

1 IN THE CIRCUIT COURT
2 TWENTIETH JUDICIAL CIRCUIT OF ILLINOIS
 ST. CLAIR COUNTY

3 FRANCES E. KEMNER, et. al.)
)
4 Plaintiffs,)
)
5 VS.) NO: 80-L-970
)
6 MONSANTO COMPANY,)
)
7 Defendant.)

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9
10 REPORT OF PROCEEDINGS

11 Before the HON. RICHARD P. GOLDENHERSH

12 JURY TRIAL

13 July 25, 1985 (morning session)
14

15 APPEARANCES:

16 Mr. Rex Carr
17 Mr. Jerome Seigfreid
 On Behalf of the Plaintiffs;

18 Mr. Kenneth Heineman
19 Mr. Joseph Nassif
 On Behalf of the Defendant.

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23 Debra M. Musielak, CSR, CM
24 Official Court Reporter

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EXHIBITS SUBMITTED ON BEHALF OF THE PLAINTIFF:

Plaintiff's Exhibit No.:

1513	(Dr. Roush - notes)	32	
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920	(report)		54
922	(same as Plf. 1513)	32	
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1 BE IT REMEMBERED, that on the 25th day of July,
2 1985, the same being one of the regular judicial days of said
3 court, the above-styled cause came on regularly for hearing
4 before the HONORABLE RICHARD P. GOLDENHERSH, one of the
5 Judges at the St. Clair County Building, 10 Public Square, in
6 the City of Belleville, County of St. Clair, State of
7 Illinois. Whereupon the following proceedings were had:

8 COURT CONVENED:
9

10 DR. GEORGE ROUSH

11 (being called as a witness on behalf of the Plaintiff under
12 Section 2-1102, upon being previously sworn, continued to
13 testify as follows)

14 CLARIFICATION EXAMINATION

15 BY MR. KENNETH HEINEMAN

16 Q. Roush, when we left off yesterday at noon time, we
17 were just about to talk about Lowell West, sir?

18 A. Yes, sir.

19 Q. Now, with respect to Lowell West, sir, based upon
20 the records that you have before you, would you include
21 Lowell West in Table 1, in the exposed group under one of the
22 cancers listed there?

23 A. No, sir.

24 Q. And why not, sir?

1 A. Because a physician didn't mention the fact that he
2 had a skin tumor, only said he has Chloracne.

3 Q. Now, why in your mind would you differentiate
4 between what the physician reported and what was reported by
5 the individual who the interviewer --

6 A. Well, several things. The physician did
7 examination the man and he did know the condition of his
8 skin, and he knew whether he had any of the cancerous lesions
9 on his face, and not seeing them, he thought there was not
10 any reason for saying this man had a skin cancer. Might have
11 had a lump that was taken off, but it was probably not
12 cancer.

13 Q. All right.

14 A. You'd have to talk to him to get the full story,
15 but that's what the record said.

16 Q. Said you'd have to talk to whom?

17 A. That doctor that made no mention of the skin
18 cancer.

19 Q. All right. Now, did Dr. Suskind have access to
20 those physicians?

21 A. Yes, sir.

22 Q. And prior to classifying those people one way or
23 the other, did he have the opportunity to discuss with his
24 physician --

1 A. Yes.

2 Q. Exactly what his findings were?

3 A. Yes, sir.

4 Q. And did he have the opportunity to discuss what the
5 man told the physician at the time of the physical
6 examination?

7 A. Yes, sir.

8 Q. All right. Now, with respect to Keith Hill, sir.

9 A. Yes, sir.

10 Q. Based upon the records that you have before you,
11 would you include Keith Hill in Table 1 as an exposed person
12 for both bladder cancer and skin, cancer as he's listed here?

13 A. Yes, sir. He was exposed. He did have a malignant
14 mole. That means he had a melanoma, and the doctor so listed
15 it, so that should been reported, he did have a skin cancer
16 called a melanoma.

17 Q. All right, so you would list him for a skin cancer?

18 A. Yes, sir.

19 Q. All right. Now, with respect to the bladder cancer
20 for which Mr. Hill is listed in Plaintiff's Exhibit 1473 C,
21 would you list him for a bladder cancer?

22 A. No, sir.

23 Q. And would you tell us why not?

24 A. The doctor made a specific point of saying the man

1 had a benign bladder neck tumor. That's not a cancer.

2 Q. All right, sir. Now, sir, with respect to Clarence
3 Matheny, sir, based upon the records that you have before
4 you, would you include Mr. Matheny in Table 1 as an exposed
5 person with a cancer?

6 A. Yes, sir.

7 Q. All right. And for what cancer would he be listed?

8 A. Bowel.

9 Q. All right. The bowel -- would the bowel and the
10 colon be equated, we are talking about the same thing?

11 A. Yes.

12 Q. All right. With respect to Mr. Roy Woodall, sir,
13 based on the records that you have before you, would you
14 include Mr. Woodall in Table 1 as an exposed person having a
15 cancer?

16 A. Yes, sir, I would include him because he had a
17 basal cell carcinoma, it was identified as a basal cell
18 carcinoma. The answer is yes, he was exposed and had a skin
19 cancer.

20 Q. Now, with respect to June Martin, sir, based upon
21 the records that you have before you, would you include June
22 Martin in Table 1 as an exposed person who had a cancer?

23 A. Yes. He had a bladder cancer identified by the
24 doctor, and he was exposed.

1 Q. With respect to Frank West, sir, based upon the
2 records that you have before you, would you include Frank
3 West?

4 A. Yes, sir. He was exposed and he had skin cancer.

5 Q. All right. So he would go in Table 1 as an exposed
6 person with a skin cancer?

7 A. Yes, sir.

8 Q. With respect to Mr. James McGinn, sir, based on the
9 records you have before you, would you place him in Table 1
10 as an exposed person with a type of cancer?

11 A. Yes.

12 Q. All right. And where would you place him?

13 A. On exposed skin cancer.

14 Q. Okay. And with respect to Thomas Waldorf, sir,
15 would you place him in Table 1, based upon the records you
16 have before you as an exposed person with a cancer of one
17 sort or another?

18 A. The physician's record was not clear, but in the
19 recording on the physical examination there was no mention of
20 a skin cancer, so it's difficult to say whether he had one or
21 not. I'd put a question mark there. You need more
22 information. You ought to talk to the doctor and read what I
23 couldn't read.

24 Q. So on the copy you have, you can't read it, sir?

1 A. Yes, although the implication is it's not there
2 because it wasn't mentioned, but we don't have the whole
3 record in our hands.

4 Q. All right. Dr. Suskind, of course, did he have the
5 original record?

6 A. Yes, sir.

7 Q. And he could see the original record and talk to
8 the physician?

9 A. Right.

10 Q. So you would say need more information here?

11 A. Yes.

12 Q. Now, with respect to Charles Dunn, sir, based on
13 the records you have before you, would you include Mr. Dunn
14 in Table 1 as an exposed person with a cancer?

15 A. Yes, sir.

16 Q. All right. And what is that based upon, sir?

17 A. Based on the doctor saying he had a skin cancer as
18 well as the workers saying it and the fact he was exposed.

19 Q. And now, Mr. William McClanahan, sir, based upon
20 the records you have before you, would you include Mr.
21 William McClanahan in Table 1 as an exposed person with a
22 type of cancer?

23 A. Yes, I would like to talk to the physician about
24 that, the fact that Mr. McClanahan denied having a skin

1 cancer, and the doctor -- and the basis for him saying he had
2 one, but, on the physical examination he did find a skin
3 cancer, and that may have influenced his opinion of what was
4 before. But, in fact, he had one at the time he was being
5 examined, so it probably means he had one before, but I'm not
6 sure what the doctor meant when he said skin cancer.

7 Q. So --

8 A. I would say yes, he had skin cancer.

9 Q. So you would include him?

10 A. Yes, sir. But I would like to talk to him and find
11 out why he took, when the worker said he denied he had the
12 cancer, he may have had a pre-malignant one taken off before
13 and the doctor said he probably had had it when he went --
14 could have been a pre-malignant one, so it isn't clear.

15 Q. Now, with respect to Mr. James Lewis, sir, based
16 upon the records that you have before you, would you include
17 Mr. Lewis in Table 1 as a person who is exposed and who would
18 be listed as having some sort of cancer?

19 A. I'd say yes for skin cancer.

20 Q. All right. And what about the --

21 A. And yes for the colon.

22 Q. Or bowel?

23 A. Yes.

24 Q. Now, with respect to Mr. Roy Rogers, sir, based

1 upon the records that you have before you, would you include
2 Mr. Roy Rogers as an exposed person with a cancer?

3 A. He had recurrent skin cancer. I don't understand
4 why the man denied that he had the cancer, that's hard to
5 figure out, but that should be resolved by talking to the
6 physician and understanding what he thought about that.

7 Q. All right.

8 A. And again, I suspect it's because he had
9 pre-cancerous lesions on his face. Now, -- but he was not
10 exposed by as far as Dr. Suskind had said, and I would agree
11 with him.

12 Q. Based upon the records that you have before you?

13 A. Yes, sir. There was no evidence that he had
14 exposure?

15 A. Significant exposure?

16 A. The way I should put that when I say no, he had --
17 he worked in an area where he had probably what would be
18 called minimal exposure, you can't prove he didn't have any.

19 Q. Now what do you mean by that, sir?

20 A. He worked in let's see, what was it? I've
21 forgotten what it is.

22 Q. Why don't we pull out the record,, sir and see if
23 that will help you.

24 A. Right.

1 Q. Let's see if we have that other exhibit.

2 A. Rogers, 422. Yes, 422. Should I go over the
3 record?

4 Q. Yes, please, sir, I just want to be sure we got --
5 since it doesn't have his name on it, I want to be sure we
6 have the right number. Yes, sir.

7 A. Yes.

8 Q. Please go ahead.

9 A. On the work record, he was a production helper up
10 to 1948, and he couldn't have had an exposure at that time.
11 And he worked as a warehouseman shipping, and after three
12 years he was foreman. And, he was in receiving, which means
13 receiving of non-2,4,5-T and non-dioxin exposure from 1960 to
14 1973, and the only time that he really had any possibility of
15 being involved was when he worked in the warehouse from 1949
16 to 1955, and it's hard to say that he had no exposure, but,
17 the exposure was minimal to none.

18 Q. Now, why would you come to that conclusion, sir?

19 A. Because the nature of the operation is that they do
20 not do anything but handle the material that's going to be
21 sent out, and the sending out of the 2,4,5-T that was shipped
22 out was shipped out in that, in three different forms. It
23 was shipped out in bags for awhile, it was shipped out in
24 cardboard drums, I call them, and they shipped them out in

1 aluminum bins. And the exposure of this man, he had nothing
2 to do with bagging, so there was not a dusty job. He really
3 had no exposure. That doesn't mean that there couldn't be a
4 little bit of a material on the surface of the bag. But
5 that's all. And, there could be occasion where they would
6 spill a bag and break it and have to sweep it up, but again,
7 there is little to know personal contact with any place
8 except the little bit that would be on the surface of the
9 bag. So you can't say none, but, so close to being none it
10 wouldn't be compared with the other types of exposures. So I
11 say no exposure.

12 Q. When you say the other types of exposures, what are
13 you talking about?

14 A. In the production unit in making of the 2,4,5-T and
15 TCP.

16 Q. People that were in there every day?

17 A. Yes.

18 Q. Now with respect to Curtis Postlethwite, based upon
19 the record you have before you, would you include Mr.
20 Postlethwite in Table 1 with a person with exposed cancer?

21 A. No, sir, the doctor didn't mention the fact that he
22 had any problem with his skin and made no suggestion that he
23 had anything would be called a skin cancer.

24 Q. So on this occasion you were relying upon -- are

1 you relying upon the report of the physician as opposed to
2 what the individual told the interviewer?

3 A. Yes, sir.

4 Q. And why would you be doing that, sir?

5 A. Because the physician was there and talked to him
6 and to drew his own conclusions about whether that man had a
7 lump that was taken off of his skin maybe, and looking at his
8 skin in general.

9 Q. So the physician was able to examination his skin?

10 A. Yes, sir, and he didn't think it was worthwhile
11 mentioning.

12 Q. Now, with respect to Mr. Homer Scarberry, sir,
13 based upon the information you have before you, would you
14 include Mr. Scarberry among the exposed people in Table 1
15 with a type of cancer?

16 A. No, sir.

17 Q. And can you tell me why not?

18 A. When Mr. Scarberry was operated on in 1972 for a
19 lung tumor, if the man had a lung cancer he would have had an
20 operation in addition to having been opened and having the
21 tumor taken out. He would have had a partial lung resection
22 or a total lung removal if he had cancer, and he didn't have
23 that done. So, I don't believe he had a -- didn't have a
24 lung cancer. And if he had a bowel cancer -- we had another

1 case where a man had a colostomy, where if the tumor is in
2 the distal part of the colon the man has had his rectum taken
3 out and the put an opening in his abdominal wall for drainage
4 of the gastrointestinal content. He didn't have that, and if
5 he didn't have a distal colon, he would have had a partial
6 colectomy or part of the colon taken out, just like President
7 Reagan had part of his colon taken out for only a polyp, so,
8 neither one of those things are cancers. They were both
9 tumors that were found to be benign when they got in and
10 looked at them.

11 Q. Now, sir, you refer to the President Reagan
12 operation?

13 A. Yes.

14 Q. Was not that polyp found to be malignant at the
15 time it was removed?

16 A. Yes. Yes.

17 Q. How would you differentiate that from this
18 statement by this physician?

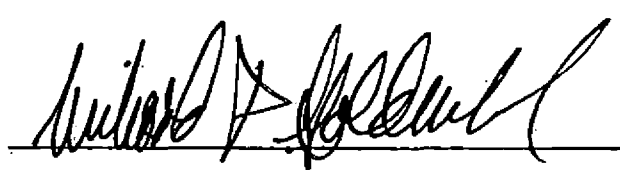
19 A. Because when they got in there and found the tumor
20 and found it was a cancer they did a more radical resection.
21 They took out all of the adjoining colon above and below it,
22 as well as all the blood drainage and supply to that part of
23 the colon they took out. So they do a very wide resection to
24 make sure that they have got all possible cancer, and they

1 STATE OF ILLINOIS)
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2 TWENTIETH JUDICIAL CIRCUIT) SS
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I, RICHARD P. GOLDENHERSH, one of the Judges in and
for the Twentieth Judicial Circuit, do hereby certify that I
have examined the aforesaid transcript of proceedings, and
certify the foregoing to be a true and accurate transcript of
the testimony and proceedings in the above-styled cause.

Dated this _____ day of July, 1985.



HON. RICHARD P. GOLDENHERSH

1 didn't do it in this case.

2 Q. So, because of the information that the doctor
3 recorded, you would not include either?

4 A. That's right.

5 Q. Of those as cancers?

6 A. That's right.

7 Q. Now with respect to Mr. Chester Gorrell, sir, would
8 you include Mr. Gorrell in Table 1, based upon the records
9 you have before you as on exposed person who had a cancer?

10 A. No, sir, and the reason I wouldn't put him exposed
11 is because he was not exposed.

12 Q. And on what do you base that conclusion, sir?

13 A. We did discuss this one before about his exposure.
14 And, what I checked into utilities, just to be sure, the
15 utilities. Mr. Gorrell worked in -- he produced steam that's
16 required and compressed air that's also required, and they
17 compressed ammonia, primarily for refrigeration, and that are
18 the exposures he had, and his time was working in that
19 operation.

20 Q. Would Mr. Gorrell -- he was classified as a utility
21 worker, sir?

22 A. Yes. I don't have that record here. 128.

23 Q. 128?

24 A. Yes. And his name is on it.

1 Q. Okay. As a utility worker, sir, where would he be
2 employed at the Nitro plant?

3 A. Mr. Gorrell -- I've got the names mixed up, I
4 should look at the record. Yes. He was a utilities
5 supervisor from 1945 to 1976. And so he was in that
6 operation where they made steam, compressed air and
7 compressed ammonia.

8 Q. He was a utilities supervisor?

9 A. Yes, sir.

10 Q. Now, would that be in the power plant?

11 A. Yes.

12 Q. Now, the power plant services the plant with power,
13 is that right?

14 A. Yes.

15 Q. But how do they do that?

16 A. By power. They have got pipelines carry the
17 material wherever it's needed, the compressed air and the
18 steam and the ammonia.

19 Q. So would a person who worked in the power plant be
20 exposed to the production facility?

21 A. No, sir.

22 Q. Now, sir, if we go through all of those people that
23 we have just been through, and total up what the conclusions
24 you've reached with respect to the inclusion of them, with

1 respect to Chester Gorrell skin cancer, you would say that
2 skin cancer should not be included?

3 A. That's right. Right.

4 Q. With respect to Mr. Scarberry, there would be no
5 bowel and no lung, correct?

6 A. Correct.

7 Q. Now, with respect to Mr. Postle -- try that one
8 more time. With respect to Mr. Postlethwite, you would not
9 include him in a skin cancer, correct?

10 A. Right.

11 Q. With respect to Mr. Rogers on a skin cancer, you
12 would not include him, is that right?

13 A. That's right.

14 Q. With respect to Mr. Waldorf?

15 A. You skipped those others?

16 Q. Well, those you are including, are you not, sir?

17 A. Yes, yes. You are right. I'm sorry.

18 Q. All of those are being included?

19 A. Yes.

20 Q. Okay. With respect to Mr. Waldorf, that you need
21 more information?

22 A. That's right.

23 Q. So that would be skin?

24 A. Question.

1 Q. Question mark? With respect to Mr. Hill you would
2 not include the bladder?

3 A. That's right.

4 Q. Because it was -- the doctor said it was a benign
5 bladder?

6 A. Right.

7 Q. With respect to Mr. Lowell West, you would not
8 include him on the skin?

9 A. Right.

10 Q. Right? With respect to Mr. John Selby with respect
11 to skin cancer, you would need more information?

12 A. That's right, with respect to Mr. Harry Honaker you
13 would include him but one time?

14 A. Yes.

15 Q. That's right?

16 A. That's right.

17 Q. So you would not include both?

18 A. You can't have two people. The way they record
19 that we have here is -- we are saying that on the Suskind
20 table it talks about persons with cancer, and even though
21 he's got two cancers, he only can have one cancer, can't have
22 two people.

23 Q. The way the data --

24 A. -- is presented.

1 Q. Is presented. Now, what would happen, sir, if you
2 listed him twice?

3 A. It would mean that another person had to have had
4 the cancer. If I only had two people there and one man had
5 two cancers and the other one did not, if I put down on that
6 Table 2 cancers, that would mean they each had one, they
7 can't --

8 Q. Now, sir, with respect to that, you recall the
9 Moses study, do you not?

10 A. Yes, sir.

11 Q. Of the Nitro population?

12 A. Yes, sir.

13 Q. In what fashion did she express the cancers
14 observed?

15 A. She expressed it in the same way that Dr. Suskind
16 expressed it, but she put that extra cancer as a footnote
17 down below the table, also had such and such a cancer.

18 Q. Now, did Dr. Suskind put such a footnote below?

19 A. No, he did not.

20 Q. Dr. Moses did, however?

21 A. Yes.

22 Q. Now, which one of those cancers would you list and
23 which would you not?

24 A. I don't know how you decide.

1 Q. All right. One would go and one would not?

2 A. But the way Suskind has it reported, he doesn't say
3 which type, all he says that has cancer.

4 Q. Well, if Mr. Honaker has a prostate and the
5 leukemia, correct, sir?

6 A. Yes.

7 Q. He does list, and he's exposed, does he say, does
8 he list the prostate cancer along the exposed in the footnote
9 down here?

10 A. Yes. Yes. I think he reported the prostate
11 because the leukemia is missing.

12 Q. So he listed the prostate and not the leukemia?

13 A. Yes. Yes. And prostate, but not for a table.
14 Depends what we are trying to do now.

15 Q. If we are to assume that the leukemia is the one
16 that came out, then we are listing the ones that would come
17 out here, right, not the ones that stayed in?

18 A. Yes, right.

19 Q. So the prostate would not be listed here?

20 A. That's right.

21 Q. Okay. Now with respect to Mr. Edward Volz, sir,
22 said yes on the skin, no on the bladder?

23 A. Yes.

24 Q. Because the doctor said the bladder was benign?

1 A. That's right.

2 Q. So we would take one bladder out for Edward Volz,
3 correct?

4 A. That's right.

5 Q. With respect to Mr. Harry Reynolds, sir, you listed
6 him as not exposed?

7 A. Yes.

8 Q. Therefore, his bladder would be taken out?

9 A. Right.

10 Q. With respect to Mr. Edward McDade, sir, on the
11 skin, you said need more information?

12 A. Yes, sir.

13 Q. What would you do with that?

14 A. Question mark.

15 Q. Question mark on skin. With respect to Mr. John
16 Hein, sir, you said you needed more information there?

17 A. Yes.

18 Q. And what was that for?

19 A. Because he had a tumor of the colon without any
20 further definition and it could well be that he also is a no
21 cancer.

