTION RANGING ANYWHERE
15 FROM FIVE TO 15 MINUTES DURING WHICH IT HAS
16 BEEN ESTIMATED THAT LEVELS OF VINYL CHLORIDE
17 EXPOSURE IN THE AREA OF THE GRASSO HOME
18 RANGED AS HIGH AS SEVERAL HUNDRED PARTS PER
19 MILLION.

20 NOW, DOCTOR, BASED UPON THAT
21 INFORMATION, AND BASED UPON YOUR EXPERIENCE
22 AS A PHYSICIAN AND A TOXICOLOGIST, AND YOUR
23 KNOWLEDGE OF THE LITERATURE AND MEDICAL
24 EVIDENCE IN THE AREA OF CANCER AND CANCER
25 CAUSING CHEMICALS, DO YOU HAVE AN OPINION AS

21103066

BFG09808

1 TO WHAT CAUSED THE ANGIOSARCOMA OF THE LIVER
2 THAT MR. JOHN GRASSO HAD?

3 A. YES.

4 Q. AND WHAT IS YOUR OPINION, DOCTOR?

5 A. ~~MY OPINION IS THAT THERE IS A~~
6 ~~SUBSTANTIAL PROBABILITY THAT IS HIS~~
7 ~~ANGIOSARCOMA WAS DUE TO RESIDENTIAL EXPOSURE~~
8 ~~TO VINYL CHLORIDE EMITTED FROM THE B.F.~~
9 ~~GOODRICH PLANT.~~

10 Q. DOCTOR, WHY DIDN'T ANYBODY ELSE IN
11 THE GRASSO FAMILY GET THE ANGIOSARCOMA OF THE
12 LIVER?

13 A. WELL, I HAVE THREE RESPONSIVE
14 COMMENTS: FIRST OF ALL, I BELIEVE ON THE
15 BASIS OF THE EXPOSURE DATA THAT WE HAVE, THAT
16 THE GRASSO FAMILY IS AT RISK AND WHILE NOBODY
17 IN THAT FAMILY HAS DEVELOPED CANCER SO FAR, I
18 BELIEVE THAT THE FAMILY IS AT RISK AND
19 THEREFORE ONE CAN'T ANSWER THAT QUESTION
20 UNTIL THE REST OF THE FAMILY AND LOCAL
21 RESIDENTS HAVE BEEN FOLLOWED UP FOR LIFETIME,
22 POINT ONE.

23 POINT TWO, ~~MR. GRASSO~~ MAY
24 WELL -- AND I'M NOT PREPARED TO EXCLUDE THE
25 POSSIBILITY -- ~~MAY WELL HAVE BEEN~~

21109067

BFG09809

1 SENSITIZED TO THE VINYL CHLORIDE BY OTHER
2 EXPOSURES, SUCH AS CHEMICALS, A WIDE RANGE OF
3 CHEMICALS, NON-CARCINOGENIC AND CARCINOGENIC
4 WHICH HE HANDLED WHILE WORKING AT DUPONT.

5 AND THIRDLY, IN ANY
6 POPULATION OF ANIMALS OR HUMANS WHO ARE
7 EXPOSED, THERE IS A DISTRIBUTION, WHAT WE
8 CALL A GAUSSIAN, TYPE OF DISTRIBUTION OF
9 SENSITIVITY. SOME INDIVIDUALS FOR GENETIC AND
10 OTHER REASONS HAVE HIGH SENSITIVITY; SOME
11 INDIVIDUALS ARE THE OTHER KIND -- END OF IT,
12 HAVE A LOW SENSITIVITY AND SOME HAVE
13 INTERMEDIATE SENSITIVITY. THIS IS A
14 CHARACTERIC, BIOLOGICAL SENSE, WHEN YOU TAKE
15 ANY POPULATION, RATS, HUMANS, THE SENSITIVITY
16 IS -- SOME ARE VERY SENSITIVE, SOME
17 RESISTANT, SOME INTERMEDIATE. AND IT MAY WELL
18 BE THAT MR. GRASSO FELL INTO THE -- THE END
19 OF THE SPECTRUM, REPRESENTING THOSE WHO, FOR
20 GENETIC AND OTHER REASONS, ARE MORE SENSITIVE
21 THAN OTHERS.

22 MR. VASSALOTTI: THANK YOU,
23 DOCTOR, NO FURTHER QUESTIONS, YOUR HONOR.

24 THE COURT: CROSS-EXAMINE
25 CROSS EXAMINATION

21109068

BFG09810

1 BY MR. RENNEISEN:

2 Q. DOCTOR EPSTEIN, YOU USED TERM
3 SUBSTANTIAL PROBABILITY. WHAT DO YOU MEAN BY
4 SUBSTANTIAL PROBABILITY?

5 A. I THINK THE TERMS ARE
6 SELF-EXPLANATORY, BUT I'M WILLING TO OFFER
7 YOU SYNONYMS FOR SUBSTANTIAL AND SYNONYMS FOR
8 PROBABILITY, IF THIS IS WHAT YOU WISH.

9 Q. IN OTHER WORDS, IT SHOULD BE
10 INTERPRETTED WITHOUT ANY MEDICAL SIGNIFICANCE?
11 IT'S SIMPLY WHAT THE WORDS MEAN IN AN
12 ORDINARY DICTIONARY MEANING; IS THAT CORRECT?

13 A. NO. IT IS A STATEMENT OF -- MY
14 MEDICAL AND SCIENTIFIC OPINION THAT THERE IS
15 A SUBSTANTIAL PROBABILITY THAT HIS
16 ANGIOSARCOMA WAS DUE TO RESIDENTIAL EXPOSURE.

17 Q. I UNDERSTAND YOU'VE SAID THAT,
18 DOCTOR.

19 CAN YOU EXPAND UPON THAT AND
20 EXPLAIN WHAT YOU MEAN?

21 A. CERTAINLY. I THINK THAT SCIENCE --

22 Q. PROBABILITY MEANS MORE LIKELY THAN
23 NOT, DOES IT NOT?

24 A. YES. MEDICAL SCIENCE IS UNABLE IN
25 ANY PARTICULAR CASE OF AN ADVERSE EFFECT TO

21109069

BFG09811

1 TALK IN ABSOLUTE TERMS. ONE CAN ONLY DEVELOP
2 POSITIONS, INFERENTIALLY AND ON THE BASIS OF
3 PROBABILITIES. WITH VERY RARE EXCEPTION --
4 I'M GOING TO GIVE YOU AN EXCEPTION IN A
5 MOMENT -- THERE IS NO SINGLE ONE CAUSE FOR
6 ANY ONE DISEASE AND YOU CAN'T NECESSARILY IN
7 ANY ONE CASE TALK ABOUT ABSOLUTE CAUSALITY.
8 YOU CAN'T SAY, "I'M 100 PERCENT CERTAIN," OR
9 IF SOMEBODY SAYS THEY'RE 100 PERCENT CERTAIN,
10 THEY'RE ON SHAKY SCIENTIFIC GROUNDS. THERE
11 ARE CERTAIN KINDS OF CANCERS MESOTHELIOMA
12 THAT -- A CANCER INDUCED BY ASBESTOS --
13 WHICH FOR ALL INTENTS AND PURPOSES, HAS NEVER
14 -- ALTHOUGH THEY HAVE -- IT IS DANGEROUS
15 AT -- HAS NEVER, IF AT ALL BEEN INDUCED BY
16 AGENTS OTHER THAN ASBESTOS. THEREFORE, IF WE
17 WERE TALK ABOUT MESOTHELIOMA, THE LIKLIHOOD
18 IS ONE WOULD TALK IN MORE ABSOLUTE TERMS.

19 BUT IN A CASE LIKE THIS, I
20 THINK THAT IT IS SCIENTIFICALLY APPROPRIATE
21 TO TALK ABOUT THE MOST LIKELY AND THE MOST
22 PROBABLE. AND THE TERM SUBSTANTIAL
23 PROBABILITY REALLY EXPRESSES WHAT ARE THE
24 MOST LIKELY EXPLANATIONS FOR THIS CONDITION.

25 Q. THANK YOU, DOCTOR. NOW, WITH RESPECT

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BFG09812

1 TO ANGIOSARCOMA, I BELIEVE YOU HAVE ALREADY
2 TOLD US THAT THERE ARE FOUR AGENTS OR
3 CHEMICALS THAT HAVE BEEN IDENTIFIED TO DATE
4 AS CAUSATIVE -- AS AGENTS WHICH WILL CAUSE
5 ANGIOSARCOMA.

6 A. WELL, I'M NOT ABSOLUTELY -- JUST
7 ONE SLIGHT CAVEAT IF I MAY.

8 WHEN IT COMES TO THE ANABOLIC
9 STEROIDS, I DON'T THINK ONE CAN DEFINITELY
10 INCRIMINATE THOSE. ONE CAN TALK ABOUT
11 PROBABILITY. THE AUTHORS OF THE PAPER, FAULK
12 ET AL WERE VERY CAUTIOUS ABOUT THIS. THEY
13 DIDN'T INCRIMINATE THEM UNEQUIVOCALLY IN THE
14 SAME SENSE THAT VINYL CHLORIDE IS
15 INCRIMINATED. THEY TALKED ABOUT PROBABILITY
16 AND TO USE THE LANGUAGE, IF YOU WISH ME TO
17 QUOTE FROM THE LANGUAGE THEY USED -- THEY
18 SAY IT IS SUGGESTED THAT LONG TERM ANABOLIC
19 STEROIDS IS THE FORTH CAUSE AGAIN. THE
20 SUGGESTED ASSOCIATION WITH THE ANABOLIC
21 STEROIDS AND ANGIOSARCOMA REMAIN TO BE
22 CONFIRMED. I THINK WHAT WE CAN SAY IS THERE
23 ARE THREE CLEARCUT CAUSES AND A FOURTH --

24 Q. AND A POSSIBLE FOURTH?

25 A. AND A POSSIBLE FOURTH WHICH IS

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BFG09813

1 PROBLEMATIC, POSSIBLE.

2 Q. THE ARTICLE BY HENRY FAULK AND HIS
3 ASSOCIATES YOU'RE REFERRING TO, IS THAT THE
4 ARTICLE IN THE LANCET, IS IT NOT, NOVEMBER 24,
5 1979?

6 A. YES.

7 Q. IS IT TRUE, DOCTOR, THAT IN THAT
8 ARTICLE, THEY IDENTIFY APPROXIMATELY 25
9 PERCENT OF THE CASES WHICH HAVE CAUSES?

10 A. THAT'S RIGHT, YES.

11 Q. WHICH WOULD MEAN 75 PERCENT OF THE
12 CASES HAVE NOT YET BEEN IDENTIFIED AS HAVING
13 A CAUSE?

14 A. WELL, THAT'S A VERY INTERESTING
15 POINT, BECAUSE THAT'S NOT EXACTLY WHAT THEY
16 SAY.

17 Q. WELL, LET'S LOOK --

18 A. LET ME JUST COMPLETE MY ANSWER. WHAT
19 THEY SAY IS AS FOLLOWS: THEY SAY THAT OF THE
20 CASES DESCRIBED SOMETIME -- NAMELY BETWEEN
21 64 AND 74 -- THESE ARE THE ONLY RECORDED
22 CAUSES. THEY DON'T SAY THEY ARE THE ONLY
23 NECESSARY CAUSES. IN FACT, THEY GO TO POINT
24 OUT AT THE END OF THE ARTICLE --

25 Q. SUPPOSE --

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BFG09814

1 A. THE LAST SENTENCE READS.

2 THE COURT: LET THE DOCTOR
3 FINISH. YOU STARTED THE LINE OF QUESTIONING.

4 THE WITNESS: THE LAST
5 SENTENCE READS: "THE MOST IMPORTANT PURPOSE
6 IN CALLING ATTENTION TO THIS RANGE OF
7 CONDITIONS IS TO ENCOURAGE THE SEARCH OR
8 ETIOLOGIC FACTOR ENDOGENOUS, MEDICAL AND
9 ENVIROMENTAL AND INDUSTRIAL, WHICH ARE
10 RESPONSIBLE FOR THE CASE CONSIDERED SO FAR TO
11 BE IDIOPATHIC." BY IDIOPATHIC, ONE MEANS THE
12 CASES FOR WHICH THERE IS NO KNOWN RECORDED
13 ETIOLOGY. SO THE AUTHORS OF THIS PAPER SAY,
14 WE SHOULD LOOK A GREAT DEAL BETTER THAN WE
15 REALLY HAVE FOR CAUSES, FOR ANGIOSARCOMA
16 WHICH UP TILL NOW HAVE BEEN REGARDED AS
17 IDIOPATHIC. AND, IN FACT, THERE IS A
18 SUBSEQUENT LITERATURE, THE ARTICLE BY BRADY,
19 MAKES IT VERY CLEAR THAT THE -- THERE ARE
20 MORE KNOWN CAUSES -- OR AS MANY KNOWN
21 CAUSES OF ANGIOSARCOMA AS THERE ARE UNKNOWN
22 CAUSES.

23 Q. WOULD YOU READ THE FIRST SENTENCE OF
24 THE SUMMARY FOR ME, PLEASE?

25 A. CERTAINLY.

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1 Q. THE VERY FIRST SENTENCE IN THE
2 ARTICLE.

3 A. A RETROSPECTIVE
4 EPIDEMIOLOGICAL STUDY OF DEATHS FROM HEPATIC
5 ANGIOSARCOMA HAS IN THE U. S. SHOWED DURING
6 1954-74 THERE WERE 168 SUCH CASE, OF WHICH
7 37, 22 PER CENT, WERE ASSOCIATED WITH
8 PREVIOUSLY KNOWN CAUSES, VINYL CHLORIDE,
9 THOROTRAST AND INORGANIC ARSENIC AND FOUR,
10 THREE POINT ONE PERCENT, OF THE REMAINING 131
11 CASES WITH THE USE OF ANDROGENIC-ANABOLIC
12 STEROIDS.

13 Q. AM I CORRECT, DOCTOR IN
14 UNDERSTANDING THERE IS NO DISCUSSION OF THE
15 CAUSE OF THE OTHER 75 PERCENT?

16 A. THAT'S NOT MY POINT. MY POINT IS
17 THAT THEY CONCLUDE THAT FOR THE OTHER CASES,
18 WE SHOULD LOOK FOR THE CAUSES AND THAT --
19 LET ME REPEAT AGAIN. THAT WE SHOULD LOOK --
20 THE MOST IMPORTANT PURPOSE, THE BOTTOM LINE
21 OF THE ARTICLE -- AND I REMEMBER -- THE
22 MOST IMPORTANT PURPOSE IN CALLING ATTENTION
23 TO THIS RANGE OF CONDITIONS IS TO ENCOURAGE
24 THE SEARCH FOR THE ETIOLOGIC FACTORS,
25 ENVIROMENTAL, INDUSTRIAL, ENDOGENOUS AND

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BFG09816

1 MEDICAL, WHICH ARE RESPONSIBLE FOR THE CASES
2 CONSIDERED SO FAR TO BE IDIOPATHIC. FOR THE
3 CASES WHICH UP TO NOW WHICH HAVE BEEN
4 CONSIDERED TO HAVE NO CAUSE. HIS POINT IS FOR
5 THESE REMAINING CASES, WE SHOULD TRY TO FIND
6 THE CAUSE, SUCH AS COMMUNITY RESIDENCES,
7 WHICH TILL RELATIVELY RECENTLY, HAVEN'T BEEN
8 WELL DOCUMENTED.

9 Q. ~~WOULD THE COURT REPORTER READ BACK~~
10 ~~MY QUESTION, PLEASE? I DON'T THINK IT WAS~~
11 ~~ANSWERED. IF IT HAS BEEN, I'LL APPOLOGIZE.~~
12 ~~BUT I'D LIKE THE QUESTION READ BACK.~~

13 THE COURT: READ BACK THE
14 QUESTION.

15 (QUESTION READ)

16 BY MR. RENNEISEN:

17 Q. ~~CAN YOU ANSWER THAT QUESTION YES OR~~
18 ~~NO, DOCTOR?~~

19 A. ~~THE ANSWER IS, THERE IS A DISCUSSION.~~

20 Q. ~~THERE IS A DISCUSSION?~~

21 A. ~~YES.~~

22 Q. AND IS YOUR -- THE ANSWER YOU'VE
23 JUST GIVEN ME, THE DISCUSSION THAT EXISTS?

24 A. THAT IS THE BOTTOM LINE OF THE
25 ARTICLE, YES; THERE ARE OTHER REFERENCES TO

BFG09817

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1 THIS PROBLEM THROUGHOUT THE PAPER. BUT THE
2 -- I REPEAT, IT SAYS THE MOST IMPORTANT
3 PURPOSE. THE PAPER SAYS THE MOST IMPORTANT
4 PURPOSE IS TO LOOK FOR CAUSES FOR THOSE
5 ANGIOSARCOMAS WHICH UP TILL NOW HAVE BEEN
6 CONSIDERED NOT TO HAVE A CAUSE. THAT IS WHAT
7 THE PAPERS SAYS.

8 Q. THE PAPER SAYS LOOK FOR CAUSES. DOES
9 THE PAPER DISCUSS POSSIBLE OTHER CAUSES?

10 A. NO. IT DOESN'T. BECAUSE WE HAVE A
11 RANGE OF CAUSES, FOUR CAUSES, AND IN THESE
12 164 CASES, WHAT HAVE YOU, IT IS IMPORTANT
13 THAT EACH OF THEM SHOULD BE CAREFULLY SERCHED
14 TO EXAMINE FOR THE POSSIBILITY OF EXPOSURE TO
15 THESE AGENTS. AND IN THE LITERATURE IN THE
16 PAST, THERE HASN'T BEEN DOCUMENTATION OF SUCH
17 EXPOSURES. IN THE SAME WAY AS SOME OF THE
18 COMMUNITY CANCER CASES HAVEN'T BEEN
19 RECOGNIZED IN THE PAST AS BEING DUE TO
20 ANGIOSARCOMA. AND THIS IS THE POINT OF THE
21 PAPER. IN CASES WHICH ARE CONSIDERED NOT TO
22 HAVE A CAUSE, LOOK FOR THE CAUSES, LOOK AND
23 SEE IF THEY LIVE CLOSE TO A PLANT, LOOK AND
24 SEE IF THEY WORK IN A PVC FABRICATION PLANT,
25 LOOK FOR THESE CAUSES.

21109076

BFG09818

1 Q. PRESENTLY DOCTOR, ARE THERE CASES
2 FOR WHICH CAUSES ARE UNATTRIBUTABLE FOR THE
3 CENTER OF DISEASE CONTROL AND HENRY FAULK AND
4 IS --

5 A. ~~MOST CERTAINLY.~~

6 Q. ~~AND CURRENTLY, IS THAT ABOUT 75~~
7 ~~PERCENT OF THE TOTAL NUMBER OF CASES?~~

8 A. ~~I WOULDN'T AGREE WITH THAT FIGURE~~
9 ~~AND LET ME GIVE YOU THE REASONS FOR NOT~~
10 ~~AGREEING.~~

11 LET US TURN TO --
12 THE COURT: LET ME SAY THIS,
13 DOCTOR: DO YOU WANT HIM TO CONTINUE ON.

14 MR. RENNEISEN: NO, SIR, BUT
15 EVERYTIME I CUT HIM OFF, YOUR HONOR, I'VE
16 BEEN --

17 THE COURT: ~~THIS SHOULD BE~~
18 ~~MORE OF A QUESTION AND ANSWER. HE'LL ASK THE~~
19 ~~QUESTION. I'VE GIVEN YOU BROAD LATITUDE. BUT~~
20 ~~REMEMBER, HE'S QUESTIONING YOU AND YOU'LL~~
21 ~~RESPOND TO HIS ANSWERS. WHEN IT COMES BACK~~
22 FOR REDIRECT, IF THERE'S SOMETHING THAT
23 COUNSEL FOR THE PLAINTIFF WANTS TO GET OUT OF
24 YOU, HE'LL GET OUT OF YOU. BUT, DO IT BY
25 QUESTION AND ANSWER AND SORT OF STAY AWAY

21109077

1 FROM THE VOLUNTEERING. GO AHEAD.

2 MR. RENNEISEN: WHAT WAS MY
3 LAST QUESTION?

4 (DESIGNATED QUESTION IS READ.)

5 BY MR. RENNEISEN:

6 Q. ~~SO, DOCTOR, I WAS ASKING YOU AT THE~~
7 ~~PRESENT TIME, ARE APPROXIMATELY 75 PERCENT OF~~
8 ~~THE TOTAL CASES OF ANGIOSARCOMA ATTRIBUTED BY~~
9 ~~THE CENTER FOR DISEASE CONTROL TO UNKNOWN~~
10 ~~CAUSES?~~

11 A. YES.

12 Q. ~~THANK YOU.~~

13 Q. DOCTOR, WHEN YOU TESTIFIED
14 CONCERNING YOUR QUALIFICATIONS, YOU GAVE US A
15 GREAT DEAL OF BACKGROUND ABOUT YOURSELF. HAVE
16 YOU DONE ANY ANIMAL STUDIES YOURSELF WITH
17 RESPECT TO VINYL CHLORIDE?

18 A. I'VE DONE NO CARCINOGENICITY STUDIES.
19 I DID SOME MUTAGENICITY STUDIES ABOUT TEN
20 YEARS AGO, BUT I'VE DONE NO CARCINOGENICITY
21 STUDIES WITH THE WITH IT.

22 Q. YOU TESTIFIED THIS MORNING THAT
23 ANGIOSARCOMA IS A VERY RARE FORM OF LIVER
24 CANCER. HOW MANY CASES CAN WE EXPECT A YEAR
25 IN THE ENTIRE COUNTRY; DO YOU KNOW, DOCTOR?

21109078

BFG09820

1 A. WELL, THERE HAVE BEEN VARYING
2 ESTIMATES ON THIS, SOMEWHERE IN THE RANGES OF
3 ABOUT 25 TO 30 A YEAR, SOMEWHERE IN THAT BALL
4 PARK. THAT WAS A C.D.C. ESTIMATE OF A FEW
5 YEARS AGO.

6 Q. IN TALKING ABOUT THE HISTORY OF THE
7 LITERATURE SHOWING INFORMATION ABOUT VINYL
8 CHLORIDE, YOU, I BELIEVE, SAID THAT BACK IN
9 AROUND 1930, IT WAS FOUND THAT CONCENTRATIONS
10 OF FIVE PERCENT PRODUCED ACUTE TOXICITY IN
11 ANIMALS. FIVE PERCENT IS HOW MANY PARTS PER
12 MILLION?

13 A. IT'S VERY HIGH, ABOUT 50 THOUSAND,
14 P.P.M..

15 Q. AND ^{concentration} NATIONALS HIGHER THAN IT IS
16 EXPLOSIVE LIMIT?

17 A. OH, YES, VERY HIGH CONCENTRATIONS
18 INDEED.

19 Q. AND AT THAT LEVEL, IT WOULD MAKE AN
20 ANIMAL UNCONSCIOUS POSSIBLY?

21 A. SURE, ABSOLUTELY.

22 Q. AND NOBODY -- NOBODY EVER WORKED
23 IN LEVELS THAT HIGH, DID THEY?

24 A. THERE HAVE BEEN RECORDED HIGH LEVELS
25 IN AUTOCLAVES. I CAN'T RECALL THE EXACT

21109079

BFG09821

1 LEVELS, BUT I WOULD AGREE WITH YOU THAT IN
2 ALL PROBABILITY, THIS IS AN EXTRAORDINARY
3 HIGH LEVEL, WHICH PROBABLY ISN'T COMMONLY
4 FOUND IN THE WORK PLACE.

5 Q. AND IF SOMEBODY STRUCK A MATCH IN
6 THAT LEVEL, BOOM, IT WOULD GO OFF, RIGHT?

7 A. IT WOULD GO OFF, SURE.

8 Q. IN YOUR REVIEW OF THE LITERATURE
9 -- AND I THINK YOU SAID IT WAS MOSTLY
10 EUROPEAN LITERATURE -- TALKING ABOUT
11 TOXICITY, YOU DIDN'T FIND ANY REFERENCE TO
12 ANGIOSARCOMA, DID YOU, ABOUT THE PERIOD FROM
13 1949 TO 1970?

14 A. TO -- I MISSED --

15 Q. IN THE PERIOD FROM 1949 UNTIL VIOLA
16 IN 1970 --

17 A. THAT'S RIGHT.

18 Q. -- THERE WAS NO REFERENCE TO --

19 A. CORRECT.

20 Q. -- ANGIOSARCOMA.

21 NOW, I THINK YOU HAVE SAID
22 THAT THAT LITERATURE WAS AVAILABLE AND COULD
23 BE READ BY ANYONE WHO WAS INTERESTED IF THEY
24 DID A LITERATURE SEARCH; IS THAT CORRECT?

25 A. YES.

21109060

BFG09822

1 Q. WERE YOU FAMILIAR WITH THE
2 LITERATURE BEFORE 1970?

3 A. OF VINYL CHLORIDE?

4 Q. YES.

5 A. I DON'T THINK SO. BUT THEN I DIDN'T
6 HAVE RESPONSIBILITIES IN THE AREA.

7 Q. YOU WERE IN THE ENVIROMENTAL AREA AT
8 THAT TIME, WERE YOU NOT?

9 A. YES. I I WAS INTERESTED IN THOUSANDS
10 OF CHEMICALS.

11 Q. ALL RIGHT. DOCTOR, IS IT TRUE THAT
12 THERE WAS A PERIOD OF TIME -- I BELIEVE IT
13 WAS IN 1950'S BUT IT MAY HAVE BEEN IN THE
14 1960'S -- WHEN BECAUSE OF ITS NARCOTIC
15 EFFECT, VINYL CHLORIDE WAS -- WAS
16 EXPERIMENTED WITH BY THE MEDICAL PROFESSION
17 AS AN ANESTHETIC?

18 A. ABSOLUTELY.

19 Q. I KNOW THAT STUDY WAS ABANDONED, BUT
20 IT DIDN'T PRODUCE ANY CANCER RESULTS THAT
21 ANYBODY KNOWS ABOUT, DOES IT?

22 A. I HAVE NO IDEA WHETHER THE PEOPLE
23 HAVE BEEN FOLLOWED UP. I JUST HAVE NO IDEA. I
24 THINK IT WOULD BE AN INTERESTING THING TO DO.
25 THAT MAY BE ONE OF THE UNEXPLAINED CAUSES OF

21109081

BFG09823

1 ANGIOSARCOMA.

2 Q. IT DIDN'T PRODUCE -- WHEN THE
3 EXPERIMENT TO USE IT AS AN ANESTHETIC STOPPED,
4 THERE WERE NO ACCOMPANING PAPERS DISCUSSING
5 CANCER, WERE THEY?

6 A. I DON'T THINK -- I DON'T THINK
7 THESE PAPERS HAVE BEEN FOLLOWED UP. I THINK
8 IT'S AN EXCELLENT IDEA TO FOLLOW THEM UP TO
9 SEE HOW MANY OF THEM HAVE GOT ANGIOSARCOMA OR
10 IF ANY HAVE. SPLENDID CONCEPT.

11 Q. YOU MENTIONED THAT PRIOR TO 1971,
12 THERE WERE EIGHT CASES OF ANGIOSARCOMA IN
13 VINYL CHLORIDE WORKERS.

14 WHEN DID THAT KNOWLEDGE --
15 WHEN WAS THAT KNOWLEDGE COLLECTED?

16 A. WELL, IT IS IT CAME IN TWO STAGES:
17 FIRST OF ALL, THESE WORKERS WERE KNOWN TO
18 HAVE DIED FROM CANCER OF THE LIVER. HOWEVER,
19 THE DIAGNOSIS OF ANGIOSARCOMA WAS ONLY MADE
20 AFTER THE B.F. GOODRICH ANNOUNCEMENT IN
21 JANUARY, 74, THAT SOME OF ITS WORKERS HAD
22 DIED OF ANGIOSARCOMA AND THIS WAS FIVE YEARS
23 AFTER THE VIOLA PUBLICATION OF THE
24 CARCINOGENICITY IF YOU RECALL. AND THE
25 REFERENCE TO THE -- THESE ANGIOSARCOMAS IS

21109082

BFG09824

1 THERE WERE TWO PAPERS, ONE BY HEATH AND THE
2 OTHER BY BYRON, THE SEVEN CASES WERE REPORTED
3 BY THE HEATH AND THE OTHER CASE WAS BY BYRON.

4 Q. DOCTOR, I DON'T WANT TO ARGUE WITH
5 YOUR ARITHMETIC. BUT VIOLA WAS 1970?

6 A. THAT'S RIGHT.

7 Q. AND THE B.F. GOODRICH ANNOUNCEMENT
8 WAS IN --

9 A. 74.

10 Q. AM I CORRECT THEN IN UNDERSTANDING
11 THAT AFTER DOCTOR CREECH AND DOCTOR JOHNSON
12 WHO ~~WERE~~ ACTUALLY HERE IN THE COURTROOM, MADE
13 THE ANNOUNCEMENT THAT THEY HAD DISCOVERED
14 THREE CASES IN GOODRICH WORKERS IN
15 LOUISVILLE, THEN OTHER PHYSICIANS BEGAN TO
16 EXAMINE OTHER DEATH RECORDS AND FOUND OTHER
17 CASES OF MEN WHO HAD DIED OF WHAT THEY THEN
18 DISCOVERED TO BE ANGIOSARCOMA OF THE LIVER.

19 A. ABSOLUTELY.

20 Q. AND THEN THEY WERE LOOKING AT DEATH
21 RECORDS OF PEOPLE WHO WORK WITH VINYL
22 CHLORIDE AND THEY FOUND THESE OTHER CASES; IS
23 THAT RIGHT?

24 A. CORRECT.

25 Q. YOU TALKED ABOUT MATALONI. AND I GOT

21109083

BFG09825

1 A LITTLE MIXED UP ON HIS DATES

2 HIS FIRST STUDIES WERE 1972.

3 HIS FIRST STUDIES WERE DISCUSSED IN A PAPER
4 PRESENTED IN 1972; IS THAT CORRECT?

5 A. NO, SIR, NO, NO, NOT AT ALL.

6 MATALONI STARTED -- AFTER
7 VIOLA'S PUBLICATION AND PRESENTATION,
8 MATALONI WAS GIVEN A CONTRACT TO CONFIRM AND
9 EXTEND THE FINDINGS. BY OCTOBER OF 1972, HE
10 HAD CONFIRMED A CARCINOGENICITY AND EXTENDED,
11 HAD GONE TO MUCH LOWER DOSES. THREE MONTHS
12 AFTER THAT, THIS INFORMATION WAS PASSED ON TO
13 THE MANUFACTURING CHEMISTS ASSOCIATION.

14 Q. EXCUSE ME?

15 A. BUT.

16 THE COURT: JUST A MOMENT.

17 MR. RENNEISEN: I DON'T THINK
18 I ASKED HIM THAT. I ASKED HIM WHAT DATE --

19 THE WITNESS: I'M GOING TO
20 TELL YOU.

21 BY MR. RENNEISEN:

22 Q. LET ME ASK YOU FIRST OF ALL, ARE WE
23 CORRECT IN UNDERSTANDING THAT HIS STUDIES
24 WERE IN SOME SENSE COMPLETED IN OCTOBER OF
25 1972?

21109084

1 A. NO, SIR, THAT'S NOT WHAT I SAID.

2 Q. WELL, WHEN WERE THEY COMPLETED?

3 A. LET ME ANSWER YOU, IF I MAY

4 HE STARTED A SERIES OF

5 ONGOING STUDIES IN ABOUT -- WITHIN SIX TO 9

6 MONTHS OF VIOLA'S COMMUNICATION. BY 1972, IN

7 THE ONGOING STUDIES, HE HAD DEMONSTRATED THE

8 CARCINOGENIC EFFECTS OF VINYL CHLORIDE AND

9 HAD EXTENDED VIOLA'S INDEPENDENT FINDINGS.

10 THE FIRST STATEMENT OF THIS CAME -- WAS

11 RELEASED IN JANUARY, 1974 ON THE SAME DAY AS

12 B.F. GOODRICH AND ANOUNCED THE DEATH FROM

13 ANGIOSARCOMA. THE FIRST PUBLICATION OF

14 MATALONI CAME SUBSEQUENT TO THAT. SO, AFTER

15 74.

16 Q. I'M SORRY, OKAY.

17 NOW, WHAT LEVELS WAS HE USING

18 IN THE STUDIES THAT WERE RELEASED IN JANUARY

19 OF 1974?

20 A. WELL, THE -- BY THEN, HE WAS

21 WORKING WITH CONCENTRATIONS OF ABOUT 50

22 P.P.M.. WHEN -- 50 P.P.M. BALL PARK. TO THE

23 BEST OF MY KNOWLEDGE, WHEN B.F. GOODRICH MADE

24 THE ANNOUNCEMENTS IN JANUARY, 1974, I DON'T

25 THINK THEY DISCLOSED DETAILS OF THE MATALONI

21103085

BFG09827

1 TESTS. THE INFORMATION ON THE MATALONI TEST
2 CAME FROM THE SUBSEQUENT PUBLICATIONS NOT NEW
3 YORK ACCADEMY OF SCIENCE VOLUME AND OTHER
4 PLACES. BUT IT WAS ABOUT 50 P.P.M. BY 1974.

5 Q. THEN LATER, HE CONTINUED STUDIES. IS
6 THAT RIGHT?

7 A. THAT'S CORRECT, YES. A SET OF
8 ONGOING STUDIES.

9 Q. AND THEY, ARE THEY STILL ONGOING?

10 A. TO THE BEST OF MY KNOWLEDGE, THE
11 OVERWHELMING MAJORITY OF THEM ARE COMPLETE
12 AND HAD BEEN COMPLETED BY 1978. THEY WERE
13 INFLUENCED -- THEY WERE PRESENTED IN COLD
14 SPRING HARBOR SYMPOSIUM IN 1978.

15 Q. I THINK YOU MENTIONED THAT IN ANIMAL
16 STUDIES, A SINGLE DOSE OF VINYL CHLORIDE DID
17 PRODUCE TUMORS OR DO I RECALL YOUR TESTIMONY
18 INCORRECTLY?

19 A. YOU RECALLED IT CORRECTLY BUT YOU'RE
20 LINKING IT NOW WITH MATALONI WHICH IS NOT
21 WHAT HE STUDIED.

22 Q. WHO DID THAT?

23 A. THAT WAS A CONSUMER PRODUCT SAFETY
24 COMMISSION ON STUDY ON BRIEF EXPOSURES TO
25 VINYL CHLORIDE.

21109086

BFG09828

1 Q. WHAT WAS THE DOSAGE FOR THAT BRIEF
2 KNOWLEDGE?

3 A. WELL IT WAS A RANGE OF YOUR DOSAGE
4 GOING FROM 50 P.P.M. TO ABOUT, I THINK, 5,000
5 OR SO AND THE RANGE AT -- AT THE ONE HOUR
6 LEVEL, THE LEVEL -- THE LEVEL AT WHAT THEY
7 -- AT WHICH THEY GOT TUMORS AT ONE HOUR WAS
8 50 -- WAS 500 P.P.M.. SO, FOR THE ONE HOUR
9 EXPOSURE, THAT -- WHICH WASN'T A MATALONI
10 STUDY, WHICH WAS IT IS CONSUMER PRODUCT
11 SAFETY COMMISSION, THEY GOT EFFECTS AT --
12 AT 500 P.P.M.. THE MATALONI STUDY, WHICH I
13 WAS REFERRED TO OF THE LOWEST LEVEL, THE ONE
14 P.P.M., THAT WAS AN INTERMITTENT EXPOSURE
15 OVER THE COURSE OF A YEAR, AT WHICH THE
16 BREAST CANCER WERE DEVELOPED FOLLOWING.

17 Q. WHEN YOU SAY INTERMITTENT, EIGHT
18 HOURS ON, EIGHT --

19 A. NO, BASICALLY IT WAS A FOUR HOUR.
20 FOR THE ONE PART PER MILLION STUDY, IT WAS
21 -- TO THE BEST OF MY RECOLLECTION, IT WAS
22 FOUR HOURS A DAY FOR FIVE DAYS A WEEK ON AND
23 OFF FOR THE YEAR. THAT WAS -- THAT WAS AN
24 INTERMITTENT LEVEL.

25 Q. FOUR HOURS A DAY --

21103087

BFG09829

1 A. FIVE DAYS A WEEK.

2 Q. FIVE DAYS A WEEK.

3 A. YEAH.

4 Q. IS THERE A WAY TO RELATING DOSE IN
5 RATS AND DOSAGE IN MAN, TAKING INTO
6 CONSIDERATION THEIR RESPECTIVE WEIGHTS OR
7 ISN'T THAT NECESSARY?

8 A. WELL, YOU KNOW, I CAN'T REALLY TELL
9 YOU WHETHER IT'S NECESSARY. IT'S POSSIBLE TO
10 DEVELOP A LOT OF PAPER CALCULATIONS ON THIS
11 RESPECT. AND RELATING DOSE ON THE BASIS OF
12 SURFACE AREA OR WEIGHT. THIS COULD BE DONE. I
13 DON'T HAVE -- I HAVEN'T MADE THESE
14 CALCULATIONS.

15 GENERALLY, I THINK IN
16 CARCINOGENESIS EXPERIMENT, ONE USES ANIMAL
17 DATA, NOT FOR MAKING QUANTITATIVE INFERENCES,
18 BUT SIMPLY FOR SAYING WHETHER THE MATERIAL IS
19 CARCINOGENIC FOR NOT OR NOT. THAT'S WHY I
20 -- HESITATED A BIT ABOUT --

21 Q. YOU MADE REFERENCE TO, I THINK,
22 TESTS CONDUCTED BY THE CONSUMER PRODUCT
23 SAFETY COMMISSION, THAT PRODUCED BREAST
24 TUMORS, IS THAT RIGHT?

25 A. NO. I'M AFRAID -- I APPEAR TO BE

21109088

1 CONFUSING YOU.

2 THE MATALONI STUDY AT ONE
3 PART PER MILLION PRODUCED BREAST TUMORS.

4 Q. WHAT DID THE C.P.S. -- THE
5 CONSUMER SAFETY PRODUCTS --

6 A. FINE. THE CONSUMER PRODUCT
7 COMMISSION PRODUCED PULMONARY ADENOMAS AND
8 THESE ARE SO CALLED BENIGN TUMORS OF THE LUNG
9 AND PULMONARY ADENOCARCINOMAS.

10 Q. AND THE ANGIOSARCOMA --

11 A. NO, NO. NO, THOSE WERE PULMONARY
12 TUMORS.

13 Q. DOCTOR, YOU HAVE REFERRED TO A
14 SERIES OF ARTICLES AND I THINK I HAVE COPIES
15 OF MOST OF THEM HERE.

16 IF I REFER TO AN ARTICLE THAT
17 YOU DON'T HAVE, I THINK I HAVE AN EXTRA COPY,
18 BUT IF YOU CAN LOCATE YOURS, THAT WOULD BE
19 FINE.

20 BUT BEFORE WE GET TO ARTICLES,
21 I HAVE A COUPLE OTHER QUESTIONS I'D LIKE TO
22 ASK YOU.

23 I BELIEVE YOU ALREADY HAVE
24 TESTIFIED THAT ARSENIC IS A KNOWN CAUSE OF
25 ANGIOSARCOMA; IS THAT CORRECT?

211090807

BFG09831

1 A. YES, SIR.

2 Q. AND YOU KNOW THAT FROM LITERATURE
3 STUDIES THAT YOU HAVE READ; IS THAT CORRECT?

4 A. YES, SIR.

5 Q. DO YOU KNOW THAT MR. GRASSO LIVED IN
6 SALEM COUNTY, NEW JERSEY AND THAT SALEM
7 COUNTY IS RURAL AND, FURTHERMORE, THAT
8 ARSENIC WAS USED AS AN INSECTICIDES IN SALEM
9 COUNTY. DO YOU KNOW THAT?

10 A. I DIDN'T KNOW THAT, BUT I WOULDN'T
11 BE SURPRISED.

12 Q. I TAKE IT YOU KNOW THAT ARSENIC IS
13 AN INGREDIENT IN INSECTICIDES?

14 A. I DO.

15 Q. ARSENIC IS A MINERAL, IS IT NOT?

16 A. WELL, I ANYONE PERHAPS MORE
17 CORRECTLY CALL IT A METALLOID, BUT I CALL IT
18 A MINERAL BY ALL MEANS.

19 Q. WELL, I DON'T WANT TO BE
20 UNSCIENTIFIC. WHAT IS THE DIFFERENCE BETWEEN
21 A MINERAL AND A METALLOID?

22 A. I THINK THAT TECHNICALLY THE TERM IS
23 THE METALLOID, BUT I'D RATHER NOT GET INTO

24 --

25 Q. IN ANY EVENT, AFTER YOU SPRAY IT ON

21109090

BFG09832

1 POPULATION, YOU'D EXPECT TO SEE 20 YEARS BUT
2 IN SPITE OF THAT, THERE ARE A WIDE RANGE OF
3 ANGIOSARCOMAS AND OTHER CANCERS IN WHICH IT'S
4 BEEN SEEN LESS THAN TEN YEARS AND IN FACT,
5 SOME SEEN AT SIX AND EIGHT YEARS.

6 Q. WHEN YOU SAY THE AVERAGE IS TEN TO
7 20--

8 A. NO, I DIDN'T SAY THAT. I SAID THE
9 AVERAGE IS 20.

10 Q. HOW MANY CASES GO INTO MAKE UP THAT
11 AVERAGE?

12 A. THAT'S A GOOD POINT. HEATH'S FIGURE,
13 I THINK, WAS BASED ON ABOUT 40 -- I OFFHAND
14 CAN'T RECALL. I'LL SAY SOMEWHERE 40 OR 50.

15 NOW, TO THE BEST OF MY
16 KNOWLEDGE, WHEN HEAT DEVELOPED HIS AVERAGE
17 PHYSICIAN, HE DIDN'T, AT THAT STAGE, HAVE
18 DOCUMENTATION ON THE COMMUNITY CASES WHICH WE
19 HAVE NOW. SO, THE LARGER THE NUMBER -- THE
20 LARGER THE NUMBER OF PEOPLE ON WHICH YOU BASE
21 AN AVERAGE, THE MORE MEANINGFUL IT IS. IF
22 YOU'RE TALKING ABOUT TWO PEOPLE, AN AVERAGE
23 OF TWO ISN'T VERY MEANINGFUL. WHEN YOU'RE
24 TALKING ABOUT 2,000, IT'S MORE MEANINGFUL,
25 2,000, STILL NOT MEANINGFUL. SO, WE'RE REALLY

21109113

BFG09833

1 TALKING ABOUT RELATIVELY SMALL NUMBERS.

2 Q. AM I CORRECT IN UNDERSTANDING THAT
3 THE CENTER FOR DISEASE CONTROL COLLECTS DATA
4 ON VINYL CHLORIDE CAUSED ANGIOSARCOMAS?

5 A. YES, THERE IS AN ONGOING REGISTRY AT
6 WHICH C.D.C. AND CENTER FOR DISEASE CONTROL

7 --

8 Q. AND AGAIN, THAT'S THE ORGANIZATION
9 DOWN AT --

10 A. IN ATLANTA, WHICH IS THE PARENT
11 ORGANIZATION OF THE NATIONAL INSTITUTE OF
12 OCCUPATIONAL SAFETY AND HEALTH.

13 Q. AND WHEN THEY -- DO THEY DO ANY
14 SCREENING OR ANALYSIS TO DETERMINE INTO WHICH
15 CATEGORY THEY PUT A -- LET'S SUPPOSE THEY
16 GET AN ANGIOSARCOMA DEATH. WHAT DO THEY DO TO
17 DECIDE WHETHER IT'S VINYL CHLORIDE, ARSENIC
18 OR UNKNOWN?

19 A. I CAN'T REALLY TELL YOU EXACTLY. I
20 THINK YOU SHOULD MORE APPROPRIATELY DIRECT
21 THE QUESTIONS TO THEM.

22 THE LISTINGS -- IF YOU LOOK
23 AT A PAPER BY SPERTAS, WHICH BASICALLY LISTS
24 THE CASES OF ANGIOSARCOMA, THESE ARE REALLY
25 OCCUPATIONAL ANGIOSARCOMAS WHICH THEY'RE

21109114

BFG09834

1 COLLECTING. SO, BASICALLY, THEY'RE CLERKING
2 ANGIOSARCOMAS IN THE WORK FORCE.

3 NOW, IT SO HAPPENS THAT SOME
4 OF THE C.D.C. PERSONNEL HAVE ALSO BEEN
5 INVOLVED IN PUBLICATIONS ON ANGIOSARCOMA
6 CAUSED BY AGENTS OTHER THAN PVC. BUT THEY'RE
7 MAJOR PRE-OCCUPATION IS ENLISTING THE
8 OCCUPATIONAL ANGIOSARCOMAS.

9 Q. HELP LIST THEM ALL, ALL THAT THEY
10 GET, DO THEY IS NOT?

11 A. YES, SURE.

12 Q. AND FOR EACH ONE, THEY TRY USING
13 SCIENTIFIC PRINCIPLES TO DETERMINE WHAT THE
14 CAUSE IS.

15 A. I DON'T KNOW WHETHER THEY HAVE --
16 HAVE DONE THIS FOR ALL CASES OF ANGIOSARCOMA.
17 I JUST DON'T KNOW WHETHER THIS IS THE CASE. I
18 KNOW THAT FROM THE -- IN THE OCCUPATIONAL
19 ONES, THEY'VE LISTED THE SPECIFICS, WHETHER
20 IT WAS A VC OPERATOR OR PVC OPERATOR. BUT
21 THERE ARE OTHER CASES, SUCH AS THE COMMUNITY
22 ONES WHICH HAVEN'T APPEARED IN THEIR LISTINGS,
23 BECAUSE THIS ISN'T THEIR RESPONSIBILITIES. IT
24 JUST SO HAPPENS THAT CHRISTINE PUBLISHED HER
25 RESIDENTIAL CASES IN AN OFFICIAL GOVERNMENT

21109115

BFG09835

1 PUBLICATION.

2 Q. THAT'S MORTALITY AND MORBIDITY, TOO?

3 A. YES, MORTALITY AND MORBIDITY REPORTS,
4 YES.

5 MR. RENNEISEN: YOUR HONOR,
6 I'M GOING TO BE A WHILE. I HAVE THESE
7 ARTICLES LEFT TO GO THROUGH.

8 THE COURT: LET'S TAKE A
9 RECESS AT THIS TIME. LET'S TAKE A LITTLE BIT
10 EARLIER RECESS.

11 TEN MINUTE RECESS, LADIES AND
12 GENTLEMEN.

13 (AT WHICH TIME THE JURY
14 LEAVES THE COURTROOM.)

15 THE COURT: WE'LL STANDS ON
16 RECESS, TEN MINUTES.

17 (SHORT RECESS.)

18 THE COURT: MR. RENNEISEN,
19 YOU MAY CONTINUE, SIR.

20 BY MR. RENNEISEN:

21 Q. DOCTOR, I'M GOING TO GET TO THOSE
22 ARTICLES I WAS TALKING ABOUT.

23 THE CHRISTINE ARTICLE IS THE
24 ONE THAT'S ON MORBIDITY AND MORTALITY; IS
25 THAT CORRECT?

21109116

1 A. YEAH.

2 Q. AND I BELIEVE YOU HAVE TOLD ME THIS
3 IS A GOVERNMENT PUBLICATION?

4 A. YEAH. I'M NOT ABSOLUTELY SURE. I
5 THINK IT'S A C.D.C. DOCUMENT, BUT I'M REALLY
6 NOT 100 PERCENT CERTAIN.

7 Q. WELL, AT THE VERY END, IT SAYS
8 "ADDRESS ALL CORRESPONDENCE FOR CENTER FOR
9 FOR DISEASE CONTROL."

10 A. YEAH, I'M PRETTY SURE, YEAH.

11 Q. AT THE ENDS OF THE CHRISTINE ARTICLE,
12 ON PAGE 216, THERE'S AN EDITORIAL NOTE. WOULD
13 THE EDITORIAL NOTE BE DOCTORS WITH C.D.C.?

14 A. I IMAGINE SO. SURE.

15 Q. NOW, AT THE TOP OF THE SECOND COLUMN
16 IN THE EDITORIAL NOTES, IT SAYS IN ABOUT THE
17 SIXTH OR SEVENTH LINE, "WHILE THESE FINDINGS
18 ESTABLISH NO CAUSAL CONNECTION BETWEEN
19 EXPOSURE TO PVC AND ANGIOSARCOMA OF THE LIVER,
20 THEY DO RAISE THE POSSIBILITY OF SUCH A
21 RELATIONSHIP."

22 A. SURE.

23 Q. DO YOU AGREE WITH THAT STATEMENT?

24 A. WELL, I DON'T THINK IT'S POSSIBLE TO
25 TALK ABOUT CAUSAL RELATIONSHIPS IN ABSOLUTE

21109117

BFG09837

1 TERMS. I THINK ALL YOU CAN TALK ABOUT IS
2 PROBABLE ASSOCIATIONS, THE MOST PROBABLE, THE
3 MOST LIKELY. THIS IS IT IS WAY IN WHICH ALL
4 CAUSALITY IS ATTRIBUTED IN MEDICINE. IF YOU
5 KNOW OF SOMEBODY WHO DIES OF LUNG CANCER AND
6 HE SMOKED FIVE PACKS OF CIGARETTES A DAY, IT
7 WOULD BE A RASH, A SCIENTIFICALLY RASH PERSON
8 TO SAY HIS LUNG CANCER WAS ABSOLUTELY CAUSED
9 BY THE SMOKING. SO WE'RE TALKING ABOUT MOST
10 PROBABLE ASSOCIATIONS, AND THE STRENGTH OF
11 THESE ASSOCIATIONS BECOMES GREATER THE MORE
12 CASES THAT APPEAR IN THE LITERATURE.

13 Q. BUT HERE WE'RE TALKING ABOUT THE
14 WORD POSSIBILITY. I MEAN, YOU HAVE TALKED
15 ABOUT PROBABILITY BUT HERE THE AUTHORS OF THE
16 EDITORIAL NOTE WHO YOU HAVE SAID ARE THE
17 DOCTORS AT CENTER FOR DISEASE CONTROL SAY,"
18 "THESE FINDINGS ESTABLISH NO CAUSAL
19 CONNECTION BETWEEN EXPOSURE TO PVC AND
20 ANGIOSARCOMA OF THE LIVER, THEY DO RAISE THE
21 POSSIBILITY OF SUCH A RELATIONSHIP."
22 POSSIBILITY IS LESS THAN PROBABILITY, ISN'T
23 IT?

24 A. YES, IT IS. BUT I WOULDN'T USE THE
25 WORD POSSIBILITY. I WOULD USE THE WORD

21109118

1 PROBABILITY AND, IN FACT, THE AUTHOR OF THE
2 REPORT GOES FURTHER THAN THIS.

3 Q. DOCTOR CHRISTINE GOES FURTHER?

4 A. YES. FOR INSTANCE, IF YOU LOOK AT
5 THE THIRD PARAGRAPH, TWO OF THE PATIENTS --

6 Q. THIRD PARAGRAPH, THAT'S BACK ON PAGE
7 210?

8 A. LET'S GET THE APPROPRIATE PLACE.

9 Q. ALL RIGHT, I'M LOOKING AT IT. TELL
10 ME WHAT YOU MEAN OR READ IT TOO ME, IF YOU
11 WANT TO.

12 A. SURE.

13 Q. THE FIRST SENTENCE SAYS, "TWO OF THE
14 PATIENTS APPEAR --

15 A. NO, THAT'S OCCUPATIONAL.

16 BUT ON PAGE 216, ANOTHER TWO
17 PATIENTS WHO HAD NO OCCUPATIONAL EXPOSURE HAD
18 BEEN LONG-TIME RESIDENTS. AND THEN IT GOES ON
19 TO SAY HAD LIVED FOR 35 YEARS, NO HISTORY OF
20 OCCUPATIONAL -- THEY ARE BASICALLY
21 REPORTING ANGIOSARCOMAS IN RESIDENTS NEAR VC
22 PVC PLANTS WHO HAD NO OCCUPATIONAL EXPOSURE.
23 THIS IS BASICALLY WHAT THEY'RE DOING. YOU'RE
24 NOT DISCUSSING -- IT'S A CASE REPORT, WHICH
25 IS EXACTLY -- THEY SAY THEY FOUND AN

21109119

1 ANGIOSARCOMA IN A WOMAN WHO LIVED NEAR A
2 PLANT AND A COUPLE OF PEOPLE WHO LIVED NEAR A
3 PLANT WHO HAD NO OCCUPATIONAL EXPOSURE AND
4 THAT'S BASICALLY ALL THEY REPORT.

5 Q. SO, THE AUTHOR ISN'T REALLY
6 EXPRESSING AN OPINION ONE WAY OR ANOTHER OF
7 POSSIBILITY OR PROBABILITY. THEY'RE
8 DESCRIBING A CASE?

9 A. THIS IS A CASE REPORT, I THINK.
10 THAT'S THE BEST WAY OF DESCRIBING IT.

11 Q. I'D LIKE TO REFER YOU TO THE ARTICLE
12 IN THE BRITISH MEDICAL JOURNAL, OCTOBER 8,
13 1977, WHERE PETER J. BAXTER IS THE FIRST
14 AUTHOR.

15 A. SURE.

16 Q. DO YOU HAVE THAT REPORT?

17 A. I THINK SO, HOLD ON A SECOND. I
18 THINK SO. YES.

19 Q. NOW, ON PAGE 18 AT THE BOTTOM OF
20 YOUR -- NOT THIS REPORT BUT OF YOUR REPORT
21 OR YOUR PRELIMINARY REPORT TO THE TOP OF PAGE
22 19, YOU COMMENTED ON THIS ARTICLE BY PETER J.
23 BAXTER. AND YOU OBSERVED THAT A REVIEW OF 14
24 CASES OF ANGIOSARCOMA DIAGNOSIED IN GREAT
25 BRITAIN, 1963 TO 1973 --

21109120

BFG09840

1 A. I'M SORRY, WHAT PAGE WAS THAT.

2 Q. I AM NOW --

3 A. OH, 18, SURE, I'VE GOT YOU.

4 Q. DIAGNOSIED IN GREAT BRITAIN INCLUDED
5 ONE CASE WHERE THE INDIVIDUAL INVOLVED WORKED
6 IN A PLANT THAT USED PVC AS RAW MATERIAL. AND
7 I BELIEVE YOU ARE REFERRING TO THE BAXTER
8 ARTICLE FOR THAT INFORMATION; IS THAT TRUE?

9 A. YOU'VE LOST ME NOW. WE'RE TALKING
10 ABOUT THE BAXTER ARTICLE.

11 Q. FIRST I'M TALKING ABOUT YOUR
12 REFERENCE TO IT.

13 A. SURE. AND WE'RE TALKING NOW ABOUT
14 RESIDENTS. ARE WE TALKING ABOUT ANGIOSARCOMA
15 IN RESIDENTS OR ARE WE TALKING ABOUT LATENCY?

