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WITNESSES CALLED ON BEHALF OF THE PLAINTIFF:

1. DR. GEORGE ROUSH (2-1102)

Cross Examination. 2

EXHIBITS

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EXHIBITS SUBMITTED ON BEHALF OF THE PLAINTIFF:

Plaintiff's Exhibit No.:

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1 BE IT REMEMBERED, that on the 12th 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: Ladies and gentlemen, we are going to
10 vary the schedule a little bit. We are going to take a break
11 around five minutes to ten. One of the lawyers in our
12 Circuit, Earle McCaskill, is being sworn in as an Associate
13 Circuit Judge. I'm supposed to be at the swearing in at ten
14 o'clock. We will break around then and resume immediately
15 after the swearing in, approximately five to 10:00 to 10:30.
16 Just like the swearing in of attorneys, something like this
17 is a public thing. If you'd like to see it, you are welcome
18 to do so. Mr. Carr, you may proceed.

19
20 DR. GEORGE ROUSH

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

24 CROSS EXAMINATION

1 BY MR. REX CARR

2 Q. Doctor, I'd like to hand you Plaintiff's Exhibit
3 1485 ask you to see if you recognize that as a letter written
4 by Dr. Barnes with attachments that is a part of your
5 Department of Medicine and Environmental Health?

6 A. Yes, sir.

7 MR. CARR: Offer 1485 into evidence if it please
8 the Court.

9 THE COURT: Any objection?

10 MR. HEINEMAN: Your Honor, we would object on the
11 basis that it apparently has to do with a request about Agent
12 Orange, not the product in question, we think it's irrelevant
13 to the issues of the lawsuit. And further, I don't think
14 adequate foundation has been laid for submission. Object to
15 it on that basis.

16 MR. CARR: Your Honor, the document deals with
17 chlorinated phenol manufactured by Monsanto. It demonstrates
18 their attitude toward their chlorinated phenols and dioxin
19 content thereof. It illustrates and is relevant on the issue
20 of punitive damages.

21 THE COURT: Admitted over objection.

22 Q. (by Mr. Carr) Dr. Roush, this exhibit deals with a
23 telephone call that your department received relative to a --
24 the two 50-gallon barrels of what had contained the chemical

1 substances that have been referred to in the past as Agent
2 Orange, is that correct, sir?

3 A. Yes, sir.

4 Q. Now, the first drum, or at least each barrel in
5 question according to this call, had been purchased from the
6 Granite City Arsenal in 1965, do you see that, sir?

7 A. Yes, sir.

8 Q. And, the one or two gallons remaining in each drum
9 according to the label apparently on that drum was 50 percent
10 2,4-D, which is the chlorinated phenol and 50 percent
11 2,4,5-T, which is a chlorinated phenol, is that correct, sir?

12 A. Phenoxy herbicides, not phenols.

13 Q. Well, it's a derivative?

14 A. It's a derivative of it.

15 Q. Yes. And, it is the -- that is the make-up of
16 Agent Orange, wasn't it, sir, it was formulated so it could
17 be 50 percent 2,4-D and 50 percent 2,4,5-T?

18 A. I think there really is not 2,4,5-T, they are the
19 esters of 2,4,5-T. The second would be Agent Orange to me,
20 not the first one.

21 Q. Well, in any event the first one has 2,4-D and
22 2,4,5-T both in it?

23 A. Yes, sir.

24 Q. And you, of course, knew that the 2,4,5-T

1 manufactured by Monsanto in 1965 contained TCDD at levels of
2 40 to 55 parts per million, didn't you, sir?

3 A. I'm sorry, I didn't hear that percentage.

4 Q. You knew that the 2,4,5-T manufactured by Monsanto
5 in 1965 contained TCDD at the levels of 40 to 55 parts per
6 million, some of the batches, did you not, sir?

7 A. I don't recall the numbers.

8 Q. I'll hand you Plaintiff's Exhibit 1486, ask you to
9 read that and see if you recognize that as a Monsanto
10 document referring to what you had stated in the past as to
11 the dioxin content of the 2,4,5-T manufactured in 1965 by
12 Monsanto, or at the very least, see if it refreshes your
13 recollection as to what you knew about the dioxin content of
14 that 2,4,5-T?

15 MR. HEINEMAN: Let me object, Your Honor, to asking
16 him any questions about this document. There is nothing on
17 this document here that has just been marked 1486 that
18 identifies the author. Doesn't identify the recipient.
19 There is no indication that Dr. Roush has ever seen it
20 before, and I would object to any questioning of the witness
21 about that document on that basis.

22 THE COURT: I think it's been posed to him to
23 refresh his recollection. For that purpose I don't think
24 your objection is -- is accurate. The objection is

1 overruled. At this point in time.

2 Q. (by Mr. Carr) Does it refresh your recollection,
3 Dr. Roush, as to the TCDD content of the 2,4,5-T produced at
4 Nitro in 1965?

5 A. Yes, sir.

6 Q. And, you indeed do recall that the dioxin content
7 was 40 to 55 parts per million, do you not, sir?

8 A. I don't recall this. I'm not sure how accurate
9 this reflecting -- but I'm assuming it is.

10 Q. Well, I'm asking right now whether or not that
11 refreshes your recollection. I have plenty of other
12 documents, Doctor.

13 MR. HEINEMAN: Your Honor, I object to the
14 questioning.

15 Q. To help you if you have no memory of it.

16 MR. HEINEMAN: I object to the question as being
17 misleading. The document says an average of 6 to 8 parts per
18 million from '66 to '69 and three samples measured from 40 to
19 55 parts per million in 1965, and he's implying that all of
20 it at that level, and I object to it.

21 THE COURT: Objection is overruled.

22 Q. (by Mr. Carr) Could you answer that question,
23 please, Doctor? Doctor, it refreshes your recollection that
24 the 2,4,5-T or at least some of the 2,4,5-T manufactured in

1 1965 had dioxin content TCDD at the levels of 40 to 55 parts
2 per million?

3 A. This is not my statement.

4 Q. Dr. Roush, I didn't ask you whether it was or not,
5 it refers to things that you have said in a letter to Dr.
6 Suskind, does it not, sir?

7 A. Yes, sir.

8 Q. Now, does that, first of all, does it accurately
9 quote you as to what you told Dr. Suskind?

10 A. I don't know.

11 Q. Secondly, does it refresh your recollection as to
12 what dioxin content there was in the 2,4,5-T manufactured in
13 1965?

14 A. It's in the range, but that's all I can say.

15 Q. All right. Doctor, I'll hand you in addition
16 Exhibits 1487 and 1488, and ask you to take a look at those,
17 if you would. See if you recognize those as Monsanto
18 documents dealing with the dioxin content of the 2,4,5-T
19 manufactured by Monsanto at Nitro, the one I just gave you is
20 the second numbered document and this is the first numbered
21 document. I don't recall the numbers. The single page
22 document is numbered 1486, is it not, Doctor?

23 A. Yes, sir. The old one, this was 86, this is 87.

24 Q. All right. The one that says from Udell's graph is

1 1487, correct, Doctor?

2 A. Yes, sir.

3 MR. CARR: And then the next documents here would
4 be 1488, offer those two document into evidence if it please
5 the Court.

6 MR. HEINEMAN: Your Honor, we would object to them
7 on the basis that there is no identification of author. No
8 identification of recipient. No indication Dr. Roush has
9 ever seen either one of them before. There is no foundation
10 laid for their admission whatsoever, and in addition,
11 Plaintiff's Exhibit 1488 is obviously two random sheets taken
12 from some other document. It's not complete. There has got
13 to be 33 pages missing.

14 MR. CARR: Yes, if you want the complete, mark that
15 1488 A.

16 Q. (by Mr. Carr) Doctor, who is H. C. Gott, Jr.

17 A. I can't characterize -- I think he's an industrial
18 chemist.

19 Q. Employed by Monsanto, is he not?

20 A. Yes, sir.

21 Q. Hand you now what's been marked Plaintiff's Exhibit
22 1488 A, ask you to turn to page numbered, well, the number is
23 on the document that I've given you here that's 1488, C21175,
24 please.

1 A. This number?

2 Q. That's correct, and is the page that's part of
3 Exhibit 1488 contained in Exhibit 1488 A?

4 A. Which exhibit are you saying?

5 Q. Right here, 1488 is that page, is it not?

6 A. Yes, sir.

7 MR. CARR: Counsel, would you like to see it?

8 MR. HEINEMAN: Yes, please. Your Honor, did the
9 Court rule on the offer?

10 THE COURT: No, I haven't ruled on either one of
11 them.

12 MR. HEINEMAN: Our objection still stands with
13 respect to 1487 and 1488. I don't believe 1488 A has been
14 offered, has it?

15 THE COURT: Are you offering 1488 A?

16 MR. CARR: No, Your Honor, just to show that 1488
17 is a page from 1488 A.

18 THE COURT: Okay.

19 MR. CARR: I see no point in offering the entire
20 document for the record. There is no dispute.

21 THE COURT: Do you have any other objections?

22 MR. HEINEMAN: We would further object on
23 relevancy, Your Honor. Lack of relevancy.

24 THE COURT: They are both admitted over objection.

1 1487, 1488.

2 MR. CARR: Your Honor, the only exhibit that we had
3 prepared to pass to the jury is 1487, it duplicates and is
4 the same as the information on 1488.

5 Q. (by Mr. Carr) Doctor, those exhibits show, as did
6 the memo that referred to your conversation, or letter rather
7 to Dr. Suskind, that indeed the TCDD content of 2,4,5-T in
8 1965 in April of 1965 was 16 to 55 parts per million, did it
9 not, sir, do they not, sir?

10 A. From 5 to --

11 Q. Did you understand my question, Doctor?

12 A. Yes, sir.

13 Q. Referring to April of '65 goes from from 12 to 55
14 parts per million, does it not, sir?

15 A. Yes, sir.

16 Q. And, in 1964 the average content according to those
17 documents was 12 parts per million, was it not, sir?

18 A. Yes, sir.

19 Q. Now, if the -- if this 50-gallon drum that this
20 gentleman filled with diesel oil contained two gallons of
21 diesel fuel, it would have two -- I mean 50 gallons of diesel
22 fuel, it would have yet two gallons of 2,4,5-T, 2,4-D
23 therein, would it not?

24 A. Yes, sir.

1 MR. HEINEMAN: Object, that calls for speculation
2 and conclusion on the part of this witness.

3 MR. CARR: Calls for mathematical calculation.

4 THE COURT: Objection is overruled., you may
5 proceed.

6 A. Yes, sir.

7 Q. That would be anywhere from one twenty-fifth to
8 one-fifthieth of that drum would be the Agent Orange content,
9 wouldn't it, sir?

10 A. Yes, sir.

11 Q. And one-fiftieth of 55 parts per million is over 1
12 part per million, isn't it, sir?

13 A. Yes.

14 Q. And, that would be the dioxin contaminant in that
15 drum that that man was working with if the drum had
16 originally contained that batch that had 55 parts per million
17 of TCDD, correct, sir?

18 A. Yes, sir.

19 Q. Now, on the other hand, if that drum that he was
20 working with in 1965 had been in fact manufactured in 1964,
21 the dioxin contaminant in 1964 was 12 parts per million, was
22 it not, sir?

23 A. Yes, sir.

24 Q. So, if that drum that he was working with had been

1 manufactured in '64, he would be working with one-fiftieth of
2 12 parts per million, wouldn't he, sir?

3 A. Yes, sir.

4 Q. Which would be 240 parts per billion, wouldn't it,
5 sir?

6 A. Yes, sir.

7 Q. So, this man has worked with and put on the floor
8 of his garage, and around the various parts of his property,
9 material that is contaminated with dioxin that may range from
10 240 parts per billion, to one or two parts per million, is he
11 not, sir?

12 A. Yes, sir.

13 Q. Now, Doctor, you at Monsanto knew in 1983 that that
14 was the contaminant of products that you manufactured, you at
15 Monsanto knew that this man had put on his property, on his
16 body, on his dirt, at his home, material that had at least
17 240 parts per billion of dioxin therein, did you not, sir?

18 MR. HEINEMAN: Your Honor, I object, there is no
19 information in any of my notes, exhibits to identify it as
20 Monsanto product.

21 MR. CARR: Your Honor, I think that can be inferred
22 by the fact that the man called Monsanto. Monsanto
23 manufactured the contaminant at the time, that it was
24 obtained from the Granite City Arsenal, and that while it

1 doesn't appear from the document that Monsanto's label was on
2 it, and in any event whether that is the -- well, there is a
3 Chemtech message that it was phoned to them by those people.
4 In any event, it demonstrates the attitude of Monsanto toward
5 the public and toward dioxin and toward the people of
6 Sturgeon. That is the basic elements of this case relating
7 to punitive damages. It illustrates what they knew about the
8 product and what they did about it. The same thing as what
9 they did with Sturgeon, Your Honor, what they did here.

10 MR. HEINEMAN: Your Honor, I object to that speech
11 as being jury argument. I ask that the speech be stricken
12 from the record and that the jury be instructed to disregard
13 it.

14 THE COURT: Objection is overruled.. It was proper
15 response to your objection which was made before the witness
16 answered the question. Going to the merit of the objection,
17 the objection is overruled. It's a proper question.