22 Q. All right. Well, should he be removed or should
23 there be a question mark?

24 A. I think he should be removed.

1 Q. You think this should be a no here?

2 A. Yes. I'd like to look at that and see if we
3 recorded it when we went through there correctly.

4 Q. Number 26, sir.

5 A. Yes. Hein. 26. The record here, as I looked at
6 it, it has malignant cancer removed, and so I'd call him a
7 cancer.

8 Q. I'm sorry, sir, what is it you are referring to?

9 A. I had listed him in my list as yes rather than no
10 when I had reviewed them before, and so my question is how I
11 recorded this up here.

12 Q. All right.

13 A. I put down that --

14 Q. Let's make sure we are looking at the right
15 record.

16 MR. CARR: Doctor, did you say you had a list that
17 you prepared?

18 A. Huh?

19 MR. CARR: Did you say you had a list that you
20 prepared?

21 A. I went through those, went through them and
22 recorded what I thought when I went through them.

23 MR. CARR: Where is that list? May I see it?

24 A. Yes, sir.

1 MR. CARR: Would you have it marked, please?

2 A. And here's the other one on skin.

3 MR. CARR: Oh, you have two.

4 A. I can't see the --

5 MR. CARR: I can't hear you.

6 A. I'm trying --

7 MR. CARR: I'm not asking you for an explanation,
8 I'm asking you to speak loud enough so it can be on the
9 record that I can hear you.

10 A. Yes, sir.

11 Q. Maybe that's not the right record, that's part of
12 that Plaintiff's Exhibit or maybe I've got the wrong one.
13 Hein's number 26. Okay, there we are.

14 A. Yes.

15 Q. All right.

16 A. The record shows he had a cecum tumor and I'm still
17 saying I need more information.

18 Q. So you were looking at the Hein record when you
19 recorded this?

20 A. Right.

21 Q. Okay. So need more information, is that correct?

22 A. Yes, sir.

23 Q. All right, so you would put a question mark for
24 Hein under bowel, is that right?

1 A. Yes.

2 Q. And the other Edward Miller and Willard Crites you
3 said you would include?

4 A. Yes.

5 Q. All right. Sir, if we take Plaintiff's Exhibit
6 1474, with respect to the bladder cancers, this exhibit, does
7 this exhibit reflect that there were two reported and three
8 omitted?

9 A. Yes.

10 Q. And you would also omit three?

11 A. Yes.

12 Q. With respect to the colon cancers reported, sir,
13 how many are reported, according to this exhibit?

14 A. Three.

15 Q. And --

16 A. Plus one.

17 Q. One omitted. And with respect to colon, you would
18 take one off?

19 A. Yes.

20 Q. And maybe question another?

21 A. Yes.

22 Q. Now, with respect to Mr. Hein, does it appear that
23 Dr. Suskind included him?

24 A. Yes.

1 Q. Reported on him?

2 A. Yes.

3 Q. Now, with respect to skin cancer, sir, there are
4 how many reported, according to this exhibit?

5 A. Eight.

6 Q. How many are omitted, according to this exhibit?

7 A. Seven.

8 Q. And on your list of skin cancers you would remove
9 how many for sure?

10 A. Four.

11 Q. With respect to those three, what would you need?

12 A. More information.

13 Q. So you would for sure take four off?

14 A. Yes.

15 Q. And perhaps all seven?

16 A. It could well be.

17 Q. But you need more information based upon the
18 information that you have in the records before you?

19 A. All we have is this very limited record, and they
20 had more information.

21 MR. CARR: No, Dr. Roush, they did not. If they
22 did, then Monsanto is in contempt, because we asked for all
23 of the data that Suskind had, and the record is clear on
24 that. I've asked the jury to be instructed to disregard the

1 last statement of the doctor.

2 MR. HEINEMAN: Your Honor, may I respond to that?

3 THE COURT: Sure.

4 MR. HEINEMAN: I believe there has been a great
5 deal of evidence here that Dr. Suskind had available to him,
6 the work records in Nitro, and to my information that
7 information was made available to Mr. Carr, Nitro work
8 records.

9 THE COURT: Well, assuming that that is so, I don't
10 think that addresses the point Mr. Carr made. The objection
11 is sustained. The jury is ordered to disregard that remark.
12 I'm talking about things that have not been made available.
13 So the objection is sustained.

14 Q. (by Mr. Heineman) Dr. Roush, did Dr. Suskind have
15 access to the Nitro work records?

16 A. Yes, sir.

17 Q. All right. Did he have access to Max Galloway?

18 A. Yes, sir.

19 Q. Who is, I think you described him before as what,
20 sir?

21 A. He's environmental man at this time, but he had
22 been personnel before.

23 Q. He was in the Personnel Department at the plant?

24 A. Yes.

1 Q. And, whatever conclusions Suskind made, were they
2 made based upon the information that he had?

3 A. Yes.

4 Q. All right. Now, with respect to the --

5 A. The other thing is he had access to the physician
6 who did the examinations.

7 Q. All right. Through -- would that be through oral
8 communication?

9 A. Yes. Yes.

10 Q. Now, Doctor, with respect to the prostate cancer
11 that's reported here, that is reported, and none omitted
12 according to this Plaintiff's Exhibit 1474?

13 A. Yes, sir.

14 Q. With respect to the leukemia, it's listed as
15 omitted in Plaintiff's 1474?

16 A. Yes, sir.

17 Q. And you would omit that as well?

18 A. For only one purpose, we have got one person with
19 two diseases. The reason that was left off --

20 Q. So which -- you would do either one or the other?

21 A. That's right, and record it someplace else.

22 Q. And so, as Plaintiff's Exhibit 1474 demonstrates,
23 Dr. Suskind reported the prostate and omitted the leukemia,
24 correct?

1 A. Yes, sir.

2 Q. And it could have been done the other way around?

3 A. That's right.

4 Q. Now, with respect to lung cancer, sir, there is one
5 omitted, is that right, according to Plaintiff's Exhibit
6 1474?

7 A. Yes, sir.

8 Q. And would you also omit that lung cancer?

9 A. Yes, sir.

10 Q. So, with respect to a final tally here, sir, on the
11 number of cancers which Mr. Carr listed on Plaintiff's
12 Exhibit 1474 A as omitted, how many of those would you omit?

13 A. I'd have to look at that. Nine.

14 Q. What about the other four?

15 A. I would take off the skin as well, those four,
16 that's all I would do at this time.

17 Q. Because of --

18 A. The question --

19 Q. Question marks?

20 A. Yes.

21 Q. As you sit here right now, you would need more
22 information before you would take those off?

23 A. Yes, sir.

24 Q. Is that right?

1 A. Yes, sir.

2 Q. Dr. Roush, there is, I think, at least one of those
3 people would was included twice for both a skin and a bowel,
4 correct?

5 A. I don't recall which ones they were.

6 Q. Mr. James Lewis?

7 A. Yes.

8 Q. All right. Sir, now why would you include both two
9 cancers in the case of a skin and the bowel, and only one in
10 the case of --

11 A. On Honaker.

12 Q. One in the case of leukemia and prostate?

13 A. It's the way the chart was made up, the table was
14 made up. Because they list skin cancer separately from other
15 cancers.

16 Q. So that one person could be in there twice if he
17 had a skin cancer and something else?

18 A. Yes, sir.

19 Q. Now, that's because why?

20 A. The way the table was prepared. If they would have
21 put the skin cancers with the other cancers, then you
22 wouldn't have done that, you'd only list him once.

23 Q. But in this case skin cancer was listed separately
24 from other cancers?

1 A. Yes, sir.

2 Q. And why was that done?

3 A. Because of our ability to tell in any single person
4 whether -- what is reported skin cancers is truly a skin
5 cancer, and the other is that many people have operations for
6 or have skin cancers taken off that are not recorded
7 anyplace, so the prevalence of how many skin cancers there
8 are happening in the general public is not well defined.

9 Q. So they -- do they need to be analyzed separately?

10 A. Yes, sir.

11 Q. From other cancers?

12 A. Yes, sir.

13 Q. Now, sir, with respect to those persons who are
14 reported in skin cancer, but who were reported in the records
15 to have multiple skin cancers, should they be listed more
16 than once in the skin cancer category?

17 A. No, sir, they only can be listed once on that
18 table.

19 Q. Because of what reason, sir?

20 A. One man got multiple skin cancer is the same as the
21 man having one cancer, as far as that table is concerned.

22 Q. One which kind of cancer?

23 A. Skin cancer.

24 Q. All right. So whether it's one or more skin

1 cancers, there will be a listing in skin cancer?

2 A. That's right.

3 Q. And whether there is one or more other types of
4 cancers, it will be listed once in other cancers?

5 A. Yes, sir.

6 Q. And the only time they will appear twice is if they
7 have a skin and another?

8 A. That's right.

9 Q. Okay. Now, sir, with respect to the Marion Moses
10 study of the Nitro population, you were talking about people
11 that may be minimally exposed, I think, in the case of one of
12 those people. How did Dr. Moses handle that in the Moses
13 study?

14 A. In order to do an epidemiologic study, in a good
15 fashion, we really should be able to identify those who are
16 clearly exposed and those who are clearly not exposed. In
17 the study of dioxin, because of our inability to measure it,
18 we usually go to some kind of a qualitative evaluation, means
19 he had some and he had a lot. And that's exactly what Marion
20 Moses did. She said there were some who clearly had no
21 exposure; there were some who had minimal exposure; some who
22 had moderate, and those who worked in the plant were heavily
23 exposed. The plant where they made trichlorophenol and where
24 they had the 2,4,5-T they had heavy exposure. So it was

1 clearly a difference of degree of exposure.

2 Q. And, so how does she correlate the data, by what
3 marker?

4 A. She didn't feel comfortable doing that, so she
5 ended up by just comparing those with and without Chloracne.

6 Q. All right, sir. So she did not or did she throw in
7 marginally exposed people with heavily exposed people to
8 arrive at the population?

9 A. She probably mixed them up and just took them, you
10 no, with and without Chloracne.

11 Q. All right. So the marker was Chloracne and not the
12 level of exposure?

13 A. Chloracne means heavily exposed whenever they got
14 it. Know Chloracne means some exposure but considerably less
15 than those who had Chloracne. And the purpose of that is
16 those who have just a little bit, if they are going to have a
17 response, are going to be a little response, and those who
18 have got Chloracne are going to have a significant response.

19 Q. All right. So to that degree can the data in the
20 Moses study be correlated to some sort of level of exposure?

21 A. Yes, sir.

22 Q. Insofar as it is manifested in a Chloracne
23 reaction?

24 A. That's right.

1 MR. HEINEMAN: May I have a moment, Your Honor?

2 THE COURT: Sure. Would this be a good point for a
3 short break?

4 MR. HEINEMAN: That would be fine, Judge.

5 THE COURT: Gentlemen, could I see you at the bench
6 for a minute, please?

7 (Following a Side Bar conversation which was had outside the
8 hearing of the Court Reporter and the jury, the following
9 proceedings were had in open court.)

10 THE COURT: Okay, ladies and gentlemen, we will
11 take a short recess at this time. I would remind you, and
12 this would go for any other breaks that we take, that you are
13 not to discuss this matter among yourself, with anyone
14 outside the jury panel, or as of yet form any opinions or
15 conclusions about the matters on trial. Court will be in a
16 short recess.

17 (Following a recess, these proceedings were had in open
18 court.)

19 Q. (by Mr. Heineman) Dr. Roush, let me hand you what
20 I've had marked as Defendant's Exhibits 922 and 923, they are
21 also marked as Plaintiff's Exhibits 1513 and 1514, you see
22 that, sir?

23 A. Yes, sir.

24 Q. Can you tell us what those are, please?

1 A. Those are -- those two sheets are my work sheets
2 that resulted from my going through those twenty-some records
3 and looking at the complete records for the first time and
4 trying to decide what conclusions I would come to by looking
5 at the records regarding whether they had cancer or not.

6 Q. Now, sir, in court you were shown Plaintiff's
7 Exhibit 1468 for the first time, correct?

8 A. Yes, sir.

9 Q. And at that time did Mr. Carr provide us with a
10 copy, with a set of a copy of the same records?

11 A. Yes, sir.

12 Q. All right. Now, when you prepared Defendant's
13 Exhibits 922 and 923 --

14 MR. CARR: Counsel, let's get the record straight,
15 1468 was supplied to us by you, if that's the group exhibit.
16 Is it not the group exhibit.

17 MR. HEINEMAN: 1468 was among a whole lot of
18 records supplied to you, is it not?

19 MR. CARR: But the point is, you said I supplied it
20 to you. The point is --

21 MR. HEINEMAN: You supplied it to the witness is
22 what I said.

23 MR. CARR: No, you said I supplied it to you for
24 the first time.

1 MR. HEINEMAN: No, sir.

2 MR. CARR: The point -- those are your records you
3 supplied to me by order of Court.

4 MR. HEINEMAN: Those are among many records we
5 supplied to you.

6 MR. CARR: That's correct.

7 MR. HEINEMAN: And you selected this group as
8 Plaintiff's Exhibit 1468.

9 MR. CARR: No doubt about that.

10 MR. HEINEMAN: You gave them to this witness and
11 gave us a copy of that Plaintiff's Exhibit 1468, correct?

12 MR. CARR: No doubt about that either.

13 MR. HEINEMAN: All right. There we are.

14 Q. (by Mr. Heineman) Now, Dr. Roush, in the process
15 of preparing 922 and 923, which set of documents of 1468 did
16 you look at?

17 A. What do you mean which set?

18 Q. Well, this set was here in the courthouse, wasn't
19 it?

20 A. Yes, sir.

21 Q. Did you look at our set?

22 A. Yes, sir.

23 Q. Our set. Okay. Now, I want to get back to the
24 John Hein situation.

1 A. Yes, sir.

2 Q. All right. Now, first of all, let me hand you
3 what's been marked 923 again, Defendant's 923 there, how do
4 you have Mr. Hein listed?

5 A. As having a bowel cancer.

6 Q. All right. And it's not -- you list him as having
7 a cancer?

8 A. Yes, sir.

9 Q. Okay. Now, what is the basis upon which you made
10 that determination when you reviewed the records that we made
11 available to you?

12 A. It was on sheets that were attached to the Hein
13 record rather than just the record here that we are reviewing
14 here.

15 Q. Well, wait a minute, let me go through this pile
16 with you here, sir. Here -- what's that?

17 A. That's Mr. Hein's record as given to us by Suskind.

18 Q. All right. But, also in this pile, sir --

19 A. Yes, sir.

20 Q. -- are those two sheets, are they not?

21 A. Yes, sir.

22 Q. Now, were they attached when you looked at the
23 record, and we were going through this yesterday?

24 A. No.

1 MR. CARR: They were attached. They have always
2 been attached. They were given to you that way, they were
3 put into evidence that way.

4 MR. HEINEMAN: They are not attached right here.

5 MR. CARR: If they are not attached it's because
6 the witness has detached them. They were attached when they
7 were offered and admitted into evidence. They were
8 attached. You have a copy on your desk where they were
9 attached. There were no loose sheets when that exhibit was
10 put into evidence and when the witness had it.

11 MR. HEINEMAN: Mr. Carr, they are loose right now.

12 MR. CARR: Yes, they are loose right now but the
13 witness has had it, and you have had it. And you had the
14 exhibit and it's attached to your sheet. Attached to that
15 sheet. Been attached to the beginning.

16 MR. HEINEMAN: Certainly attached here.

17 MR. CARR: Yes, certainly was attached there.

18 THE COURT: Gentlemen, could I see you at the bench
19 for a minute?

20 (The following Side Bar conversation was had outside the
21 hearing of the jury.)

22 THE COURT: What is the point of all this?

23 MR. HEINEMAN: I want to clear up, Judge, is the
24 fact that the document that demonstrates that Mr. Hein has a

1 malignancy are those two sheets. All right.

2 THE COURT: Okay.

3 MR. HEINEMAN: When he went through this with me
4 yesterday, all he picked up was this. This document doesn't
5 say anything about a malignancy. This does. This was
6 attached to that here. I'm not implying any impropriety on
7 anyone's part. I'm just explaining why he said there was a
8 malignancy when he looked at this sheet with this, and not
9 malignancy when he looked at this alone. That's the point.

10 THE COURT: Maybe I'm missing something, but since
11 they were all supplied, since they were all attached, I mean,
12 why don't you just ask him that. What difference does it
13 make what was attached, what wasn't? It was all given to
14 you.

15 MR. HEINEMAN: All right. Okay, I'm going to get
16 on with that.

17 THE COURT: Okay.

18 (The following proceedings were had in open court.)

19 Q. (by Mr. Heineman) Now, Doctor, let me refer you to
20 this record.

21 A. Yes, sir.

22 Q. Right here. Separately from this, okay?

23 A. Yes, sir.

24 Q. Now, with respect to this portion of the Hein

1 record, tell us what that indicates with respect to his
2 colon? Well, first of all, what is in there in that portion
3 that addresses Mr. Hein's condition with respect to his
4 colon?

5 A. The record says he had a colon tumor removed, and
6 the history as recorded by the physician said he had a colon
7 tumor removed in 1974, and the abnormal findings as listed by
8 the physician was a cecum tumor, and so he had a tumor of the
9 colon.

10 Q. All right, sir. Now, what is listed in here in
11 that portion of the Hein record?

12 A. It lists that he had a carcinoma of the colon with
13 colectomy, and this is the basis why I said that he had a
14 bowel cancer in my notation.

15 Q. All right. Now, what -- in what posture should
16 John Hein be placed as a result of the consideration of both
17 of those records.

18 A. He had a colon cancer, and the interviewer -- and
19 he was exposed.

20 Q. All right. John Hein told the interviewer that he
21 had a bowel cancer?

22 A. Yes.

23 Q. The doctor said there was a colon tumor?

24 A. Yes, sir.

1 Q. This other medical records say it's a malignant
2 tumor?

3 A. Yes, sir.

4 Q. Correct?

5 A. Yes, sir.

6 Q. Now, that being the case, what would be the status
7 of John Hein?

8 A. Colon cancer exposed.

9 Q. So he should be a yes?

10 A. Yes.

11 Q. That being the case, sir, the Hein entry on this
12 page should be, what should be done with it?

13 A. It should be on -- shouldn't be on that list.

14 Q. Should not be on this list?

15 A. That's right.

16 Q. All right. And should Mr. Hein be included as an
17 exposed person with a tumor, with a cancer in Table 1?

18 A. He should be on that exposed list and listed under
19 the cancer of all sites.

20 Q. Cancer of all sites?

21 A. Yes.

22 Q. All right. Now, would you describe for me those
23 two portions of the Hein exhibit.

24 A. This one said that he had a tumor, and that we

1 needed more information, and this extra sheet of paper
2 supplies more information than is available here that said he
3 had a colon cancer.

4 Q. All right.

5 A. You need both.

6 Q. What is this portion here that you have in your
7 right hand?

8 A. This is the summary of all the data that was
9 gathered on Mr. Hein by the Suskind study when they were down
10 in Charleston. That's all the information available.

11 Q. And what does this record -- what is this record
12 regarding Mr. Hein?

13 A. This is several sheets out of apparently all the
14 sheets out of Mr. Hein's medical record at the Nitro plant.
15 It doesn't have a name on top, so I'll have to presume it,
16 but it does describe, it's got his name on it, got a number
17 187, but it talks about he had a burn in the area of his
18 right foot, and the kind of thing you would have in a plant,
19 but then it does say, I don't know the date, but it says 1976
20 that he had an -- in January of '76, he had a carcinoma of
21 the colon with partial resection of his colon. Then the
22 second page is a further, a notation on a pre-employment
23 examination. I don't understand why it's pre-employment
24 examination, but it talks about a malignant resection of -- a

1 malignant -- I can't read the next word, but resection of the
2 colon, and then the next sheet is just a recording of the
3 physical examination forms. But, those -- obviously all
4 three of them were from the medical records at the plant.

5 Q. All right. Now, the medical records at the plant
6 are separate records from the record prepared in the course
7 of the Suskind Nitro morbidity study, is that right?

8 A. Yes, sir.

9 Q. But were they available to Dr. Suskind, the medical
10 records at the plant, when he was making his conclusions?

11 A. Yes, sir.

12 Q. Now, with respect to Defendant's Exhibit 922, which
13 is also Plaintiff's Exhibit 1513, would you tell me what
14 those notations mean at the bottom?

15 A. All right. I took the -- I don't know which one of
16 the charts, no, the other one, just a listing of -- and I
17 went through that list.