16 Q. WELL, LET'S FIRST GO TO YOUR REPORT.

17 A. OKAY, FINE.

18 Q. AUGUST 13, 1980.

19 A. YEAH.

20 Q. AT THE BOTTOM OF PAGE 18, YOU SAY, "A
21 REVIEW OF 14 CASES OF HEPATIC ANGIOSARCOMA
22 DIAGNOSIED IN GREAT BRITAIN DURING 1953-1973
23 FOUND ONE CASE WHO HAD WORKED IN A PLANT
24 WHICH USED PVC AS RAW MATERIAL," AND YOU SAY
25 BAXTER 1977.

2109121

1 A. YEAH.

2 Q. AND THE BAXTER 1977 IS THE ARTICLE,
3 IS IT NOT, IN THE BRITISH MEDICAL JOURNAL
4 DATED OCTOBER --

5 A. THAT'S RIGHT, YES.

6 Q. EIGHT --

7 A. RIGHT.

8 Q. NOW, REFERRING TO THE BAXTER ARTICLE,
9 ISN'T IT TRUE, DOCTOR, THAT THE BAXTER
10 ARTICLE REPORTED ON THE FINDINGS OF A PANEL
11 OF DOCTORS WHO REVIEWED 14 -- I'M SORRY,
12 REVIEWED 41 DEATH WHEN THE DEATH CERTIFICATE
13 MENTIONED A DIAGNOSIS OF ANGIOSARCOMA OF THE
14 LIVER.

15 A. I THINK SO, YES, I THINK THAT WAS
16 WHAT THEY DID.

17 Q. ISN'T IT TRUE, DOCTOR, THAT THE
18 PANEL AGREED ON ANGIOSARCOMA OF THE LIVER AS
19 A DIAGNOSIS IN 14 OF THE CASES?

20 A. I THINK SO, YES. THAT'S TABLE TWO,
21 YES, ONE, TWO -- YES.

22 Q. NOW, I'M REFERRING TO PAGE 921 OF
23 THE ARTICLE, THE SECOND PARAGRAPH IN THE
24 RIGHT-HAND COLUMN. AND I ASK YOU, ISN'T IT
25 TRUE THAT THE PANEL AGREED ON ANGIOSARCOMA OF

21109122

1 THE LIVER DIAGNOSIS -- I'M SORRY. STRIKE
2 THAT QUESTION

3 ISN'T IT TRUE THAT ONLY ONE
4 CASE OF ANGIOSARCOMA OCCURRING 1953 TO 1973
5 COULD BE CONFIDENTLY ATTRIBUTED BY THE PANEL
6 TO VINYL CHLORIDE?

7 A. YES.

8 Q. NOW, IF WE LOOK BACK TO PAGE 920 IN
9 THE SECOND COLUMN, THE SECOND PARAGRAPH UNDER
10 CASES AGREED BY THE PANEL, IT SAYS ONE HAD
11 BEEN A PROCESS WORKER IN PVC MANUFACTURE
12 EXPOSED TO LEVELS OF VCM EXCEEDING 200 PARTS
13 PER MILLION OVER 20 YEARS. DOESN'T IT?

14 A. YEAH.

15 Q. AND THAT'S THE ONE CASE, IS IT NOT?

16 A. JUST TELL ME WHERE YOU ARE ON THE
17 ARTICLE NOW. I'VE LOST YOU.

18 Q. I'M ON PAGE 920 OF THE ARTICLE.

19 A. YEAH.

20 Q. THE SECOND COLUMN, THE SECOND
21 PARAGRAPH UNDER THE HEADING, "CASES AGREED BY
22 THE PANEL." AND I'M READING ONE HAD BEEN A
23 PROCESS WORKER IN PVC MANUFACTURE EXPOSED TO
24 LEVELS OF VCM EXCEEDING 200 PARTS PER MILLION
25 OVER 20 YEARS.

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1 A. UM-HUM. AND.

2 Q. I'M ASKING YOU ISN'T THAT THE ONE
3 CASE TALKED ABOUT BY BAXTER?

4 A. NO, THIS IS A TABLE TWO WHICH HAS
5 -- WHICH HAS ALL THE CASES CLASSIFIED BY
6 THE PANEL AS ANGIOSARCOMA OF THE LIVER.

7 Q. THAT'S RIGHT. BUT AT THE CONCLUSION,
8 THEY SAID ONLY ONE CONFIDENTLY COULD BE
9 ATTRIBUTABLE TO VCM?

10 A. YES, BECAUSE ONLY ONE WAS -- AT
11 THAT TIME TO HAVE LIVED -- TO HAVE WORKED
12 IN PVC AND VC KIND OF PRODUCTS.

13 Q. AND THE ONE THE AUTHORS CONFIDENTLY
14 ATTRIBUTED TO VCM WAS A MAN WHO HAD WORKED IN
15 PVC MANUFACTURE AND WAS EXPOSED TO VCM AT
16 LEVELS EXCEEDING 200 PARTS PER MILLION FOR
17 OVER 20 YEARS; ISN'T THAT TRUE?

18 A. THAT'S RIGHT, YES.

19 Q. SO, HE WAS NOT A PVC FABRICATOR, HE
20 WAS ACTUALLY A PVC MANUFACTURER WORKING WITH
21 THE RAW VINYL CHLORIDE; ISN'T THAT TRUE?

22 A. WELL, IN THIS -- IN THE TABLE,
23 THEY TALK ABOUT A FIBER GAS WORKER WORKING
24 WITH PVC PASTE, THAT WAS THE MAN I WAS
25 REFERRING TO.

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1 Q. BUT THE AUTHOR SAID ONLY ONE WAS --

2 A. I UNDERSTAND YOUR QUESTION. BUT I'M
3 REFERRING TO -- TABLE TWO GIVES A LISTING
4 OF ALL THE CASES OF ANGIOSARCOMA. ON THE
5 RIGHT-HAND COLUMN, IT GIVES STATEMENTS OF
6 EXPOSURE TO VCM, ONE OF WHOM WAS OBVIOUSLY A
7 PVC FABRICATOR, WHICH IS WHAT I REPORT.

8 Q. THAT'S RIGHT. BUT THAT GENTLEMAN,
9 ACCORDING TO THE AUTHORS OF THIS ARTICLE
10 COULD NOT CONFIDENTLY BE CONSIDERED TO BE
11 -- HAVE THE DISEASE CAUSED BY VINYL
12 CHLORIDE; ISN'T THAT TRUE?

13 A. I THINK THAT IT IS A PARTIAL TRUTH,
14 BECAUSE THEY GO TO SAY, THE POSSIBILITIES
15 REMAINS THAT THE ANGIOSARCOMA OF THE LIVER
16 ASSOCIATED WITH -- WELL, IN THE LAST
17 PARAGRAPH, THEY SAY, ONLY ONE CASE COULD BE
18 CONFIDENTLY ATTRIBUTED.

19 Q. ALL RIGHT.

20 A. AND THEN THEY GO ON TO SAY ONE
21 PATIENTS WAS SUSPECTED. HE HAD LIVED --

22 THE COURT: DOCTOR, THE
23 QUESTION TO YOU WAS --

24 BY MR. RENNEISEN:

25 Q. WHICH CASE CONFIDENTLY CAN BE SAID

21109125

1 TO BE BY THESE TO BE ATTRIBUTED VINYL
2 CHLORIDE?

3 A. THEY CAME TO THE CONCLUSION THAT THE
4 ONE WITH VERY HIGH EXPOSURE LINES, THEY WERE
5 CONFIDENT OF THIS. BUT FOR OTHER CASES, THEY
6 CLEARLY RAISED THE POSSIBILITY OR PROBABILITY
7 OF A RELATIONSHIP SUCH AS COMMUNITY OR OTHER
8 KINDS OF EXPOSURE. THEY TALK ABOUT ANOTHER
9 HAD LIVED FOR SIX YEARS --

10 Q. THAT'S TRUE.

11 A. -- NEAR THE PLANT.

12 Q. I RECOGNIZE THEY DISCUSS THE MAN
13 THAT HAD SIX YEAR EXPOSURE. BUT THE MAN THAT
14 THEY SAID CONFIDENTLY HAD A CAUSAL
15 RELATIONSHIP WAS A MAN WHO HAD 20 YEARS
16 EXPOSURE TO --

17 A. THERE'S NO QUESTION AT ALL. IT'S
18 MUCH EASIER TO MAKE A CONFIDENT STATEMENT OF
19 STRONG PROBABILITY IF SOMEBODY HAD BEEN
20 WORKING INSIDE A PLANT. UNTIL RELATIVELY
21 RECENTLY, THE LITERATURE HAS ONLY JUST
22 RECENTLY RECOGNIZED THE WHOLE AREA OF
23 COMMUNITY HAZARDS. AND THIS IS -- THIS IS A
24 CASE IN POINT. THEY CONCLUDE THAT THERE WAS
25 ONE CASE WHO HAD NO OCCUPATIONAL EXPOSURE,

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1 WHO LIVED NEAR A PLANT, HAD ONLY LIVED NEAR A
2 PLANT FOR SIX YEARS AND DEVELOPED
3 ANGIOSARCOMA. AND NO HISTORY OF OTHER
4 EXPOSURE TO THOROTRAST.

5 NOW, THIS ISN'T A CONFIDENCE.
6 THIS IS A STATEMENT OF WHAT I WOULD CONSIDER
7 PROBABILITY.

8 Q. THE AUTHORS DIDN'T EVEN SAY
9 PROBABILITY, DID THEY?

10 A. WELL, THE AUTHORS MAKE IT CLEAR THAT
11 THEY CONSIDER THESE TO BE ASSOCIATED. THEY
12 SAY IN THE TABLE, EXPOSURE TO VINYL CHLORIDE
13 LIVED NEAR PVC PLANT. THAT IS FAIRLY EXPLICIT.

14 Q. THAT'S AN EXPLICIT STATEMENT OF
15 WHERE HE LIVED. BUT IT IS --

16 A. NO, IT ISN'T. IT'S A STATEMENT OF
17 EXPOSURE TO VINYL CHLORIDE. THEY HAVE A TABLE
18 WHICH SUMMARIZES DETAIL -- TABLE TWO,
19 DETAILS OF ALL CASES CLASSIFIED BY THE PANEL
20 AS ANGIOSARCOMA OF THE LIVER. THEY HAVE ON
21 THE RIGHT-HAND SIDE COLUMN EXPOSURE TO VCM.
22 THEY HAVE ONE, YES, PROCESS WORKER, YES; THE
23 OTHER POSSIBLY PVC PASTE. HE WAS THE
24 FABRICATOR. THE OTHER, LIVED NEAR PVC PLANT.

25 THE AUTHORS MAKE IT VERY

21109127

1 CLEAR THAT THEY REGARD HAD THESE AS SOURCES
2 OF EXPOSURE TO VINYL CHLORIDE.

3 NOW, HAVING SAID THEY WERE
4 EXPOSED TO VINYL CHLORIDE, THEY WENT ON TO
5 SAY, WELL, OBVIOUSLY, THE GUY WHO WORKED IN
6 THE PLANT, WE CAN BE MORE CERTAIN ABOUT
7 MAKING INFERENCES THAN IT IS OTHERS.

8 Q. THE ONLY -- DOCTOR, AM I CORRECT,
9 THE ONLY MAN THAT THEY SPECIFICALLY IDENTIFY
10 IS THE MAN WHO HAD A 20 YEAR EXPOSURE OF 200
11 PARTS PER MILLION?

12 A. THAT IS NOT TRUE. ON PAGE 91, THEY
13 IDENTIFY ANOTHER WHO HAD LIVED FOR SIX YEARS
14 WITHIN A HALF MILE OF A PLANT MANUFACTURING
15 PVC AND IN THE TABLE, THEY REFER TO THIS AS
16 EXPOSURE TO VCM, A CASE OF MAN AGED 70 WHO
17 -- AGE 61 WHO DIED IN 1970 WHO WAS A
18 CASHIER AND WHO HADN'T WORKED IN THE PLANT
19 BUT LIVED NEAR THE PLANT. AND THAT IS --
20 FALLS INTO WHAT I THINK IS PROPER TO REGARD
21 AS A COMMUNITY CANCER CASE.

22 Q. CAN YOU POINT OUT TO ME ANYPLACE IN
23 THIS REPORT WHERE THEY SAY THE PASTE WORKER'S
24 ANGIOSARCOMA WAS PROBABLY OR POSSIBLY CAUSED
25 BY VINYL CHLORIDE, WHERE THEY USE EITHER OF

21109128

1 THOSE WORDS?

2 A. THE TABLE IS VERY EXPLICIT. OVER
3 AND ABOVE THE TABLE, THEY HAVE A WHOLE
4 PARAGRAPH ON LEVELS OF VINYL CHLORIDE IN THE
5 ATMOSPHERE UP TO HALF A MILE AWAY FROM THE
6 FACTORY. THEY PRESENT MEAN LEVELS OF VINYL
7 CHLORIDE IN THE ATMOSPHERE UP TO HALF A MILE
8 AWAY FROM THE FACTORY FROM WHERE THE
9 NEIGHBORHOOD CASE OF ANGIOSARCOMA OF THE
10 LIVER OCCURRED, WHERE THE NEIGHBORHOOD CASE
11 OF ANGIOSARCOMA ARE CONSIDERED TO BE SO AND
12 SO AND MAY HAVE BEEN SEVERAL TIMES HIGHER IN
13 THE PASSENGER, INDICATING THE ORDER OF
14 EXPOSURE OF PEOPLE LIVING CLOSE TO FACTORIES
15 MANUFACTURING PVC.

16 Q. DOES THE ARTICLE --

17 A. SO, IT IS CLEAR THAT THEY CONSIDERED
18 THIS TO BE A COMMUNITY CANCER CASE.

19 Q. IT'S CLEAR TO YOU.

20 A. THEY MAY NOT HAVE USED YOUR LANGUAGE
21 OF POSSIBILITIES OR PROBABILITY OR MY
22 LANGUAGE. THEY REPORT THEIR FINDINGS.

23 THE COURT: LET'S NOT HAVE
24 THE ARGUMENT. JUST ASK THE QUESTION, YOU
25 RESPOND.

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1 BY MR. RENNEISEN:

2 Q. DOCTOR, I DON'T THINK WE'RE GOING TO
3 ANSWER THAT QUESTION. WE'LL GO ON.

4 LET'S REFER TO THE BRADY
5 ARTICLE FOR A MINUTE.

6 A. SURE.

7 Q. THAT'S THE ARTICLE THAT APPEARED IN
8 THE ~~Journal~~ Journal OF THE NATIONAL CANCER INSTITUTE,
9 NOVEMBER, 1977.

10 A. SURE, I HAVE IT.

11 Q. BEFORE WE GO ON, I WOULD LIKE TO
12 MARK AS AN EXHIBIT -- AND AGAIN I DON'T
13 HAVE A CLEAN COPY, BUT I'LL GET ONE -- AS
14 THE NEXT DEFENDANT'S EXHIBIT, THE BAXTER
15 ARTICLE.

16 THE COURT: DO YOU KNOW WHAT
17 NUMBER THAT IS?.

18 MR. RENNEISEN: YOUR HONOR,
19 I'LL WRITE ON HERE, D-4 AND I'LL SUBSTITUTE A
20 CLEAN ONE FOR IT. I'LL WRITE D-4 AND I'LL
21 WRITE "SUBSTITUTE CLEAN."

22 BY MR. RENNEISEN:

23 Q. NOW, REFERRING TO THE BRADY ARTICLE,
24 DOCTOR, THIS ARTICLE STUDIED 26 PATIENTS, DID
25 IT NOT?

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1 A. CORRECT.

2 Q. ISN'T IT TRUE THAT 73 PERCENT OF THE
3 26 PATIENTS STUDIED HAD NO DOCUMENTED DIRECT
4 EXPOSURE TO VINYL CHLORIDE, ARSENIC OR
5 THORIUM DIOXIDE?

6 A. NO, SIR.

7 Q. ISN'T IT TRUE THAT THE ARTICLE SAYS
8 DIRECT EXPOSURE TO THESE CHEMICALS COULD NOT
9 BE DEMONSTRATED FOR 19 OF THE 26 PATIENTS?

10 A. THE ARTICLE SAYS THAT, BUT TABLE ONE
11 MAKES IT VERY CLEAR THAT THAT ISN'T THE CASE
12 AND LET ME EXPLAIN TO YOU MY MEANING, IF I
13 MAY.

14 IF YOU TURN TO TABLE ONE, YOU
15 WILL SEE SEVEN CASES, THE FIRST SEVEN CASES
16 FOR WHICH THERE IS AN EXPOSURE HISTORY, OKAY.
17 YOU WITH ME?

18 Q. YES?

19 A. FINE. HOWEVER, THERE'S ALSO ONE, TWO,
20 THREE, FOUR, FIVE, THE SUBSEQUENT FIVE CASES
21 BELOW WHO LIVED CLOSE TO A VC PVC FACTOR,
22 SEVEN PLUS FIVE IS 12. TWELVE OUT OF 26 IS
23 46 PERCENT AS OPPOSED TO 27 PERCENT.

24 WHEN YOU SAID THAT THERE'S NO
25 -- WHEN YOU INFER THERE'S NO ETIOLOGY IN IN

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1 73 PERCENT -- IN 73 PERCENT OF THE CASES,
2 THAT MEANS THAT 27 PERCENT -- ONLY 27
3 PERCENT HAVE AN ETIOLOGY. MY POINT TO YOU IS
4 THAT LOOKING AT TABLE ONE, THEIR OWN TABLE
5 MAKES IT CLEAR THAT IN 46 PERCENT, HALF OF
6 THE CASES, THEY DID HAVE AN ETIOLOGY; SEVEN
7 OF THEM, THE FIRST SEVEN AND THE LAST FIVE
8 WERE COMMUNITY RESIDENTS, PEOPLE WHO LIVED
9 CLOSE TO VC PVC PLANT. SO, IN OTHER WORDS,
10 HALF OF THE CASES IN THIS PAPER HAD A HISTORY
11 OF EXPOSURE TO VINYL CHLORIDE.

12 NOW --

13 Q. DOCTOR, YOU SAY -- .

14 THE COURT: JUST A MOMENT,
15 JUST A MOMENT. QUESTION.

16 BY MR. RENNEISEN:

17 Q. DOCTOR, DO YOU SAY THAT IN SPITE OF
18 THE AUTHORS SAYING DIRECT EXPOSURE TO THESE
19 CHEMICALS COULD NOT BE DEMONSTRATED FOR 37
20 PERCENT OF THE 26 CASES?

21 A. WELL, IT'S DIRECT EXPOSURE. THE
22 POINT IS THAT IN THE TABLE, THEY TALK ABOUT
23 EXPOSURE HISTORY. AND IN THE TABLE OF TABLE
24 ONE WHERE THEY TALK ABOUT EXPOSURE HISTORY,
25 IN 12 OF THE 26 CASES, THERE IS AN EXPOSURE

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1 HISTORY.

2 NOW, WHETHER YOU WANT TO USE
3 THE WORD DIRECT FOR THIS IS NEITHER HERE NOR
4 THERE. THIS IS A REPORT OF 25 CASES IN WHOM
5 AT LEAST IN 12 OF THESE WE HAVE AN ETIOLOGY;
6 THE ETIOLOGY VARIES IN DIFFERENT ONES OF THEM,
7 BUT THERE ARE FIVE CASES REPORTED HERE IN
8 WHICH THE ONLY KNOWN EXPOSURE WAS FROM
9 RESIDENTS IN THE VICINITY OF VC PVC PLANT. I
10 MAY ALSO POINT OUT THAT THIS IS -- THE
11 FIGURES SHOULD REALLY BE 12 OUT OF 25, WHICH
12 MAKES IT UP TO 28 PERCENT. BECAUSE IN ONE
13 CASE, THERE WAS NO RESIDENTS' HISTORY. SO, IN
14 FACT, IN 48 PERCENT OF THE CASES IN THAT
15 PAPER, THERE IS A KNOWN ETIOLOGY OR A
16 PRESUMPTIVE ETIOLOGY.

17 Q. IN OTHER WORDS, DOCTOR, YOU DON'T
18 AGREE WITH THE FIRST PARAGRAPH OF THE REPORT?

19 A. NO, THAT ISN'T THE CASE. IT HINGES
20 ON THE INTERPRETATION TO BE USED ON EITHER
21 EXPOSURE ON THE ONE HAND OR DIRECT EXPOSURE.
22 THE TABLE ONE GIVES A HISTORY OF EXPOSURE
23 -- GIVES A COLUMN MARKED EXPOSURE HISTORY.

24 Q. LOOK, DOCTOR, DO YOU ASSUME THAT
25 EVERY CASE OF VINYL CHLORIDE THAT OCCURS

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1 WITHIN A MILE OR TWO OF A PVC PLANT --

2 THE COURT: YOU MEAN EVERY

3 CASE OF --

4 BY MR. RENNEISEN:

5 Q. I'M SORRY. DOCTOR, DO YOU EVER

6 ASSUME --

7 MR. RENNEISEN: THANK YOU

8 JUDGE.

9 BY MR. RENNEISEN:

10 Q. DO YOU ASSUME THAT EVERY CASE OF
11 ANGIOSARCOMA THAT OCCURS WITHIN A MILE OR TWO
12 OF A PLANT IS CAUSED BY EMISSION FROM THAT
13 PLANT?

14 A. LET ME ANSWER YOU THIS WAY CLEARLY.

15 IF ONE HAS AN ANGIOSARCOMA
16 OCCURRING IN AN INDIVIDUAL WHO RESIDES CLOSE
17 TO A PLANT FROM WHICH DEMONSTRABLE EMISSION
18 -- THERE HAVE BEEN DEMONSTRABLE EMISSIONS
19 PVC EMISSION AND THE LONGER AND THE MORE
20 INTENSE AND THE MORE INFORMATION YOU HAVE ON
21 THIS, THE MORE CONFIDENT YOU CAN BECOME. BUT
22 THE TWO REQUIREMENTS FOR A DIAGNOSIS OF A
23 COMMUNITY ANGIOSARCOMA ARE, ONE, THE
24 DIAGNOSIS OF THE DISEASE ITSELF; TWO, THE
25 HISTORY OF RESIDENTS CLOSE TO A PLANT; AND,

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1 THREE, INFORMATION ON EMISSION FROM THE PLANT.
2 AND IN THE GRASSO CASE, WE
3 HAVE ALL THESE THREE REQUIREMENTS:
4 ANGIOSARCOMA, RESIDENTS CLOSE TO THE PLANT
5 AND DETAILED INFORMATION OF EMISSION BASED ON
6 MODELING AND OTHER DATA. SO, WE HAVE THESE
7 COMBINATION OF THREE FACTORS AND THIS IS
8 PRECISELY WHY IN SCIENCE ONE DEVELOPS A BODY
9 OF INFORMATION FROM WHICH YOU MAKE INFERENCES
10 AND YOU DEVELOP UPON THESE PARTICULAR
11 RELATIONSHIPS. THIS GOES THE WAY WE KNOW
12 ABOUT THE RELATIONSHIP OF SMOKING AND LUNG
13 CANCER; FROM PROBLEMISTIC RELATIONSHIPS, NOT
14 BECAUSE OF ANY ABSOLUTE TERMS.

15 Q. DOCTOR, WITH RESPECT TO THE FIVE
16 PEOPLE REFERRED TO IN THE BRADY REPORT WHO
17 LIVED NEAR A PLANT, DO YOU HAVE ANY EMISSION
18 DATA?

19 A. NO, EXCEPT WHAT THEY SAY IS -- LET
20 US SEE EXACTLY WHAT THEY SAY. OF POSSIBLE
21 IMPORTANCE IS THE FACT THAT THE AMBIENT
22 EMISSION OF VC MONOMER FOR THE FACTORY
23 LOCATED 1,700 FEET FROM THE RESIDENCE OF
24 PATIENT NUMBER TEN WERE AS HIGH AS 92,000
25 P.P.M.. THEY ALSO GO ON TO SAY -- WHERE IS

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1 THIS? IN THIS STUDY, 35 PEOPLE WITH
2 ANGIOSARCOMA LIVED NEARER TO PULOMIZATION
3 PLANTS AND FABRICATION PLANTS. IN CASES, AS
4 YOU KNOW, THIS WAS KIND OF A CASE CONTROL
5 STUDY IN WHICH THEY MATCHED CONTROLS FOR ALL
6 CASES WITH THE CANCERS AND IN NONE OF THE
7 MATCHED CONTROLS DID THEY LIVE -- WHO HAD
8 OTHER CANCER, DID THEY LIVE CLOSE TO A VC OR
9 PVC FABRICATING PLANT

10 NOW, THIS ISN'T ABSOLUTE
11 LEGALISTIC PROOF. THIS IS A REPORTED CASE
12 -- A REPORTED COMMUNITY CASE OF
13 ANGIOSARCOMA AND AS I'VE INDICATED BEFORE,
14 THE REQUIREMENTS ARE, MINIMALLY, DIAGNOSIS OF
15 ANGIOSARCOMA AND IN ADDITION TO THAT,
16 PROXIMITY OF RESIDENCE AND IF IN ADDITION,
17 YOU DO HAVE EVIDENCE ON EMISSION FOR MODELING
18 OR DIRECT MONITORING, THEN THE STRENGTH OF
19 YOUR ASSOCIATIONS BECOME ALL THE GREATER. AND
20 THIS IS THE BASIS OF WHAT WE MEAN WHEN WE
21 TALK ABOUT COMMUNITY CANCER.

22 Q. DOCTOR, ARE YOU SAYING THEN THAT IN
23 ANY SITUATION WHERE YOU FIND AN ANGIOSARCOMA
24 NEAR A PVC PLANT, THERE'S A SUBSTANTIAL
25 PROBABILITY THAT THE PLANT CAUSED THE

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1 ANGIOSARCOMA?

2 A. I'VE ALREADY ANSWERED THIS, I THINK,
3 BUT I'LL REPEAT THE -- MY ANSWER: THAT THE
4 STRENGTH -- ASSURANCE OF MAKING STATEMENTS
5 OF PROBABILITY DEPENDS, APART FROM THE
6 DIAGNOSIS OF ANGIOSARCOMA, DÉPENDS ON
7 PROXIMITY OF RESIDENCE, AND ALSO THE TIME
8 SEQUENCE AND FINALLY, INFORMATION ON EMISSION.

9 Q. BUT, DOCTOR --

10 A. NO, I HAVE TO ANSWER YOU, BECAUSE
11 YOU'VE ASKED ME THIS THREE TIMES AND I
12 BELIEVE I'VE ANSWERED THE SAME WAY.

13 IF YOU HAVE INFORMATION ON
14 EMISSION OF VINYL CHLORIDE FROM THE PLANT BY
15 MODELING OR BY MONITORING, THEN THE STRENGTH
16 OF A STATEMENT ON PROBLEMISTIC -- ON
17 PROBLEMISTIC RELATIONSHIPS BECOMES STRONGER.
18 THIS IS EXACTLY WHAT WE HAVE IN GRASSO. WE
19 HAVE VERY DETAILED INFORMATION --

20 THE COURT: I THINK THE
21 QUESTION HE'S ASKING YOU, DOCTOR IS A CAPABLE
22 OF A RESPONSE, YES OR NO.

23 READ THAT QUESTION. I THINK
24 THE DOCTOR CAN RESPOND YES OR NO.

25 MR. RENNEISEN: THANK YOU,

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1 YOUR HONOR

2 (COURT REPORTER READS PENDING
3 QUESTION.)

4 THE WITNESS: NOT IN ANY
5 SITUATION. IN SOME SITUATIONS.

6 MR. RENNEISEN: THANK YOU,
7 DOCTOR.

8 BY MR. RENNEISEN:

9 Q. AND IN THOSE SITUATIONS WHERE YOU
10 HAVE MORE DATA; IS THAT CORRECT?

11 A. IN PARTICULAR, WHERE YOU HAVE DATA
12 ON EMISSION. IF, FOR INSTANCE, YOU HAD A PVC
13 PLANT THAT WASN'T FUNCTIONING AND HAD NEVER
14 FUNCTIONED, THEN I WOULD SAY -- I WOULDN'T
15 BE WILLING TO ASCRIBE A RELATIONSHIP.

16 Q. LET ME CHANGE THE QUESTION, DOCTOR.
17 ARE YOU SAYING THEN THAT IF YOU HAVE AN
18 ANGIOSARCOMA NEAR A FUNCTIONING PVC PLANT
19 WITH EMISSION, THERE IS A SUBSTANTIAL
20 PROBABILITY THAT THAT ANGIOSARCOMA WAS CAUSED
21 BY THE EMISSION FROM THE PLANT?

22 A. YES, ESPECIALLY IN THE ABSENCE OF
23 EXPOSURE TO -- KNOWN EXPOSURE TO OTHER
24 AGENTS INDUCING ANGIOSARCOMA.

25 Q. NOW, I THINK WE -- WE BOTH AGREE,

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1 DOCTOR, THAT IF YOU HAD A MAN LIVING OUT IN
2 WYOMING AWAY FROM EVERY PVC PLANT AND NEVER
3 USED A SPRAY CAN OF ANYTHING, HE COULD STILL
4 HAVE ANGIOSARCOMA?

5 A. CERTAINLY. I'VE ALREADY DISCUSSED
6 THE FOUR CAUSES.

7 Q. AND IF THAT GENTLEMAN WAS NOT
8 EXPOSED TO THOROTRAST, VINYL CHLORIDE,
9 STEROID OR ARSENIC, HE STILL COULD GET
10 ANGIOSARCOMA, COULDN'T HE?

11 A. WELL, IF HE GETS ANGIOSARCOMA, HE
12 GETS IT, SO, THEREFORE, THERE'S NO ARGUMENT
13 ABOUT IT. THE QUESTION IS WHAT IS THE CAUSE.

14 Q. WELL, YOU'VE ALREADY SAID, DOCTOR,
15 THAT THERE ARE MANY CARCINOGENS NOT YET
16 IDENTIFIED.

17 A. WELL, WE HAVE FOUR KNOWN CAUSES OF
18 ANGIOSARCOMA. I'M UNWILLING TO EXCLUDE THE
19 POSSIBILITY THAT AT SOME STAGE IN THE FUTURE,
20 ANOTHER CAUSE -- I'M NOT GIFTED WITH
21 PROPHECY. ALL WE CAN SAY IS WE NOW KNOW OF
22 THREE DEFINITE CAUSES OF ANGIOSARCOMA AND A
23 FOURTH POSSIBLE CAUSE OF ANGIOSARCOMA.

24 Q. AND TEN YEARS FROM NOW, WE MAY HAVE
25 TEN CAUSES; ISN'T THAT TRUE?

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1 A. THAT IS POSSIBLE. BUT IT'S NOT
2 PROBABLE. I'M NOT WILLING TO EXCLUDE THAT
3 POSSIBILITY.

4 Q. IT'S NOT PROBABLE?

5 A. NO.

6 Q. HOW MANY YEARS AGO THERE WERE NO
7 KNOWN CAUSES?

8 A. THE REASON WHY IT'S NOT PROBABLE
9 -- THIS IS A VERY RARE CANCER AND THE --
10 OF THE RARE CANCERS OF ANGIOSARCOMAS WHICH
11 WE'VE SEEN SO FAR, WE HAVE -- THE MORE WE
12 EXAMINE THEM, THE MORE WE'VE BEEN ABLE TO
13 DEVELOP INFORMATION ON ETIOLOGY. AND
14 BASICALLY, WHAT IS HAPPENING NOW IS THAT THE
15 CASES OF ANGIOSARCOMA THAT ARE DEVELOPING ARE
16 BEING EXAMINED MORE AND MORE CAREFULLY AND
17 CONSIDERATIONS SUCH AS PROXIMITY OF RESIDENCE
18 IS NOW BEING RECOGNIZED MORE AND MORE AND
19 OTHER SUCH FACTORS OF IT.

20 Q. WELL, DOCTOR, ARE YOU TELLING ME
21 THAT MORE AS AND MORE CASES ARE BEING
22 EXAMINED, PEOPLE LIKE YOURS ARE TRYING HARDER
23 AND HARDER TO FIT THEM INTO ONE OF FOUR
24 CATEGORIES?

25 A. THAT'S NOT WHAT I SAID. THE

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1 SCIENTIFIC COMMUNITY IS PAYING PARTICULAR
2 ATTENTION TO THIS, AMONG OTHER ISSUES,
3 ESPECIALLY BECAUSE ANGIOSARCOMA HAPPENS TO BE
4 A RARE DISEASE AND THEREFORE, IT'S EASIER TO
5 STUDY. WHEN YOU HAVE A VERY COMMON CANCER
6 LIKE LUNG CANCER, IT BECOMES FAR MORE
7 DIFFICULT TO STUDY FROM THIS POINT OF VIEW OF
8 ASCRIBING CAUSALITY. WHEN IT COMES TO
9 RELATIVELY UNUSUAL CANCERS, LIKE MESOTHELIOMA
10 FROM ASBESTOS OR ANGIOSARCOMA, IT THEN
11 BECOMES EASIER TO TRY TO DEVELOP INFORMATION
12 ON CAUSALITY.

13 Q. DOCTOR, WAS THERE A TIME WHEN THE
14 MEDICAL PROFESSION HAD NO KNOWN CAUSES FOR
15 ANGIOSARCOMA?

16 A. CERTAINLY. THE TESTS HADN'T BEEN
17 DONE IN ANIMALS AND THERE HAD BEEN THE FEW
18 CASES THAT HAD OCCURRED IN THE MID-SIXTIES
19 HAD BEEN MISS DIAGNOSIED.

20 Q. AND AS DOCTOR LAUCIUS WHO WAS HERE
21 THIS MORNING SAID THAT ANGIOSARCOMA OF THE
22 LIVER HAD BEEN KNOWN FOR 80 YEARS, DO YOU
23 AGREE WITH THAT?

24 A. I CAN'T TELL YOU THE DATE WHEN
25 ANGIOSARCOMA WAS FIRST RECOGNIZED. I WOULD

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1 HAVE TO GO BACK TO THE LITERATURE. I KNOW
2 IT'S BEEN RECOGNIZED FOR SOME TIME, FOR
3 DECADES. BUT I CAN'T REALLY TELL YOU THE DATE
4 OF THE FIRST REPORT.

5 Q. DOCTOR, ISN'T IT FAIR IF THERE WAS A
6 TIME THAT IT EXISTED AND NOBODY KNEW ANY
7 CAUSES AND THEN ONE DAY THERE WAS ONE CAUSE
8 AND THEN THREE AND NOW POSSIBLY FOUR?

9 A. THAT'S CORRECT.

10 Q. AND ISN'T IT REASONABLE TO ASSUME,
11 PARTICULARLY SINCE THERE SEEMS TO BE NO
12 RELATIONSHIP IN THE FOUR KNOWN OR SUSPECTED
13 CAUSES WITH EACH OTHER, THAT THERE ARE
14 PROBABLY OTHER CAUSES; ISN'T THAT TRUE?

15 A. WELL, I'M NOT WILLING TO EXCLUDE
16 THAT AS A POSSIBILITY. ALL I CAN SAY IS THAT
17 AT THE MOMENT, THREE DEFINITE CAUSES HAVE
18 BEEN DEMONSTRATED AND A FOURTH POSSIBLE CAUSE
19 HAS BEEN DEMONSTRATED. THAT'S AS FAR AS AS
20 ONE CAN GO IN THIS LINE.

21 Q. DID YOU REFER TO THE -- I DON'T
22 THINK YOU REFER TO IT BY AUTHOR'S NAME. BUT I
23 THOUGHT YOU WERE REFERRING TO AN ARTICLE BY
24 CHIAZZE ENTITLED MORTALITY AMONG EMPLOYEES OF
25 PVC FABRICATORS?

21109142

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1 A. I DIDN'T LIST THAT IN THE COMMUNITY
2 CANCER. OR IN THE -- OR IN THE ONES WITH
3 LATENCIES UNDER TEN YEARS, NO, I DIDN'T LIST
4 THAT.

5 Q. DID YOU REFER TO IT WHEN YOU WERE
6 TALKING ABOUT CASES IN FABRICATORS --

7 A. THAT'S RIGHT.

8 Q. -- WHERE THERE WAS EXPOSURES OF
9 ZERO TO TWO PARTS PER MILLION?

10 A. YES, IN THAT CONNECTION, I REFER TO
11 CHIAZZE.

12 Q. AND ON PAGE 19 OF YOUR REPORT,
13 REFERENCE IS MADE TO A CROSS-SECTION,
14 MORTALITY STUDY OF 3,845 DEATHS AMONG
15 EMPLOYEES OF PVC FABRICATORS BY LEONARD
16 CHIAZZE; ISN'T THAT TRUE?

17 A. THAT'S TRUE.

18 Q. AND CHIAZZE IN FACT, WITH HIS
19 ASSOCIATES, NICHOLS AND WONG, DID, IN FACT,
20 STUDY DEATH OF PVC FABRICATORS, DID THEY NOT?

21 A. THAT'S RIGHT, YES.

22 Q. AND THESE ARE GENTLEMEN OR WOMEN WHO
23 TOOK POLYVINYLCHLORIDE AND IN SOME PROCESSES,
24 MANUFACTURED INTO PRODUCTS THAT WERE USED
25 TODAY?

21109143

BFG09863

1 A. CORRECT.

2 Q. ISN'T IT TRUE THAT DOCTOR CHIAZZE
3 FOUND NO ANGIOSARCOMA DEATH AMONG THE GROUP
4 THAT HE STUDIED?

5 A. THAT'S RIGHT, HE FOUND VARIOUS OTHER
6 CANCERS, BUT NO ANGIOSARCOMAS.

7 Q. ISN'T IT TRUE THAT THE PRIMARY
8 OBJECTIVE OF HIS STUDY WAS TO DETERMINE
9 RELATIVELY QUICKLY WHETHER OR NOT ANY
10 ANGIOSARCOMA DEATH COULD BE IDENTIFIED AMONG
11 THE STUDY GROUP?

12 A. I REALLY DON'T RECALL. IT'S QUITE
13 POSSIBLE HE TRIED TO DO THAT. BUT ESSENTIALLY
14 WHAT HE DID FIND WAS AN EXCESSIVE CANCER OF
15 DIFFERENT MALIGNANCY. AND THIS HAS BEEN
16 REPORTED IN SEVERAL OTHER STUDIES, TOO.

17 Q. WELL, IF YOU'LL TO PAGE 523 OF THE
18 BOTTOM OF THE CHIAZZE ARTICLE --

19 A. I DON'T HAVE THAT IN FRONT OF ME, I
20 REGRET.

21 Q. I'M SORRY, I'LL GET YOU ONE.

22 THE COURT: YOU WANT SOME
23 MORE WATER, DOCTOR.

24 THE WITNESS: THAT WOULD BE
25 NICE, THANK YOU.

21109144

1 THE WITNESS: I DIDN'T, I SEE
2 THE POINTS YOU WERE MAKING.

3 BY MR. RENNEISEN:

4 Q. AND HE DOES SAY, DOES HE NOT, THE
5 PRIMARY STUDY OBJECT WAS TO DETERMINE
6 RELATIVELY QUICKLY WHETHER ANY -- WHETHER
7 OR NOT ANY ANGIOSARCOMA DEATH --

8 A. CORRECT.

9 Q. COULD BE --

10 Q. COULD BE IDENTIFIED AMONG THE STUDY
11 GROUP.

12 A. CORRECT.

13 Q. AND WHEN HE COMPLETED HIS ORJECT, HE
14 FOUND NONE, ISN'T THAT TRUE?

15 A. CORRECT. BUT OTHER CANCERS, WHICH
16 ALSO HAVE BEEN ASSOCIATED WITH VINYL CHLORIDE
17 EXPOSURE.

18 Q. NOW, YOU REFER TO A BAXTER AND FOX
19 ARTICLE, DID YOU NOT?

20 A. YEAH.

21 Q. AND THAT IS IN THE LANCET, JANUARY
22 31, 1976, ISN'T IT?

23 A. YEAH. HANG ON. OKAY.

24 Q. AND I BELIEVE YOU SUGGESTED THAT
25 BAXTER AND FOX FOUND LUNG AND BRAIN CANCER;

21109145

BFG09865

1 IS THAT TRUE?

2 A. I DON'T RECALL SAYING THAT. WHAT I

3 -- LET'S JUST REFRESH MY MEMORY AND YOUR
4 MEMORY, IF I MAY.

5 Q. FINE, DOCTOR.

6 A. FIRST OF ALL, I REFER TO BAXTER AS
7 HAVING DESCRIBED ONE COMMUNITY CANCER CASE OF
8 A LIVER ANGIOSARCOMA WITH A LATENCY OF SIX
9 YEARS IN SOMEBODY WHO LIVED WITHIN A HALF
10 MILE FROM A BRITISH PVC PLANTS. THAT'S ONE
11 POINT I MADE.

12 Q. IS THAT REFERRED TO IN THIS BAXTER
13 AND FOX ARTICLE?

14 A. I THINK SO. SURE. WAIT A SECOND.
15 WE'RE LOOKING AT DIFFERENT BAXTER ARTICLES. I
16 THINK THAT'S THE BASIS FOR THE CONFUSION. I
17 WAS LOOKING AT BAXTER, ANTHONY, RODERICK,
18 MC QUEEN, ET CETERA, WHICH IS BRITISH MEDICAL
19 JOURNAL, OCTOBER, 1977. I'M SORRY I MISLEAD
20 YOU WITH THE REFERENCE.

21 Q. I WAS TALKING ABOUT BAXTER AND FOX.

22 A. WELL, MY REFERENCE THIS MORNING TO
23 THE -- MY REFERENCE PREVIOUSLY TO THE
24 COMMUNITY CANCER AND THE SHORT LATENCY PERIOD
25 WAS BAXTER ET AL., 1977. I THINK THAT'S THE

21109146

1 BASIS OF THE CONFUSION.

2 SO, I HAVE THE BAXTER AND
3 FOX ARTICLE HERE, SURE.

4 Q. AND YOU DID REFER TO IT IN YOUR
5 REPORT ON PAGE 19, DID YOU NOT?

6 A. I THINK SO. PAGE 19, NO.

7 I REFER TO BAXTER ET AL., 77,
8 NOT -- AND THIS IS BAXTER 76, BAXTER ET AL.
9 77 IS THE -- IS THE ONE WITH THE COMMUNITY
10 CANCER CASE.

11 Q. YOU ARE FAMILIAR WITH BAXTER AND FOX,
12 ARE YOU NOT?

13 A. I HAVE BOTH OF THEM IN FRONT OF ME,
14 SIR.

15 Q. ALL RIGHT. NOW, IF WE TAKE BAXTER
16 AND FOX --

17 A. YOU SEE, ON PAGE 19, THERE'S TWO
18 REFERENCES TO BAXTER. THAT'S THE PROBLEM.

19 Q. I AM REFERRING TO THE LANCET,
20 JANUARY 31, 1976 --

21 A. FINE.

22 Q. BAXTER AND FOX TOWARD THE END. AND
23 IT SAYS, "VINYL CHLORIDE HAS BEEN SUGGESTED
24 AS CAUSING CANCER OF THE LUNG AND BRAIN AS
25 WELL AS ANGIOSARCOMA OF THE LIVER AND OTHER

21109147

BFG09867

1 LIVER DISEASES. IN THIS STUDY, THE OBSERVED
2 NUMBER OF DEATHS FROM THESE CAUSES WERE NOT
3 IN EXCESS OF THOSE EXPECTED."

4 A. THAT'S RIGHT, THAT'S CORRECT. BUT
5 THERE HAVE BEEN A WIDE RANGE OF OTHER STUDIES
6 SINCE THEN WHICH HAVE DEMONSTRATED THAT THERE
7 ARE TARGET ORGANS BESIDES THE LIVER AND THIS
8 IS WELL RECOGNIZED IN THE LITERATURE NOW.

9 Q. DOES THE -- DID THE PEOPLE AT THE
10 CENTER FOR DISEASE CONTROL CONSIDER LUNG AND
11 BRAIN CANCER TO BE CAUSED BY VINYL CHLORIDE,
12 IF YOU KNOW?

13 A. WELL, ALL I CAN TELL YOU -- I
14 HAVEN'T SEEN ANY CATEGORICAL STATEMENTS ON
15 THIS. BUT THE INTERNATIONAL AGENCY FOR THE
16 RESEARCH ON CANCER, FOR WHICH C.D.C. IS
17 INVOLVED AS KIND OF A MEMBER ORGANIZATION,
18 CLEARLY RECOGNIZES LUNG, BRAIN AND VARIOUS
19 OTHER SITES AS TARGET ORGANS FOR VINYL
20 CHLORIDE INDUCED CANCER.

21 Q. YOU DO RECOGNIZE C.D.C. AS ANOTHER
22 AGENCY WHICH SERVES A PURPOSE FOR THE MEDICAL
23 COMMUNITY AND COLLECTS INFORMATION AND MAKES
24 CONCLUSIONS?

25 A. CERTAINLY, I'M VERY FAMILIAR WITH

21109148

1 THE OPERATION OF C.D.C. C.D.C., IN FACT
2 ISN'T -- ITS PRIMARY EXPERTISE ISN'T IN
3 CARCINOGENESIS. NATIONAL CANCER INSTITUTE AND
4 NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY
5 AND HEALTH HAS GREATER EXPERTISE IN THIS AREA
6 AND THE INTERNATIONAL AGENCY FOR THE RESEARCH
7 ON CANCER IS BASICALLY THE INTERNATIONAL
8 AUTHORITY ON THE RECOGNITION ON RELATIONSHIPS
9 BETWEEN EXPOSURE TO CHEMICALS AND CANCER. AND
10 I SAID BEFORE, THERE'S A WIDE RANGE OF
11 PUBLICATIONS DEMONSTRATING THE INVOLVEMENT OF
12 ORGANS LIKE LUNG AND BRAIN AS A CARCINOGENIC
13 RESPONSE TO VINYL CHLORIDE. AND I HAVE MORE
14 THAN -- I HAVE LITERATURE HERE, IF YOU WISH.

15 Q. HENRY FAULK IS WITH THE CENTER FOR
16 DISEASE CONTROL?

17 A. THAT'S RIGHT, YES.

18 Q. AND DO YOU KNOW WHAT HIS POSITION IS
19 THERE?

20 A. I DON'T KNOW WHAT HIS POSITION IS
21 NOW.

22 Q. HAVE YOU HAD DEALINGS WITH HIM?

23 A. OH, YES, YES.

24 Q. WE TALKED EARLIER IN MY QUESTION OF
25 YOU ABOUT HIS ARTICLE WHERE HE TALKS ABOUT

21109143

BFG09869

1 THE STEROIDS; IS THAT --

2 A. SURE. IT'S THE SAME FAULK.

3 Q. THE SAME FAULK? AND JUST BRIEFLY --

4 I'M GOING TO STOP, DOCTOR.

5 AMONG ALL THE CASES OF
6 ANGIOSARCOMA THAT HAVE BEEN IDENTIFIED, WHAT
7 PERCENTAGE HAVE BEEN ATTRIBUTED TO UNKNOWN
8 CAUSES?

9 A. I CANNOT GIVE YOU A FLAT ANSWER TO
10 THAT, BECAUSE IN THE DIFFERENT SERIES WHICH
11 ARE BEING REPORTED, SOME PEOPLE HAVE LOOKED
12 FOR CAUSATIVE FACTORS AND SOME HAVEN'T. AND,
13 THEREFORE, ANY FIGURE I COULD TROT OUT FROM
14 THE BACK OF MY HEAD REALLY IS MEANINGLESS.
15 AND LET ME JUST REFER TO YOU A DISCUSSION WE
16 HAD BEFORE WHEN WE WERE TALKING ABOUT BRADY.

17 THE BRADY ARTICLE MAKES IT
18 VERY CLEAR THAT IN ABOUT HALF THE CASES THEY
19 LOOKED, THERE IS AN EXPOSURE HISTORY.

20 NOW, THE BASIS THERE IS AN
21 EXPOSURE HISTORY. I'M NOT WILLING TO GET UP
22 AND TELL THIS COURT THIS UNEQUIVOCALLY PROVES
23 THAT VINYL CHLORIDE WAS THE CAUSE. I'LL SAY
24 THAT THIS IS -- THIS REPRESENTS -- IF
25 THERE ARE EMISSION DATA, ALSO, THE CREATION

21109150

BFG09870

1 OF A SUBSTANTIAL PROBABILITY. THEREFORE, I
2 CAN'T ANSWER YOU AS TO WHAT PERCENTAGE OF THE
3 CASES HAS BEEN ATTRIBUTED IN THE SAME WAY AS
4 THREE OR FOUR YEARS AGO. NOW WE'RE BEGINNING
5 TO SEE MORE AND MORE OF THEM. WE'RE GOING TO
6 SEE MORE AND MORE LUNG CANCER, BECAUSE PEOPLE
7 ARE LOOKING FOR IT NOW. SO, THEREFORE, I'M
8 UNWILLING TO GIVE YOU AN ABSOLUTE FIGURE AS
9 TO THE PERCENTAGE OF CASES OF ANGIOSARCOMA IN
10 WHICH AN ETIOLOGY HAS BEEN DEMONSTRATED. THE
11 FIGURES IN THE LITERATURE SEEM TO SUGGEST
12 -- THE LITERATURE SEEMS TO SUGGEST ANYTHING
13 RANGING FROM 75 TO ABOUT 35, DEPENDING ON
14 WHAT SERIES YOU LOOK AT.

15 Q. DOCTOR, IN MAKING YOUR ANALYSIS OF
16 CAUSE AND EFFECT, OF PROBABLE CAUSE AND
17 EFFECT BETWEEN VINYL CHLORIDE AND
18 ANGIOSARCOMA, YOU BASICALLY ARE RELYING ON
19 DATA IN THE LITERATURE; ISN'T THAT TRUE?

20 A. CERTAINLY. DATA IN THE LITERATURE,
21 PLUS -- PLUS, SIR, INFORMATION ON THE
22 SPECIFICS OF MR. GRASSO'S EXPOSURE AND WHERE
23 HE LIVED.

24 Q. BUT WITH RESPECT TO THE -- THE
25 CASES THAT YOU HAVE TOLD US ABOUT TODAY --

21109151

BFG09871

1 NOT MR. GRASSO'S CASE, BUT THE ACCOUNTANT IN
2 CONNECTICUT AND THE 83 YEAR OLD WOMAN,
3 WHEREVER SHE LIVED, THOSE CASES YOU GOT FROM
4 THE LITERATURE.

5 A. CORRECT, SIR.

6 Q. YOU DIDN'T SEND OUT QUESTIONNAIRES
7 YOURSELF TO PATHOLOGISTS AROUND THE COUNTRY
8 AND COLLECT THE DATA YOURSELF?

9 A. NO.

10 Q. IS THAT RIGHT?

11 A. NO.

12 Q. SO THE PRINCIPAL SOURCE OF YOUR
13 INFORMATION ARE ARTICLES WRITTEN BY OTHER
14 REPUTABLE DOCTORS WHO HAVE THEM PUBLISHED IN
15 REPUTABLE JOURNALS?

16 A. BUT LET ME MAKE IT CLEAR THAT WHEN
17 YOU GO TO THE SCIENTIFIC LITERATURE, YOU
18 DON'T NECESSARILY GO THERE LOOKING FOR
19 OPINIONS. YOU GO THROUGH LOOKING FOR FACTS.
20 WHAT I'VE GOT OUT OF THE LITERATURE ARE FACTS
21 AND THE FACTS ARE THIS: THERE ARE A WIDE
22 RANGE OF CASES OF ANGIOSARCOMA IN PEOPLE
23 LIVING CLOSE TO PLANTS, ONE.

24 TWO, THERE ARE ANGIOSARCOMAS
25 AND OTHER MALIGNANCIES IN PEOPLE LIVING CLOSE

21109152

BFG09872

1 TO PLANTS AND PEOPLE WORKING WITH INDUSTRIES
2 IN SHORT LATENCIES.

3 THREE, WE KNOW HE LIVED HERE
4 A PLANT. WE KNEW THERE WERE A LOT OF
5 EMISSIONS. SO, WE KNOW NATIONAL ENVIROMENTAL
6 --

7 Q. EXCUSE ME, DOCTOR. DO YOU KNOW WHAT
8 QUESTION YOU'RE ANSWERING. BECAUSE I DON'T.

9 A. I CAN TELL YOU THE QUESTION THAT YOU
10 ASKED ME IS WHAT INFORMATION I GOT FROM THE
11 LITERATURE WHICH ENABLES ME TO COME UP WITH
12 INFERENCES IN THIS AREA.

13 Q. MAYBE WE'LL GO BACK TO THE QUESTION,
14 DOCTOR. OR LET'S GO ON.

15 A. SURE.

16 Q. I THINK I ASKED, DO YOU RELY ON THE
17 LITERATURE. I DON'T THINK I ASKED YOU WHAT
18 --

19 A. I SEE. I RELY ON THE FACTS IN THE
20 LITERATURE.

21 Q. ALL RIGHT. YOU RELY ON THE FACTS IN
22 THE LITERATURE.

23 A. YES.

24 Q. THERE IS LITERATURER WHICH INDICATES,
25 SAY, A POCKET OF PEOPLE IN WISCONSIN WHERE

21109153

BFG09873

1 THERE'S NO PLANTS AT ALL AND THERE'S AN
2 UNEXPLAINED GROUPING OF ANGIOSARCOMAS; ISN'T
3 THAT TRUE?

4 A. YES, THE MARSHALL FIELD CLINIC AREA.

5 Q. THAT'S RIGHT. AND THAT'S OTHER DATA
6 THAT YOU CONSIDER --

7 A. MOST CERTAINLY.

8 Q. AND AGAIN, THE DATA THAT YOU ARE
9 CONSIDERING, WHETHER IT BE OPINIONS OR FACTS
10 COMES OUT OF THE LITERATURE THAT YOU READ?

11 A. CORRECT.

12 MR. RENNEISEN: THANK YOU,
13 DOCTOR. THAT'S ALL I HAVE.

14 THE COURT: ANY REDIRECT?

15 MR. VASSALOTTI: JUST A FEW,
16 YOUR HONOR.

17 BY MR. VASSALOTTI:

18 Q. DOCTOR, THERE'S BEEN SOME TESTIMONY
19 ABOUT THE STEROIDS. I DON'T RECALL THE FULL
20 NAME OF THE STEROIDS?

21 A. ANABOLIC STEROIDS.

22 Q. THAT ARE A POSSIBLE -- IMPLICATED
23 AS A POSSIBLE CAUSE OF ANGIOSARCOMA OF THE
24 LIVER.

25 DOCTOR AS PART OF THE

21109154

BFG09874

1 MATERIALS THAT WERE PROVIDED TO YOU WITH
2 REGARD TO INFORMATION ON THE MEDICAL HISTORY
3 OF MR. GRASSO, DID YOU RECEIVE LETTERS FROM
4 THREE OF MR. GRASSO'S PERSONAL PHYSICIANS
5 THAT DATE BACK TO 1956?