18 THE COURT: Dr. Roush, please answer the question?

19 A. Would you repeat the question?

20 (Court Reporter read back the previous question.)

21 A. Dr. Byrons knew it.

22 Q. He's a Monsanto senior physician, is he not, sir?

23 A. He is no longer working for Monsanto.

24 Q. His knowledge at that time was Monsanto's

1 knowledge, was it not, sir?

2 MR. HEINEMAN: Object, Your Honor, that asks this
3 witness for a legal conclusion.

4 THE COURT: Overruled, it does not.

5 Q. This man was a responsible senior physician working
6 in your department under you, was he not, sir, for Monsanto?

7 A. Yes, sir.

8 Q. He was acting for Monsanto in responding to this
9 call, was he not, sir?

10 A. Yes, sir.

11 Q. And when he acted for Monsanto, he knew, as you
12 have stated here, that this material that this man put in his
13 garage floor, put on the dirt around his property to control
14 the dust, contained dioxin at least 240 parts per billion.
15 Now, Doctor, he told, according to this memo, he told this
16 man that his exposure was minimal due to dilution with fuel
17 oil, the dilution with fuel oil puts it down to 240 parts per
18 billion. Isn't that correct, sir?

19 A. Yes, sir.

20 Q. You at Monsanto knew that 240 parts per billion is
21 240 times higher than the level that CDC set for dirt, as a
22 minimum level, sir, you knew that, did you not, sir?

23 A. That CDC position came after this note.

24 Q. Well, Doctor, you knew that 240 parts per billion

1 -- well, even assuming that that is so, Doctor, have you
2 contacted this man since then to tell him that, even without
3 that there is no question in your mind but what it's unsafe
4 for somebody to be living in a house that dirt is
5 contaminated either with one to two parts per million of TCDD
6 or at a minimum 240 parts per billion of TCDD, you know that
7 to this day that it's unsafe, don't you, sir?

8 A. No, sir.

9 Q. It is your position, that the response that
10 Monsanto gave to this Mr. Ysenko from Niebo, Illinois, was a
11 proper and legitimate response, is that correct, sir?

12 A. I don't know what the other call, there was another
13 call made.

14 Q. Doctor, this is the sum total of the records
15 dealing with it, do you have some knowledge of another call
16 that's not given to us?

17 MR. HEINEMAN: Object, Your Honor. I don't know
18 that it's clear that this is the sum total of all records
19 that might relate to a call by somebody to Mr. Ysenko that
20 might not be covered by a request that Mr. Carr has made for
21 production of documents in this case.

22 MR. CARR: Our request, as the Court, Mr. Heineman
23 knows, was for everything dealing with dioxin that they have
24 in their possession. This deals with dioxin. If they made

1 some other contact with Mr. Yassenko that they did not give
2 us, they are in contempt of this court.

3 MR. HEINEMAN: Your Honor, it may well be that I
4 don't know whether there is a document there, but my point is
5 it may well be that there is a document written by some
6 environmental expert about a call to a Mr. Yassenko that
7 doesn't even mention the word dioxin in it.

8 THE COURT: Do you have such a document?

9 MR. HEINEMAN: No, as I say, i don't know whether
10 it exists or not.

11 THE COURT: Objection is overruled, you may
12 proceed.

13 Q. (by Mr. Carr) Doctor, do you have any knowledge of
14 any such calling or any follow-up?

15 A. No, sir, it was referred to someone else for
16 action.

17 Q. Someone else at Monsanto for action, was it not,
18 sir?

19 A. Yes, sir. Yes, sir.

20 Q. Doctor, this man is -- you told him through Dr.
21 Barnes that his exposure was minimal, because of this
22 dilution, will you agree now, sir, that his exposure is not
23 minimal?

24 A. No, sir.

1 Q. You believe that his exposure is minimal?

2 A. Yes.

3 Q. And, Doctor, it is your position that his dirt
4 contaminated with 240 parts per billion or one or two parts
5 per million is perfectly safe and appropriate for him to live
6 in, is that correct, sir?

7 A. Yes.

8 Q. And, you, of course, know that the effects from
9 dioxin contamination do not all immediately appear, you know
10 that, don't you, sir?

11 A. Yes, sir.

12 Q. And this all was in March of '83, the man had used
13 the oil in February of '83, so he called within a month
14 apparently of the time he was exposed to it and put it on his
15 property. The problems that were going to develop that may
16 develop from dioxin exposure would not necessarily have
17 developed in that first 30-day period, would they, sir?

18 A. They may well not appear.

19 Q. They may well appear in Yassenko if dioxin causes
20 cancer as the Plaintiff's evidence shows that it does and as
21 other experts believe to be the situation. This man can get
22 cancer at 10, 20, 30, 40 years from this exposure, can he
23 not, sir?

24 A. If this exposure is sufficient.

1 Q. Doctor, the exposure that he's got, he has put his
2 hands in it, it's been on his skin and more than that, it is
3 presently on the dirt in his garage, and on the loose dirt
4 around his house. It is there. It has a half-life of what
5 did we establish, ten years as a half-life in the soil? It
6 will be there for the rest of his life twenty years from now,
7 25 percent of that will still be there, 25 percent of 240
8 parts per billion, sir is 60 parts per billion, 20 years from
9 now the dirt in his house, in his garage, will still be at
10 least 60 parts per billion, Dr. Roush. Don't you consider
11 that this exposure over that period of time is going to be
12 extremely injurious to his health?

13 A. No, sir.

14 Q. And that is the position that you at Monsanto
15 believe is the appropriate position and the position that you
16 intend to maintain with regard to dioxin and its safety,
17 isn't that correct, sir?

18 A. Yes, sir.

19 Q. Will you tell me, sir, why is it that you require
20 in chemicals that you buy from other people that there be no
21 2,3,7,8 in it, and of all the other dioxins that there not be
22 more than 10 parts per billion, why is it, Dr. Roush, that
23 you say to others the chemicals you give us shall not contain
24 any 2,3,7,8, but yet you will sit in this courtroom and say

1 that it is safe for others to live with soil that has 240
2 parts per billion or 60 parts per billion or 2 parts per
3 million, will you tell me that, Dr. Roush?

4 A. There are several things. First, the level of one
5 to five to ten parts per million of dioxin was common in
6 2,4,5-T throughout the '60's and '70's with many people in
7 the United States being exposed to it on a wide basis, and
8 none of them got Chloracne, nor was it reported there was any
9 other effects on people. Used for twenty years without any
10 evidence of effects at 1 to 2 parts per million by all people
11 using those phenoxic herbicides around their houses and on
12 farms and on woods. So, that is the basis for my saying that
13 1 to 2 parts per million, and it's going to be higher than
14 that, was without effects. Now, turning to why Monsanto goes
15 to a lower level is we are talking about the new standards
16 and specifications from government. If we are going to sell
17 a product that now today that contains dioxin, and if the
18 Canadians say we won't buy your product if it contains more
19 than 1 part per billion, we better have a rule that says we
20 will meet one part per billion. Now, what's happened over
21 the last ten years up until 1982, the standard for dioxin
22 content of all phenoxic herbicides was a hundred parts per
23 billion. Before that it was 1 to 2 and where there was no
24 limitations on the dioxin content. Since then in 1982, the

1 standard for dioxin TCDD, no 2,3,7,8-TCDD in phenoxic
2 herbicides around the world has been lowered from a hundred
3 parts per billion down to 10 parts per billion and they are
4 talking about in the next three to four years going to five
5 parts per billion and the Canadians have said we won't use it
6 if it contains more than one part per billion.

7 Q. Doctor, why do you believe that the countries
8 around the world and Canada and others are saying they don't
9 want 2,3,7,8-TCDD? Why do you think they are saying that?

10 A. Because it's a contaminant and we can get it out.

11 Q. Why? There is a lot of things that are
12 contaminants they don't require you to get out. Why do they
13 want no 2,3,7,8-TCDD? Why is that, Doctor?

14 A. Because it's a possible hazard.

15 Q. Because they believe that it is a hazard, don't
16 they, Doctor?

17 A. Not at that level, they don't.

18 Q. Doctor, they are giving you standards that they say
19 we don't want 2,3,7,8-TCDD because they believe, because the
20 world believes that it is a health hazard. Isn't that the
21 reason they are setting those standards for 2,3,7,8-TCDD
22 level?

23 A. No.

24 Q. That's not the reason?

1 A. To provide safety factor.

2 Q. Yes, Doctor, why do they want to be safe? Why do
3 they want to be safe, Doctor? They don't want people to
4 become unhealthy; don't want people to have the risk of
5 cancer 20, 30 or 40 years from today, do they, Doctor?

6 A. If they can get it out, they should.

7 Q. All right, Doctor. Now, Monsanto has said they
8 consider this a health thing, knowledge today that they have
9 in the past ten years that they didn't have, you say, in the
10 prior period of time and give that as it is, they have got
11 the knowledge today in the past ten years, you've got that
12 knowledge, I've got that knowledge, the world's got that
13 knowledge, so they are saying no more 2,3,7,8. As a matter
14 of fact, Monsanto has set the level of, you said, 1 part per
15 billion of 2,3,7,8. Monsanto has set the level for the
16 chemicals it buys have no 2,3,7,8-TCDD, not any detectable at
17 a level down to 1 part per trillion, no 2,3,7,8-TCDD, isn't
18 that correct, Dr. Roush?

19 A. Not to my knowledge.

20 Q. I'll show it to you in a few moments when we get to
21 that point if you are not aware of it. But now, you say that
22 there is no evidence that people got Chloracne and use this
23 for years and that's one reason you say demonstrates that
24 it's safe because nobody got Chloracne. Well, Doctor, you

1 have seen a number of workers admittedly with equal exposure.
2 to dioxin, some get Chloracne and some do not get Chloracne,
3 and you have seen that some get porphyrin abnormalities and
4 some don't get porphyrin abnormalities, and you have seen
5 that some get neuro-psychiatric problems and others don't
6 get. Some get tired and others don't. You have seen and we
7 have demonstrated in this case a variety of consequences from
8 dioxin exposure not just Chloracne. The Chloracne is one of
9 the signs. We have demonstrated to you and we have shown you
10 the articles that porphyrin abnormalities may be a better
11 sign of dioxin poisoning than Chloracne, and we have got
12 other documents to show you as well on that. Now, Doctor --

13 MR. HEINEMAN: Your Honor, I object to that as a
14 speech. He obviously has nothing to do with this question
15 because he says, "Now, Doctor." Just made a speech.

16 MR. CARR: I'm giving him --

17 MR. HEINEMAN: May I make my objection?

18 MR. CARR: You interrupted my question, Mr.
19 Heineman. I did not finish my question.

20 THE COURT: Mr. Carr, go finish your question
21 please. Your objection is overruled.

22 Q. In view of that circumstance, when you say that you
23 don't know of any ill effects because you haven't seen
24 Chloracne, isn't it possible that the people that have used

1 those herbicides have gotten cancer, that they can't prove
2 because of their low-dose exposure, isn't it possible they
3 got cancer caused by this exposure. Isn't it possible when
4 they which home at night more tired than ordinary, have more
5 sleep difficulty than ordinary, more irritability with their
6 children, fly off the handle more quickly, isn't it possible
7 that those things which you know are symptoms of dioxin
8 poisoning, isn't it possible that those things that they are
9 showing were in fact caused by the dioxin exposure that you
10 say was in their products. Isn't it possible that those
11 sicknesses have been caused by this prior dioxin exposure
12 which the various Governments and which the various
13 scientists today is saying is unsafe. Isn't that possible,
14 sir?

15 A. No, sir.

16 MR. HEINEMAN: Wait a minute Doctor, please, let me
17 make my objection. May I object to the question now?

18 THE COURT: Now you can.

19 MR. HEINEMAN: I'd like to object, first of all, to
20 the speech that preceded it. Ask it be stricken and that the
21 jury be instructed to disregard it. Second thing I'd like to
22 object to the question on the grounds that it's a multiple
23 question, probably eight or ten questions in there. I don't
24 see how it's possible for the doctor to answer all of them.

1 The third thing is that he assumes as true, he states as a
2 fact that there are illnesses which is totally unknown and
3 which there isn't any evidence that there is anybody else
4 claiming illnesses from exposure to those things that Mr.
5 Carr is referring to right now, and I object to that.

6 THE COURT: Objection is overruled. Doctor, you
7 did answer no, is that correct?

8 MR. CARR: I don't think he answered.

9 THE COURT: I thought I heard you say no.

10 A. I'm not sure.

11 THE COURT: Read back the answer.

12 MR. CARR: I'm sorry.

13 COURT REPORTER: "No, sir."

14 THE COURT: We will break until approximately
15 10:30.

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

18 THE COURT: Ladies and gentlemen, before we start,
19 in line with our policy of trying to keep you advised of
20 times when we would not have court, as soon as we know of
21 those times, I think I have already told you, if not I'll
22 tell you now we won't have court on July 19th, Friday, July
23 19th. We are also not going to have Court this next Monday,
24 July 15th, and the afternoon of July 22nd. So we will go to

1 noon on that day.