18 Q. By that list you are referring to 1473 C?

19 A. Yes. And I divided those up into those with skin
20 cancer and those with cancer of all sites except skin.

21 Q. All right. Now, each of your lists has a title to
22 it, does it not?

23 A. Yes.

24 Q. And what does that title say?

1 A. Suskind Health Effects, Suskind Human Health
2 Effects-2,4,5-T.

3 Q. And does it have any numbers in the upper
4 right-hand corner?

5 A. Yes, sir, it has 1473 and 1474 on both of them.

6 Q. All right. And the numbers of those exhibits here
7 are 1473 C and 1474 A, correct, sir?

8 A. I don't know.

9 Q. You want to look at them?

10 A. That's A, yes.

11 Q. C, this one?

12 A. Yes, sir.

13 Q. All right. Now, so, where did those numbers come
14 from?

15 A. Well, there are 28 there and I divided them up into
16 skin cancers to reflect the Suskind chart separating the skin
17 cancers from the other sites, and so I have one list titled
18 skin cancers, one titled skin cancers, and then I listed all
19 from that list on my work list, so I have all the skin
20 cancers listed according to that file.

21 Q. And how about the other sheet which is exhibit,
22 Defendant's Exhibit 923 and Plaintiff's Exhibit 1514?

23 A. Then after I had taken those skin cancers off, I
24 went down then and picked up all those that were not on the

1 skin cancer list to make a list of twelve. So I have sixteen
2 skin cancers on that list, so the 28, 16 skin cancers and
3 there are 12 other cancer sites.

4 Q. All right. Both of those were taken from this 1473
5 C list?

6 A. Yes, sir.

7 Q. And, the other exhibit also has the same title at
8 the top of it, does it not?

9 A. It has listed Suskind human health effects 2,4,5-T,
10 and then it lists cancer of all sites except skin, that
11 reflects the title that's on the Suskind chart.

12 Q. And in the upper right-hand corner do some numbers
13 appear on that exhibit as well?

14 A. Yes, sir.

15 Q. 1473 and 1474?

16 A. Yes, sir.

17 Q. Are the numbers that appear -- All right. Now,
18 what did you do in preparing each of those exhibits, sir?

19 A. I just went through those records and tried to
20 decide if I were given this responsibility to decide whether
21 they had a cancer or not. I went through them like I had any
22 medical records and drew my conclusion whether they had a
23 skin cancer, cancer of another site, and then I also looked
24 at them to decide whether I thought their exposure was real

1 or not, whether there was exposure or whether there was not
2 exposure.

3 Q. All right. And in doing that, did you also
4 consider Plaintiff's Exhibit 1474?

5 A. Yes, sir.

6 Q. Okay. And how did you consider that?

7 A. I didn't repeat that table or summary of it, what I
8 did was I took that and just tried to decide whether I could
9 identify the bladder cancers there, and primarily I was
10 looking at the ones that were omitted to see whether they
11 were -- whether I would come to the same conclusion.

12 Q. All right. And that would be omitted as reported
13 on Plaintiff's Exhibit 1474 A?

14 A. Yes, sir.

15 Q. And then did you report conclusions on those two
16 documents, those exhibits?

17 A. Yes, sir. Yes, sir.

18 Q. All right. Now, what does this mean here, this
19 thing at the bottom of Exhibit 922?

20 A. I recorded that. I said that there were 16 skin
21 cancers on that list, and I went through it and I said that
22 there were five that would not have been included on that
23 list, that I would take five off.

24 Q. Now, sir, here is your description of the skin

1 cancers?

2 A. Yes, sir.

3 Q. And you've listed four here?

4 A. Yes, sir.

5 Q. Which is the fifth, do you know?

6 A. It has to be either Waldorf -- I have listed
7 Waldorf as no confirmation.

8 Q. So, on your list you would take -- that you
9 prepared originally, you would take Waldorf off?

10 A. The reason when I went back over this is that --
11 when rereading this is I really can't be sure what the
12 physician really recorded. That's the basic difference. A
13 medical record of the physician isn't clearly enough stated
14 so I can really draw conclusions.

15 Q. Is this the one where the copy is bad?

16 A. Yes.

17 Q. And you can't read a portion of it?

18 A. Yes, sir.

19 Q. All right. So that is the -- if you put Waldorf
20 in, that would be the five that you have listed there?

21 A. Yes, sir.

22 Q. All right. With respect to the bladder, are those
23 the three that you have listed there?

24 A. Yes, sir.

1 Q. And how about the bowel, Scarberry listed as one
2 you would take off?

3 A. Yes, sir.

4 Q. How about the lung, Scarberry?

5 A. Yes.

6 Q. And leukemia?

7 A. I -- on my list I said leukemia not recorded by the
8 M.D.

9 Q. Okay. This is the one where there was the prostate
10 and the leukemia?

11 A. Right.

12 Q. And you could not report either one?

13 A. Right.

14 MR. HEINEMAN: I have no further question of the
15 witness at this time, Your Honor.

16 THE COURT: Mr. Carr?

17

18 RECROSS EXAMINATION

19 BY MR. REX CARR

20 Q. Doctor, ordinarily I would start right out with the
21 subject we just left, that's freshest in your mind and the
22 jury's mind, but there is an exhibit I'm missing I need. I
23 will have it at one. So I'd like to start with you back at
24 the beginning of your Clarification Examination by Mr.

1 Heineman. And to refresh your memory in that respect, you
2 started out discussing your visit with Dr. Suskind that you
3 had during our recess?

4 A. Yes, sir.

5 Q. And, as Mr. Heineman has now brought out that's
6 even occurred more recently, you have bills that indicate
7 that you have just paid the Suskind bill for your Krummrich
8 study, is that correct, Dr. Roush?

9 A. Yes, sir.

10 Q. Dr. Roush, when you testified here before the break
11 and before your visit with Suskind, you called this Krummrich
12 study the final report, did you not, sir?

13 A. I called it a final report after Dr. Suskind said
14 to call it the final report.

15 Q. Doctor, you called it the final report before you
16 had the visit with Suskind, did you not, sir?

17 A. I had -- I can't give you the date but I would
18 think that's right.

19 Q. And as a matter of fact you testified in this court
20 on May 31st before your visit with Suskind that this
21 Krummrich study, this exhibit that you got on September 29th,
22 1980, was the final report, didn't you, sir?

23 A. I assumed -- the only problem I've got--

24 Q. Excuse me, my question is simply did you not so

1 testify under oath in this court before you went back and
2 discovered those documents and had your visit with Dr.
3 Suskind?

4 A. Yes, sir.

5 Q. Yes. And, at that time, before you had those other
6 things take place, you considered it the final report, did
7 you not, sir?

8 A. I called it the final report.

9 Q. Well, you called it what you considered it to be,
10 did you not, sir?

11 A. At Dr. Suskind's request.

12 Q. Now, Doctor, again, your testimony under oath
13 before you visited Dr. Suskind, did you recall this
14 testimony, sir --

15 A. I remember discussing it but I --

16 Q. Did you recall that I asked you specifically and
17 your answer was. You did get that final report.

18 MR. HEINEMAN: You have the citation?

19 MR. CARR: 66 and 67 of his testimony of May 31st,
20 this year.

21 Q. (by Mr. Carr) And starting at Page 66, I asked you
22 the questions, the Krummrich study was done, your answer to
23 -- I started to ask you a question you said. "The Krummrich
24 study was done by Suskind and we were not given copies of

1 that report." And then I said, "Well, Doctor, we will get to
2 that shortly, Doctor." You said, "All right." Question:
3 "In any event you haven't read it, is that right?" Your
4 answer was, "I haven't looked at it. I read the final report
5 but not the individual histories." Then my question: "That's
6 what I'm talking about, the final report, you have got that?"
7 Answer: "The final report. You have got that and you have
8 read that? Yes, sir." Do you recall those being your answers
9 under oath at that time, Dr. Roush?

10 A. Yes, sir.

11 Q. You were telling the truth then, weren't you, Dr.
12 Roush?

13 A. I don't know.

14 Q. Dr. Roush, you were aware that this Krummrich study
15 had been analyzed by us, your counsel knew that we had the
16 records, you were coming here to testify as to the head of
17 the department?

18 A. Yes, sir.

19 Q. Those people -- and, you do know the difference
20 between something that is the truth and is not the truth,
21 don't you, sir?

22 A. Yes, sir.

23 Q. And, when you testified that you read the final
24 report, you were testifying to that, to the truth, weren't

1 you, Dr. Roush?

2 A. I was testifying that I had read the report, not
3 the final report..

4 Q. Doctor, this is your language, not mine, see that
5 sir, where it says your words, sir, the final report, I read
6 the final report, you didn't say I read the report, you said
7 I read the final report, didn't you, Dr. Roush?

8 A. Yes, sir.

9 Q. Doctor, all this business about getting this
10 correspondence and those other things that you all delivered
11 to me last week, last Friday, for the first time --

12 A. Yes, sir.

13 Q. This all came about because you were concerned that
14 you had testified that you had the final report and that you
15 had not given it to the workers, and you knew that during our
16 break that I gave it to the workers, you knew all that,
17 didn't you, sir?

18 A. No, sir.

19 MR. HEINEMAN: Object, Your Honor, are you
20 suggesting those documents were created, Mr. Carr, at that
21 time?

22 MR. CARR: Counsel, I have no knowledge of where
23 those documents were or how they came to be, how long
24 Monsanto knew this was a final report. I do know this, that

1 among the documents you gave me was a voucher dated May 30th,
2 1985, in which Dr. Sprall had written on it Final Report
3 Payment, I know that. That took place before the break, as
4 well.

5 MR. HEINEMAN: This testimony is on the 31st,
6 correct, sir?

7 MR. CARR: That's correct. Well you couldn't
8 hardly get the bill dated May 30th, counsel, it was dated in
9 Cincinnati May 30, couldn't very well have gotten it and
10 marked it Final Payment, final bill in time for Dr. Roush to
11 know about it and testify here the very next day. The bill
12 counsel, if you recall is dated May 30th, dated at
13 Cincinnati.

14 MR. HEINEMAN: Didn't he tell you about a prior
15 phone call before the visit, Mr. Carr?

16 MR. CARR: Counsel, he told me so many things about
17 those calls and about those conversations with Dr. Suskind,
18 it's difficult for me to keep it straight.

19 THE COURT: Objection is overruled. You may
20 proceed, Mr. Carr.

21 Q. (by Mr. Carr) Doctor, in any event, you now are
22 aware of the fact that you had information in your hands and
23 Monsanto's hands since September 29th, 1980 and you had not
24 given it to your workers, isn't that right?

1 A. Yes, sir.

2 Q. Yes. Doctor, you've also brought out here with Mr.
3 Heineman that you have given information to the workers as to
4 the effects of dioxin and you told them about how dioxin is
5 harmful, you recall Mr. Heineman just going through that with
6 you, I think it was yesterday or the day before yesterday?

7 A. Yes, sir.

8 Q. Now, you went through all your records, didn't you,
9 Dr. Roush, to try to find documents that would support the
10 thesis that Mr. Heineman was going to bring bring here that
11 you had informed your workers as to the health effects of
12 dioxin. You've made a study for that, didn't you, sir, find
13 out what documents you had?

14 A. I went back to clarify in my mind what had been
15 given.

16 Q. Yes. You went back as far as 1979, didn't you,
17 sir?

18 A. I didn't limit it on time.

19 Q. You went back then as far as you could to find out
20 what you told the workers about dioxin and the health
21 effects, didn't you, sir?

22 A. That's right.

23 Q. Sir?

24 A. Yes, sir.

1 Q. And you brought in that information, didn't you,
2 the totality of the information that you and others, I take
3 it, discovered as to the health effect of dioxin, did you do
4 that?

5 A. Yes, sir.

6 Q. Sir?

7 A. Yes, sir.

8 Q. And that was Monsanto's Exhibit 920, wasn't it,
9 sir?

10 A. I don't know.

11 Q. I just had it here a second ago, Your Honor. Here,
12 I have it now. You recall the testimony that Mr. Heineman
13 was bringing up for clarification, had to do with the fact
14 that we had pointed out, that you had pointed out to others,
15 people that you were going to contract with, people that had
16 the ability to sue you, that you had pointed out, and by you,
17 I mean Monsanto, you had pointed out the various problems
18 that scientists suspect of being caused by dioxin, including
19 cancer, liver, nerve changes, all this, that's shown on
20 Exhibit 1494 D, you recall that?

21 A. I remember that exhibit.

22 Q. You recall that he asked you about Exhibit 920, you
23 have of Monsanto Exhibit 920, or did you take it, counsel?

24 MR. HEINEMAN: I think it's here.

1 MR. CARR: All right, fine.

2 Q. (by Mr. Carr) I hand you now Defendant's Exhibit
3 920, and ask you if -- could you mark this? Ask you to look
4 at Plaintiff's Exhibit 1515 and see if that isn't a page
5 taken from Monsanto Exhibit 920, that is Roman Numeral II-3?

6 A. Yes, sir.

7 MR. CARR: Offer 1515 into evidence, if it please
8 the Court?

9 MR. HEINEMAN: May I see it, please?

10 MR. CARR: Sure.

11 THE COURT: Any objections?

12 MR. HEINEMAN: Your Honor, I would -- one moment.
13 Your Honor, I would object only if he offers just this part
14 of it. Can't we have the entire exhibit in, and refer to
15 this page? I think it would be helpful to the jury to have
16 the whole exhibit.

17 MR. CARR: I have no objection to the entire
18 exhibit, Your Honor. Fine with me.

19 THE COURT: Fine. It's all admitted into
20 evidence. 920 is admitted into evidence by agreement, Page
21 1515 being part of an admitted exhibit, is admitted into
22 evidence.

23 Q. (by Mr. Carr) Doctor, what do you really tell the
24 workers that the health hazards are associated with dioxin in

1 this Exhibit 1515?

2 A. We tell them that there are chlorinated
3 dibenzo-dioxins found in chlorophenols and it states that
4 there is much concern about by environmentalists and
5 government officials over their potential health hazards, and
6 very little is known about the potential toxicity of dioxin,
7 what exposure to dioxins may result in skin a condition
8 called Chloracne, there may be reversible liver effects as
9 well.

10 Q. So you actually tell them two things, that you can
11 get a skin condition called Chloracne, and that some
12 reversible liver effects have been reported, don't you, sir?

13 A. Yes, sir.

14 Q. Now, by reversible, you mean to tell them that
15 there are liver effects that will go away, will have no long
16 lasting consequences, don't you, sir?

17 A. Yes, sir.

18 Q. And, that is all you tell the workers, don't you,
19 sir?

20 A. Yes, sir.

21 Q. You don't tell them about what you told the workers
22 that were going to work for you, and that could sue you, that
23 they are suspected of causing certain types of cancers, you
24 don't tell them that, do you, sir?

1 A. No, sir.

2 Q. And you, of course, knew that in 1979, didn't you,
3 sir?

4 A. Yes, sir.

5 Q. You don't tell your workers that it can cause liver
6 and nerve changes, do you, sir?

7 A. No, sir.

8 Q. You knew that in 1979, didn't you?

9 A. Yes, sir.

10 Q. Sir?

11 A. Yes, sir.

12 Q. You don't tell them that there can be other
13 possible injuries at certain concentrations, do you, sir?

14 A. No, sir.

15 Q. And you knew that as well, didn't you, sir?

16 A. Yes, sir.

17 Q. As a matter of fact, those things that are listed
18 in Plaintiff's Exhibit 1267 A, that are the toxic effects of
19 2,3,7,8-TCDD in man, all of those things have been known,
20 were all known in 1979, weren't they, sir?

21 A. No, sir.

22 Q. They weren't known? Which of those things were not
23 known in 1979?

24 A. There are a number of those things --

1 Q. Which things were not known in 1979?

2 MR. HEINEMAN: Objection.

3 A. Cardiovascular disorders.

4 MR. HEINEMAN: Doctor, please let me make my
5 objection. All right?

6 A. Yes, sir.

7 MR. HEINEMAN: He interrupted his answer. He
8 started to say a number of things, then Mr. Carr cut him off.

9 THE COURT: Objection is overruled.

10 Q. Cardiovascular disorders were not known as a toxic
11 effect in 1979?

12 A. Questionable.

13 Q. Doctor, my question is it was known and reported in
14 1980, this is dated December '79, is it not, sir?

15 A. Yes, sir.

16 Q. It had been reported to be a toxic effect of
17 2,3,7,8-TCDD in man prior to December of '79, had it not,
18 sir?

19 A. No, sir, it was reported -- that list says it but
20 that isn't what is correct.

21 Q. Doctor, now we are back to quarreling about whether
22 or not you personally believe those to be toxic effects or
23 not. We don't need to go through all that. We have gone
24 through that once. The Northwestern people listed it as

1 toxic effects in man in their protocol, did they not, that
2 you paid for, correct, sir?

3 A. Yes, sir.

4 Q. And, Doctor, some scientists had said prior to
5 December of '79, that all of those were possible toxic
6 effects of 2,3,7,8-TCDD exposure in man, did they not, sir?

7 A. No, sir.

8 Q. Sir?

9 A. No, sir.

10 Q. Which ones were not, cardiovascular disorders were
11 mentioned as possible disorders before December of '79, were
12 they not, sir?

13 A. Yes, sir, possible.

14 Q. And urinary tract disorders were also mentioned,
15 were they not, sir? Which one of those toxic effects was not
16 known prior to 1979, or was not known at 1979?

17 A. Cardiovascular should not be on there.

18 Q. Doctor, my question is has it not been reported and
19 has it not been reported by reputable scientists that
20 cardiovascular disorders may result from dioxin exposure?

21 A. No, sir.

22 Q. That has not been reported?

23 A. No, sir.

24 Q. And so whoever wrote that down is either not a

1 reputable scientist, or he is misquoting what somebody said,
2 one of the two?

3 A. No, sir.

4 Q. Well, it's on this list, is it not, sir?

5 A. Yes, sir.

6 Q. And the people at Northwestern are reputable
7 scientists, aren't they, sir?

8 A. Yes.

9 Q. And the people that wrote the Huff-Moore, those
10 studies, are reputable scientists?

11 A. Yes, sir.

12 Q. And included cardiovascular disorders, didn't they?

13 A. No, sir, they put there as a question rather than
14 real, none of -- there has never been anywhere --

15 Q. Doctor, did Northwestern put this in as a question?

16 A. Yes, sir.

17 Q. Where does it say question, where in the protocol
18 that we went through ad nauseum for some length of time,
19 where did she say there was any question about it, they said
20 and we quoted the line from the text, and you read the line
21 of the text, those are the toxic effects in man, didn't they,
22 sir?

23 A. No, sir.

24 Q. Doctor, do you recall reading that line from that

1 text?

2 A. Yes, sir.

3 Q. Did I quote it to you directly?

4 A. You read the line correctly.

5 Q. They said that in that protocol, did they not, sir?

6 A. Yes, sir.

7 Q. Doctor, you did not, and this was known to man, to
8 scientists, to the world, before they put it in this Table 7,
9 wasn't it, sir?

10 A. Known what?

11 Q. The scientific studies that have been made that led
12 to the conclusion that cardiovascular disorders should be
13 included in the list, those studies were performed, the
14 reports were written before December of '79, weren't they,
15 sir?

16 A. No, sir.

17 Q. When were they written then?

18 A. They were written, but they didn't say what you
19 said.

20 Q. Doctor, the studies that Northwestern used in
21 making their statement, and that the people that wrote this
22 article that we went through, those were studies that were
23 performed before December of '79, weren't they, sir?

24 A. Yes, sir.

1 Q. And, you at Monsanto were aware of those studies,
2 weren't you, sir?

3 A. Yes, sir.

4 Q. Now, are there, is there anything in here where
5 studies were not done relating to those disorders?

6 A. I don't understand your question.

7 Q. Is there anything listed here, sir, where the
8 worked not been done prior to December of '79?

9 A. There hadn't been any work done on cardiovascular,
10 urinary tract.

11 Q. Doctor, we just went through the cardiovascular.
12 There was scientific studies made, were there not, sir?

13 A. Yes, sir.

14 Q. Those were made before December of '79, were they
15 not, sir?

16 A. Yes, sir.

17 Q. Is the same thing also true for the urinary and the
18 respiratory and all nose other things listed here, sir, the
19 work in that was done before December of '79, wasn't it, sir?

20 A. Yes, sir.

21 Q. Doctor, the only thing that you mentioned here is
22 reversible liver and Chloracne, isn't that correct, sir?

23 A. Yes, sir.

24 Q. Doctor, what is potential toxicity? What do you

1 mean when you say potential toxicity?

2 A. It's a misuse of the word potential toxicity in
3 this sentence.

4 Q. Doctor, you brought in the exhibit, it is your
5 exhibit. I'm now asking you what is meant by saying
6 potential toxicity.

7 MR. HEINEMAN: Object, Your Honor. He hasn't
8 established that this man was the author of it. He just
9 brought a document in to court. Now, if he wants his opinion
10 on what potential toxicity means, that's one thing, but I
11 think he's asking him to speculate about what the author here
12 meant.

13 THE COURT: Objection is overruled. I don't think
14 that's what the question calls for.

15 A. Would you read back the question?

16 COURT REPORTER: "Doctor, you brought in the
17 exhibit, it is your exhibit. I'm now asking you what is
18 meant by saying potential toxicity?"

19 A. Potential refers to the likely hazard of exposure
20 to dioxin.

21 Q. Doctor, how do you determine potential toxicity?

22 A. Potential toxicity comes from both animal studies
23 as well as human experience.

24 Q. Now, Doctor, there had been done prior to December

1 of 1979 a great deal of animal study work relating to the
2 toxicity of 2,3,7,8-TCDD, had there not, sir?