6 A. YEAH, I'VE GOT SEVERAL LETTERS ON
7 THIS AND, YEAH, I'VE GOT THREE LETTERS,
8 THAT'S RIGHT.

9 Q. AND DO THOSE LETTERS PURPORT TO
10 DESCRIBE ALL THE MEDICATION OR DRUGS THAT
11 WERE ADMINISTERED OR PRESCRIBED TO MR. GRASSO
12 BY THOSE DOCTORS?

13 A. THAT'S CORRECT.

14 Q. ARE THERE --

15 MR. RENNEISEN: I OBJECT TO
16 THIS LINE OF QUESTIONING.

17 THE COURT: I'LL SUSTAIN THAT.

18 MR. VASSALOTTI: EXCUSE ME,
19 YOUR HONOR.

20 THE COURT: SUSTAIN THE
21 OBJECTION.

22 MR. VASSALOTTI: YOUR HONOR,
23 MAY WE APPROACH THE BENCH?

24 THE COURT: SURE.

25 (SIDE BAR ON RECORD.)

21109155

BFG09875

1 MR. VASSALOTTI: FIRST, I'D
2 LIKE TO NO WHAT THE BASIS OF THE OBJECTION IS.

3 THE COURT: I ASSUME IT'S A
4 HEARSAY OBJECTION OF THE CASES.

5 MR. RENNEISEN: IT'S HEARSAY
6 AND IT DOESN'T FALL IN THE MEDICAL RECORD
7 EXCEPTION BECAUSE THEY WERE NOT MADE FOR THE
8 PURPOSE OF TREATMENTS. THEY WERE GIVEN TO
9 THIS DOCTOR FOR THE TESTIFYING.

10 THE COURT: I ASSUMED THAT
11 WAS THE BASIS HE WAS OBJECTING ON.

12 MR. VASSALOTTI: THERE IS A
13 RULE, AS I UNDERSTAND, ON THE FEDERAL RULES
14 OF EVIDENCE, IF DOCTOR EPSTEIN SAID HE WOULD
15 RELY ON INFORMATION LIKE THIS, THEN --

16 THE COURT: WELL, IT WOULD BE
17 USED NOT FOR THE TRUTH. HE WAS BEGINNING TO
18 ASK HIM --

19 MR. RENNEISEN: IT'S -- IT
20 DOESN'T GET INTO EVIDENCE UNDER THE HEARSAY
21 RULE.

22 MR. VASSALOTTI: I UNDERSTAND.
23 THE RULES -- AS AN EXPERT, IF HE WOULD RELY
24 UPON STATEMENTS BY A MAN'S PERSONAL PHYSICIAN
25 AS TO THE TYPE OF MEDICATION THAT WAS

21109156

1 PRESCRIBED TO THAT MAN ON THE WAYS OF
2 DETERMINING WHAT CAUSED THE MAN'S CANCER,
3 UNDER THE FEDERAL RULES OF EVIDENCE, THAT'S
4 AN EXPERT'S REPORT UPON --

5 THE COURT: LET ME ASK YOU
6 THIS: HAVE YOU SEEN THE LETTERS?

7 MR. RENNEISEN: NO, SIR.

8 THE COURT: WHY DON'T YOU
9 SHOW HIM THE LETTERS?

10 MR. RENNEISEN: THAT'S NOT
11 GOING TO CHANGE MY OPINION.

12 THE COURT: I UNDERSTAND.

13 MR. VASSALOTTI: JUDGE, I CAN
14 TE;; YOU, I WROTE TO THE PHYSICIANS, WILL YOU
15 PLEASE TELL ME EVERY DRUG YOU PRESCRIBED ON
16 THIS MAN. THE LETTERS WERE SENT TO ME. I SENT
17 THEM TO DOCTOR EPSTEIN.

18 MR. RENNEISEN: THAT CONFIRMS
19 THE BASIS FOR MY OBJECTION. IF YOU'RE GOING
20 TO PROVE HE HAD NO STEROIDS, YOU'VE GOT TO
21 BRING THOSE DOCTORS IN.

22 THE COURT: LET ME ASK YOU
23 THIS: INFORMATION WAS GIVEN TO THIS WITNESS
24 ON WHICH HE BASED HIS OPINION, TOO, FROM
25 EXPERTS WHICH IT'S TECHNICALLY HEARSAY ALSO,

21109157

1 TOO.

2 MR. RENNEISEN: NOBODY

3 OBJECTED.

4 THE COURT: WELL, I'M GOING
5 TO REVERSE MYSELF AND ALLOW IT

6 (THE FOLLOWING TAKES PLACE IN
7 OPEN COURT.)

8 BY MR. VASSALOTTI:

9 Q. DOCTOR, DID YOU REVIEW THE LETTERS
10 FROM, I BELIEVE IT WAS DOCTORS ROZANSKI,
11 DE PERSIA AND GILPATRICK?

12 A. YES, SIR.

13 Q. WAS THERE ANY INDICATION IN ANY OF
14 THOSE LETTERS THAT MR. GRASSO RECEIVED ANY
15 STEROIDS?

16 A. NO, SIR.

17 Q. DOCTOR, DURING YOUR
18 CROSS-EXAMINATION, YOU MENTIONED THAT E.P.A.
19 ENACTED A NATIONAL EMISSION STANDARD FOR THE
20 EMISSION OF VINYL CHLORIDE IN -- I THINK IT
21 WAS OCTOBER OF 1975?

22 A. THAT'S CORRECT.

23 Q. ARE YOU FAMILIAR WITH THE FINDINGS
24 THAT THE ENVIRONMENTAL PROTECTION AGENCY MADE
25 AND RELIED UPON AND UPON WHICH THEY BASED

21109158

1 THEIR STANDARD?

2 A. YES, I WAS A MEMBER OF AN E.P.A.
3 ADVISORY COMMITTEE THAT CAME UP WITH THIS
4 RECOMMENDATION AT THE TIME.

5 Q. CAN YOU DESCRIBE FOR US THE FINDINGS
6 THAT WERE MADE BY E.P.A. AND UPON WHICH THEY
7 BASE THEIR CONCERN ABOUT EMISSION OF VINYL
8 CHLORIDE?

9 A. YES, I THINK I CAN.
10 MONITORING STUDIES BY THE
11 ENVIRONMENTAL PROTECTION AGENCY IN 1974 HAD
12 DEMONSTRATED AVERAGE LEVELS OF 17 PARTS PER
13 BILLION IN THE VICINITY OF A RANGE OF PLOTS.
14 IT WAS ASSUMED -- IT WAS BELIEVED THAT FOUR
15 POINT SIX MILLION PEOPLE IN THE UNITED STATES
16 WERE LIVING IN THE VICINITY OF PLANTS WITH
17 EXPOSURES ON THE AVERAGE -- I BEG YOUR
18 PARDON -- OF ABOUT 17 PARTS PER BILLION.

19 Q. THAT'S PER BILLION?

20 A. PER BILLION I'M TALKING ABOUT NOW.
21 THE ENVIRONMENTAL PROTECTION AGENCY ESTIMATED
22 THAT WITH THIS LEVEL OF EXPOSURE, ONE COULD
23 ANTICIPATE BETWEEN --

24 MR. RENNEISEN: YOUR HONOR,
25 AT THIS POINT, I OBJECT. IT'S THE OPINION OF

21109153

BFG09879

1 A REGULATORY AGENCY WITH --

2 THE WITNESS: THESE ARE
3 FIGURES --

4 MR. VASSALOTTI: YOUR HONOR,
5 IT'S EXACTLY THE POINT. IT'S A FINDING OF A
6 GOVERNMENT AGENCY AND IT CLEARLY FALLS WITHIN
7 THE EXCEPTION OF RULE 8038.

8 THE COURT: ALLOWED.
9 OVERRULED. LET'S PROCEED.

10 THE WITNESS: THE
11 ENVIRONMENTAL PROTECTION AGENCY CALCULATED
12 THAT WITH THIS KIND OF LEVEL OF EXPOSURE,
13 THEY COULD ANTICIPATE BETWEEN LESS THAN ONE
14 AND TEN ANGIOSARCOMAS A YEAR. FOR THESE
15 GROUNDS, THEY FELT IT WAS ESSENTIAL TO REDUCE
16 THE LEVELS OF VINYL CHLORIDE EMISSION. THE
17 NEW STANDARD OF THE ENVIRONMENTAL PROTECTION
18 AGENCY WAS DESIGNED TO REDUCE THE EMISSION BY
19 90 PERCENT.

20 NOW, WE WERE TALKING THERE
21 ABOUT 17 PARTS PER BILLION. AND ON THE 17
22 PARTS PER BILLION LEVEL SPREAD OVER FOUR
23 POINT SIX MILLION PEOPLE, UP TO TEN
24 ANGIOSARCOMAS A YEAR WERE ESTIMATED. WE'RE
25 NOW TALKING IN THIS INSTANCE -- WELL,

21109160

1 PERHAPS THIS ISN'T -- THIS ISN'T IN
2 RESPONSE TO THE QUESTION.

3 THE COURT: WELL, LET IT BE
4 IN RESPONSE TO THE QUESTION, OR OTHERWISE YOU
5 CAN'T.

6 BY MR. VASSALOTTI:

7 Q. THAT WAS MY NEXT QUESTION, DOCTOR.
8 THE E.P.A. CONSIDERED LEVELS OF 17 PARTS PER
9 BILLION IN THEIR FINDINGS UPON WHICH THEY
10 BASE THEIR STANDARDS; IN THIS CASE -- AND
11 IS IT TRUE THAT BASED UPON THOSE LEVELS OF
12 EXPOSURE, THE E.P.A. CONSIDERED THAT THERE
13 WAS AN EXCESS RISK OF ANGIOSARCOMA AS A
14 RESULT OF THE VINYL CHLORIDE EXPOSURE?

15 A. CORRECT, SIR.

16 Q. AND THE LEVELS WE'RE TALKING ABOUT
17 IN THIS CASE ARE IN THE PARTS PER MILLION --
18 WHEN I SAY THIS CASE WE'RE TALKING ABOUT
19 GRASSO -- THAT YOU'RE BASING YOUR OPINION
20 ON?

21 A. BASED ON THE DATA WHICH HAVE BEEN
22 SUBMITTED TO ME BY DOCTOR PESKIN, THAT
23 APPEARS TO BE THE CASE. EVEN THE DAMES AND
24 MOORE DATA WOULD BE CONSISTENT WITH THE
25 ESTIMATE OF THE E.P.A.

21109161

1 THE COURT: ANYTHING FURTHER?

2 MR. VASSALOTTI: YOUR HONOR,

3 EXCUSE ME.

4 BY MR. VASSALOTTI:

5 Q. DOCTOR EPSTEIN, THERE HAS BEEN SOME
6 MENTION OF ARSENIC BEING USED IN PESTICIDES.
7 DO YOU HAVE ANY INFORMATION RELATING TO
8 SHOWING THAT ARSENIC OR ARSENIC COMPOUNDS
9 CONTAINED IN PESTICIDES ARE CAUSELY RELATED
10 TO ANGIOSARCOMA OF THE LIVER?

11 A. ARSENIC CERTAINLY IS A CAUSE OF
12 ANGIOSARCOMA. AND IF THE ARSENIC IS --
13 WHETHER IT'S CONTAINED IN A PESTICIDE OR ANY
14 OTHER PRODUCT, I WOULD CERTAINLY WISH TO
15 CONSIDER THIS.

16 Q. DOCTOR, IF -- AND I SAY IF BECAUSE
17 IT HASN'T BEEN SHOWN -- SOMEONE LIKE MR.
18 GRASSO HAD BEEN EXPOSED TO SOME UNKNOWN
19 LEVELS OF PESTICIDES THAT CONTAINED ARSENIC
20 AND WAS THEN EXPOSED TO THE VINYL CHLORIDE
21 THAT WE'VE TALKED ABOUT IN THIS CASE, IS
22 THERE ANY MEDICAL EVIDENCE OR SCIENTIFIC
23 EVIDENCE TO INDICATE THAT THE TWO CANCER
24 CAUSING AGENTS WOULD WORK TOGETHER?

25 A. WELL, LET ME ANSWER THIS GENERALLY

21109162

1 AND THEN SPECIFICALLY. FROM A GENERAL
2 STANDPOINT, WE HVE VERY, VERY SUBSTANTIAL
3 LITERATURE TO SHOW THE EFFECTS OF A CHEMICAL
4 CARCINOGEN. IT CAN BE WHAT WE CALL SINOGISED.
5 THAT'S THE EFFECTS CAN BE MULTIPLIED BY
6 EXPOSURE EITHER BEFORE OR AFTERWARDS TO
7 ANOTHER CHEMICAL OR TO ANOTHER CHEMICAL
8 CARCINOGEN. AND THERE'S A LOT OF LITERATURE
9 ON THIS PRACTICE

10 BUT LET ME BE MORE SPECIFIC
11 AS FAR AS VINYL CHLORIDE IS CONCERNED.

12 THERE'S ONE VERY CRITICAL
13 EXPERIMENT WHICH I VERY MUCH REGRET THAT I
14 NEGLECTED TO INFORM THE COURT ABOUT THIS
15 MORNING WHICH YOU JUST TRIGGERED ME. AND THAT
16 IS A STUDY BY A DOCTOR RADICKE FROM
17 CINCINATTI WHICH WAS REPORTED AT THE
18 CONFERENCE, A GOVERNMENT CONFERENCE ON VINYL
19 CHLORIDE IN THE SPRING OF 1980. AND WHAT SHE
20 DID WAS QUITE FASCINATING IN THIS CONTEXT.
21 SHE TOOK SOME RATS, SPAYED OR NEUTERED RATS
22 AND DOSED THEM WITH ALCOHOL, NONE
23 NON-CARCINOGEN. SHE THEN GAVE THE RATS WHICH
24 WERE DOSED WITH ALCOHOL SOME VINYL CHLORIDE.
25 AND THE RATS WHICH HAD VINYL CHLORIDE WITH

21109163

BFG09883

1 ALCOHOL PRE-TREATMENT GOT A SINOGISTIC EFFECT
2 IN RELATION TO TWO THINGS: A VERY, VERY,
3 MARKED INCREASE IN THE INCIDENCE OF
4 ANGIOSARCOMA AND AN INCREASE IN HEPATIC
5 CANCERS WHICH ARE DIFFER FROM ANGIOSARCOMAS.
6 SO, THE PRE-TREATMENT, THE MODEST
7 PRE-TREATMENT OF THE RATS WITH THE EQUIVALENT
8 OF A FEW DOUBLE MARTINIS AND WHAT HAVE YOU
9 -- I HAVEN'T TRANSLATED THE DOSE INTO EXACT
10 ALCOHOL CONCENTRATIONS -- MASSIVELY
11 SINOIGISED THE INCIDENCE OF ANGIOSARCOMAS OF
12 THE LIVER IN RATE AND ALSO HEPATIC CANCER.

13 THE COURT: COULD YOU DEFINE
14 SINOIGISED SO EVERYONE KNOWS WHAT THAT TERM IS.

15 THE WITNESS: I'M SORRY, I
16 SHOULD HAVE DEFINED MY TERMS. LET US SAY YOU
17 HAVE AN AGENT -- LET'S SAY YOU GIVE
18 SOMEBODY -- YOU GIVE A POPULATION OF RATS A
19 DOSE OF ONE CARCINOGEN WHICH GIVES THEM TEN
20 PERCENT CANCER, OKAY, AND A DOSE OF ANOTHER
21 CARCINOGEN WHICH ALONE WOULD GIVE FIVE
22 PERCENT. SO, YOU'D EXPECT WHEN YOU PUT THE
23 TWO TOGETHER, YOU'D GET 15 PERCENT, WOULDN'T
24 YOU. THAT WOULD BE AN ADDITIVE EFFECT. TEN
25 PERCENT OF CANCER IN ONE SET OF EXPERTS. YOU

21109164

1 GET TEN PERCENT FROM THE CHEMICAL. ANOTHER
2 SET OF EXPERTS, YOU GET ANOTHER FIVE PERCENT.
3 BUT, IN FACT, WHEN YOU PUT THE TWO TOGETHER,
4 IF YOU GET 15 PERCENT, THAT MEANS IT'S A
5 MULTIPLICATIVE ACTION OR SINOGIST EFFECT. SO,
6 A SINOGISTIS EFFECT IS GREATER THAN YOU COULD
7 ANTICIPATE FROM THE MERE ADDITION OF THE TWO
8 THINGS TOGETHER. SO, ALCOHOL BY ITSELF IS
9 -- THE LITERATURE ON THE CARCINOGENICITY OF
10 ALCOHOL IS COMPLEX WHICH I REALLY WON'T
11 DEVOTE ANY TIME TO. BUT A SMALL PRE-TREATMENT
12 WITH ETHYL ALCOHOL PRODUCED A VERY, VERY
13 MAJOR INCREASE IN THE CARCINOGENIC EFFECTS OF
14 VINYL CHLORIDE.

15 NOW, FOR THIS REASON, I THINK
16 WHAT WE -- WHAT WE NOW HAVE TO CONSIDER IS
17 WHETHER -- THE POSSIBILITY AS TO WHETHER IF
18 HE HAD EXPOSURE TO ARSENIC OR IF HE HAD
19 EXPOSURE TO OTHER CARCINOGENS OR SOME NON-
20 CARCINOGENS AT DUPONT, WHETHER THESE MIGHT
21 POSSIBLY HAVE CONTRIBUTED SOMEWHAT. WE'RE
22 DEALING WITH A PRIME CAUSE WHICH IS THE VINYL
23 CHLORIDE. IN MY OPINION, THE VINYL CHLORIDE
24 IS THE AGENT FOR WHICH THERE IS A SUBSTANTIAL
25 PROBABILITY. BUT I'M UNWILLING TO EXCLUDE THE

21109165

BFG09885

1 FACT THAT AN EXPOSURE OF PRIOR EXPOSURE TO
2 ARSENIC OR PRIOR EXPOSURE TO SOME OF THESE
3 OTHER AGENTS MAY HAVE HAD AN ADDITIONAL
4 CONTRIBUTORY ROLE. AND ONE REASON WE MAY WISH
5 TO CONSIDER THAT IS BECAUSE OF THE WHOLE
6 HISTORY. WE DO KNOW AT DUPONT, HE WAS EXPOSED
7 TO OTHER CHEMICALS, ALTHOUGH MY LEVEL OF
8 INFORMATION ON THE NATURE OF THIS EXPOSURE IS
9 NOT OF A HIGH ORDER. NONE OF THESE AGENTS
10 WHICH HE WAS EXPOSED TO AT DUPONT WERE KNOWN
11 TO INDUCE ANGIOSARCOMA OF THE LIVER, HOWEVER.

12 THE COURT: LET'S PROCEED.

13 MR. VASSALOTTI: I HAVE
14 NOTHING FURTHER, YOUR HONOR.

15 THE COURT: REDIRECT --
16 RECROSS.

17 MR. RENNEISEN: THANK YOU.

18 RECROSS-EXAMINATION

19 BY MR. RENNEISEN:

20 Q. THERE, THIS SINOGISTIC EFFECT YOU
21 JUST TALKED ABOUT, THAT APPLIES TO EVERYBODY,
22 DOESN'T IT, NOT JUST MR. GRASSO?

23 A. WHAT APPLIES TO EVERYBODY?

24 Q. A SINOGISTIC EFFECT WHEN THERE'S A
25 CERTAIN COMBINATION OF CHEMICALS OR DRUGS IS

21109166

1 A CONDITION THAT IS PRESENCE IN RATS AND
2 PEOPLE AND CHIMPANZEES AND EVERYONE ELSE,
3 ISN'T IT?

4 A. YOU CAN DEMONSTRATE SINOGISTIC
5 EFFECTS.

6 Q. IN ANYBODY, ISN'T THAT TRUE?

7 A. IF ONE HAS THE APPROPRIATE
8 CONDITIONS FOR THE INDUCTION OF THE SINOGISM,
9 SURE. TOO MUCH EXPOSURE TO A PARTICULAR
10 CHEMICAL CARCINOGEN WHICH INDUCES A
11 CARCINOGENIC EFFECT AND IN ADDITION TO THAT,
12 SOME OTHER CHEMICALS CAN SINOGISE. AND WE DO
13 HAVE THE LITERATURE ON THIS BOTH IN ANIMALS
14 AND HUMANS. I DON'T KNOW IF THIS IS WHAT
15 YOU'RE ASKING ME.

16 Q. THAT'S FINE, DOCTOR. HOW MANY CASES
17 OF ANGIOSARCOMA DID THE E.P.A. FIND WITHIN
18 THOSE FOUR POINT SIX MILLION PEOPLE WHO LIVE
19 AROUND PVC PLANTS?

20 A. I DON'T THINK AT THE TIME THEY HAD
21 DONE ANY STUDIES. THEY WERE -- THAT
22 PARTICULAR -- THAT REPORT, THE SO CALLED
23 STAR REPORT IN 1975, BASICALLY DID TWO THINGS:
24 IT LISTED ALL THE KNOWN CASES OF ANGIOSARCOMA
25 AND IT INCLUDED ALSO THOSE TWO CASES WITH

21103167

1 SHORT LATENCY PERIODS AND ALSO THEY REPORTED
2 ON MONITORING AND MODELING STUDIES. AND AMONG
3 OTHER THINGS, IT REPORTED ON A STUDY BY THE
4 AMERICAN PUBLIC HEALTH ASSOCIATION ON THE
5 NUMBER OF PEOPLE LIVING IN THE VICINITY OF
6 PLANTS. THEY PUT ALL THE DATA TOGETHER AND
7 SAID ON THE BASIS OF OUR MONITORING DATA, WE
8 THINK THAT THE LEVELS OF VINYL CHLORIDE IN
9 PEOPLE LIVING CLOSE TO VINYL CHLORIDE PLANTS
10 IS ON THE AVERAGE 17 PARTS PER BILLION. WE
11 ESTIMATE ON THE BASIS OF THE AMERICAN PUBLIC
12 HEALTH ASSOCIATION DATA FOUR POINT SIX PEOPLE
13 LIVE IN THESE AREAS. THEY PUT THE TWO
14 TOGETHER AND THEY CAME UP WITH THESE
15 ESTIMATES.

16 NOW, I'M WILLING TO CRITICIZE
17 THESE ESTIMATES. I THINK IT'S VERY DIFFICULT
18 TO MAKE THESE QUANTITIES TAKE THE DIFFERENT
19 ESTIMATES. BUT THE BEST GOVERNMENT ESTIMATES
20 AT THE TIME WAS WE CAN ANTICIPATE IN THE
21 COMMUNITIES BETWEEN LESS THAN ONE -- HE
22 DIDN'T SAY HOW MUCH LESS THAN ONE UP TO TEN.
23 THAT'S A BROAD RANGE. WHEN IT'S LESS THAN ONE,
24 IT COULD BE ZERO POINT ZERO ZERO ONE. GOD
25 KNOWS. BUT THEY WERE CONCERNED ABOUT IT

21109168

BFG09888

1 ENOUGH TO SAY ON THE BASIS OF THESE FINDINGS,
2 WE ARE DETERMINED TO LIMIT THE AMOUNT OF
3 EMISSIONS FROM PVC 90 PERCENT.

4 Q. AND YOU WEREN'T CONSULTANT AT THAT
5 TIME?

6 A. I WAS OPERATING ON E.P.A. AT SEVERAL
7 -- I WAS A CONSULTANT AND EXPERT WITNESS IN
8 THEIR SPECIAL CANCER HEARINTGS ON PESTICIDES
9 BUT I WAS ALSO A MEMBER OF THE ENVIRONMENTAL
10 HEALTH ADVISORY COMMITTEE AND A SUBCOMMITTEE
11 WHICH WAS CONSIDERING SOME OF THE DATA WHICH
12 WE WERE LOOKING AT.

13 Q. AFTER THIS ESTIMATE WAS MADE, DID
14 ANYBODY GO OUT AND FIND OUT HOW MANY CASES
15 THERE WERE?

16 A. WE'RE DOING JUST THIS KIND OF THING
17 NOW, BECAUSE THERE HASN'T BEEN --

18 Q. WHO IS WE?

19 A. WE ARE CONSIDERING HERE IN THIS
20 COURT --

21 THE COURT: I THINK HE WANTS
22 TO KNOW WHO IS WE.

23 THE WITNESS: WE IN THIS
24 COURT, SIR, ARE CONSIDERING JUST ONE OF THESE
25 CASES, NAMELY A MR. GRASSO.

21109163

BFG09889

1 BY MR. RENNEISEN:

2 Q. YOU MEAN IN THIS ROOM?

3 A. WE ARE CONSIDERING ONE COMMUNITY'S
4 CANCER CASE. THERE HASN'T BEEN A SYSTEMIZED
5 STUDY OF THIS WHOLE PROBLEM OF COMMUNITY
6 CANCER. BUT THE ENVIRONMENTAL PROTECTION
7 AGENCY WAS CONCERNED SIX YEARS AGO BY THE
8 FACT THIS THIS LEVEL OF EXPOSURE COULD
9 PRODUCE UP TO 120 CANCERS EVERY YEAR. NOW,
10 IT'S IN ADDITION TO --

11 Q. IT'S PRODUCED TEN CANCERS?

12 A. WELL, THIS WAS THEIR ESTIMATE.
13 SHORTLY AFTER THAT, LEVELS WERE PRODUCED. NOW,
14 THERE HAVE BEEN STUDIES WHICH I REFERRED TO
15 THIS MORNING,, QUITE APART FROM THE
16 ANGIOSARCOMAS OF EXCESS BRAIN TUMORS OF
17 LIVING IN THE VICINITY OF PLANT. NOW, I CAN'T
18 GIVE YOU ABSOLUTE CLEARCUT ANSWERS TO THESE
19 THINGS BECAUSE WE DON'T KNOW. ALL WE KNOW IN
20 THIS CASE IS SOMEBODY WAS EXPOSED TO LEVELS
21 OF VINYL CHLORIDE WHICH APPEAR TO HAVE BEEN A
22 GREAT DEAL HIGHER THAN THOSE WHICH CONCERNED
23 THE ENVIRONMENTAL PROTECTION AGENCY SO MUCH
24 AS TO ORDER INDUSTRY TO REDUCE ITS EMISSION
25 BY 90 PERCENT. THAT SPEAKS FOR ITSELF.

21109170

1 Q. ALL RIGHT. I HEARD YOU SAY THAT. HAS
2 ANYBODY CHECKED THAT DATA? DO WE, THE
3 INFORMED PUBLIC, THE DOCTOR EPSTEINS OF THE
4 WORLD, THE MEDICAL COMMUNITY, E.P.A., KNOW
5 HOW MANY ANGIOSARCOMAS ARE IN THAT GROUP OF
6 PEOPLE?

7 A. ONE OF THE THINGS IN THIS COUNTRY IS
8 WE DON'T HAVE A NATIONAL TUMOR INDEX. WE
9 DON'T KNOW THE CAUSE OF DEATH OF EVERYBODY IN
10 THIS COUNTRY. WE DON'T HAVE AN AUTOPSY OF
11 EVERYBODY IN THIS COUNTRY. PEOPLE -- IT'S
12 IMPOSSIBLE TO ANSWER THAT. WE DO HAVE SURVEYS.
13 FOR INSTANCE, THE THIRD NATIONAL CANCER
14 SURVEY OR THE SEARS PROGRAM. THESE ARE BASED
15 ON TEN PERCENT OF THE AMERICAN POPULATION. IN
16 CONNECTICUT, YOU HAVE A GOOD TUMOR REGISTRY.
17 I CAN'T ANSWER YOU THESE QUESTIONS, BECAUSE
18 WE DON'T HAVE A DATA BANK IN THIS COUNTRY
19 WHICH GIVES YOU INFORMATION ON BIRTH TO DEATH,
20 INCLUDING AUTOPSY ON EVERY SINGLE ONE OF THE
21 220 MILLION AMERICANS.

22 Q. I WAS ONLY ASKING ABOUT FOUR MILLION
23 -- FOUR POINT SIX MILLION PEOPLE THAT I
24 THOUGHT THAT YOU AND THE E.P.A. WERE
25 CONCERNED ABOUT.

21409171

BFG09891

1 A. SIR, WE DON'T HAVE A DATA BANK
2 COVERING THE WHOLE OF THE U.S. THERE ARE
3 CONCERNS OVER A WIDE RANGE OF ISSUES, NOT
4 ONLY THE VINYL CHLORIDE ISSUE. THE CONCERN
5 THEN RELATED TO FOUR AND A HALF MILLION
6 PEOPLE AND I THINK I'M BEING REPETITIVE AND
7 THE CONCERN WAS ADEQUATE TO RESULT IN THIS
8 REDUCTION OF EMISSION. BUT THERE HASN'T BEEN
9 A SPECIFIC FOLLOW UP OF THESE FOUR POINT SIX
10 MILLION PEOPLE. THERE HASN'T BEEN A DETAILED
11 FOLLOW UP OF THEM. THERE HASN'T BEEN A FOLLOW
12 UP OF THE PEOPLE WHO WERE GIVEN VINYL
13 CHLORIDE AS AN ANESTHETIC AGENT.

14 Q. SINCE THERE'S NO FOLLOW UP TO FIND
15 OUT WHAT HAPPENS TO THIS FOUR POINT SIX
16 MILLION PEOPLE, IS IT FAIR THEN, DOCTOR, TO
17 SAY, WE DON'T KNOW WHETHER THERE'S A HIGHER
18 INCIDENCE OF ANGIOSARCOMA CLOSE TO POLYVINYL
19 PLANTS OR NOT?

20 A. I THINK ON THE BASIS OF THE ABSENCE
21 OF INFORMATION, THE ANSWER WOULD BE YES.
22 HOWEVER, AS I'VE INDICATED, I GAVE YOU A LIST
23 OF A WHOLE SERIES OF ANGIOSARCOMAS, WHICH HAD
24 OCCURRED IN PEOPLE LIVING IN THE VICINITY OF
25 PLANTS. THAT IS --

21109172

BFG09892

1 Q. YOU'VE GIVEN ME EIGHT OUT OF FOUR
2 POINT FOUR MILLION PEOPLE?

3 A. NO, SIR, I HAVEN'T. I'VE GIVEN YOU
4 EIGHT OUT OF A VERY SMALL NUMBER OF THE TOTAL
5 NUMBER OF ANGIOSARCOMAS WHICH ARE RECOGNIZED.
6 OF THE TOTAL NUMBER OF ANGIOSARCOMAS THAT ARE
7 RECOGNIZED, WE HAVE, I WOULD SAY, A FAIRLY
8 SUBSTANTIAL NUMBER OF COMMUNITY CANCERS.

9 Q. HOW MANY OUT OF FOUR POINT SIX
10 MILLION?

11 A. FOUR POINT SIX MILLION IS YOUR
12 DENOMINATION.

13 Q. THAT'S YOUR NUMBER.

14 THE COURT: LET'S NOT ARGUE
15 BACK AND FORTH. LET'S GO ON. LET'S MOVE ALONG.

16 MR. RENNEISEN: I HAVE NO
17 FURTHER QUESTIONS, JUDGE.

18 THE COURT: ANYTHING FURTHER?

19 MR. VASSALOTTI: JUST ONE
20 QUESTION.

21 BY MR. VASSALOTTI:

22 Q. DOCTOR, I FORGOT TO ASK YOU, WHEN
23 YOU REFER TO THOSE LETTERS OF DOCTOR ROZANSKI,
24 DOCTOR DE PERSIA AND DOCTOR GILPATRICK,
25 DOCTOR, IN YOUR POSITION AS A PHYSICIAN AND

21109173

1 TOXOCOLOGIST STUDYING CAUSAL CONNECTIONS --
2 CAUSAL RELATIONS BETWEEN CHEMICAL SUBSTANCES
3 AND CANCER, WOULD YOU ORDINARILY RELY UPON
4 THE REPORTS OF PHYSICIANS OF THE VICTIMS OF
5 CANCER THAT YOU WERE STUDYING IN FORMING YOUR
6 OPINION.

7 MR. RENNEISEN: OBJECTION. I
8 DIDN'T HEAR ONE QUESTION ASKED ABOUT THAT
9 SUBJECT.

10 THE COURT: I SUSTAIN THE
11 OBJECTION, UNLESS YOU REPHRASE YOUR QUESTION.

12 MR. VASSALOTTI: YOUR HONOR,
13 I'M REFERRING BACK TO -- I AGREE
14 WHOLEHEARTEDLY THAT MR. RENNEISEN DID NOT
15 BROACH THIS SUBJECT IN HIS RECROSS. THIS IS A
16 MATTER THAT I OMITTED WHEN I -- WHEN I
17 EXAMINED DOCTOR EPSTEIN IN REGARD TO THIS AND
18 I WANTED TO TIE UP A LOOSE END. THAT'S THE
19 ONLY PURPOSE.

20 THE COURT: ALL RIGHT. I'LL
21 LET YOU DO IT.

22 BY MR. VASSALOTTI:

23 Q. DOCTOR, IN YOUR CAPACITY OR POSITION
24 AS A PHYSICIAN ENGAGED IN THE STUDY OF
25 TOXICOLOGY AND CONSIDERING THE QUESTIONS OF

21109174

1 THE CONNECTION BETWEEN CANCER CAUSING
2 CHEMICALS AND DEVELOPMENT OF CANCER, WOULD
3 YOU ORDINARILY RELY UPON LETTERS WRITTEN FROM
4 PHYSICIANS OF THE VICTIMS OF CANCER THAT YOU
5 WERE CONSIDERING WHEN SUCH PHYSICIANS REPORT
6 TO YOU INFORMATION REGARDING THE
7 ADMINISTRATION OR PRESCRIPTION OF ANY
8 MEDICATIONS TO THE PAINT?.

9 MR. RENNEISEN: YOUR HONOR,
10 I'LL STIPULATE THE ANSWER IS YES, SO THE
11 DOCTOR DOESN'T HAVE TO ANSWER THE QUESTION.

12 THE COURT: ALL RIGHT.

13 MR. VASSALOTTI: THANK YOU.

14 THE COURT: THANK YOU.

15 ANYTHING FURTHER NOW?

16 ALL RIGHT. DOCTOR, YOU MAY
17 STEP DOWN.

18 THE WITNESS: THANK YOU, SIR.

19 THE COURT: WHY DON'T YOU JUST
20 STAY RIGHT WHERE YOU ARE FOR THE TIME BEING.

21 THE COURT: LADIES AND
22 GENTLEMEN. GOOD TIME FOR STOP FOR THE DAY.

23 AS I HAVE CAUTIONED YOU
24 BEFORE AND WILL CONTINUE TO CAUTION YOU
25 DURING THE COURSE OF THIS TRIAL, UNTIL THIS

21109175

1 CASE IS SUBMITTED TO YOU FOR DELIBERATIONS,
2 YOU MUST NOT DISCUSS THIS CASE WITH ANYONE OR
3 REMAIN WITHIN HEARING OF ANYONE DISCUSSING
4 IT. NEITHER SHOULD YOU READ ANY NEWSPAPER
5 ARTICLE, LISTEN TO ANY RADIO BROADCAST, NOR
6 VIEW ANY TELEVISION PROGRAM WHICH DISCUSSES
7 THIS CASE.

8 IF, HOWEVER, YOU SHOULD
9 BECOME AWARE OF ANY SUCH STORY, ARTICLE OR
10 NEWS REPORT, YOU ARE TO REPORT THAT MATTER TO
11 ME IN MY CHAMBERS AT YOUR EARLIEST
12 OPPORTUNITY SO THAT WE MAY DISCUSS IT.
13 NEEDLESS TO SAY, SHOULD YOU HAVE SUCH
14 EXPOSURE, YOU SHOULD NOT MENTION THAT FACT TO
15 ANY OF YOUR FELLOW JURORS. YOU ARE TO KEEP
16 AN OPEN MIND AND YOU MUST NOT DECIDE ANY
17 ISSUE IN THIS CASE UNTIL THE CASE IS
18 SUBMITTED TO YOU FOR YOUR DELIBERATIONS UNDER
19 THE INSTRUCTIONS OF THE COURT.

20 WE'LL STAND IN RECESS NOW
21 UNTIL TOMORROW MORNING AT 9:30. HAVE A
22 PLEASANT EVENING.

23 (RECESS FOR THE DAY.)
24
25

21109176

1 ONCOLOGY.

2 Q. WHEN AND FROM WHAT SCHOOL DID YOU
3 RECEIVE YOUR MEDICAL DOCTOR DEGREE?

4 A. JEFFERSON -- THOMAS JEFFERSON
5 UNIVERSITY MEDICAL COLLEGE 1967.

6 Q. IS THAT IN PHILADELPHIA,
7 PENNSYLVANIA?

8 A. YES.

9 Q. UPON COMPLETION OF YOUR MEDICAL
10 SCHOOL TRAINING, DID YOU SERVE AN INTERNSHIP?

11 A. YES, I DID.

12 Q. WHERE DID YOU SERVE YOUR INTERNSHIP?

13 A. PHILADELPHIA GENERAL HOSPITAL.

14 Q. AND HOW LONG DID YOU SERVE THAT?

15 A. ONE YEAR.

16 Q. AND COULD YOU DESCRIBE BRIEFLY THE
17 DUTIES THAT YOU HAD DURING YOUR INTERNSHIP?

18 A. I'D BE RESPONSIBLE FOR THE CARE OF
19 MEDICAL IN PATIENTS AND OUT PATIENTS.

20 Q. IN GENERAL MEDICINE?

21 A. YES.

22 Q. UPON COMPLETION OF YOUR INTERNSHIP,
23 DID YOU SERVE A RESIDENCY?

24 A. YES, I DID.

25 Q. WHAT IS A RESIDENCY? WHAT DOES THAT

1110

2110001

1 MEAN?

2 A. WHEN ONE GRADUATES FROM MEDICAL
3 SCHOOL, ONE BECOMES -- IS REQUIRED TO SERVE
4 ONE YEAR AS A PHYSICIAN IN A HOSPITAL SETTING
5 AND THEN ONE GETS A LICENSE TO PRACTICE
6 MEDICINE. DURING INTERNSHIP, UNDER IMMEDIATE
7 SUPERVISION. A RESIDENT IS A FURTHER TRAINING
8 IN WHATEVER FIELD IS DESIRED.

9 Q. SO IT'S FURTHER TRAINING IN A
10 SPECIALIZED FIELD?

11 A. YES.

12 Q. WHERE DID YOU SERVE YOUR RESIDENCY?

13 A. THOMAS JEFFERSON UNIVERSITY HOSPITAL.

14 Q. AND HOW LONG WAS THAT RESIDENCY?

15 A. IT WAS TWO YEARS.

16 Q. AND WHAT FIELD OR AREA OF MEDICINE
17 DID YOU SPECIALIZE IN IN YOUR RESIDENCY AT
18 JEFFERSON?

19 A. INTERNAL MEDICINE, WHICH IS THE NONE
20 SURGICAL TREATMENT OF ADULTS.

21 Q. IT IS INTERNAL ORGANS OF THE BODY?

22 A. YES.

23 Q. AFTER THE COMPLETION OF YOUR
24 RESIDENCY, DID YOU SERVE ANY ADDITIONAL
25 RESIDENCY OR FELLOWSHIPS TO FURTHER

21110002

1 SPECIALIZED --

2 A. I WAS A MEDICAL ONCOLOGIC FELLOW,
3 WHICH IS A SUBSPECIALTY OF MEDICINE.

4 Q. WHERE DID YOU SERVE THIS FELLOWSHIP?

5 A. I SERVED ONE YEAR AT JEFFERSON
6 UNIVERSITY HOSPITAL AND ONE YEAR AT AMERICAN
7 ONCOLOGIC HOSPITAL, BOTH IN PHILADELPHIA.

8 Q. NOW, UPON COMPLETION OF YOUR
9 FELLOWSHIP, DID YOU BEGIN TO WORK IN THE
10 PRIVATE PRACTICE OF MEDICINE?

11 A. YES, I DID.

12 Q. IS THERE ANY PARTICULAR AREA OF
13 MEDICINE THAT -- IN WHICH YOU RESTRICT YOUR
14 PRACTICE OR SPECIALIZE IN?

15 A. MEDICAL ONCOLOGY.

16 Q. CAN YOU DESCRIBE FOR US WHAT
17 ONCOLOGY IS AND WHAT AN ONCOLOGIST DOES?

18 A. IT COMES IN A GREEK WORD MEANING
19 CANCER, GROWTHS, AND IT HAS TO DO WITH THE
20 DIAGNOSIS, TREATMENT, PREVENTION OF CANCER.

21 Q. DOES ONCOLOGY -- DO YOU AS AN
22 ONCOLOGIST ALSO CONCERN YOURSELVES WITH THE
23 CAUSES OF CANCER AND THE GROWTHS OF CANCEROUS
24 TUMORS?

25 A. YES.

2110003

BFG09899

1 Q. IS ONCOLOGY AN AREA OF MEDICINE THAT
2 IS RECOGNIZED AS AN AREA SPECIALIZATION BY
3 ANY BOARD OR ORGANIZATION?

4 A. YES.

5 Q. HAVE YOU BEEN CERTIFIED BY --

6 A. YES.

7 Q. BY SUCH BOARD OR ORGANIZATION?

8 WHAT IS THAT BOARD THAT
9 CERTIFIES SPECIALIST IN ONCOLOGY?

10 A. IT'S A SUBSPECIALTY OF INTERNAL
11 MEDICINES, SO THE CERTIFIER IS THE AMERICAN
12 BOARDS OF INTERNAL MEDICINE.

13 Q. AND WHAT HAVE YOU BEEN CERTIFIED AS?

14 A. FIRST I WAS CERTIFIED IN INTERNAL
15 MEDICINE IN 1972 AND I WAS THEN CERTIFIED IN
16 MEDICAL ONCOLOGY IN 1977.

17 Q. WERE THERE ANY REQUIREMENTS TO
18 OBTAIN THIS CERTIFICATIONS THAT YOU RECEIVED
19 FROM THAT BOARD?

20 A. ONE HAS TO BE RECOMMENDED BY THE
21 HEAD OF THE TRAINING PROGRAM AND ONE HAS TO
22 PASS AN EXAMINATION.

23 Q. DOCTOR, WITH WHAT HOSPITALS ARE YOU
24 PRESENTLY ASSOCIATED?

25 A. CURRENTLY I'M WITH FOUR HOSPITALS:

2110004

BFG09900

1 THOMAS JEFFERSON UNIVERSITY HOSPITAL,
2 METHODIST HOSPITAL, NAZARETH HOSPITAL, ALL IN
3 PHILADELPHIA AND OUR LADY OF LOURDES HOSPITAL
4 IN CAMDEN, NEW JERSEY.

5 Q. WHAT IS YOUR POSITION AT THE
6 JEFFERSON HOSPITAL?

7 A. I'M AN ATTENDING PHYSICIAN IN THE
8 HOSPITAL AND I'M ASSISTANTS PROFESSOR OF
9 MEDICINE IN THE MEDICAL SCHOOL.

10 Q. SO, YOU TEACH, IN ADDITION TO YOUR
11 MEDICAL PRACTICE, YOU TEACH AT THE MEDICAL
12 SCHOOL?

13 A. YES.

14 Q. AT JEFFERSON?

15 A. YES.

16 Q. WHAT IS YOUR -- WHAT DO YOU TEACH
17 OVER AT THE MEDICAL SCHOOL, WHAT AREAS OF
18 MEDICINE?

19 A. INTERNAL MEDICINE AND MEDICAL
20 ONCOLOGY.

21 Q. WHO DO YOU TEACH?

22 A. MEDICAL STUDENTS, RESIDENTS.

23 Q. MEDICAL STUDENTS AND RESIDENTS?

24 A. RIGHT.

25 Q. DOCTOR, HAVE YOU WRITTEN ANY

2110005

BFG09901

1 ARTICLES THAT HAVE BEEN PUBLISHED IN ANY
2 MEDICAL OR SCIENTIFIC JOURNALS?

3 A. YES, I HAVE.

4 Q. APPROXIMATELY HOW MANY ARTICLES HAVE
5 YOU WRITTEN OR PUBLISHED?

6 A. SEVENTEEN ARTICLES AND TWO CHAPTERS
7 IN BOOKS.

8 Q. AND GENERALLY, WHAT OF THESE
9 ARTICLES AND CHAPTERS IN THE BOOKS DEALT WITH?

10 A. MAJOR EMPHASIS HAS BEEN ON
11 IMMUNOTHERAPY OF MALIGNANCY.

12 Q. THAT'S THE TREATMENTS OF CANCER?

13 A. TREATMENT OF CANCER.

14 Q. IN ADDITION TO THE DUTIES THAT
15 YOU'VE JUST DESCRIBED TO US, DO YOU ALSO
16 ENGAGE IN AT ANY TIME AS A CONSULTANT FOR ANY
17 OUTSIDE AGENCIES?

18 A. WELL, NOT -- NOT USUAL USUALLY.
19 I'M A PARTICIPANT IN A CANCER RESEARCH GROUP,
20 BUT IT'S NOT A CONSULTANT, I DON'T THINK.

21 Q. NOW, DOCTOR, IS IT TRUE THAT I'VE
22 ADVISED THAT OUR OFFICE WILL BE PAYING YOU
23 FOR THE TIME YOU'RE USING TO TESTIFY IN THIS
24 MATTER?

25 A. YES.

211K0006

BFG09902

1 Q. DOCTOR, WHEN DID YOU FIRST COME TO
2 TREAT MR. JOHN GRASSO? I'M SORRY, DOCTOR.
3 BEFORE WE GET INTO THAT, YOUR HONOR, I'D LIKE
4 TO MOVE INTO EVIDENCE AS PLAINTIFF'S EXHIBIT
5 TEN THE RECORDS OF FOUR HOSPITALIZATIONS OF
6 MR. GRASSO AT THE JEFFERSON HOSPITAL, THE
7 FIRST HOSPITALIZATION PERIOD BEING JUNE 15,
8 1976 THROUGH JUNE 30, 1976; THE SECOND
9 HOSPITALIZATION BEING JULY 28, 1976 THROUGH
10 AUGUST 21, 1976; THE THIRD HOSPITALIZATION
11 BEING DECEMBER 23, 1976 TO DECEMBER 24, 1976;
12 AND THE FINAL HOSPITALIZATION BEING DECEMBER
13 29 -- DECEMBER 29, 1976 TO JANUARY 8, 1977.

14 THE COURT: THEY'RE ALL
15 MARKED AS ONE EXHIBIT.

16 MR. VASSALOTTI: THEY'RE
17 ALTOGETHER AND TABULATED AND I BELIEVE MR.
18 RENNEISEN HAS NO OBJECTION TO THIS.

19 THE COURT: ARE THEY
20 PREMARKED.

21 MR. VASSALOTTI: THEY'RE
22 PREMARKED.

23 MR. RENNEISEN: YOUR HONOR, I
24 HAVE AGREED ALL ALONG THAT I WOULD NOT
25 REQUIRE THE CUSTODIAN TO BE CALLED TO

BFG09903

21110007

1 AUTHENTICATE THEM. I THINK THAT THE DOCTOR
2 CAN REFER TO THEM AND, THEY WOULD BE
3 ADMISSIBLE OTHERWISE. I'M NOT AGREEING ON THE
4 ADMISSIBILITY TO THE ENTIRE RECORD.

5 THE COURT: LET'S HAVE THEM
6 MARKED FOR IDENTIFICATION AND THE DOCTOR MAY
7 REFER TO THEM.

8 MR. VASSALOTTI: IT'S BEEN
9 PREMARKED YOUR HONOR AS PLAINTIFF'S EXHIBIT
10 TEN.

11 (AT WHICH TIME THE AFOREMENTIONED EXHIBITS
12 WERE MARKED FOR IDENTIFICATION.)

13 BY MR. VASSALOTTI:

14 Q. NOW, DOCTOR, DID THERE COME A TIME
15 HAD YOU TREATED A MR. JOHN GRASSO?

16 A. YES.

17 Q. DO YOU RECALL WHEN YOU FIRST TREATED
18 HIM?

19 A. REFERRING TO THE RECORD, IT WAS
20 AUGUST 6, 1976.

21 Q. AND WHERE WAS THAT?

22 A. THOMAS JEFFERSON UNIVERSITY HOSPITAL.

23 Q. AND DID YOU EXAMINE HIM AT THAT TIME?

24 A. YES.

25 Q. AND WHAT WERE HIS PHYSICAL

21100008

BFG09904

1 COMPLAINTS WHEN YOU FIRST SAW HIM AT THAT
2 TIME?

3 A. HE HAD COUGHED UP BLOOD, PAIN IN HIS
4 ABDOMEN, FEVER.

5 Q. DID YOU INQUIRE AS TO WHETHER HE HAD
6 BEEN AT THE JEFFERSON HOSPITAL BEFORE THE
7 TIME THAT YOU -- THE HOSPITALIZATION WHEN
8 YOU FIRST TREATED HIM?

9 A. I WAS AWARE, YES.

10 Q. DID YOU REVIEW THE RECORDS OF THAT
11 PREVIOUS HOSPITALIZATION WHEN YOU WERE CALLED
12 IN TO SEE MR. GRASSO?

13 A. I DID.

14 Q. NOW, DOCTOR, YOU'VE JUST BEEN HANDED
15 THE MEDICAL RECORDS FOR THE HOSPITALIZATIONS.
16 THOSE RECORDS INDICATE THAT MR. GRASSO WAS
17 FIRST HOSPITALIZED AT JEFFERSON IN JUNE OF
18 1976.

19 FROM YOUR REVIEW OF THOSE
20 RECORDS, CAN YOU TELL US WHAT MR. GRASSO'S
21 PHYSICAL COMPLAINTS WERE WHEN HE WAS TREATED
22 DURING THAT FIRST HOSPITALIZATION?

23 A. HE COUGHED UP BLOOD.

24 Q. AND WHAT TESTS OR TREATMENT WAS
25 UNDERTAKEN DURING THAT FIRST HOSPITALIZATION

2110009

BFG09905

1 OF MR. GRASSO TO DETERMINE WHAT MIGHT BE
2 CAUSING HIS PROBLEM?

3 A. WELL, HE HAD A CHEST -- CHEST
4 X-RAY; HE HAD BRONCHOSCOPY, WHERE ONE LOOKS
5 INTO THE LUNG, THE BRONCHI TO SEE WHETHER
6 THEY WOULD FIND A TUMOR. THEY DIDN'T. AND HE
7 WAS DISCHARGED WITH A DIAGNOSIS OF
8 HEMOPHTHISIS, WHICH IS A COMPLAINT,
9 BRONCHIECTASIS AND POSSIBLE --

10 Q. EXCUSE ME, WHAT IS HAD 1 MONTHS /TEU
11 CYST?

12 A. CAUGHING UP BLOOD.

13 Q. AND WHAT WERE THE OTHER --

14 A. AND POSSIBLE ASBESTOSIS.

15 Q. WAS THERE ANY DIAGNOSE MADE OF WHAT
16 MR. GRASSO'S CONDITION WAS AT THAT TIME?

17 A. NO. THERE WERE LABORATORY TESTS THAT
18 WERE ABNORMAL. BUT A CLEAR CONCLUSIVE
19 DIAGNOSIS WAS NOT REACHED.

20 Q. WERE ANY TESTS OF THE LIVER DONE
21 DURING THAT FIRST HOSPITALIZATION?

22 A. HE HAD ON PHYSICAL EXAMINATION, HIS
23 LIVER WAS OF NORMAL SIZE. LIVER ENZYMES WERE
24 PERFORMED AND ONE OF THEM WAS ABNORMAL.

25 Q. WHILE YOU THERE THERE WAS NO

2110010

BFG09906

1 DIAGNOSIS AT ANY -- OF ANY SPECIFIC
2 CONDITION AFTER THAT FIRST HOSPITALIZATION?

3 A. NO.

4 Q. WHEN WAS HE DISCHARGED FROM
5 JEFFERSON THAT FIRST TIME?

6 A. JUNE 30, 1976.

7 Q. AND THEREAFTER, WAS HE
8 REHOSPITALIZED AT THE JEFFERSON HOSPITAL?

9 A. YES.

10 Q. WHEN WAS THAT?

11 A. JULY 28, 1976.

12 Q. THAT WAS THE HOSPITALIZATION WHEN
13 YOU FIRST CAME TO TREAT MR. GRASSO; IS THAT
14 CORRECT?

15 A. YES.

16 Q. WHAT WAS HIS CONDITION UPON
17 ADMISSION TO JEFFERSON HOSPITAL THE SECOND
18 TIME?

19 A. THIS TIME, HE HAD RIGHT UPPER
20 QUADRANT PAIN, THAT'S IN THE ABDOMEN, COUGHED
21 UP BLOOD, FEVER.

22 Q. WERE ANY TESTS CONDUCTED ON MR.
23 GRASSO DURING THE SECOND HOSPITALIZATION IN
24 AN ATTEMPTS TO DETERMINE --

25 A. YES.

2110011

BFG09907

1 Q. -- WHAT CAUSED HIS PROBLEMS?

2 A. YES.

3 Q. CAN YOU GIVE ME A DESCRIPTION OF
4 SOME OF THE TESTS THAT WERE ADMINISTERED TO
5 HIM?

6 A. WELL, A PHYSICAL EXAMINATION
7 REMEMBER SEALED HE HAD A LARGE LIVER, A MASS.

8 Q. YOU MENTIONED IN THE FIRST
9 HOSPITALIZATION THE PHYSICAL EXAMINATION DID
10 NOT REVEAL A ENLARGED LIVER?

11 A. YES.

12 Q. AND THE SECOND HOSPITALIZATION DID
13 REVEAL AN ENLARGED LIVER?

14 A. YES.

15 Q. WHAT OTHER FINDINGS OR TESTS WERE
16 DONE?

17 A. A LIVER SCAN WAS ABNORMAL. IT WAS
18 CONSISTENT WITH METASTATIC DISEASE, OR CANCER.
19 BRONCHOSCOPY WAS REPEATED WHICH SHOWED HE HAD
20 DIFFUSE PULMONARY BLEEDING. CHEST X-RAY NOW
21 SHOWED TUMOR NODULES.

22 Q. IN THE LUNG?

23 A. IN THE LUNGS.

24 Q. THEY WEREN'T PRESENT BEFORE IN THE
25 X-RAY?

2110012

BFG09908

1 A. NO, THEY WERE NOT.

2 Q. THOSE TUMOR MODULES DID NOT SHOW IN
3 THE X-RAYS IN THE FIRST HOSPITALIZATION?

4 A. THAT'S CORRECT. THE LIVER BIOPSY
5 WAS PERFORMED.

6 Q. WHAT IS A BIOPSY?

7 A. WELL, BIOPSY IS TAKING A SAMPLE OF
8 SOMETHING. IT'S USUALLY SURGICAL.

9 Q. WAS A SURGICAL BIOPSY DONE WITH MR.
10 GRASSO OR WAS IT DONE BY ANOTHER MEANS?

11 A. IT WAS DONE BY A NEEDLE.

12 Q. HOW IS THAT ACCOMPLISHED?

13 A. ONE PUTS IN A LOCAL ANESTHETIC AND
14 PUTS A NEEDLE, WHICH HAS A HOLLOW CORE, AND
15 ONE STICKS IT IN AND TAKES -- SUCKS OUT A
16 PIECE OF LIVER FOR MICROSCOPIC EXAMINATION.