2 THE COURT: Mr. Carr, you may proceed.

3 Q. (by Mr. Carr) Doctor, you responded negatively to
4 the question that I asked you as to the position that
5 Monsanto's taken. And, I take it that what has occurred, the
6 things that you at Monsanto have learned since, at least
7 since the Sturgeon incident took place, to this date has not
8 been sufficiently important to you at Monsanto to change the
9 attitude that Monsanto has toward dioxin and as to the need
10 to keep humans away from exposure to dioxin, is that correct,
11 sir? Have I interpreted your response correctly?

12 A. No, sir.

13 Q. I have not interpreted?

14 A. No, sir.

15 Q. All right. Then is it that Monsanto does perceive
16 that dioxin is injurious to the health of people, that people
17 should not be exposed to it, that there is more risk to it
18 than simply teenage acne or Chloracne?

19 A. No, sir.

20 Q. That isn't correct either?

21 A. No, sir.

22 Q. Is it your position then that it is only the acne
23 problem that you at Monsanto are concerned with as of being
24 associated with or caused by dioxin?

1 A. No, sir.

2 Q. That isn't correct either?

3 A. No, sir.

4 Q. Then do you believe that this lung cancer rate of
5 deaths at Nitro being a 143 percent higher than what it
6 should be in the amount of deaths from lung cancer that
7 should be, do you think that is an important factor that you
8 at Monsanto should consider when you tell people how they
9 should react to dioxin contaminated dirt as this gentleman,
10 Mr. Ysenko, or to other people like the people at Sturgeon,
11 is that a factor, sir?

12 A. No, sir.

13 Q. That's not a factor either?

14 A. No.

15 Q. You are not persuaded that the fact that -- and
16 admittedly those may all -- the lung cancer rates that we
17 know have association with tobacco, but even at that, the
18 lung cancer at Nitro is a 143 percent higher than what was
19 expected, than even expected among smokers, doesn't that mean
20 anything to you, Dr. Roush?

21 A. Yes, but they are not related.

22 Q. Now, Dr. Roush, what makes you say that those lung
23 cancer deaths in the people at Nitro that were exposed to
24 dioxin is not related to the dioxin exposure?

1 A. Because there is a -- the same level of lung cancer
2 in the non-exposed workers.

3 Q. No, Doctor, you are misunderstanding this figure,
4 it's not the same level, we have pointed out, sir, if you
5 recall, there are only three or four, one, two, three, yes,
6 three lung cancers in the unexposed, in the group you call
7 unexposed. In a larger group of people than the exposed
8 people, and there is ten in the exposed people. Doctor,
9 doesn't that persuade you?

10 A. No, sir.

11 Q. Doctor, how can it, if you've got a larger group of
12 people and presumably they are the same age, they started to
13 work the same time, one group of people, only three lung
14 cancers, and the other group of people a smaller group of
15 people, the only thing live is the exposure to dioxin, the
16 only thing that you know is that is different, you get 10
17 deaths from lung cancer in the smaller group and only three
18 deaths from lung cancer in the larger group. Doctor, why
19 isn't that persuasive to you?

20 A. Because your are looking at that same persons, says
21 there is no more lung cancer in the exposed than there is in
22 the unexposed.

23 Q. Doctor, the figures that you have here, the figures
24 that you see here, the figures this exhibit, this is the

1 exhibit that you agreed accurately reflected the number of
2 deaths from lung cancer associated with dioxin. This is your
3 testimony, sir, those exhibits are introduced into evidence
4 because it's came from Monsanto's records. It shows three
5 deaths from those who are unexposed from lung cancer and ten
6 deaths from those who were exposed. Your only people with
7 six before we took the four that were exposed and put them in
8 with the six that were admittedly exposed by Zack, your own
9 people at six said that was a higher rate than was expected.
10 The table that you put them in. The six was a higher rate
11 than was expected. Doctor, how can you gain say, how can you
12 say that ten out of 67 is not as significant as the three
13 which was out of a 128 or something like that?

14 A. Because you can't take the ten out of the 67.

15 Q. Doctor, you can. Those are the ten from the 67
16 that were exposed to dioxin, those are your figures, not
17 mine.

18 A. No, sir, those are not.

19 Q. Doctor, do you not agree that those four people
20 were exposed to dioxin?

21 A. Yes, sir.

22 Q. And those four people should be with the six that
23 were exposed to dioxin, should they not, sir?

24 A. Yes, sir.

1 Q. And that makes ten, doesn't it?

2 A. Yes, sir.

3 Q. And when you take those four from the group that
4 was not exposed, you are left with three lung cancer deaths,
5 aren't you, sir?

6 A. Yes, sir.

7 Q. Now, Doctor, ten out of 67 is larger than three out
8 of whatever the number was, 128 or something of that sort,
9 isn't that correct, sir, 207?

10 A. No, sir.

11 Q. 10 out of 67 is not a greater percentage than 3 out
12 of a 120 or 207, whatever that figure was?

13 A. Where did you get the 67?

14 Q. The 58 deaths, sir, plus the 9 that was reported by
15 Zack, plus the 9 additional deaths from cancer that she
16 omitted to report, 67, do you recall that, sir, we went
17 through one whole day of that?

18 A. Yes, sir.

19 Q. You don't recall that, sir?

20 A. Yes, sir, but I disagree with your denominator of
21 67.

22 Q. Doctor, you agreed with the denominator when we put
23 it on the board. You agreed that those records showed those
24 deaths, did you not, sir?

1 A. Yes, sir. But I don't agree with the 67.

2 Q. Doctor, were there 67 deaths total reported when
3 you add the 9 to the 58?

4 A. Yes, sir.

5 Q. Were there not?

6 A. There weren't 58 deaths with it.

7 Q. Sir? Yes, there were 58.

8 A. All right.

9 Q. And the 9 added to the 58 is 67, isn't it, sir, and
10 that makes 67 deaths among those people that were exposed to
11 dioxins, doesn't it, sir?

12 A. But you have to change the denominator, too.

13 Q. The denominator is the 67 when you add the 9 to
14 it.

15 A. No, sir.

16 Q. I don't want to go through all that again, but do
17 you not admit that the 10 in the exposed is more than the 3
18 in the unexposed?

19 A. Yes.

20 Q. And it's a higher rate among the exposed than --
21 that 10 is a higher rate?

22 A. No, sir.

23 Q. Doctor, isn't 10 out of whatever the number was
24 higher than the 3?

1 A. 58 and 32 together before you get -- that's the
2 denominator.

3 Q. Where is the 32?

4 A. That's the total deaths in the Zack-Suskind study.

5 Q. The total deaths the Zack-Suskind study?

6 A. That's where you are getting the other.

7 Q. The Zack-Suskind study were all exposed, we add
8 that we have a much higher rate.

9 A. But you have to have that denominator before you
10 talk about the percent.

11 Q. Doctor, if you add the Zack-Suskind deaths to this,
12 you even have a higher rate of death rate?

13 A. That's what you've got those lung cancers, you are
14 adding those two together.

15 Q. Doctor, it's a 143 percent.

16 A. No, sir, it is not.

17 Q. Doctor, I'm not going to quarrel with you, Doctor,
18 I'm not going to go over and re-examine those, but the 10 is
19 higher than the 3, isn't it?

20 A. Yes, sir.

21 Q. Now, Doctor, that doesn't persuade you, I take it,
22 does it, sir?

23 A. No, sir.

24 Q. None of this other evidence persuades you?

1 A. What other evidence?

2 Q. The evidence of the 30 percent abnormal porphyrins,
3 that doesn't persuade you either?

4 A. I don't think those were abnormal porphyrins.

5 Q. Doctor, the laboratory reported them to be
6 abnormal?

7 A. No, sir.

8 Q. Doctor, we went through that. Did not the
9 laboratory put those in the abnormal category?

10 A. No, sir.

11 Q. Doctor, did not Dr. Suskind call them abnormal in
12 his draft from the laboratory report?

13 A. Yes.

14 Q. During those abnormal porphyrins -- has anybody
15 called those porphyrins normal? Have you seen any
16 laboratory, any doctor anywhere that called those porphyrins
17 normal?

18 A. They don't interpret them.

19 Q. Doctor, did anybody call them normal, any time,
20 anywhere?

21 A. No one called them abnormal either.

22 Q. Dr. Suskind called them abnormal, he put them in
23 his table. We have the table in evidence. You've seen it.

24 A. Yes, sir.

1 Q. Didn't he call them abnormal?

2 A. Yes, sir.

3 Q. Doctor, doesn't those abnormal porphyrins, when you
4 talk about the number of people over the period of years that
5 have been exposed to the Monsanto products that contain
6 dioxin, you know that the abnormality in the porphyrins can
7 cause people to be tired, you know that, don't you?

8 A. No, sir.

9 Q. You don't know that?

10 A. No, sir.

11 Q. Doctor, doesn't porphyria have all kinds of bad
12 consequences, one of which is fatigue and tiredness?

13 A. If this is porphyria.

14 Q. Doctor, that's what I'm asking you, doesn't
15 porphyria cause people to be tired?

16 A. No, sir.

17 Q. It doesn't?

18 A. No, sir.

19 Q. You just got through saying that if it is porphyria
20 it is one of the attributes, didn't you just say that?

21 A. Yes, sir.

22 Q. Doctor, you are really going around in circles, if
23 it is an attribute of porphyria, tiredness is a symptom of
24 porphyria, is it not, sir?

1 A. No, sir.

2 Q. Doctor, didn't you just tell me that people get
3 tired when they have porphyria?

4 A. They can.

5 Q. Well, Doctor, what are you doing here, what game
6 are we playing here?

7 MR. HEINEMAN: Your Honor, I object to --

8 Q. You just got through saying --

9 MR. HEINEMAN: May I object to the tone and to the
10 argumentative nature of the question. Mr. Carr keeps
11 switching back and forth between porphyria as a disease and
12 abnormal porphyrins.

13 MR. CARR: That isn't so, I used the word
14 porphryia, porphyria, porphyria with this doctor, attributed
15 to, associated with tiredness. He says porphyria can cause
16 tiredness.

17 A. Yes, sir.

18 THE COURT: Objection is overruled. The questions
19 are clear and any change in subject is also clear within the
20 context of the question, and this witness is able to follow
21 that. Objection is overruled.

22 Q. (by Mr. Carr) Now, Doctor, if dioxin can cause
23 porphyria, and if porphyria can cause people to be tired, is
24 it not possible, sir, that the tiredness that some people

1 have may have in it a component of dioxin causation?

2 A. If there is sufficient porphyria.

3 Q. Yes. And, Doctor, abnormal porphyrins, the
4 laboratories, the very first thing you do to discover
5 porphyria, is to send the urine to a laboratory to see if the
6 porphyrins are abnormal, don't you, sir?

7 A. Yes, sir.

8 Q. And, you know that Dr. Ellefson has testified in
9 this case under oath by deposition that the abnormal
10 porphyrins shown in around 20 of the Sturgeon Plaintiffs
11 indicates that they may have intoxication porphyria, you know
12 that as well, don't you, sir?

13 A. No, sir.

14 Q. You don't know that?

15 A. No, sir.

16 Q. Did you not read Dr. Ellefson's deposition?

17 A. No, sir.

18 Q. Has not counsel informed you of what Dr. Ellefson
19 testified to?

20 A. No, sir.

21 Q. Well, would you assume, please, that Dr. Ellefson
22 has testified that the abnormal porphyrins in the Plaintiffs
23 who had the abnormal porphyrins indicates intoxication
24 porphyria. Will you assume that, please?

1 MR. HEINEMAN: Your Honor, may I object to the
2 implication that Mr. Carr is trying to make. At Mr. Carr's
3 request this Court has excluded witnesses from the trial and
4 it would be an implicit violation of that order, perhaps, to
5 have a witness read testimony from a prior witness.

6 THE COURT: Objection is overruled, that's not at
7 all the intent of that order.

8 MR. HEINEMAN: May we approach the bench, Your
9 Honor?

10 (The following Side Bar conversation was had outside the
11 hearing of the jury.)

12 THE COURT: Are you trying to say an exclusionary
13 order prevents you from briefing the witness and preparing
14 the witness as the context to which he is appearing?

15 MR. HEINEMAN: No, sir.

16 THE COURT: That's what your remark implied to me.

17 MR. HEINEMAN: Can he read testimony of a prior
18 witness?

19 MR. CARR: Read an evidence deposition that was
20 taken before the order was ever entered?

21 MR. HEINEMAN: I'm talking about, you are asking
22 him about the testimony that occurred in court.

23 MR. CARR: No, it was an evidence deposition.

24 THE COURT: Wait a second, but that's even to

1 restrictive. What you are implying, you are saying you can't
2 even tell him the substance of what Ellefson said as opposed
3 to reading the deposition or not, that's what you just told
4 me.

5 MR. HEINEMAN: I have assumed that that is not a
6 violation of this Court's --

7 THE COURT: And that is an absolutely correct
8 assumption, and you can derive the information and
9 communicate the information that Ellefson catagorized one of
10 those people as having intoxication porphyria without having
11 him read an entire two days of evidence deposition or
12 whatever. You know, I don't see any basis for the objection
13 that you made.