3 A. Yes, sir.

4 Q. And a lot was known about the potential toxicity of
5 2,3,7,8-TCDD?

6 A. Yes.

7 Q. Barrels and barrels was known, wasn't it, sir?

8 A. Not barrels -- there were a lot of studies.

9 Q. Doctor, it states in here, you say very little is
10 known concerning the potential toxicity of dioxin, is just
11 one hundred percent false, isn't it, sir?

12 A. No, sir.

13 Q. Doctor, a lot was known, you had scientific work
14 had been done with all kinds of animals, you created cancers,
15 you created deaths, you created liver, you created all kinds,
16 ever possible thing that could happen to an animal through a
17 toxic substance had already been done by December of 1979,
18 had it not, sir?

19 A. Yes, sir.

20 Q. And, all that was a large scientific body of
21 information dealing with potential toxicity of dioxin, wasn't
22 it, sir?

23 A. Yes, sir, in the animal.

24 Q. And, Doctor, that is the reason you do the work

1 with the animal, so you'll know the possible, the potential
2 toxicity of when man is exposed to that substance, isn't that
3 correct, sir?

4 A. No, sir.

5 Q. That isn't the reason you do it?

6 A. That's part of it.

7 Q. That is one of the reasons that it's done, isn't
8 it, sir?

9 A. Yes, sir.

10 Q. So as to demonstrate the potential toxicity of the
11 substance?

12 A. No, sir.

13 Q. Sir?

14 A. No, sir.

15 Q. Isn't that the reason the FDA requires that you do
16 animal studies with every drug before you can even use it in
17 the clinic on an experimental basis with humans, it has to go
18 through the animals first, doesn't it, sir?

19 A. Yes, sir.

20 Q. In order to discover the potential toxicity of that
21 drug?

22 A. No, sir.

23 Q. Doctor, why do they put it with the animals, why
24 did the FDA require that every drug that is put on the market

1 in the United States, first, before they can even go and work
2 with humans with it, that it goes through the animal test?

3 A. To determine the possible health effect.

4 Q. And the possible health effect is potential
5 toxicity, isn't it, sir?

6 A. No, sir.

7 Q. When you are talking about toxic effects, aren't
8 you talking about health effects?

9 A. Yes, sir.

10 Q. And, Doctor, then when they do it for those
11 possible health effects, they are dealing with toxicity,
12 aren't they, sir?

13 A. Yes, sir, in the animal.

14 Q. That's exactly what I said, they are doing that
15 before they allow it to go to humans, aren't they?

16 A. Yes, sir.

17 Q. They want to determine the potential toxicity of
18 that substance, don't they, sir?

19 A. No, sir?

20 Q. Sir?

21 A. No, sir.

22 Q. Doctor, is toxicity equivalent to health effects?

23 A. No, sir.

24 Q. When you talk about toxic effects aren't you

1 talking about health effects?

2 A. You may.

3 Q. When you are talking about toxicity here, you are
4 not talking about something in the abstract, you are talking
5 about possible health effects, both in Exhibit 1267 A, and in
6 Exhibit 1515, aren't you, sir, Monsanto Exhibit 920?

7 A. Yes, sir.

8 Q. So they are both talking about the same thing,
9 aren't they, sir?

10 A. No, sir.

11 Q. Doctor, do you understand what you are saying here?

12 A. Yes, sir.

13 Q. This is talking about -- the Exhibit 1267 is
14 talking about health effect in man, is it not, sir?

15 A. Possible health effect.

16 Q. And this is talking about possible health effect,
17 isn't it, sir?

18 A. Yes, sir.

19 Q. All right. So, the possible health effect in man
20 is demonstrated by what happens to animals, isn't it, sir?

21 A. No, sir -- possible, yes, sir.

22 Q. That's what I said, Doctor.

23 A. I'm sorry, yes, sir.

24 Q. Now, a lot is known about the possible health

1 effects in man, isn't it, sir, by virtue of animal studies?

2 A. Yes, sir.

3 Q. Yes. So this statement here where you say that
4 very little is known about concerning the potential toxicity
5 of dioxins is false, isn't it, sir?

6 A. No, sir.

7 Q. Well, Doctor, let's go through it one more time.

8 A. Yes, sir.

9 Q. A lot is known about the potential toxicity of
10 dioxins by virtue of animal studies, isn't it, sir?

11 A. No, sir.

12 Q. Oh, no? Have the animals been studied to determine
13 what the toxic effects upon them are going to be?

14 A. On who?

15 Q. On the animals, sir?

16 A. Yes, sir.

17 Q. So a lot is known about the toxic effects of dioxin
18 on animals, isn't it, sir?

19 A. Yes, sir.

20 Q. That work is done in order to determine what might
21 possibly be the effects upon man, isn't that right, sir?

22 A. Yes, sir.

23 Q. So that information leads to and assists you in
24 determining the potential toxicity of dioxin and other drugs

1 or other substances in man, isn't that correct, sir?

2 A. Yes, sir.

3 Q. So then a lot is known about the potential toxicity
4 of dioxin, isn't it, sir?

5 A. For whom?

6 Q. Doctor, do you enjoy playing this game with me?

7 A. No, sir.

8 MR. HEINEMAN: Objection. Object to the
9 characterization of a game.

10 THE COURT: Objection is overruled.

11 A. Would you repeat the question?

12 Q. You answered the question, Doctor. Doctor, if you
13 don't enjoy then, would you please listen to my questions and
14 answer truthfully, if you can?

15 A. Yes, sir.

16 Q. A lot is known about the potential toxicity of
17 dioxin insofar as it effects animals, isn't that right, sir?

18 A. Yes, sir.

19 Q. And the reason you do the work in animals is to
20 determine what the potential toxicity in man, don't you?

21 A. No, sir?

22 Q. Sir?

23 A. No, sir.

24 Q. What other reasonable --

1 A. To find a possible.

2 Q. Is potential and possible equivalent words?

3 A. Not to me.

4 Q. What does "potential" mean? Have the capacity to
5 do something? Isn't that what it means, sir, that it may do
6 something, not necessarily that it will do it, but that it
7 has the power to do it, has the possibility of doing it?
8 Isn't that what you mean when you say potential?

9 A. No, sir.

10 Q. Doesn't potential mean that it has the power to do
11 it?

12 A. Yes.

13 Q. And when you say that this has the potential
14 toxicity, you mean that it may do it, it has the power to do
15 it, it may not do it, but it has the power to do it?

16 A. Yes, sir.

17 Q. Now, you know that this has the power to do it in
18 the animals?

19 A. Yes, sir.

20 Q. But you don't know whether or not for sure it can
21 do all those things in man, isn't that right, sir?

22 A. Yes, sir.

23 Q. So, it has the possible toxicity to man as shown by
24 the fact that it has toxicity to animals?

1 A. Possible.

2 Q. Yes. And, Doctor, you didn't tell your workers
3 that, did you, sir, in this exhibit?

4 A. Yes, sir.

5 Q. Where did you tell them that, Doctor?

6 A. When we say potential toxicity of dioxins is known
7 --

8 Q. No, no, no, you say very little is known, you don't
9 say it's known. The truth of the fact is that a lot was
10 known but you told them very little was known?

11 A. We are talking about man here.

12 Q. We sure are.

13 A. Yes, sir.

14 Q. That was exactly what my question was aimed at, Dr.
15 Roush?

16 A. Yes, sir.

17 Q. Now, where do you tell them about those possible
18 toxic effects of dioxin, sir?

19 A. We didn't think that there was --

20 Q. My question is where do you tell them that, sir?

21 A. We don't.

22 Q. As a matter of fact, you tell them just the
23 opposite, don't you sir, you tell them that very little is
24 known, don't you, sir?

1 A. Yes, sir.

2 Q. Doctor, is there any other document -- you've had
3 all this time to come up with this information of what you
4 told your workers about the possible health effects of dioxin
5 to counter what you are telling the outside people that can
6 sue you. What other document is there that?

7 MR. HEINEMAN: Objection, Your Honor, about the
8 constant reference to someone who can sue them. Mr. Carr
9 doesn't know that. That isn't evidence in this case. It's
10 just meant to try to inflame the jury, and I object to it.

11 THE COURT: Objection is overruled.

12 Q. Doctor the thrust of my question is what other
13 information do you have, what other document do you have that
14 you can give us that you told your workers about the possible
15 health effects of exposure to dioxin?

16 A. Other documents. --

17 Q. Yes, Doctor?

18 A. In our newspaper that goes out, there have been
19 other statements about the effects of dioxin on man.

20 Q. Where are they, Doctor?

21 A. I don't have them with me.

22 Q. Well, Doctor, I don't have them either, and they
23 were supposed to be produced to me. Doctor, this exhibit
24 dated December of 1979 --

1 A. Yes, sir.

2 Q. Is the best that you at Monsanto can do to come up
3 and demonstrate what you in fact told the workers, isn't that
4 right, sir?

5 A. Yes, sir.

6 THE COURT: Gentlemen, could I see you at the bench
7 for a minute, please?

8 (Following a side bar conversation which was outside the
9 hearing of the Court Reporter and the jury, the following
10 proceedings were had in open court.)

11 Q. Doctor, you have never told anybody else,
12 customers, the public, the people at Sturgeon, you've never
13 told anybody else, other than, or any more than what you've
14 told the workers as shown in Exhibit 1515, or Monsanto's 920,
15 isn't that correct, sir?

16 A. I don't know.

17 Q. Doctor, isn't it a fact that the position that
18 you've taken with your workers, as shown by Exhibit 1515,
19 Monsanto Exhibit 920, isn't it a fact that this is the same
20 position that you at Monsanto have taken with regard to the
21 public that might be exposed to dioxin in your products, to
22 the people at Sturgeon that might be exposed to the dioxin in
23 your chemicals, and to everybody else that has any connection
24 with Monsanto produced dioxins?

1 A. No, sir.

2 Q. What other position have you taken, sir?

3 A. We were concerned --

4 Q. Excuse me, what other position have you taken,
5 other than what is stated in this exhibit?

6 A. I don't know what you mean by position.

7 Q. Doctor, you've taken a position here demonstrated
8 by this document that you brought into court to show how
9 forthcoming you have been about knowledge of dioxin to your
10 workers?

11 A. Yes, sir.

12 Q. And there are no other documents. I want to know,
13 sir, what position have you taken with the world at large,
14 the plaintiffs in this case, your customers of your
15 chemicals, your workers, anybody else other than the position
16 that is manifested and demonstrated and stated in Monsanto
17 Exhibit 920?

18 A. No other document that I know of.

19 Q. Has there been any public -- well, all your public
20 pronouncements come in the way of press releases -- those
21 would be a document, so there isn't anything else then, is
22 there, sir?

23 A. We told the employees at Nitro related to there
24 exposure to dioxin.

1 Q. Did you tell them that in writing?

2 A. No, sir.

3 Q. Doctor, did you have a stenographer write down what
4 you told them?

5 A. We have records that Dr. Suskind was down there and
6 told them about the study.

7 Q. Did you tell them something other than you told the
8 workers at Krummrich as shown in Exhibit 920?

9 A. Yes, sir.

10 Q. What else did you tell them, sir?

11 A. They were given copies of all the tables from the
12 Suskind final draft report, all those tables were presented
13 to them over a period of two or three hours.

14 Q. Doctor, those tables, and we will get to that on
15 this morbidity study in a moment, those tables simply compare
16 the ailments of highly exposed people to people who are not
17 so highly exposed?

18 A. Yes, sir.

19 Q. Doctor, there isn't anything in your studies, in
20 this Suskind study that tells those people whether they are
21 healthy or sick, all they do is compare the extent of
22 sickness. There are no normal reference ranges given in
23 those studies?

24 A. No, sir.

1 Q. And so they are really not given any information
2 other than comparing them to one another, that's all they are
3 given, isn't that right, sir?

4 A. Yes, sir.

5 Q. Doctor, where is the -- is the document where you
6 tell those people that they can have cardiovascular
7 disorders?

8 A. It's in Dr. Suskind's report.

9 Q. Does it say there that they can get a
10 cardiovascular disorder from exposure to dioxin?

11 A. No, sir.

12 Q. But, you know that and we have demonstrated that,
13 that's considered by some scientists as a potential problem
14 with dioxin exposure?

15 A. No, sir.

16 Q. Doctor, didn't we just get through going through
17 that?

18 A. Yes, sir.

19 Q. And, Doctor, what they were told in your morbidity
20 study is that they have the same rate as others in the
21 Kanawha Valley?

22 A. Yes, sir.

23 Q. And you have said that's because the people that
24 live in that valley have an unusual lifestyle that makes them

1 more susceptible to cardiovascular heart disease, isn't that
2 right?

3 A. Yes, sir.

4 Q. You didn't tell those people that exposure to the
5 chemicals that Monsanto puts out in that valley might be a
6 cause of those cardiovascular disorders, did you, sir?

7 A. No, sir.

8 MR. HEINEMAN: Objection, Your Honor, there is no
9 evidence of that.

10 THE COURT: Objection is overruled.

11 Q. And you well know, though, don't you, Doctor, that
12 the chemicals emitted by that plant may well contribute to
13 cause or to cause cardiovascular disorders, you know that,
14 don't you?

15 A. No, sir.

16 Q. Didn't Mr. Heineman suggest to you that because
17 those people in a question, and it was passed over, I don't
18 know that you had an opportunity to respond, but didn't he
19 suggest to you that the cardiovascular disorders in that
20 valley were because of the chemical companies that were lined
21 up there in the valley, you recall him asking that question?

22 A. Yes, sir.

23 Q. And, did you not agree or did you even answer that
24 question?

1 A. No, sir.

2 Q. You didn't answer that, did you, sir?

3 A. No, sir.

4 Q. He just passed that over, hoping that it would
5 appear that Monsanto's position is that the chemicals caused
6 it, but there wouldn't be anything on record to support that
7 isn't that right, sir?

8 A. I don't know.

9 MR. HEINEMAN: Objection.

10 THE COURT: Objection is overruled.

11 Q. Your position, in fact, Monsanto's position in fact
12 is that those chemicals put out by Monsanto and the other
13 chemical companies in that valley haven't caused or
14 contributed to cause the heart disease, isn't that correct,
15 sir?

16 A. Yes, sir.

17 Q. And it is Monsanto's position that the 34 percent
18 higher heart disease death rate in that valley is simply
19 because all the people in that valley live a lifestyle, they
20 eat more fat food, they smoke more, they drink more, they
21 sleep less, they do everything different in that valley in
22 Nitro West, Virginia, in Charleston, West Virginia, they do
23 all those things in that area differently than the rest of
24 us, and that's the reason they have got their heart disease,

1 that is your position, isn't it, Doctor?

2 A. Yes, sir.

3 Q. But you at Monsanto have never examined the people,
4 you have never done a study to determine whether their
5 lifestyle is any difference than anybody else's, isn't that
6 also correct, sir?

7 A. Yes, sir.

8 Q. And it's also correct that you have not one single
9 bit of information, other than the fact that they have got a
10 34 percent higher death rate from heart disease than the rest
11 of the country, you haven't one single bit of information
12 other than that fact, isn't that right, Dr. Roush?

13 A. Yes, sir.

14 Q. Now, and this is something that you've also told
15 your workers there at Nitro, isn't it, sir?

16 A. Yes.

17 Q. You've got a 34 percent higher death rate from
18 heart disease, but it's not caused by the chemicals that you
19 are exposed to, it's caused because you live
20 extraordinarily fast or unusual or live differently than the
21 rest of the country lives. That's what you are telling them
22 in effect?

23 A. No, sir.

24 Q. What are you telling them, sir?

1 A. We are telling them that there is no more mortality
2 in the workers in our plant than there is outside of our
3 plant.

4 Q. In that valley?

5 A. In that valley.

6 Q. Yes.

7 A. And the fact that the workers who aren't exposed to
8 dioxin, who do not have Chloracne, have the same amount of
9 cancer, same amount of cardiovascular disease, and that there
10 is no increase, no difference between the two; says that
11 there is no relationship between their exposure and
12 cardiovascular disease, and that's exactly the same thing
13 that Moses found.

14 Q. Moses said, in effect, that it was the chemicals in
15 the Kanawha Valley?

16 A. No, sir.

17 Q. Didn't she?

18 A. No, sir.

19 Q. Well, we will get into that when I get to the
20 Moses-Selikoff study. Did not Moses and Selikoff point out
21 that the heart rate was higher in the Kanawha Valley than the
22 rest of the country?

23 A. Yes, sir.

24 Q. Did Moses-Selikoff say that that was because of the

1 lifestyle that they had there?

2 A. No, sir.

3 Q. What did they say caused that?

4 A. They didn't say why, just that it was the case.

5 Q. But now your position is that it's the lifestyle
6 and not the chemicals?

7 A. Yes, sir.

8 Q. But Moses-Selikoff didn't take that position, did
9 they?

10 A. Yes, sir.

11 Q. Where did they take that position?

12 A. They took the fact that we found an excess of heart
13 disease, and the same level of excessive heart disease was
14 found in the valley, and saying that that means that our
15 experience within the plant was not exaggerated over the
16 non-exposed.

17 Q. Doctor, everybody in that valley is exposed to
18 those chemicals, this effluent from those chemical plants,
19 isn't that correct, sir?

20 A. Yes, sir.

21 Q. All you are comparing is more heavily exposed with
22 less heavily exposed, with less heavily exposed. That's all
23 you are comparing when you talk about those people in that
24 valley?

1 A. Yes, sir.

2 Q. So, Doctor, you can't use the words unexposed in
3 describing the people in that valley, can you, sir?

4 A. It's so small that you can't measure it.

5 Q. Doctor, there is all kinds of things so small you
6 can't measure it, you are still exposed to it.

7 A. It's possible.

8 Q. Doctor, Moses-Selikoff did not say anywhere that
9 that valley had a different lifestyle than the rest of the
10 country, did they, sir?

11 A. No, sir, they did not.

12 Q. Suskind didn't that say either, did he, sir?

13 A. No, sir.

14 Q. Nobody said that except you and Monsanto, isn't
15 that correct, sir?

16 A. Yes, sir. So did Moses.

17 Q. I thought I just asked you if Moses-Selikoff said
18 that and you said, no, she didn't say that?

19 A. She said there was excess cardiovascular disease.

20 Q. That's exactly what she said, didn't attribute that
21 to the lifestyle, did she, sir?

22 A. Yes, sir.

23 Q. Where did she attribute it to the lifestyle?

24 A. It's implied in that sentence.

1 Q. Because someone has a higher death rate, that is
2 implied that it's from a lifestyle, not from the chemicals?

3 A. Yes, sir.

4 Q. Doctor, were on earth did you go to school? How
5 can you possibly say there are 34 percent people in Kanawha
6 Valley that have higher death rates and that means ipso facto
7 that it's their lifestyle. There could be a million things
8 that could cause that, and that's an exaggeration, other than
9 lifestyle, isn't that right, sir?

10 A. No, sir.

11 Q. Well, where did Moses-Selikoff say that it was the
12 lifestyle? Don't give me the implication, we can read and
13 interpret the words, Doctor, did she say that that higher
14 death rate from heart disease was from lifestyle?

15 A. No, sir.

16 Q. All she said there is a higher death rate from
17 heart disease among the Monsanto plant workers and there is
18 also a higher death rate in that valley, that's what she
19 said, didn't she, sir?

20 A. Yes, sir.

21 Q. And, Doctor, you know as you sit there, you know in
22 your heart and in your mind that those people in that valley
23 live exactly the same way the rest of us live?

24 A. No, sir.

1 Q. You don't know that?

2 A. No, sir.

3 Q. Doctor, why? What makes you say -- they have a
4 higher death rate. What makes you say they live different
5 than the people here in Belleville?

6 A. One of the most heavily studied medical problems
7 today is heart disease, and the risk factors that contribute
8 to heart disease are well described, the magnitude is just
9 horrendous.

10 Q. Yes, I agree.

11 A. All right, smoking, obesity --

12 Q. Yes.

13 A. Cholesterol, high blood pressure, inactivity, all
14 of those are well recognized factors.

15 Q. No doubt about it.

16 A. And there are -- the doctors in Kanawha Valley will
17 talk about the lifestyle abnormalities as the basis for their
18 heart disease, the good ones, the University of West Virginia
19 in Charleston will say the same thing.

20 Q. Doctor, the lifestyle that you are describing will
21 cause heart disease, and it's all through the country?

22 A. Yes, sir.

23 Q. And it's what has gone to make what is the standard
24 death rate in the United States, all those people doing those

1 things all thrown in together make up that standard, doesn't
2 it, sir?

3 A. Yes, sir.

4 Q. All right. Now, so that is taken care of when you
5 look at the standard. Now, the people in Kanawha Valley, has
6 anybody said that that large group of people live differently
7 than anybody else?