17 Q. AND AS A RESULT OF THE NEEDLE BIOPSY
18 THAT WAS DONE ON MR. GRASSO, WAS A DIAGNOSIS
19 OF HIS ILLNESS MADE?

20 A. YES.

21 Q. WHAT WAS THAT DIAGNOSIS?

22 A. ANGIOSARCOMA.

23 Q. WAS THE ANGIOSARCOMA LOCATED IN ANY
24 PARTICULAR PLACE?

25 A. IT WAS IN HIS LIVER.

2110013

BFG09909

1 Q. WHAT IS ANGIOSARCOMA OF THE LIVER,
2 CAN YOU TELL US?

3 A. IT'S A SMALL -- ANGIO MEANS BLOOD
4 VESSEL. SARCOMA MEANS MALIGNANCY DERIVED FROM
5 MESOTHELIUM; CARCINOMA AND SARCOMA ARE THE
6 TWO MALIGNANTS TUMORS IN HUMANS. COMA COMES
7 FROM SURFACE OF ORGANS, LIKE THE SKIN.
8 SARCOMAS ARE SOLID ORGANISMS LIKE BONE,
9 MUSCLE, BLOOD VESSELS. ANGIOSARCOMA IS
10 DERIVED FROM BLOOD VESSELS.

11 Q. AND HIS CANCER APPARENTLY DEVELOPED
12 IN THE LIVER?

13 A. YES.

14 Q. WHEN YOU WERE CALLED IN TO SEE MR.
15 GRASSO, DID YOU PROVIDE ANY COURSE OF
16 TREATMENT FOR HIS CANCER?

17 A. YES, I DID.

18 Q. BEFORE WE GET TO THAT, IS
19 ANGIOSARCOMA OF THE LIVER A TYPE OF CANCER
20 WHICH CAN BE CURED UNDER KNOWN MEDICAL
21 METHODS?

22 A. ALMOST ALWAYS WHEN THEY OCCUR IN THE
23 LIVER, THERE INOPERABLE. ONE CAN'T REMOVE THE
24 ENTIRE LIVER. IN OTHER SITES, WHICH ARE RARE,
25 THEY CAN BE SURGICALLY REMOVED AND ARE

2110014

BFG09910

1 CURABLE. HIS SITUATION WAS NOT A CURABLE
2 SITUATION.

3 Q. DID YOU TELL MR. GRASSO ABOUT THE
4 SEVERITY OF HIS DISEASE?

5 A. YES.

6 Q. DID YOU TELL HIM THAT HIS CONDITION
7 WAS TERMINAL?

8 A. I TOLD HIM IT WAS POTENTIALLY FATAL.

9 Q. AND DO YOU RECALL WHEN YOU TOLD HIM
10 THAT?

11 A. I BELIEVE I TOLD HIM DURING THIS
12 HOSPITALIZATION WHERE I FIRST SAW HIM.

13 Q. WHAT WAS -- WHAT WAS MR. GRASSO'S
14 CONDITION, PHYSICAL CONDITION, AS HE
15 PROGRESSED THROUGH THAT SECOND
16 HOSPITALIZATION AT THE END OF AUGUST OF 1975?

17 A. WELL, HE HAD -- HIS MAJOR SYMPTOMS
18 WERE PAIN IN HIS LIVER, COUGHING UP BLOOD,
19 FEAR.

20 Q. YOU SAY FEAR?

21 A. OF DYING; AND ANGER THAT HE WAS
22 DYING.

23 Q. DID HE EXPRESS THOSE FEELINGS TO YOU?

24 A. YES.

25 Q. NOW, YOU MENTIONED THAT YOU STARTED

BFG09911

2110015

1 A COURSE OF TREATMENT FOR MR. GRASSO'S
2 ANGIOSARCOMA OF THE LIVER.

3 CAN YOU DESCRIBE WHAT TYPE OF
4 TREATMENT YOU ADMINISTERED TO HIM?

5 A. YES. BASIC. --

6 Q. WHAT -- I'M SORRY, GO AHEAD.

7 A. BASICALLY, WHEN HE WAS DIAGNOSIED,
8 WE HAD LIMITED ABILITY TO USE OF ACTIVE
9 CHEMOTHERAPEUTIC AGENTS. AND HE WAS INVOLVED
10 IN A STUDY THAT COMPARED GIVING ADRIAMYCIN OR
11 -- WHICH IS A CHEMOTHERAPEUTIC AGENT VERSUS
12 CYTOXAN, VINCRISTIN AND ACTINOMYCIN D.

13 Q. ARE THESE DRUGS ALL KNOWN AS
14 CHEMOTHERAPEUTIC DRUGS?

15 A. YES.

16 Q. WHAT IS CHEMOTHERAPY, HOW DOES IT
17 WORK AGAINST CANCER?

18 A. WELL, SOME CASES, WE DON'T KNOW WHY.
19 SOME SPECIFIC DRUGS DO. BUT IN GENERAL, IT'S
20 DESIGNED TO KILL GROWING CELLS AND HOPEFULLY
21 GET A PREFERENTIAL EFFECT OVER THE CELLS THAT
22 ARE MALIGNANT THAT ARE GROWING VERSUS THE
23 NORMAL CELLS THAT ARE GROWING IN THE BODY
24 THAT ARE NORMALLY REQUIRED FOR SURVIVAL.

25 Q. SO, THE CHEMOTHERAPEUTIC AGENTS HAVE

21110016

BFG09912

1 ANY EFFECTS ON OTHER PARTS OF THE PATIENTS
2 BODY IN ADDITION TO THE CANCEROUS TUMORS?

3 A. YES.

4 Q. WHAT TYPE OF EFFECTS DOES THE
5 CHEMOTHERAPY HAVE ON THE REST OF THE PATIENTS
6 BODY? WHAT ARE THE SIDE EFFECTS?

7 A. WELL, THE MOST SERIOUS MEDICAL SIDE
8 EFFECTS ARE SIDE EFFECTS UPON GROWING CELLS
9 THAT ARE NORMALLY REQUIRED. AND THE GROWING
10 CELLS THAT ARE NORMALLY REQUIRED ARE THE BONE
11 MARROW, WHICH MAKES RED CELLS AND WHITE CELLS
12 AND PLATELETS.

13 Q. THAT'S BLOOD CELLS?

14 A. YES. AND THEN SORE THROAT, SORE
15 MOUTH, G.I. TRACT, NAUSEA AND VOMITING, WHICH
16 MR. -- JOHN HAD A FAIR AMOUNT OF THAT;
17 HAIR LOSS.

18 Q. PATIENTS WILL LOSE ALL THEIR HAIR AS
19 A RESULT OF THE CHEMOTHERAPY?

20 A. THE ADRIAMYCIN, YES, AND TO A LESSER
21 EXTENT, THE CYTOXAN.

22 Q. DID MR. GRASSO LOSE ALL OF HIS HAIR?

23 A. YES, HE DID.

24 Q. HOW MANY TIMES AND HOW OFTEN WAS
25 CHEMOTHERAPY GIVEN TO MR. GRASSO WHILE HE WAS

2110017

BFG09913

1 HOSPITALIZED DURING THAT SECOND TIME IN 1976?

2 A. I BELIEVE HE RECEIVED IT ONCE DURING
3 THE HOSPITALIZATION. THE ADRIAMYCIN WAS GIVEN
4 EVERY THREE WEEKS.

5 Q. AFTER HE WAS DISCHARGED FROM THE
6 HOSPITAL THAT TIME, DID YOU CONTINUE TO SEE
7 MR. GRASSO?

8 A. YES.

9 Q. AND TREAT HIM?

10 A. YES.

11 Q. HOW OFTEN WAS THE CHEMOTHERAPY
12 ADMINISTERED AFTER HE GOT OUT OF THE HOSPITAL
13 IN AUGUST OF 1976?

14 A. WELL, THE REMAINDER OF HIS LIFE HE
15 CONTINUED ON CHEMOTHERAPY. THE AGENTS CHANGED.

16 Q. HOW OFTEN DID HE RECEIVE THE DOSAGE?

17 A. THE ADRIAMYCIN WAS EVERY THREE WEEKS
18 AND LATER WHEN HE WORSEND, HE RECEIVED
19 CYCLOPHOSLOMID, ADRIAMYCIN, VINCRISTIN. AND
20 DURING HIS LAST HOSPITALIZATION, HE RECEIVED
21 TWO OTHER AGENTS. THAT'S JUMPING AHEAD.

22 Q. DID YOU CONTINUE TO TREAT MR. GRASSO
23 UP UNTIL THE TIME OF HIS DEATH?

24 A. I DID.

25 Q. DURING THE COURSE OF YOUR TREATMENT

2110018

BFG09914

1 OF MR. GRASSO, DID HE EVER COMPLAIN OF PAIN
2 TO YOU RELATIVE TO HIS CONDITION?

3 A. YES.

4 Q. WHAT TYPE OF COMPLAINTS DID HE MAKE
5 TO YOU?

6 A. HE HAD FAIRLY CONSISTENT LIVER PAIN.
7 HE HAD --

8 Q. WHEN YOU SAY LIVER PAIN, WHAT DO YOU
9 MEAN BY LIVER PAIN?

10 A. IT'S A -- THE LIVER IN THE --
11 BETWEEN THE CHEST AND THE ABDOMEN AND IT'S
12 ON THE RIGHT SIDE. SO, IT CONSISTENT --

13 Q. PAIN ON THE RIGHT SIDE OF THE BELLY?

14 A. YES. SOMETIMES IT'S REFERRED AS
15 THAT THE SHOULDER, TOO.

16 Q. HE COMPLAINED OF THAT PAIN. DID HE
17 HAVE ANY OTHER COMPLAINTS OF PAIN?

18 A. THAT WAS HIS MAJOR PAIN COMPLAINT.

19 Q. DID YOU ADMINISTER OR PRESCRIBE ANY
20 MEDICATIONS FOR MR. GRASSO FOR THE PURPOSE OF
21 RELIEVING HIS PAIN?

22 A. YES.

23 Q. WHAT TYPES OF PAIN RELIEF
24 MEDICATIONS DID YOU PROVIDE TO HIM?

25 A. WELL, HE WAS -- HE WAS ON A

2110019

BFG09915

1 NARCOTIC CODEINE UNTIL -- I BELIEVE, UNTIL
2 DECEMBER. AND THEN HIS PAIN WORSENERD AND HE
3 WAS ON PERIDIN, WHICH IS DEMEROL. AND LATER
4 --

5 Q. IS THAT A STRONGER PAIN RELIEF
6 MEDICATION THAN CODEINE?

7 A. YES. AND HE ALSO RECEIVED MORPHINE,
8 WHICH IS STRONGER YET.

9 Q. WERE THESE PAIN RELIEF MEDICATIONS
10 COMPLETELY EFFECTIVE IN RELEAVING HIS PAIN?

11 A. IN GENERAL, THEY HAD REASONABLE
12 CONTROL, I SUPPOSE. ALTHOUGH ONE ALWAYS HAS
13 PAIN. IT'S NEVER TOTAL RELIEF.

14 Q. YOU MENTIONED THAT MR. GRASSO
15 EXPRESSED FEAR AND ANGER TO YOU, AT LEAST AT
16 ONE POINT. DID HE EVER EXPRESS THOSE EMOTIONS
17 TO YOU AGAIN AS YOU WERE TREATING HIM UNTIL
18 THE TIME OF HIS DEATH.

19 A. NO, -- FEAR, CERTAINLY. -- YOU
20 KNOW, HUMAN REACTION, HE DIDN'T WISH TO DIE.
21 HE WAS AN ACTIVE, ENTHUSIASTIC PERSON THAT
22 WAS NOT LIKELY TO GIVE UP, BECOME PASSIVE.

23 Q. CAN YOU DESCRIBE HOW MR. GRASSO'S
24 ILLNESS PROGRESSED DURING THE MONTHS OF
25 SEPTEMBER, OCTOBER AND DECEMBER OF 1975?

2110020

BFG09916

1 A. WELL, HE HAD A CONTINUED
2 DETERIORATION OVER ALL HIS -- HE HAD SOME
3 RELIEF OF HIS PAIN WITH THE CHEMOTHERAPY
4 WHILE HE WAS GETTING THE ADRIAMYCIN UNTIL
5 DECEMBER. THE PULMONARY NODULES, THE SPREAD
6 OF THE CANCER HAD NOT CHANGED APPRECIABLY. SO,
7 HIS IMPROVEMENT WAS MARGINAL.

8 IN DECEMBER, HE FAILED
9 TOTALLY ON THE ADRIAMYCIN AND WAS SWITCHED TO
10 DIFFERENT CHEMOTHERAPY, WHICH WAS INEFFECTIVE.
11 AND FROM DECEMBER UNTIL HIS DEATH IN JANUARY,
12 HE DID PROGRESSIVELY WORSE, NO APPETITE, NO
13 STRENGTH, NO VIGOR, PAIN, SHORTNESS OF BREATH.

14 Q. DOCTOR, YOU HAD MENTIONED BEFORE
15 THAT CHEMOTHERAPY DRUGS THAT YOU ADMINISTERED
16 HAD EFFECTS UPON PARTS OF THE BODY THAT MAKE
17 OUR BLOOD CELLS. WAS MR. GRASSO'S BLOOD
18 CONSTANTLY MONITORED DURING THE TIME HE WAS
19 GIVEN CHEMOTHERAPY?

20 A. YES. THE MAJOR PROBLEM WE HAD WAS
21 WITH HIS RED CELL COUNT. HE LOST BLOOD
22 WHETHER HE COUGHED UP BLOOD. CHEMOTHERAPY
23 PREVENTED HIM FROM MAKING IT WELL AND HIS
24 DISEASE ALSO HAS AN EFFECT. AND HE WAS
25 CONSISTENTLY ANEMIC, WHICH WOULD MAKE HIS

21110021

BFG09917

1 SHORTNESS OF BREATH WORSE AND HE REQUIRED
2 MULTIPLE BLOOD TRANSFUSIONS.

3 Q. AND DID HE RECEIVE A CONSIDERABLE
4 NUMBER OF BLOOD TRANSFUSIONS DURING HIS
5 TREATMENT?

6 A. YES, HE DID.

7 Q. NOW, WAS MR. GRASSO REHOSPITALIZED
8 IN DECEMBER OF 1975?

9 A. YES, HE WAS.

10 Q. WHAT WAS THE DATE OF HIS FIRST
11 HOSPITALIZATION IN DECEMBER?

12 A. 12-23 TO 12-24.

13 Q. AND WHAT WAS HIS CONDITION UPON
14 ADMISSION AT THAT TIME?

15 A. HE WAS WORSE. HE WAS SEVERLY ANEMIC.
16 DURING THE HOSPITALIZATION, HE RECEIVED BLOOD
17 TRANSFUSIONS. HIS LIFE WAS LIMITED. HE WAS
18 DETERMINED TO GO HOME FOR CHRISTMAS.

19 Q. AFTER CHRISTMAS, WAS HE
20 REHOSPITALIZED AGAIN?

21 A. YES, HE WAS.

22 Q. AND WHEN WAS THAT?

23 A. IT WAS 12-29, 1976.

24 Q. AND THAT WAS HIS LAST
25 HOSPITALIZATION, WASN'T IT?

2110022

BFG09918

1 A. YES, IT WAS.

2 Q. DID HIS CONDITION CONTINUED TO
3 DETERIORATE AT THAT POINT?

4 A. YES, IT DID.

5 Q. DID HE EVER THE SAME TYPES OF
6 COMPLAINTS?

7 A. YES.

8 Q. WAS IT AT THIS POINT THAT HE BEGAN
9 TO RECEIVE MORPHINE FOR CONTROL OF PAIN?

10 A. YES.

11 Q. DURING THE COURSE OF THAT LAST
12 HOSPITALIZATION, WAS MR. GRASSO -- YOU SAW
13 MR. GRASSO, I PRESUME, ON A DAILY BASIS THEN?

14 A. YES.

15 Q. WAS HE CONSCIOUS FOR THE MOST PART?

16 A. YES. DROWSY AT TIMES, WEAK.

17 Q. HE WAS VERY WEAK?

18 WHEN DID HE DIE, DOCTOR?

19 A. JANUARY 8, 1977.

20 Q. WAS AN AUTOPSY PERFORMED, DOCTOR?

21 A. YES, IT WAS.

22 Q. AT JEFFERSON?

23 A. YES.

24 Q. WHAT DID THE AUTOPSY REPORT INDICATE
25 WAS THE CAUSE OF MR. GRASSO'S DEATH?

21110023

1 A. HE HAD MASSIVE INTRA-ABDOMINAL
2 HEMORRHAGE WITH ANGIOSARCOMA OF THE LIVER.

3 Q. WAS THE INTRA-ABDOMINAL HEMORRHAGE,
4 WAS THAT INTERNAL BLEEDING IN THE AREA OF THE
5 ABDOMEN?

6 A. YES, FROM THE LIVER.

7 Q. IT WAS FROM THE LIVER?

8 A. YEAH.

9 Q. WAS THAT AS A RESULT OF THE
10 ANGIOSARCOMA OF THE LIVER?

11 A. YES.

12 Q. DOCTOR, I'D LIKE YOU TO REFER TO THE
13 NARRATIVE SUMMARY RECORD IN THE SECOND
14 HOSPITALIZATION, THE ONE OF JULY, 1975.

15 DID YOU PREPARE THAT
16 NARRATIVE SUMMARY?

17 A. I DID.

18 Q. AND THERE IS A REFERENCE IN THAT
19 SUMMARY TO THE FACT, AMONG OTHERS, THAT MR.
20 GRASSO HAS HAD EXPOSURE TO A VARIETY ORGANIC
21 CHEMICALS AT PEDRICKTOWN, MARYLAND.
22 APPARENTLY, THERE WAS A VINYL CHLORIDE PLANT.

23 OF WHAT SIGNIFICANCE WAS IT
24 TO YOU THAT MR. GRASSO LIVED IN THE VICINITY
25 OF A VINYL CHLORIDE PLANT?

2110024

BFG09920

1 A. BECAUSE ANGIOSARCOMA IS A RARE TUMOR
2 AND THERE'S BEEN A LINK WITH VINYL CHLORIDE
3 EXPOSURE.

4 Q. DOCTOR, BASED UPON YOUR REVIEW OF
5 MR. GRASSO'S HOSPITAL RECORDS AND ALL OF THE
6 TESTS STUDIES THAT WERE DONE ON HIM AND YOUR
7 TREATMENTS OF HIS ILLNESS FOR APPROXIMATELY
8 FIVE MONTHS AND BASED UPON YOUR EXPERIENCE AS
9 A PHYSICIAN SPECIALIZING IN THE TREATMENT OF
10 CANCER, DO YOU HAVE AN OPINION, BASED UPON A
11 REASONABLE DEGREE OF MEDICAL PROBABILITY AS
12 TO WHETHER -- AS TO WHEN MR. GRASSO'S
13 ANGIOSARCOMA OF THE LIVER FIRST DEVELOPED?

14 A. I WOULD SUSPECT WITHIN THE LAST SIX
15 MONTHS -- AT THE EARLIEST SIX MONTHS PRIOR
16 TO HIS BRONCHOSCOPY. SO, I WOULD SUSPECT IT
17 DEVELOPED IN THE SAME YEAR, 1976, ALMOST
18 CERTAINLY. I BASE THAT --

19 Q. FOR MY OWN CLARIFICATION, DOCTOR,
20 ARE YOU SAYING THAT HIS TUMOR PROBLEM
21 DEVELOPED WITHIN A PERIOD SIX MONTHS FROM
22 WHEN HE FIRST STARTED COUGHING UP BLOOD IN
23 MAY OF 1976?

24 A. YES.

25 Q. WHAT IS THE BASIS FOR YOUR OPINION

BFG09921

21110025

1 THAT THE TUMOR DEVELOPED WITHIN THAT PERIOD
2 OF TIME?

3 A. BASICALLY, IT HAS TO DO WITH ITS
4 GROWTH RATE.

5 Q. CAN YOU EXPLAIN TO ME WHAT YOU MEAN
6 BY THAT?

7 A. WELL, IN JUNE OF 1976 WHEN HE HAD
8 HIS FIRST SYMPTOMS, HIS X-RAY WAS NEGATIVE, I
9 HAD SHOWED NO NODULES AND HIS X-RAY WAS NONE
10 REMARKABLE. HIS LIVER WAS NOT ENLARGED. BY
11 JULY, HE HAD CLEAR PULONARY TUMOR NODULES ON
12 HIS CHEST X-RAY AND HIS LIVER WAS
13 DRAMATICALLY ENLARGED.

14 Q. AND WHAT CUT FROM THE GROWTH RATE OF
15 A TUMOR. IS THIS KIND OF TIME MORE A RAPID
16 GROWING TUMOR AT ALL STAGES OF ITS LIFE OR
17 DOES IT GROW MORE RAPID AT THE BEGINNING OR
18 THE END?

19 A. THE EVIDENCE SUGGESTIONS THAT FROM
20 ANIMAL AND HUMAN EXPERIENCE THAT THEIR
21 GROWTHS RATE IS GREATEST AT THE BEGINNING AND
22 SLOWEST AT THE END.

23 Q. AND BASED -- YOU TREATED MR.
24 GRASSO AT THE END OF HIS DISEASE; IS THAT
25 CORRECT?

2110026

BFG09922

1 A. TO THE END, YES.

2 Q. TO THE END. AND DID YOU OBSERVE THE
3 GROWTH RATE OF HIS TUMOR DURING THE END
4 PERIODS OF HIS LIFE?

5 A. YES, IT SLOWED.

6 Q. IT SLOWED. BUT WOULD YOU

7 CHARACTERIZE IT AS A RAPID --

8 A. YES, VERY RAPID.

9 Q. VERY RAPID. AND DID THAT INDICATE TO
10 YOU THAT PRIOR TO THE TIME THAT HIS DISEASE
11 WAS FOUND THAT THE TUMOR WAS GROWING EVEN
12 MORE RAPIDLY?

13 A. YES.

14 Q. BASED UPON WHAT YOU JUST TOLD US?

15 A. YES.

16 Q. AND BASED UPON THAT, IT'S YOUR
17 OPINION THAT HIS TUMOR PROBABLY DEVELOPED
18 SOME TIME APPROXIMATELY SIX MONTHS BEFORE HE
19 FIRST COUGHED UP BLOOD IN MAY OF 1975?

20 A. YES.

21 Q. DOCTOR, IN YOUR PRACTICE OF ONCOLOGY
22 AND YOUR TEACHING OF ONCOLOGY TO -- AT THE
23 JEFFERSON MEDICAL SCHOOL, ARE YOU CONCERNED
24 AT ALL WITH THE CAUSES OF CANCER?

25 A. YES.

2110027

BFG09923

1 Q. WHY ARE YOU CONCERNED WITH THE
2 CAUSES OF CANCER AS AN ONCOLOGIST?

3 A. WELL, PART OF THE JOB IS NOT JUST
4 INDIVIDUAL PATIENTS. IT'S AN ATTEMPT TO
5 PREVENT CANCER AS MUCH AS POSSIBLE. OFF TIMES
6 WE HAVE PATIENTS WE CURE WITH DRUGS WHOM
7 WE'VE -- WE GIVE CANCER TO BY GIVING THEM
8 THE CHEMO THERAPY, BECAUSE OFF TIMES, THE
9 AGENTS ARE CARCINOGEN. SO, NATURALLY, WE HAVE
10 AN INTEREST.

11 Q. WOULD YOU CONSIDER YOURSELF AS ONE
12 WHO KEEPS A BREAST OF SCIENTIFIC DEVELOPMENTS
13 IN THE AREA OF CANCER CAUSATION?

14 A. YES.

15 Q. DOCTOR, THERE'S BEEN A CONSIDERABLE
16 AMOUNT OF TESTIMONY SO FAR IN THIS CASE
17 REGARDING WHERE MR. GRASSO LIVED, ITS
18 PROXIMITY OR ITS RELATIONSHIP TO THE GOODRICH
19 PVC PLANT. I'M GOING A -- YOU WEREN'T HERE
20 TO HEAR THAT TESTIMONY, SO I'M GOING TO ASK
21 YOU TO ASSUME CERTAIN FACTS AND THEN I'M
22 GOING TO ASK YOU FOR AN OPINION.

23 ~~DOCTOR, I ASK YOU TO ASSUME~~
24 ~~THAT JOHN GRASSO WAS BORN IN DECEMBER OF 1927~~
25 ~~AND THAT PRIOR TO HIS LAST ILLNESS, HE HAD NO~~

2110028

1 ~~MEDICAL HISTORY OF CANCER OR LIVER DISEASE;~~

2 AND THAT HIS PARENTS AND BROTHERS AND SISTERS
3 ALSO HAD NO PRIOR MEDICAL HISTORY OF CANCER
4 OR LIVER DISEASE.

5 I FURTHER ASK YOU TO ASSUME
6 THAT MR. GRASSO BEGAN WORKING AT THE DUPONT
7 CHAMBERS WORKS IN DEEPWATER, NEW JERSEY IN
8 APPROXIMATELY 1946 OR 1947; AND THAT EXCEPT
9 FOR PERIODS DURING WHICH HE WAS LAID OFF, HE
10 WORKED AT THAT FACILITY UNTIL MAY OF 1976.

11 I ASK YOU TO FURTHER ASSUME
12 THAT IN HIS EMPLOYMENT AT DUPONT, HE WAS NOT
13 EXPOSED TO ARSENIC OR ARSENIC COMPOUND OR TO
14 VINYL CHLORIDE; AND THAT DURING THE PERIODS
15 WHEN HE WAS LAID OFF FROM DUPONT FACILITY, HE
16 HELD VARIOUS JOBS RANGING FROM A GROCERY
17 CLERK, AN AUTO PARTS SALESMAN, A GAS STATION
18 ATTENDANT, AS A CONSTRUCTION LABORER ON A
19 HIGHWAY JOB, AS AN AUTO MECHANIC, A BUS
20 DRIVER AND A SHEET METAL WORKER; AND IN
21 CONNECTION WITH HIS POTENTIAL EXPOSURE TO
22 VINYL CHLORIDE IN THE AREA OF HIS HOME, I ASK
23 YOU TO ASSUME THAT DURING THE YEARS OF 1970
24 THROUGH 1975, MR. GRASSO WAS AWAY FROM HIS
25 HOME APPROXIMATELY 50 TO 55 HOURS PER WEEK,

2110029

BFG09925

1 AND THAT -- AND THAT, THEREFORE, HE WAS
2 HOME OR IN THE AREA OF HIS HOUSE
3 APPROXIMATELY 50 PERCENT OF THE TIME FOR
4 THOSE YEARS. IN ADDITION TO BEING HOME 50
5 PERCENT OF THE TIME GENERALLY, DURING THE
6 PERIOD OF FEBRUARY, 1973 TO DECEMBER OF 1973,
7 MR. GRASSO WAS AT HOME OR IN THE AREA OF HIS
8 HOME CONTINUOUSLY AS HE WAS RECUPERATING FROM
9 A CORONARY ARTERY BYPASS SURGERY.

10 NOW, I FURTHER ASK YOU TO
11 ASSUME THAT DURING THE PERIOD FROM MARCH OF
12 1970 TO DECEMBER OF 1975, THAT MR. GRASSO'S
13 HOME WAS LOCATED APPROXIMATELY 1.7 MILES FROM
14 A POLYVINYL CHLORIDE PLANT OPERATED BY THE
15 B.F. GOODRICH COMPANY AND THAT DURING THE
16 YEARS IN QUESTION, IT HAS BEEN ESTIMATED THAT
17 THE GOODRICH PLANT EMITTED BETWEEN 1.4 AND
18 OVER 4.3 MILLION POUNDS OF VINYL CHLORIDE
19 INTO THE ATMOSPHERE ON AN ANNUAL BASIS; AND
20 IT HAS ALSO BEEN ESTIMATED THAT DURING THE
21 YEARS, THE PVC PLANT ALSO EMITTED INTO THE
22 ATMOSPHERE DUST PARTICLES THAT RANGED IN SIZE
23 FROM ONE TO TEN MICRONS AND THAT SUCH PVC
24 DUST PARTICLES CONTAINED IN THEM ENTRAPPED
25 LEVELS OF VINYL CHLORIDE THAT WOULD SLOWLY

2110030

1 DISSIPATE AND THOSE LEVELS OF ENLARGED VINYL
2 CHLORIDE RANGED FROM ANYWHERE FROM 40 PARTS
3 PER MILLION UP TO AN ESTIMATED 2,000 PARTS
4 PER MILLION.

5 IT HAS BEEN FURTHER ESTIMATED
6 THAT DURING THE YEARS 1970 THROUGH 1975, THAT
7 THE LEVELS OF VINYL CHLORIDE IN THE AIR
8 AROUND THE GRASSO HOME RANGED FROM A LOW OF
9 1.1 PARTS PER MILLION UP TO 28 PARTS PER
10 MILLION FOR A TOTAL OF 1,508 HOURS DURING
11 THAT FIVE AND A HALF, SIX YEAR PERIOD; AND
12 THAT DURING THOSE YEARS, IN ADDITION TO THE
13 RANGE OF EXPOSURES AT THAT TIME, DURING A
14 NUMBER OF HAZY POLLUTION DAYS, THAT THE
15 LEVELS OF EXPOSURE IN THE AREA OF GRASSO HOME
16 RANGED AS HIGH AS FROM TEN TO 90 PARTS PER
17 MILLION; AND FINALLY IN ADDITION TO ALL OF
18 THAT, I ASK YOU TO ASSUME THAT DURING THE
19 PERIOD FROM MARCH OF 1970 TO DECEMBER OF 1975,
20 THERE WERE PERIODS DURING WHICH SHORT PERIODS
21 OF EXPOSURE OF VINYL CHLORIDE IN THE AREA OF
22 THE GRASSO HOME, RANGING FROM FIVE TO FIFTEEN
23 MINUTES WOULD HAVE OCCURRED IN LEVELS UP TO
24 SEVERAL HUNDRED PARTS PER MILLION.

25 ~~NOW, DOCTOR, BASED UPON THOSE~~

2110031

BFG09927

1 ~~FACTS AND BASED UPON YOUR KNOWLEDGE OF MR.~~
2 ~~GRASSO'S CONDITION AND YOUR TREATMENTS OF HIS~~
3 ~~CONDITION AND BASED UPON YOUR EXPERIENCE AND~~
4 ~~EXPERTISE AS A PHYSICIAN SPECIALIZING IN THE~~
5 ~~TREATMENT OF CANCER, DO YOU HAVE AN OPINION~~
6 ~~AS TO WHAT MAY HAVE CAUSED MR. GRASSO'S~~
7 ~~AN OPINION WITHIN A REASONABLE STILE OF~~
8 ~~MEDICAL PROBABILITY AS TO WHAT CAUSED MR.~~
9 ~~GRASSO'S ANGIOSARCOMA OF THE LIVER?~~
10 A. ~~YES, I DO.~~

11 MR. RENNEISEN: YOUR HONOR, I
12 OBJECT TO THE QUESTION. THERE IS NO EVIDENCE
13 WHATSOEVER THAT IT IS DUST PARTICLES THAT MAY
14 HAVE BEEN EMITTED FROM THE PLANT REACHED THE
15 GRASSO HOME. THERE'S BEEN TESTIMONY AS TO
16 DUST AND IT WAS WHITE, BUT THERE IS NO
17 TESTIMONY THAT DUST WAS POLYVINYL CHLORIDE.

18 FURTHERMORE, ANY ESTIMATES
19 MADE BY THE WITNESSES CONCERNING THE VINYL
20 CHLORIDE CONTAINED IN THE DUST IS SO
21 SPECULATIVE BECAUSE IT DEPENDS ON THE AGE AND
22 THE DUST AND SO FORTH, THAT I THINK THAT PART
23 OF THE QUESTION CLEARLY IS ADMISSIBLE.

24 MR. VASSALOTTI: YOUR HONOR,
25 FIRST WITH RESPECT TO THE ADMISSION OF DUST

2110032

BFG09928

1 AND THE TRANSPORT TO THE AREA OF THE GRASSO
2 HOME, PROFESSOR DAVIDSON TESTIFIED THAT THE
3 PLANT WOULD CAUSE EMISSION OF PVC DUST
4 PARTICLES AND SPECIFICALLY DUST PARTICLES
5 WITHIN THE RANGE OF ONE TO TEN MICRONS, AS HE
6 DESCRIBED IT. PROFESSOR DAVIDSON -- I'M
7 SORRY, PROFESSOR PESKIN ALSO TESTIFIED THAT
8 PARTICLE SIZES OF PVC DUST IN THE RANGE OF
9 ONE TO TEN MICRONS WOULD BE CARRIED IN THE
10 ATMOSPHERE IN A SIMILAR MANNER TO THE VINYL
11 CHLORIDE GAS TO WHICH HE MODEL HAD -- AND I
12 RECALL HIS TESTIMONY SPECIFICALLY THAT THOSE
13 MATERIALS WOULD REACH THE AREA OF THE GRASSO
14 HOME UNDER THE WIND CONDITIONS THAT HE
15 DESCRIBED.

16 IN ADDITION, WE HAVE THE
17 OBSERVATIONS OF MRS. GRASSO AND HER SON
18 CONCERNING THE WHITE DUST AND I --

19 THE COURT: I'LL OVERRULE THE
20 OBJECTION. I'LL ALLOW IT. LADIES AND
21 GENTLEMEN, IT'S YOUR RECOLLECTION OF THE
22 TESTIMONY, NOT WHAT COUNSEL MAY SAY AS THEIR
23 RECOLLECTION. IT'S YOUR RECOLLECTION OF THE
24 TESTIMONY. YOU MAY PROCEED.

25 BY MR. VASSALOTTI:

21110033

1 Q. DOCTOR, WHAT IS YOUR OPINION
2 REGARDING THE CAUSE OF MR. GRASSO'S
3 ANGIOSARCOMA OF THE LIVER?

4 A. VINYL CHLORIDE.

5 Q. AND IN YOUR OPINION, ARE YOU BASING
6 THAT UPON THE VINYL CHLORIDE EXPOSURE LEVELS
7 IN WHICH I HAVE JUST GIVEN YOU IN THE
8 HYPOTHETICAL SITUATION THAT HE RECEIVED IN
9 THE AREA OF HIS HOME?

10 A. YES.

11 Q. DOCTOR, THERE ARE OTHER -- ARE
12 THERE OTHER KNOWN CAUSES OF ANGIOSARCOMA OF
13 THE LIVER?

14 A. YES.

15 Q. WHAT ARE IT IS OTHER KNOWN CAUSES,
16 TO YOUR KNOWLEDGE?

17 A. ARSENIC, ARSENIC COMPOUNDS AND
18 THOROTRAST.

19 Q. IS THAT THOROTRAST?

20 A. YES.

21 Q. IN MY HYPOTHETICAL FACT SITUATION,
22 DOCTOR, I DIDN'T MENTION TO YOU THOROTRAST.
23 BUT LET ME ADD FURTHER THAT THERE IS NO
24 KNOWLEDGE THAT MR. GRASSO -- NO ONE --
25 STRIKE THAT. THERE'S NO EVIDENCE THAT MR.

21110034

1 GRASSO HAD ANY DIAGNOSTIC X-RAYS IN WHICH A
2 DYE OR RADIOACTIVE DYE WAS USED.

3 WHAT IS THOROTRAST USED FOR
4 OR WHAT WAS IT USED FOR?

5 A. IT WAS A RADIOACTIVE DYE THAT WAS
6 USED FOR BLOOD FLOW STUDIES TO -- FOR
7 X-RAYS, ARTERIALGRAMS.

8 Q. AND HOW LONG HAS IT BEEN SINCE THAT
9 MATERIALS BEEN USED FOR THAT PURPOSE?

10 A. I SUSPECT IT'S BEEN -- IT WAS
11 KNOWN TO CAUSE DIFFICULTY IN THE THIRTIES AND
12 ITS BEEN DISCONTINUED.

13 Q. DOCTOR LAUCIUS, YOU'VE TESTIFIED
14 THAT VINYL CHLORIDE IS A KNOWN CAUSE OF
15 ANGIOSARCOMA OF THE LIVER?

16 IF A HUNDRED PEOPLE WERE
17 EXPOSED TO VINYL CHLORIDE IN A GIVEN
18 CONCENTRATION AT ONE TIME, WOULD YOU EXPECT
19 EVERYONE TO DEVELOP CANCER?

20 A. NO.

21 Q. WHY IS IT THAT SOME PEOPLE ARE
22 SUSCEPTIBLE OR DEVELOP CANCER AS A RESULT TO
23 EXPOSURE TO CANCER CAUSING MATERIALS AND
24 OTHER PEOPLE DON'T?

25 A. THEORY OR EVIDENCE?

2110035

BFG09931

1 Q. WELL, DOES ANYONE NO INFORMATION FOR
2 SURE?

3 A. IT'S UNKNOWN.

4 Q. IS IT KNOWN FOR SURE THOUGH THAT NOT
5 EVERYONE REACTS THE SAME WAY TO A CANCER
6 CAUSING MATERIAL?

7 A. YES.

8 Q. WHY IS IT THAT MR. GRASSO WOULD HAVE
9 DEVELOPED ANGIOSARCOMA OF THE LIVER AND MRS.
10 GRASSO HAS NOT?

11 A. ONE SUSPECTS CHANCE, CHANCE EVENT IS
12 A POSSIBILITY.

13 Q. DOES IT HAVE ANYTHING TO DO WITH THE
14 SUSCEPTIBILITY OF INDIVIDUALS TO -- FOR THE
15 SENSITIZATION OF INDIVIDUALS TO THESE
16 PARTICULAR TYPE OF CANCER MATERIALS?

17 A. THAT'S YOUR UNIFYING HYPOTHESIS FROM
18 ANIMALS.

19 Q. DOCTOR, TO YOUR KNOWLEDGE, HAS ANY
20 LEVEL OF EXPOSURE TO VINYL CHLORIDE BEEN
21 ESTABLISHED AS BEING SAFE?

22 A. NO.

23 MR. VASSALOTTI: ALL RIGHT.

24 THANK YOU DOCTOR, I HAVE NO FURTHER QUESTIONS.

25 THE COURT: CROSS-EXAMINE.

2110036

BFG09932

1 CROSS EXAMINATION BY MR. RENNEISEN.

2 Q. DOCTOR, HAVE YOU WRITTEN ANY PAPERS
3 CONCERNING VINYL CHLORIDE ITS RELATIONSHIP TO
4 ANGIOSARCOMA?

5 A. NO, I HAVE NOT.

6 Q. HAVE YOU MADE ANY STUDIES OF VINYL
7 CHLORIDE IN ITS EFFECT AND ITS RELATIONSHIP
8 TO ANGIOSARCOMA?

9 A. WELL, THIS MAN, JOHN I DID -- I
10 DON'T KNOW WHETHER IT'S A STUDY. I HOPE TO
11 INITIATE ONE. I DID CALL, WHEN I FOUND OUT HE
12 HAD AN ANGIOSARCOMA, I DID CALL THE
13 CARCINOGENESIS BRANCH OF THIS COMMUNICABLE
14 DISEASE CENTER.

15 Q. IS THAT IN ATLANTA, GEORGIA?

16 A. YES.

17 Q. YOU HAD SOME CORRESPONDENCE WITH
18 DOCTOR FAULK, DID YOU NOT?

19 A. HE NEVER RETURNED ANY OF MY CALLS. I
20 FOUND OUT ABOUT THE SUBSEQUENTLY, I GUESS
21 THROUGH PLAINTIFFS ATTORNEY.

22 Q. YOU ARE -- YOU ARE FAMILIAR WITH
23 HENRY FAULK, ARE YOU NOT?

24 A. YES, I AM. HE'S THE PERSON I CALLED.

25 Q. AND HE IS ASSOCIATED WITH THE CENTER

21110037

1 FOR DISEASE CONTROL IN ATLANTA, GEORGIA, IS
2 HE NOT?

3 A. YES, HE IS.

4 Q. HAVE YOU READ ARTICLES THAT HE'S
5 WRITTEN ABOUT VINYL CHLORIDE IN CANCER?

6 A. YES, I HAVE.

7 Q. ARE YOU FAMILIAR WITH AN ARTICLE IN
8 THE LANCET, L-A-N-C-E-T, DATED NOVEMBER 24,
9 1979 BY DOCTOR FAULK DISCUSSING ANOTHER CAUSE
10 OF VINYL CHLORIDE?

11 THE COURT: ANOTHER CAUSE OF
12 VINYL CHLORIDE.

13 BY MR. RENNEISEN:

14 Q. I'M SORRY, CAUSE OF ANGIOSARCOMA.

15 A. UM-HUM, YES, I AM.

16 Q. ARE YOU FAMILIAR WITH THAT ARTICLE?

17 A. UM-HUM.

18 Q. AND THAT ARTICLE DISCUSSES A FOURTH
19 KNOWN CAUSE OF ANGIOSARCOMA, DOES IT NOT?

20 A. YES, IT DOES.

21 Q. AND WHAT IS THAT FORTH KNOWN CAUSE?

22 A. ANDROGENIC ANABOLIC STEROIDS.

23 Q. AND DOES THAT ARTICLE SAY FROM A
24 GROUP OF CASES STUDIED BY DOCTOR FAULK AND
25 HIS ASSOCIATE WHAT'S THAT APPROXIMATELY 25

21110038

BFG09934

1 PERCENT OF THE CAUSES OF ANGIOSARCOMA WERE
2 KNOWN AND, THEREFORE, APPROXIMATELY 75
3 PERCENT WOULD BE UNKNOWN?

4 A. YES.

5 Q. DO YOU AGREE THAT MANY CAUSES OF
6 ANGIOSARCOMA OR -- MANY CASES OF
7 ANGIOSARCOMA ARE OF UNKNOWN ORIGIN?

8 A. WELL, THERE AREN'T THAT MANY CASES.

9 Q. HOW MANY CASES ARE THERE A YEAR?

10 A. I'M NOT AWARE, BUT I THINK IN 1976
11 WHEN HE WAS DESCRIBED, I THINK THERE WERE 60
12 IN A YEAR IN THE UNITED STATES.

13 Q. IN THIS ARTICLE, DOCTOR FAULK IS
14 STUDYING ANGIOSARCOMA DATA REPORTED FROM 1954
15 TO 1974 AND HE REPORTED 168 SUCH DEATHS AND
16 HE'S CONCLUDED 22 WERE ASSOCIATED WITH
17 PREVIOUSLY KNOWN CAUSES, VINYL CHLORIDE,
18 THOROTRAST AND ARSENIC AND 3.1 WITH THE
19 STEROID THAT YOU MENTIONED, WHICH WOULD MEAN
20 75 PERCENT B.F. UNKNOWN CAUSES, IS THAT TRUE?

21 A. THAT'S WHAT HIS -- THAT'S WHAT HE
22 STATES.

23 Q. AND HE IS CONSIDERED TO BE AN
24 AUTHORITY IN THE FIELD, IS HE NOT, OF CANCER
25 AND THE CAUSES OF CANCER?

21110039

BFG09935

1 A. YES, HE IS.

2 Q. HAVE YOU DONE -- FROM YOUR

3 LITERATURE THAT YOU'VE READ -- AND I THINK

4 YOU SAID YOU KEEP UP TO DATE, DO YOU HAVE AN

5 OPINION AS TO WHAT THE LATENCY PERIOD IS FOR

6 ANGIOSARCOMA? WELL LET'S FIRST DEFINE LATENCY

7 PERIOD. HOW DO YOU DEFINE LATENCY PERIOD?

8 A. LATENCY IN CARCINOGENESIS?

9 Q. YES.

10 A. HAS TO DO WITH TIME TO EXPOSURE TO A

11 CARCINOGEN TO THE DEVELOPMENT OF CANCER.

12 Q. FROM THE FIRST EXPOSURE TO

13 DEVELOPMENT?

14 A. RIGHT.

15 Q. FROM YOUR LITERATURE, STUDIES, DO

16 YOU KNOW WHAT THE LATENCY PERIOD IS FOR

17 ANGIOSARCOMA?

18 A. GENERALLY, THE CASES THAT HAVE BEEN

19 DESCRIBED HAVE BEEN LATENCY PERIODS OF TEN TO

20 20 TO 30 YEARS.

21 Q. AND WITH RESPECT TO MR. GRASSO, IT

22 WOULD BE LESS THAN SIX YEARS, WOULD IT NOT?

23 A. YES, IT WOULD.

24 Q. YOU MENTIONED THAT ARSENIC WAS A

25 CAUSE OF ANGIOSARCOMA; IS THAT CORRECT?

2110040

1 A. YES.

2 Q. DO YOU KNOW THAT ARSENIC IS USED IN
3 INSECTICIDES?

4 A. YES.

5 Q. DO YOU KNOW THAT ARSENIC
6 INSECTICIDES CONTAIN ^{W1} ARSENIC WERE USED OVER A
7 LONG PERIOD OF TIME IN SALEM COUNTY ON THE
8 FARMS DOWN THERE?

9 A. I DON'T KNOW, OF COURSE.

10 MR. VASSALOTTI: YOUR HONOR,
11 MAY WE APPROACH THE BENCH?

12 A. YES, SIR.

13 (SIDE BAR DISCUSSION ON RECORD)

14 MR. VASSALOTTI: YOUR HONOR, I
15 ASK FOR AN OFFER OF PROOF FROM THE DEFENDANT
16 AT THIS POINT WITH REGARD TO THE REPEATED
17 STATEMENTS THAT ARSENIC IS USED IN
18 INSECTICIDES AND WAS USED HEAVILY IN THE
19 SALEM COUNTY AREA.

20 THE COURT: LET THE RECORD
21 REFLECT THAT MR. RENNEISEN HAS GIVEN TO
22 COUNSEL FOR THE PLAINTIFF SOME DOCUMENT TO
23 READ.

24 MR. RENNEISEN: IT'S A STUDY
25 PERFORMED OF THE NEW JERSEY AGRICULTURE

21110041

BFG09937

1 DEPARTMENT, I BELIEVE.

2 MR. VASSALOTTI: THERE'S NO
3 -- THIS IS AN EXTRACTION OF SOMETHING
4 WITHOUT ANY TITLE, AUTHOR, DATE.

5 MR. RENNEISEN: YOUR HONOR, I
6 WOULD LIKE TO ASK JOHN BULEY, MY ASSOCIATE TO
7 COME UP AND IDENTIFY ON THE RECORD WHERE THIS
8 DOCUMENT CAME FROM. SINCE MR. VASSALOTTI DOES
9 NOT ACCEPT IT AS AN OFFICIAL DOCUMENT. I CAN
10 IDENTIFY WHAT IT IS, BUT I'D RATHER IT BE
11 CORRECT IN STATING WHERE IT CAME FROM.

12 THE COURT: WELL, I'M SORT OF
13 HESITATE SOMEBODY SITTING IN THE AUDIENCE.

14 MR. RENNEISEN: HE'S FROM MY
15 OFFICE. I CAN PUT IT ON THE RECORD. WE GOT
16 THIS DOCUMENT FROM THE STATE OF NEW JERSEY. I
17 CAN FIND IT IN MY NOTES, BUT I DON'T WANT TO
18 BE INACCURATE. THERE IS NO DOUBT THAT ARSENIC
19 WAS USED IN SALEM COUNTY IN OLDSMANS TOWNSHIP.

20 MR. VASSALOTTI: YOUR HONOR,
21 THIS APPEARS TO BE --

22 THE COURT: LET ME SEE IT.

23 MR. VASSALOTTI: 35 PAGE
24 DOCUMENT OR 25 PAGE DOCUMENT.

25 THE COURT: WHY DON'T YOU

21110042

BFG09938

1 CONFER WITH HIM AND GET THE -- YOU MAY
2 CONFER WITH HIM AND GET THE CORRECT TITLE TO
3 THIS.

4 MR. RENNEISEN: YOUR HONOR,
5 THIS DOCUMENT WAS PREPARED BY THE PESTICIDE
6 PROJECT -- ~~DEPARTMENT~~ -- NEW JERSEY
7 DEPARTMENT OF HEALTH, TRENTON, NEW JERSEY. IT
8 WAS SUPPLIED TO JOHN BULEY FROM MY OFFICE
9 FROM DOCTOR TERRY SCHULTZ, S-C-H-U-L-T-Z, WHO
10 IS EMPLOYED BY THE NEW JERSEY DEPARTMENT OF
11 HEALTH.

12 MR. VASSALOTTI: JUDGE, I'M
13 AT A COMPLETE LOSS. ARE YOU GOING TO OFFER
14 THAT?

15 MR. RENNEISEN: IF YOUR
16 WITNESS CONTINUES TO DENY THAT THEY
17 CONSIDERED ARSENIC AS A CAUSE, THEN AS
18 REBUTTAL, I'LL OFFER THAT INTO EVIDENCE. IF
19 YOUR WITNESS ADMITS THAT ARSENIC IS A
20 POSSIBLE CAUSE AND HE WAS EXPOSED TO ARSENIC,
21 THEN I WON'T OFFER IT.

22 THE COURT: WELL, WHAT'S YOUR
23 POSITION RIGHT NOW? HE HAS IDENTIFIED THE
24 DOCUMENT WHICH HE'S USING FOR PURPOSE OF
25 CROSS-EXAMINATION, WHICH HE -- NOW --

2110043

1 MR. VASSALOTTI: I WOULD
2 OBJECT TO HIM USING THAT DOCUMENT AT THIS
3 POINT TO CROSS EXAMINE THE WITNESSES.

4 I WOULD LIKE A COPY OF THE
5 DOCUMENT. THE REASON I WOULD OBJECT TO HIM
6 USING THE DOCUMENT IS BECAUSE WE DON'T EVEN
7 KNOW WHAT IT IS. BUT MORE SO THAN THAT, IF HE
8 WANTS TO QUESTION THE WITNESS REGARDING
9 POSSIBLE ARSENIC EXPOSURES, FINE. BUT I WOULD
10 -- I WOULD NOT WANT THAT DOCUMENT USED TO
11 CROSS EXAMINE THIS WITNESSES.

12 MR. RENNEISEN: RIGHT NOW HE
13 SAID HE DOESN'T KNOW.

14 THE COURT: THE POINT IS THIS:
15 HE HAS A RIGHT TO UTILIZE A DOCUMENT ASKING
16 QUESTIONS, BUT, OF COURSE, YOU'VE GOT TO
17 IDENTIFY THE DOCUMENT AND ASK SOMEBODY IF
18 HE'S FAMILIAR WITH THE DOCUMENT.

19 MR. RENNEISEN: I SAID DO YOU
20 KNOW WHETHER OR NOT ARSENIC WAS USED. AND HE
21 SAID, NO, HE DIDN'T NO, AND THAT'S THE END
22 OF IT. THE NEXT QUESTION, WAS THAT USED, DID
23 YOU MAKE ANY EFFORT TO DETERMINE WHETHER
24 ARSENIC WAS USED.

25 THE COURT: THAT'S THE END

2110044

BFG09940

1 OF THAT. IF HE WANTS TO -- IF HE'S CROSS
2 EXAMINED, GET AN EXPERT BASED ON THAT
3 DOCUMENT, HE'S GOING TO DOCUMENT ASSESS A
4 WITNESS, WHETHER HE CONSIDERS THAT AN
5 AUTHORITATIVE SOURCE, THAT WHOLE BIT HAS GOT
6 TO BE GOTTEN INTO.

7 MR. RENNEISEN: THAT'S TRUE,
8 BUT I HAVEN'T GOTTEN TO THAT POINT.

9 (THE FOLLOWING TAKES PLACE IN OPEN COURT.)

10 BY MR. VASSALOTTI:

11 Q. DOCTOR, I WAS ASKING YOU WHETHER OR
12 NOT YOU KNEW IF ARSENIC INSECTICIDES HAVE
13 BEEN USED IN SALEM COUNTY IN THE AREA WHERE
14 MR. GRASSO LIVED.

15 A. I OBVIOUSLY DON'T KNOW.

16 Q. DID YOU MAKE ANY EFFORTS TO FIND OUT?

17 A. NO, I DIDN'T.

18 Q. FOR HOW LONG MEDICALLY HAS THE
19 DISEASE OF ANGIOSARCOMA OF THE LIVER BEEN
20 KNOWN AND IDENTIFIED?

21 A. I CAN'T ANSWER THAT.

22 Q. WELL, IS IT -- IS IT A SHORT
23 PERIOD OF TIME, TEN YEARS, ARE WE TALKING
24 ABOUT 50 YEARS OR A HUNDRED YEARS?

25 A. I SUSPECT IT'S BEEN SINCE PATHOLOGY

2110045

BFG09941

1 STARTED, PERHAPS 80, 90 YEARS WOULD BE MORE
2 LIKELY.

3 Q. SO THAT ANGIOSARCOMA OF THE LIVER
4 EXISTED BEFORE THERE WAS VINYL CHLORIDE OR
5 THOROTRAST, ISN'T THAT TRUE?

6 A. THAT'S CORRECT, PROBABLY CORRECT.

7 Q. HAVE YOU DONE ANY STUDIES CONCERNING
8 -- STRIKE THAT QUESTION.

9 ARE YOU FAMILIAR WITH THE
10 LITERATURE WHICH DISCUSSES THE CASES OF
11 ANGIOSARCOMA WHICH THE MEDICAL PROFESSION HAS
12 ATTRIBUTED TO VINYL CHLORIDE?

13 A. I'VE READ SOME OF THE ARTICLES, YES.

14 Q. AND GENERALLY SPEAKING, DO YOU KNOW
15 WHAT JOB -- WHAT TYPE OF WORK THE MEN HAD
16 WHO GOT ANGIOSARCOMA WHO WERE REVIEWED AND
17 DISCUSSED IN THOSE ARTICLES?

18 A. YES.

19 Q. WHAT KIND OF JOBS DID THEY HAVE?

20 A. GENERALLY THE ONES THAT WERE FIRST
21 LINKED HAD HIGH EXPOSURE JOBS WORKING ON THE
22 PLANT, CLEANING OUT THE PLANT.

23 Q. THEY WORKED ON PVC PLANT, DID THEY
24 NOT?

25 A. YES.

2110046

BFG09942

1 Q. AND THEY WERE PEOPLE WHO WITHIN THAT
2 CATEGORY HAD HIGH EXPOSURE, DID THEY NOT?

3 A. YES, THEY DID.

4 Q. IS IT TRUE THAT THEY HAD EXPOSURES
5 FOR -- WELL, DO YOU KNOW THE LENGTH OF
6 THEIR EXPOSURES?

7 A. WELL, SOME OF THEM HAD EXPOSURES FOR
8 VERY LONG LENGTHS OF TIME.

9 Q. DO YOU HAVE ANY -- DO YOU HAVE ANY
10 KNOWLEDGE AS TO THE DEGREES OR THE
11 CONCENTRATION TO WHICH THOSE GENTLEMEN WERE
12 EXPOSED?

13 A. THEY WERE EXCEEDINGLY HIGH, HUNDREDS
14 OF PARTS PER MILLION.

15 Q. MUCH HIGHER THAN MR. GRASSO'S; IS
16 THAT CORRECT?

17 A. YES.

18 Q. WHAT -- WHAT IS YOUR REASON FOR
19 DECIDING THAT VINYL CHLORIDE IS THE CAUSE

20 -- WHAT IS YOUR REASON OR REASONS FOR
21 DECIDING THAT VINYL CHLORIDE IS THE CAUSE OF
22 THE ANGIOSARCOMA THAT MR. GRASSO HAD?