14 MR. HEINEMAN: My objection, Your Honor, was that
15 Mr. Carr was, in his tone of voice and inflection, chastising
16 this witness for not having read the prior testimony that was
17 admitted into evidence.

18 MR. CARR: Simply isn't so. I wasn't chastising
19 any witness.

20 THE COURT: That's not at all what happened. Your
21 objection is overruled.

22 MR. HEINEMAN: May I have this clarification? Is
23 it your position that they cannot read testimony, prior
24 testimony of a witness in court?

1 THE COURT: I haven't even considered that. Before
2 I would say what my position is I'd like to have that
3 discussed. What is your position on that?

4 MR. CARR: I see absolutely no reason to say that a
5 witness can't read prior testimony in court. The
6 exclusionary rule is to keep the witness from being here in
7 the courtroom to hear the testimony at that time. I don't
8 know that it has ever been, that the rule has ever been
9 interpreted to mean they cannot read evidence depositions or
10 transcripts of testimony.

11 THE COURT: What's your position?

12 MR. HEINEMAN: That's fine with me, Judge.

13 THE COURT: I think that's fine with me, too.
14 That's fine with me.

15 MR. HEINEMAN: I was just giving the Court's order
16 the broadest implication.

17 THE COURT: No, no, no, no. The whole point of, I
18 think, your objection is to what Mr. Carr said was on a much
19 more narrow basis, and I think it was, I don't agree with the
20 objection, and you know, offhand I don't see any reason why
21 it can't be read either.

22 MR. HEINEMAN: Okay. That's why I wanted to
23 approach the bench, make sure.

24 THE COURT: But his broad question, contrary to the

1 objection, was informing him by any means, memorandum,
2 discussion with you, discussion with technical people at
3 Monsanto, or reading of either the evidence deposition or the
4 transcript, or that part of the evidence deposition that was
5 read in court, of this particular fact, and that was the
6 broad implication of Mr. Carr's question. Your objection on
7 that basis is overruled.

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

9 Q. (by Mr. Carr) Doctor, I take it that you have no
10 knowledge then that the Plaintiffs in this case have been
11 said by Dr. Ellefson, a number of Plaintiffs in this case
12 have been said by Dr. Ellefson to have intoxication
13 porphyria?

14 A. No, sir.

15 Q. Now, Doctor, those Plaintiffs were exposed to the
16 dioxin and your workers were exposed to the dioxin. Dr.
17 Ellefson diagnosed -- I want you to assume, if you will, that
18 he diagnosed it as intoxication porphyria based upon one or
19 more of certain porphyrin abnormalities in the urine tests,
20 mainly related to the uroporphyrin and the coproporphyrins.
21 Would you do that, please?

22 A. (indicates affirmatively.)

23 Q. Where he found an abnormality in the uroporphyrins
24 or when he found an abnormality in the coproporphyrins, he

1 said that is an indication of intoxication porphyria. Would
2 you assume that, please?

3 A. Yes, sir.

4 Q. Now, if that is his diagnosis of porphyria, and you
5 have 35 percent of your admittedly exposed Nitro workers
6 having porphyria, and another 28.6 percent of the people that
7 work in the plant, and having, as you say, admittedly you
8 can't work there without having some exposure, also having
9 abnormalities in porphyrias, and we will demonstrate shortly
10 that your Krummrich plant workers have abnormalities in the
11 porphyrins. Doctor, would not those, if those abnormal
12 porphyrins indicate or show that those people have porphyria,
13 could not the tiredness that those people indicate be caused
14 by porphyria, assuming first that they have got porphyria?

15 A. No, sir, I don't think so.

16 Q. Doctor, you told us that -- the sign of porphyria
17 or one of the consequences of porphyria is tiredness, did you
18 not, sir?

19 A. I don't recall what I said, I'd like --

20 Q. Would you instruct the witness that he testified
21 that one of the consequences of porphyria, one of the signs
22 of porphyria is tiredness.

23 THE COURT: So instructed.

24 A. All right, sir.

1 Q. Doctor, if those people have got porphyria, assume
2 they have got porphyria, you could also expect them to have
3 tiredness then, couldn't you?

4 A. Yes.

5 Q. Now, Doctor, if they have porphyria, from exposure
6 to dioxin and/or tiredness, could there not be literally
7 millions of Americans, literally millions of Americans who
8 have some form of porphyria from exposure to dioxin and who
9 have some tiredness that they just can't explain that that
10 could be a consequence of porphyria?

11 A. If they have porphyria?

12 Q. Yes.

13 A. Yes.

14 Q. And this porphyria can be caused by dioxin, can it
15 not, sir?

16 A. Yes.

17 Q. And, Doctor, it is possible, is it not, sir, that
18 the dioxin that you at Monsanto have spread throughout the
19 United States in your herbicides, and in your germicides, and
20 Lysol and other things can be causing porphyria?

21 A. No, sir.

22 Q. That isn't possible?

23 A. No, sir.

24 Q. Doctor, if porphyria can be caused by dioxin, isn't

1 it possible that the dioxin that's spread out has caused
2 porphyria?

3 A. No, sir.

4 Q. Doctor, if dioxin causes porphyria, and you've got
5 2,4,5-T in the parts per million that's been spread
6 throughout the United States, can't dioxin cause porphyria,
7 sir? Your workers have got the abnormalities. Would you
8 assume, please, sir, that those abnormalities may be an
9 indication, as Dr. Ellefson has testified, of intoxication
10 porphyria, would you assume that, sir?

11 A. Assume that they are abnormal?

12 Q. Yes, assume they are abnormal, of course, I've
13 given you that, sir, can't that abnormality be an indication
14 of porphyria?

15 A. If they have got the abnormality of porphyria,
16 could that be porphyria?

17 Q. If they have got abnormal porphyrins, can not that
18 abnormality be an indication of porphyria?

19 A. It depends on degree of abnormality. The answer is
20 no.

21 Q. Then no abnormality in the porphyrins indicates
22 porphyria, you dispute what Dr. Ellefson has said, I'm --

23 A. I don't know.

24 Q. Well, Doctor, are you disputing what he said? He

1 said that those abnormalities in those particular Plaintiff's
2 abnormal uroporphyrins, abnormal coproporphyrins were an
3 indication of intoxication porphyria. A form of porphyria
4 caused by chemicals. Now, do you dispute that, sir, that
5 chemicals such as dioxin can cause porphyria? You don't
6 dispute that, do you, sir?

7 A. Not that, no, sir.

8 Q. Do you dispute that an abnormality in uroporphyrins
9 or in coproporphyrins may indicate intoxication porphyria, do
10 you dispute that, sir?

11 A. From dioxin?

12 Q. From any chemical.

13 A. The answer is yes.

14 Q. You do dispute that?

15 A. I don't dispute that.

16 Q. You don't. You don't dispute the fact that dioxin
17 can cause porphyria, you so stated?

18 A. Yes, sir.

19 Q. And, Doctor, then is it not possible that the
20 others who have been exposed to dioxin, just as the Sturgeon
21 Plaintiff's, just as the Nitro workers, just as we will
22 demonstrate the Krummrich workers, that their abnormal
23 porphyrins are not just with those people, but that others
24 exposed to your 2,4,5-T or your 2,4-D, or your Lysol, that

1 others too may have abnormal porphyrins on account of that
2 exposure, isn't that possible, sir?

3 A. No, sir.

4 Q. That isn't possible?

5 A. No, sir.

6 Q. Doctor, then I am at a loss, because you've said
7 that dioxin can cause porphyria?

8 A. Yes, sir.

9 Q. And that you know that 2,4,5-T and the Lysol and
10 2,4-D all has dioxin in it?

11 A. Yes, sir.

12 Q. Can't that dioxin in those chemicals cause
13 porphyria?

14 A. No, sir.

15 Q. It can't?

16 A. No, sir.

17 Q. Dioxin in one form can cause porphyria and in
18 another form cannot, is that what you are saying, Dr. Roush?

19 A. No, sir.

20 Q. All dioxin, all TCDD, all 2,3,7,8, and when I said
21 dioxin I want to be more specific and say 2,3,7,8-TCDD, can
22 cause porphyria, it can cause it whether it's in 2,4,5-T,
23 whether it's in Lysol, whether it's in the ground, assuming
24 you get exposed to it, of course, and that you ingest it,

1 dioxin, no matter what it's in, if it gets in you, can cause
2 porphyria, can it, sir?

3 A. No, sir.

4 Q. It cannot?

5 A. Has to be a sufficient dose.

6 Q. Of course it does, Doctor.

7 A. We haven't mentioned dose, we haven't said anything
8 about dose.

9 Q. I know I haven't said -- I'm simply saying dioxin
10 can cause it, can't it, sir?

11 A. Yes.

12 Q. And what you are saying is that the dose has to be
13 sufficient.

14 A. Yes, sir.

15 Q. Now, what is the dose that in your judgment will
16 cause porphyria?

17 A. Higher than the levels that we get in our Nitro
18 plant or our --

19 Q. What is the dose, Doctor?

20 A. No.

21 Q. You don't know?

22 A. I don't know.

23 Q. You don't know the dose, do you?

24 A. No, sir.

1 Q. You are saying higher than the levels in the Nitro
2 plant yet you know that Dr. Suskind has reported that your
3 Nitro people have got abnormal porphyrins, you know that,
4 don't you, sir?

5 A. Yes, sir.

6 Q. And it is possible that if they are abnormal that
7 it was caused by the Nitro dioxin, isn't it, sir?

8 A. No, sir.

9 Q. Doctor, if they are exposed to -- if they have got
10 abnormal porphyrins?

11 A. Yes, sir.

12 Q. And they work at Nitro and they are exposed to the
13 dioxin at Nitro, isn't it possible that that caused their
14 abnormal porphyrins?

15 A. If they have got more than the unexposed.

16 Q. Doctor, we have agreed, the other day you agreed
17 that the unexposed in fact were not unexposed, that they too
18 are exposed to dioxin just by virtue of having to walk
19 through the plant or carry messages or walk back and forth
20 every day?

21 A. Yes, sir.

22 Q. So we don't have any really unexposed group, they
23 didn't compare. See to do the really job of comparing the
24 abnormal porphyrins, what you need to do is to take a group

1 of people that have had no exposure to dioxin, you've got to
2 take a control group, not that works in the same plant that
3 makes the stuff where they are exposed to it every day,
4 you've got to take for a valid study, you've got to take a
5 control group that have had no opportunity for exposure.
6 Then you compare their porphyrins with the group that works
7 in the chemical plant. The normal person, Doctor, only you
8 agreed yesterday, has an abnormal lab result or abnormal
9 porphyrins, that's only in 5 percent or less. Now, that is
10 the normal control group, only 5 percent or less of the
11 people who have an abnormal porphyrin, isn't that correct,
12 sir?

13 A. Yes, sir.

14 Q. So when you -- they say that is the control group,
15 and you look at the 5 percent in the normal population that
16 will have an abnormality, and compare it with a group of
17 chemical workers where you've got 30 percent have got
18 abnormal porphyrins, you have to deduce as a scientist that
19 something that those 30 percent were exposed to, that the
20 five percent were not exposed to, caused those abnormalities,
21 must you not, Dr. Roush?

22 A. No, sir.

23 Q. Sir?

24 A. No, sir.

1 Q. You don't?

2 A. No, sir.

3 Q. What else could have caused those 30 percent to
4 have those abnormal porphyrins when the 5 percent did not
5 have them, sir?

6 A. How many tests were being run?

7 Q. Excuse me, Doctor, could you answer that question,
8 please, sir?

9 A. I'm trying to. If we do two separate studies, if
10 we do just uroporphyrins and coproporphyrins, each one of
11 them have a 5 percent chance of being abnormal.
12 Uroporphyrins and coproporphyrins, therefore 10 percent would
13 be suspected to be abnormal.

14 Q. We have got 35 percent even that begin?

15 A. Then you would include the one on the low side,
16 well, the high and low 5 percent of the top, 5 percent of the
17 low, that's 10 percent times two, is 20 percent.

18 Q. So what you are saying is that when you said
19 yesterday that five percent of people would have an abnormal
20 porphyrin, what you meant to say was that 20 percent would
21 have it, is that right, sir?

22 A. I'm talking --

23 Q. Is that right, Dr. Roush? Is it 20 percent of the
24 people that take a porphyrin test are going to have abnormal

1 porphyrin, is that what you are saying?

2 A. If we are talking about high or low.

3 Q. Is that what you are saying about total porphyrin.
4 test, 20 percent of the people are going to show up with the
5 abnormality?

6 A. If you take all the tests together, yes.

7 Q. Doctor, wherein did you find that figure, and where
8 did you discover that that 20 percent of the people are going
9 to have abnormal porphyrin tests?

10 A. That's the way they set the reference levels.

11 Q. Doctor, where did you find that, no testimony in
12 this case and no laboratory ever said that 20 percent of the
13 tests are going to be abnormal in the porphyrins?

14 A. It says on each one of the tests you have to take
15 that five percent on above and below.

16 Q. Where does it say that?

17 A. That's what reference values are.

18 Q. Where did you find that, Doctor?

19 A. Where did I find what?

20 Q. Why did you testify yesterday that five percent of
21 the population will have abnormal porphyrins? That's what
22 you said that's high, low, or whatever?