8 A. Yes, sir.

9 Q. Who said it?

10 A. The doctors at West Virginia Medical School.

11 Q. Who said it, sir?

12 A. Dr. Waldman, the profes --

13 Q. What did he say?

14 A. He said the people's heart disease that he examined
15 from Nitro was related to their lifestyle.

16 Q. Now, Doctor, that may well be. Isn't what it
17 means, Doctor, if you are overweight, and if you smoke, and
18 if you don't exercise that there is a risk, an important risk
19 that you are going to have heart disease?

20 A. Yes, sir.

21 Q. Now, that's the risk that applies to every person,
22 but that person put in Kanawha Valley, that person that
23 doesn't exercise, and those other things, and has high
24 lipids, that person put in Kanawha Valley has his lifestyle

1 there just as he has the lifestyle elsewhere, and that person
2 is subject along with others to a higher death rate by virtue
3 of the fact that he is in Kanawha Valley?

4 A. No. No, sir.

5 Q. No? Doctor, has anybody said that isn't a fact?

6 A. Yes, sir.

7 Q. Who said that, sir?

8 A. There are populations in the United States where
9 people do not smoke, do not eat meat, do not drink, and just
10 those three factors, and their heart disease is very low.
11 Those people are vegetarians.

12 Q. Nobody is quarreling with that. That goes in to
13 make up the average death?

14 A. No, sir.

15 Q. Doctor, the people at Rush City, a subdivision of
16 East St. Louis, I'm sure you are familiar with it, aren't
17 you, sir?

18 A. I know --

19 MR. HEINEMAN: Object, Your Honor, that has
20 absolutely no relevance to this case.

21 MR. CARR: It has indeed relevance, Your Honor.

22 THE COURT: Go ahead, Mr. Carr.

23 Q. (by Mr. Carr) Those people are living adjacent to
24 the Monsanto Krummrich plant, you know that, don't you, sir?

1 A. Yes, sir.

2 Q. And you know that on occasion they get exposed to
3 chemicals and chemical discharge from that plant that the
4 workers don't get exposed to, you know that, don't you, sir?

5 A. Not that the workers don't get exposed to.

6 Q. Doctor, you know the workers have their -- as soon
7 as a spill takes place, as soon as this valve gets stuck or
8 can't close, or a pipe pops, that chemical goes out and the
9 workers have their alarm system and they immediately take
10 protective measures, don't they, sir?

11 A. Yes, sir.

12 Q. So that to prevent them from being exposed to that
13 escaping chemical?

14 A. Yes, sir.

15 Q. Now the people of Rush City, they don't have those
16 rubber suits and respirators, do they?

17 A. Yes, sir, they do not.

18 Q. That chemical comes down in Rush City, doesn't it,
19 sir?

20 MR. HEINEMAN: Your Honor, may I have this be a
21 continuing objection?

22 THE COURT: Sure.

23 MR. HEINEMAN: To this totally irrelevant line of
24 questioning, which in my view is being offered to introduce

1 inflammatory matters in front of the jury, and I object to it.

2 THE COURT: Objection is overruled. It is
3 relevant, it's not inflammatory. Mr. Carr, you may proceed,
4 I will note it as a continuing objection.

5 Q. (by Mr. Carr) Doctor, in addition to that kind of
6 accidental discharge, the people of Rush City living closer
7 to that chemical plant and those things, because you gave an
8 example the other day about how the closer you are the more
9 risk you have. They have a greater risk to the things that
10 come out of that plant than the people say in Belleville,
11 don't they, sir? Belleville being some five to ten miles
12 from that plant?

13 A. Greater exposure.

14 Q. They have a greater exposure, therefore greater
15 risk?

16 A. Not necessarily.

17 Q. Doctor, I thought you've been telling us all the
18 time that the risk is related to the dose?

19 A. Yes, sir, absolutely.

20 Q. And those people are exposed to greater dose than
21 the people in Belleville, aren't they, sir?

22 A. Yes, sir.

23 Q. Therefore they have a greater risk?

24 A. Depends on the level that will produce an effect.

1 Q. . Whatever is there, they have a greater risk if it
2 is one one-ten-billionth, they have a greater risk than the
3 people in Belleville, who may be exposed to one
4 one-ten-trillionth, isn't that right?

5 A. No, sir.

6 Q. They don't have a greater risk?

7 A. No, sir.

8 Q. Then there is no relationship between dose and
9 exposure or risk?

10 A. No, sir.

11 Q. You are saying there is or is not?

12 A. There is a correlation.

13 Q. There is. And, Doctor, doesn't it follow that the
14 people in Rush City are exposed to a higher level of
15 contaminant coming out of that plant than the people at
16 Belleville?

17 A. Yes, sir.

18 Q. And if there is any risk connected with that
19 exposure, they are at greater risk, aren't they, sir?

20 A. Yes, sir.

21 Q. Now, that same thing, Dr. Roush, is also true for
22 the people of the Kanawha Valley, isn't it, sir?

23 A. What the same is true?

24 Q. The people living closer to Monsanto's plant are at

1 greater risk for accidental exposure, and for just every day
2 exposure to those contaminant discharged by that plant,
3 aren't they, sir?

4 A. No, sir.

5 Q. It's true for the people here in St. Clair County
6 that's connected with the Krummrich Plant at Sauget, it's not
7 true for the people at Kanawha Valley?

8 A. Depends on what chemical you are talking about.

9 Q. Doctor, whatever the chemical may be?

10 A. No, sir.

11 Q. Doctor, did the Krummrich Plant for years
12 manufacture chemicals that had in it 2,3,7,8-TCDD?

13 A. I don't think so.

14 Q. What makes you say you don't think so, Dr. Roush?

15 A. We haven't been able to measure it in most of our
16 chemicals.

17 Q. Doctor, what chemicals haven't you -- how about
18 2,4,5-T?

19 A. 2,4,5-T, yes.

20 Q. Sir?

21 A. Yes, sir.

22 Q. Manufactured for years at Nitro, wasn't it, sir?

23 A. Yes, sir.

24 Q. And dioxin is in that 2,4,5-T at Nitro, no question

1 about that?

2 A. Yes, sir. No, sir.

3 Q. There is also 2,3,7,8-TCDD found in the chemical
4 manufactured at Sauget, Illinois, isn't that correct?

5 A. TCDD, yes.

6 Q. 2,3,7,8-TCDD?

7 A. Some chemicals, yes.

8 Q. Now, Doctor, the people at Kanawha Valley are
9 exposed to that, were exposed to that 2,3,7,8 TCDD, were they
10 not, sir?

11 A. I don't know.

12 Q. Doctor, do you not remember agreeing with me that
13 they are exposed to dioxins put out by that plant, you recall
14 that, sir, your testimony earlier in this case?

15 A. Yes, sir.

16 Q. That was the truth then, wasn't it, sir?

17 A. No, sir, we are talking --

18 Q. Was it a lie then?

19 A. No, sir.

20 Q. Was it a mistake, those people at Kanawha Valley
21 exposed, do they have some exposure to dioxin emitted in the
22 fumes, emitted in the air, in the dust, in however it goes
23 through, do they have some exposure to the dioxin?

24 A. Theoretically.

1 Q. And they have it -- if the dioxin is manufactured
2 there it can and does escape, doesn't it, sir?

3 A. Yes, sir.

4 Q. There was an escape in 1949, wasn't there, sir?

5 A. Some, yes, sir.

6 Q. And the people of Kanawha Valley are exposed to
7 those dioxins that are contained in your effluence, in your
8 gases, in your smoke, in your steam, and in your accidental
9 discharge, and in the dust blowing off from your plant,
10 aren't they, sir?

11 A. Yes, sir.

12 MR. CARR: Your Honor, that would be -- I've gone
13 past noon.

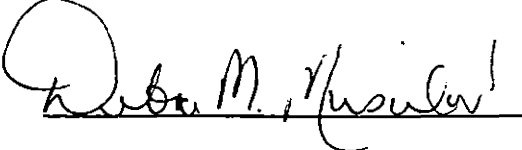
14 THE COURT: Ladies and gentlemen, we will break for
15 lunch at this time. We will start again at one o'clock. The
16 admonishments that I've given you earlier will apply during
17 this lunch break also. Court is in recess for lunch.

18 COURT ADJOURNED:
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1 STATE OF ILLINOIS)
2 TWENTIETH JUDICIAL CIRCUIT) SS
3 COUNTY OF ST. CLAIR)
4

5 I, DEBRA M. MUSIELAK, certify the foregoing to be a
6 true and accurate transcript of the testimony and proceedings
7 in the above-entitled cause.

8 Dated this 26 day of July, 1985.
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IN THE CIRCUIT COURT
TWENTIETH JUDICIAL CIRCUIT OF ILLINOIS
ST. CLAIR COUNTY

FRANCES E. KEMNER, et. al.)
)
Plaintiffs,)
)
VS.) NO: 80-L-970
)
MONSANTO COMPANY,)
)
Defendant.)

REPORT OF PROCEEDINGS
Before the HON. RICHARD P. GOLDENHERSH
JURY TRIAL
July 18, 1985

APPEARANCES:

Mr. Rex Carr
Mr. Jerome Seigfreid
On Behalf of the Plaintiffs;

Mr. Kenneth Heineman
Mr. Joseph Nassif
On Behalf of the Defendant.

Debra M. Musielak, CSR, CM
Official Court Reporter

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EXHIBITS

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EXHIBITS SUBMITTED ON BEHALF OF THE DEFENDANT:

Defendant's Exhibit No.:

909 (paper) 104

1 BE IT REMEMBERED, that on the 17th day of July,
2 1985, the same being one of the regular judicial days of said
3 court, the above-styled cause came on regularly for hearing
4 before the HONORABLE RICHARD P. GOLDENHERSH, one of the
5 Judges at the St. Clair County Building, 10 Public Square, in
6 the City of Belleville, County of St. Clair, State of
7 Illinois. Whereupon the following proceedings were had:

8 COURT CONVENED:

9 THE COURT: Mr. Heineman?

10
11 DR. GEORGE ROUSH

12 (being called as a witness on behalf of the Plaintiff, under
13 Section 2-1102, having been previously sworn, continued to
14 testify as follows)

15 CLARIFICATION EXAMINATION

16 BY MR. KENNETH HEINEMAN

17 Q. Dr. Roush, yesterday during a break, you suggested
18 to me, did you not, sir, there was a statement you had made
19 with respect to porphyrins that you wanted to clarify, is
20 that right?

21 A. Yes, sir.

22 Q. Okay, would you please do so.

23 A. In my example of one of the porphyrins diseases I
24 used the word acute intermittent porphyria. Acute

1 intermittent porphyria I said was related to elevation of
2 uroporphyrins. That was an incorrect statement. In my
3 generalization from talking about porphyrin metabolism and
4 then talking about what causes it, I slipped. And I meant to
5 say -- I should have said porphobilinogen, which is a step
6 before the making of uroporphyrin that goes up to acute
7 intermittent porphyria. The uroporphyrins go up in
8 erythropoietic porphyria. That's another congenital
9 disease. The one in which the uroporphyrins go up, that's
10 associated with skin disease and usually this disease is
11 found by the dermatologist. The man will go to the
12 dermatologist and say every time I go out in the sun I get a
13 blister. Just a little exposure will get a blister, he may
14 say that the urine that he's been putting out will be red.
15 And then they will run uroporphyrins and they will go up in
16 that form. That's about the same as it is in the porphyria
17 cutanea tarda, that's the part of the porphyria associated
18 with dioxin. That's very similar to erythropoietic
19 porphyria.

20 Q. As I understand what you said, erythropoietic
21 porphyria and intermittent porphyria are genetic in origin?

22 A. Yes, sir.

23 Q. Now, Dr. Roush, yesterday when we left off, we were
24 talking about this exhibit which is Plaintiff's Exhibit 1264,

1 as representing some notes taken by Phocion Park at a meeting
2 on February the 9th, 1979. Do you recall our discussion of
3 this last night, sir?

4 A. Yes, sir.

5 Q. And, we mentioned the fact that the 37 parts per
6 billion, it was your decision to tell the EPA that all of it,
7 to assume that all of it was 2,3,7,8, even though Monsanto
8 didn't have any evidence that that was the case, is that
9 right?

10 A. That's right, sir.

11 Q. Now, this third paragraph on those notes has a
12 couple of statements I want to ask you about. Can you read
13 it there, sir? It says first sign of exposure to dioxin is
14 Chloracne?

15 A. Yes, sir.

16 Q. All right. Now, do you recall in that meeting
17 whether that subject was discussed, that is the subject of
18 what would one expect to find from dioxin exposure?

19 A. Yes, sir.

20 Q. All right. Now, would Chloracne be the first sign
21 of dioxin exposure, taking into account dose response
22 relationship, and that's one of the things I wanted to ask
23 you about today.

24 A. Industrial experience very clearly demonstrates

1 that the first effects that you will see with exposure to
2 dioxin is going to be Chloracne at the clinical level.
3 Whether there are some things, if we did a study more than
4 has been done and see if there was something else at the same
5 time is not clear, but the general feeling of everyone having
6 looked at it at a clinical level, the first thing you are
7 going to see is Chloracne.

8 Q. All right. Now, that is if it's in a sufficient
9 dose to produce Chloracne?

10 A. Right. And that's quite clear what those doses
11 will take to produce that, the study by Quigman quite clearly
12 demonstrated it's going to be more than 16 micrograms to
13 produce it, and it may be up to multiples of that before you
14 will see Chloracne.

15 Q. All right. And that's applied to the human skin,
16 is that right?

17 A. (indicates affirmatively.)

18 Q. Now --

19 THE COURT: I'm sorry, I didn't hear an answer to
20 that.

21 A. That's applied to the skin, yes.

22 Q. Now, here in parenthesis is the phrase, "This is an
23 acute toxicity effect?"

24 A. That's what it says, yes, sir.

1 Q. Now, we have been talking about acute effects and
2 chronic effects in the course of your testimony, isn't that
3 right?

4 A. Yes, sir.

5 Q. Now, there are certain things which you have stated
6 you recognized to be acute effects based upon, among other
7 things, the experience at Nitro, is that right?

8 A. And what's been published as well.

9 Q. All right. Now, those acute effects include
10 Chloracne?

11 A. Yes, sir.

12 Q. Correct? Chloracne is not the only acute effect,
13 is it, sir?

14 A. No, sir.

15 Q. Depends upon the dose?

16 A. That's right.

17 Q. Now, the third line said that as of February the
18 9th, 1979, chronic effects of dioxin exposure is not known,
19 do you see that, sir?

20 A. Yes, sir.

21 Q. All right. What discussion did you have with
22 respect to the chronic effects of dioxin?

23 A. Well, the chronic effects as we see in our workers
24 is that if you take them out of exposure, their Chloracne

1 will diminish. We also know that the worker exposed to
2 dioxin on a continuing basis, as in the work place, without
3 an acute exposure may develop Chloracne, and we don't know
4 whether that's an acute effect during the time of exposure
5 with a little bit or what it is, but you can see it with
6 chronic exposure as well.

7 Q. Now, you have testified in this court, have you
8 not, sir, that in your opinion, Chloracne is the chronic
9 effect of dioxin exposure, is that right?

10 A. When you talk about chronic effects, you have to
11 talk about if you've had an exposure, and you stop exposing
12 him what will be left, the literature is replete with
13 demonstrations that all of the effects will go away for
14 practical purposes except for Chloracne. So, after an acute
15 effect you can have chronic effects from just one acute
16 exposure. You can have chronic things that may go on for
17 years. Now, that's different than talking about a man
18 exposed at a chronic low level. The concerns that chronic
19 low level is started with the concern about reproductive
20 problems in Viet Nam. And about the same time they did
21 animal studies that said there are reproductive effects in
22 the rat with exposure to dioxin. And there were several
23 episodes, particularly one I recall is in Portland where they
24 were spraying 2,4,5-T and the question was was there birth

1 defects associated with that and, with further study they
2 showed that wasn't the case, but they still had the lingering
3 problem, does it produce reproductive problems at some level,
4 not at all levels, but under some circumstances can it
5 produce reproductive problems.

6 Q. That's in human beings?

7 A. Yes.

8 Q. Now, what was your feeling, sir, at that time, as
9 to 37 parts per billion, assuming it was all 2,3,7,8, what
10 was your feeling as to whether or not that would be a hazard,
11 taking into account all of the things you've just said?

12 A. We know that dioxin has been present in 2,4,5-T
13 used worldwide as a very effective herbicide and most people
14 had it in their garage and used it for spraying from time to
15 time. So, very widely used. And the numbers aren't huge,
16 but it's something on the order of five million pounds used
17 per year of this material that contains in the parts per
18 million. And I don't know how high you want to go, but it's
19 thought that it was above 5 ppm and considerably higher than
20 that in the 1960's, so there is a concern of those workers
21 exposed at that level at 5 ppm or higher, chronically, over
22 many years whether that has produced any effects including
23 cancer. But, the Government had said that 100 parts per
24 billion is a safe level of dioxin for 2,4,5-T. That was the

1 same in Canada and the same thing in Europe. So, the concern
2 is for that level of exposure. It's dose related. They are
3 not interested and not concerned about background levels,
4 whatever that means when in 1979 we thought that ten parts
5 per billion was a very low dose, very low amount of dioxin,
6 but since then we are not able to get down to the parts per
7 trillion. So, the exposure of the workers or the people who
8 lived in Times Beach at a hundred parts per billion, the
9 people who lived in Sturgeon exposed at less than one part
10 per billion, was not a concern, because we are talking about
11 one part per billion vs. 5 ppm or a thousand to five thousand
12 times higher than the level found at Sturgeon.

13 Q. Now, it was your opinion, sir, in 1979, then, that
14 37 parts per billion, even assuming that it was all 2,3,7,8
15 would not be a hazard?

16 A. That's right.

17 Q. And isn't that your opinion today?

18 A. Yes, sir.

19 Q. Now, following this meeting there were
20 communications between Monsanto and the EPA, is that correct,
21 sir?

22 A. Yes, sir.

23 Q. And, there were oral communications and written
24 communications?

1 A. Yes, sir.

2 Q. Sir, let me hand you what's been marked Defendant's
3 Exhibits 867, you see that, sir?

4 A. Yes, sir.

5 Q. Now, that's a document as to which you got a copy,
6 is that right?

7 A. Yes, sir.

8 Q. And that is a memo from Joe Metcalf to the file
9 dated February the 12th, 1979, isn't that right, sir?

10 A. Yes, sir.

11 Q. Now, would you read aloud, please, the first
12 paragraph of that document?

13 A. "On Friday, February 9, about 7:30 p.m., I called
14 Harry Gilmer and reported that we had detected 0.037 ppm of
15 tetrachlorodibenzo-para-dioxin in our reserve sample of the
16 tank car ruptured at Sturgeon, Missouri, on January 10. The
17 analysis were done in triplicate and the actual values
18 were .034, .036, .040 ppm. The limit of detection for our
19 method was .10 ppm."

20 Q. Excuse me, .010?

21 A. Right.

22 Q. .010 ppm?

23 A. Right.

24 Q. Now, those numbers expressed like that are

1 equivalent to what, sir?

2 A. Put them in parts per billion, it would be 34 parts
3 per billion, 36 parts per billion and 40 parts per billion
4 with unlimited detection at 10 parts per bill.

5 Q. And the number that was reported in the second line
6 by Joe Metcalf to Harry Gilmer was?

7 A. 37 parts per billion, which is about the average of
8 those three.

9 Q. All right. Now, that's a phone call on Friday
10 February the 9th, 1979, at 7:30 p.m., correct?

11 A. Yes.

12 Q. Now, the second paragraph, would you read that,
13 please, sir?

14 A. "He asked if we had identified the isomer, and I
15 told him we didn't have this analytical capability. We
16 doubted that it was the 2,3,7,8 isomer, but couldn't be
17 sure. In response to his question, I told him that it was
18 our opinion that this finding did not change the situation at
19 Sturgeon. The citizens were not at increased risk."

20 Q. And then that indicates in the next paragraph, does
21 it not, that Mr. Metcalf told Mr. Gilmer that he planned to
22 call Western Environmental Services the next morning,
23 correct?

24 A. Yeah.

1 Q. And Western Environmental Service was the clean-up
2 contractor on the site?

3 A. Yes, sir.

4 Q. All right, would you read the fourth paragraph of
5 the memo, please, sir?

6 A. "On February 10th, I tried several times to call
7 Western Environmental Services, (WES), and Gilmer called me
8 back before I got through to them. He had already contacted
9 them and they were using additional safety equipment. I did
10 talk to Roland Miller of WES, who confirmed the conversation
11 with Gilmer. He appreciated the call but was not overly
12 concerned about an additional hazard existed."

13 Q. Would your read the next paragraph, please?

14 A. "Gilmer had talked to several people including
15 Renata Kimbrough and Dr. Doull. They had expressed varying
16 degrees of concern. EPA had chartered an airplane and a
17 sample taken at the site was being flown to Chicago for
18 analysis. He requested that the two portions of our reserve
19 sample that he had promised earlier be taken to Lambert Field
20 where they could be picked up on their return to Kansas
21 city."