23 A. WELL, I SUSPECT I WAS LOOKING FOR A
24 CAUSE OF CARCINOGENS. I TOLD DOCTOR NEELD. HE
25 TOLD ME THERE WAS A B. F. GOODRICH. I LOOKED

BFG09943

2110047

1 IT UP IN CHEMICAL ENGINEERING NEWS; THERE
2 WAS. I CALLED THE COMMUNICABLE DISEASE CENTER.
3 THAT THEY HAD A POTENTIAL EIPDEMOLOGICAL
4 PROBLEM THERE. I SUSPECT IT WAS HYPOTHESIS,
5 WHERE IS HIS EXPOSURE, FINDING AN EXPOSURE
6 AND ATTRIBUTION; IS IT MERE COINCIDENCE THAT
7 THE ONLY CASE OF VINYL CHLORIDE -- WELL, I
8 TAKE IT BACK. THE ONLY CASE OF ANGIOSARCOMA I
9 SEE AND MY PARTNERS SEEN IN TEN YEARS HAPPENS
10 TO BE THE PERSON WHO LIVES NEXT TO A VINYL
11 CHLORIDE PLANT. THAT'S ONE WAY OF LOOKING AT
12 IT.

13 Q. OF COURSE, THERE WERE MANY PEOPLE
14 WHO LIVE NEAR THE VINYL CHLORIDE PLANT WHO
15 DON'T HAVE AN ANGIOSARCOMA; ISN'T THAT TRUE?

16 A. THAT'S TRUE.

17 Q. AND FROM THE LITERATURE, DO YOU KNOW
18 THAT THERE ARE PEOPLE WHO LIVE NOWHERE NEAR
19 VINYL CHLORIDE PLANT WHO GET ANGIOSARCOMA,
20 TOO, ISN'T THAT TRUE?

21 A. THAT'S TRUE, ALSO. HOWEVER, THEY
22 POTENTIALLY DO HAVE SOME EXPOSURES THAT HAVE
23 NOW BEEN LIMITED ELSEWHERE, LIKE THE AIR
24 FLOWS -- I MEAN THE PRODUCTS.

25 Q. IN OTHER WORDS, A PERSON LIVING IN

21110048

1 WYOMING NOWHERE NEAR A VINYL CHLORIDE PLANT
2 COULD HAVE EXPOSURE TO VINYL CHLORIDE BECAUSE
3 IT WAS USED AS A PROPELLANT IN SPRAY CANS, IS
4 THAT CORRECT?

5 A. THAT'S CORRECT.

6 Q. SO, WHEN YOU SAID THE CAUSE OF MR.
7 GRASSO'S DISEASE WAS VINYL CHLORIDE, YOU
8 DIDN'T NECESSARILY MEAN IT WAS IN THE B.F.
9 GOODRICH PLANT. IT COULD HAVE BEEN FROM
10 AEROSOL CANS, IS THAT TRUE?

11 A. IT COULD HAVE BEEN, BUT YOU'RE
12 ASKING WHY I BELIEVE WAS MOST PROBABLE. WE
13 HAVE NO WAY OF DOING THE KIND OF STUDY YOU
14 PROPOSE AND THAT IS EXPOSING EVERYBODY TO
15 DIFFERENT PARTS PER MILLION OF VINYL CHLORIDE
16 TO HUMANS AND WAITING FIVE YEARS AND SEEING
17 HOW MANY END UP WITH ANGIOSARCOMA. I MEAN,
18 ONE CAN'T SAY WITH CERTAINTY, BUT YOU CAN SAY
19 WITH A DEGREE OF PROBABILITY.

20 Q. YOU FOUND A CASE AND A CAUSE AND YOU
21 LINKED THEM TOGETHER; IS THAT RIGHT.

22 A. THE LITERATURE HAS LINKED THEM
23 TOGETHER, THE MEDICAL INFORMATION.

24 Q. BUT THE MEDICAL LITERATURE AND THE
25 FIRST ARTICLE I TALKED TO US, THAT 75 PERCENT

2110049

BFG09945

1 OF THE CASES ARE OF UNKNOWN ORIGIN? WHY DO
2 YOU PICK ONE OF FOUR KNOWN ORIGINS INSTEAD
3 SAYING, IT WAS OF UNKNOWN ORIGIN?

4 A. BECAUSE -- BECAUSE I THOUGHT --
5 THOUGHT IT WAS MOST LIKELY DO TO VINYL
6 CHLORIDE. I STILL BELIEVE THAT. I MEAN, HOW
7 WOULD YOU PROPOSE TO -- HOW WOULD YOU
8 REASONABLY ASK ME TO CHANGE MY OPINION?

9 Q. WELL, LET ME ASK YOU THIS, DOCTOR.
10 THE COURT: WELL, LET ME SAY
11 THIS. YOU CAN'T ASK QUESTIONS OF COUNSEL.
12 THAT'S GETTING INTO AN ARGUMENTATIVE
13 SITUATION. YOU ASK THE QUESTIONS, YOU ANSWER
14 THEM.

15 THE WITNESS: OKAY.

16 BY MR. RENNEISEN:

17 Q. LET ME ASK YOU THIS, DOCTOR: IN
18 MAKING YOUR DETERMINATION, DID YOU CONSIDER
19 THAT THE MEDICAL LITERATURE INDICATES LATENCY
20 PERIODS MUCH LONGER THAN MR. GRASSO'S?

21 A. IS THERE A QUESTION THERE? I MISSED
22 IT.

23 Q. I THOUGHT IT WAS A QUESTION. LET ME
24 ASK AGAIN.

25 IN MAKING YOUR DECISION THAT

2110050

1 IT'S VINYL CHLORIDE THAT CAUSED -- DID YOU
2 CONSIDER THE FACT THAT THE MEDICAL LITERATURE
3 INDICATES LATENCY PERIODS GREATER THAN MR.
4 GRASSO'S LATENCY PERIOD?

5 A. I DID.

6 Q. IN MAKING YOUR DECISION, DID YOU
7 CONSIDER THE FACT THAT OF THE KNOWN CASES
8 WHICH THE MEDICAL PROFESSION HAS ATTRIBUTED
9 TO VINYL CHLORIDE EXPOSURE TO ANGIOSARCOMA,
10 THE PEOPLE WHO CONTRACTED ANGIOSARCOMA HAD
11 INTENSE EXPOSURE IN THE WORK PLACE?

12 A. YES.

13 Q. AND, DID YOU CONSIDER THE FACT THAT
14 MR. GRASSO DID NOT HAVE INTENSE EXPOSURE IN
15 THE WORK PLACE; IS THAT CORRECT?

16 A. I CAN'T TESTIFY TO WHAT EXPOSURE HE
17 REALLY HAD, WHERE HE WORKED. BUT I -- IF
18 YOU TAKE THAT AS A GIVEN AND HE DIDN'T HAVE
19 ANY EXPOSURE WHERE HE WORKED --

20 Q. THE EXPOSURE --

21 A. THEN I DID CONSIDER IT, YES.

22 Q. THE EXPOSURE YOU KNEW ABOUT WAS
23 LIVING APPROXIMATELY TWO MILES FROM THE PLANT?

24 A. AND BEING TOLD BY DOCTOR NEEDL AT
25 DUPONT THAT THEY DIDN'T MAKE QUANTITIES OF

21110051

BFG09947

1 VINYL CHLORIDE.

2 Q. HE ACTUALLY TOLD YOU THEY HAD SOME,
3 DIDN'T HE?

4 A. HE TOLD ME THEY HAD NONE, BUT I
5 SUBSEQUENTLY LEARNED THAT THEY HAD SOME IN A
6 DIFFERENT AREA WHERE HE DIDN'T WORK. I THINK
7 IT WAS TO FILL -- FILL OUT THE AIR SOLES, I
8 BELIEVE.

9 Q. DID YOU -- AND I THINK YOU'VE
10 ALREADY TOLD ME THAT YOU DIDN'T MAKE ANY
11 VESSELS TO ELIMINATE ARSENIC AS A CAUSE?

12 A. WHERE BLOOD ARSENIC LEVELS DONE ON
13 HIS AUTOPSY, NO, BUT THE POSTMORTUM DIDN'T
14 SHOW ANY EVIDENCE OF CHRONIC ARSENIC COMPOST
15 AS FAR AS WE CAN TELL.

16 Q. INCIDENTALLY, DOCTOR, JUST SOMETHING
17 THAT YOU SAID EARLIER, WHEN MR. GRASSO WAS
18 -- WAS CAUGHING UP BLOOD, WAS THAT BECAUSE
19 IT IS LIVER CANCER HAD SPREAD TO HIS LUNGS?

20 A. YES, I BELIEVE.

21 Q. SO THAT EVEN THOUGH THERE WERE NO
22 TUMORS ON THE X-RAYS IN MAY OF 1976, IT WOULD
23 HAVE MEANT THAT THERE WERE SOME BLOOD
24 INVOLVEMENT BY THAT TIME; IS THAT CORRECT?

25 A. I HAVEN'T GOT A X-RAY. JUNE IS THE

21110052

1 EARLIEST X-RAY I'VE SEEN.

2 Q. WELL, HE WAS CAUGHING UP BLOOD IN
3 MAY, I BELIEVE.

4 A. YES.

5 Q. ACCORDING TO THE TESTIMONY WE HAD
6 HERE.

7 A. ONE WOULD SUSPECT THAT THE TUMOR IS
8 PRESENT.

9 Q. IN THE LITERATURE THAT YOU WERE
10 FAMILIAR WITH -- I GUESS THIS IS A
11 VIOLATION OF THE COPYRIGHT LAWS -- BUT ARE
12 YOU FAMILIAR WITH THIS DOCUMENT WHICH --
13 WHICH WAS A PUBLICATION OF THE NEW YORK
14 ACADEMY OF SCIENCE, TOXICITY OF VINYL
15 CHLORIDE, POLYVINYL CHLORIDE?

16 A. NO, I'M NOT.

17 THE COURT: ARE YOU GOING TO
18 BE LONG.

19 MR. RENNEISEN: NO, I'M VERY
20 CLOSE TO BEING FINISHED.

21 THE COURT: BECAUSE I'M
22 HOLDING UP THE RECESS. WILL THERE BE REDIRECT,
23 MR. VASSALOTTI?

24 MR. VASSALOTTI: JUST A
25 COUPLE OF QUESTIONS, YOUR HONOR.

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BFG09949

1 BY MR. RENNEISEN:

2 Q. WHEN YOU SAID THAT YOU WERE FAMILIAR
3 WITH SOME LITERATURE IN THE FIELD THAT
4 DISCUSSED THE RELATIONSHIP BETWEEN VINYL
5 CHLORIDE AND ANGIOSARCOMA, DO YOU RECALL NOW
6 WHO THE AUTHORS OF THAT LITERATURE WERE?

7 A. WELL, I HAD SOME OF THE LITERATURE
8 OVER THERE THAT I BROUGHT ALONG THAT --

9 Q. I WON'T TEST YOUR MEMORY.

10 A. BUT I MEAN THE BASIC REVIEW ARTICLE
11 IN THE MEDICAL COMMUNITY IS THE ANDERSON
12 INTERNAL MEDICINE. AND I READ THAT.

13 Q. AND THESE ARE PUBLISHED BY ACCEPTED
14 PUBLISHING HOUSES THAT KEEP THEM APPRISED OF
15 LATEST DEVELOPMENTS; IS THAT RIGHT?

16 A. YES.

17 Q. AND THAT LITERATURE INDICATED TO YOU
18 THE LONG LATENCY PERIODS THAT YOU AND I HAVE
19 BEEN TALKING ABOUT; IS THAT CORRECT?

20 A. IT INDICATED THERE WAS A LATENCY
21 PERIOD, YES.

22 Q. AND THAT SAME LITERATURE DISCUSSED
23 THE CONCENTRATION LEVELS TO WHICH
24 ANGIOSARCOMA -- ANGIOSARCOMA PATIENTS HAD
25 BEEN EXPOSED WHEN THEY WERE EXPOSED TO VINYL

2110054

1 CHLORIDE; IS THAT TRUE?

2 A. YES, IT HAD SOME NUMERICAL PHYSICIAN,
3 YES.

4 Q. AND THOSE FIGURES, AGAIN, WOULD YOU
5 TELL ME WERE AGAIN IN HUNDREDS OF PARTS PER
6 MILLION?

7 A. YEAH.

8 Q. ON A REGULAR BASIS IN THE WORK PLACE;
9 IS THAT CORRECT?

10 A. YES.

11 MR. RENNEISEN: THANK YOU,
12 DOCTOR.

13 THE COURT: REDIRECT.

14 MR. VASSALOTTI: NO, YOUR
15 HONOR.

16 THE COURT: I HAVE NO FURTHER
17 QUESTIONS.

18 THE COURT: LADIES AND
19 GENTLEMEN, LET'S TAKE OUR MORNING RECESS, TEN
20 MINUTES.

21 (JURY LEAVES THE COURTROOM.)

22 THE COURT: TEN MINUTES RECESS.
23 YOU MAY STEP DOWN.

24 (RECESS.)

25 (THE FOLLOWING TAKES PLACE IN OPEN COURT WITH

21110055

BFG09951

1 THE JURY PRESENT.)

2 THE COURT: CALL YOUR NEXT
3 WITNESS.

4 MR. VASSALOTTI: THANK YOU,
5 YOUR HONOR. DOCTOR SAMUEL EPSTEIN.
6 SAMUEL EPSTEIN SWORN.

7 DIRECT EXAMINATION BY MR. VASSALOTTI.

8 Q. DOCTOR, BY WHOM ARE YOU PRESENTLY
9 EMPLOYED?

10 A. THE UNIVERSITY OF ILLINOIS MEDICAL
11 CENTER IN CHICAGO.

12 Q. AND WHAT IS YOUR POSITION WITH THE
13 UNIVERSITY OF ILLINOIS MEDICAL CENTER?

14 A. I'M PROFESSOR OF OCCUPATIONAL AND
15 ENVIROMENTAL MEDICINE.

16 Q. CAN YOU DESCRIBE THE AREA OF
17 MEDICINE AND/OR TOXICOLOGY THAT YOU ARE
18 INVOLVED WITH IN THAT POSITION?

19 A. MY MAJOR PROFESSIONAL INTERESTS
20 RELATING TO THE TOXICS AND CANCER CAUSING OR
21 CARCINOGENIC EFFECTS OF CHEMICALS IN THE
22 ENVIRONMENT WITH PARTICULAR REFERENCE TO
23 POLLUTANTS IN AIR, FOOD, WATER AND THE WORK
24 PLACE.

25 Q. YOU ARE A MEDICAL DOCTOR?

2110056

1 THE SLIDES THAT YOU HAD SHOWN US WERE GRAPHS
2 OR CHARTS OR CASES OF DIAGNOSED ANGIOSARCOMA
3 AND EXPOSURE TO -- THE POPULATION EXPOSED
4 AND COMPARING THE TWO; IS THAT CORRECT?

5 A. THE GRAPHS THAT I SHOWED WERE ALL OF
6 THE CASES OF ANGIOSARCOMA RELATED TO VINYL
7 CHLORIDE EXPOSURE.

8 Q. WELL, WHEN YOU SAY RELATED TO VINYL
9 CHLORIDE EXPOSURE, WAS IT REALLY RELATED TO
10 VINYL CHLORIDE EXPOSURE OR VINYL CHLORIDE
11 EXPOSURE OF PVC WORKERS?

12 A. NO. THE -- THE TERM PVC -- AND I
13 THINK IN VINYL CHLORIDE, I USE, I THINK, A
14 LITTLE MORE SEPARATELY. THE OCCURRENCE OF
15 ANGIOSARCOMA HAS OCCURRED NOT IN THE
16 PRODUCTION, THE MAKING OF VINYL CHLORIDE. IT
17 HAS BEEN ASSOCIATED WITH VINYL CHLORIDE BEING
18 USED TO FORM THE POLYMER, PVC. AND IT HAS NOT
19 BEEN ASSOCIATED WITH THE POLYVINYL CHLORIDE
20 BEING USED FOR FABRICATIONS. AND ALL THE
21 ANGIOSARCOMA CASES THAT ARE SHOWN IN THERE
22 ARE THOSE WHOSE DEVELOPMENT OF THE TUMOR AND
23 THEIR WORK HISTORIES SHOW SOME OR VARYING
24 DEGREES OF WORK-RELATED CONVERSION OF VINYL
25 CHLORIDE TO POLYVINYLCHLORIDE.

2110057

1 Q. WHAT GROUP WAS THAT YOU STUDIED IN
2 EPIDEMIOLOGICAL STUDIES. IT'S CALLED A
3 COHORT, ISN'T IT? IS THAT WHAT YOU CALLED A
4 GROUP?

5 A. THIS WAS NOT A COHORT STUDY. THIS
6 SIMPLY IDENTIFIES ALL THE CASES THAT WE HAVE
7 THAT WE KNOW OF IN THE LITERATURE, FROM OUR
8 OWN EXPERIENCE, FROM OTHER PLANTS, AND WE'RE
9 LOOKING AT THESE ANGIOSARCOMAS AND
10 CHARACTERIZING GOING ON THEIR CLINICAL,
11 HISTOLOGICAL, PHYSICAL CHARACTERISTICS, THEIR
12 EXPOSURE HISTORIES.

13 Q. OKAY. IN YOUR DIRECT TESTIMONY, YOU
14 MENTIONED THAT DOCTOR MATALONI HAD DONE SOME
15 STUDIES ON THE CANCER-CAUSING EFFECTS OF
16 VINYL CHLORIDE. I THINK YOU TESTIFIED THAT HE
17 FOUND ANGIOSARCOMAS IN RATS EXPOSED TO 25
18 PARTS PER MILLION.

19 A. I BELIEVE THAT WAS THE LOWER DOSE
20 WHICH HE FOUND OUT.

21 Q. DID HE FIND CHANGES YES, SIR OF ANY
22 OTHER KINDS IN DOSES LOWER THAN THAT?

23 A. YES, HE REPORTED THAT.

24 Q. HOW FAR DOWN DID HE GO?

25 A. IF I RECALL CORRECTLY, I THINK HE

21110058

BFG09954

1 HAD A TUMOR IN ONE ANIMAL -- I'VE FORGOTTEN
2 WHICH ORGAN SYSTEM -- ONE PART PER MILLION.

3 Q. ONE PART PER MILLION?

4 A. I THINK THAT'S CORRECT. I'D HAVE TO
5 CHECK THE LITERATURE AGAIN. IT WAS EITHER AT
6 ONE OR AT FIVE.

7 Q. LET'S BE SURE, DOCTOR. LET ME SHOW
8 YOU AN ARTICLE THAT'S ENTITLED "VINYL
9 CHLORIDE CARCINOGENICITY AND EXPERIMENTAL
10 MODEL FOR CARCINOGENIC STUDIES." IT'S BY C.
11 NATALONI. IS THAT THE PROFESSOR NATALONI THAT
12 WE'VE BEEN TALKING ABOUT?

13 A. YES.

14 Q. PAGE 133 OF THIS PUBLICATION,
15 THERE'S A CHART THAT INDICATES THE LEVELS OF
16 EXPOSURE TO WHICH MR. NATALONI -- DOCTOR
17 NATALONI EXPOSED THESE ANIMALS.

18 A. RIGHT.

19 Q. IS THERE A TEST FOR -- WAS A STUDY
20 DONE AT ONE PART PER MILLION?

21 A. YES, THERE WAS.

22 Q. AND WERE ANY CANCER -- CANCEROUS
23 FINDINGS LOCATED?

24 A. PART 12, FOUR FROM OTHER SITES AND
25 EIGHT IN THIS CHART SHOWS THAT HE

2110059

1 DEMONSTRATED IN A 120 ANIMALS THAT THERE WERE
2 A TOTAL OF 12 CANCERS OF WHICH FOUR WERE FROM
3 UNSPECIFIED SITES AND EIGHT WERE FROM
4 MAMMARY CANCER.

5 Q. THAT WAS AT ONE PART PER MILLION?

6 A. THAT IS CORRECT.

7 Q. DOCTOR, IN A LOT OF THE ARTICLES
8 THAT I'VE READ AND I THINK IN SOME OF YOUR
9 TESTIMONY HERE TODAY, WHEN WE'VE BEEN
10 CONCERNED ABOUT OR WHEN YOU AND THE
11 PROFESSION HAVE BEEN CONCERNED ABOUT
12 EXPOSURES OR DETERMINING WHAT THE EXPOSURE OF
13 AN EMPLOYEE WAS TO VINYL CHLORIDE, IT'S
14 COMMONLY BEEN QUANTIFIED IN TERMS OF PARTS
15 PER MILLION; IS THAT CORRECT?

16 A. THAT'S CORRECT.

17 Q. 50 PARTS PER MILLION MEASURED AT
18 ACTUALLY WHAT THE WORKERS WOULD HAVE BEEN
19 EXPOSED TO; IS THAT CORRECT, OR ESTIMATED AT
20 WHAT THE WORKERS WOULD HAVE BEEN EXPOSED TO?

21 A. THOSE ARE ESTIMATES, THAT'S CORRECT.

22 Q. IN OTHER WORDS, IF A MAN WERE
23 CLEANING A REACTOR, BASED UPON THE
24 INFORMATION YOU DESCRIBED AS TO HOW IT WAS
25 DETERMINED THAT HE WAS EXPOSED TO HIGH LEVELS,

2110060

BFG09956

1 YOU WOULD SAY THAT WHILE HE WAS CLEANING THE
2 REACTOR, HE WAS EXPOSED TO MAYBE UP TO 200,
3 500 PARTS PER MILLION OF VINYL CHLORIDE?

4 A. COULD HAVE.

5 Q. WHILE HE WAS CLEANING IT?

6 A. YES.

7 Q. I NOTICE THAT IN NONE OF THE
8 LITERATURE THAT I HAVE SEEN AND NONE OF YOUR
9 TESTIMONY REGARDING THE LITERATURE IS THERE
10 ANY TALK OF THE ANNUAL AVERAGE EXPOSURE OF
11 THESE PEOPLE. IN DETERMINING OR IN TRYING TO
12 ESTIMATE THE CANCER-CAUSING EFFECTS OF VINYL
13 CHLORIDE, ARE YOU INTERESTED IN THE DIRECT
14 EXPOSURE OF AN EMPLOYEE OR HIS ANNUAL AVERAGE
15 EXPOSURE OR BOTH?

16 A. BOTH. THERE IS A CONCERN OVER
17 ACCURACY WHEN ONE IS DOING ESTIMATES BASED ON
18 PAST MEMORY. THAT IS ONE OF THE REASONS WHEN
19 WE DID OUR STUDY, WE DID IT ON THE BASIS OF
20 RANK ORDERING, BECAUSE IN THE RANK ORDERING
21 DONE ON EACH INDIVIDUAL YEAR THAT AN
22 INDIVIDUAL WORKS, IT TAKES INTO CONSIDERATION
23 THAT WHATEVER VARIATION HAPPENED FROM YEAR TO
24 YEAR, THAT VARIATION IS KEPT CONSTANT IN THE
25 ENTIRE WORK POPULATION, SINCE YOU TREAT IT IN

2110061

BFG09957

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THE DIVISION OF THE NUMBER OF CASES.
DOCTOR, YOUR EXPLANATION OF THE
RELATIONSHIP OF WINE CHLORIDE IN THE LIVER AND
RELATIONSHIP TO THE CANCER PROMOTING
CHARACTERISTICS OF WINE CHLORIDE, IS THAT
WHY GENERALLY ACCEPTED IN THE MEDICAL
CIRCLE AS DEFINING THE CAUSAL CONNECTION
BETWEEN WINE CHLORIDE AND CANCER?
THE "AY SCIENTIFIC DATA IS ACCEPTED
WHAT AFTER YOU'VE DONE AN EXPERIMENT OF
THE DOSE WORK, YOU WRITE IT UP AND YOU
SENT IT TO SCIENTIFIC JOURNALS WHERE YOUR
PEOPLE OF EQUAL EXPERIENCE OR EQUAL
STATUS, REVIEW THAT FOR ITS CREDIBILITY,
ACCURACY, ITS SCIENTIFIC MERIT, AND THEN
EITHER ACCEPTED OR IT IS NOT ACCEPTED FOR
PUBLICATION.
NOW, WHAT YOU CONCLUDE AS
ACCEPTED AT THE TIME IS BASED ON
ALL KNOWLEDGE, SCIENTIFIC KNOWLEDGE, AND
PEOPLE HAVE PROVIDED OR I HAVE
RECORDED AND WRITTEN ABOUT IN PUBLICATIONS
BEEN SUBMITTED TO SCIENTIFIC JOURNALS,
BEEN ACCEPTED AND HAVE BEEN PUBLISHED.
DON'T WANT TO SOUND IMMODEST, BUT I

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1 PRESUME THAT MY PEERS HAVE FOUND THIS TO BE
2 SCIENTIFICALLY ACCEPTABLE IN THE --

3 Q. YOUR METHODS ARE SCIENTIFICALLY
4 ACCEPTABLE. BUT WHAT I'M INTERESTED IN, ARE
5 YOUR CONCLUSIONS ACCEPTED BY THE MEDICAL
6 COMMUNITY AS A DEFINITION OF THE MECHANICS OF
7 HOW VINYL CHLORIDE CAUSES CANCER OR IS IT
8 ACCEPTED AS A HYPOTHESIS?

9 A. YOU MEAN, IS THIS FACT?

10 Q. IS IT FACT?

11 A. A HUNDRED PERCENT, NO; THOSE ARE
12 HYPOTHESES BASED ON THE DATA WE NOW PRESENTLY
13 HAVE AND THIS HAS BEEN MODIFIED SINCE 1974
14 AND UPDATED. AND AS WE GATHER NEW FACTS, IT
15 WILL BE MODIFIED MORE.

16 Q. BUT IT REMAINS A HYPOTHESIS AT THIS
17 POINT?

18 A. THAT'S RIGHT.

19 Q. NO ONE KNOWS FOR SURE HOW VINYL
20 CHLORIDE CAUSES CANCER?

21 A. THAT'S TRUE. WE DON'T KNOW HOW ANY
22 AGENT CAUSES CANCER.

23 Q. DR. TALBOTT, YOU'VE MENTIONED THAT
24 YOU BELIEVE THAT EVEN IF MR. GRASSO WERE
25 EXPOSED TO THREE PARTS PER HUNDRED OF VINYL

21110064

BFG09960

1 CHLORIDE OVER THE FIVE AND A HALF, SIX YEAR
2 PERIOD THAT WE HAVE HERE, THAT, IN YOUR
3 OPINION, WOULD NOT BE THE CAUSE OF HIS
4 ANGIOSARCOMA OF THE LIVER.

5 A. WHAT --

6 Q. DOES THAT MEAN THREE PARTS PER
7 MILLION IS A SAFE LEVEL OF EXPOSURE TO VINYL
8 CHLORIDE?

9 A. WHAT I'VE SAID IS THAT I DO NOT
10 BELIEVE THAT THERE'S A CAUSAL RELATIONSHIP
11 HERE BECAUSE WE HAVE NO EPIDEMIOLOGICAL AND
12 BIOLOGICAL DATA IN ANY OF THE OTHER STUDIES
13 DONE THAT SHOW THAT THAT LEVEL OF EXPOSURE,
14 EVEN FOR LONGER PERIODS OF TIME THAN MR.

15 GRASSO HAD, HAVE DEVELOPED LIVER DISEASE OR
16 ANGIOSARCOMA.

17 Q. VERY INDIVIDUAL, THOUGH, IS
18 DIFFERENT IN HIS SUSCEPTIBILITY TO A
19 CHEMICAL CAUSING CANCER, ISN'T HE?

20 A. THAT'S TRUE BUT I'M AGAIN DOING
21 THIS ON THE BASIS OF THE FACT THAT WE'RE
22 DEALING WITH NOT ABSOLUTES, BUT PROBABILITY.

23 Q. I UNDERSTAND THAT. NOW, YOU'VE
24 PICKED THREE PARTS PER MILLION AVERAGE,
25 APPARENTLY FOR SOME REASON. IS THAT THAT YOU

21110065

1 CONSIDER --

2 MR. RENNEISEN: OBJECTION,
3 YOUR HONOR. THERE'S NO EVIDENCE IN THIS CASE
4 THAT THERE WAS AN AVERAGE OF THREE PARTS PER
5 BILLION AT ALL.

6 MR. VASSALOTTI: YOUR HONOR,
7 I READ IN -- AND THE DOCTOR AGREED A HALF
8 HOUR AGO THAT HE HAD TOLD SOMEONE -- AND I
9 GOT THE INFORMATION FROM MR. RENNEISEN --
10 THAT EVEN IF MR. GRASSO WERE EXPOSED AT A
11 LEVEL OF THREE PARTS PER MILLION DURING THIS
12 ENTIRE TIME, THAT THAT WOULD NOT BE THE CAUSE
13 OF HIS CANCER.

14 THE COURT MR. RENNEISEN
15 YOU'RE SPEECHLESS.

16 MR. RENNEISEN: I ASKED THE
17 DOCTOR IF PLAINTIFF PROVED THREE PARTS PER
18 MILLION ON A --

19 THE COURT: I'M GOING TO
20 ALLOW THE QUESTION. YOU MAY PROCEED.
21 OBJECTION OVERRULED.

22 BY MR. VASSALOTTI:

23 Q. IS THAT WHERE YOU GOT THE THREE
24 PARTS PER BILLION?

25 A. ~~NO, WHAT I HAVE SIMPLY SAID, AGAIN~~

21110066

1 STATE, THAT WE HAVE NO DATA THAT ANYTHING
2 BELOW TEN PARTS PER MILLION IN HUMAN DATA, AS
3 WELL AS ANIMAL DATA PRODUCES AN ANGIOSARCOMA.
4 SO, SOMEONE HAS THREE, SON, SOMEONE HAS TWO,
5 SOMEONE HAS FIVE, I WOULD DRAW THE SAME
6 CONCLUSION BASED ON THE DATA.

7 Q. BASED UPON YOUR OPINION THAT THAT IS
8 NOT ENOUGH?

9 A. BASED ON A SCIENTIFIC --

10 Q. NOT ENOUGH OF AN EXPOSURE?

11 A. YEAR.

12 Q. IS THERE ANY PRESENTLY ACCEPTABLE
13 WAY TO DETERMINE RELIABLY IF THERE IS ANY SAFE
14 LEVEL OF EXPOSURE TO A CHEMICAL CARCINOGEN?

15 A. MAKING THE ASSUMPTION THAT NO
16 CHEMICAL PRESENT, THEREFORE, NO CANCER, IS
17 THE BASIS AND THE ONLY ASSOLUTE WE HAVE.

18 SINCE WE CAN'T DO THIS ENVIRONMENTALLY IN
19 HUMANITIES, WE ARE NOW DEALING WITH A CONCEPT
20 OF WHETHER OR NOT THERE IS A LEVEL WHERE THE
21 OCCURRENCE OF A CANCER WILL NOT BE ANY
22 GREATER IN ONE INDIVIDUAL THAN IT WOULD BE IN
23 ANY OTHER INDIVIDUAL, AND THAT'S WHAT THE
24 EXPECTED AVERAGES OF TUMOR OCCURRENCES ARE
25 ABOUT. AND WE MAY

21110067

1 OR OTHERWISE AT PRESENT, THAT PEOPLE WHO ARE
2 EXPOSED TO UNDER TEN PARTS PER MILLION HAVE
3 ANY GREATER INCIDENCE OF LIVER ENGIOSARCOMA
4 THAN THOSE THAT HAVE NO PARTS PER MILLION.
5 AND SO, EPIDEMIOLOGICALLY, THE PROBABILITY IS
6 THAT THAT'S NOT AN ASSOCIATION.

7 Q. WELL, LET ME ASK YOU THE QUESTION
8 AGAIN, BECAUSE I DON'T KNOW IF YOU ANSWERED
9 IT.

10 IS THERE ANY PRESENTLY
11 ACCEPTABLE WAY IN THE MEDICAL COMMUNITY TO
12 DETERMINE RELIABLY IF THERE'S A SAFE
13 THRESHOLD LEVEL FOR A CHEMICAL CARCINOGEN?

14 A. YES, I THINK THE METHOD I'VE JUST
15 OUTLINED IS A -- THE BEST AND MOST RELIABLE
16 METHOD. IF YOU SHOW THAT AN INDIVIDUAL OR A
17 GROUP OF INDIVIDUALS ARE AT NO GREATER RISK
18 IN THE OCCURRENCE OF A TUMOR THAN ANOTHER
19 GROUP THAT HAS TOTALLY NO EXPOSURE TO THE
20 SAME ENVIRONMENT, YOU HAVE DEMONSTRATED AS
21 BEST WE CAN THAT THEY'RE AT NO GREATER RISK.

22 Q. SO FAR, THERE'S BEEN NO GREATER RISK?

23 A. RIGHT.

24 Q. THAT'S YOUR OPINION, DOCTOR? IS THAT
25 CORRECT?

2110068

1 ~~NO, THAT IS A STANDARD PROCEDURE FOR~~
 2 ~~SCIENCE IN GENERAL AND HAS BEEN THE WAY BY~~
 3 ~~WHICH THE ORIGINAL STANDARD WAS SET. THE~~
 4 ~~ORIGINAL~~

5 Q. DOCTOR, ARE YOU FAMILIAR WITH A
 6 GROUP KNOWN AS THE INTERAGENCY REGULATORY
 7 LIAISON GROUP WHICH PUBLISHED A -- WHICH IS
 8 A GROUP CONSISTING OF MEMBERS OF THE JURY OF
 9 THE CONSUMER PRODUCTS SAFETY COMMISSION, THE
 10 ENVIRONMENTAL PROTECTION AGENCY, THE FOOD AND
 11 DRUG ADMINISTRATION AND THE OCCUPATIONAL
 12 SAFETY AND HEALTH ADMINISTRATION.

13 A. I'VE HEARD OF THE GROUP.

14 Q. ARE YOU FAMILIAR WITH THEIR
 15 PUBLICATION, SCIENTIFIC BASIS FOR
 16 IDENTIFICATION OF POTENTIAL CARCINOGENS AND
 17 EMISSIONS -- I'M SORRY, AND ESTIMATIONS OF
 18 RISKS?

19 A. NO, I'M NOT FAMILIAR WITH THAT
 20 PUBLICATION.

21 Q. IS THAT A GOVERNMENT BODY THAT DID
 22 THAT STUDY?

23 A. THOSE ARE GOVERNMENT BODIES. I DON'T
 24 KNOW THAT THAT'S A STUDY.

25 Q. WELL, LET ME SHOW YOU THE STUDY,

2110069

1 DOCTOR.

2 THIS IS IN THE JOURNAL OF THE
3 NATIONAL CANCER INSTITUTE, JULY OF 1970.
4 WOULD YOU TAKE A LOOK AT THAT? (HANDING.)

5 (BRIEF PAUSE.)

6 MR. RENNEISEN: YOUR HONOR,
7 IF THE WITNESS IS BEING ASKED TO READ THE
8 WHOLE THING, I --

9 THE WITNESS: I'M JUST
10 READING THE ABSTRACT, IF THAT'S PERMISSIBLE.

11 MR. RENNEISEN: IF HE'S BEING
12 ASKED TO READ THE WHOLE THING, I THINK IT'S
13 TEN OR 15 MINUTES LONG.

14 MR. VASSALOTTI: I'D LIKE TO
15 GIVE HIM A --

16 THE COURT: HE SAID HE'S
17 READING THE ABSTRACT.

18 MR. RENNEISEN: HE SAID HE
19 NEVER SAW THE DOCUMENT BEFORE.

20 THE WITNESS: THERE'S PARTS
21 OF THIS DOCUMENT THAT HAVE BEEN PUBLISHED
22 OTHER PLACES, BUT I'VE NEVER SEEN THIS
23 PARTICULAR DOCUMENT.

24 BY DR. VASSALOTTI:

25 Q. LET ME REFER YOU TO PAGE 236 A --

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BFG09966

1 ACTUALLY IT'S PAGES 234 AND 235. THERE'S A
2 PARAGRAPH ENTITLED "LACK OF PREDICTABLE
3 THRESHOLDS FOR AN EXPOSED POPULATION."

4 DOCTOR, DOES IT NOT SAY AT
5 THE TOP OF PAGE 235 THAT THERE IS NO RELIABLE
6 ACCEPTABLE WAY TO DETERMINE RELIABLY -- I'M
7 SORRY. STRIKE THAT. LET ME START OVER AGAIN.

8 THERE IS PRESENTLY NO
9 ACCEPTABLE WAY TO DETERMINE RELIABLY A
10 THRESHOLD FOR A CARCINOGEN FOR AN ENTIRE
11 POPULATION?

12 A. YES, IT DOES SAY THAT. BUT YOU'VE
13 GOT TO REMEMBER THE WORD IS PREDICTABLE. AND
14 WHAT I WAS POINTING OUT TO YOU
15 EPIDEMIOLOGICALLY IT IS NOT PREDICTABLE. WHAT
16 WE'RE DOING WITH EPIDEMIOLOGICAL STUDIES IS
17 RETROSPECTIVELY SAYING THAT THAT LEVEL IS
18 SAFE BASED ON EXPERIENCE. BUT THERE'S NO WAY
19 TO PREDICT THAT A LEVEL WILL NOT PRODUCE A
20 TUMOR WITHOUT ACTUALLY LOOKING AT THE
21 EXPERIENCE. AND --

22 Q. ARE YOU SAYING THAT IF YOUR
23 RETROSPECTIVE STUDIES SHOW THAT TEN PARTS PER
24 MILLION IS SAFE, THAT YOU CAN'T ASSUME OR
25 POSTULATE OR PREDICT THAT THAT LEVEL WILL BE

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BFG09967

1 . SAFE TOMORROW?

2 A. NO. I'M SAYING JUST THE OPPOSITE:
3 THAT IF YOU HAVE ADEQUATE EXPERIENCE IN TIME,
4 IN NUMBERS OF INDIVIDUALS, THAT SHOW THAT NO
5 ONE'S DEVELOPED A DISEASE AT TEN PARTS PER
6 MILLION, THAT THAT'S A REASONABLE
7 PREDICTABLENESS THAT YOU WILL NOT DEVELOP THE
8 DISEASE IN THE FUTURE.

9 Q. THAT'S YOUR OPINION?

10 A. NO, THAT'S SCIENTIFICALLY AN
11 ACCEPTED PROCESS AND AS EACH SUCCESSIVE YEAR
12 GOES ON, THAT'S HELD TRUE. YOU'RE MISREADING
13 THAT. IT SAYS PREDICTING IT. WHAT WE'RE DOING
14 IS BASING IT ON PAST EXPERIENCE, LONG YEARS
15 OF EXPERIENCE AND BY CHARACTERIZATION OF THE
16 DISEASE. AND YOU'RE SAYING ON THE BASIS OF
17 THIS PAST EXPERIENCE, THIS VAST PAST
18 EXPERIENCE, THAT BIOLOGICALLY, WE SHOULD NOT
19 EXPECT SOMETHING TOO HAPPEN. AND THAT'S
20 PREDICTABLE. BUT WHAT THEY'RE SAYING IS, YOU
21 CANNOT SET UP ANY STUDY EITHER ANIMAL-WISE,
22 HUMAN-WISE OR EPIDEMIOLOGICAL-WISE BEFORE THE
23 FACT AND PREDICT WHETHER OR NOT A CHEMICAL
24 WILL OR NOT NOT PRODUCE CANCER IN THE FUTURE.
25 AND THAT'S TRUE.

2110072

1 Q. HOW ABOUT THE LAST SENTENCE OF THAT
2 SECTION. COULD YOU READ THAT TO US?

3 A. "EVEN IF THRESHOLDS FOR CARCINOGENS
4 COULD BE DEMONSTRATED FOR CERTAIN INDIVIDUALS
5 OR FOR A DEFINED POPULATION, NO RELIABLE
6 METHOD IS KNOWN FOR ESTABLISHING A THRESHOLD
7 THAT COULD BE APPLIED TO THE TOTAL HUMAN
8 POPULATION."

9 Q. DO YOU AGREE OR DISAGREE WITH THAT
10 STATEMENT?

11 A. I WOULD AGREE WITH THAT STATEMENT.

12 Q. DOCTOR, ARE YOU FAMILIAR WITH THE
13 GROUP KNOWN AS THE PRESIDENT'S COMMITTEE ON
14 TOXIC SUBSTANCES STRATEGY?

15 A. I'VE HEARD OF THE GROUP.

16 Q. AND WAS THAT GROUP PUT TOGETHER TO
17 STUDY TOXICOLOGICAL EFFECTS OF CHEMICAL
18 SUBSTANCES, AMONG OTHERS?

19 A. YOU'RE ASKING THE QUESTION IN A
20 FORMAT THAT IMPLIES THAT THEY WERE SET UP TO
21 DO STUDIES.

22 Q. NO, I DON'T HEAR STUDIES.

23 A. THAT IS NOT MY UNDERSTANDING OF WHY
24 THEY WERE SET UP. THEY WERE SET UP TO ADVISE
25 AND MAKE RECOMMENDATION.

2110073

BFG09969

1 Q. MAKE RECOMMENDATION AS TO WHAT
2 COURSE WE SHOULD TAKE IN HANDLING TOXIC
3 CHEMICALS?

4 A. RIGHT.

5 Q. HAVE YOU SEEN THE REPORT OF THAT
6 COMMITTEE?

7 A. ONLY PARTS OF IT.

8 Q. I HAVE THE WHOLE THING HERE. IT'S
9 ENTITLED "TOXIC CHEMICALS AND PUBLIC
10 PROTECTION, A REPORT TO THE PRESIDENT BY THE
11 TOXIC SUBSTANCES STRATEGY COMMITTEE." THAT'S
12 THE PRESIDENT OF THE UNITED STATES BY THE WAY.
13 AND IT'S DATED MAY OF 1970.

14 I WANT TO READ TO YOU FROM
15 PAGE ONE 53 OF THIS REPORT WHERE IT STATES:
16 "METHODS -- " STRIKE THAT.

17 "METHODS NOW AVAILABLE FOR
18 QUANTIFYING THE ESTIMATED HUMAN RISKS FROM A
19 GIVEN EXPOSURE TO A POTENTIAL CARCINOGEN CAN
20 BE -- " I'M SORRY, "CAN PROVIDE ONLY ROUGH
21 APPROXIMATIONS OF THE ACTUAL RISKS."

22 YOU WANT ME TO READ THAT TO
23 YOU AGAIN?

24 A. NO, I HEARD WHAT YOU SAID.

25 Q. DO YOU AGREE OR DISAGREE WITH THAT

21110074

1 STATEMENT?

2 A. I THINK ALL THE DATA THAT I'VE
3 STUDIED SAYS THAT'S THE WAY WE DO IT.

4 Q. ROUGH APPROXIMATIONS?

5 A. WELL, THE WAY WE DO IT --

6 Q. THAT'S WHAT WE USE HERE. THAT'S

7 WHY I'M ASKING YOU --

8 A. IF IT'S ROUGH -- YOU'RE TALKING BASED ON
9 PROBABILITY, YES.

10 Q. DOCTOR, ARE YOU FAMILIAR WITH THE
11 REGULATIONS OF THE DEPARTMENT OF OCCUPATIONAL
12 SAFETY AND HEALTH REGARDING VINYL CHLORIDE?

13 A. I BELIEVE NOT AT THE TIME.

14 Q. AND ARE YOU FAMILIAR -- WERE YOU
15 INVOLVED AT ALL IN THE FORMULATION OF THOSE
16 STANDARDS FOR LEVELS TRYING TO SET UP
17 CONTROLS ON THE LEVEL OF EXPOSURE TO VINYL
18 CHLORIDE IN THE WORKPLACE?

19 A. NO, I WAS NOT.

20 Q. ARE YOU FAMILIAR WITH THE REPORT OF
21 THE NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY
22 AND HEALTH THAT WAS SUBMITTED IN CONNECTION
23 WITH THE PREPARATION OF THAT REPORT REGARDING
24 THE SAFETY OF HANDLING VINYL
25 CHLORIDE?

2110075

BFG09971

1 A. THERE WERE MANY REPORTS. IF YOU'RE
2 SPEAKING TO THE FACT THAT THE ORIGINAL
3 RECOMMENDATION HAD TO BE ZERO PARTS PER
4 MILLION, YES.

5 Q. AND WHAT WAS THE LEVEL OF VINYL
6 CHLORIDE EXPOSURE WHICH IS EMBODIED IN THE
7 STANDARD OF THE OCCUPATIONAL HEALTH AND
8 SAFETY ADMINISTRATION?

9 A. I BELIEVE IT TO BE ONE PART PER
10 MILLION.

11 Q. DOCTOR, ARE YOU FAMILIAR WITH THE
12 ENVIRONMENTAL PROTECTION AGENCY'S REGULATIONS
13 REGULATE GOING ON THE EMISSION OF VINYL
14 CHLORIDE GAS FROM VINYL CHLORIDE IN PVC
15 PLANTS?

16 A. TO A LESSER DEGREE, YES.

17 Q. ARE YOU FAMILIAR WITH THE FACT THAT
18 THE ENVIRONMENTAL PROTECTION AGENCY IN
19 STUDIES THAT THEY MADE BEFORE ISSUING THIS
20 STANDARD, DETERMINED THAT THERE WERE
21 APPROXIMATELY 4.5 MILLION PEOPLE WHO LIVED
22 WITHIN FIVE MILES OF VINYL CHLORIDE AND PVC
23 PLANTS IN THE COUNTRY?

24 A. I HAVE HEARD THAT REPORT.

25 Q. AND THAT THIS POPULATION WAS EXPOSED

21110076

BFG09972

1 TO AN ANNUAL AVERAGE CONCENTRATION OF VINYL
2 CHLORIDE IN THE RANGE OF 17 PARTS PER BILLION?

3 A. YES.

4 Q. AND BASED UPON THAT AND THE SIZE
5 OTHER INFORMATION, THE DEPARTMENT OF
6 ENVIRONMENTAL PROTECTION -- I'M SORRY, THE
7 ENVIRONMENTAL PROTECTION AGENCY, THIS IS THE
8 FEDERAL AGENCY, PROMULGATED A STANDARD WHICH,
9 IN EFFECT, INTENDED TO REDUCE EMISSIONS OF
10 VINYL CHLORIDE FROM PVC PLANTS LIKE THE ONE
11 IN QUESTION TO THE EXTENT OF 95 PERCENT?

12 A. YES.

13 Q. IN YOUR WORK FOR THE B.F. GOODRICH
14 COMPANY, DOCTOR, AND THE GRANT THAT THEY GAVE
15 YOU OR THE GRANTS, DID THE GOODRICH COMPANY
16 PROVIDE YOU WITH ANY STUDIES REGARDING THE
17 TOXICITY OR CARCINOGENICITY OF VINYL CHLORIDE
18 THAT THEY HAD CONDUCTED BEFORE THEY RETAINED
19 YOU?

20 A. NO, THEY DID NOT..

21 Q. DID YOU INQUIRE AS TO WHETHER ANY
22 SUCH STUDIES HAD BEEN UNDERTAKEN?

23 A. YES, WE'VE DISCUSSED WHAT KINDS OF
24 WORK THAT THEY HAD DONE AND WHAT OTHER
25 COMPANIES HAD DONE.

21110077

BFG09973

1 Q. WELL, I'M LIMITING IT TO GOODRICH
2 RIGHT NOW. HAD THEY DONE ANYTHING WHEN THEY
3 FIRST CONTACTED YOU IN THIS AREA?

4 A. THEY HAD DONE STUDIES RELATED TO
5 HUMANS, BUT NOT TO ANIMALS.

6 Q. THOSE STUDIES INVOLVED THE THREE
7 CASES OF ANGIOSARCOMA THAT WERE DISCOVERED?

8 A. NO, THEY HAD ALREADY BEGUN A
9 SCREENING PROGRAM, HAD DESIGNED THE SCREENING
10 PROGRAM, HAD IMPLEMENTED A SCREENING PROGRAM,
11 HAD LOOKED AT A NUMBER OF INDIVIDUALS WHO HAD
12 NO CHEMICAL ABNORMALITIES, HAD MEDICALLY
13 WORKED THEM UP; THEIR INITIAL SCREENING
14 PROGRAM WAS REASONABLY STARTED BY THE TIME I
15 ARRIVED AT THE UNIVERSITY OF LOUISVILLE.

16 Q. THAT WAS IN 1974?

17 A. 1974. THAT WAS BETWEEN JANUARY AND
18 SEPTEMBER.

19 MR. VASSALOTTI: I HAVE
20 NOTHING FURTHER, DOCTOR, THANK YOU.

21 THE COURT: ANY REDIRECT?

22 MR. RENNEISEN: I MAY HAVE
23 JUST ONE QUESTION.

24 REDIRECT EXAMINATION BY MR. RENNEISEN.

25 BY MR. RENNEISEN:

21110078

1 Q. DOCTOR, AT THE END OF YOUR
2 CROSS-EXAMINATION THERE, YOU WERE ASKED ABOUT
3 AN E.P.A. REGULATION THAT REDUCED EMISSIONS
4 FROM POLYVINYLCHLORIDE PLANTS. DO YOU KNOW
5 THE DATE OF THAT REGULATION?

6 A. NO, I DON'T.

7 Q. DO YOU KNOW -- IT'S BEEN TESTIFIED
8 TO EARLIER IN THIS CASE THAT THE ONE PART PER
9 MILLION WORK PLACE REQUIREMENT WAS, I THINK,
10 IN LATE 74; WAS THE OTHER REGULATION BEFORE
11 OR AFTER THAT?

12 A. I THINK IT WAS AFTER.

13 MR. RENNEISEN: I HAVE NO
14 FURTHER QUESTIONS.

15 THE COURT: ANYTHING FURTHER.

16 MR. VASSALOTTI: NOTHING,
17 YOUR HONOR.

18 THE COURT: ALL RIGHT. THANK
19 YOU VERY MUCH, DOCTOR. YOU MAY STEP DOWN.

20 ANY FURTHER WITNESSES?

21 MR. RENNEISEN: I HAVE NO
22 FURTHER WITNESSES. I HAVE EXHIBITS TO OFFER
23 INTO EVIDENCE, BUT I BELIEVE AFTER THE JURY
24 IS DISMISSED.

25 THE COURT: WITH THE

2110073

1 EXCEPTION OF INTRODUCING SUCH EXHIBITS, THE
2 DEFENSE RESTS; IS THAT CORRECT?.

3 MR. REVEISEN: YES, YOUR
4 HONOR.

5 THE COURT: DO YOU HAVE ANY
6 REBUTTAL?

7 MR. VASSALOTTI: NOTHING,
8 YOUR HONOR.

9 THE COURT: ALL RIGHT, SO YOU
10 HAVE RESTED.

11 MR. VASSALOTTI: RESTED.

12 THE COURT: LADIES AND
13 GENTLEMEN, I THINK WHAT WE'LL DO IS THIS:
14 THIS CASE, FOR ALL INTENTS AND PURPOSES AS
15 FAR AS TESTIMONY AND EVIDENCE IS CONCERNED,
16 IS FINISHED. NOW, THERE ARE CERTAIN LEGAL
17 ARGUMENTS I MUST HEAR AND CERTAIN PROCEDURES
18 I MUST FOLLOW AT THIS TIME. AND THAT MAY TAKE
19 SOME TIME. SO RATHER THAN FIND YOURSELVES IN
20 THE POSITION OF HAVING SUMMATIONS AND CHARGE
21 LATE IN THE DAY, I'M GOING TO EXCUSE YOU FOR
22 THE BALANCE OF THE DAY AND WE'LL COME BACK
23 TOMORROW MORNING AT 9:30, AT WHICH TIME THERE
24 WILL BE SUMMATIONS BY COUNSEL, FOLLOWED BY MY
25 CHARGE AS TO THE LAW AND THEN YOU WILL HEAR.

2110080

1 HAVE THE CASE AND WILL TAKE THE CASE WITH YOU
2 TO THE JURY DELIBERATION ROOM AND DELIBERATE
3 UNTIL YOU HAVE REACHED A DETERMINATION. SO,
4 TOMORROW WILL BE A REAL WORKING DAY. OUR WORK
5 HAS STOPPED AFTER TOMORROW AND YOUR WORK
6 REALLY BEGINS. SO, I THINK THAT THIS IS THE
7 BEST COURSE OF ACTION TO FOLLOW.

8 NOW, LADIES AND GENTLEMEN, AS
9 I HAVE CAUTIONED YOU BEFORE AND WILL CONTINUE
10 TO -- WELL, NO LONGER, BUT AS I'VE
11 CAUTIONED YOU BEFORE, UNTIL THIS CASE IS
12 SUBMITTED TO YOU FOR YOUR DELIBERATIONS, YOU
13 MUST NOT DISCUSS THIS CASE WITH ANYONE OR
14 REMAIN WITHIN HEARING OF ANYONE DISCUSSING IT.
15 NEITHER SHOULD YOU READ ANY NEWSPAPER ARTICLE,
16 LISTEN TO RADIO BROADCAST NOR VIEW ANY
17 TELEVISION PROGRAM THAT DISCUSSES THIS CASE.

18 IF, HOWEVER, YOU SHOULD
19 BECOME AWARE OF ANY SUCH STORY, ARTICLE OR
20 NEWS REPORT, YOU ARE TO REPORT THAT MATTER TO
21 ME IN MY CHAMBERS AT YOUR EARLIEST
22 OPPORTUNITY SO THAT WE MAY DISCUSS IT.

23 NEEDLESS TO SAY, SHOULD YOU
24 HAVE SUCH EXPOSURE, YOU SHOULD NOT MENTION
25 THAT FACT TO ANY OF YOUR FELLOW JURORS. YOU

21110081

1 ARE TO KEEP AN OPEN MIND AND YOU MUST NOT
2 DECIDE ANY ISSUE IN THIS CASE UNTIL THE CASE
3 IS SUBMITTED TO YOU FOR YOUR DELIBERATIONS
4 UNDER THE INSTRUCTIONS OF THE COURT.

5 NOW, WE'RE AT A VERY CRITICAL
6 STAGE IN THIS CASE, SO, PLEASE, I WANT TO
7 EMPHASIZE AGAIN, DON'T DISCUSS THIS WITH
8 ANYONE, NOT EVEN AMONGST YOURSELVES. BECAUSE
9 THE TIME TO DISCUSS THE CASE AMONGST
10 YOURSELVES IS IN JURY ROOM WITH ALL OF YOU
11 TOGETHER AND AFTER YOU HAVE HEARD THE
12 SUMMATIONS AND MY CHARGE. SO, WITH THAT, I'LL
13 EXCUSE YOU UNTIL TOMORROW MORNING AT 9:30.

14 (AT WHICH TIME THE JURY
15 LEAVES THE COURTROOM.)