23 A. No, sir.

24 Q. That will be 5 percent of the people show up with

1 abnormal porphyrins, didn't you say that?

2 A. Yes, because we only --

3 Q. You did say that?

4 A. Yes, sir.

5 Q. And let's -- please, the case will never end if I
6 have to reestablish points once said. Now, we have got, on
7 your instance, we have got 35 percent of your people, not
8 five percent, now, Doctor, what other than dioxin exposure do
9 they have that could cause that 35 percent of the people to
10 have abnormal porphyrins when you expected to find it only in
11 5 percent?

12 A. I assume the 35 percent is abnormal?

13 Q. Yes.

14 A. How many tests were run?

15 Q. Doctor, please answer my question.

16 A. I am trying to. I have to know how many tests.

17 Q. 436 tests were run.

18 A. Have we done uro --

19 Q. Doctor, would you please answer that question?

20 A. I am trying to.

21 Q. Doctor, I am not the witness, you understand?

22 A. Yes, sir.

23 Q. You have the knowledge, I have given you the facts,
24 I want to know, based upon the facts that I have given you,

1 sir, the facts that Dr. Suskind has given us, sir, the facts
2 that are in the evidence in this case, that's all we can go
3 on is the facts that we have, Dr. Roush. Now, based upon
4 that, would 35 percent of those workers having abnormal
5 porphyrins, what could have caused those abnormal porphyrins
6 when you expect five percent of the people to have abnormal
7 porphyrins, other than the exposure to the chemicals in their
8 work place?

9 A. (pause) The answer to that would be yes.

10 Q. It would be the chemicals in the work place, would
11 it not, Doctor?

12 A. If they are abnormal.

13 Q. Now, Doctor, isn't it possible, sir, that if dioxin
14 has caused those abnormalities in the porphyrins, that that
15 dioxin that they are exposed to at that level that you
16 mentioned earlier, can also cause abnormal porphyrins in
17 other people exposed to that product manufactured by
18 Monsanto?

19 A. Exposed to the same level?

20 Q. Yes.

21 A. Yes.

22 Q. And, Doctor, nobody has yet established the level,
23 the lowest level that will cause intoxication porphyria if
24 it's dioxin, have they, sir?

1 A. Yes, sir.

2 Q. Who established the level that would cause
3 porphyria in human beings or abnormal porphyrins and where
4 was it established?

5 A. Not as an absolute number.

6 Q. Well, where was it established, who established it?

7 A. Dr. Poland has done it.

8 Q. What did he do with humans?

9 A. He looked at the people at Diamond Shamrock and
10 said he didn't find any porphyria.

11 Q. Now, Doctor, you are answering me with a different
12 thing. I want to know what is the level, the lowest level
13 that was established that would cause porphyria?

14 A. I don't have it.

15 MR. HEINEMAN: Object, Your Honor.

16 Q. You don't have it, do you?

17 MR. HEINEMAN: He asked him who did it, he just
18 answered who did it.

19 THE COURT: Objection is overruled.

20 Q. There hasn't been any. The lowest level necessary
21 to cause porphyria by dioxin established, has there, Doctor?

22 A. No, sir.

23 Q. And nobody knows how little it may take to cause
24 porphyria, do they, sir?

1 A. No, sir.

2 Q. And, Doctor, as you sit there, based upon the
3 scientific evidence that you have as to what levels of dioxin
4 can cause porphyria, you have no scientific evidence other
5 than speculation as to how much dioxin it will take to cause
6 porphyria, isn't that correct, sir?

7 A. Yes, sir.

8 Q. Doctor, that porphyria can be caused by dioxin, not
9 just a one-time dose, but by the dioxin that accumulates in
10 your body over a lifetime, can't it, sir?

11 A. No, sir.

12 Q. It cannot be caused by that?

13 A. No, sir.

14 Q. Why can't the dioxin that accumulates in your liver
15 over the lifetime reach a certain level however low or
16 however high it might be to cause that blood abnormality
17 known as porphyria?

18 A. Would you read that, please?

19 (Court Reporter read back the previous question)

20 A. The occupational porphyria as that have happened,
21 there have been only two out of the ten to fifteen different
22 groups that have been studied with occupational exposure.

23 Q. Doctor, I submit you are not answering my
24 question. I am asking you why you cannot, you said dioxin

1 can cause porphyria?

2 A. Yes, sir.

3 Q. Now, I want to know why dioxin accumulated in your
4 body cannot cause porphyria.

5 MR. HEINEMAN: Your Honor, may I object, I believe
6 Mr. Carr interrupted the witness' answer, I think the witness
7 was being responsive to the question.

8 THE COURT: Objection is overruled. The answer was
9 not responsive to the question.

10 A. The workers with exposure to occupational dioxin
11 that have been shown to have porphyria --

12 Q. Doctor, that isn't what I'm asking you, that's a
13 different question. You've said dioxin exposure can cause
14 porphyria?

15 A. Yes, sir.

16 Q. Now, cannot the dioxin that you are exposed to over
17 a period of time accumulate in your body?

18 A. Yes, sir.

19 Q. And cannot you accumulate dioxin in sufficient
20 levels in your body, whether it's a one-dose shot or whether
21 it's a little dose shot 365 days of the year, can't it reach
22 a level that will cause porphyria?

23 A. Not to my knowledge.

24 Q. Doctor, why is it that dioxin in the one-shot can

1 cause porphyria and dioxin in a cumulative shot cannot?

2 A. I don't know.

3 Q. Doctor, you don't know that it cannot, is that
4 correct?

5 A. Yes, sir.

6 Q. So what is correct, dioxin can cause porphyria, can
7 cause porphyria in a one-dose, in a five-dose or in a
8 cumulated amount, can't it, sir?

9 A. No, sir.

10 Q. Can't cause it in the one-dose?

11 A. Yes, sir.

12 Q. Can it cause it in a dose taken over a period of
13 thirty days?

14 A. I would assume so, yes.

15 Q. Can it cause it in a dose taken in a period of a
16 year?

17 A. I don't know how long it takes.

18 Q. My question is, can it cause it -- do you have any
19 knowledge it can't be caused in a period of a year of
20 exposure?

21 A. No, sir.

22 Q. Can it cause it in a period of five years?

23 A. I don't think so.

24 Q. Why not, Doctor, is there anything less toxic about

1 the dioxin that you accumulate over a period of time as
2 opposed to dioxin that you accumulate in a short period of
3 time? Is there any qualitative difference in that dioxin?

4 A. Yes, sir.

5 Q. What is the qualitative difference?

6 A. It goes into different places. The accumulation of
7 dioxin goes into the fat and leaves the liver. We talked
8 about that before. The dioxin is more soluble in fat than it
9 is in the liver, so the dioxin leaves the liver with
10 continued exposure and is deposited in the fat.

11 Q. And doesn't accumulate in the liver?

12 A. Not --

13 Q. Didn't you see the liver tissue of the lady at
14 Seveso?

15 A. That was an acute exposure.

16 Q. Doctor, it was more than acute exposure, the lady
17 lived with it for days, did she not have it in her liver?

18 A. She lived in it for days, that's right, that's not
19 a year's accumulation.

20 Q. But it is accumulation, isn't it, sir?

21 A. Yes, sir.

22 Q. It was in the liver in very massive doses?

23 A. Yes, sir, absolutely.

24 Q. Doctor, if the level of dioxin exposure at Nitro,

1 some of those people at Nitro, Doctor, that have those
2 abnormal porphyrins, were exposed to dioxin only ten,
3 fifteen, or twenty years prior thereto, weren't they, sir?

4 A. Yes, sir.

5 Q. So that means that that -- if the dioxin caused the
6 abnormal porphyrins, as a matter of fact, from '49 to '79
7 would have been thirty years prior thereto, if the abnormal
8 porphyrins were caused by the dioxin, had to have been caused
9 then by dioxin that they were exposed to some thirty years
10 before, is that correct, sir, if it was caused by dioxin?

11 A. And if they are abnormal?

12 Q. Yes, and if they are abnormal.

13 A. And if all of those were abnormal that you are
14 saying --

15 Q. That's right, assume they have been called abnormal
16 by a reputable scientific scientist called Dr. Suskind?

17 A. Doesn't mean it's true.

18 Q. That's true nothing he says is true or false
19 because he said it. Just assume he said it, as you have seen
20 he said it. Assume that if that occurred, that abnormality
21 occurred by exposure to something that took place thirty
22 years before, didn't it, Doctor?

23 A. And also we are saying that the level of
24 abnormality was no different between his unexposed and the

1 exposed, if the abnormals are about the same, statistically
2 are not different, then it's from the porphyrin, then it's
3 not from dioxin.

4 Q. Doctor, it is if those that are so-called unexposed
5 have a daily dose and the daily exposure by virtue of working
6 in that plant, isn't it, sir?

7 A. There still has to be a dose response. If there is
8 no dose response, then it's not real.

9 Q. We already established that you haven't yet --
10 science hasn't yet found the no effect level of a dose of
11 dioxin?

12 A. Yes, sir.

13 Q. You haven't yet determined the smallest amount of
14 dioxin that it would take to have no effects on the body, on
15 the system?

16 A. Yes, sir.

17 Q. So, that means that no matter how small they cut
18 the dioxin into, no matter what how minute particles they
19 have treated thus far, they cannot yet find a dose small
20 enough that it won't cause some effects. Now, Doctor, this
21 is the kind of chemical that those men are exposed to on a
22 daily basis, on those people that you have said are
23 unexposed. This is the kind of chemical that we are dealing
24 with. Now, Doctor, can it not be that their abnormal

1 porphyrins have been caused, if you've got no other
2 explanation for it, can it not be that those abnormal
3 porphyrins were caused by their daily small dose, admittedly
4 small dose because they are not working with it, simply
5 passing through the plant? Can it not be that it's caused by
6 that low dose, small dose exposure to dioxin?

7 MR. HEINEMAN: Let me object, Your Honor, to the
8 statement portion of Mr. Carr's question, if that's what it
9 is, because he never asked the doctor whether or not he
10 agreed with that portion, and I object to it. Ask that it be
11 stricken and ask the jury be instructed to disregard it.

12 THE COURT: Objection is overruled. It was
13 properly preparatory to the question that was asked. Answer
14 the question, please, Dr. Roush.

15 A. If the degree of abnormalities in the so-called
16 unexposed, you are saying have low-level exposure, if their
17 degree of abnormality is the same as those with a known
18 continued higher exposure, if their degree of abnormality is
19 different, then it's possible, but this appears the same,
20 then no relationship.

21 Q. We know that it's different because there are 35
22 percent for one group and 28.6?

23 A. That may be statistically not different.

24 Q. It is different, Doctor.

1 A. No, sir.

2 Q. Isn't 35 percent different than 28.6?

3 A. No, sir.

4 Q. Not different?

5 A. No, sir.

6 Q. Are they the same, Doctor, 35 the same as 35?

7 A. If they are not --

8 Q. Is 35 the same as 35?

9 A. 35 is -- yes, sir.

10 Q. 35 the same as 34?

11 A. No, sir.

12 Q. Doctor, there is a difference while -- what you are
13 saying is that you don't know whether or not it is what from
14 a statistical viewpoint whether or not it is statistically
15 different or unusual or of consequence, is what you are
16 saying in fact?

17 A. No, sir.

18 Q. No. All right. Doctor, is there any other factor
19 involved in the hypothetical facts that I've given you, where
20 this man has his abnormal porphyrins and he makes daily low
21 dose, very small dose, admittedly, by walking through the
22 plant or walking through the department or carrying a message
23 to the foreman or whatever, is there anything else that you
24 know of that he could have been exposed to to cause the

1 abnormal porphyrins other than the dioxin?

2 A. No, sir.

3 Q. And, Doctor, if his abnormal porphyrins can be
4 caused by that kind of dose, cannot that kind of dose in
5 other context cause abnormal porphyrins as well?

6 A. If all of what you said is correct --

7 Q. Yes?

8 A. Then it would be.

9 Q. And if that is true, cannot the dioxin that
10 Monsanto and others have put in the communities by virtue of
11 2,4-D, and Lysol, and 2,4,5-T, and silvex, and half a dozen
12 other chemicals, cannot those persons exposed to that on a
13 daily basis, admittedly a low-dose exposure if it caused it
14 in the Nitro workers, may it not possibly cause it in those
15 people as well?

16 A. (pause) What am I going to use for a normal?

17 Q. Could you answer the question that I've given you,
18 Doctor?

19 A. I don't know.

20 Q. Doctor, you know if it caused, if that kind of
21 exposure, hypothetically, admittedly, I'm not asking you to
22 agree that you agree that in fact it caused it, because I
23 know Monsanto's position, but hypothetically if it caused
24 abnormal porphyrins in the one instance, may not the same

1 kind of exposure, same kind of a dose cause it in other
2 instances?

3 A. Yes.

4 Q. Doctor, the kind of doses that we are talking about
5 there, are many times smaller than the dose that Mr. Yassenko
6 was exposed to, is it not, sir?