22 Q. Okay. Would you read the next paragraph, please,
23 sir?

24 A. "I called Jim Gloeckner, the Krummrich Laboratory

1 Supervisor, who went to the plant, packed the samples and
2 delivered them to the B Building lobby early Saturday morning
3 -- Saturday afternoon."

4 Q. And the next paragraph?

5 A. "I called Dr. Paget at 11:50 a.m. Gilmer had
6 called him around 11 p.m. the night before and was told that
7 our position was not changed."

8 Q. Now, there is an asterisk at the bottom of the page
9 and it says actually University of Illinois at Champaign,
10 correct?

11 A. Yes.

12 Q. And that asterisk refers to, if you look at the
13 third to the last paragraph which you just read a few minutes
14 ago where it says Chicago?

15 A. Yes, sir.

16 Q. All right. So Metcalf is recording his
17 understanding that the EPA had chartered an airplane and a
18 sample taken at the site was being flown to Chicago for
19 analysis. And it turned out it was actually the University
20 of Illinois at Champaign?

21 A. Yes, sir.

22 Q. Correct. Now, if you turn to the next page, sir,
23 and you look at the second to the last paragraph, would you
24 read that, sir, please?

1 A. "Gilmer called me on the morning of February 12th
2 to say that the EPA had detected 9 parts per trillion of
3 2,3,7,8 isomer in the site sample. This information had been
4 given to the press release. I told him that we had heard
5 over the radio Saturday night mentioned only dioxin, one of
6 the most toxic chemicals known."

7 Q. All right, would you read the last paragraph,
8 please?

9 A. "He was unhappy about the release in that he
10 thought the Mayor of Sturgeon, the N & W Railroad, WES,
11 landfill operators in Wright City and Kansas, and Monsanto
12 should have been informed before the information was released
13 to the public. Nevertheless he was quite pleased that the
14 level was so low."

15 Q. Now, those are all conversations that occurred
16 between Joe Metcalf and Harry Gilmer, all things that
17 Monsanto was doing in the few days following this meeting
18 when it was first learned that there were tetra-dioxin
19 isomers in the reserve sample?

20 A. Yes, sir.

21 Q. Now, let me hand you, sir, what's been marked as
22 Defendant's Exhibit No. 875 and this shows, if you look at
23 the fifth page, sir, did you get a copy of this document as
24 well?

1 A. Yes, sir.

2 Q. Now, if we look at this memorandum dated February
3 -- pardon me, not a memorandum, it's a copy of a letter, is
4 it not, sir?

5 A. Yes, sir.

6 Q. To whom?

7 A. Dr. Gilmer of the EPA.

8 Q. From whom?

9 A. From Joe Metcalf of Monsanto.

10 Q. And, this letter puts in writing some of the things
11 that are referred to in the memorandum that we just were
12 talking about, isn't that right?

13 A. Yes, sir.

14 Q. A written letter informing Gilmer officially of
15 some of this information?

16 A. Yes, sir.

17 Q. Now, if you look at the second page of this letter,
18 sir, would you start, read the third paragraph?

19 A. "You asked that I explain why we would not expect
20 the 2,3,7,8 tetrachlorodibenzo-para-dioxin to be present in a
21 significant amount in our product."

22 Q. Would you go on?

23 A. "In our chlorophenol operation our primary products
24 are 4 chlorophenol and 2,4-dichlorophenol. In preparing the

1 4 chlorophenol, we also form the 2-chloro isomer which is
2 separated by distillation and is a component of
3 orthochlorophenol-crude."

4 Q. Yes, sir. Would you continue?

5 A. "In preparing the 2,4-dichlorophenol, we form a
6 small amount of 2,6 isomer and traces of trichlorophenol.
7 Since chlorine attacks the phenol molecule primarily in the
8 ortho and para or the 2,4,6 positions, this trichlorophenol
9 is present as the 2,4,6 isomer. This material is present in
10 high boilers from the distillation of 2,4-dichlorophenol and
11 is another component of orthochloro-crude.

12 Q. Please go on, sir.

13 A. Some tetrachloro-dioxins are formed by the
14 condensation of two molecules of trichlorophenol. The 2,4,6
15 isomer will form the 1,3,6,8 molecule. Whereas the
16 2,4,5-isomer, is needed to produce the 2,3,7,8 dioxin. The
17 2,4,5-trichlorophenol is not produced by the direct
18 chlorination of phenol. It is manufactured by the hydrolysis
19 of tetrachloro-benzene."

20 Q. Now, would you read the next paragraph, please,
21 sir?

22 A. "We cannot say that there is no 2,4,5-isomer in
23 this small trichlorophenol component of
24 orthochlorophenol-crude. But it is certainly not a major

1 constituent. It follows then that the 2,3,7,8
2 tetrachloro-dioxin, if present at all will be only a small
3 fraction of the total tetrachloro-dioxins."

4 Q. Now, sir, did you have conversations with Ed Paget
5 about this time?

6 A. Yes, I did.

7 Q. And who is Ed Paget?

8 A. Dr. Paget is a physician who came to Monsanto just
9 shortly before this episode took place, and he came to us
10 from England where he was running a toxicology laboratory of
11 considerable size and real respect. In addition to that, he
12 was known for his work on drug development with one of the
13 drug companies, so he had had a great deal of very important
14 experience and is well recognized as a toxicologist as well
15 his ability in drug development.

16 Q. Now, sir, at the time that this incident occurred,
17 the Sturgeon spill, was Dr. Paget reporting to you?

18 A. Yes, sir.

19 Q. And, did you have conversations with him with
20 respect to this incident, the Sturgeon spill and this 37
21 parts per billion?

22 A. Yes, sir.

23 Q. All right. Did you communicate with him your
24 decision that the EPA should be informed to assume that the

1 37 parts per billion was all 2,3,7,8?

2 A. Yes, sir. We do that because in toxicology we have
3 to make different assumptions and we will say what would
4 happen if it were all, and therefore we said in this case we
5 will assume it is all 2,3,7,8-tetrachlorodibenzo-dioxin.

6 Q. Now, did you instruct him to inform the EPA of that
7 fact?

8 A. Yes, sir.

9 Q. Now, if you were to assume, sir, that Dr. Paget
10 testified in this courtroom that indeed he did so inform
11 Harry Gilmer, would that have been in compliance with your
12 instruction?

13 A. Yes, sir.

14 Q. Now, sir, we were talking about the differences in
15 exposure that would be possible in the Krummrich plant
16 between the dusty conditions in Department 2,3,6 and the
17 liquid in the pipes and vats and tanks in Department 2,3,7?

18 A. Yes, sir.

19 Q. Correct?

20 A. Yes, sir.

21 Q. Now, why was there a dusty condition in Department
22 2,3,6?

23 A. The pentachlorophenol, that's product made in 2,3,6
24 is a crystalline structure that is -- forms large plate-like

1 structures, and in the process of making those structures,
2 part of it is in a powder, and part of it is just plain old
3 broken fragments of those thin wafers of pentachlorophenol.

4 Q. Now, Mr. Carr in questioning you suggested to you
5 that 2,3,6 and 2,3,7 were adjacent departments, didn't he?

6 A. Yes, sir.

7 Q. And he said that one could stand right by 2,3,7, at
8 the edge of 2,3,7, and 2,3,6 would just be a couple of feet
9 away, correct?

10 A. Yes, sir.

11 Q. Now, why is it, did you understand from his
12 question, sir, that he was implying to you that not only was
13 2,3,7 an open-air department, but 2,3,6 was as well?

14 MR. CARR: Your Honor, I would object. I was
15 asking questions of the witness. The witness was either
16 agreeing with those questions or disagreeing, I wasn't
17 testifying. It was the witness who was testifying. I object
18 to the suggestion that I was implying that either the witness
19 did or did not agree with --

20 THE COURT: Objection is sustained.

21 Q. (by Mr. Heineman) Doctor, why is it that the dust
22 in Department 2,3,6 stayed in Department 2,3,6 and became an
23 exposure problem?

24 A. It was exposure problem and it had to be contained.

1 Q. Why didn't it get out? Why didn't it blow away?

2 A. It had to be contained to be in some kind of an
3 enclosed area, so it was a partially enclosed area at least.

4 Q. Now, as you sit there now, sir, are you aware as to
5 whether or not 2,3,6 was contained in a building?

6 A. I'm not sure.

7 Q. Not sure. All right. So you don't know one way or
8 another whether or not somebody could just walk from 2,3,7
9 right straight through into 2,3,6, you don't know that?

10 MR. CARR: Counsel, my question went from 2,3,6 not
11 to 2,3,7, not as you are putting it. My suggestion is that
12 the people in 2,3,6 could be exposed to 2,3,7 not as you are
13 -- you've got it backwards.

14 Q. Well, sir, you don't know as you sit here, whether
15 or not conversely, someone from 2,3,6 could merely walk
16 across into 2,3,7?

17 A. No, sir.

18 Q. And you don't know, as you sit here, whether or not
19 indeed the people who worked in 2,3,6 did go over to 2,3,7
20 while they were working in 2,3,6?

21 A. No, sir.

22 Q. You don't know one way or the other?

23 A. (indicates negatively.)

24 Q. And you don't know whether or not 2,3,6 was

1 enclosed in a building or not?

2 A. In our factory, no, sir, but it's hard to explain
3 the dust problems they had without some degree of enclosure.

4 Q. Now, Mr. Carr was asking you about whether or not
5 someone would be exposed if they were just walking by or if
6 they just happened to be in the same plant area for either,
7 for any period of time, you recall that?

8 A. Yes.

9 Q. And, it's talking about whether or not there are
10 low-dose exposures, you recall that, sir?

11 A. Yes, sir.

12 Q. And, as I recall, you advised that there could be
13 some kind of exposure by just walking through a department,
14 did you not?

15 A. Yes, sure.

16 Q. Now, would you explain to us what you mean by that
17 in terms of degree of exposure, dose response, what you mean
18 by whether there could really be an exposure?

19 A. The amount of chemical that a man will get is
20 related to his distance from the source of that chemical. As
21 a matter of fact, it decreases by the square of the distance
22 from that exposure. In other words, if you go ten feet as
23 opposed to one foot away from it, it's one one-hundredth of
24 the dose you would get at one foot, so there is a dose

1 response. There is a dose related to distance from the
2 source. If you are ten feet away as opposed to one you get
3 one-hundreth of a dose you get at one foot. So the effective
4 distance is very important. So, what we do, and we do this
5 in a plant all the time, is we monitor the level of exposure
6 that takes place inside of a plant. And in the
7 pentachlorophenol, we keep it below one half million gram per
8 cubic meter. In other words, we actually have an air sampler
9 that takes -- that sucks the air through a -- through a pump
10 and deposits it on a piece of filter paper and then we
11 analyze that to find a concentration. We analyze the levels
12 within the plant and we analyze for where it's not found.
13 So, when I say that it can take place out in the street, I am
14 talking theoretically, because it's not that we could ever
15 measure it.

16 Q. Now, when you say you can't measure it, what do you
17 mean? You've got measurement levels that go down to parts
18 per trillion?

19 A. No, sir, not for pentachlorophenol.

20 Q. Now, but the analytical laboratories that you have
21 at Monsanto can measure down to parts per trillion, can they
22 not?

23 A. Not for all chemicals. You can do that for
24 chlorinated chemicals because of the presence of the chlorine

1 atom but there are other substances you don't have chlorine.
2 So whether you could do it in penta I'd have to talk to a
3 chemist about how far they have gone because we didn't find
4 it necessary to go that low.

5 Q. What you find is that while theoretically there may
6 be an exposure, you can't measure it, you can't find it on
7 the filter paper?

8 MR. CARR: Your Honor, I object, this is not
9 relevant to the issue. The issue is not whether or not our
10 clients were exposed to penta, whether the workers of
11 Krummrich are exposed. The issue our clients are exposed to
12 dioxin which they can measure down to parts per trillion. All
13 this is irrelevant to the issue. I object to the question,
14 it's completely irrelevant and immaterial.

15 MR. HEINEMAN: Your Honor, I believe I'm talking --
16 trying to talk generally about the relationship between dose
17 and levels and response and exposure. The Doctor just
18 happened to use the example of penta, but I would -- I do
19 intend to expand it into the other chlorophenols that are the
20 subject.

21 THE COURT: The extent to which you've gone into it
22 now is not relevant. If you wish to go into a relevant area
23 of it you may. On the basis of what's been testified to so
24 far, the objection is sustained.

1 Q. Dr. Roush, Mr. Carr was asking you specifically
2 yesterday about if someone in Department 2,3,6 walked into
3 Department 2,3,7 would there be some exposure, or if someone
4 in the street walked past Department 2,3,7, could there be
5 some exposure, you remember that?

6 A. Yes, sir.

7 Q. Now, it was to that series of questions that you
8 testified that there could be some exposure?

9 A. Yes, sir.

10 Q. Now, that is what I want you to discuss, please,
11 rather than the penta, what do you mean by there could be
12 some exposure?

13 A. If a chemical is found in the air, and a man walks
14 through it, and what we do, he'll have a little personal
15 sampler that he wears on his lapel, that little sampler just
16 as I described, it will take the air through it, deposit it
17 on that filter, and then we take it back to the laboratory
18 and analyze it and decide whether or not we can -- what we
19 can find on there. In our work at all of our plants, we
20 sample for eight hours of continuous exposure, and we
21 selected all in that filter. We do not do analyses for short
22 exposures. But, the fact is, is the amount we measure over
23 eight hours is the sum total of the little bits he gets for
24 that entire eight-hour period. So, if that's the case, then,

1 if he's there, what reaction, ten minutes, five minutes,
2 three minutes, it's three minutes, oh, vs. Sixty times eight
3 or three minutes or 480 minutes or one one-hundreth of the
4 dose he would get if he would stay there all day. So, it's
5 small compared to the amount that the workers are getting
6 there on an eight-hour basis.

7 Q. Now, are you capable of measureing the dose that a
8 person could be exposed to by walking through a department
9 like 2,3,7?

10 A. Depends on the level of contamination of that
11 nature to which he is walking, and it depends on the
12 detection capability of the instrument we use for measuring
13 the material that is deposited on that filter.

14 Q. Now, let's assume, sir, that Department 2,3,7 is,
15 as you testified, an enclosed system and there is testimony,
16 there has been testimony in the case that in Department 2,3,7
17 it's enclosed, the materials are liquid, they are in pipes,
18 they are in vats, they are in tanks. In that situation, is
19 there any appreciable amount that someone could be exposed to
20 by walking through Department 2,3,7 or even working there on
21 an eight-hour basis per day?

22 A. The workers who are there are exposed to very
23 little. We are much below the permitted exposure level for
24 the chlorophenols. So the man who walks through there is

1 getting that depending how long he stays there that ten
2 percent or five percent or one-hundreth, as I took for a five
3 minute time.

4 Q. So there would be -- would there be an appreciable
5 level of exposure, something you could measure?

6 A. It depends on level detectable and what the
7 concentration, I do the eight-hour, I know that, and if I've
8 got the quantity that was found in that hour sample, I could
9 then talk by the amount of times spent in that work area,
10 what the actual amount he was exposed to, but the other one
11 is -- the man who walks through there, and doesn't get close
12 to that pipe or valve or whatever, the little bit is coming
13 out, he's still working at that low concentration as compared
14 to the man who was working close to the source. So, if the
15 man is working at 10, 15, or 20 feet, or a hundred feet away
16 from the source, if we took a man and put him there and said
17 you stand where this man came in there by chance, and he had
18 that on here, we could do that analysis other an eight-hour
19 period and then divide it by the amount of time spent there
20 and tell you how much is present and it will be dependent
21 only on one thing, it's a percent of the eight-hour time he
22 spent there, when we say the man can be there for eight hours
23 without an adverse effect.

24 Q. Now, you say a man can be there for eight hours

1 without an adverse effect?

2 A. It's by an appreciable amount because of the low
3 vapor pressure of the chlorophenols.

4 Q. You say chlorophenols have a low vapor pressure?

5 A. Yes.

6 Q. Now, the fact that Dr. Suskind reports that with
7 respect to those people who worked only in Department 2,3,7,
8 there was no Chloracne found?

9 A. Yes, sir.

10 Q. What does that tell you about exposure in 1979 to
11 workers in the Department 2,3,7?

12 A. That their exposure is below the level at which it
13 will produce Chloracne.

14 Q. Can you tell whether or not there is any exposure
15 at all?

16 A. We do it best by the personal monitors that we have
17 on those workers and we are appreciably below the TLV or our
18 exposure level permitted in that workplace.

19 Q. What do you mean by TLV, sir?

20 A. The Government has a -- not the Government, but
21 it's called, there is an agency called the American
22 Conference of Government Industrial Hygienists who over the
23 last 20 to 30 years have been developing standards for man
24 exposure to him of the toxic substances. There is something

1 between three and four hundred chemicals for which standards
2 have been written. Although this is only a semi-official
3 agency, those exposure limits, safe exposure limits for the
4 worker produced by this group are used worldwide as a
5 standard for exposure. In those limits that they have
6 prescribed, are called TLV's, or threshold limit values.
7 Now, there is no threshold limit value for chlorophenol. So,
8 we have written our own. And we are below that level.

9 Q. On what basis did you write your own, sir?

10 A. Below the level which it would produce irritation
11 in the man because of the irritant potential of the material.

12 Q. So you were able to determine the level at which an
13 irritation could be produced by chlorophenols in a human
14 being?

15 A. Right.

16 Q. And what was that level, do you recall?

17 A. I don't recall, because -- I don't recall the
18 number, but we do have it -- I think it's three-tenths of a
19 milligram threshold but that's only as I recall, I wouldn't
20 say as a fact.

21 Q. Now, and that's the amount, the threshold limit
22 value is the amount that a person can be exposed to eight
23 hours a day, five days a week, 365 days a year, well,
24 wouldn't be 365 if it's only five days a week. What is the

1 definition for that?

2 A. A threshold limit value is that limit to which most
3 workers can work exposed below that, at that level or below
4 for eight hours a day, five days a week, throughout his
5 lifetime without an adverse effect.

6 Q. Now, is there a difference, sir, between exposure
7 -- strike that, let me start over again. You talked about
8 there being a difference between exposure depending upon the
9 distance from the source, is that right?

10 A. Yes, sir.

11 Q. So that the farther you get away from the source,
12 the more diluted the material would be and therefore the less
13 the exposure?

14 A. Yes, sir.

15 Q. Now, therefore, one walking by the plant, would
16 have a much less exposure, if any exposure, than the person
17 who is right there at the source, is that right?

18 A. Yes, sir.

19 Q. Now when you are measuring exposures, when you are
20 comparing groups who have been exposed. Can you therefore
21 compare groups within the same plant who have differing
22 levels of exposure?

23 A. If they are exposed to the same materials,
24 certainly can.

1 Q. Now, would why would you, for example, compare
2 people who had Chloracne with people who did not have
3 Chloracne?

4 A. The purpose of comparing those with and without
5 Chloracne is recognizing that it requires a certain exposure
6 to develop the Chloracne. Those who have not gotten
7 Chloracne have had lesser exposure. And so the comparison is
8 a part of the understanding of toxicology, the bigger the
9 dose, the more likely there is going to be an effect and this
10 is a part of pharmacology, teaching of medicine, everything
11 we do about using of drugs is related to that principle. For
12 instance, no one would suggest that taking a fraction of an
13 aspirin is as effective for taking care of a headache as
14 would taking two aspirin. No one would think of taking a
15 crumb for an effect. So there is a dose response curve. Man
16 who's got Chloracne as a bigger dose than the man who does
17 not have Chloracne, so the comparison is the means of
18 comparing the effects of high exposure with low exposure.

19 Q. Now, sir, do you still have before you Defendant's
20 Exhibit 908?

21 A. No, sir.

22 Q. It's the Moses, Marion Moses study?

23 A. No, sir.

24 Q. Let me hand you Defendant's Exhibit 908. Now, as a

1 matter of fact what you have just described, is that what
2 Marion Moses did when she did her examination of the Nitro
3 workers?

4 A. Yes, sir.

5 Q. Now, she says, does she not, if you look at page
6 169, you see that portion where she talks about occupational
7 history and exposure assessment?

8 A. Yes, sir.

9 Q. Would you read that first sentence a aloud, please?

10 A. "Attempts to construct a reliable exposure index in
11 order to determine whether duration or intensity of exposure
12 to 2,4,5-T was associated with any of the biological various
13 were unsuccessful for several reasons."

14 Q. And the several reasons she talks about are the
15 availability of measurements of the various variables
16 contaminants, finally products in the workplace, correct?

17 A. Yes, sir.

18 Q. The job classifications and work assignments?

19 A. Yes, sir.

20 Q. The fact that workers not directly involved in
21 2,4,5-T production often worked in areas adjacent to 2,4,5-T
22 processes, correct?

23 A. Yes, sir.

24 Q. Now, if you go onto Page 170, sir, she said that --

1 would you read the first paragraph at the top of Page 170?