16 THE COURT: ALL RIGHT.

17 MR. RENNEISEN: I'LL TAKE THE
18 EXHIBITS IN ORDER, YOUR HONOR, I THINK.

19 THE COURT: YES.

20 MR. RENNEISEN: YOUR HONOR,
21 D-1 IS A SCETCH I MADE SHOWING WIND
22 DIRECTIONS WHICH WAS PREPARED DURING THE
23 CROSS-EXAMINATION OF PROFESSOR PESKIN.

24 THE COURT: ANY OBJECTION TO

25 D-1?

2110082

BFG09978

1 MR. VASSALOTTI: NO, I HAVE
2 NO OBJECTION.

3 THE COURT: IN EVIDENCE
4 (D-1 IS MARKED IN EVIDENCE.)

5 MR. RENNEISEN: D-2 IS
6 ANOTHER SKETCH I MADE SHOWING WIND DIRECTION
7 DURING THE EXAMINATION OF PROFESSOR PESKIN.

8 THE COURT: ANY OBJECTION?

9 MR. VASSALOTTI: NO OBJECTION.

10 THE COURT: IN EVIDENCE
11 (D-2 IS MARKED IN EVIDENCE.)

12 MR. RENNEISEN: D-3 IS
13 PROFESSOR PESKIN'S REPORT WHICH I WITHDRAW.

14 D-4 IS AN ARTICLE THAT NEVER
15 GOT A STICKER ON IT BECAUSE THE ONLY COPY I
16 HAD WAS UNDERLINED AND I HAVE NOT BEEN ABLE
17 TO LOCATE A CLEAN COPY OF IT. IT IS A REPORT
18 THAT I WAS USING WHEN I CROSS-EXAMINED DOCTOR
19 EPSTEIN BY PETER BAXTER PRINTED IN THE
20 BRITISH MEDICAL JOURNAL, OCTOBER, 1977. I
21 COULD PUT A STICKER ON IT.

22 MR. VASSALOTTI: YOU INTEND
23 TO OFFER THAT INTO EVIDENCE?

24 MR. RENNEISEN: YES, I DO.

25 MR. VASSALOTTI: I OBJECT TO

21110083

1 THAT, YOUR HONOR.

2 THE COURT: SHOW ME THAT RULE
3 THAT SAYS I CAN PUT THAT IN EVIDENCE.

4 MR. RENNEISEN: MY
5 EXPLANATION FOR IT, WHY IT GOES INTO EVIDENCE
6 IS BECAUSE THERE WAS A DIFFERENCE OF OPINION
7 BETWEEN ME AND DOCTOR EPSTEIN AS TO WHAT THE
8 REPORT SAYS.

9 THE COURT: WELL, THAT
10 HAPPENS ALL THE TIME.

11 MR. VASSALOTTI: AND THAT'S
12 ON THE RECORD.

13 MR. RENNEISEN: AND HE STATED
14 THERE WERE CERTAIN CONCLUSIONS FROM THE
15 REPORT WHICH I THINK ARE DIFFERENT FROM THE
16 LANGUAGE CONTAINED IN THE REPORT AND I THINK
17 THE JURY SHOULD HAVE THE RIGHT TO LOOK AT THE
18 LANGUAGE IN THE REPORT AND SEE --

19 THE COURT: YOU SHOW ME THE
20 FEDERAL RULE OF EVIDENCE THAT SAYS I CAN
21 ADMIT IT. IN THE MEANTIME, I DENY YOUR
22 APPLICATION UNTIL YOU CAN SHOW ME UNDER THE
23 FEDERAL RULES THAT'S ADMISSIBLE. YOU POINT TO
24 THE SPECIFIC RULE. YOU CAN USE IT FOR
25 CROSS-EXAMINATION, NO QUESTION ABOUT THAT.

21110084

1 BUT CERTAINLY IT'S A BIG QUESTION IN MY MIND
2 WHETHER IT CAN BE ADMITTED AS AN EXHIBIT.

3 MR. RENNEISEN: WELL, IT
4 SEEMS TO ME IF YOU CAN USE IT FOR
5 CROSS-EXAMINATION, I CAN POINT OUT AN
6 INCONSISTENCY BETWEEN DOCTOR ERSTEIN'S
7 TESTIMONY AND THE REPORT, THE JURY SHOULD BE
8 ALLOWED TO DETERMINE WHETHER OR NOT THERE IS
9 AN INCONSISTENCY. I'M GOING TO GIVE YOU THE
10 OPPORTUNITY. YOU CHECK THE RULE AND YOU SHOW
11 ME. WE'LL HOLD THAT IN ABEYANCE.

12 MR. RENNEISEN: ALL RIGHT.
13 D-5 IS A CHART ENTITLED "ANNUAL AVERAGE
14 EXPOSURE LEVELS DUE TO EMISSIONS FROM THE
15 B.F. GOODRICH PLANT, MODEL AND DATA BASE
16 COMPARISON" PREPARED BY --

17 THE COURT: ANY OBJECTION?

18 MR. VASSALOTTI: NO OBJECTION.

19 THE COURT: D-5 IN EVIDENCE.

20 (D-5 IS MARKED IN EVIDENCE.)

21 MR. RENNEISEN: D-5 IS
22 ANOTHER CHART PREPARED BY DR. GUTREUND,
23 ANNUAL AVERAGE VINYL CHLORIDE EXPOSURE OF DR.
24 GRASSO DUE TO EMISSIONS FROM THE B.F.
25 GOODRICH PLANT.

2110085

1 THE COURT: ANY OBJECTION.

2 MR. VASSALOTTI: NO OBJECTION.

3 THE COURT: IN EVIDENCE.

4 (D-7 IS MARKED IN EVIDENCE.)

5 MR. RENNEISEN: D-7 IS ON THE
6 BACK OF THIS BOARD AND IS ENTITLED "SHORT
7 TERM EPISODIC CONCENTRATIONS AT GRASSO
8 RESIDENCE CALCULATED BY RAMR." SHALL I TURN
9 IT AROUND FOR YOU MR. VASSALOTTI.

10 MR. VASSALOTTI: NO, I HAVE
11 NO OBJECTION.

12 THE COURT: IN EVIDENCE.

13 D-7 IS (MARKED IN EVIDENCE.)

14 MR. RENNEISEN: NOW, THE LAST
15 TWO DRAWINGS WHICH WERE MADE HAVE NEVER BEEN
16 MARKED. ONE WAS MADE BY -- I GUESS THEY
17 WERE BOTH MADE BY MR. GUTFREUND. I'LL CALL
18 THE FIRST ONE EIGHT, WHICH HE WAS USING TO
19 ILLUSTRATE THE PLUME OF A -- OF AN EMISSION
20 FROM A -- FROM A STACK, AND NUMBER NINE
21 --

22 THE COURT: FIRST OF ALL, ANY
23 OBJECTION TO D-8.

24 MR. VASSALOTTI: NO OBJECTION.

25 THE COURT: D-8 IN EVIDENCE.

2110086

1 CO-1 IS MARKED IN EVIDENCE.)

2 MR. RENNEISEN: NUMBER NINE

3 IS ANOTHER SKETCH MADE BY MR. GUTREUND

4 SHOWING WIND DIRECTIONS AND ALSO SHOWING THE

5 CHARACTERISTICS OF A PLUME WHEN YOU LOOK DOWN

6 ON IT FROM ABOVE.

7 MR. VASSALOTTI: NO OBJECTION.

8 THE COURT: D-9 IN EVIDENCE

9 CO-9 IS MARKED IN EVIDENCE.)

10 THE COURT: DOES THAT TAKE

11 CARE OF IT."

12 MR. RENNEISEN: YES, YOUR

13 HONOR.

14 THE COURT: IS THERE ANYTHING

15 FURTHER AT THIS TIME, GENTLEMEN.

16 MR. VASSALOTTI: YOUR HONOR,

17 ONLY THAT IF MR. RENNEISEN FINDS THE BASIS TO

18 ADMIT THE -- IS IT THE BAXTER ARTICLE, I'M

19 ASKING, MR. RENNEISEN, IF THAT ARTICLE

20 ARTICLE ADMITTED?

21 MR. RENNEISEN: YES.

22 MR. VASSALOTTI: I WOULD LIKE

23 AN OPPORTUNITY TO OFFER IN REBUTTAL THE TWO

24 REPORTS THAT I OFFERED DOCTOR TAMBURRO WITH

25 WHICH HE DISAGREED.

2110087

BFG09983

1 THE COURT: WELL, MY HOLDING
2 AT THE PRESENT TIME IS I DENIED HIS
3 APPLICATION. I ALLOWED HIM THE OPPORTUNITY OF
4 SHOWING TO ME UNDER WHAT RULE OF EVIDENCE HE
5 ASSERTS I SHOULD ADMIT IT.

6 MR. VASSALOTTI: WELL, JUDGE
7 WHATEVER RULING HE SAYS --

8 THE COURT: WHAT'S SAUCE FOR
9 THE GOOSE IS SAUCE FOR THE GANDER IS WHAT
10 YOU'RE TELLING ME.

11 MR. VASSALOTTI: RIGHT, JUDGE..

12 THE COURT: ALL RIGHT. SO,
13 I'LL WAIT TO HEAR -- THE BALL IS RIGHT NOW
14 IS IN MR. RENNEISEN'S HANDS.

15 MR. RENNEISEN: THANK YOU,
16 I'LL JUGGLE WITH IT.

17 THE COURT: NOW, IS THERE
18 ANYTHING ELSE AT THIS POINT?.

19 MR. RENNEISEN: NO, SIR.

20 THE COURT: ALL RIGHT. HOW
21 ABOUT IF WE DO THIS, GENTLEMEN? LET'S HAVE
22 LUNCH AND IF YOU'LL COME BACK AT 1:30, I'D
23 LIKE TO SEE YOU IN MY CHAMBERS AND WE'LL GET
24 INTO THE RULE 91 HEARING WITH RESPECT TO THE
25 CHARGE.

21110083

BFG09984

1 MR. VASSALOTTI: VERY GOOD,
2 JUDGE.

3 THE COURT: ARE THERE ANY
4 MOTIONS?

5 MR. RENNEISEN: I HAVE A
6 MOTION FOR DIRECTED VERDICT UNDER RULE 50
7 SUBMITTED TO THE COURT. I'LL GIVE YOU TWO
8 COPIES.

9 THE COURT: JUST WAIT ONE
10 SECOND.

11 ALL RIGHT. I'LL HEAR YOUR
12 MOTION.

13 MR. RENNEISEN: YOUR HONOR,
14 THE FACTUAL BASIS FOR THE MOTION FOR A
15 DIRECTED VERDICT IS -- WAS SUMMARIZED WHEN
16 I MADE A MOTION FOR DIRECTED VERDICT AT THE
17 END OF THE PLAINTIFF'S CASE. DURING THE
18 COURSE OF DEFENDANT'S CASE, IT HAS BECOME, I
19 THINK, QUITE CLEAR THAT WITH RESPECT TO
20 NEGLIGENCE, THERE SIMPLY IS NONE.

21 THE COURT: IN OTHER WORDS,
22 YOU'RE REPEATING THE SAME ARGUMENTS YOU MADE
23 AT THE CONCLUSION --

24 MR. RENNEISEN: AND I DON'T
25 REALLY WANT TO BURDEN THE COURT WITH --

21110089

1 THE COURT: -- OF THE
2 PLAINTIFF'S CASE.

3 MR. RENNEISEN: EXCEPT FOR
4 THE FACT THAT THERE IS NOTHING IN DEFENDANT'S
5 CASE WHICH IN ANY WAY CHANGES THE ARGUMENT
6 THAT I MADE PREVIOUSLY, AND IN FACT, BOLSTERS
7 THOSE ARGUMENTS WITH RESPECT TO NEGLIGENCE
8 AND THE ACTIVITY CONDUCTED AT THE B.F.
9 GOODRICH PLANT.

10 THE COURT: ALL RIGHT. EXCEPT,
11 OF COURSE, THE COURT HAS HEARD TESTIMONY
12 WHICH IT DID NOT HAVE AT THE TIME IT
13 CONSIDERED THE PLAINTIFF'S -- THE MOTIONS
14 MADE AT THE CONCLUSION OF THE PLAINTIFF'S
15 CASE.

16 MR. RENNEISEN: THAT'S TRUE.
17 THERE'S BEEN ADDITIONAL TESTIMONY. BUT THAT
18 ADDITIONAL TESTIMONY, I THINK, STRENGTHENS
19 THE DEFENDANT'S POSITION, IF WE'RE GOING TO
20 TALK ABOUT NEGLIGENCE. IT'S CLEAR NOW THAT
21 THE -- THE PLANT WAS DESIGNED AND
22 CONSTRUCTED BY COMPETENT, QUALIFIED PEOPLE
23 WHO TOOK INTO CONSIDERATION INDUSTRY
24 STANDARDS AT THE TIME, WHAT WAS KNOWN ABOUT
25 TOXICITY AND, IN FACT, THE PLANT HAS BEEN

21140090

BFG09986

1 GRANTED NUMEROUS PERMITS BY THE ENVIRONMENTAL
2 PROTECTION AGENCY OF THE STATE OF NEW JERSEY

3 --

4 THE COURT: ISN'T THAT AN
5 ISSUE FOR THE JURY TO DETERMINE?

6 MR. VASSALOTTI: JUDGE, WE
7 DON'T CONTEND THAT THE PLANT WAS NEGLIGENT
8 WHEN BUILT. WE DIDN'T PUT IN ANY PROOF THAT
9 THE PLANT WAS NOT BUILT OR WAS BUILT IN A
10 NEGLIGENT FASHION. MR. TENNEISEN SAYS IT IS
11 TRUE, IT WAS BUILT -- .

12 THE COURT: YOU'RE TALKING
13 ABOUT NEGLIGENT OPERATION, AREN'T YOU.

14 MR. VASSALOTTI: I'M
15 TALKING ABOUT --

16 THE COURT: WHAT IS YOUR
17 BASIC NEGLIGENCE CLAIM? WHAT DO YOU SAY WAS
18 THE NEGLIGENCE OF THE GOODRICH COMPANY?

19 MR. VASSALOTTI: THAT THE
20 GOODRICH COMPANY FAILED TO CONDUCT ANY TESTS
21 OR STUDIES REGARDING THE CARCINOGENICITY OR
22 TOXICITY OF VINYL CHLORIDE, EVEN THOUGH THEY
23 KNEW UNTIL THE CONSTRUCTION OF THIS PLANT
24 THAT MR. BIXBY BUILT AND WHICH HE TESTIFIED
25 TO, EVEN THOUGH THEY KNEW THAT THE VINYL

21110091

BFG09987

1 CHLORIDE WAS GOING TO BE EMITTED AND WOULD
2 CARRY OVER THE FENCE LINE.

3 THE COURT: THAT IS THE SOLE
4 BASIS OF YOUR CLAIM FOR NEGLIGENCE; IS THAT
5 CORRECT?

6 MR. VASSALOTTI: I BELIEVE SO.

7 THE COURT: IN OTHER WORDS,
8 NOT FAILURE TO CONDUCT STUDIES BEFORE THEY
9 BUILT THE PLANT.

10 MR. VASSALOTTI: OH, YEAH,
11 THAT'S IT, THAT THEY FAILED TO CONDUCT THOSE
12 STUDIES. THEY FAILED TO CONDUCT ANY TESTS
13 BEFORE OR AFTER. THEY JUST WENT AHEAD AND DID
14 IT.

15 THE COURT: IN OTHER WORDS,
16 YOU'RE SAYING THAT R.F. GODDRICH WAS
17 NEGLIGENCE IN NOT CONDUCTING PROPER TESTS OR
18 STUDIES EITHER BEFORE IT OPENED THE
19 POLYVINYLCHLORIDE PLANT IN PEDRICKTOWN OR
20 AFTER THE OPENING OF THE PLANT; IS THAT
21 CORRECT?

22 MR. VASSALOTTI: THAT'S RIGHT,
23 CANCER CAUSING OR TOXIC OR ANY HARMFUL
24 EFFECTS.

25 THE COURT: NOW, THESE TESTS

2600112

BFG09988

1 ARE SUFFICIENTLY BROAD. NOW, ARE YOU ALSO
2 INCLUDING WITHIN THEM, THE FAILURE TO MONITOR
3 THE AIR IN THE AREA.

4 MR. VASSALOTTI: I'M SORRY.

5 THE COURT: I MEAN, I'M
6 READING FROM THE ALLEGATIONS OF THE PLEADINGS
7 AND THOSE SET FORTH IN YOUR TRIAL MEMORANDUM.

8 MR. VASSALOTTI: I'M, SORRY,
9 YOUR HONOR.

10 THE COURT: ARE YOU AND I ON
11 THE SAME WAVELENGTH OR HAVE WE DEPARTED
12 SOMEWHAT.

13 MR. VASSALOTTI: THERE ARE
14 ADDITIONAL CONTENTIONS THAT ARE SOMEWHAT
15 RELATED. THE ONE IS THAT THEY DIDN'T MONITOR
16 IN THE RESIDENTIAL AREAS. THE OTHER IS THAT
17 THEY NEVER WARNED OR ADVISED THE PEOPLE OF
18 PEDRICKTOWN AS TO WHAT WAS BEING EMITTED OR
19 ITS CANCER CAUSING --

20 THE COURT: THE FACT REMAINS
21 YOU'RE NOT MAKING ANY CLAIM THAT THE
22 DEFENDANT WAS NEGLIGENT IN ANY WAY IN THE
23 CONSTRUCTION -- IN THE PLANNING OR
24 CONSTRUCTION OF THAT PLANT.

25 MR. VASSALOTTI: UNLESS YOU

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1 CONSIDER PLACING A MONITOR IN THE RESIDENTIAL
2 AREAS AS PART OF THE PLANNING AND
3 CONSTRUCTION OF THE PLANT.

4 THE COURT: ALL RIGHT.

5 DR. VASSALOTTI: I AGREE WITH
6 THAT.

7 THE COURT: ALL RIGHT. YOU
8 MAY CONTINUE, MR. RENNEISEN.

9 MR. RENNEISEN: WITH RESPECT
10 TO WARNING THEN, I'LL LIMIT MY DISCUSSION TO
11 THOSE -- WHAT I UNDERSTAND TO BE THREE
12 THEORIES: ONE, NO TESTS WERE CONDUCTED TO
13 DETERMINE CARCINOGENICITY. THEY DIDN'T
14 MONITOR FROM 1970 TO 1978 AND SOMEHOW, THEY
15 DIDN'T WARN THE PEOPLE IN THE PEDRICKTOWN
16 AREA.

17 SINCE THIS IS -- THIS IS A
18 NEGLIGENCE COUNT, WE'RE TALKING ABOUT WHAT IS
19 REASONABLE AND PRUDENT UNDER THE
20 CIRCUMSTANCES. IN 1970, PLAINTIFF'S CASE HAS
21 SHOWN -- PLAINTIFF'S CASE HAS SHOWN FROM
22 1949 TO 1970, THE ONLY KNOWLEDGE ABOUT THE
23 HARMFUL EFFECTS OF VINYL CHLORIDE WERE, ONE,
24 TOXICITY AND, TWO, TO PEOPLE IN THE WORK
25 PLACE. NOT ONLY WAS THERE NO KNOWLEDGE OF

2110094

1 CANCER, THERE WAS NO KNOWLEDGE OF ANY HARMFUL
2 EFFECTS WHATSOEVER TO ANYBODY SOMEPLACE ELSE.
3 BUT, IT WOULD SEEM TO ME THAT IT IS NEITHER
4 REASONABLE, SENSIBLE, PRUDENT OR ANY OTHER
5 WORD YOU USE TO DESCRIBE NEGLIGENCE TO FAIL
6 TO TEST FOR THE EFFECTS OF -- ON THAT
7 SUBSTANCE ON PEOPLE AT A DISTANCE,
8 PARTICULARLY WHEN THE SUBSTANCE HAD BEEN
9 EXPERIMENTED WITH BY THE MEDICAL PROFESSION
10 AS AN ANESTHETIC WITHOUT ANY CANCEROUS SIDE
11 EFFECTS, PARTICULARLY WHEN IT WAS BEING USED
12 AS A PROPELLANT IN SPRAY CANS ALL OVER THE
13 COUNTRY AND WITH KNOWLEDGE THAT IN THE
14 MANUFACTURING PROCESS, THE ONLY TOXICITY THAT
15 THERE WAS A CONCERN ABOUT WAS THE
16 ACROOSTEOLYSIS, PLUS EXPLOSION AND DROWSINESS,
17 ALL OF WHICH WERE TAKEN CARE OF WHEN THE
18 PLANT WAS DESIGNED. SO THAT I DON'T THINK
19 THAT IT'S REASONABLE TO EXPECT THAT KIND OF A
20 TEST.

21 THE SAME ARGUMENT GOES TO THE
22 MONITORING. IF THERE'S NO REASON TO EXPECT A
23 DANGER, THERE'S NO REASON -- NO REASON TO
24 MONITOR. AND THE SAME GOES TO WARNINGS. IF
25 THERE'S NO REASON TO EXPECT A DANGER, THERE

21110095

1 IS NO DUTY TO WARN. FURTHERMORE, THE HERE
2 FACT THAT MRS. GRASSO STILL LIVES IN
3 PEORICKTOWN OBVIOUSLY SHOWS THAT THE FAILURE
4 TO WARN IS NOT THE APPROXIMATE CAUSE OF
5 ANYTHING. SHE HAS --

6 MR. VASSALOTTI: I OBJECT TO
7 THAT, YOUR HONOR.

8 MR. PENNEISEN: SHE HAS KNOWN
9 KNOWN ABOUT --

10 MR. VASSALOTTI: I TAKE
11 EXCEPTION TO THAT BECAUSE HE IMPLIES THAT
12 MRS. GRASSO IS FINANCIALLY ABLE TO MOVE
13 WHEREVER SHE WANTS TO MOVE. AND THAT MAY NOT
14 BE THE CASE.

15 THE COURT: WELL, EITHER WAY,
16 YOU GIVE ME THAT ARGUMENT AFTER HE'S FINISHED.

17 MR. VASSALOTTI: WELL, YOUR
18 HONOR, THAT REALLY HAS NOTHING TO DO WITH THE
19 CASE.

20 THE COURT: IT MAY OR MAY NOT,
21 BUT THAT'S HOW YOU RESPOND TO IT.

22 MR. PENNEISEN: IN ANY EVENT,
23 THE DUTY TO WARN RELATES TO KNOWLEDGE OF A
24 DANGER ABOUT WHICH THE WARNING SHOULD BE
25 GIVEN AND CLEARLY THERE WAS NO REASON FOR THE

2110096

BFG09992

1 B. F. GOODRICH COMPANY TO KNOW THAT VINYL
2 CHLORIDE UNDER ANY CIRCUMSTANCES WOULD HAVE A
3 HARMFUL EFFECT ON PEOPLE IN THE VICINITY. SO,
4 THAT'S -- THAT'S THE BASIC ARGUMENT WITH
5 RESPECT TO NEGLIGENCE.

6 THE REST OF MY ARGUMENT I
7 WILL BE GLAD TO DEFER AT THE POINT WHERE
8 WE'RE TALKING ABOUT THE CHARGE TO THE JURY
9 BECAUSE IT RELATES TO LEGAL THEORY UNDER
10 WHICH THE CASE IS SUBMITTED TO THE JURY OTHER
11 THAN NEGLIGENCE. IF NUISANCE IS STILL IN THE
12 CASE, THE WAY I READ THE RESTATEMENT IS THAT
13 THE CONDUCT MUST BE INTENTIONAL AND
14 UNREASONABLE AND UNREASONABLE IS A NEGLIGENCE
15 CONCEPT AND THE SAME WOULD RELATE TO NUISANCE
16 AS RELATES TO THE -- THE OPERATION OF THE
17 PLANT.

18 IF WE'RE TALKING ABOUT THE
19 CITY OF THE BRIDGETON THEORY AND THE THEORY
20 THAT'S SET FORTH IN SECTION 510 OF THE
21 RESTATEMENT OF TORTS, IT IMPOSES LIABILITY ON
22 AN ABNORMALLY DANGEROUS ACTIVITY. IT SEEMS TO
23 ME THAT THE CONSTRUCTION AND OPERATION OF A
24 POLYVINYLCHLORIDE PLANT HAS NOT BEEN PROVED
25 TO BE AN ABNORMALLY DANGEROUS ACTIVITY, EVEN

21110097

BFG09993

1 IF YOU ACCEPT THE PREMISE THAT MR. GROSS IS
2 A UNIQUE CASE AND VERY, VERY SUSCEPTIBLE TO
3 CANCER AND, IN FACT, HIS DISEASE WAS CAUSED
4 BY THE PLANT. I STILL DO NOT BELIEVE THAT THE
5 ACTIVITY OF THE W. F. GOODRICH COMPANY IS
6 ABNORMALLY DANGEROUS SIMPLY BECAUSE OF A
7 SINGLE RESULT.

8 THE COURT: HOW ABOUT THE
9 EMISSION, THE EMISSION OF THE VINYL CHLORIDE,
10 THE ALLOWANCE OF THAT EMISSION?.

11 MR. RENNEISEN: BASED ON ALL
12 THE KNOWLEDGE, MY POSITION IS THAT IS NOT AN
13 ABNORMALLY DANGEROUS CONDITION.

14 THE COURT: ISN'T VINYL
15 CHLORIDE AN ABNORMALLY DANGEROUS SUBSTANCE?

16 MR. RENNEISEN: VINYL
17 CHLORIDE -- VINYL CHLORIDE IS A HYDROCARBON
18 AND AS SUCH, IT'S PROBABLY LIKE GASOLINE AND
19 ABNORMALLY DANGEROUS IF IT EXPLODES.

20 THE COURT: HOW ABOUT IF
21 IT'S INHALED BY ITSELF IN ITS PURE STATE,
22 IT'S INHALED? HASN'T THERE BEEN ENOUGH
23 TESTIMONY HERE TO INDICATE THAT IT'S
24 DANGEROUS?

25 MR. RENNEISEN: IN ITS PURE

21110098

BFG09994

1 STATE INHALED, IT COULD MAKE YOU DIZZY, IT
2 COULD KILL YOU. SO COULD OXYGEN IF YOU
3 BREATHE ENOUGH OF IT. BUT IN THE AMOUNTS
4 BEING EMITTED IN 1972 OR TODAY, THERE IS NO
5 EVIDENCE THAT THERE IS -- THAT IT'S
6 ABNORMALLY DANGEROUS OR IN THE LANGUAGE OF
7 S20, THAT THERE'S AN EXISTENCE OF A HIGH RISK
8 OF HARM.

9 THE COURT: WELL, ISN'T THAT
10 SOMETHING FOR THE JURY TO DECIDE? ISN'T THAT
11 A QUESTION HERE PRESENTED BY THE TESTIMONY? I
12 MEAN, ONE SIDE SAYS ONE THING, ANOTHER SIDE
13 SAYS ANOTHER. HIS EXPERTS DON'T AGREE WITH
14 YOURS AND YOURS DON'T AGREE WITH HIS. DOESN'T
15 THAT PRESENT A JURY QUESTION? DOESN'T THE
16 JURY HAVE TO FIND THIS?

17 THE COURT: YOUR HONOR, THERE
18 ARE THREE ALTERNATIVES. YOU FIND IT -- YOU
19 FIND THE ACTION -- YOU FIND THAT THERE IS
20 OR THERE ISN'T OR THE JURY FINDS IT. AND IF
21 -- AND I THINK THAT UNDER THE FACTS OF THE
22 CASE, THERE IS SUFFICIENT EVIDENCE FOR YOU TO
23 FIND -- FIND THAT'S NOT ABNORMALLY
24 DANGEROUS. BUT THE ALTERNATIVE IS TO HAVE THE
25 CASE SUBMITTED TO THE JURY ON THAT BASIS,

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BFG09995

1 WHICH IS LEFT BY SUPPLEMENTAL POINTS FOR
2 CHARGE PROPOSE. SO, I'M MAKING TWO ARGUMENTS.
3 THE COURT: OKAY.

4 MR. REINEISEN: AND I'M --

5 THE COURT: I UNDERSTAND.

6 I'LL HEAR YOU NOW, MR. VASSALOTTI. YOUR TIME
7 HAS COME.

8 MR. VASSALOTTI: YOUR HONOR,
9 IN THE NEGLIGENCE THEORY, I THINK IT'S CLEAR
10 THAT THE TESTIMONY HAS SHOWN THAT BEFORE THIS
11 PLANT WAS BUILT, THERE WAS MEDICAL LITERATURE
12 AND SOME OF GOODRICH'S OWN WITNESSES HAVE
13 ACKNOWLEDGED THIS, THAT EXISTED INDICATING
14 THAT VINYL CHLORIDE WAS A TOXIC SUBSTANCE TO
15 SOMEONE. ADMITTEDLY, THOSE STUDIES DEALT WITH
16 WORKERS. THERE WAS ALSO -- WELL, THERE WAS
17 LIVER ABNORMALITIES AND THERE WAS THE
18 ACROOSTEOLYSIS OR WHATEVER IT IS, AND THERE
19 WERE SEVERAL OTHER STUDIES.

20 THEN IN 1970, DOCTOR VIOLA
21 ANNOUNCED HIS LINK BETWEEN VINYL CHLORIDE AND
22 CANCER. IF WE STOP RIGHT THERE, THAT'S THE
23 YEAR THE PLANT OPENED. UP TO THE POINT,
24 GOODRICH HAD DONE NOTHING TO TEST THIS
25 MATERIAL. THEY HAVE AN OBLIGATION, WE CONTEND,

2110100

BFG09996

1 AS A MAJOR MANUFACTURER OF CHEMICAL PRODUCTS,
2 AS A MANUFACTURER WHO KNOWS THAT THEIR PLANT
3 IS CONSTRUCTED IN SUCH A WAY THAT THIS
4 MATERIAL IS GOING TO GET OUT, TO CONDUCT
5 TESTS AND STUDIES TO DETERMINE WHETHER IT IS
6 GOING TO BE HARMFUL TO ANYBODY. AS A MATTER
7 OF FACT, TESTS AND STUDIES WERE DONE LATER
8 WHICH SHOWED THAT IT WAS HARMFUL. THERE IS
9 EVIDENCE IN THE CASE THAT THE METHODS THAT
10 WERE USED TO CONDUCT THOSE TESTS AFTER THIS
11 WERE AVAILABLE BEFORE. THERE'S INDICATIONS
12 -- I'M SORRY.

13 THERE'S TESTIMONY IN THE CASE
14 REGARDING THE AVAILABILITY OF MONITORS TO
15 MONITOR THIS MATERIAL TO SEE IF THERE WAS ANY
16 HEALTH HAZARD. THE GOODRICH COMPANY DID
17 NOTHING AND AS MR. RENNEISEN POINTED OUT, YOU
18 HAVE TO MEASURE THEIR CONDUCT -- THE
19 CONDUCT OF THE GOODRICH COMPANY IN LIGHT OF
20 WHAT A REASONABLE PERSON IN THEIR POSITION
21 WOULD HAVE DONE.

22 WELL, WE'RE NOT TALKING ABOUT
23 A REASONABLE PERSON, WE'RE TALKING ABOUT A
24 CHEMICAL COMPANY. AND THE LAW AS WE CITE IN
25 OUR BRIEF AND I HAVE IN REQUEST FOR CHARGE,

2119101

BFG09997

1 MEASURES THE REASONABLENESS OF CONDUCT BY
2 ONE'S POSITION OR ONE'S KNOWLEDGE OR ACCESS
3 TO KNOWLEDGE REGARDING THE GIVEN HAZARD. AND
4 I THINK IN THIS CASE, IT'S CLEARLY A JURY
5 QUESTION AS TO WHETHER GOODRICH CONDUCTED
6 ITSELF IN A REASONABLE MANNER IN CONSTRUCTING
7 THIS PLANT, ALLOWING THE EMISSIONS TO COME
8 OUT WITHOUT HAVING DONE ANY GROUNDWORK,
9 TESTING OR STUDIES TO DETERMINE IF IT WOULD
10 CAUSE ANYONE ANY HARM.

11 NOW, THAT'S WITH RESPECT TO
12 NEGLIGENCE. AND THE SAME ARGUMENT APPLIES
13 WITH THE MONITOR AND THE FAILURE TO WARN. IN
14 1974, THEY KNEW THAT VIDLY FOUND THAT THE
15 MATERIAL CAUSED CANCER. THEY DIDN'T CONDUCT
16 ANY TESTS THEN EITHER. THEY DIDN'T PUT ANY
17 MONITORS OUT THEN TO DETERMINE HOW MUCH OF
18 THIS MATERIAL WAS GETTING OUT, EVEN THOUGH
19 THEY KNEW IT WAS GETTING OUT. THEY DIDN'T
20 TELL THE PEOPLE AT PEDRICKTOWN, "HEY, THIS
21 STUFF WE'RE PUTTING OUT HAS BEEN DETERMINED
22 TO CAUSE CANCER, BUT DON'T WORRY ABOUT IT."
23 THEY DIDN'T EVEN TELL THEM THAT TO ALLOW
24 PEOPLE LIKE MR. GRASSO TO TAKE WHATEVER
25 PROTECTIVE ACTION THEY WOULD HAVE LIKED TO

2110102

BFG09998

1 HAVE TAKEN AT THAT TIME. AND IT ALL STEMS
2 FROM THEIR LACK OF GROUNDWORK WHEN HE THEY
3 STARTED THIS WHOLE PROJECT. AND THAT IS WHAT
4 WE'RE CONTENDING THE CORE OF THEIR NEGLIGENCE
5 IS.

6 NOW, WITH REGARD TO THE
7 STRICT LIABILITY, I DISAGREE WITH MR.
8 RENNEISEN THAT THE RESTATEMENT RULINGS ARE
9 WHAT GOVERN HERE. I THINK THE CITY OF
10 BRIDGETON CASE AND THE P.S.R. CASE -- I
11 THINK THAT'S IT -- ADOPTED THE RULE OF
12 STRICT LIABILITY FOR A POLLUTER AND RECOGNIZE
13 AN ENVIRONMENTAL TORT AND I THOUGHT YOUR HONOR
14 IN YOUR RULING AT THE END OF PLAINTIFF'S CASE
15 HAD INDICATED THAT YOU BELIEVED THAT THE NEW
16 JERSEY SUPREME COURT WOULD EMBRACE SUCH A
17 DOCTRINE. AS UNDER THE RULES IN THOSE CASES,
18 THE ESTABLISHMENT OF, ONE, THAT VINYL
19 CHLORIDE IS A HAZARDOUS MATERIAL; TWO, IT
20 WAS EMITTED FROM THE PLANT; THREE, MR.
21 GRASSO WAS EXPOSED TO IT; AND, FOUR, THAT
22 EXPOSURE CAUSED HIS ANGIOCARCINOMA OF THE LIVER
23 ARE THE ELEMENTS OF THE PLAINTIFFS CASE AND
24 THAT'S STRICT LIABILITY THEORY -- NOT THE
25 ELEMENTS IN RESTATEMENT 520 WHICH TALK ABOUT

2110103

BFG09999

1 WHETHER IT WAS REASONABLE TO KNOW OF -- FOR
2 GOODRICH TO KNOW OF THIS MATERIAL BEING
3 DANGEROUS OR NOT. THAT IS NOT WHAT IS ADOPTED
4 IN THOSE TWO CASES. THE STRICT LIABILITY RULE
5 ADOPTED IN THOSE TWO CASES WAS TAKEN UPON THE
6 SAME PRINCIPALS AS STRICT LIABILITY DEVELOPED
7 IN THE PRODUCTS SITUATION; THAT IS, THE
8 MANUFACTURER OR THE PLANT OWNER IS IN BEST
9 POSITION TO KNOW WHAT'S COMING OUT OF HIS
10 PLANT AND TO TAKE CORRECTIVE ACTION REGARDING
11 THAT. IT IS ALWAYS IN THE BEST POSITION AND
12 CERTAINLY IS SOCIALLY RESPONSIBLE TO PAY FOR
13 ANY DAMAGE CAUSED BY HIS PROFIT-MAKING
14 CHEMICAL PLANTS.

15 THE COURT: ALL RIGHT. NOW,
16 ARE YOU SAYING THAT THE -- THAT THE
17 MATERIAL WHICH WITH WE'RE CONCERNED ABOUT IS
18 EMISSION OF VINYL CHLORIDE GASES OR POLYVINYL
19 -- POLYVINYL DUST.

20 MR. VASSALOTTI: WELL, YOUR
21 HONOR, WE'RE CONCERNED WITH THE VINYL
22 CHLORIDE GAS, BUT THE PVC DUST, I THINK
23 THERE'S BEEN CLEAR TESTIMONY FROM BOTH SIDES
24 CONTAINED WITHIN IT ENTRAPPED VINYL CHLORIDE
25 GAS WHICH COME OUT. WE'RE NOT SAYING THAT THE

2110104

BFG10000

1 PVC DUST ITSELF CAUSES CANCER, BUT THERE IS
2 TESTIMONY THAT IT WAS EMITTED, THAT IT RANGED
3 FROM ONE TO TEN MICRONS, THAT IT COULD HAVE
4 TRAVELED FROM THE DISTANCE -- WOULD HAVE
5 TRAVELED THE DISTANCE FROM THE -- FROM THE
6 PLANT TO THE HOME AND THAT IT WAS OF
7 RESPIRABLE SIZE AND WOULD GET ENTRAPPED IN
8 THE LUNGS. THERE IS ALSO TESTIMONY OF THE
9 LEVELS OF VINYL CHLORIDE THAT WERE CONTAINED
10 IN THAT DUST. SO, THAT IS THE ONLY
11 RELATIONSHIP OF THE PVC DUST.

12 THE COURT: IN OTHER WORDS,
13 THE VINYL CHLORIDE WAS CONTAINED WITHIN THE
14 DUST.

15 MR. VASSALOTTI: CORRECT.

16 THE COURT: AND THAT WAS
17 ALLEGEDLY INHALED.

18 MR. VASSALOTTI: THERE WAS
19 TESTIMONY THAT IT DIFFUSES OUT OF THE DUST.
20 AND --

21 THE COURT: IN THE ATMOSPHERE
22 BECOMES A GAS AND INHALED ALONG WITH THE AIR,
23 ISN'T THAT WHAT YOU'RE SAYING?

24 MR. VASSALOTTI: INHALED
25 ALONG WITH THE AIR OR IF YOU INHALE A PIECE

2110105

BFG10001

1 OF THE DUST ITSELF, IT'S GOING TO DISSEMINATE
2 IN YOUR BLOODSTREAM.

3 THE COURT: OKAY.

4 THE COURT: NEXT THEORY?

5 MR. VASSALOTTI: THE NUISANCE
6 THEORY.

7 THE COURT: YES.

8 MR. VASSALOTTI: YOUR HONOR,
9 I THINK THE CASE IS MADE OUT FOR THE NUISANCE
10 THEORY. HOWEVER, I THINK THAT SUBSTANTIALLY
11 OVERLAPS WHAT I PERCEIVE TO BE OUR THEORY
12 UNDER STRICT LIABILITY. AND DEPENDING ON
13 WHICH -- ON WHAT YOUR HONOR PERCEIVES THAT
14 THEORY TO BE, I'D BE WILLING TO FOREGO THE
15 NUISANCE THEORY TO THE JURY.

16 THE COURT: WELL, WE'LL
17 DISCUSS THAT IN MY CHAMBERS. ANYTHING FURTHER?

18 MR. VASSALOTTI: NOTHING
19 FURTHER.

20 THE COURT: YOUR MOTION IS
21 DENIED, MR. RENNEISEN, FOR THE REASONS SET
22 FORTH WHEN YOU MADE THE SAME MOTION AT THE
23 CONCLUSION OF PLAINTIFF'S CASE. THERE ARE
24 JURY QUESTIONS HERE THAT HAVE TO BE PRESENTED
25 TO THAT JURY.

2110106

1 ALL RIGHT, GENTLEMEN, WE'LL
 2 SEE YOU THEN. -- I SEE SOME TIME'S GONE BY,
 3 SO LET'S MAKE IT QUARTER TO TWO INSTEAD OF
 4 1:50.

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CERTIFICATE

I, P. LYNNE BELL, A NOTARY PUBLIC
AND CERTIFIED SHORTHAND REPORTER OF THE STATE
OF NEW JERSEY DO HEREBY CERTIFY THAT THE
FOREGOING IS A TRUE AND ACCURATE TRANSCRIPT
OF THE TESTIMONY AS TAKEN STENOGRAPHICALLY BY
AND BEFORE ME AT THE TIME, PLACE AND ON THE
DATE HEREBY SET FORTH.

I DO FURTHER CERTIFY THAT I AM
NEITHER A RELATIVE NOR EMPLOYEE NOR ATTORNEY
NOR COUNSEL OF ANY OF THE PARTIES TO THIS
ACTION, AND THAT I AM NEITHER A RELATIVE NOR
EMPLOYEE OF SUCH ATTORNEY OR COUNSEL AND THAT
I AM NOT FINANCIALLY INTERESTED IN THIS
ACTION.

P. LYNNE BELL, C.S.P.

NOTARY PUBLIC, STATE OF NEW JERSEY

MY COMMISSION EXPIRES 5/10/81

DATE: JANUARY 27, 1981

8010112

BFG10004

C E R T I F I C A T I O N

I, STEPHEN J. DANER, OFFICIAL
COURT REPORTER FOR THE UNITED STATES DISTRICT
COURT, FOR THE DISTRICT OF NEW JERSEY, DO
HEREBY CERTIFY THAT THE FOREGOING MATTER IS A
TRUE AND ACCURATE TRANSCRIPT OF MY
STENOGRAPHIC NOTES TAKEN AT THE TIME AND
PLACE HEREINBEFORE SET FORTH.



STEPHEN J. DANER, CP, RPR
OFFICIAL U. S. REPORTER

DATE: _____

1-27-81

BFG10005

U. S. DISTRICT COURT - CAMDEN, NEW JERSEY

60101112

1 MR. RENNEISEN: DOCTOR

2 TAMBURRO.

3 [REDACTED] PREVIOUSLY SWORN.

4 DIRECTION EXAMINATION.

5 MR. RENNEISEN: MAY I PROCEED,
6 YOUR HONOR.

7 THE COURT: YES, SIR.

8 Q. DOCTOR TAMBURRO, WOULD YOU TELL US
9 WHAT ANGIOSARCOMA OF THE LIVER IS?

10 A. THIS IS A CANCER OF THE SUPPORTING
11 CELLS OF THE LIVER, MAINLY THOSE CELLS WHICH
12 LINE THE VASCULAR SEGMENTS OF THE LIVER.

13 Q. AND HOW IS IT DIAGNOSIED?

14 A. WELL, I THINK I COULD BEST
15 ILLUSTRATE WITH SLIDES.

16 THIS IS SIMPLY AN
17 ILLUSTRATION TO POINT OUT WHERE THE LIVER IS.
18 THOUGH MOST PEOPLE I THINK HAVE A CONCEPT, IT
19 IS A VERY LARGE ORGAN WHOSE MAJOR PURPOSE IS
20 SOME SYNTHESIZE OR MAKE BODY PROTEIN, BODY
21 FATS, BODY HYDROCARBONS, IT'S THE ENERGY
22 SYSTEM FOR IT IS BODY. IT ALSO HAPPENS TO
23 HAVE AS A MAJOR FUNCTION THE REMOVAL OF WASTE
24 PRODUCTS AND TOXIC MATERIALS. IT IS THE MAJOR
25 DETOXIFYING OR TOXIC REMOVING ORGAN OF THE

BFG10006

2110110

1 BODY. AND IT ALSO HAS A DUAL SYSTEM OR
2 GETTING RID OF THESE TOXIC MATERIALS, NOT
3 ONLY BY BURNING THEM OR BY METABOLIZING THEM
4 OR ALSO BY EXTRUDING THEM TO THE GALL BLADDER
5 INTO THE INTESTINES. IN ADDITION TO THIS, IT
6 HAS A BLOOD SUPPLY SYSTEM, ONE COMING FROM
7 ARTERIES OF THE BODY AND A BODY SUPPLY SYSTEM
8 THAT COMES FROM THE GASTROINTESTINAL TRACT
9 THAT CARRIES OXYGENATED BLOOD TO THE LIVER.

10 NOW, IF ONE WILL TAKE A LOOK
11 AT THE VASCULAR SYSTEM SPREAD OUT THROUGHOUT
12 THE LIVER, IT LOOKS DIFFERENTLY AND THE LIVER
13 IS CUT IN SLICES. AND UP HERE IN THIS CORNER
14 AS AN ARTISTS VIEW OF THE LIVER WHEN IT'S CUT
15 IN SLICES AND THESE RED CUBOIDAL OR
16 RECTANGULAR CELLS ARE THE LIVERS MAIN CELLS,
17 THE CELLS THAT DO ALL THE BUILDING AND ALL
18 THE DETOXIFYING. BUT THE SPACE IN BETWEEN
19 HERE, THIS AREA IN HERE (INDICATING) IS THE
20 BLOOD PASSAGEWAYS, AND THERE CALLED
21 SINUSOIDAL. AND IT IS THESE CELLS INSIDE HERE,
22 IF YOU CAN SEE THIS BETTER HERE (INDICATING)
23 THESE BLOOD VESSELS THAT LINE THESE CORDS OF
24 LIVER CELLS THAT HAVE -- THAT ARE MADE UP
25 OR CONSTRUCTED OF WHAT WE CALL ENDOTHELIAL

2110111

BFG10007

1 CELLS. AND IT IS THESE CELLS THAT ARE HERE
2 -- I THINK THIS IS BEST, I'LL -- THESE ARE
3 THE LIVER CELLS. AND THESE ARE THE CELLS OF
4 THE BLOOD VESSEL WALL THAT LINE THE BLOOD
5 PASSAGE CENTER. AND THESE ARE THE CELLS THAT
6 BECAME MALIGNANT IN ANGIOSARCOMA. THAT'S WHY
7 THE TERM, ANGIO WHICH MEANS BLOOD VESSEL AND
8 SARCOMA WHICH MEANS A TUMOR FROM THE
9 SUPPORTING STRUCTURE OF THE ORGAN AND THERE'S
10 WHERE THE TERM COMES FROM. THERE HAVE BEEN
11 OTHER TERMS USED WHICH ARE ALSO BLOOD RELATED
12 IN THE PAST, BUT THEY ALL MEAN THE SAME THING.
13 THEY'RE IN ADDITION, OTHER CELLS INSIDE THE
14 BLOOD SYSTEM THAT CONSUME, EATS UP
15 PARTICULATE BODY THAT THE BODY MAY HAVE
16 CIRCULATING IN ITS BLOOD AND THESE ARE CALLED
17 MACROPHAGES OR CUPFFER CELLS. NOW, THESE
18 LIVER CELLS ALSO CAN BECOME MALIGNANT, BUT
19 WHEN THEY DO, THEY FORM A DIFFERENT TYPE OF
20 LIVER TUMOR CALLED A PRIMARY LIVER CELL TUMOR.
21 AND THAT'S THE DIFFERENCE BETWEEN THE
22 ANGIOSARCOMA AND LIVER TUMOR.

23 NOW, WHEN ONE GOES TO
24 DIAGNOSE THIS, YOU NEED TO TEST THE SYSTEM
25 THAT TESTS FOR THE BLOOD VESSELS AND MOST.

2110112

BFG10008

1 MEDICAL TEST SYSTEMS ONLY TEST FOR THE LIVER
2 CELL. AND SO, THE DIAGNOSIS OF ANGIOSARCOMA
3 IN ITS EARLY DEVELOPMENT IS VERY DIFFICULT.
4 IN FACT, IN THE EARLIEST STAGES, A PERSON MAY
5 HAVE NO ABNORMALITIES OF ANY TEST THAT WE
6 NORMALLY USE. AND SO, ONE HAS TO USE VERY
7 SPECIALIZED TESTS WHERE YOU ACTUALLY INJECT
8 MATERIAL INTO THE BLOOD VESSELS AND OUTLINE
9 THEM AND SHOW THAT THERE'S BEEN A DISTORTION;
10 BLOOD VESSELS AT A TIME WHEN ALL THE TESTS
11 THAT WE USE FOR THE LIVER AND HOW IT
12 FUNCTIONS APPEAR NORMAL.

13 Q. ALL RIGHT. AT ITS LATER STAGES, CAN
14 ANGIOSARCOMA OF THE LIVER BE DIAGNOSED FROM
15 OTHER TYPES OF LIVER CANCER BY A TRAINED
16 PHYSICIAN?

17 A. IT CAN. THIS REQUIRES A PATHOLOGIST
18 AND A LIVER BIOPSY TO BE OBTAINED.

19 Q. AND WHAT DOES THE PATHOLOGIST DO
20 THEN?

21 A. WELL, HE ACTUALLY LOOKS AT THE LIVER
22 TISSUE AND DISTINGUISHES WHICH CELL IS
23 ABNORMAL. AND I HAVE SOME ILLUSTRATIVE SLIDES
24 THAT SHOW THE PROGRESSION OF THIS FROM ITS
25 NORMAL STAGE TO THE ACTUAL STAGE OF THE

2110113

BFG10009

1 ANGIOSARCOMA.

2 Q. YOU WANT TO SHOW THOSE TO US, THEN?

3 A. NOW, THIS IS THE REAL -- THIS IS
4 NOT AN ARTISTS DRAWING, BUT THIS IS THE REAL
5 LIVER FROM A NORMAL INDIVIDUAL SHOWING THE
6 LIVER CELLS HERE. EACH ONE OF THESE (INDICATING)
7 IS THE NUCLEUS OR THE CENTRAL CONTROL CENTER
8 FOR EACH OF THE CELLS. AND THEY ARE IN CORDS,
9 ONE ATTACHED TO THE OTHER. AND ON BOTH SIDES
10 OF THE CELL, THERE ARE THESE BLOOD VESSELS
11 WHICH ARE LINED WITH CELLS THAT ARE THE
12 ENDOTHELIAL LINING CELLS OR THE CELLS THAT
13 BECAME MALIGNANT IN ANGIOSARCOMA.

14 NOW, THESE SLIDES COME FROM A
15 COMPOSIT OF INDIVIDUALS WHO HAD TO HAVE
16 BIOPSYS FOR MEDICAL REASONS OR BECAUSE IN OUR
17 SCREENING PROGRAM, THEY HAD SOME ABNORMALITY
18 WHICH MEDICALLY INDICATED OUR GETTING A LOOK
19 AT THEIR LIVER TISSUE.

20 NOW, THIS IS THE EARLIEST
21 CHANGE THAT ONE SEES WITH CHEMICAL EXPOSURES
22 TO VINYL CHLORIDE AND ONE BEGINS TO SEE THESE
23 LINING CELLS HERE BEGINNING TO CHANGE IN
24 THEIR SHAPE AND IN THEIR SIZE WHILE THE LIVER
25 CELL ITSELF DOES NOT.

BFG10010

2110114

1 AT A LATER STAGE, THE CELLS
2 BECOME EVEN MORE CHANGED AND DISTORTED IN
3 THEIR CONFIGURATION, IN THEIR SHAPE. NOW, AT
4 THIS TIME, THERE ARE ONLY THE MOST REFINED
5 AND SENSITIVE TESTS OF ABNORMALITIES, THE
6 THINGS THAT WE WOULD USE FOR ONLY RESEARCH
7 PURPOSES. THESE ARE VARIOUS TESTS. IT MEANS
8 WE HAVE TO INJECT THINGS AND LOOK AT PEOPLE
9 AND IN THE STANDARD PRACTICE OF MEDICINE,
10 THESE WOULD NOT BE DETECTED. AT THIS STAGE,
11 THE PEOPLE WERE "SYMPTOMATIC ". IT MEANS
12 THEY HAD NO COMPLAINTS. THE REASON WE
13 DISCOVERED THIS, BECAUSE AT THAT TIME, WE
14 WERE DELIBERATELY LOOKING FOR POSSIBLE
15 PROBLEMS.

16 THIS IS A MUCH LATER STAGE IN
17 WHICH THE CELLS THAT LINE THE SINUSOIDAL OR
18 THE VESSEL SURFACE HAVE NOW BEGUN TO
19 REPLICATE, GROW, SO, THIS IS THE EARLIEST
20 STAGES OF MALIGNANCY. AND AT THIS PARTICULAR
21 STAGE, THE X-RAYS, THE LABORATORY TESTS THAT
22 ARE COMMONLY USED WERE NORMAL. AND AT THIS
23 POINT, THE PATHOLOGIST WAS REASONABLY SURE
24 THAT THIS WAS A MALIGNANCY, BUT STILL HAD
25 SOME CONCERNS BECAUSE THESE ARE VERY TYPICAL

2110115

BFG10011

1 CELLS. HERE, THIS NUCLEUS HAS BEEN BROKEN UP
2 AND THE CELL IS ABOUT TO DIVIDE. AND FOR THIS
3 PARTICULAR REASON, ONE SEES THE DEVELOPMENT
4 OF ANGIOSARCOMA PRESENTING ITSELF IN
5 COMPLAINTS BY THE PATIENT VERY, VERY LATE IN
6 THE STAGE OF THE DISEASE PROCESS.

7 AND FINALLY, THIS IS THE
8 MALIGNANCY ITSELF. AT THIS STAGE, THE PERSON
9 IS SYMPTOMATIC, LABORATORY TESTS ARE ABNORMAL
10 AND THIS IS ONE OF THE LATER PHASES OF THE
11 DISEASE PROCESS.

12 NOW, IF WE WERE ALSO
13 FORTUNATE IN HAVING THE OPPORTUNITY TO FIND
14 X-RAYS, VASCULAR X-RAYS, IN SOMEONE HAD BEEN
15 MEDICALLY EXAMINED FOR ANOTHER REASON AND
16 THOSE X-RAYS, WHEN WE LOOKED AT THEM
17 RETROSPECTIVELY, HAD THE SAME VASCULAR
18 CHARACTERISTICS AS WE FOUND IN THE SAME
19 INDIVIDUAL FOUR YEARS LATER WHEN HE HAD THE
20 TUMOR IN THE EXACT SAME SPOT. SO, FROM THESE
21 TWO GROUPS OF STUDIES, WE HAVE EVIDENCE THAT
22 THE TUMOR MAY BE PRESENT AS EARLY AS FOUR
23 YEARS BEFORE THE INDIVIDUAL BECOMES
24 SYMPTOMATIC OR ILL OR AS LATE AS ONE YEAR.
25 AND THIS IS REASONABLE WITH WHAT WE

2110116

BFG10012

1 UNDERSTAND THE GROWTH OF TUMORS TO BE; THAT
2 THEY ARE PRESENT FOR A CONSIDERABLE AMOUNT OF
3 TIME BEFORE THE PERSON IS AFFECTED BY IT. AND
4 ESPECIALLY WHEN IT INVOLVES THE LIVER, SINCE
5 IT IS SUCH A ENORMOUS ORGAN, HAS SUCH GREAT
6 RESERVE, THAT IT TAKES A CONSIDERABLE AMOUNT
7 OF TIME BEFORE ONE REDUCES THE RESERVE IN
8 ORDER FOR SOMEONE TO BECOME -- HAVE
9 SYMPTOMS.