7 A. Who is Mr. Yassenko?

8 Q. He's the gentleman from Illinois who wrote, who
9 called Monsanto and asked for information because he was
10 exposed to 2,4,5-T, asked for guidance, it's what brought up
11 this conversation that we are having?

12 A. I see.

13 Q. Doctor --

14 A. I understand.

15 Q. Wasn't his exposure many times greater than the
16 exposure that we are talking about for the Nitro worker or
17 for the worker in the field or the user of the 2,4-D, wasn't
18 his exposure many times greater and won't it be continuing to
19 be many times greater than the exposure we have been talking
20 about?

21 A. The man using 2,4,5-T?

22 Q. Yes.

23 A. No, sir.

24 Q. Doctor, you don't use 2,4,5-T any more?

1 A. I'm talking about when we were using 2,4,5-T.

2 Q. I'm talking about this man, he has it now all the
3 time, every day on a daily basis since 1983?

4 A. How is he getting it every day?

5 Q. Doctor, did you read the note I gave you?

6 A. Yes, sir.

7 Q. Did he not put it on his garage floor to control
8 dust?

9 A. Yes, sir.

10 Q. And on various parts of his property, mine has got
11 a blank out there, but I assume it's something around his
12 house. Did he not use it there, see that, perhaps you didn't
13 read that, Doctor.

14 A. Yes, I did, I'm sorry.

15 Q. You are on the wrong page. Right there, Doctor..

16 A. I'm not sure what it says after, including his
17 house.

18 Q. Yeah, he poured the oil, just like Bliss did over
19 at Times Beach, sprayed this oil on the community that they
20 have now abandoned because the dirt got the TCDD in it. He's
21 got in it in his garage, got it around the foundations or
22 various parts of his property at least in his house, he's
23 living with it on a daily basis.

24 A. Yes, sir.

1 Q. Isn't he going to get more exposure than your
2 occasional Nitro worker passing through the plant?

3 A. I don't know.

4 Q. Well, Doctor, you know he will have a daily
5 exposure, don't you, sir?

6 A. Yes.

7 Q. Now, Doctor, insofar as Monsanto's position, is it
8 going to be that Monsanto is going to persist in its attitude
9 toward people like Ysenko and attitude toward the world at
10 large that dioxin is harmless and that it's, well, not
11 harmless, I withdraw that word, but that dioxin, the only
12 think you needed to worry about is Chloracne?

13 A. No, sir.

14 Q. Doctor, do you agree to that which you have
15 disagreed with earlier while your Northwestern people said
16 it's so, do you agree now, finally that dioxin can cause
17 those things described in Exhibit 1267 A?

18 A. No, sir.

19 Q. You don't agree then?

20 A. No, sir.

21 Q. Is it that you believe dioxin, as you stated it
22 when I put you first on the stand, dioxin will cause only
23 Chloracne?

24 A. No, sir.

1 Q. Because that's what you said first, didn't you,
2 sir?

3 MR. HEINEMAN: Object, Your Honor.

4 A. No, sir.

5 MR. HEINEMAN: Mischaracterization of what he said.

6 THE COURT: Overruled.

7 Q. (by Mr. Carr) You didn't say that, sir, not just
8 in court but in your deposition, the only thing dioxin will
9 cause will be Chloracne?

10 A. No, sir.

11 Q. Well, I'll bring the deposition back after lunch,
12 Doctor, and we will see what exactly what you said. All
13 right?

14 A. Yes, sir.

15 Q. But you have said today, at least, that dioxin will
16 cause porphyria?

17 A. Yes.

18 Q. And will dioxin cause hyperpigmentation and
19 hirsutism?

20 A. Yes, sir.

21 Q. Dioxin cause liver damage?

22 A. Yes, sir.

23 Q. Dioxin call elevated serum hepatic enzyme levels?

24 A. Yes.

1 Q. Disorders of fat metabolism?

2 A. Yes.

3 Q. Will dioxin cause disorders of carbohydrate

4 metabolism?

5 A. I don't know.

6 Q. You can't say that it doesn't, is that correct?

7 A. I don't think it's been established.

8 Q. So it may -- it's not been satisfied to your

9 approval yet?

10 A. Not to just me.

11 Q. Will it cause cardiovascular disorders?

12 A. I don't think so.

13 Q. Doctor, we have heart disease in your Nitro people

14 37 percent higher than expected, this is Zack-Gaffey here?

15 A. Yes, sir.

16 Q. What caused that in this exposed group, 37 percent

17 higher than expected, if it wasn't the dioxin?

18 A. That's the same level as found in the Nitro area,

19 people live outside of Monsanto, or don't work at Monsanto

20 have the same level of heart disease.

21 Q. Well, do they breathe air that comes from fumes

22 emitted by Monsanto?

23 A. It isn't just people that live close to that plant.

24 Q. Excuse me, do they live in the Kanawha valley where

1 Monsanto and other chemical companies put out fumes that
2 could be considered injurious to ones health, are those the
3 people that you are talking about?

4 A. Yes, sir.

5 Q. What you are talking about, you are comparing your
6 workers to the people that live in a valley that's surrounded
7 by chemical companies, aren't you, sir?

8 A. Yes, sir.

9 Q. That 37 percent higher figure is compared to the
10 normal population, isn't it, sir?

11 A. To what normal population?

12 Q. The porportional normal population selected by Zack
13 and Gaffey?

14 A. Yes, sir.

15 Q. Those workers of yours got cardiovascular disorders
16 37 percent higher than expected, 37 percent higher, a large
17 figure, Doctor. Now, do you now agree that dioxin can cause
18 cardiovascular disorders?

19 A. No, sir.

20 Q. You don't, correct?

21 A. No, sir.

22 Q. What you are saying is that this 37 percent was
23 caused by something else and not dioxin, haven't you, sir?

24 A. Yes, sir.

1 Q. What evidence do you have that that 37 percent was
2 caused by something else and not by dioxin?

3 A. It's the same as the people in the area, have the
4 same level of heart disease.

5 Q. Doctor, cannot all of those people being exposed,
6 living near Monsanto, can't they all get the dioxin from
7 Monsanto's fumes?

8 A. To some degree.

9 Q. Yes, indeed, Doctor, so you don't have a control
10 group. You are comparing it to a group of people that's
11 exposed to the same thing. That's not a control group. If
12 that 37 -- if those people could have heart disease caused by
13 your chemical fumes, those people have a heart disease caused
14 by the dioxin, it's the same thing, Doctor. Now, do you
15 agree that dioxin can cause cardiovascular disorders?

16 A. No, sir.

17 Q. You still don't agree. All right, Doctor. You
18 don't believe, then, and you don't agree with Northwestern
19 University?

20 A. That isn't Northwestern's position.

21 Q. Doctor, we have established that you paid
22 Northwestern and we went through this, we read the sentence
23 from their text that they wrote, they wrote it, didn't they,
24 sir? I didn't write it.

1 A. Yes, sir.

2 Q. They wrote it. They said those are the toxic
3 effects from dioxin exposure, didn't they, sir?

4 A. No, they did not.

5 Q. Doctor, didn't we read that sentence from the text?

6 A. Yes, sir.

7 Q. They said that, didn't they, sir?

8 A. No, sir.

9 Q. Who said it if they didn't?

10 A. They were quoting that man who wrote that chart.

11 Q. Doctor --

12 A. That wasn't --

13 Q. The text that we read was not a quote, was it, sir?

14 A. Yes, sir.

15 Q. It was in the body of the text, wasn't it, sir?

16 A. No, sir.

17 Q. Do you have that protocol, that particular
18 document? No, that's not the one. I don't recall the number
19 right now. Do you have the number, Jerry? The number that
20 comes to my mind is 1277, but that seems too early. I've got
21 it. 1266.

22 A. I've got it. Page 28.

23 Q. No, that's the table, Doctor, I'm looking for the
24 text.

1 A. That's on 27, on the second paragraph.

2 Q. It says, does it not, sir, "The toxic effects of
3 2,3,7,8-TCDD in man are summarized in Table 7?"

4 A. Yes, sir.

5 Q. That is Northwestern's statement, isn't it, Doctor?

6 A. Yes, sir.

7 Q. And, we went through that, did we not, sir, they
8 are saying that Table 7 is the toxic effects of 2,3,7,8-TCDD
9 in man, are they not, sir?

10 A. They are quoting somebody else's --

11 Q. Excuse me, Doctor, they are not quoting anybody,
12 that is their text, is it not, sir?

13 A. Yes.

14 Q. And they are not quoting anyone, are they? They
15 are saying positively affirmatively, definitely, without
16 quotes, without hesitation, without equivocation, they are
17 saying the toxic effects of 2,3,7,8-TCDD in man are
18 summarized in Table 7, aren't they, sir?

19 A. Yes.

20 Q. And, Doctor, one of those toxic effects is
21 cardiovascular disorders, isn't it, sir?

22 A. Yes.

23 Q. And you do not agree with the statement that one of
24 the toxic effects of 2,3,7,8-TCDD exposure in man is

1 cardiovascular disorder, do you, sir?

2 A. Not established.

3 Q. My question is, you don't agree with it, do you?

4 A. No, sir.

5 Q. Therefore, you disagree with this statement in this
6 protocol, do you not, sir?

7 A. I do not agree with that.

8 Q. And you also say that the fact that you've got
9 heart disease rate of 37 percent higher in your Nitro people
10 are caused by something and not caused by dioxin, don't you,
11 sir?

12 A. Yes, sir.

13 Q. What evidence do you have that it's not caused by
14 dioxin, Dr. Roush?

15 A. Because it's the same the people that live outside
16 the plant.

17 Q. What evidence do you have that what those people
18 outside got is not caused by your chemicals?

19 A. You have to have a dose response --

20 Q. What evidence do you have that their high heart --
21 what else goes on in that Kanawha Valley other than the
22 manufacture of those toxic chemicals, probably all of which
23 can cause cardiovascular disorders not just dioxin, probably
24 all of which can cause it, what else is going on there to

1 cause this high rate in your people?

2 A. Lifestyle.

3 MR. HEINEMAN: Let me object, Doctor. Please let
4 me object. Please.

5 MR. CARR: Do you have --

6 MR. HEINEMAN: I'd like to object to the form of
7 the question, Your Honor. Mr. Carr is stating all kinds of
8 things as to which there is no evidence whatever, so with
9 respect to all other things in the valley, and it's totally
10 irrelevant to the lawsuit, and I object to it.

11 THE COURT: Objection is overruled.

12 Q. (by Mr. Carr) Doctor, what is there in that valley
13 that you are aware of that can cause or account for this
14 heart disease other than exposure to chemicals?

15 A. First thing you say is lifestyle.

16 Q. Do they have a different lifestyle there, sir?

17 A. The people with heart disease have a different
18 lifestyle than those who don't.

19 Q. Doctor, that is because they have got the heart
20 disease. The heart disease came second.

21 A. Yes, sir.

22 Q. Now, Doctor, the lifestyle can't cause the heart
23 disease if you are changing your lifestyle because of the
24 heart disease?

1 A. No, sir.

2 Q. Now, Doctor, what else is there in that valley, do
3 the people in the Kanawha Valley, the Nitro workers, with
4 this 37 percent higher rate, do they have a different
5 lifestyle than you or me or anybody else?

6 A. That's what causes heart disease.

7 Q. What you are saying for some peculiar reason, those
8 people have a different lifestyle than the average American
9 citizen, and therefore they have got a 37 percent higher --

10 A. Yes, sir.

11 Q. And, Doctor, then that accounts for everybody then,
12 everybody, the normal American citizen which includes the
13 lifestyles of all of us. What about those people do you have
14 any knowledge that they live any differently than you or that
15 I do?

16 A. No, sir.

17 Q. Then, Doctor, how can you say then that lifestyle
18 causes their heart disease, if you have no such knowledge?
19 You are simply speculating, aren't you, sir?

20 A. No, sir, there are a lot of pockets of high heart
21 disease in the United States that are not exposed to dioxin.

22 Q. Doctor, there is a lot of things that cause heart
23 disease, isn't there?

24 A. They are well recognized, too.

1 Q. No question about that. One of those things is
2 dioxin, isn't it?

3 A. No, sir.

4 Q. Dioxin isn't recognized?

5 A. No, sir.

6 Q. Well, you don't recognize it, but is there
7 something about those folks at Nitro when Zack-Gaffey looked
8 at that, they looked at all elements, didn't they, sir?

9 A. All what elements?

10 Q. All elements that might go into account for those
11 problems?

12 A. No, sir.

13 Q. They didn't?

14 A. No, sir.

15 Q. Then they just threw that out there and they looked
16 into -- why did they look into the heart disease, why did
17 they look into the cancer, why did they look into those
18 things unless they wanted to see whether or not it had a
19 relationship with dioxin, what's the point of the study?

20 A. Describe the mortality experience of that
21 population.

22 Q. Why did they go into the cause of death, just want
23 to talk about the mortality experience?

24 A. I'm sorry? Why did they go into what caused the

1 death?

2 Q. That's what mortality study is.

3 Q. And they did that because they wanted to see
4 whether or not there was a relationship to dioxin exposure,
5 didn't they, sir?