2 A. "Thus, since Chloracne is generally considered a
3 quite reliable indicator of heavy dioxin exposure, it was
4 decided to use Chloracne as a surrogate for exposure and to
5 classify the study population by its presence or absence. It
6 is recognized that those without Chloracne but with
7 appropriate work history, work exposure history might also
8 have had TCDD exposure and were therefore not unexposed."

9 Q. Unexposed control?

10 A. Control, right.

11 Q. So what she is saying there is that she is using
12 Chloracne as the indicator, correct?

13 A. Yes, sir.

14 Q. That it is possible that there are people who did
15 not have Chloracne, who may have had some degree of TCDD
16 exposure, is that right?

17 A. Yes, sir.

18 Q. But that she was unable to tell which those people
19 were, is that right?

20 A. That's right.

21 Q. So, she compared Chloracne with non-Chloracne,
22 isn't that right?

23 A. Yes, sir.

24 Q. And isn't that exactly what Dr. Suskind did?

1 A. Yes, sir.

2 Q. And Dr. Suskind did that, sir, in the Zack-Suskind
3 study, isn't that right?

4 A. No, sir.

5 Q. Which study was it, sir?

6 A. It was in the Nitro study, the Suskind Nitro study.

7 Q. The Suskind morbidity study?

8 A. Yes.

9 Q. Okay. Now, and did he do that in the Krummrich
10 study as well?

11 A. Yes, sir.

12 Q. Now, sir, if you were to assume that the
13 concentration of 2,3,7,8-TCDD in the materials spilled at
14 Sturgeon were 37 parts per billion, or 40 parts per billion,
15 or 45 parts per billion, would that constitute a hazard with
16 respect to the people who are residents of that town?

17 A. The hazard associated with the dioxin in Sturgeon
18 is going to be related to only one thing and that is man's
19 contact with that material. And man's contact with that
20 material is going to be dependent on how close he gets to
21 it. Now, since this material was not -- that was spilled in
22 Sturgeon was not 2,3,7,8, but was chlorophenol contaminated
23 with dioxin, we had to be concerned there not with the
24 dioxin, but with the chlorophenol, because as small as a half

1 a teaspoon of chlorophenol may well kill a man, a half a
2 teaspoon, and if they were to get that material on their
3 skin, they could get a bad blister, therefore, the amount of
4 contact any man would have with that material would be
5 related to the toxicity of the chlorophenol. So, in order to
6 get to the place where that chlorophenol was not going to
7 produce an irritation and a burn of the skin, the
8 concentration of that chlorophenol would have to get below
9 about five percent.

10 If we get down to five percent of chlorophenol in
11 that area, if they cleaned it up that good so there was only
12 95 percent of it had been cleaned up, the amount of dioxin
13 now present would be below 1 part per billion and so now we
14 have to be concerned with material below 1 part per billion,
15 because once it got down to that level where there was no
16 chance of a man getting a burden, now we have to be concerned
17 with what is the hazard with the man being exposed to one
18 part per billion. And the way the man is going to be exposed
19 to that dioxin is going to be possibly by inhalation if it
20 has sufficient vapor pressure, and for practical purposes the
21 vapor pressure is so low that you can't measure it if we took
22 that same monitor and went out and measured it. So, it isn't
23 going to be an inhalation problem. There are only two ways a
24 man can get it, if it's not inhalation, one is by eating it.

1 And that's very unlikely. The EPA suggests that indeed
2 children could eat it, but they have said that below one part
3 per billion that a child could be eating up to ten grams of
4 that contaminated soil for all of his youth time while he was
5 eating dirt and it would be without effect, would be a safe
6 exposure, so, the practical problem then is related to skin
7 contact. And the likelihood of skin contact along the
8 railroad is very small. So, trying to assess the hazard of
9 the dioxin content as found at 37 to 45 ppb in that
10 chlorophenol, orthochlorophenol-crude spill is -- there is
11 little or no hazard associated with that kind of an exposure.

12 Q. Now, sir, let's assume that there are, whether or
13 not 37 or 45 parts per billion of 2,3,7,8-TCDD in the
14 material and it spills out of the tank car and it hits the
15 soil?

16 A. Yes, sir.

17 Q. Or the ballast. Which is gravel and rock and that
18 sort of thing on top of the dirt below, what happens to it in
19 terms of its concentration as soon as it hits the soil or the
20 gravel or ballast?

21 A. Once it hits the soil, you can't talk about it any
22 longer in terms of that was 45 parts per billion in the soil,
23 it's going to be 45 parts per billion. As soon as it hits
24 the soil it's going to start diluting. And --

1 Q. What dilutes it, the --

2 A. It becomes diluted in the soil. It isn't all going
3 to be chlorophenol. It's not going to be all dioxin. It's
4 going to be impregnated on the dirt, so it's going to be
5 related to the amount of dirt in which it's now
6 contaminated.

7 Q. So that as soon as it hits the soil or the rock or
8 the ballast or whatever, the concentration begins to dilute?

9 A. Yes, sir.

10 Q. And, let's assume then that some of that soil is
11 carried away, is carted off either in drums or in trucks,
12 then if there is dioxin in the soil that is carried away,
13 that dioxin is no longer there, is it, sir?

14 A. No, sir.

15 Q. And, if it drives and blows away in the wind, then
16 it's no longer at Sturgeon, it may be someplace else in the
17 wind, but it's certainly more dilute then?

18 A. Yes, sir, and related to that, if it gets a hundred
19 yards as opposed to one yard away it becomes one
20 ten-thousandths of what it was at one foot or one yard.

21 Q. So it just, the dilution continues geometrically by
22 it's distance from the original source?

23 A. Yes, sir.

24 Q. And whatever there is, whatever there was there in

1 January of '79, is all the dioxin that there was?

2 A. Yes, sir.

3 Q. Now, your concern, your main concern, as I
4 understand it in January or February of 1979, was exposure to
5 the chlorophenol?

6 A. Yes, that might have killed them.

7 Q. And, were you in contact with Harry Gilmer about
8 that, Gilmer knew there was chlorophenol there, didn't he?

9 A. Yes, sir.

10 Q. And, the EPA planned to supervise this clean-up and
11 get it out of there?

12 A. Yes, sir.

13 Q. Now, if you were to assume, sir, that on January
14 the 20th approximately, 19th, 18th, there was a soil sample
15 taken by the EPA, that showed 69,000 parts per million of
16 chlorinated phenols in the soil, what would that tell you
17 about the concentration of the chlorophenols in the soil, on
18 that occasion?

19 A. I assume that's an average, so that says it's about
20 7 percent.

21 Q. That would be an average of the core sample taken?

22 A. Right.

23 Q. So it would be a little under 7 percent?

24 A. Yes, sir.

1 Q. Would that be right about -- you said something
2 about 5 percent?

3 A. Yes, that was to keep from being an irritant.

4 Q. So that at 5 percent or below, it wouldn't even be
5 an irritant any longer?

6 A. That's right.

7 Q. You could still smell it?

8 A. Oh, yes.

9 Q. And that would be the chlorophenol itself?

10 A. Yes.

11 Q. Now, if that chlorophenol, before it hit the soil
12 or the ballast, contained 45 parts per billion of
13 2,3,7,8-TCDD, what would be the concentration of 2,3,7,8-TCDD
14 in that soil contaminated with 7 percent orthochlorophenol?

15 A. It would be less than 2 to 3 parts per billion,
16 because without dilution it would be 3, around 2 to 3 parts
17 per billion, and as soon as it gets in the soil it would be
18 diluted, determined by how much soil it was diluted in.

19 Q. So that if they measure the soil contaminated with
20 OCP and phenol, and that is 7 percent OCP and phenol in the
21 soil, then you would multiply that by the 45 parts per
22 billion to see what the level of 2,3,7,8 could be?

23 A. Yes, sir.

24 Q. And, that would be in the area of what, three?

1 A. Something of that order.

2 Q. Parts per million. Now, you mentioned in your
3 testimony, sir, that it was your understanding that the level
4 of chlorophenol to which the EPA was having the track cleaned
5 was 200 parts per million?

6 A. Yes, sir.

7 Q. Is that correct?

8 A. Yes, sir.

9 Q. Now, what would be -- that would be 3,000, 300
10 times less than that original soil sample, I haven't done my
11 arithmetic here.

12 A. Nor have I.

13 Q. 350 times less than that original sample?

14 A. So you take 350 -- it's of 45.

15 Q. No, you take 350 of whatever it was at 7 percent,
16 wouldn't you, sir?

17 A. No, no, you take it of the original, if you go down
18 to 200 ppm, you take that and that's -- multiply that times
19 45, so it's 45 divided by 350 so that's --

20 MR. CARR: No, it's not Doctor. Mr. Heineman is
21 right and you are wrong. You already reduced it when you get
22 down to 70, that caused you to reduce it.

23 A. I didn't know what that number 350 was.

24 MR. CARR: 200, 1300, 50th of the 70,000, not of

1 the one million.

2 A. Right.

3 Q. So what you would take, sir, if you take 45
4 times.07, that's 3.15 and divide that by 350?

5 MR. CARR: 350.

6 Q. You get .009 parts per billion, correct?

7 A. Yes, sir.

8 Q. Would that be 9 parts per trillion?

9 A. Yes, sir.

10 Q. And is that what the EPA said the University of
11 Illinois found?

12 A. There were several samples that I don't know who
13 did it, but I know there were several samples that were found
14 in parts per trillion range.

15 Q. Well, there were two, sir, weren't there, there was
16 one --

17 MR. CARR: Witness said there was several, I'd like
18 to know those several.

19 Q. Which ones do you know about, sir?

20 A. There is one of 60 parts per trillion, as I recall,
21 and there is another one that was higher than that. There
22 were two samples -- all I recall they were both in the parts
23 per trillion range.

24 Q. Well, we just read about one of them in the exhibit

1 we are looking at, did we not, sir? In Exhibit 867, I don't
2 know if you still have that before you or not?

3 A. No, I do not.

4 THE COURT: Before you get into that exhibit, is
5 this a good point for a short break?

6 MR. HEINEMAN: Sure.

7 A. Oh, yes, I have it.

8 THE COURT: We will take a short break at this time
9 and we will resume testimony. I would remind you this would
10 go for any other breaks we take during the day that you are
11 not to discuss this matter among yourselves, with anyone
12 outside the jury panel, or as of yet form any opinions or
13 conclusions about the matters in trial. Court is in recess.
14 (Following a recess, these proceedings were had in open
15 court.)

16 Q. Doctor, just before the break, I was asking you to
17 look at Defendant's Exhibit 867, do you have that before you
18 there, sir?

19 A. Yes, sir.

20 Q. And that is the Joe Metcalf's memo to the file that
21 we read from earlier, do you recall?

22 A. Yes, sir.

23 Q. And, if you look at Page 2 of that exhibit, it says
24 in the next to last paragraph, it mentions that the EPA had

1 detected 9 parts per trillion of the 2,3,7,8 isomer in the
2 site sample?

3 A. Yes, sir.

4 Q. See that, sir, and on the first page it refers to
5 them getting that site sample and taking it to the University
6 of Illinois at Champaign?

7 A. Yes, sir.

8 Q. See that, sir?

9 A. Yes, sir.

10 Q. Now, is that one sample that you knew about, one
11 test?

12 A. Yes, sir.

13 Q. All right. And then you knew about one that you
14 said was somewhere around 60?

15 A. Yes, sir.

16 Q. Parts per trillion, right? Are there any other soil
17 sample tests for the presence of dioxin that you are aware
18 of, sir?

19 A. No, sir, all I know is that there were soil samples
20 taken for phenol.

21 Q. Okay. And that was done by the EPA?

22 A. No, sir, I don't think so.

23 Q. The samples were taken by whom?

24 A. The clean-up crew, it was under their

1 responsibility.

2 Q. I see. The samples were actually taken by Western
3 Environmental Services?

4 A. No, I think it was subsequent to that.

5 Q. Okay. By O. H. Materials?

6 A. Yes.

7 Q. And they measured the amount of phenol?

8 A. Chlorophenols.

9 Q. Chlorophenols in the soil?

10 A. Right.

11 Q. I think -- I don't want go into all that with you,
12 sir, now, I know the jury has seen Plaintiff's Exhibit 123
13 which is the soil book done by O. H. Materials and that's in
14 evidence. I don't want go through all that with you now. I
15 will ask you this one thing, if you have ever seen that soil
16 book before. Do you have 123? Can't seem to find it right
17 now.

18 THE COURT: Okay.

19 Q. We will get back to it another time. Now, getting
20 back to where we were, Doctor, if the soil sample -- if the
21 soil were reduced to a concentration of chlorinated phenols
22 of 200 parts per million, which, and that contained a
23 concentration of dioxins of 45 parts per billion, then the
24 concentration of dioxin in that soil sample would be 9 parts

1 per trillion?

2 A. Yes, sir.

3 Q. By the calculations we did before. Now, would a
4 soil concentration, sir, of 9 parts per trillion present any
5 hazard?

6 A. No, sir.

7 Q. To anyone?

8 A. No, sir.

9 Q. Now, you mentioned earlier the Center for Disease
10 Control, what was the level which they reached of soil
11 contamination which they found to be the borderline between
12 the level, for a level of concern?

13 A. One part per billion.

14 Q. One part per billion in soil?

15 A. Yes.

16 Q. And what did they say with respect to how much one
17 could consume of soil contaminated with --

18 MR. CARR: Your Honor, this is all repetition.
19 Counsel went into that with this witness just this morning.
20 I object to it, it's cumulative, testimony been in this case
21 at least thirty times by now.

22 THE COURT: Objection is sustained. It is
23 cumulative.

24 Q. Doctor, you mentioned in your testimony a moment

1 ago, that a child could eat, according to the CDC, ten grams
2 of soil per day for its lifetime?

3 A. During the time when it would be eating soil.

4 Q. And, with no adverse effects?

5 A. Yes, sir.

6 Q. And, the -- there has been testimony in the case,
7 sir, by witnesses that the estimate of the total amount of
8 dioxin that could have been spilled at Sturgeon was something
9 on the order of 3 grams. Now, how does that compare, sir,
10 with, for example, the Seveso, or Seveso incident in Italy?

11 A. The number I recall is 2 kilograms.

12 Q. Two kilograms?

13 A. Two thousand --

14 Q. Two thousand grams?

15 A. Right.

16 Q. Was on the soil at Seveso?

17 A. Yes.

18 Q. Now, there have been documents published, have
19 there not, sir, about what has been found among the people at
20 Seveso?

21 A. Yes, sir.

22 Q. And, what is the result of the follow-up of those
23 people, sir?

24 A. There were a small number of people who were

1 exposed to the Seveso spill of 2,3,7,8-TCDD who developed
2 Chloracne. And there were some of them who had some
3 neurologic deficit, and there was something else I've
4 forgotten, some other minor effects, but those over a period
5 of a short period of a year or so, those effects went away
6 and there was no after effects beside the fact that they
7 formerly had had Chloracne.

8 Q. So that the Chloracne that they had went away?

9 A. Yes.

10 Q. Was the Chloracne concentrated, the appearance of
11 Chloracne, was it concentrated among the children?

12 A. Primarily children.

13 Q. Was there an explanation given in those studies as
14 to why the children primarily got Chloracne?

15 A. It has the same concern of CDC that the children
16 are out there playing in the grass, lying in the grass, and
17 getting their hands in the dirt, so that they had by far the
18 greatest exposure.

19 Q. In this, on this grass and soil that had some two
20 thousand grams?

21 A. Yes.

22 Q. Spread on it. And, indeed when this incident
23 occurred, does the literature state something about a cloud
24 of material that came out of the plant and went over the

1 Seveso area?

2 A. Yes, sir.

3 Q. And the children playing hide and seek in this
4 cloud it was so dense?

5 A. Yes, sir.

6 Q. Now, if there had been material in that cloud,
7 obviously that would have been a source of skin exposure to
8 the children, would it not?

9 A. Yes, sir.

10 Q. Now, the Environmental Protection Agency, sir, has
11 listed certain sites in Missouri that they have referred to
12 as dioxin sites, isn't that right?

13 A. Yes, sir, the order of thirty of them.

14 Q. Thirty of them. Has the EPA ever listed Sturgeon
15 as one of those sites?

16 A. Not to my knowledge.

17 Q. Now, what was the contamination level on the
18 Missouri dioxin sites listed by the EPA in the soil to the
19 best of your recollection?

20 A. Any site where they had more than one part per
21 billion.

22 Q. Any site where they had more than --

23 A. One part per billion.

24 Q. What in fact were some of the contaminations, some

1 of those sites?

2 A. Generally the levels of contamination in the sites
3 were in the order of a hundred parts per billion or lower,
4 but they did find at least one place where it went up to one
5 part per million, it was at Quail Run, I think.

6 Q. Now, a number of those people living at those
7 Missouri dioxin sites have been examined medically, have they
8 not?

9 A. Yes, sir.

10 Q. Has there been any Chloracne found in any of those
11 people to your knowledge?

12 A. No, sir.

13 Q. Now, the Times Beach people were examined by the
14 Center for Disease Control, were they not?

15 A. Under the auspices of the CDC.

16 Q. Who actually performed the examination?

17 A. It was primarily done by St. Louis University.

18 Q. Dr. Stephen Ayres?

19 A. Yes, sir, Karen Webb is the one who did the study,
20 but she worked for Dr. Ayres, so they were working at it
21 together, but she was responsible for the conduct of the
22 examination.

23 Q. Now, this was an examination done of people who
24 were at Times Beach and other sites?

1 A. I think it was primarily at Times Beach.

2 Q. And, this area had been sprayed how many years
3 before those examinations had occurred?

4 A. Something in the order of ten years.

5 Q. And, was there any -- I guess there were children
6 living in those communities?

7 A. Yes, sir.

8 Q. Who played in the soil in their yards and did the
9 various things that the CDC was contemplating when they set
10 that one part per billion limit?

11 A. Yes, sir.

12 Q. Is there any evidence reflected by that study, sir,
13 of any adverse effects to any of those people?

14 A. Nothing of statistical significance. In other
15 words, they found nothing they could relate to their being in
16 that area.

17 Q. Now, you mentioned earlier that the 7 percent
18 concentration of chlorinated phenols in the soil would be an
19 average concentration based upon the total of the soil sample
20 taken, is that right, there was a core sample taken it would
21 be averaged out to 7 percent?

22 A. That talk about that 7 percent, that one number we
23 have, that was taken with a core and that was the original
24 concentration in that core.

1 Q. All right. Now, how does the CDC take their soil
2 samples, sir, same way?

3 A. Yes, sir.

4 Q. And, have they devised this one part per billion
5 level in the same fashion?

6 A. Using that -- using those same methods of taking
7 the core sample is the basis for their saying whether it's
8 one part per billion or higher.

9 Q. So, it would be an average?

10 A. Yes.

11 Q. Of whatever would be in the soil, is that right?

12 A. Yes.

13 Q. You mentioned to Mr. Carr in his examination of
14 you, that the period of time as to which you had, you were
15 directing your concern on the Sturgeon matter was during the
16 period of the initial clean-up, do you remember that
17 conversation between you and Mr. Carr?

18 A. Yes.

19 Q. That was that two-month period when Western
20 Environmental Services was in there cleaning up the road bed?

21 A. Yes, sir.

22 Q. That period. Did you consider whether there would
23 be any danger of exposure to any one after that clean-up
24 occurred?

1 A. No, sir.

2 Q. Why not?

3 A. Because they had to clean-up that area to the level
4 where it was not going to be producing a burden on the people
5 and, therefore, it had to be below five percent to me and
6 that means that five percent of chlorophenol is of the order
7 of one part per billion in the soil, that's one. And, in
8 order for them to get that one part per billion, they had to
9 be in contact with the material, and since it was confined to
10 the railroad area, they are not going to be getting into that
11 area to any appreciable amount. Since it was deposited on
12 the, primarily on the chat and gravel, that is sunk down
13 below the gravel, is not going to hold the dioxin, so it's
14 going to be down below that area, and it is not going to be
15 where people are going to be in contact with it. So, without
16 contact with the material, you are not going to be exposed to
17 it and absorb it.

18 Q. Now, you say it was confined to the road bed, now,
19 if there were some that while -- first of all, surely Western
20 Environmental Services would have cleaned up and carried away
21 a large portion of that which had been contaminated.

22 A. Yes, sir.

23 Q. And, it was taken in trucks and drums and railroad
24 cars, I think as we mentioned before. Let's assume that some

1 of this soil might have dropped out of a truck as it was
2 driving out of town?

3 A. Yes, sir.

4 Q. And would be deposited on a street. What would --
5 what effects would that have in terms of the concentration of
6 the material in the soil at the site?

7 A. If we talk about it being at one part per billion,
8 or if we take that 45 parts per billion, and you don't talk
9 about 45 parts per billion, you've got to talk about the size
10 of the thing you are putting out there, and if you put that
11 out there, you are not going to be able to measure it, and if
12 you can't measure it, the CDC said it's not a problem.