10 Q. DOCTOR, WHAT ARE -- OTHER THAN
11 VINYL CHLORIDE, WHAT ARE OTHER KNOWN CAUSES
12 OF ANGIOSARCOMA OF THE LIVER?

13 A. I BELIEVE YOU'VE HEARD THEM ALL, BUT
14 NOW REPEATING THEM, OTHER THAN VINYL CHLORIDE,
15 WE HAVE GOOD BIOLOGICAL EVIDENCE THAT ARSENIC,
16 A MINERAL, CAUSES ANGIOSARCOMA; THAT A
17 RADIOACTIVE ISOTOPE CALLED THOROTRAST
18 PRODUCES THIS, AND I THINK WE HAVE VERY GOOD
19 EVIDENCE THAT A MALE HORMONE CALLED
20 ANDROGENIC ANABOLIC STEROIDS ALSO CAUSES
21 ANGIOSARCOMAS.

22 Q. FOR THESE FOUR KNOWN CAUSES, ARE
23 THERE ANY PHYSICAL OR CHEMICAL SIMILARITIES
24 IN THE CAUSATIVE AGENT OR ARE THEY ALL
25 DIFFERENT OR ALL THE SAME?

2110117

BFG10013

1 A. NO, THESE ARE ALL DIFFERENT AGENTS
2 AND WE HAVE SOME EVIDENCE THAT THE MECHANISM
3 BY WHICH THEY CAUSE THE TUMOR OR THE
4 MECHANISM WE BELIEVE CAUSE THE TUMOR IS
5 DIFFERENT. FOR INSTANCE, IN THE CASE OF
6 THOROTRAST, THIS IS A RADIOACTIVE MATERIAL
7 THAT IS ATTACHED TO A PROTEIN THAT IS
8 INJECTED INTO THE INDIVIDUAL AND IS TAKEN UP
9 BY THOSE BLOOD VESSEL LINING CELLS AND HELD
10 THERE. AND THEN ONE IS ABLE TO TAKE A FILM OR
11 A X-RAY OF ONES LIVER WITH THESE RADIOACTIVE
12 MATERIALS OUTLINING ON IT.

13 IN THE EARLY DAYS OF RADIO
14 ISOTOPES, WE DID NOT REALIZE THE LIFE OR THE
15 DURATION OF THESE RADIATION EMITTING
16 MATERIALS AND THE THOROTRAST HAPPENS TO BE
17 500 YEARS. SO, IN THIS PARTICULAR CASE, ONE
18 RETAINS THE RADIOACTIVE MATERIAL AND THE
19 RADIATIONS THAT WE BELIEVE CAUSES THE
20 ANGIOSARCOMA IN THAT CASE; WHEREAS, THE
21 VINYL CHLORIDE IS BECAUSE OF THE WAY THE BODY
22 METABOLISES IT. IN THE CASE OF ARSENIC, WE'RE
23 NOT AS CLEAR ON WHAT THE MECHANISM IS. IN THE
24 CASE OF THE STEROID, THESE ARE STIMULATORS
25 FOR GROWTH AND WE FEEL THAT HAS -- PLAYS A

2110118

BFG10014

1 ROLE IN WHY THE CELL DEVELOPS INTO A TUMOR.

2 Q. APPROXIMATELY HOW MANY CASES OF
3 ANGIOSARCOMA ARE DIAGNOSTIC IN THE YEAR IN
4 THE UNITED STATES?

5 A. WELL, THE ESTIMATES HAVE VARIED
6 ANYWHERE FROM ONE CASE IN EVERY FOUR MILLION
7 PEOPLE TO AS FEW AS ONE CASE IN EVERY 20
8 MILLION. BUT ROUGHLY 25 TO 30 CASES A YEAR
9 HAVE BEEN DOCUMENTED IN VARIOUS SURVEYS.

10 Q. ARE ALL CASES OF ANGIOSARCOMA
11 ATTRIBUTED TO ONE OF THE FOUR CAUSES YOU JUST
12 DISCUSSED?

13 A. NO. ONLY ABOUT A QUARTER, 25 PERCENT
14 OF THEM ARE.

15 Q. DO YOU HAVE AN OPINION AS TO WHETHER
16 OR NOT ADDITIONAL CAUSES WILL BE DISCOVERED
17 AS MORE RESEARCH IS DONE?

18 A. FROM WHAT WE UNDERSTAND ABOUT
19 BIOLOGY AND OUR EXPERIENCE WITH OTHER TUMORS,
20 I WOULD SUSPECT THAT WE WILL FIND AT LEAST
21 ONE; MOST LIKELY MANY MORE CAUSES FOR A TUMOR.
22 I KNOW OF NO TUMOR THAT DEVELOPS BECAUSE OF A
23 SINGLE CAUSE. THE MECHANISM BY WHICH IT MAY
24 EVOLVES MAY BE THE SAME, BUT THERE ARE MANY,
25 NUMEROUS, I SHOULD SAY, AGENTS WHICH WILL

BFG10015

2110119

1 CAUSE THE SAME KINDS OF TUMORS.

2 Q. FROM YOUR -- FROM YOUR STUDIES

3 -- I THINK YOU SUGGESTED THAT IN AN EARLIER

4 ANSWER -- DO YOU HAVE INFORMATION

5 CONCERNING HOW VINYL CHLORIDE IS ACTUALLY

6 HANDLED BY THE LIVER?

7 A. WELL, WE'VE CONDUCTED BOTH ANIMAL

8 AND HUMAN STUDIES RELATED TO THIS. AND I'M

9 -- IT IS, I THINK, NECESSARY TO EXPLAIN A
10 LITTLE BIT ABOUT HOW THE BODY HANDLES

11 CHEMICALS TO UNDERSTAND WHY WE SEE VARIATION

12 AND WHY WE THINK WE'RE CORRECT IN WHAT WE SEE.

13 AND AGAIN, I'D LIKE TO USE, IF I MIGHT, SOME

14 ILLUSTRATION TO DEMONSTRATE THIS AND MAKE IT,

15 I HOPE, CLEARER.

16 THE LIVER IS A VERY, VERY

17 INTERESTING ORGAN IN THE SENSE THAT IT IS

18 BIOLOGICALLY DESIGNED TO GET RID OF ABNORMAL

19 PRODUCTS. BUT THE CREATOR MAY OR MAY NOT HAVE

20 ANTICIPATED THAT WE'D USE SYNTHETIC AGENTS.

21 BUT IT IS DESIGNED EVOLUTIONARY-WISE TO

22 HANDLE NATURAL AGENTS. NOW, WHEN IT GETS A

23 SYNTHETIC PARTICULATE, IT HAS A LIMITED

24 NUMBER OF MECHANISMS BY WHICH TO HANDLE THESE

25 AGENTS.

BFG10016

2110120

1 NOW, THIS SIMPLY ILLUSTRATES
2 THE CHEMICAL FORMULA FOR VINYL CHLORIDE DOWN
3 HERE. IT'S A VERY SIMPLE MOLECULE. IT HAS TWO
4 CARBON ATOMS AND THEN A CHLORIDE. AND THESE
5 ARE JUST SIMILAR STRUCTURAL AND SYNTHETICS.

6 NOW, IT'S THESE TWO CARBONS
7 THAT ARE ATTACHED BY BONDS, AND THESE BONDS
8 CAN BE BROKEN, IN FACT, THAT'S HOW YOU
9 METABOLIZE SOMETHING, YOU BREAK THE BONDS OF
10 A MOLECULE IN THE SUBSTANCE DEGRADATED.

11 NOW, THE CHEMISTS AT DOW AND
12 AT SOME OF THE UNIVERSITIES IN NEW YORK HAD
13 BEEN DOING SOME CHEMICAL STUDIES ON HOW VINYL
14 CHLORIDE MULTIPLYS. AND THESE ARE THREE STEPS
15 BY WHICH IT IS METABOLIZED. THE FIRST STEP
16 -- AND THIS IS VINYL CHLORIDE.

17 THE COURT: DOCTOR, WHAT DO
18 YOU MEAN BY METABOLIZE, SO THE JURY WILL KNOW.

19 THE WITNESS: METABOLISM IS A
20 WAY OF BREAKING DOWN A SUBSTANCE, BURNING IT
21 UP. THE SAME THING ONE WOULD DO IN BURNING
22 COAL. YOUR CONSUMING IT OR CHANGING IT IN ITS
23 STRUCTURE. AND IT'S A GENERAL TERM FOR THAT.

24 THE ALCOHOL -- THE FIRST
25 STEP IS THE SAME ROUTE THAT IS TAKEN FOR

2110121

BFG10017

1 METABOLIZING OR BURNING UP ALCOHOL, WHICH IS
2 ANOTHER CHEMICAL. AND THIS OCCURS ONLY AT
3 VERY LOW LEVELS OF VINYL CHLORIDE EXPOSURE.
4 IT APPEARS THAT AS ITS LEVEL BEGINS TO RISE
5 OR THE EXPOSURE IS INCREASED, THE LIVER CELL
6 TAKES ON ADDITIONAL MECHANISM IN ORDER TO
7 BREAKDOWN THE PRODUCT. NOW, THE THIRD STEP
8 OCCURS AT THE HIGHER LEVELS, PROBABLY IN THE
9 RANGE OF 200 PARTS PER MILLION IN WHICH THE
10 LIVER ITSELF CONVERTS TO VINYL CHLORIDE INTO
11 WHAT WE CALL AN APOXSIDE. IT MEANS SIMPLY
12 THAT OXYGEN IS ATTACHED TO WHERE THE DOUBLE
13 BONDS ARE. NOW, THIS MOLECULE IS VERY, VERY
14 REACTIVE AND HAS BEEN SHOWN BY ANIMAL
15 EXPERIMENTS TO INJURE -- IT IS GENETIC
16 MATERIAL OF A CELL SO THAT IT CAN BE
17 DISTORTED WITHOUT KILLING THE CELL. AND IN
18 THAT WAY, ALLOW THE CELL TO BECOME
19 MUTAGENICALLY CHANGED, THAT IS TO FORM
20 ABNORMALITIES OR EVEN TO GO ON TO MALIGNANCY.
21 AND THE PRESENT LIFE THAT THIS METABOLISTIC
22 IS THE SOURCE OF THE ANGIOSARCOMA AND THAT
23 THE LIVER NORMAL CELLS, THE LIVERS MAIN CELLS,
24 ARE RESPONSIBLE FOR THAT CONVERSION. SO THAT
25 THE LIVER ACTUALLY IS TAKING SOMETHING WHICH

2110122

BFG10018

1 IS A STABLE SUBSTANCE AND MAKING IT INTO A
2 CANCER PRODUCING SUBSTANCE.

3 NOW, THE LIVER, ALSO WHILE
4 IT'S DOING THIS, GETS RID OF IT BY A
5 MECHANISM OF CONVERGING ON THIS WITH WATER
6 AND THEN BEING ABLE TO RELEASE IT OR EXCRETE
7 IT INTO THE BODY. AND THIS BALANCE BETWEEN
8 HOW MUCH IS MADE AND HOW MUCH IS GOTTEN RID
9 OF WE BELIEVE IS A CRITICAL FACTOR IN WHETHER
10 THE TUMOR IS DEVELOPED.

11 NOW, THIS IS JUST A DRAWING
12 ILLUSTRATING ON A LIVER CELL, THAT SQUARED
13 CELL AND THEN THE LINING CELL, THAT'S AT THE
14 SURFACE. IT IS OUR PRESENT BELIEF THAT VINYL
15 CHLORIDE AND POSSIBLY OTHER CHEMICALS SIMILAR
16 TO IT ARE TAKEN UP BY THE MAJOR LIVER CELLS
17 AND THERE THE INTERMEDIATE ACTIVE SUBSTANCE,
18 THE APOXY, IS FORMED. AND DEPENDING UPON HOW
19 WELL THE LIVER CAN GET RID OF THAT IS A
20 CRITICAL FACTOR IN WHETHER OR NOT THE LIVER
21 CELLS BECOMES MALIGNANT OR WHETHER IT BECOMES
22 INJURED AND DIES.

23 NOW, THIS ALSO HAPPENS TO
24 HOLD TRUE FOR THE LINING CELLS. IN FACT, FOR
25 ANY CELL IN THE BODY. IT DEPENDS ON THEIR

2110123

BFG10019

1 ABILITY TO GET RID OF THIS SUBSTANCE THAT IS
2 MADE. AND DEPENDING UPON THAT CAPABILITY, ONE
3 FINDS THE RISK OF CANCER INCREASING WITH THE
4 DECREASED ABILITY OR REVERSE.

5 NOW, WE BELIEVE THIS CAN
6 ACCOUNT FOR WHY SOME PEOPLE DEVELOP MALIGNANCY
7 AND OTHERS DON'T AT VERY, VERY LOW LEVELS.
8 THE LIVER CELL CAN HANDLE THE METABOLISM OF
9 THIS COMPOUND AND ALSO ITS REMOVAL OF THE
10 INTERMEDIATE MATERIAL. AT A MORE MODERATE
11 LEVEL, IT MAYBE OVERWHELMED AND ALLOW THE
12 APOXIDE TO BE AROUND AND DO DAMAGE TO THE
13 NUCLEUS OR TO THE GENETIC MATERIAL AND THEN
14 THAT INJURED CELL CAN GO IN THE FUTURE AND
15 DEVELOP CANCER. AT VERY HIGH LEVELS, IT
16 ACTUALLY KILLS THE CELL AND THEN THE BODY
17 REPLACES IT WITH ANOTHER ONE AND THERE IS
18 THEN NO DEVELOPMENT OF CANCER BECAUSE THE
19 CELL THAT WAS INJURED HAS DIED. AND SO, THERE
20 MAY BE PEOPLE WHO CAN GET THE SAME LEVEL OF
21 EXPOSURES IN WHOM THERE'S CELLS THAT HAVE
22 BEEN GENETICALLY TRANSFORMED, DIED AND
23 THEREFORE, THOUGH THEY'VE BEEN EXPOSED IN THE
24 SAME LEVELS, THEY DO NOT DEVELOP TUMORS.
25 Q. DOCTOR, HAVE YOU ACTUALLY TREATED

2110124

BFG10020

1 . ANGIOSARCOMA PATIENTS?

2 A. YES, WE HAVE.

3 Q. WHERE AND HOW MANY AND --

4 A. WE HAVE TREATED SIX ANGIOSARCOMA,
5 FIVE ARE VINYL CHLORIDE EXPOSED INDIVIDUALS
6 AND A SIXTH WAS ONE WE DON'T REALLY HAVE THE
7 SOURCE OF THE ANGIOSARCOMA.

8 Q. WITH RESPECT TO THE VINYL CHLORIDE
9 EXPOSED PATIENTS, DO YOU KNOW WHAT THE
10 ESTIMATED LEVEL OF VINYL CHLORIDE WAS?

11 A. IN ALL FIVE CASES FROM OUR DETAILED
12 OCCUPATIONAL RECORDS, THEIR EXPOSURES LEVELS
13 WERE ABOVE 50 PARTS PER MILLION AND WE
14 ESTIMATE SOMEWHERE IN THE RANGE OF 200 TO 500
15 DURING A GREATER PROPORTION OF THEIR WORK
16 HISTORY.

17 Q. DOCTOR, WHAT IS EPIDEMIOLOGY?

18 A. THIS IS THE STUDY OF THE DEVELOPMENT
19 OF DISEASE IN POPULATION. WE CAN STUDY IT IN
20 AN INDIVIDUAL, BUT THERE ARE ALSO TIMES WHEN
21 WE WANT TO STUDY THE OCCURRENCE OF DISEASE IN
22 GROUPS OF INDIVIDUALS, WHERE WE'RE NOT
23 ACTUALLY STUDYING THE INDIVIDUAL DISEASE
24 PROCESS ITSELF. AND IT IS THIS AREA OF
25 MEDICINE THAT ALLOWS US TO DETERMINE THE

2110125

BFG10021

1 FREQUENCY WITH WHICH DISEASES ARE OCCURRING
2 AND CHANGING AND ALSO ALLOWS US TO DETERMINE
3 WHETHER OR NOT THE PROBLEM THAT A DISEASE IS
4 OCCURRING IN A CERTAIN AREA IS DUE TO OR
5 COULD BE RELATED TO SOME ENVIRONMENTAL OR
6 SOCIAL OR VIRAL CAUSE.

7 Q. AND GENERALLY, WOULD YOU DESCRIBE
8 HOW EPIDEMIOLOGICAL STUDIES ARE DONE?

9 A. WELL, THIS IS DONE WITH THE BASIS
10 BEING IN STATISTICS OR PROBABILITY. AS YOU'VE
11 HEARD BEFORE, IN MEDICINE, WE REALLY DO NOT
12 DEAL WITH THE ABSOLUTE. THERE IS SO MUCH
13 NATURAL VARIATION BETWEEN HUMANS THAT WE
14 CANNOT BE ABSOLUTE PREDICTORS. AND SO, WE
15 DEAL WITH WHAT WE CALL PROBABILITY; THAT IS,
16 WHAT IS LIKLIHOOD THAT AN EVENT, DEVELOPMENT
17 OF A DISEASE WOULD OCCUR IF CERTAIN
18 ENVIRONMENTAL THINGS WERE CHANGED. WE DO THIS
19 WITH VIRUS -- IF YOU HAVE A CERTAIN VIRUS
20 PRESENT, THERE'S A CERTAIN FREQUENCY, OR A
21 CERTAIN OCCURRENCE OF THIS DISEASE PROCESS.
22 WE TAKE THE VIRUS AWAY, THAT DOESN'T HAPPEN
23 NOW, YOU MAKE THOSE STUDIES BY LOOKING AT A
24 POPULATION OF PEOPLE WHO HAVE THAT PARTICULAR
25 AGENT OR MATERIAL PRESENT AND YOU LOOK AT A

2110126

BFG10022

1 COMPARABLE POPULATION THAT DOES NOT. AND THEN
2 YOU FIND OUT WHETHER THE OCCURRENCE OF THE
3 DISEASE OCCURS ANY GREATER IN ONE POPULATION
4 VERSUS ANOTHER. NOW, IF IT DOES, THEN YOU
5 HAVE A VERY HIGH PROBABILITY, 95 CHANCES OUT
6 OF A HUNDRED, THAT THAT IS RELATED TO THE
7 ENVIRONMENT OR TO THE AGENT YOU'VE IDENTIFIED
8 IN ANOTHER. AND BY REPEATING THAT SAME STUDY
9 IN WHICH POPULATION AND FINDINGS THE SAME
10 RESULTS, YOU INCREASE THE RELIABILITY THAT
11 THAT'S A TRUE EVENT, THAT DID NOT HAPPEN BY
12 CHANCE.

13 Q. ARE YOU FAMILIAR WITH
14 EPIDEMIOLOGICAL STUDIES DONE WITH RESPECT TO
15 VINYL CHLORIDE AND ANGIOSARCOMA?

16 A. MOST I AM.

17 Q. AND HAVE YOU DONE STUDIES YOURSELF?

18 A. WE HAVE.

19 Q. WITH RESPECT TO THE STUDIES THAT
20 YOU'VE DONE YOURSELF, WHAT GROUP OF PEOPLE
21 DID YOU -- WHICH GROUPS OF PEOPLE DID YOU
22 COMPARE?

23 A. WELL, IT IS NOT ALWAYS EASY. ONE OF
24 THE MAJOR LIMITATIONS TO EPIDEMIOLOGICAL
25 STUDIES IS THAT WE HAVE DIFFERENT POPULATION.

2110127

BFG10023

1 WE HAVE DIFFERENT RACES, OF DIFFERENT SEX, WE
2 HAVE DIFFERENT EATING PATTERNS, DIFFERENT
3 LIVING PATTERNS, DIFFERENT ENVIRONMENTAL
4 PATTERNS. SO, YOU TRY TO GET A MATCH IN THE
5 POPULATION AS BEST YOU CAN.

6 NOW, THE VARIATION TO THIS,
7 YOU CAN TAKE ONE POPULATION AND DIVIDE IT
8 INTO TWO GROUPS AND MAKE A COMPARISON IN THAT
9 WAY, OR YOU CAN GET TWO GROUPS FROM DIFFERENT
10 AREAS AND MAKE A COMPARISON. WHAT WE WERE
11 ABLE AND WERE FORTUNATE ENOUGH TO DO IS TO
12 HAVE A POPULATION OF INDIVIDUALS WHO WERE
13 EXPOSED FOR A VERY LONG TIME AT WHAT IS
14 BELIEVED TO BE THE HIGHEST LEVELS AND ALSO
15 THE LOWEST LEVELS OF VINYL CHLORIDE. AND
16 ABOUT 1,200 OF THESE INDIVIDUALS AND ABOUT
17 600 RETIREES WHO HAD WORKED IN A PROLONGED
18 PERIOD OF TIME AND WE WATCHED THEIR
19 DEVELOPMENT. AND WE WERE ABLE TO SEPERATE IN
20 THAT GROUP BETWEEN THE GROUP THAT WORKED WITH
21 VINYL CHLORIDE AND THE GROUP THAT WORKED WITH
22 SYNTHETIC RUBBER OR WAS ABLE TO SHOW THERE
23 WAS A DIFFERENCE IN THE TYPES OF DISEASES IN
24 THESE TWO GROUPS AND THAT IT WAS RELATED TO
25 WORK. WE WERE ALSO DOING STUDIES IN

2110128

BFG10024

1 FABRICATORS WHO WORKED AT OTHER PLANTS AND
2 LOOKING FOR THE OCCURRENCE OF LIVER DISEASE
3 AMONG THEM AS EVIDENCE OF EXPOSURE TO THE
4 CHEMICAL IN COMPARISON TO OTHER GROUPS WHO
5 WORKED WITH DIFFERENT KIND OF AGENTS. AND
6 THIS WAY, WE'VE BEEN ABLE TO FIND OUT WHETHER
7 OR NOT THERE WAS A GREATER OCCURRENCE OF
8 LIVER DISEASE OR OTHER KINDS OF DISEASE AMONG
9 THESE WORKERS. LET'S TAKE THE HIGHLY EXPOSED
10 GROUP. DID YOU FIND A HIGHER INCIDENCE THAN
11 EXPECTED IN ANGIOSARCOMA AMONG THAT GROUP?

12 A. YES, AND WE WERE ABLE TO IDENTIFY
13 THE AGENT BY THESE EPIDEMIOLOGICAL STUDIES.

14 Q. AND WHAT WAS THE EXPOSURE LEVEL OF
15 THAT GROUP?

16 Q. EXPOSURE LEVEL OF VINYL CHLORIDE?

17 A. WE HAVE TO DO THIS ON THE BASIS OF
18 HISTORY, BECAUSE WE DO NOT HAVE ABSOLUTE DATA.
19 SO, I WOULD LIKE, IF I CAN, TO ILLUSTRATE HOW
20 WE WENT ABOUT DOCUMENTING THAT THE EXPOSURE
21 WAS HIGH AND THEN TO SHOW WHAT EVIDENCE WE
22 HAD AND WHAT THAT EXPOSURE -- THAT, QUOTE,
23 HIGH EXPOSURE WAS, IF I MIGHT. WHEN DOCTOR
24 CREECH AND DOCTOR JOHNSON HAD DISCOVERED THE
25 ANGIOSARCOMA IN MAN, WE HAD A UNIQUE

BFG10025

2110129

1 SITUATION BECAUSE WE HAD ANIMAL STUDIES EVEN
2 BEFORE THAT OR AT THE SAME TIME, WHICH HAD
3 SHOWN THAT IF YOU USE ONLY VINYL CHLORIDE,
4 YOU PRODUCE THE TUMOR. BUT IN THE EARLY
5 STAGES, IT WAS UNCLEAR WHETHER OR NOT IT WAS
6 THE VINYL CHLORIDE ITSELF, THE MONOMER THAT
7 YOU HEARD ABOUT, OR WHETHER IT WAS THE
8 POLYMER OR THE POLYVINYLCHLORIDE, THE PRODUCT,
9 THAT CAUSED THIS. AND SO, AS PART OF OUR
10 NATIONAL CANCER INSTITUTE GRANT, WE WENT
11 ABOUT SETTING UP A SYSTEM THAT WOULD ALLOW US
12 TO DETERMINE EXPOSURE BASED ON WHERE PEOPLE
13 HAD WORKED, HOW LONG THEY HAD WORKED AND
14 WHETHER OR NOT THOSE JOBS WERE ASSOCIATED
15 WITH VINYL CHLORIDE IN A -- WHAT WE CALL A
16 RANK ORDERING; THAT IS, THAT WE WOULD TAKE A
17 SETS OF INDIVIDUALS, SIX THAT WE TOOK, MAKING
18 ZERO PEOPLE WHO WERE OUTSIDE THE PLANT
19 ALTOGETHER, ONE WOULD BE THE MINIMUM AMOUNT
20 OF POSSIBLE EXPOSURE ONE COULD HAVE, AND SIX
21 BEING THOSE PEOPLE WHO WERE INTIMATELY
22 INVOLVED WITH THAT. AND BY THE USE OF THIS
23 RANK ORDERING AND THE KINDS OF JOBS THAT THE
24 INDIVIDUALS HAD, WE WERE ABLE TO DESIGN AN
25 ESTIMATE THAT DID NOT HAVE AN ABSOLUTE FIGURE

2110130

BFG10026

1 ON WHO HAD THE MOST EXPOSURE RELATIVE TO
2 THEIR COMPANY WORKERS. AND BY DOING THIS, WE
3 WERE ABLE TO SEE WHETHER OR NOT THOSE
4 INDIVIDUALS WITH THE HIGHEST DEGREE OF
5 EXPOSURE ON THESE ESTIMATES WERE MORE
6 ASSOCIATED WITH ANGIOSARCOMA THAN THOSE WHO
7 HAD LESS. AND WHAT THIS DEMONSTRATED WAS THE
8 FOLLOWING: EACH OF THESE COLUMNS HAS MADE UP
9 OF LITTLE STACKS. EACH STACK IS AN INDIVIDUAL
10 WHO HAS A WORK HISTORY ESTIMATE OF THEIR
11 EXPOSURE TO A CHEMICAL CALLED ACRYLONITRILE.
12 WE EXAMINED 22 CHEMICALS. THIS IS JUST SIMPLY
13 ONE TO ILLUSTRATE THIS. THIS IS THE BASE
14 CHEMICAL FOR THE FORMATION OF SYNTHETIC
15 RUBBER.

16 NOW, WE HAD FOUND FOUR
17 ANGIOSARCOMAS DURING THIS TIME OF 1974 TO
18 1977. AND EACH ANGIOSARCOMA CASE IS
19 ILLUSTRATED IN RED. NOW, THE POSITION THE
20 ANGIOSARCOMA HAS IN THESE GROUPS OF
21 INDIVIDUALS IS RELATIVE TO THEIR EXPOSURE TO
22 THIS PARTICULAR CHEMICAL. AND WHAT THIS
23 SIMPLY ILLUSTRATES IS THAT FOR MEN OF THE
24 SAME SEX, ROUGHLY THE SAME AGE, PLUS OR MINUS
25 A YEAR WHO WORKED FOR THE SAME NUMBER OF

BFG10027

2110131

1 YEARS, THEIR TOTAL ESTIMATED EXPOSURE TO THIS
2 PARTICULAR CHEMICAL PUT THEM SOMEWHERE IN THE
3 MIDDLE OR THE LOWER END OF THIS CHEMICAL,
4 INDICATING THAT THE ANGIOSARCOMA CASES DID
5 NOT HAVE A HIGH ASSOCIATION WITH THIS
6 CHEMICAL.

7 NOW, WHEN WE LOOK AT VINYL
8 CHLORIDE, WE SEE THAT THE ANGIOSARCOMA CASES
9 ARE THE HIGHEST OR AMONG THE HIGHEST IN THEIR
10 EXPOSURE TO VINYL CHLORIDE, ILLUSTRATING ON
11 -- THEN FROM AN EPIDEMIOLOGICAL POINT OF
12 VIEW, THAT IT IS VERY HIGHLY PROBABLE THE
13 CHANCES OF US MAKING THE ERROR IN THESE
14 PARTICULAR CASES STATISTICALLY IS ONLY ONE IN
15 A THOUSAND, SO, IT'S A 99 -- 999-99 CHANCES
16 WE'RE RIGHT WITH THIS HYPOTHESIS AND ONE
17 CHANCE WE'RE WRONG, THAT THIS PARTICULAR
18 TUMOR IS ASSOCIATED WITH VINYL CHLORIDE
19 EXPOSURE.

20 NOW, OF THE 22 CHEMICALS THAT
21 WE HAVE A CHANCE TO LOOK AT, ONLY FOUR SHOWED
22 THIS ASSOCIATION. NOW, ANY TIME YOU TRY TO
23 TAKE A LARGE NUMBER OF POSSIBILITIES AND PUT
24 THEM TOGETHER, BY CHANCE, YOU'LL COME UP WITH
25 AN ASSOCIATION. IT'S ESTIMATED THAT IF YOU

BFG10028

2110132

1 HAD 20 POSSIBILITIES, YOU'D HAVE AN AT LEAST
2 ONE BY CHANCE, MEANING IT WASN'T REAL, JUST
3 HAPPENED BY CHANCE THAT YOU SAW THAT
4 ASSOCIATION. WELL, WE CAME UP WITH FOUR. WE
5 WERE RATHER SURPRISED BECAUSE THAT WAS HIGHER
6 THAN WE WOULD HAVE EXPECTED. AND HAVE SOURCE,
7 WE DID EXPECT THE VINYL CHLORIDE, BUT WE HAD
8 TWO OTHER -- THREE OTHER AGENTS; ONE OF
9 WHICH WERE CATALYSTS THAT WE USED WITH VINYL
10 CHLORIDE TO CONVERT IT INTO THE POLYMER. THE
11 SECTION WAS A SOLVENT, SOMETHING TO DISSOLVE
12 THE CATALYST. AND THE THIRD, WHICH IS
13 SPECIALIZED CATALYST USED IN VINYL CHLORIDE.
14 SO, ALL OF THE SYNTHETIC RUBBER CHEMICALS,
15 THE ONES USED FOR RUBBER MANUFACTURING DID
16 NOT SHOW ANY ASSOCIATION. BUT THE AGENTS
17 THAT WERE USED WITH VINYL CHLORIDE SHOWED
18 THAT IT DID. AND THIS FURTHER DOCUMENTED THAT
19 OUR ESTIMATES, OUR WORK ESTIMATES ABOUT THEIR
20 EXPOSURE WERE CORRECT EPIDEMIOLOGY AND THIS
21 WAS ASSOCIATED WITH THE DEVELOPMENT OF CANCER.

22 NOW, WHEN WE WENT TO LOOK AT
23 LUNG CANCER, WHICH IS ALSO HIGHLY SUSPECTED
24 OF BEING ASSOCIATED WITH VINYL CHLORIDE, WE
25 WERE UNABLE AMONG OUR SEVEN CASES OF LUNG

2110133

BFG10029

1 . CANCER TO SHOW THAT THERE WAS ANY ASSOCIATION
2 WITH ANY OF THE RUBBER CHEMICALS AS
3 ILLUSTRATED BY ACRYLONITRILE AND ALSO THAT
4 THERE WASN'T ANYTHING ASSOCIATED WITH VINYL
5 CHLORIDE. NOW, THIS HAS LED US TO SIMPLY
6 CONCLUDE THAT THERE IS AN INCREASE IN CANCER
7 OF THE LUNG, BUT THAT IT IS NOT ASSOCIATED
8 EPIDEMIOLOGY WITH THE CHEMICALS WE LOOKED AT
9 AND THAT MEANS WE STILL HAVE TO FIND THE
10 AGENT.

11 Q. DOCTOR, IN YOUR SIX CATEGORIES OF
12 EXPOSURES FROM PEOPLE OUTSIDE THE PLANT UP
13 THROUGH THE VARIOUS LEVELS, IN WHICH CATEGORY
14 DID YOUR -- THE ANGIOSARCOMA CASES THAT YOU
15 FOUND FALL?

16 A. THEY WERE MOSTLY IN CATEGORIES OF
17 FOUR, FIVE AND SIX. WE FOUND NONE WHO FELL
18 INTO THE CATEGORIES OF ZERO, ONE, TWO OR
19 THREE.

20 Q. AND WHAT TYPES OF JOBS DID FOUR,
21 FIVE AND SIX HAVE?

22 A. WELL, THE INDUSTRY HAD A --
23 FORGIVE ME FOR USING THE WRONG TERM, I ASSUME
24 THEY HAD SOME SORT OF SENIORITY ORDER.
25 EVERYONE WHO CAME TO WORK DID ONE JOB FIRST

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BFG10030

1 AND THAT WAS WORKING IN THE CLEANING ON OF
2 THE BIG VATS. AND SO, /TKAB AS THE WORKER
3 THEN WOULD BE PROMOTED, HE WOULD LEAVE THAT
4 JOB. SOME STAYED ON THAT JOB LONGER TIMES
5 THAN OTHERS, BUT ALL OF THEM HAD WORKED FOR
6 CONSIDERABLE PERIODS OF TIME IN THESE VATS OR
7 AROUND THESE VATS.

8 ~~QUESTION: IF YOU HAVE AN ANGIOSARCOMA~~
9 ~~NEAR A FUNCTIONING PYC PLANT THAT HAS~~
10 ~~EMISSIONS, IS THERE A SUBSTANTIAL PROBABILITY~~
11 ~~THAT THE ANGIOSARCOMA WAS CAUSED BY AN~~
12 ~~EMISSION FROM THE PLANT IN THE ABSENCE OF~~
13 ~~OTHER EXPOSURE TO OTHER AGENTS INDUCING~~
14 ~~ANGIOSARCOMA OF THE LIVER?~~

15 A. I DO NOT BELIEVE THERE IS.

16 Q. AND WHY IS THAT?

17 A. WELL, IT SEEMS POSSIBLE, BUT AGAIN,
18 WE HAVE TO DEAL WITH WHETHER OR NOT WE HAVE

19 ~~EVIDENCE THAT THERE IS A REASONABLE~~
20 ~~PROBABILITY IN THE EPIDEMIOLOGICAL STUDIES~~

21 ~~DONE BY NUMEROUS INVESTIGATORS BOTH IN~~
22 ~~ENGLAND AND THE UNITED STATES HAVE NEVER BEEN~~
23 ~~ABLE TO~~

24 ~~LIVER INJURY OR OF ANGIOSARCOMA OCCURRED~~
25 ~~WITHIN A GREATER FREQUENCY AMONG THE POPULOUS~~

110135

BFG10031

1. ~~THAT HAS LIVED AROUND THE PLANTS ENVIRONMENT,~~
2. THEN ONE WOULD HAVE EXPECTED THAT DIDN'T. NOW,
3. IT -- IT BECOMES SUSPICIOUS WHEN ONE SEES
4. CASES AND THAT IS WHY ONE DOES
5. EPIDEMIOLOGICAL STUDIES, TO FIND OUT WHETHER
6. YOUR SUSPICIONS ARE CHANCE HAPPENINGS OR
7. WHETHER OR NOT SINCE YOU'RE REALLY SEEING
8. SOMETHING THAT'S REALLY HAPPENING.

9. Q. DOCTOR EPSTEIN TESTIFIED CONCERNING
10. ANGIOSARCOMA AT LOW LEVELS OF EXPOSURE. I
11. BELIEVE HE DISCUSSED PVC FABRICATE FORCE
12. EXPOSED TO LEVELS OF NONE DETECTABLE TO TWO
13. PARTS PER MILLION. AS A RESULT OF STUDIES
14. DONE BY YOU OR YOUR RESEARCH, DO YOU KNOW IF
15. THERE IS ANY HIGHER INCIDENCE OF ANGIOSARCOMA
16. AMONG PVC FABRICATE FORCE?

17. A. BOTH BY OUR STUDIES AND THOSE THAT
18. HAVE BEEN PUBLISHED, WE HAVE NOT FOUND ANY
19. EVIDENCE THAT THE PVC PRODUCTION WORKERS OR
20. FABRICATORS HAVE ANY INCREASED INCIDENCE OF
21. EITHER INJURY ASSOCIATED WITH CHEMICALS OR
22. WITH ANGIOSARCOMA.

23. Q. IF AN AGENT IS KNOWN TO CAUSE A
24. PARTICULAR -- I'M SORRY. IF AN AGENT IS
25. KNOWN TO CAUSE CANCER IN A PARTICULAR PART OF

2110136

BFG10032

1 THE BODY, WILL IT NECESSARILY CAUSE CANCER TO
2 OTHER PARTS OF THE BODY?

3 A. ONE HAS TO UNDERSTAND THAT EVERY CELL
4 HAS A DIFFERENT JOB AND HAS DIFFERENT
5 CAPABILITIES. AND THE REASON WE BELIEVE ONE
6 CELL DEVELOPS CANCER AND ANOTHER DOESN'T IS
7 DEPENDENT UPON THESE CAPABILITIES. AND AS YOU
8 SAW ILLUSTRATED IN THE LIVER ITSELF WITH TWO
9 DIFFERENT CELLS, DEPENDING ON THEIR ABILITY,
10 THEY EITHER DEVELOP CANCER OR THEY DON'T. IN
11 GENERAL, YOU CAN BE HIGHLY SUSPICIOUS THAT
12 ONE CHEMICAL, IF IT DEVELOPS A CANCER IN ONE
13 TISSUE MAY DO IT IN OTHERS. BUT YOU CANNOT
14 SAY BECAUSE IT DEVELOPED IT IN ONE TISSUE, IT
15 WILL DEVELOP IT IN OTHERS. AND ONE HAS TO
16 TAKE INTO CONSIDERATION HOW THAT PARTICULAR
17 AGENT IS HANDLED BY THE CELLS AND WHETHER THE
18 CELL HAS THE CAPABILITIES OF DEFENDING ITSELF.
19 AND THOSE CELLS THAT DON'T, THEN THE
20 PROBABILITY IS GREATER THAT THEY'LL HAPPEN.
21 AND IF IT DOESN'T, IT WON'T. AND SO, YOU
22 CAN'T JUST MAKE A SIMPLE STATEMENT THAT
23 CANCER DEVELOPMENTS IN ONE TISSUE WILL
24 DEFINITELY DEVELOP IN ANOTHER. YOU CAN BE
25 SUSPICIOUS, BUT YOU HAVE TO DEMONSTRATE IT.

2110137

BFG10033

1 Q. DOCTOR EPSTEIN HAS DISCUSSED EIGHT
2 CASES OF ANGIOSARCOMA IN INDIVIDUALS LIVING
3 WITHIN TWO MILES OF PVC PLANTS AND HE
4 REFERRED TO ARTICLES BY CHRISTIAN, BAXTER AND
5 BRADY. FIRST OF ALL, ARE YOU FAMILIAR WITH
6 THOSE ARTICLES?

7 A. YES.

8 Q. DOES THE EXISTENCE OF THESE EIGHT
9 CASES MEAN THERE IS A SUBSTANTIAL MEDICAL
10 PROBABILITY THAT THEIR ANGIOSARCOMAS WERE
11 CAUSED BY VINYL CHLORIDE?

12 MR. VASSALOTTI: EXCUSE ME.
13 ARE YOU ASKING THE DOCTOR IN HIS OPINION.

14 MR. RENNEISEN: YEAH, IN HIS
15 OPINION, I'M SORRY. SHALL I REPHRASE THE
16 QUESTION?

17 MR. VASSALOTTI: NO, I JUST
18 WANTED IT CLEAR.
19 BY MR. RENNEISEN:

20 Q. IN YOUR OPINION, DOCTOR, DOES THE
21 EXISTENCE OF THESE EIGHT CASES MEAN THAT
22 THERE IS A SUBSTANTIAL MEDICAL PROBABILITY
23 THAT THOSE INDIVIDUALS HAD ANGIOSARCOMA
24 CAUSED BY VINYL CHLORIDE?

25 A. WELL, THE PRESENCE OF THESE CASES

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BFG10034

1 HAVE MADE US ALL SUSPICIOUS THAT THIS
2 POSSIBILITY MIGHT EXIST AND THAT'S WHY THE
3 EPIDEMIOLOGICAL STUDIES WERE CARRIED OUT. NOW,
4 THOSE EPIDEMIOLOGICAL STUDIES HAVE NOT
5 VALIDATED THAT THERE IS A CAUSAL RELATIONSHIP.
6 NOW, IN EPIDEMIOLOGY, WE CANNOT PROVE A
7 NEGATIVE. YOU PROVE ONLY A POSITIVE. AND SO,
8 WHAT WE HAVE IS INCREASING ATTEMPTS TO PROVE
9 THE POSITIVE COMING UP WITH THE NEGATIVE. AND
10 SO LONG AS THAT CONTINUES ON, WE DO NOT HAVE
11 SCIENTIFIC DATA THAT SAYS THAT THESE CASES
12 WERE -- DID NOT HAPPEN BY CHANCE.

13 Q. I'D LIKE TO ASK YOU A HYPOTHETICAL
14 QUESTION: DOCTOR, ASSUME THAT JOHN C GRASSO
15 WAS BORN ON DECEMBER 27, 1927 AND WAS
16 EMPLOYED AT THE DUPONT CHAMBERSWORKS FROM 19
17 44 UNTIL 1976 WITH A PERIOD AROUND 1950 WHEN
18 HE HAD OTHER TYPES OF EMPLOYMENT; ASSUME THAT
19 MR. GRASSO LIVED 1.7 MILES FROM THE B.F.
20 GOODRICH PEDRICKTOWN PLANT FROM THE DATE IT
21 OPENED IN 1970 UNTIL HIS DATE OF DEATH IN
22 1977. ASSUME FURTHER THAT THE PEDRICKTOWN
23 PLANT IS IN SALEM COUNTY, WHICH GENERALLY IS
24 A RURAL AREA AND ASSUME THAT WHEN MR. GRASSO
25 WAS AT DUPONT, DUPONT USED A GREAT NUMBER OF

21110139

BFG10035

1 CHEMICALS; ASSUME THAT MR. GRASSO WAS
2 HOSPITALIZED IN JUNE OF 1976 WHEN HE BEGAN
3 COUGHING UP BLOOD AND HAD OTHER SYMPTOMS AND
4 CONDITIONS AS DESCRIBED IN THE HOSPITAL
5 RECORDS WHICH I'VE SUBMITTED TO YOU FOR YOUR
6 REVIEW. ASSUME THAT MR. GRASSO WAS
7 HOSPITALIZED AT THOMAS JEFFERSON MEDICAL
8 COLLEGE IN AUGUST OF 1976 AND THAT ON AUGUST
9 5, 1976, THE DIAGNOSIS OF ANGIOSARCOMA OF THE
10 LIVER WAS MADE. ASSUME THAT THE PLANT IN
11 PEDRICKTOWN DID OPEN ON MARCH 25, 1970 AND IT
12 MANUFACTURED POLYVINYLCHLORIDE. DURING THE
13 COURSE OF THE MANUFACTURING PROCESS, VINYL
14 CHLORIDE GAS WAS EMITTED INTO THE ATMOSPHERE.
15 ASSUME THAT CONCENTRATIONS OF VINYL CHLORIDE
16 WERE FOUND IN THE AREA OF THE GRASSO HOME IN
17 THE RANGE OF SIX TO NINE PARTS PER BILLION
18 AND THAT MR. GRASSO ON AN ANNUAL AVERAGE THAT
19 MR. GRASSO HIMSELF HAD AN ANNUAL AVERAGE
20 EXPOSURE OF FIVE TO EIGHT PARTS PER BILLION.
21 ASSUME THAT THE HIGH 24 HOUR AVERAGE FOR MR.
22 GRASSO WOULD HAVE BEEN 260 PARTS PER BILLION
23 AND ON AN HOURLY BASIS ON TWO TO FOUR TIMES A
24 YEAR, AN HOURLY AVERAGE WOULD HAVE BEEN AS
25 HIGH AS FIVE TO SIX PARTS PER MILLION. ASSUME

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BFG10036

1 THAT MR. GRASSO WAS EXPOSED AS A RESULT OF
2 EPISODIC EMISSIONS OCCURRING APPROXIMATELY 20
3 TIMES IN SIX YEARS FOR PERIODS OF TWO TO 15
4 MINUTES AND DURING THOSE EXPOSURE PERIODS,
5 THE VINYL CHLORIDE LEVEL -- THE VINYL
6 CHLORIDE CONCENTRATION WAS SEVERAL HUNDRED
7 PARTS PER MILLION.

8 FIRST BASED ON THOSE ASSUMED
9 FACTS AND YOUR KNOWLEDGE OF THE MEDICAL
10 RECORDS, DO YOU HAVE AN OPINION WITH
11 SUBSTANTIAL MEDICAL PROBABILITY AS TO WHEN
12 THE LIVER TUMOR DIAGNOSIED ON AUGUST 5, 1976
13 FIRST WAS PRESENT IN MR. GRASSO?

14 A. YES, I DO.

15 Q. AND WHAT IS THAT OPINION?

16 A. FROM OUR OWN EXPERIENCE WITH THE
17 DISEASE AND FROM THAT THAT'S IN THE
18 LITERATURE, I WOULD SUSPECT THAT THE TUMOR
19 HAD BEEN PRESENT AT A MINIMUM OF A YEAR AND
20 POSSIBLY UP TO FOUR.

21 Q. AND THAT'S -- YOU'VE TESTIFIED AS
22 TO YOUR EXPLANATION OF THAT PREVIOUSLY, HAVE
23 YOU NOT?

24 A. WELL, THE REASON WE CHARACTERIZED A
25 DISEASE IS BECAUSE WITH EACH CASE OF A

2110141

BFG10037

1 DISEASE THAT WE SEE, WE CONTINUED TO COLLECT
2 INFORMATION AS TO THE NATURAL PROGRESSION OF
3 THE DISEASE. AND THAT BECOMES A DESCRIPTION
4 OF THE DISEASE PROCESS. THAT'S HOW ONE
5 DISEASE IS DIFFERENTIATED FROM ANOTHER. AND
6 ONE ACCUMULATES THIS BY THE CASES THAT ONE
7 SEES, SO THAT THE FIRST CASE -- THE FIRST
8 AND ONLY CASE OF A NEW DISEASE MAY NOT SHOW
9 YOU ALL THE VARIATIONS. BUT AS ONE BEGINS TO
10 CONTINUE TO INCREASE THE NUMBER OF CASES ONE,
11 ONE BEGINS TO MORE CLEARLY DEFINE THE
12 VARIATION. AND SO WE NOW HAVE A NUMBER OF
13 CASES SHOWING US A VARIATION IN THE TIME OF
14 THE TUMOR OCCURRENCE. IT'S ON THAT THAT WE
15 BASE THAT OPINION.

16 Q. DOCTOR, DO YOU HAVE AN OPINION WITH
17 SUBSTANTIAL MEDICAL PROBABILITY AS TO WHETHER
18 OR NOT VINYL CHLORIDE EMITTED BY THE R.F.
19 GOODRICH PLANT IN PEDRICKTOWN CAUSED MR.
20 GRASSO'S ANGIOSARCOMA IN?

21 A. YES, I DO.

22 Q. WHAT IS YOUR OPINION?

23 A. BASED ON OUR MEDICAL KNOWLEDGE, I DO
24 NOT BELIEVE THAT THAT IS THE SOURCE OF MR.
25 GRASSO'S ANGIOSARCOMA.

2110142

BFG10038

1 Q. AND CAN YOU EXPLAIN FOR THE JURY HOW
2 YOU ANALYZED THAT SITUATION IN ORDER TO GIVE
3 ME THAT ANSWER.

4 A. I'D LIKE TO. I'D LIKE AGAIN TO USE
5 SOME SLIDES TO ILLUSTRATE WHAT WE KNOW ABOUT
6 THE ANGIOSARCOMA FROM ALL THE CASES THAT HAVE
7 BEEN OBTAINABLE IN THE WORLD RELATED TO VINYL
8 CHLORIDE.

9 THIS IS A CHART ILLUSTRATING
10 ALL THE REPORTED CASES THAT HAVE BEEN
11 VERIFIED BY PATHOLOGISTS AND MEDICAL EXPERTS
12 THAT THESE ARE TRULY ANGIOSARCOMAS, NOT SOME
13 OTHER KINDS OF TUMOR, AND WE ALSO KNOW THE
14 EXPOSURES OF THESE INDIVIDUALS AND ALL OF
15 THEM HAD BEEN WORKING WITH VINYL CHLORIDE FOR
16 VARYING PERIODS OF TIME. THERE IS ROUGHLY 30
17 SOME CASES WITH AN ADDITIONAL TWO IN 1979 AND
18 ONE IN 1980. THAT IS NOT ON THIS CHART.

19 THE ONES THAT ARE IN RED ARE
20 THOSE FROM THE UNITED STATES AND THE ONES IN
21 WHITE ARE FROM THE NORTH AMERICA, CANADA AND
22 FROM ALL OF EUROPE AND ASIA.

23 NOW, IF ONE LOOKS AT WHEN
24 -- WHEN THESE CANCER OCCURRED, THAT IS,
25 WHEN THEY WERE DIAGNOSED IN THE VARIOUS

2110143

BFG10039

1 COUNTRIES, I'VE ILLUSTRATED FOUR COUNTRIES,
2 BECAUSE THESE ARE THE COUNTRIES THAT HAVE OR
3 ACCOUNT FOR 90 PERCENT OF ALL THE
4 ANGIOSARCOMAS AMONG VINYL CHLORIDE WORKERS.
5 WHAT YOU SEE HERE IS THE NAME OF THE COUNTRY
6 AND THE DATE -- MEANING 1941 IS ROUGHLY THE
7 EARLIEST EXPOSURE OF ANY OF THE INDIVIDUALS
8 IN THIS GROUP OF INDIVIDUALS.

9 Q. DOCTOR, AS YOU GO THROUGH, TELL US
10 THE NAME OF THE COUNTRY, BECAUSE --

11 A. SURE, CANADA IS AT THE TOP. THEIR
12 PLANT STARTED IN 1939, 1940'S. THE AMERICAN
13 PLANTS -- THIS IS AN ERROR, THAT SHOULD
14 HAVE BEEN 1941 -- IS -- I'M SORRY. THAT
15 IS NOT AN ERROR. THERE IS A PLANT IN THE
16 UNITED STATES THAT BEGAN ITS EXPOSURES IN
17 1939, FORGIVE ME. THEN FRANCE, THEY STARTED
18 IN 1941, BUT THE MAJORITY OF THEM WERE IN THE
19 FIFTIES. AND IN GERMANY, THEY STARTED IN THE
20 MID 1950'S AND LATE 1960'S. SO THAT THE
21 COUNTRIES ARE LISTED IN THE OLDEST PLANTS TO
22 THE MORE RECENT ONES. AND YOU'LL NOTICE THAT
23 THE OLDER OR THE PLANTS THAT WERE STARTED IN
24 THE EARLIER TIMES HAVE THE EARLIEST
25 DEVELOPMENT OF ANGIOSARCOMAS, STARTED IN THE

2110144

BFG10040

1 FORTIES, BEGUN TO BE IDENTIFIED IN THE
2 FIFTIES, AND THOSE THAT STARTED IN THE LATE
3 FIFTIES BEING IDENTIFIED IN THE SIXTIES. SO
4 THAT THIS TREND, AS WELL AS THE PEAK NUMBER
5 -- THAT IS, THE MOST FREQUENT OCCURRENCE OF
6 ANGIOSARCOMAS -- ALSO SHOWS -- SHOWN IN
7 YELLOW, THE SAME OCCURRENCE. NOW, THIS TELLS
8 US THAT THE ON SET OF EXPOSURE AND WHEN ONE
9 BEGINS TO DEVELOP THE TUMOR, AS WELL AS ONE
10 REACHES THE MAXIMUM NUMBER OF CASES APPEARS
11 TO BE THE SAME, WHETHER THEY ARE IN CANADA,
12 THE UNITED STATES, FRANCE OR GERMANY. SO,
13 THIS GIVES US AN IDEA ABOUT THE DISEASE
14 PROCESS AS HAVING CERTAIN CHARACTERISTICS
15 WHICH ARE CONSISTENT.

16 THIS TAKES NINE SAME CASES
17 BUT DISTRIBUTES THEM UNDER DIFFERENT
18 CIRCUMSTANCES. THIS HAS THE TOTAL NUMBER OF
19 YEARS OF EXPOSURE OF EACH OF THE CASE WHO
20 DEVELOPED HEPATIC ANGIOSARCOMA, LIVER
21 ANGIOSARCOMA, IN THESE VINYL CHLORIDE WORKERS.
22 AND THIS INDICATES THEIR NUMBER -- TOTAL
23 NUMBER OF YEARS OF EXPOSURE. AND AS YOU SEE,
24 THIS RANGES ANYWHERE FROM ABOUT THREE YEARS
25 TO AS MUCH AS 33 YEARS OF EXPOSURE.

2110145

BFG10041

1 NOW, I PUT A NUMBER OF THESE
2 IN RED. AND THAT'S BECAUSE THERE APPEARS TO
3 BE TWO PEAKS. THERE ARE A GROUP, ABOUT EIGHT,
4 WHO DEVELOPED ANGIOSARCOMA WITH ONLY THREE TO
5 SIX YEARS OF EXPOSURE AND THEN THE MAJORITY
6 OF CASES THAT HAD TEN TO 30 YEARS WITH THE
7 MEAN BEING AROUND 15 TO 20. IN FACT, THERE
8 MAY BE THREE PEAKS. BUT, THIS GROUP WAS
9 THOUGHT TO BE POSSIBLY A UNIQUE GROUP. AND I
10 ILLUSTRATE THEM IN ANOTHER CONTEXT. AS WE
11 DESCRIBED -- AS WHERE UPON THEN LOOK AT THE
12 SAME THING, WE LOOK NOW AT LATENCY. AS YOU
13 KNOW, THAT'S THE TIME FROM THE FIRST EXPOSURE
14 TO THE TIME THE PATIENTS BECOMES DIAGNOSED
15 AS HAVING THE TUMOR. AND THIS IS CONSIDERED A
16 VERY IMPORTANT FACTOR IN CANCER, SINCE THERE
17 APPEARS TO BE A TIME REQUIREMENT FOR THE
18 DEVELOPMENT OF CANCER AND THIS IS USUALLY
19 FELT TO BE RELATED TO THE DOSE OF EXPOSURE.
20 THE LOWER THE DOSE OF EXPOSURE, IT'S BELIEVED
21 THE LONGER IT TAKES TO DEVELOP CANCER. SO,
22 THEY THOUGHT THAT THESE LOW EXPOSED GROUPS
23 SHOULD THEN HAVE THE LONGEST LATENCY. AND AS
24 YOU SEE, THAT'S NOT QUITE TRUE. THESE EIGHT,
25 WHICH ARE SHOWN IN RED, HAVE LATENCIES WHICH

2110146

BFG10042

1 VARY FROM AS SHORT AS FOUR YEARS TO AS LONG
2 AS 4 YEARS. AND IN FACT, THAT FOLLOW THE
3 PATTERN OF ALL THE ANGIOSARCOMAS, SO THAT THE
4 LATENCY TELLS US THAT THOUGH WHATEVER THE
5 EXPOSURE MAY BE, IT STILL REQUIRES AT LEAST
6 NINE TO TEN YEARS FOR THE DISEASE TO EVOLVE
7 AND DEVELOP; AND THAT SOME PEOPLE REQUIRE A
8 SMALLER EXPOSURE DOSE IN ORDER TO GET THIS
9 PROCESS IN MOTION THAN OTHERS, BUT THAT THE
10 LATENCY DOES NOT STRICTLY FOLLOW THOSE RULES.