6 A. Wanted to decide whether or not there was a
7 mortality experience different than a normal community.

8 Q. They found that there was?

9 A. Not different, heart disease was the same as the
10 community.

11 Q. They found it was 37 percent higher than expected,
12 didn't they, Doctor?

13 A. For the non-Kanawha Valley population, yes.

14 Q. Doctor, they found that something about their
15 occupation caused this problem then, is that it?

16 A. No, sir.

17 Q. What about the lung cancer, was the lung cancer
18 caused also because of living in Kanawha Valley?

19 A. Yes.

20 Q. And the genitourinary cancer caused because they
21 are living there?

22 A. No, sir.

23 Q. That was caused by dioxin?

24 A. Yes, sir -- no, sir.

1 Q. Then it was caused by living in Kanawha Valley?

2 A. No, sir.

3 Q. What was it caused by?

4 A. Being exposed to PAB.

5 Q. The bladder cancer was caused by PAB?

6 A. Yes, sir.

7 Q. And lymphatic cancer was caused by what?

8 A. Lymphatic --

9 Q. Lymphatic cancer, 92 percent higher was caused by
10 what?

11 A. Those numbers are too small to draw any
12 conclusions.

13 Q. What was it caused by?

14 A. Could be just the little lymphatic cancer that
15 happens in all of us.

16 Q. No, it's 92 percent higher than what happens in all
17 of us.

18 A. You can't do that with only three.

19 Q. Doctor, those are the figures, this figure is taken
20 from your reports?

21 A. Yes, sir.

22 Q. She did it, Zack-Gaffey did it?

23 A. Yes, sir.

24 Q. So don't say you can't do it, because Monsanto did

1 it, did they not do it?

2 A. Yes, sir.

3 Q. And, Doctor, what caused it then, those all other
4 cancers 43 percent higher, what caused that, just living in
5 Kanawha Valley?

6 A. Yes, sir.

7 Q. Then nothing about the occupation of your Nitro
8 workers has anything to do with any disease that they get
9 other than the PAB caused diseases, is that correct, sir?

10 A. That's what that study shows.

11 Q. What the other chemical companies did, however,
12 caused those diseases in your men, in your workers?

13 A. No, sir.

14 Q. Well, that's what we are talking about living in
15 Kanawha Valley caused those problems, we are talking about
16 exposure to the results of chemical companies, all the other
17 chemical companies are at fault and not Monsanto, if I read
18 you correctly?

19 A. No, sir.

20 Q. Well, is Monsanto at fault, sir?

21 A. For what?

22 Q. For causing those problems with the Nitro workers?

23 A. No, sir.

24 Q. Then is somebody else at fault?

1 A. No, sir.

2 Q. God hated those people and pointed the finger at
3 those folks?

4 A. No, sir.

5 Q. But it wasn't Monsanto that caused any of those
6 problems, right?

7 A. Besides the PAB?

8 Q. PAB problems caused by Monsanto but none of the
9 others?

10 A. Yes, sir.

11 Q. The other chemical companies caused the problems?

12 A. No, sir.

13 Q. The lifestyles caused the problems?

14 A. Yes, sir.

15 Q. The way those people lived caused them to get lung
16 cancer?

17 A. Yes, sir.

18 Q. All right. And, those ten folks that got that lung
19 cancer lived differently and you know they lived differently
20 than the fellow that didn't get lung cancer?

21 A. Yes, sir.

22 Q. Now, which one of those persons, identify for me
23 the person that you know that lived differently than his
24 neighbor?

1 A. The chart talks about all those people practically
2 were smokers.

3 Q. Yes, Doctor, so?

4 A. Well --

5 Q. But this is a higher rate than expected among the
6 smokers?

7 A. No, sir.

8 Q. Oh, yes, Doctor, you better read your report again,
9 Doctor. It's a higher rate because we have established and
10 you have established that exposure to something that can
11 cause cancer can be heightened, can be increased can be
12 promoted by dioxin, which you know to be a fact, don't you,
13 sir?

14 A. Not in man.

15 Q. Not in man? All right. Then, again, this lung
16 cancer was not any responsibility of Monsanto's?

17 A. No, sir.

18 Q. Dioxin didn't cause it at all?

19 A. No, sir.

20 Q. All right. So now, the only thing that you will
21 say that the dioxin exposure had a connection with is the
22 bladder cancer?

23 A. Yes, sir.

24 Q. And everything else is somebody else's fault?

1 A. No, sir.

2 Q. Well, you said the heart disease is caused because
3 they live in this valley that's surrounded by chemical
4 companies?

5 A. No, sir.

6 Q. No, you said it's caused by their lifestyle?

7 A. Yes, sir.

8 Q. Which of those 27 persons, name those persons that
9 had a lifestyle and tell me where you got the information
10 that they lived differently than you and I?

11 A. I don't have that information.

12 Q. Then, Doctor, you don't have the information that
13 their lifestyle is any different than mine or yours or
14 anybody else that doesn't have heart disease, do you, sir?

15 A. We know what causes heart disease.

16 Q. Excuse me, Doctor, do you have any information that
17 a single one of those persons has a different lifestyle, any
18 information that a single one of those 27 have a lifestyle
19 that causes heart disease?

20 A. No, sir.

21 Q. Then, Doctor, what you are saying then it's pure
22 speculation, you are saying that the lifestyle caused it, but
23 you have absolutely not one iota of evidence to suggest that
24 those people did not live a sound, sober, careful life which

1 would prevent heart disease, do you, sir? You don't have a
2 single evidence, all you know is they have got heart disease,
3 isn't that correct, sir?

4 A. Yes, sir.

5 Q. The single fact that you have is that they have got
6 heart disease?

7 A. No, sir.

8 Q. What other fact do you have other than exposed to
9 dioxin?

10 A. They live in a town that has the same kind of heart
11 disease as our workers.

12 Q. But, Doctor, you said it's caused by lifestyle and
13 not by the chemical companies is what you said now. You said
14 this heart disease was caused by lifestyle?

15 A. Yes, sir.

16 Q. Now, does the people in that valley have a
17 different lifestyle than anybody else?

18 A. I would presume so.

19 Q. Do you know they do?

20 A. No, sir.

21 Q. You don't have any evidence that a single one of
22 them has a different lifestyle than anybody else, do you?

23 A. No, sir.

24 Q. They have the same lifestyle that you have and that

1 I have, don't they, sir, so far as you know?

2 A. No, sir.

3 Q. Do you have some knowledge that they have a
4 different lifestyle?

5 A. They have.

6 Q. What is the knowledge that you have as to their
7 different lifestyle?

8 A. Because they have got heart disease.

9 Q. Doctor, you are saying because it's a horse it was
10 caused by something else. Now, Doctor, I want to know the
11 evidence upon which you base your statement that they have a
12 different lifestyle other than the fact that they got heart
13 disease?

14 A. Because they got heart disease they got different
15 lifestyle.

16 Q. So everybody that has got heart disease got a
17 different lifestyle is what you are saying?

18 A. Yes, sir.

19 Q. So if we all changed our lifestyle, none of us
20 would have heart disease?

21 A. I can't go that far.

22 Q. No, you can't go that far you know that chemicals
23 cause heart disease?

24 A. No, sir.

1 Q. You know that -- you don't know that either?

2 A. No, sir.

3 Q. Doctor, then those people that have it at a higher,
4 all the people that have heart disease are in the group of
5 expected, aren't they, sir, they look at the total
6 population, don't they, sir?

7 A. I'm sorry?

8 Q. There is all kind of lifestyles in this total
9 population, isn't there, sir?

10 A. Yes, sir.

11 Q. And when they say 37 percent higher, they are
12 talking about a normal population that includes all kinds of
13 lifestyles, aren't they, sir?

14 A. Yes, sir.

15 Q. Doctor, if lifestyle is the only cause of heart
16 disease, then Northwestern University is dead wrong when they
17 say that cardiovascular disorders can be caused by chemicals,
18 aren't they, sir?

19 A. I don't think Northwestern said that.

20 Q. Doctor, didn't we just go through that?

21 A. Yes, sir.

22 Q. And didn't you agree that they did say that?

23 A. That's what they said.

24 Q. All right. Doctor, please don't tell me again that

1 you don't think they said that when you know they did say
2 it. Let's pass on from that. Doctor, is there any evidence
3 at all that you have that dioxin does not cause heart
4 disease?

5 A. No, sir.

6 Q. Doctor, what you are saying is that you don't have
7 any evidence that dioxin does not cause heart disease. We
8 have the evidence here that people exposed to dioxin got a
9 rate 37 percent higher than expected. We have got
10 Northwestern's statement that cardiovascular disorders are
11 caused by dioxin exposure and we have other scientists that
12 say the same thing. And you have no evidence to counter it,
13 isn't that the state of where we are right now, Dr. Roush?

14 A. No, sir, others say the same thing I say.

15 Q. Who says that?

16 A. AMA says that.

17 Q. Says what, says dioxin doesn't cause heart disease?

18 A. No evidence that it causes heart disease.

19 Q. Is that the equivalent to saying dioxin does not
20 cause it? All they are saying, it's not yet been proved to
21 their satisfaction?

22 A. Yes, sir.

23 Q. And part of what they are saying is based upon
24 studies like Zack-Gaffey, isn't that correct, sir?

1 A. Yes, sir, that showed the 37 percent higher.

2 Q. Part of what they are saying is based upon a study
3 that you know and based upon Suskind's study, a study you
4 know to be a fraud?

5 A. No, sir.

6 Q. Doctor, that's what you testified to?

7 A. That they are frauds?

8 Q. Yes, the Suskind -- you said if he did not report
9 the cancers that were reported to him, that it was a fraud,
10 do you recall saying that, sir?

11 A. Not that I recall.

12 MR. HEINEMAN: Object, Your Honor, that certainly
13 was not my recollection of his testimony.

14 THE COURT: Objection overruled.

15 Q. (by Mr. Carr) Doctor, those positions that others
16 have taken as far as humans are concerned, are based in good
17 part upon things that Monsanto has printed or had cause to be
18 printed, and said, and things that you did, press releases
19 that you sent out and studies that you had, isn't that
20 correct, sir?

21 A. Yes, sir.

22 MR. CARR: Your Honor, I have noon.

23 THE COURT: Okay. And, Ladies and gentlemen, we
24 will break for lunch at this time. We will resume again at

1 one o'clock. The admonishments that I normally give to you
2 during the break will apply during this lunch break also.
3 Court is in recess for lunch.

4 (Following a recess for the lunch hour, these proceedings
5 were had in open court.)

6 THE COURT: Mr. Carr.

7 Q. (by Mr. Carr) Dr. Roush, at the break or sometime
8 before the lunch break you mentioned that it was not your
9 testimony that Chloracne was the only result that could occur
10 from exposure to 2,3,7,8-TCDD, do you recall that, sir?

11 A. Yes, sir.

12 Q. And, you recall your testimony on the 30th of May,
13 1985 at Page 196 Line 8, Doctor, whether or not this question
14 was asked you.

15 MR. HEINEMAN: Excuse me, what date?

16 MR. CARR: May 30th, 1985.

17 Q. Now along that line it is your belief, is it not,
18 sir, that acute exposure to 2,3,7,8-TCDD will cause Chloracne
19 and in the long run that Chloracne is the only adverse human
20 health effect from exposure to 2,3,7,8-TCDD and your answer
21 was yes?

22 A. That was for chronic exposure.

23 MR. HEINEMAN: The statement says in the long run.

24 Q. Yes, indeed.

1. A. Chronic exposure, yes. Acute, all those things we
2 had listed. All of those of concern.

3 Q. What you are saying is that you can get all of
4 those things?

5 A. Or some of them.

6 Q. Well, is it all of them or some of them?

7 A. There are a question on many of them, but some of
8 them will surely occur if the exposure is high enough.

9 Q. And, you'll have those problems then for the rest
10 of your life?

11 A. No, sir.

12 Q. Then what you are saying is that there is no
13 long-term effect from exposure to dioxin except Chloracne?

14 A. Yes, sir..

15 Q. And that is the position that you take and have
16 taken?

17 A. Yes, sir.

18 Q. That all the other problems that come from exposure
19 to dioxin will -- it will be either Chloracne, or it will go
20 away?

21 A. Yes, sir.

22 Q. And you also believe that you can't get any
23 problems from chronic low-dose exposure to dioxin, isn't that
24 correct, sir?

1 A. If you don't get Chloracne?

2 Q. Yes. And, it's perfectly all right to be exposed
3 to as much dioxin on a long-range basis as there may be and
4 if it doesn't cause Chloracne, it's not going to cause any
5 problems, isn't that correct, sir?

6 A. Yes.

7 Q. Yes. So, and that is the philosophy by which
8 Monsanto has been guided with it's own workers, with the
9 people at Sturgeon, and with the public at large, isn't that
10 correct, sir?

11 A. No, sir.

12 Q. No? Well, is that what Monsanto believes to be the
13 case?

14 A. What does Monsanto believe?

15 Q. As I posed it to you, sir, that if you don't get
16 Chloracne, it doesn't make any difference how much dioxin you
17 are exposed to, and over how long a period of time you are
18 exposed to it, if you don't get Chloracne, you are not going
19 to have any other ill effects from it or any ill effects from
20 it?