13 Q. The Center for Disease Control talked about the
14 various methods of exposure, didn't they?

15 A. They sure did.

16 Q. Did they regard inhalation to be a problem?

17 A. No, sir.

18 Q. Why not?

19 A. Because of the lack of volatility of the material
20 and the fact that the amount that could be deposited on the
21 dust in the area is so small that it was a small portion of
22 the risk factor as far as they calculated it.

23 Q. Now, so that if there were soil that were carried
24 away from the site and dropped off a truck and got scattered

1 on the street, maybe dried there, become dust and blew in the
2 wind, would that have, what effects would that have on the
3 concentration with respect to that soil?

4 A. Which soil?

5 Q. That which had dried and became dust and blown in
6 the wind?

7 A. The site where it was taken from or where it was
8 deposited?

9 Q. Where it's deposited, sir.

10 A. It depends on how much was in that, how big. We
11 are talking about in soil that was carried away and the cloud
12 was left there. Got to talk about how much we are talking
13 about, but no matter what, it would be so small, once it's
14 broken up, that you wouldn't be able to measure it. It would
15 not be a source that could be measured, and if it's not
16 measurable, you can't talk about the effect.

17 Q. Now, of that three grams that was there, we know
18 that some would have washed perhaps into the pond, if some
19 washed into Mr. Kemner's pond that would no longer be in the
20 road bed, would it, sir?

21 A. No, sir.

22 Q. Would the effect of removing it from the road bed
23 and it washing over to Kemner's pond, would that have a
24 tendency to dilute it?

1 A. The amount that is washed away into the pond can no
2 longer be in the railroad, so both of them are diluted.

3 Q. So the amount that is in the railroad bed is
4 diluted by whatever goes into the pond, but the amount in the
5 pond is diluted from what the level was when it was in the
6 railroad bed?

7 A. Yes, sir.

8 Q. Is that by virtue of the fact that it's been mixed
9 now with water and other soil and things like that?

10 A. Yes, sir.

11 Q. Now, let's assume, sir, that some goes off into
12 Saling Creek, would there be a further diluting of that?

13 A. Yes, sir.

14 Q. And any that went down the creek would be gone?

15 A. Yes, sir, it's well demonstrated from the time the
16 Missouri sites, the Minker Stout area, there was a place
17 where they had had the dirt that had been in the Shenandoah
18 Stables was taken over. And it was the high parts, it was in
19 parts per million when it was put there. And, they did a
20 study of an stream that ran down there and despite this being
21 in parts per million, they found it in that stream bed in
22 parts per trillion. Just again demonstrating, and they
23 wouldn't find it very often, they knew that the soil was
24 being carried away because they could see where a ravine had

1 been cut that had carried the soil away.

2 Q. You mean there was erosion of the soil?

3 A. That's right, and the amount they can measure down
4 in the stream was in the parts per trillion range compared to
5 parts per million where it had been deposited.

6 Q. Okay. Parts per million would be a thousand times
7 higher than parts per billion?

8 A. Yes.

9 Q. Now, if you were to assume, sir, that there was a
10 flushing operation that occurred in 1979 and 1980 on the
11 railroad track, including the passing track, where water was
12 injected into the ballast, what do we know now about the
13 ability of water to remove dioxin from sand or gravel or
14 rock?

15 A. You do it by comparison. Dioxin has an affinity for
16 some soils more than others. And it is not clear what all
17 the factors are related to, but it appears to be related at
18 least to the organic content of the soil. In comparing that
19 with rock, and chat, and sand, there is very little
20 absorption that takes place on those, except for the little
21 bit of organic that may be on the surface of it, so there can
22 be some, but by and large it is washed off the rock.

23 Q. Now, have there been studies or tests done which
24 have demonstrated that principle?

1 A. The studies down at Elgin Air Force Base is where
2 they looked to see if it comes off of the sand.

3 Q. Okay. How do you spell that, sir?

4 A. E-l-g-i-n, I think, Eglin.

5 MR. CARR: Eglin, not Elgin.

6 A. E-g-l-i-n.

7 Q. E-g-l-i-n?

8 MR. CARR: Yes.

9 A. Yes.

10 Q. Okay. So there have been studies at Eglin Air
11 Force Base indicating the proclivity of dioxin to bind to
12 sand?

13 A. No, to wash it off of sand, will come off of sand.

14 Q. Whether it can be washed off?

15 A. Matter of degree again is not absolute.

16 Q. Now, if you were to assume that the water that
17 would be flushed through the track would be carried into a
18 filtration system, with perhaps activated carbon or something
19 in the filtration system, would that tend to remove dioxin?

20 A. I'm sure it would.

21 Q. Why do you think that the activated carbon or
22 charcoal would tend to remove dioxin from water?

23 A. The same thing we know that it binds to organic, is
24 the same thing would make it bind to the active charcoal.

1 Q. Organic material is material that has carbon atoms
2 in it, isn't that right, sir?

3 A. That's right.

4 Q. That's how organic material is defined, really,
5 carbon and hydrogen?

6 A. Yes, sir.

7 Q. Now, Mr. Carr suggested to you that the photographs
8 taken at Sturgeon would show dioxin in the snow, you remember
9 that, sir?

10 A. I didn't recall him saying.

11 MR. CARR: I'm sure he couldn't recall it because I
12 asked him nothing about dioxin in the snow. You must be
13 thinking about some other case.

14 MR. HEINEMAN: No, I remember your saying something
15 about dioxin in the snow and you don't have an obligation to
16 test the soil and prove it's still there. I remember that
17 very clearly.

18 Q. Now, sir, can you see dioxin in snow?

19 A. If you had enough.

20 Q. If you had enough you could see it?

21 A. Sure.

22 Q. What would it look like?

23 A. I don't know, I've never seen it.

24 Q. Do you know how much it would take to see it?

1 A. I'm not even sure what the color of it is and
2 depending on what color it is, but it certainly ought to in
3 grams, I don't know, but it certainly would be an appreciable
4 amount, much greater than we are talking about.

5 Q. So if you had three grams spread over a half a
6 mile, you think you'd be able to see that in the snow?

7 A. No, sir.

8 Q. You had some conversation with Mr. Carr about
9 whether or not a no-effect level of dioxin had ever been
10 established, you remember that, sir?

11 A. Yes, sir.

12 Q. What do you mean by the term established, what does
13 that mean to you?

14 A. Established means that there is sufficient
15 information to say that if a man is exposed to that material,
16 then it is quite clear that that level of exposure won't
17 produce any effects.

18 Q. Does it have anything to do with any official
19 recognition?

20 A. Yes, sir.

21 Q. What is that official recognition?

22 A. The EPA and CDC has come to the place where they
23 say that at one part per billion that level of exposure is
24 safe for man's exposure for a lifetime. That's an

1 established number, then it results, it's really a consensus
2 of all experts saying that's a reasonable place to say that
3 there is no -- that could be without effects.

4 Q. Have there been, sir, incidents which would
5 demonstrate that at a particular level no effect occurred?

6 A. There have been a series of -- depends on acute or
7 chronic effects. There is little doubt that the level of a
8 hundred parts per billion in the soil does not produce
9 Chloracne. And so that is established fact for practical
10 purposes that you are not going to get Chloracne if it's less
11 than a hundred parts per billion, and I suppose if you looked
12 hard enough we could find some level higher than that that
13 will not produce Chloracne. You could do some work but it
14 would be a calculation of what would be a safe level of
15 preventing Chloracne in the soil. Now, in terms of the
16 long-term health effects, there are a number of lifetime
17 studies in which they have not demonstrated a cancer effect.
18 The Germans did find three cases of stomach cancer as I
19 recall in their work force, but they didn't have any excess
20 of cancer. But they had three stomach cancers and they
21 couldn't decide whether that was related to the exposure or
22 not. But, when you put all of them together with the others
23 not showing stomach cancer, it was to indicate that the level
24 of exposure of occupational exposure is without effects. We

1 are still left with the problem what to do about the soft
2 tissue sarcomas that have come out of a number of studies.
3 But the sum total of looking at all the soft tissue sarcoma
4 studies to me, say that there is little or no evidence that
5 soft tissue sarcomas is produced by the levels of exposure
6 that have happened in industry with levels up to -- I don't
7 know how high, at least 50 ppm and higher.

8 Q. At least what?

9 A. 50 ppm.

10 Q. 50 parts per million?

11 A. Yes, and higher without any evidence of cancer or
12 soft tissue sarcoma being established.

13 Q. So that there obviously are no-effect levels but
14 there has been no official recognition of a no-effect level,
15 is that what you are saying?

16 A. That's right.

17 Q. Let me ask you about those soft tissue sarcomas,
18 sir. Mr. Carr asked you about the NIOSH studies in which
19 there had been a combination of those soft tissue sarcomas
20 which had been found among Monsanto employees with those that
21 had been found among Dow employees, you recall that?

22 A. Yes, sir.

23 Q. What -- that study was published a number of years
24 ago, was it not?

1 A. The review of that was only in the last year or
2 two.

3 Q. The --

4 A. At first there was a concern that they had those
5 seven or eight cancers that represented some multiple, I've
6 forgotten how, but appreciable increase over expected, when
7 they took those out of those Dow-Monsanto studies, but that
8 was based on findings of seven soft tissue sarcomas, and then
9 when they went back and started looking at themselves as you
10 should do, NIOSH decided that three of those people did not
11 have exposure to dioxin or significant exposure or measurable
12 exposure by their definition. They called them non-exposed
13 and couldn't be associated with it, and then there are
14 several of them in which the tumors that had originally been
15 called soft tissue sarcomas were not soft tissue sarcomas.
16 So they ended up with two tumors that are soft tissue
17 sarcomas, which makes it a game of saying it has no
18 established relationship.

19 Q. Now, has -- those studies, and I don't know if you
20 can call them studies, I remember something done by a Dr.
21 Honcher and then followed up by a Fingerhut, is that what you
22 are talking about?

23 A. Yes, sir.

24 Q. Now, and Dr. Honcher is employed by NIOSH?

1 A. I think she still is, when we started it, but
2 Fingerhut took over the responsibility for it.

3 Q. On behalf of NIOSH?

4 A. Yes.

5 Q. So is it now NIOSH's position that that soft tissue
6 sarcoma question that was raised originally by Honcher is no
7 longer a concern?

8 A. No, they are really saying they can't, that concern
9 has been lessened, but to establish that there is no effects
10 they are still wanting to do some other studies.

11 Q. They want to do additional investigation but they
12 are saying that what they thought was initially a connection
13 does not apparently exist because of additional data?

14 A. That's right.

15 Q. Now, one of the things that Mr. Carr asked you
16 about was whether or not if there were dioxin in the material
17 that went into the ballast, that it would tend to be
18 concentrated at the top, do you remember that questioning?

19 A. Yes, sir.

20 Q. Would it indeed concentrate at the top layers of
21 whatever material it was going through?

22 A. The distribution of dioxin in the soil when it is
23 put on the surface initially, when it's put down, will be
24 higher on the surface than it is deep, so there will be a

1 gradation down to zero, based on how much was put on the
2 soil, the porosity of the soil, so that if you had sand, the
3 concentration on the top would be relatively soil. If it was
4 rock on the surface it would be relatively soil. So it would
5 run through that and start binding to the soil as it goes
6 down. There is no evidence that the concentration would be
7 higher in the soil than it was in what was put on the top of
8 the soil. If it were that, there would have to be a
9 filtering system that collects it out of that, and there is
10 nothing to suggest that that is the case. But, it could come
11 up, I would suspect, if you kept on putting it so that it
12 would approach the concentration in the material that was put
13 on it. But not higher than.

14 Q. So at the top it could approach the concentration
15 of the material that was put on?

16 A. Right.

17 Q. The top. That would be what, if you get putting it
18 on?

19 A. Yes.

20 Q. Now, if it were concentrated at the top, if you
21 remove the top, you would remove the greatest concentration?

22 A. Yes, sir. Yes, sir.

23 Q. There were some -- Mr. Carr was asking you about
24 the Freeman and Shroy studies that have been done at

1 Monsanto, and I wonder if you would -- well, let me ask you
2 this, there was a discussion between you as to whether or not
3 you agreed with their conclusion, you remember that, sir?

4 A. Yes, sir.

5 Q. Now, as I recall, sir, you said that what they have
6 shown is that whatever is at the surface of the soil, does
7 disappear, but their model is an attempt to explain why. Is
8 that right?

9 A. Yes, sir.

10 Q. So you don't disagree with the fact that it goes
11 away or leaves the soil, you are just not sure if their model
12 explains why?

13 A. That's right.

14 Q. Is there any other explanation that you know of as
15 to why?

16 A. I'm not a physicist in talking about how dioxin
17 would move in the soil, so I can't answer that question.
18 What they are really trying to deal with is that if the
19 material is left on the soil, as in Times Beach, or where
20 ever else it's been deposited, the concentration false
21 relatively fast at the surface. So that instead of having a
22 gradient from the highest concentration on the surface down to
23 the deepest point, falling off as it goes, with a period of
24 time the concentration false, and we are talking about ten

1 years now, the concentration false first on the soil, and so
2 whether the dioxin moves up by diffusion to the top and then
3 evaporates over a period of ten years, that's not talking
4 about very much per day, or per week, or per month, or
5 whether it gets to the surface and is destroyed by photolysis
6 or being exposed to the sunlight is not known. That is what
7 they are trying to prove right now. But, there is little
8 question that when the dioxin is put on the surface where
9 there is carbon, and were there is a hydrogen source, that
10 the dioxin is broken down relatively rapidly. So, what gets
11 to the surface may be evaporating or being destroyed very
12 rapidly because of contact with the sun. That is where the
13 quarrel comes, but the fact is that over a period of ten
14 years, a significant portion of it depends on the binding of
15 the soil, how tightly it's bound, but 60, 70 percent of it
16 may well be removed.

17 Q. The -- this is not related to the half-life
18 phenomenon, is it, sir?

19 A. It's the basis for the half-life determination.

20 Q. Now, if the level at the surface of the soil were
21 one part per billion, or ten parts per billion, what would be
22 the concentration of any volatilization -- let's assume that
23 it isn't immediately destroyed by the sun on the surface, but
24 rather that it volatilizes in some way, and then gets up in

1 the air, what is the concentration that that would be if it
2 were one part per billion or even ten parts per billion in
3 the soil itself?

4 A. Infinitesimal, not measurable.

5 Q. The vapor pressure of dioxin is extremely low, is
6 it not?

7 A. Very very low.

8 Q. So that there may be a few molecules breaking off
9 at a time and getting up in the air. Would that be the kind
10 of thing you would be talking about?

11 A. Yes, sir.

12 Q. In other words, when Shroy and Freeman are
13 describing this principle, they are talking about dioxin
14 moving. Is it molecule by molecule, or is it in larger
15 portions than that? Or how does that work?

16 A. It would be dependent on how much is there, I
17 suspect, but at a level of one part per billion, you are
18 talking molecules.

19 Q. Certainly whatever was available by volatilization
20 would be at a lesser concentration than the one part per
21 billion that CDC says you can be exposed to without adverse
22 effects?

23 A. Because they included that.

24 Q. Explain that to me, sir, I'm not sure I

1 understand.

2 A. When they reach the one part per billion by
3 assuming the man, or the child who is exposed to that
4 material, they consider it all sources of exposure which may
5 include that, that they can breathe in, the amount they can
6 get on the dust, the amount that he can get from getting it
7 on his skin and absorbing one percent of it, and the 30
8 percent he would get if he ate ten grams per day, so they are
9 considering all of those, and that is one part per billion
10 that is safe, includes the amount that would be taken in by
11 vaporization.

12 MR. CARR: Object to the continued use at one part
13 per billion is safe by CDC. What they said is one part per
14 billion is a level of concern. They did not call it safe. I
15 object to that and ask the jury be instructed to disregard
16 it.

17 THE COURT: Jury is so instructed.

18 MR. HEINEMAN: Your Honor, I believe that that
19 level is referred to in two places in that work, and in one
20 place I believe it's referred to as a safe level.

21 THE COURT: I don't believe that is correct, I
22 think it is considered as a level of concern. The jury is
23 ordered to disregard the phrasing that has been objected to,
24 to which this Court has agreed, and all future phrasing at

1 that level will be in the level as stated by the CDC as level
2 of concern. You may proceed.

3 Q. (by Mr. Heineman) sir, Mr. Carr asked you whether
4 you felt there was a higher risk of cancer for the children
5 of Sturgeon by virtue of the spill, do you recall that?

6 A. Yes, sir.

7 Q. Do you believe there is a higher risk of cancer for
8 those children at Sturgeon?

9 A. No, sir.

10 Q. Why not?

11 A. Because they are not being exposed to that material
12 in any appreciable amount, measurable amount.

13 Q. Do you believe that there is -- there have been a
14 number of other studies in which the subject of cancer has
15 been addressed, have there not?

16 A. Yes, sir.

17 Q. Does Diamond Shamrock, did they discuss the cancer
18 phenomenon?

19 A. I don't think so.

20 Q. How about Coalite and Seveso incidents?

21 A. The Coalite was done.

22 Q. Do any of the studies that you are aware of, of
23 occupational exposures or industrial accidents demonstrate a
24 higher risk of cancer as a result of dioxin exposure?

1 A. No, sir.

2 Q. Now, there was conversation between you and Mr.
3 Carr with respect to the Binghamton, New York fire, do you
4 remember that?

5 A. Yes, sir.

6 Q. And that was a fire in which the -- he showed you
7 an article which said that it had been estimated that there
8 was 2.8 parts per million of 2,3,7,8-TCDD found in the soot
9 that resulted from that fire, do you recall that?

10 A. Yes, sir.

11 Q. Now, do you know, sir, whether there has been a
12 follow-up with respect to the people that were exposed to
13 that clean-up of that fire?

14 A. I recall reading that a Dr. Kim from the Health
15 Department had an examination of those people and found no
16 evidence of an adverse effect on them.

17 Q. Dr. Kim of who?

18 A. He's with the Health Department, I think.

19 Q. Of the State of New York?

20 A. Yes.

21 Q. Now, that was an incident in which -- would that be
22 characterized as an acute or a chronic exposure?

23 A. It would have to be -- depends who we are talking
24 about. Those who were exposed for a brief period of time

1 before they found what was taken place would be called
2 acute. Those who were working and had some participation in
3 the clean-up of it would be called more chronic exposure.
4 How long we going to call chronic, I don't know the details
5 of who participated and how long, but they would be
6 relatively chronic, and in those who were involved in the
7 clean-up.

8 Q. Now, the Binghamton incident, was one in which
9 there was a fire in an enclosed building, is that correct,
10 sir?

11 A. Yes, sir.

12 Q. And, the soot from the fire was conducted up into
13 all kinds of nooks and crannies around the building, isn't
14 that right?

15 A. Yes, sir.

16 Q. And it was up in air ducts in the air conditioning
17 system and up between the floors and behind the covering of
18 the walls and that sort of thing?

19 A. Yes, sir.

20 Q. Now, there would be no, and I think it was tested
21 for its level before it was cleaned up. I'm sure they went
22 in and tested it while it was still on the site, the soot?

23 A. Yes, sir.

24 Q. And, there wouldn't be any sun within that building

1 to destroy any dioxin, would there be, sir?

2 A. No, sir.

3 Q. There would certainly be sun at Sturgeon, wouldn't
4 there?

5 A. Yes, sir.

6 Q. There wouldn't be any wind or rain inside that
7 building to have any effect on the concentration of the soot
8 there, would there, sir?

9 A. No, sir.

10 Q. But there certainly would be wind and rain at
11 Sturgeon, wouldn't there?

12 A. Yes, sir.

13 Q. Now, in discussing the Seveso incident with you, I
14 recall that Mr. Carr read to you from an exhibit that he
15 called -- it was Plaintiff's Exhibit 1399 A, it was a portion
16 of a study, do you remember him reading some information to
17 you about that? About the Seveso incident?

18 A. Yes.

19 Q. And there was a woman there who had had some
20 2,3,7,8 found in her body tissues, do you remember that?

21 A. Yes, sir.

22 Q. Let me hand you what has been marked here as
23 Plaintiff's Exhibit 1399 A, which is apparently Page 2 of
24 another document, is it not, sir?

1 A. Yes, sir.

2 Q. Now, he was -- Mr. Carr was telling you that this
3 woman had had a cancer, correct?

4 A. Yes, sir.

5 Q. And that had she had died from a pancreatic
6 adenocarcinoma seven months after the Seveso accident, isn't
7 that right?

8 A. Yes, sir.

9 Q. I think he had you read that sentence into the
10 record, as I recall?

11 A. Which sentence?

12 Q. The one that says the subject of the study was a 55
13 year old woman?

14 A. Yes, sir.

15 Q. There was another sentence just following that I
16 don't recall any mention being made of and it says, "Although
17 the cancer was not a result of the exposure to TCDD, the
18 woman was significantly exposed to the toxic cloud." So this
19 lady's cancer, according to this article, was not a result of
20 her TCDD exposure, correct?

21 A. Yes, sir.

22 Q. But, it does say that she did have significant
23 exposure to the toxic cloud, and it does say that she did
24 have some TCDD in certain portions of her body, is that