11 Q. DOCTOR, WHAT IS THE AVERAGE LATENCY
12 PERIOD?

13 A. THE AVERAGE LATENCY PERIOD HERE IS
14 SOMEWHERE BETWEEN 20 TO 25 YEARS, THE MAJOR
15 PEAK IS THERE.

16 Q. AND LATENCY IS DEFINED AS HOW?

17 A. AS THE TIME INTERVAL FROM THE FIRST
18 EXPOSURE TO THE TIME THE DIAGNOSIS IS MADE.

19 Q. FINE, THANK YOU.

20 A. NOW, THE LAST SLIDE SHOWS OUR
21 DEPICTING ON ALL OF THESE CASES OF
22 ANGIOSARCOMA BASED ON THE YEAR THEY BEGAN
23 THEIR EXPOSURE AND AS ONE SEES, ALL THE CASES
24 BEGAN THEIR EXPOSURE AFTER THE 1949 INTERVAL
25 BY THEIR REPORTS AND EVEN THOUGH THE PLANTS

2110147

BFG10043

1 HAVE BEGUN OPERATING IN 1939. NONE OF THE
2 WORKMEN WHO DEVELOPED ANGIOSARCOMA INDICATED
3 THEIR EXPOSURE OR THEIR WORK RECORDS
4 INDICATED THEY HAD BEGUN WORKING BEFORE 1940.

5 NOW, IT ALSO STOPS AT 1965.
6 DESPITE THE FACT NOW THAT IT IS ALMOST 15, 16
7 YEARS, THERE HAVE BEEN NO NEW ANGIOSARCOMAS
8 WHOSE EXPOSURE BEGAN AFTER 1965. AND IF ONE
9 LOOKS AT THE NUMBERS THAT BEGAN, ONE BEGINS
10 TO SEE THAT THERE'S A DECREASE IN THE NUMBERS
11 BEING EXPOSED AS ONE GOES ON IN TIME.

12 NOW, FROM THE BEST DATA THAT
13 WE CAN GATHER, THE EXPOSURE LEVELS THAT WERE
14 CONSIDERED TO BE COMMON AROUND THE PLANTS IN
15 THE 1940'S AND 1945 HAD BOTH EUROPE AND IN
16 THE UNITED STATES WERE THOUGHT TO BE AROUND
17 THE RANGE OF 2,000 PARTS PER MILLION; THAT
18 THIS WAS GRADUALLY REDUCED FOR ENGINEERING
19 REASONS SO THAT IN THE LATE FIFTIES AND
20 SIXTIES, IT WAS ESTIMATED AND REPORTED
21 OCCASIONALLY OF BEING 200 TO 500 PARTS PER
22 MILLION AND THAT IN THE LATE SIXTIES AND
23 EARLY SEVENTIES HAD BEEN REDUCED TO 50 TO 200
24 PARTS PER MILLION ABOUT THE TIME THE
25 ACROUSTEDLYSIS OR THE BONE DISSOLVING PROCESS

BFG10044

21110147A

1 IN THE FINGERS WAS DISCOVERED.

2 NOW, THIS GIVES US SOME
3 EPIDEMIOLOGICAL INDICATION OF HOW MUCH
4 EXPOSURE IS REQUIRED IN ORDER TO START THIS
5 PARTICULAR DISEASE PROCESS IN ANY AREA IN THE
6 PROCESS AND IT APPEARS THAT THERE ARE NO
7 CASES UNDER 50 PARTS PER MILLION AND THAT
8 THEY CAN GOING ON UP TO 2,000 PARTS PER
9 MILLION. AND THIS, WOULD, AGAIN, GOING ON
10 ALONG WITH WHAT WE KNOW IN ANIMAL STUDIES. IN
11 ANIMAL STUDIES, WE'VE NOT BEEN ABLE TO INDUCE
12 THE TIME MORE UNDER 25 PARTS PER MILLION AND
13 HAVE NOT BEEN ABLE TO INCREASE THE NUMBER OF
14 TUMORS WHEN WE GO BEYOND FIVE OR 6,000 PARTS
15 PER MILLION. AND I THINK THIS CAN BE
16 EXPLAINED AGAIN BY THE BIOLOGICAL FACT THAT
17 AN AGENT IN SMALL QUANTITIES CAN BE HANDLED
18 BY THE NORMAL BODY TISSUE; THAT AS IT
19 REACHES AN INTERMEDIATE STAGE, THAT THE BODY
20 MAY NOT HANDLE ADEQUATELY, BUT THAT THE CELLS
21 MAY SURVIVE WITH THE INJURY AND THEN LATER GO
22 ON TO DEVELOP CANCER. AND THEN AT THE HIGHER
23 LEVELS, THE CHEMICAL OR AGENT MAY THEREFORE
24 KILL THE CELL AND, THEREFORE, NOT EVOLVES
25 INTO A TUMOR. AND THAT WOULD EXPLAIN WHY ONE

2110146

BFG10045

1 SEES AN INCREASE IN OCCURRENCE OF THE TUMORS
2 FROM 50 PARTS TO ABOUT 2,000 OR 3,000 AND
3 THEN SEES THE OCCURRENCE TRAIL OFF.

4 NOW, THIS WOULD ALSO EXPLAIN
5 WHY THE PEAK OF THE ANGIOSARCOMAS CASES BEING
6 REPORTED WAS REACHED IN 1975. WHEN WE BEGAN
7 OUR STUDY, OUR PROTOTYPE STUDY IN 1975, WE
8 ANTICIPATED THAT THE POPULATION WE WERE
9 STUDYING SHOULD CONTINUE TO DEVELOP
10 ANGIOSARCOMAS BASED ON THEIR PAST EXPOSURE
11 FOR AT LEAST ANOTHER TEN YEARS, BECAUSE THE
12 EXPOSURE WAS NOT REDUCED TO ONE PART PER
13 MILLION UNTIL 1974, 1975; AND THEN WE HAD
14 STILL ALL THOSE PEOPLE WHO HAD BEEN EXPOSED
15 BEFORE THAT TIME.

16 NOW THIS HAS SURPRISED US,
17 BECAUSE THERE'S BEEN A MARKED, A RAPID DROP
18 IN THE NUMBER OF CASES REPORTED IN THE UNITED
19 STATES, IN GERMANY, IN FRANCE AND OTHER
20 COUNTRIES. AND THAT IT IS NOW FURTHER
21 SUPPORTIVE DATA THAT WE MAY HAVE WHAT WE CALL
22 A BIOLOGICAL THRESHOLD -- THAT IS, A LEVEL
23 AT WHICH MOST PEOPLE COULD HANDLE THE AGENTS
24 WITHOUT INDUCING THE CANCER WITHIN THEIR
25 LIFETIME. NOW, WE WILL KNOW MORE ABOUT THIS

2110149

BFG10046

1 AS YEARS GO ON, BECAUSE AS EACH YEAR GOES ON,
2 IT IS DOCUMENTATION THAT THIS IS A TRAILING
3 OFF EFFECT WILL BE FURTHER DOCUMENTED.

4 Q. DOCTOR, IF INSTEAD OF ANNUAL
5 EXPOSURES OF SIX TO NINE PARTS PER BILLION,
6 IF YOU WERE TO ASSUME THE AVERAGE ANNUAL
7 EXPOSURES WERE 20 TO 25 PARTS PER BILLION,
8 WOULD YOUR ANSWERING CHANGED?

9 A. NO, IT WOULD NOT.

10 Q. NOW, -- NOW, YOU WERE PRESENT
11 YESTERDAY WHEN DOCTOR JOHNSON TESTIFIED AND I
12 THINK YOU WERE PRESENT WHEN DOCTOR EPSTEIN
13 HAS TESTIFIED -- TESTIFIED, AND EACH ONE OF
14 THEM WERE READ A LONG HYPOTHETICAL QUESTION.
15 I'M NOT GOING TO REPEAT THAT QUESTION. I
16 WOULD LIKE YOU TO ASSUME THE FACTS THAT WERE
17 IN THE LONG QUESTION THAT I READ TO DOCTOR
18 JOHNSON YESTERDAY AND THAT MR. VASSALOTTI
19 READ TO DOCTOR EPSTEIN LAST WEEK AND
20 PARTICULARLY ASSUME THAT THE CONCENTRATIONS
21 AT THE GRASSO HOME WERE FROM 1.1 TO 20 PARTS
22 PER MILLION FOR 1,503 HOURS, FOR FIVE AND A
23 HALF YEARS AND THAT THE EXPOSURE -- THE
24 CONCENTRATION LEVEL WAS TEN TO 20 PARTS PER
25 MILLION AND 11 ON 11 TO 15 HAZY DAYS A YEAR

2110150

BFG10047

1 . FOR A PERIOD OF APPROXIMATELY FOUR HOURS A
2 DAY.

3 ASSUMING THOSE FACTS, WOULD
4 IT CHANGE YOUR OPINION CONCERNING WHETHER OR
5 NOT MR. GRASSO'S DISEASE WAS CAUSED -- YOUR
6 OPINION WITH -- LET ME GET THE WORDS THE
7 SAME SO THE QUESTIONS PARALLEL.

8 WOULD THAT CHANGE YOUR
9 OPINION AS TO WHETHER OR NOT MR. GRASSO'S
10 DISEASE WAS CAUSED BY VINYL CHLORIDE WITH
11 SUBSTANTIAL MEDICAL PROBABILITY?

12 A. NO, IT WOULD NOT CHANGE MY OPINION.

13 Q. AND YOUR OPINION AGAIN IS WHAT?

14 A. BASED ON WHAT WE NOW KNOW FROM ALL THESE
15 CASES AND THE CHARACTERIZATION OF THE DISEASE,
16 IT DOES NOT HAVE THOSE CHARACTERISTICS AND,
17 THEREFORE, I DO NOT THINK THAT THIS IS THE
18 SOURCE OF THE ANGIOSARCOMA IN THIS CASE.

19 Q. DO YOU KNOW WHAT DID CAUSE MR.
20 GRASSO'S ANGIOSARCOMA?

21 A. I HAVE SOME THEORIES, BUT I HAVE NO
22 GOOD MEDICAL DATA TO SUPPORT THAT.

23 Q. IS THIS UNUSUAL WITH RESPECT TO
24 VINYL CHLORIDE AND ANGIOSARCOMA, NOT TO HAVE
25 AN OPINION?

21110151

BFG10048

1 A. I'M NOT SURE I UNDERSTAND.

2 Q. LET ME ASK THE QUESTION THIS WAY:

3 IS IT UNUSUAL FOR THE MEDICAL PROFESSION TO
4 BE UNABLE TO DETERMINE THE CAUSE OF
5 ANGIOSARCOMA OF THE LIVER?

6 A. NO. AS I'VE STATED BEFORE, AND AS
7 OTHER PEOPLE HAVE INDICATED, THE MAJORITY OF
8 ANGIOSARCOMAS WE DO NOT KNOW THE ETIOLOGY TO.

9 Q. WHAT ABOUT OTHER CANCER, DO WE KNOW
10 THE ETIOLOGY OF OTHER CANCER?

11 A. NO, THE MAJORITY OF CANCER WE'RE NOT
12 SURE OF THE ETIOLOGY. THERE ARE A FEW WHICH
13 CAUSE IS CLEARLY DOCUMENTED, BUT NOT -- I
14 DON'T KNOW OF ANY CANCER THAT HAS A SINGLE
15 SOURCE.

16 Q. AND WOULD YOU TELL ME AGAIN THE
17 PERCENTAGE OF ANGIOSARCOMAS WHICH ARE
18 ATTRIBUTED BY THE MEDICAL PROFESSION TODAY TO
19 UNKNOWN CAUSES?

20 A. IT IS ESTIMATED BETWEEN 70 TO 75
21 PERCENT OF THEM.

22 MR. RENNEISEN: THANK YOU, I
23 HAVE NO FURTHER QUESTIONS.

24 THE COURT: MR. VASSALOTTI.
25 BY MR. VASSALOTTI:

2110152

BFG10049

1 Q. DOCTOR TAMBURRO, ABOUT THAT 70 TO 75
2 PERCENT OF UNKNOWN CAUSES, HOW WERE THOSE
3 STUDIES CONDUCTED TO DETERMINE FIRST THE
4 NUMBER OF CASES OF ANGIOSARCOMA AND THEN
5 TRYING TO ATTRIBUTE A CAUSE? ARE YOU FAMILIAR
6 WITH HOW THEY WERE CONDUCTED?

7 A. WHICHEVER TWO OF THEM, YES.

8 Q. AND WHO CONDUCTED THE STUDIES?

9 A. ONE WAS CONDUCTED IN NEW YORK AND
10 THE OTHER WAS --

11 Q. WELL, WHO CONDUCTED THAT ONE?

12 A. WELL, YOU'LL FORGIVE ME. ONE OF THE
13 THINGS I HAVE NOT A TENDENCY TO DO IS
14 REMEMBER NAMES. BUT I CAN GET YOU THE
15 LITERATURE FOR THAT IF YOU DON'T HAVE IT.
16 THEY CONDUCTED A SURVEY IN -- BY USING THE
17 REGISTRY IN NEW YORK.

18 Q. WHAT REGISTRY IS THAT?

19 A. THERE'S A CANCER REGISTRY IN THE
20 STATE OF NEW YORK WHICH RECORDS THE CAUSES OF
21 DEATH DUE TO CANCER. THERE'S A REGISTERING IN
22 CONNECTICUT. THERE ARE A NUMBER OF STATES
23 THAT HAVE CANCER --

24 Q. HOW DOES A CANCER GET REGISTERED IN
25 THIS CANCER REGISTRY?

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1 A. EVERY INDIVIDUAL WHO DIES IS
2 REQUIRED IN THE STATE TO HAVE A DEATH
3 CERTIFICATE. AND ALL THOSE DEATH CERTIFICATES
4 WHICH ARE RECORDED AS BEING DUE TO OR
5 ASSOCIATED WITH A MALIGNANCY ARE THEN
6 RECORDED IN THE CANCER REGISTRY.

7 Q. HOW DOES SOMEONE MAKE A
8 DETERMINATION THAT A DEATH IS CAUSED BY A
9 MALIGNANCY?

10 A. SINCE EVERY DEATH CERTIFICATE IS
11 SIGNED BY A PHYSICIAN, THE PRESUMPTION IS
12 MADE THAT THE DOCTOR, KNOWING THE DOCTOR
13 DIAGNOSIS, IS THE MOST INFORMED INDIVIDUAL AS
14 TO WHETHER OR NOT THE PRESENCE OR ABSENCE OF
15 A DISEASE IS PRESENT?.

16 Q. SO, AN AUTOPSY ISN'T DONE IN EVERY
17 CASE?

18 A. THAT'S CORRECT.

19 Q. IN APPROXIMATELY -- APPROXIMATELY
20 WHAT PERCENTAGE OF THE CASES IN THE REGISTRY
21 HAS AN AUTOPSY BEEN DONE, DO YOU KNOW?

22 A. THE SMALLER NUMBER, PROBABLY IN THE
23 RANGE, DEPENDING ON THE AREA AND IT IS
24 LOCATION, ANYWHERE FROM 5 TO MAYBE 35 PERCENT.

25 Q. FIVE TO 35 PERCENT WOULD BE TRULY

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BFG10051

1 --

2 A. HISTOLOGICALLY PROVEN EITHER TO HAVE

3 OR NOT TO HAVE A TUMOR.

4 Q. NOW, WE'VE HAD SOME TESTIMONY IN

5 THIS CASE THAT IT WASN'T REALLY UNTIL 1973 OR

6 1974 WHERE THE MEDICAL COMMUNITY BECAME

7 CONCERNED ABOUT THE RELATIONSHIP BETWEEN

8 VINYL CHLORIDE AND ANGIOSARCOMA OF THE LIVER.

9 AND AS A MATTER OF FACT, I THINK DOCTOR

10 JOHNSON TESTIFIED THAT A COUPLE OF THE CASES

11 THAT B.F. GOODRICH WERE MISS DIAGNOSIED AS

12 PRIMARY LIVER CANCER. ARE YOU AWARE OF THAT?

13 A. YES.

14 Q. THOSE WERE CASES WHERE AUTOPSIES

15 WERE PERFORMED, WEREN'T THEY?

16 A. THAT'S CORRECT.

17 Q. AND THEY WERE STILL MISS DIAGNOSIED.

18 A. THAT'S CORRECT.

19 Q. IS THERE A CHANCE -- I'LL JUST ASK

20 YOU THIS: IS THERE A CHANCE THAT IN THESE

21 CANCER REGISTRIES THAT NOT ALL ANGIOSARCOMAS

22 OF THE LIVER THAT ACTUALLY HAPPEN ARE LISTED?

23 A. WELL, IT'S NOT A CHANCE. THAT IS A

24 FACT.

25 Q. THAT'S A FACT.

BFG10052

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1 A. THAT'S TRUE OF EVERY CANCER.

2 Q. AS A MATTER OF FACT, THAT'S TRUE OF
3 EVERY CANCER, CORRECT?

4 A. WE WOULD NOT KNOW THE TRUE INCIDENCE
5 OF CANCER DISEASE UNLESS WE HAD AN AUTOPSY ON
6 EACH AND EVERY INDIVIDUAL WHO DECIDE. AGAIN,
7 THAT'S WHY EPIDEMIOLOGICAL STUDIES ARE USED
8 TO DETERMINE, BASED ON THE NUMBER OF
9 AUTOPSIES, WHAT THE POSSIBILITY IS THAT THE
10 DATA YOU HAVE CAN DRAW A CORRECT CONCLUSION.

11 Q. WELL, YOU JUST TALKED ABOUT CANCER
12 REGISTRIES THAT INCLUDE DATA THAT IS OBTAINED
13 FROM OTHER THAN AUTOPSIES.

14 A. RIGHT.

15 Q. THAT WAS INCLUDED IN YOUR
16 EPIDEMIOLOGICAL STUDIES, CORRECT?

17 A. WOULD YOU KINDS REMEMBER REPEAT THE
18 QUESTION. I'M NOT --

19 Q. THE DATA FROM THE CANCER BANKS OR
20 REGISTRIES --

21 A. YES.

22 Q. -- THAT'S WHAT THESE
23 EPIDEMIOLOGICAL STUDIES THAT YOU REFER TO
24 WERE BASED UPON, WEREN'T THEY?

25 A. YES. NOT TOTALLY. THAT WAS ONE --

2110156

BFG10053

1 Q. ONE SOURCE OF THE INFORMATION?

2 A. RIGHT, BUT THERE ARE OTHERS.

3 Q. NOW, ONCE THEY -- THESE -- THIS
4 STUDY IN NEW YORK THAT YOU PARTICULARLY REFER
5 TO WENT BACK AND LOOKED THROUGH THE CANCER
6 REGISTRY AND I ASSUME THEY LOOKED FOR ALL
7 ANGIOSARCOMA CASES?

8 A. YES.

9 Q. I ALSO ASSUME -- I DON'T MEAN TO
10 BE FACETIOUS THAT THESE PEOPLE ARE ALREADY
11 DEAD IN THERE IN THE CANCER REGISTRY. HOW DO
12 THEY GO ABOUT ATTRIBUTING A CAUSE TO THESE
13 PEOPLE CANCER?

14 A. UNFORTUNATELY, AS YOU PROBABLY HEARD
15 FROM OTHER SOURCES, THE OCCUPATION IS A
16 REQUESTED PIECE OF INFORMATION, BUT NOT A
17 REQUIRED ONE ON DEATH CERTIFICATES. SO IT IS
18 REQUIRED THAT THE INDIVIDUAL WHO'S INTERESTED
19 IN DETERMINING WHAT POSSIBLE CORRELATIONS ARE,
20 WILL GO BACK TO EACH AND EVERY CASE, EITHER
21 BY DIRECT, VISITING THE RELATIVES OR THE
22 HOSPITAL OR THE DOCTOR WHO CARED FOR THEM,
23 AND DETERMINE WHAT THE INDIVIDUAL DID AS AN
24 OCCUPATION. AND THEN FROM THAT DATA, ONE THEN
25 ATTEMPTS TO DRAW SOME CONCLUSIONS AS TO

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1 - WHETHER THERE'S A RELATIONSHIP BETWEEN THEIR
2 WORK IS HISTORIES AND THE DISEASE THEY HAVE.

3 Q. SO, IN THE MID NINETEEN SEVENTIES,
4 PEOPLE WERE CONCERNED ABOUT THE OCCUPATION

5 -- PEOPLE STUDYING THE EPIDEMIOLOGICAL
6 SIGNIFICANCE OF ANGIOSARCOMA WERE CONCERNED
7 WITH THE OCCUPATIONAL HISTORY OR THE
8 OCCUPATION, I THINK YOU SAID, OF THE PEOPLE
9 WHO DIED OF ANGIOSARCOMA; IS THAT CORRECT?

10 A. YES.

11 Q. NOW, WHEN DATA IS GIVEN ON A DEATH
12 CERTIFICATE AS TO OCCUPATION, THAT'S ONLY THE
13 LAST OCCUPATION OF THE PERSON, ISN'T IT?

14 A. THAT IS ABSOLUTELY CORRECT. YOU --
15 THAT'S USUALLY THE THING.

16 Q. IN THE MID NINETEEN SEVENTIES, WAS
17 THERE ANYONE CONCERNED ABOUT PROXIMITY OF
18 LOCATION OF THE PEOPLE WHO DIED OF
19 ANGIOSARCOMA TO A PVC OR VC PLANT IN THE
20 STUDIES THAT YOU RELIED UPON?

21 A. YES, THEY WENT AND LOOKED AT WHERE
22 THE PEOPLE ACTUALLY LIVED TO DETERMINE
23 WHETHER OR NOT --

24 Q. AT WHAT POINT IN THEIR LIVES DID
25 THEY -- AGAIN, WE'RE RELYING ON LAST

2110:58

BFG10055

1 ADDRESS; IS THAT CORRECT?

2 A. ONE WOULD HAVE TO DEPEND ON LAST
3 ADDRESS. WELL, IT WOULD AGAIN DEPEND --
4 DEPEND THIS IS NOT IN THE STUDIES. I MEAN ONE
5 DOESN'T KNOW IN A PUBLICATION THE ACTUAL
6 EXTENT OF THE INVESTIGATORS' EFFORTS TO
7 DETERMINE ALL LOCATIONS. IN SOME CASES, THEY
8 MAY HAVE KNOWN ALL THE LOCATIONS THE
9 INDIVIDUAL LIVED AT AND IN SOME CASES NOT. SO,
10 ONE PRESUMES THAT WE'RE DEALING PREDOMINANTLY
11 WITH THE LAST LOCATION.

12 Q. DOCTOR, ISN'T IT FAIR TO SAY THAT
13 PERCENT OF THE ANGIOSARCOMAS THAT HAVE BEEN
14 FOUND SO FAR -- THIS IS BASED UPON WHAT WE
15 JUST TALKED ABOUT -- HAVE BEEN ASSIGNED AN
16 UNKNOWN CAUSES BECAUSE WE DON'T HAVE ENOUGH
17 INFORMATION TO DETERMINE WHAT THE CAUSE WAS?

18 A. YES, THAT IS A POSSIBILITY. BUT I
19 THINK ONE HAS TO LOOK AGAIN AT THE FACT THAT
20 SINCE 1974, PEOPLE HAVE ACTIVELY BEEN LOOKING
21 TO LINK UP ALL THEIR ANGIOSARCOMAS WITH THE
22 KNOWN CAUSES, SO THAT IT IS UNLIKELY THAT AN
23 ANGIOSARCOMA DIAGNOSIED AFTER 1974, HAVING
24 ANY POSSIBILITY OF BEING ASSOCIATED WITH ANY
25 OF THE FOUR CAUSES, WOULD NOT BE ATTEMPTED TO

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1 BE LINKED. THAT'S JUST A NATURAL TENDENCY.
2 YOU KNOW WHAT IT IS AND YOU TRY TO LINK IT UP
3 WITH WHAT YOU KNOW. THE FACT THAT THERE ARE
4 STILL, DESPITE THAT, A NUMBER OF
5 ANGIOSARCOMAS THAT WE CANNOT LINK UP WITH ANY
6 REASONABLE PROBABILITY OF BEING CORRECT,
7 INDICATES THAT WE HAVEN'T YET EXCLUDED ALL
8 THE SOURCES OF ANGIOSARCOMA.

9 Q. DOCTOR, I WAS SUPPLIED SOME
10 INFORMATION WHICH INDICATED THAT -- I'LL
11 QUOTE IT TO YOU: YOU WILL TESTIFY THAT EVEN
12 AT THE -- EVEN IF THE EXPOSURE LEVEL AT THE
13 GRASSO HOME WAS A YEARLY AVERAGE OF THREE
14 PARTS PER MILLION, THAT THAT DOSE WOULD BE
15 INSUFFICIENT TO CAUSE MR. GRASSO'S
16 ANGIOSARCOMA. DID YOU TELL ANYBODY THAT?

17 A. I'VE SAID THAT A NUMBER OF TIMES.

18 Q. THAT'S THREE PARTS PER MILLION, 24
19 HOURS A DAY?

20 A. IF THAT ASSUMPTION WAS MADE BASED ON
21 THE CHARACTERISTICS OF HIS DISEASE, HIS ONSET,
22 THE PROGRESSION OF THE DISEASE, I'D STILL
23 DRAW THAT CONCLUSION.

24 Q. NOW, GETTING BACK TO HOW VINYL
25 CHLORIDE IS HANDLED IN THE BODY, YOU'VE

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1 SHOWED US SOME ACTUAL TISSUE SLIDES, I
2 BELIEVE. WERE THOSE SLIDES TAKEN FROM
3 GOODRICH WORKERS WHO HAD ANGIOSARCOMA?

4 A. AND THOSE WITHOUT ANGIOSARCOMA.

5 Q. BUT THEY WERE FROM GOODRICH WORKERS?

6 A. THOSE PARTICULAR SLIDES, YES.

7 Q. AND WHEN YOU WERE TALKING ABOUT HOW
8 THE LIVER METABOLISES OR CHANGES VINYL
9 CHLORIDE, YOU -- AND YOU HAD A SLIDE ON
10 THERE SHOWING THREE DIFFERENT LEVELS OF
11 METABOLIZATION. YOU KEPT REFERRING TO WE HAVE
12 DEVELOPED THIS APPROACH. WHO IS THE WE THAT
13 YOU REFER TO?

14 A. WELL, IT'S SORT OF UNFAIR TO SAY I
15 DID IT, SINCE WE ARE MULTIPLE WORKERS IN THE
16 AREA AND ALSO THE FACT THAT THERE ARE OTHER
17 COLLEAGUES AT OTHER INSTITUTIONS WHO HAVE DONE
18 IT. SO, I USE WE IN AN EDITORIAL SENSE. IT'S
19 SIMPLY INDICATING THAT WE'VE DONE SOME WORK
20 OURSELVES.

21 Q. WHO IS THE WE WE'VE DONE --

22 A. MYSELF, MY BIOCHEMISTS, MY
23 IMMUNOLOGISTS, MY LABORATORY TECHNICIANS, MY
24 COLLEAGUES WHO DO THE HISTOLOGY. NOT
25 EVERYTHING THAT WE PRESENT IS PERSONALLY DONE

BFG10058

2110161

1 BY ME. I MEAN, I'M NOT CAPABLE --

2 Q. I UNDERSTAND THAT. I JUST WANT TO BE
3 CLEAR. BECAUSE YOU MENTION SOME WORK WAS DONE
4 BY THE DOW CHEMICAL COMPANY?

5 A. YES.

6 Q. DID YOU WORK WITH THEM?

7 A. THERE ARE TWO VERY PROMINENT
8 CHEMISTS WHO HAVE DONE A GREAT DEAL OF THE
9 RADIOACTIVE METABOLISM OF VINYL CHLORIDE, ALL
10 RIGHT. AND THEY HAVE PUBLISHED THAT MATERIAL.
11 AND PROBABLY THEY'VE DONE THE CORE WORK
12 RELATED TO THAT.

13 Q. THEY'VE DONE THE PRINCIPAL WORK IN
14 TRYING TO SHOW THAT AT LOWER LEVELS, VINYL
15 CHLORIDE IS NOT A CANCER CAUSING AGENT; IS
16 THAT CORRECT?

17 A. FROM A METABOLIC POINT OF VIEW. FROM
18 A HISTOLOGY POINT OF VIEW, OTHERS HAVE DONE
19 MORE.

20 Q. THAT WAS IT THE DOW CHEMICAL COMPANY
21 WHO DID THAT?

22 A. DOCTOR WATANABY, THAT'S CORRECT.

23 Q. AND THE STUDIES THAT YOU DID --

24 AND WHEN I MEAN YOU, I DON'T MEAN YOU

25 PERSONALLY, I MEAN YOUR WHOLE GROUP -- WITH

21110162

BFG10059

1 REGARD TO THE METABOLISM OF VINYL CHLORIDE IN
2 THE LIVER, WHO FUNDED THOSE STUDIES?

3 A. THAT CAME FROM THREE SOURCES:
4 PRIVATE ENDOWMENT, MANUFACTURING CHEMISTS'
5 ASSOCIATION, AND THE NATIONAL INSTITUTE OF
6 HEALTH.

7 Q. DID THE GOODRICH COMPANY PROVIDE ANY
8 FUNDING FOR THOSE STUDIES?

9 A. NOT THE ONES RELATED TO METABOLISM.
10 THEY PROVIDED SOME OF THE ORIGINAL MATERIAL
11 THAT WE USED FOR DEVELOPING SCREENING TESTS
12 FOR DETECTING THE ANGIOSARCOMA.

13 Q. THAT WAS TO DETERMINE WHETHER THEIR
14 EMPLOYEES ACTUALLY HAD ANGIOSARCOMA, TRYING
15 TO GET IT IN AN EARLY STAGE. IS THAT WHAT YOU
16 MEAN BY SCREENING TESTS?

17 A. NO, WHAT WE WERE WORKING ON IS
18 WHETHER OR NOT WE COULD IDENTIFY GENETIC
19 MARKERS WHICH WOULD TELL US WHICH PEOPLE DO
20 NOT HANDLE CHEMICALS WELL, SPECIFICALLY VINYL
21 CHLORIDE. SO, WE WERE SETTING UP A SYSTEM FOR
22 LOOKING AT WHAT IS CALLED H L A TISSUE TYPING.
23 THAT IS, THERE ARE CERTAIN MOLECULES ON CELLS
24 THAT IDENTIFY IT AS HAVING CERTAIN KINDS OF
25 GENETIC CHARACTERISTICS AND THERE ARE CERTAIN

2110163

BFG10060

1 DISEASES THAT OCCUR WITH MUCH GREATER
2 FREQUENCY IN PEOPLE THAT HAVE THAT KIND OF
3 GENETIC SETUP. AND WE WERE TRYING TO SEE IF
4 WE COULD DESIGN A SYSTEM TO IDENTIFY WHO
5 WOULD BE AT HIGH RISK

6 THE SECOND SET OF STUDIES WE
7 WERE DOING WERE ALSO TO LOOK --

8 Q. LET'S TALK ABOUT THAT FIRST ONE.

9 IT'S FAIR TO SAY THAT
10 DIFFERENT PEOPLE HAVE DIFFERENT SENSITIVITIES
11 TO CANCER CAUSING CHEMICALS; ISN'T IT?

12 A. THAT'S CORRECT.

13 Q. SOME PEOPLE MAY BE ABLE TO WORK WITH
14 IT 40 YEARS AND NEVER HAVE ANY EFFECT AND
15 SOME PEOPLE MAY BE ABLE TO WORK WITH IT FOR
16 THREE YEARS AND DEVELOP ANGIOSARCOMA OF THE
17 OF THE LIVER; ISN'T THAT CORRECT?

18 A. THAT'S A POSSIBILITY.

19 Q. AS A MATTER OF FACT, PEOPLE WHO GOT
20 THE ANGIOSARCOMA OF THE LIVER AT THE GOODRICH
21 PLANT -- AND I BELIEVE AT THE OTHER PVC
22 PLANTS -- WERE, AS I THINK YOU SAID,
23 REACTION CLEANERS, REACTOR CLEANERS?

24 A. MOST OF THEM WERE.

25 Q. HOW MANY OTHER PEOPLE IN THOSE

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BFG10061

1 PLANTS WERE REACTOR CLEANERS OR HAD WORKED AS
2 REACTOR CLEANS AREA AT ONE POINTS IN THEIR
3 LIVES?

4 A. WELL, IN THE SLIDE WE SHOWN WITH
5 THE INDEX CASES IN RED, EVERY ONE THOSE
6 WORKERS, BECAUSE THOSE INDIVIDUALS WERE
7 MATCHED FOR THEIR WORK EXPOSURE AREAS. AND
8 SINCE ALL OF THEM -- SINCE IT WAS THE
9 POLICY OF THE COMPANY THAT EVERYONE HAD TO
10 COME WHEN THEY FIRST WORKED IN THE PLANTS TO
11 WORK AS A POLY CLEANER, ALL OF THEM HAD SOME
12 EXPERIENCE WORKING IN THE REACTORS.

13 Q. SO, ALL OF THE PEOPLE IN THE PLANT
14 AT ONE POINT OR ANOTHER PROBABLY HAD
15 EXPERIENCE -- EXPERIENCED CLEANING REACTORS?

16 A. YES, BUT THE REACTORS WERE TWO TYPES.
17 YOU KNOW, THEY DID HAVE REACTORS THAT HAD TO
18 DO WITH SYNTHETIC RUBBER AND THOSE DOING WITH
19 SYNTHETIC PLASTICS. SO, THOUGH SOME OF THEM
20 WERE IN THE PLANTS WITH VINYL CHLORIDE IN THE
21 ATMOSPHERE, THEY WERE WORKING AT DIFFERENT
22 -- WORKING MORE INTIMATELY WITH DIFFERENT
23 SETS OF CHEMICALS.

24 Q. HOW MANY PEOPLE IN TOTAL AT THE
25 GOODRICH PLANTS WERE EXPOSED TO WHAT YOU

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BFG10062

1 CALLED HIGH LEVELS OF VINYL CHLORIDE. I THINK
2 YOU SAID 50 TO 200 PARTS PER MILLION.

3 A. SOMEWHERE IN THE TUNE OF ABOUT 400,
4 500 OF THE 1,200.

5 Q. AND HOW MANY CASES OF ANGIOSARCOMA
6 WERE THERE WITHIN THAT GROUP?

7 A. IN THE TIME WE LOOKED AT IT, FOUR.

8 Q. AND THERE WERE NO FURTHER --

9 A. NO.

10 Q. -- CASES IDENTIFIED?

11 A. YOU'RE ASKING ME ABOUT THE 1,200
12 PEOPLE WE'VE STUDIED. THOSE WERE PEOPLE
13 EMPLOYED FROM 1974 UNTIL NOW. NOW, IN TOTO,
14 THERE'S BEEN ABOUT 55 HUNDRED EMPLOYEES AT
15 B.F. GOODRICH SINCE THE START OF THE PLANT
16 AND HAVE THEM, THERE'S BEEN 11 CASES OF
17 ANGIOSARCOMA.

18 Q. SO, 55 HUNDRED PEOPLE HAD RELATIVELY
19 HIGH EXPOSURES AND 11 DEVELOPED ANGIOSARCOMA
20 OF THE LIVER?

21 A. I THINK IT WOULD BE FAIR TO SAY THAT
22 PROBABLY ROUGHLY HALF.

23 Q. OKAY. 20 --

24 A. SAY 25.

25 Q. 25 HUNDRED, 11 DEVELOPED

2110166

BFG10063

1 ANGIOSARCOMA.

2 WHY DIDN'T THE OTHER 25,000
3 DOO TO GET IT?

4 MR. PENNEISEN: I EXCEPT --

5 MR. VASSALOTTI: I'M SORRY.

6 BY MR. VASSALOTTI:

7 Q. THE OTHER 0.2,500. 12,533

8 A. WELL, AS I POINTED OUT, THERE IS, AS
9 YOU'VE INDICATED AS A POSSIBILITY, THAT THERE
10 IS A BIOLOGICAL VARIATION IN PEOPLE IN HOW
11 THEY HANDLE THE CHEMICAL. THERE IS, ALSO, A
12 DIFFERENCE BY WHICH THE CHEMICAL HAS THE
13 CHANCE TO PRODUCE THE GENETIC INJURY. NOW,
14 SIMPLY BECAUSE YOU PRODUCE THE AGENT DOES NOT
15 NECESSARILY MEAN YOU'RE GOING TO PRODUCE
16 THOSE GENETIC INJURIES WHICH ARE GOING TO
17 LEAD THE CELL TO EVENTUALLY DEVELOP A
18 MALIGNANCY. NOW, EVEN IN THE ANIMAL STUDIES,
19 THE LARGEST PERCENTAGE THAT WAS ABLE TO BE
20 INDUCED WITH VINYL CHLORIDE EXPOSURE WAS 12
21 PERCENT. THAT MEANT THAT THE MAJORITY OF THE
22 ANIMALS WERE ABLE TO HANDLE THAT WHOLE RANGE
23 OF EXPOSURE WITHOUT THAT MULTIPLE COMPLEX
24 EVENT OCCURRING THAT ALLOWED THE DNA TO BE
25 INJURED.

2110167

BFG10064

1 NOW, IT'S THAT AREA THAT WE
2 REALLY LACK ADEQUATE KNOWLEDGE TO SAY
3 SPECIFICALLY WHY. THERE IS A LIMIT AS TO HOW
4 THESE TOXIC AGENTS CAN MANAGE THEIR TRIP FROM
5 THE CELL TO THE GENETIC MATERIAL. NOW, THOSE
6 THAT GET THROUGH HAVE THOSE POSSIBILITIES OF
7 DEVELOPING THE TUMOR. AND I THINK THAT
8 EXPLAINS, AT LEAST GIVES AN IDEA OF WHY.

9 Q. THAT'S MY POINT. THE FACT THAT NOT A
10 HUNDRED PERCENT OF THE PEOPLE EXPOSED -- AS
11 A MATTER OF FACT, THE MAJORITY OF THE PEOPLE
12 EXPOSED TO THIS CHEMICAL DID NOT DEVELOP
13 ANGIOSARCOMA OF THE LIVER IS NOT AN
14 INDICATION THAT THIS CHEMICAL DOES NOT CAUSE
15 THAT CANCER.

16 A. OH, THERE'S ABSOLUTELY NO DOUBT IN
17 ANYONE'S MINDS, AT LEAST NOT FROM A
18 SCIENTIFIC POINT OF VIEW, THAT VINYL CHLORIDE
19 DOES CAUSE ANGIOSARCOMA. THE QUESTION THAT
20 ONE IS ASKED IS IN EVERY CASE OF ANGIOSARCOMA,
21 IS IT VINYL CHLORIDE. AND THAT, I THINK, HAS
22 TO BE PROVEN BY EPIDEMIOLOGICAL OR BY
23 EXPERIMENTAL DATA.

24 Q. NOW, YOU'VE INDICATED, I THINK, THAT
25 THE LOW -- LOWER LEVEL OF EXPOSURE THAT THE

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1 LIVER METABOLISES THE AMOUNT OF VINYL
2 CHLORIDE THAT GETS INTO THE BLOODSTREAM; IS
3 THAT CORRECT?

4 A. YES.

5 Q. YOU HAVE TO GIVE US VERBAL ANSWER,
6 DOCTOR.

7 A. YES, YES, I'M SORRY.

8 Q. HOW DID YOU DETERMINE THIS? DID YOU
9 DETERMINE THAT OR WAS THAT THE DOW CHEMICAL
10 COMPANY?

11 A. THESE WERE STUDIES DONE AT DOW AND
12 BY OUR OWN CHEMISTS AT THE UNIVERSITY OF
13 LOUISVILLE, DOCTOR WONG.

14 Q. AND WERE THESE IN HUMAN STUDIES OR
15 IN ANIMAL STUDIES?

16 A. THESE WERE ALL IN ANIMAL STUDIES.

17 Q. HOW DID YOU DO THESE ANIMAL STUDIES?

18 A. TAKE AN ANIMAL OF A CERTAIN SPECIE
19 AND GENETIC BREEDING ON AND LET THEM BREATHE
20 IN VINYL CHLORIDE AT DIFFERENT LEVELS OF
21 PARTS PER MILLION AND THEN DETERMINE BY
22 RADIOACTIVELY TAGGING THE VINYL CHLORIDE HOW
23 MUCH OF IT IS CONVERTED INTO ITS BYPRODUCTS
24 AND WHICH ROUTE. AND THIS IS DONE ON THE
25 TISSUE OF THE ANIMAL AFTER THE ANIMAL IS

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BFG10066

1 EXPOSED TO IT. THERE ARE OTHER EXPERIMENTS
2 WHERE ONE ACTUALLY TAKES THE ANIMAL TISSUE
3 FROM A NON-EXPOSED ANIMAL AND ACTUALLY TAKES
4 A CULTURE. WE BREAK DOWN THE CELLS AND
5 GENERATE THEM OUT AND YOU ACTUALLY GROW THE
6 CELLS INDEPENDENTLY AND YOU EXPOSE THEM TO
7 THE AGENT AND THEN WATCH IN THE FLUID THAT
8 THE CELLS ARE LIVING AND HOW MUCH OF THE
9 PRODUCT IS PRODUCED.

10 Q. SO, YOU EXPOSED ANIMALS, RATS,
11 HAMSTERS, MICE, WHATEVER, TO AIR AND VINYL
12 CHLORIDE, MEASURED WHAT HAPPENED TO THE VINYL
13 CHLORIDE. AND THESE STUDIES SHOWED THAT AT
14 LOWER LEVELS UNDER THOSE SITUATIONS AT LOWER
15 LEVELS OF EXPOSURE -- AND WHAT DO WE MEAN
16 BY LOWER LEVELS OF EXPOSURE?

17 A. BY LOWER LEVELS, I'M USUALLY
18 SPEAKING ABOUT UNDER 25 PARTS PER MILLION.

19 Q. AND AT LOWER LEVELS OF EXPOSURE, THE
20 LIVER OF THESE ANIMALS METABOLIZED ALL OF THE
21 VINYL CHLORIDE AND RESULTED IN NON CANCER
22 CAUSING METABOLITES; IS THAT CORRECT?

23 A. THAT'S THE CONCLUSION THAT WAS DRAWN
24 ON THE BASIS OF THE FACT THAT NONE OF THE
25 ANIMALS EXPOSED AND WERE ALLOWED TO LIVE

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BFG10067

1 DEVELOPED THAT KIND OF TUMOR, THAT THERE WAS
2 NO EVIDENCE THAT WHEN THESE ANIMALS WERE
3 EXPOSED, THAT THE LIVER CELLS SHOWED
4 HISTOLOGICAL EVIDENCE OR BIOCHEMICAL EVIDENCE
5 OF INJURY, AND THAT THE MATERIALS, THE
6 SUBSTANCES THAT DETOXYIFY THESE AGENTS WAS IN
7 SUFFICIENT QUANTITIES SO THAT LIVER CELL
8 DIDN'T HAVE TO MAKE MORE.

9 THE COURT: MR. VASSALOTTI,
10 WHEN YOU REACH A POINT WHERE YOU WANT TO STOP,
11 WE'LL TAKE OUR RECESS.

12 MR. VASSALOTTI: YOUR HONOR,
13 I'D JUST LIKE TO GO ON WITH A COUPLE MORE
14 QUESTIONS AT THIS POINT.

15 THE COURT: I'LL LEAVE IT AT
16 YOUR DISCRETION.

17 BY MR. VASSALOTTI:

18 Q. DOCTOR, YOU STARTED AT THE BEGINNING
19 OF YOUR TESTIMONY THIS MORNING AND YOU SAID
20 THAT THE MAJOR FUNCTION OF THE LIVER IS TO
21 DETOXYIFY CHEMICAL AGENTS -- NOT SO MUCH
22 CHEMICAL AGENTS, ANY FOREIGN AGENTS IN OUR
23 BODY; IS THAT CORRECT?

24 A. WELL, IT IS THE MAJOR DETOXYIFYING.
25 IT IS NOT THE ONLY ONE.

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BFG10068

1 Q. THAT IS WHAT I MEANT TO SAY. THE
2 LIVER IS THE PART OF OUR BODY THAT TRIES TO
3 CLEAN OUT IMPURITIES OR THINGS THAT SHOULD
4 NOT BE THERE AND IT DOES IT BY METABOLIZING
5 THEM?

6 A. YES.

7 Q. NOW, FROM YOUR ANIMAL STUDIES, IT
8 APPEARS AS THOUGH THE MORE VINYL CHLORIDE
9 THAT WAS GIVEN TO THESE ANIMALS -- AS MORE
10 VINYL CHLORIDE WAS GIVEN TO THESE ANIMALS,
11 THE LIVER REACHED A LEVEL WHERE IT COULDN'T
12 METABOLIZE IT FAST ENOUGH; IS THAT CORRECT?

13 A. THAT IS CORRECT.

14 Q. IS THAT A FAIR CHARACTERIZATION?

15 A. THAT IS CORRECT.

16 Q. AND THESE ANIMALS WERE ONLY EXPOSED
17 TO VINYL CHLORIDE?

18 A. THAT IS CORRECT.

19 Q. IN MR. GRASSO'S CASE, YOU WERE AWARE
20 THAT HE WORKED AT AN A CHEMICAL PLANT FOR
21 OVER 20 YEARS, WEREN'T YOU?

22 A. YES.

23 Q. WERE YOU AWARE THAT HE WAS ALSO
24 EXPOSED TO VARIOUS TYPES OF ORGANIC AND
25 INORGANIC CHEMICALS THERE?

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1 A. YES.

2 Q. WOULDN'T HIS LIVER BE WORKING TRYING
3 TO METABOLIZE THE MATERIALS THAT HE WAS
4 EXPOSED TO AT DUPONT?

5 A. YES.

6 Q. AND THAT'S DIFFERENT FROM THE
7 ANIMALS THAT YOU STUDIED WHO WERE ONLY
8 EXPOSED TO VINYL CHLORIDE; IS THAT CORRECT?

9 A. YES.

10 Q. HAVE YOU EVER MADE ANY ANIMAL
11 STUDIES WHERE, IN ADDITION TO EXPOSURE TO
12 VINYL CHLORIDE, THE ANIMALS WERE EXPOSED TO
13 MULTIPLE OTHER CHEMICAL AGENTS?

14 A. OUR GROUP HAS PARTICIPATED IN SUCH
15 STUDIES. WE HAVE NOT CONDUCTED THEM.

16 Q. AND ISN'T IT A FACT THAT MR. GRASSO
17 OR THE ANIMALS IN THE STUDY ARE EXPOSED TO
18 OTHER CHEMICAL AGENTS, IN THIS CASE TO VINYL
19 CHLORIDE, AFFECT THE WAY THE LIVER -- THE
20 LIVER IS ABLE TO CLEAN OUT OUR SYSTEM AND
21 METABOLIZE THIS MATERIAL?

22 A. YES.

23 Q. IN OTHER WORDS, THE VINYL CHLORIDE
24 THAT HE WAS EXPOSED TO WOULD HAVE TO STAND IN
25 LINE AND WAIT FOR WHATEVER OTHER TOXINS WERE

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1 IN HIS SYSTEM TO BE CLEANED OUT BY HIS LIVER
2 BEFORE IT WOULD BE METABOLIZED; ISN'T THAT
3 CORRECT?

4 A. WELL, FROM A -- YES AND NO. IN THE
5 SENSE THAT THIS IS -- THE STANDING IN LINE
6 BUSINESS MAY NOT BE CORRECT.

7 Q. WELL, I DON'T MEAN THAT IT ACTUALLY
8 STANDS IN LINE. I'M A LAYMAN, DOCTOR. I DON'T
9 UNDERSTAND EXACTLY HOW THE LIVER WORKS.

10 A. WELL, WHAT YOU'RE SAYING IS THAT
11 THERE WAS A COMPETITION FOR THE ABILITY OF
12 THE LIVER CELL TO GET RID OF THESE SUBSTANCES.
13 AND THAT'S TRUE OF ALL SUBSTANCES. NOW,
14 WHETHER THE LIVER SELECTIVELY TAKES CARE OF
15 ONE AGENT OR ANOTHER, THAT YOU CAN'T BE AS
16 SIMPLISTIC ABOUT IT. THE LIVER WILL DO THAT
17 AT TIMES.

18 Q. DOES IT DO THAT WITH VINYL CHLORIDE?

19 A. PARDON?

20 Q. DOES IT DO THAT WITH VINYL CHLORIDE?

21 A. IT WOULD HAVE TO DEPEND ON A GREAT
22 DEAL WHAT AGENTS IT WAS COMPETING WITH.
23 CERTAIN AGENTS WOULD IMPEDE IT, CERTAIN
24 AGENTS WOULD DO NOTHING AND CERTAIN AGENTS
25 WOULD SPEED IT UP.

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1 Q. WOULD IT BE FAIR TO SAY THAT MR.
2 GRASSO'S EXPOSURE TO THESE CHEMICALS WOULD
3 DEFINITELY AFFECT THE RATE AT WHICH THE VINYL
4 CHLORIDE WAS METABOLIZED IN HIS LIVER?

5 A. I CAN ONLY SPECULATE TO THAT.

6 Q. WHAT WOULD YOUR SPECULATION BE.

7 MR. RENNEISEN: OBJECTION,
8 YOUR HONOR.

9 THE COURT: SUSTAINED. IS IT
10 TIME TO STOP, MR. VASSALOTTI, FOR OUR RECESS?

11 MR. VASSALOTTI: OKAY, YOUR
12 HONOR.

13 THE COURT: LET'S TAKE A TEN
14 MINUTE RECESS, LADIES AND GENTLEMEN.

15 (AT THIS TIME THE JURY LEAVES COURTROOM.)

16 THE COURT: WE'LL STAND IN
17 RECESS FOR TEN MINUTES.

18 (SHORT RECESS.)

19 THE COURT: MR. VASSALOTTI,
20 YOU MAY CONTINUE WITH YOUR CROSS-EXAMINATION.
21 BY MR. VASSALOTTI:

22 Q. DOCTOR TAMBURO, WHEN WE BROKE, WE
23 WERE TALKING ABOUT METABOLISM IN THE LIVER
24 AND HOW THE VARIOUS IMPURITIES WITHIN THE
25 BODY WOULD HAVE TO COMPETE WITH EACH OTHER TO

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1 BE METABOLIZED AND PURIFIED FROM THE LIVER;
2 IS THAT CORRECT?

3 A. YES.

4 Q. YOU MENTIONED THAT VINYL CHLORIDE IS
5 A HYDROCARBON; IS THAT CORRECT?

6 A. I DON'T THINK I DID, BUT IT IS.

7 Q. I THOUGHT YOU TESTIFIED TO THAT IN
8 YOUR DIRECT.

9 ARE ALL OF US EXPOSED TO
10 HYDROCARBONS IN -- FROM OTHER SOURCES THAN
11 VINYL CHLORIDE?

12 A. I THINK THAT'S A REASONABLE
13 ASSUMPTION.

14 Q. AS A MATTER OF FACT, EMISSIONS FROM
15 AUTOMOBILES ARE HYDROCARBONS?

16 A. CORRECT.

17 Q. AND WHEN THESE HYDROCARBONS ARE
18 BREATHED IN OR INHALED AND ABSORBED IN THE
19 BLOODSTREAM, THEY, TOO, HAVE BEEN METABOLIZED
20 BY THE LIVER; IS THAT CORRECT?

21 A. YES.

22 Q. DID YOU GIVE THE -- YOU DIDN'T DO
23 IT. DID THE PEOPLE WHO STUDY THE METABOLISM
24 OF VINYL CHLORIDE IN THE RATS EXPOSE THE RATS
25 TO ANY OTHER HYDROCARBONS?

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1 A. TO MY KNOWLEDGE, I ONLY KNOW OF ONE
2 GROUP THAT HAS DONE ANY LONG TERM EXPERIMENTS
3 OF MULTIPLE AGENTS.

4 Q. YOUR GROUP DIDN'T DO IT, THOUGH?

5 A. NO, WE COLLABORATED WITH THE GROUP
6 THAT DID.

7 Q. AND DID THOSE RESULTS SHOW THERE WAS
8 A COMPETITION BETWEEN THE VARIOUS
9 HYDROCARBONS FOR METABOLISM?

10 A. NO, THIS WAS A STUDY BY DOCTOR
11 RADICKE. WHAT THE STUDY SHOWED WAS THAT THE
12 COMBINED ASSOCIATION OF ALCOHOL AND VINYL
13 CHLORIDE INCREASED THE NUMBER OF TUMORS IN
14 THE ALCOHOL TREATED GROUP IN COMPARISON TO
15 THE VINYL CHLORIDE TREATED OR THE ALCOHOL
16 TREATED ALONE OR THE NONE-TREATED TREATED
17 ALONE.

18 Q. LET'S TALK ABOUT THAT. THAT'S THE
19 RADICKE WORK THAT DOCTOR EPSTEIN TALKED ABOUT.
20 YOU WERE HERE WHEN HE TESTIFIED.

21 A. THAT'S CORRECT.

22 Q. I THINK HE MENTIONED THAT IN A
23 DISCUSSION OF SYNERGISTIC EFFECTS OF
24 CHEMICALS. AGAIN, SYNERGISTIC EFFECTS OF --

25 A. THAT WAS HIS INTERPRETATION. THAT A

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1 SYNERGISTIC EFFECT IS THAT ONE AGENT, WHEN
2 ADDED TO ANOTHER AGENT INCREASES THE NUMBER
3 OF EVENTS THAT WOULD OCCUR THAT IS GREATER
4 THAN ADDING THEM TOGETHER. SO, IF ONE AGENT
5 COULD PRODUCE FIVE EVENTS, ANOTHER AGENT
6 COULD PRODUCE FIVE EVENTS, INSTEAD OF ENDING
7 UP WITH TEN, YOU END UP WITH 15 OR 20 OR SOME
8 NUMBER GREATER THAN THE TEN.

9 Q. NOW, DOCTOR, THESE STUDIES THAT YOUR
10 GROUP HAS CONDUCTED ON THE METABOLISM OF
11 VINYL CHLORIDE, WAS THAT IN ANY WAY FUNDED
12 THE MCA GRANT? YOU MAY HAVE ANSWERED THIS.
13 I'M NOT SURE.

14 A. IN THE PAST, IT HAS. PRESENTLY, IT'S
15 NOT.

16 Q. AND THAT -- THAT WAS THE MCA GRANT
17 THAT YOU TALKED ABOUT YESTERDAY THAT WAS
18 \$250,000 PER YEAR FOR THREE YEARS?

19 A. THE MAJOR RESEARCH THAT WAS DONE
20 WITH THAT GRANT WAS RELATED TO THE H L A
21 GENETIC TISSUE TYPING AND A SMALLER
22 PROPORTION WAS STARTED FOR THE METABOLISM
23 WHICH WE'VE SUBSEQUENTLY CONTINUED WITH
24 PRIVATE RESEARCH FUNDS.

25 Q. DOCTOR, THE SLIDES THAT -- SOME OF

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