21 A. Yes, sir.

22 Q. And that is the philosophy by which Monsanto has
23 been guided in its handling of exposure of it's own workers
24 to dioxin, the exposure of the public to dioxin and the

1 exposure of people of Sturgeon to dioxin, isn't that correct,
2 sir?

3 A. Yes, sir.

4 Q. And there has been none of the facts that you at
5 Monsanto have learned, since the spill at Sturgeon, up to and
6 including the present time, to change that view and that
7 philosophy, isn't that also correct, sir?

8 A. Yes, sir.

9 Q. And for all of the items that we have pointed out
10 here that have come from your own study, from your own
11 employees, from your own work, you have some explanation for
12 what might appear to be as something caused by long-term
13 exposure to dioxin. You'd have some other explanation for
14 that other than dioxin, do you not, sir?

15 A. Yes, sir.

16 Q. And in the instance of the heart disease, your
17 explanation is that all of the people of Kanawha Valley have
18 a lifestyle that causes in them a higher rate of
19 cardiovascular disease than the rest of the country, isn't
20 that correct, sir?

21 A. Not the rest of the country. There are other areas
22 that of the United States that have just as high heart
23 disease as in the Kanawha Valley.

24 Q. But the population at large, what is considered the

1 United States population that the heart disease rates that
2 are taken from that includes those other areas, the people of
3 the Kanawha Valley, have their heart disease because they
4 live a different lifestyle than the rest of the people that
5 do not get this high, do not have this high rate of heart
6 disease?

7 A. Yes, sir.

8 Q. And, it is your belief that since all the people in
9 the Kanawha Valley have this -- well, have you done anything
10 to investigate the truth of that statement or the accuracy of
11 that statement that all of those people in the Kanawha Valley
12 have a different lifestyle than the rest of the country?

13 A. No, sir.

14 Q. Other than those pockets?

15 A. No, sir.

16 Q. Then that again is a statement that you at Monsanto
17 insist upon that has absolutely no basis in fact, or
18 evidence, or proof, isn't that correct, sir?

19 A. No basis for what?

20 Q. For the statement that the people in Kanawha Valley
21 have a higher heart disease rate than the rest of the country
22 because they live a different lifestyle than the rest of the
23 country?

24 A. I didn't say rest of the country, I said there are

1 other pockets of excess --

2 Q. Excluding those other pockets as well that have a
3 high rate of heart disease, there are other pockets of the
4 country that have a high cardiovascular heart disease, right,
5 sir?

6 A. Yes, sir.

7 Q. And it is your belief that Kanawha Valley's
8 lifestyle and those other pockets of the country, have a
9 lifestyle that causes the heart disease that they have?

10 A. Yes, sir.

11 Q. Now, have you done any investigation, and by you I
12 mean not only you, but, any scientific authority that you
13 have previously, have you done any investigation, have you
14 seen any investigation of the lifestyle of the people of the
15 Kanawha Valley to support your statement that their lifestyle
16 is responsible for their high heart failure rate.

17 A. Haven't done any studies but there are other --

18 Q. Have you seen any studies that others have done to
19 support your position that the style of life, the way the
20 people in Kanawha Valley live and comfort themselves, is
21 responsible for their heart disease, have you seen any
22 studies by anybody that says that?

23 A. I've seen other studies that have shown that
24 lifestyle in other countries that have --

1 Q. Doctor, I'm asking you specifically about the
2 Kanawha valley, have you seen any study from anybody that
3 says it is the lifestyle of the people of the Kanawha Valley
4 that's causing their heart disease to be higher, have them
5 have more heart disease, more heart failures, more heart
6 deaths, that it's their lifestyle that is causing that?

7 A. No, sir.

8 Q. Doctor, then what you are saying, then, is absolute
9 speculation? You have absolutely not one iota of proof that
10 the people of Kanawha Valley have a lifestyle that's
11 different than anybody else's, isn't that correct, sir?

12 A. Yes, sir.

13 Q. And as a matter of fact, I'll go farther than that,
14 the evidence you've been to Kanawha Valley, you are a doctor,
15 head of the department that has an important plant there,
16 you've been there many many times, have you not, sir?

17 A. Yes, sir.

18 Q. And have you observed anything about their
19 lifestyle, have you read anything about their lifestyle in
20 the newspaper, in the magazine, have you seen anything at all
21 about those people of Kanawha Valley that would suggest to
22 you that they live a different lifestyle than we do here in
23 St. Clair County?

24 A. No, sir.

1 Q. And, Doctor, then what you do know, though, about
2 Kanawha Valley is that they have the Nitro Monsanto plant
3 there, and have had it there for how many years, sir?

4 A. Early forties at least.

5 Q. You also know that all during that time, up to
6 1970, that Nitro Monsanto plant was producing chemicals
7 emitting fumes from that production of those chemicals into
8 that community that have when they were producing dioxins,
9 you know that, too, don't you, sir?

10 A. Know what?

11 Q. That all during that period of time, your Nitro,
12 West Virginia plant in the Kanawha Valley was producing
13 dioxins?

14 A. Part of that time.

15 Q. Do you have any -- was there any part of that time
16 when they were not producing dioxins to your knowledge?

17 A. Oh, yes.

18 Q. When was that, sir?

19 A. In the early '40's and before, back into the '30's.

20 Q. Well, they started producing their dioxins then in
21 the mid-forties, did they, sir?

22 A. I'm not sure exactly, but something about them.

23 Q. They continued to produce those dioxins until at
24 least 1970, did they not?

1 A. '69.

2 Q. '69. They produced their dioxins then for 20
3 years, didn't they, sir?

4 A. Just about.

5 Q. And you know that the fumes from that plant
6 producing those dioxins, the steam, the vapor, the dust,
7 everything else associated with that plant in that valley,
8 was exposed to those dioxin contaminants, wasn't it, sir?

9 A. To a degree.

10 Q. Now, you know that dioxin was going into that
11 community and you know that it had, that entire community had
12 a higher rate of heart disease and heart failure than the
13 rest of the country, other than pockets of communities, and
14 one thing that you do know is that the dioxin was there, but
15 you do not know that their lifestyle was anything different
16 than anybody else's anyplace else. As a matter of fact, you
17 know that their lifestyle was the same as everybody else's in
18 every other place in this country, you know that for a fact?

19 A. No, sir.

20 Q. You don't know that, sir?

21 A. No, sir.

22 Q. Well, did you observe anything that they did
23 differently, lived differently in the Kanawha Valley than we
24 do here in East St. Louis or Belleville or St. Louis,

1 Missouri?

2 A. No, sir.

3 Q. What you observed is that they live exactly the way
4 we do?

5 A. No, sir.

6 Q. Oh, did you observe that they live differently than
7 the way we do?

8 A. Sir? No, sir.

9 Q. What you observed was they lived the same as we?

10 A. No.

11 Q. You can't be both ways. You observed their
12 lifestyle, did you not, sir?

13 A. No, sir.

14 Q. You didn't?

15 A. No, sir.

16 Q. All those years of going to Kanawha Valley you did
17 not observe the way the people lived?

18 A. No, sir.

19 Q. You didn't, sir?

20 A. No, sir.

21 Q. Did you have conversations with those people that
22 you talked to in Nitro, West Virginia?

23 A. Yes, sir.

24 Q. And did you talk about ordinary things, hey, did

1 you go motor boating this weekend or skiing or did you go to
2 opera, did you look at the television antenna or did you go
3 to the movies and eat popcorn, didn't you have those
4 conversations with those people?

5 A. Yes.

6 Q. Didn't you read their newspapers?

7 A. Yes.

8 Q. Didn't you see those people on the street?

9 A. Yes, sir.

10 Q. You saw them doing everything exactly the way the
11 rest of us in America live, didn't you, sir?

12 A. No, sir, not as far as their lifestyle.

13 Q. What did you see that they did differently?

14 A. I don't know what foods they ate.

15 Q. My question is what did you see that they did
16 differently than the rest of us?

17 A. Nothing.

18 Q. What you saw, what you observed, the physical
19 evidence that you saw, was that they did everything the same
20 as the rest of us, saw no difference, did you, sir?

21 A. No, sir.

22 Q. Isn't that correct?

23 A. Yes, that's right.

24 Q. The difference that you know, though, that exists

1 in Kanawha Valley is that Monsanto for 20 years put fumes
2 into that community from its dioxin making process, you know
3 that, don't you, sir?

4 A. Yes.

5 Q. Now, can you not conclude, or is it not possible,
6 sir, that of the facts that you have, the facts that are in
7 your possession, a higher heart disease rate in Kanawha
8 Valley, 37 percent higher you said than the rate of your
9 workers is the same as the rest of the community, what you
10 saw was in this pocket, the same observable lifestyle that
11 you saw elsewhere, and you know that the dioxin was coming
12 into that community for 20 years, and you see the heart
13 disease. Is there any other factor of which you are aware,
14 that you have knowledge of, other than the contamination of
15 that community by Monsanto, that could account for this heart
16 disease rate?

17 A. The lifestyle --

18 Q. Could you answer my question, please, sir?

19 A. No, sir.

20 Q. You can't answer my question or your answer is no,
21 sir, you don't know of anything except the dioxin to account
22 for the heart disease rate?

23 A. I know of nothing else besides the lifestyle that
24 we can account for.

1 Q. Sir, you don't know the lifestyle, you already said
2 as far as you have observed it's the same as everybody else's
3 is what you have said, sir. What you also have said is that
4 the dioxin contamination goes into that community from
5 Monsanto and that that is the only factor that you know of
6 that's different in that community, isn't that correct, sir?

7 A. No, sir.

8 Q. What other factors do you know of that's different
9 in that community?

10 A. We haven't looked at the risk factors --

11 Q. My question is what other factors do you know of?
12 You said you haven't looked. I want to explore our
13 knowledge. What else do you know of other than the dioxin
14 contamination of that community to account for that high
15 heart disease rate?

16 A. Nothing.

17 Q. Thank you, Doctor. Doctor, insofar as the
18 porphyrins which you said that only Dr. Suskind called the
19 porphyrins abnormal from the Nitro workers, you yourself have
20 called those porphyrin results, not those same porphyrin
21 results, but porphyrin results to be porphyrin abnormalities,
22 have you not, sir?

23 A. Which porphyrin abnormalities?

24 Q. The 26 that you had at Mayos. Could you get

1 Exhibit 1447, please? Handing you 1447 A, you recognize that
2 as your handwriting on the top of that list, do you not, sir?

3 A. Yes, sir.

4 Q. And, would you read those words that you wrote on
5 the top of that document, sir?

6 A. Porphyrin abnormalities.

7 Q. And, you recall the 26 results -- Your Honor, I
8 know I had that blown up, but I don't see it here, I don't
9 know what I did with it.

10 THE COURT: Tammy, would that be in that room out
11 there possibly?

12 MR. CARR: Did somebody change those around? They
13 are in order going which way? It's marked 1433 that's why.
14 Thank you.

15 Q. (by Mr. Carr) Doctor, the Exhibit 1433 which is
16 the blow-up of your 1447, 1447 A, is the porphyrin
17 abnormalities that you had of the 26 Nitro workers, isn't it,
18 sir?

19 A. Those are Ellefson's abnormals.

20 Q. Those are Ellefson's findings. It is your writing
21 called them porphyrin abnormalities?

22 A. Yes, sir.

23 Q. Yes. So, those people had those porphyrin
24 abnormalities, you called it in 26 of them, and Suskind

1 called it in a larger number, because he saw a larger number
2 of people, isn't that correct, sir?

3 A. Those are not my abnormalities.

4 Q. Doctor, you saw those results that were given to
5 you by Mayos?

6 A. Yes, sir.

7 Q. You have been working in laboratories, you said
8 yourself yesterday you have?

9 A. Yes, sir.

10 Q. You wrote at the top of those the words porphyrin
11 abnormalities, did you not, sir?

12 A. Yes, sir.

13 Q. And you described those as porphyrin abnormalities,
14 did you not, sir?

15 A. Based on Ellefson's normals?

16 Q. Yes.

17 A. But I am --

18 Q. Based on any laboratories normals, that's the way
19 you tell whether they were abnormal, based on those
20 laboratories normals, isn't that correct, sir?

21 A. Yes, sir.

22 Q. And, those are porphyrin abnormalities, aren't
23 they, sir?

24 A. Yes, sir.

1 Q. Now, Doctor, is there anything, and those are the
2 Nitro workers part of whom at least, if not all of whom, only
3 part of whom were in this Suskind morbidity or health study,
4 isn't that correct, sir?

5 A. I'm sure part of them were.

6 Q. Doctor, those are abnormalities caused by the only
7 element that you know of, they have in common is dioxin
8 exposure, isn't that correct, sir?

9 A. No, sir.

10 Q. Is there something else that those men have in
11 common, to your knowledge, sir, that you have knowledge of,
12 not your speculation, not your guessing, is there something
13 else that those men have in common, other than exposure to
14 dioxin?

15 A. No, sir.

16 Q. And, Doctor, we have established that not only have
17 the Suskind workers, the people in the Suskind study had
18 exposure many years prior to that time, those workers, some
19 of them have the exposure to the dioxin only back in the 1949
20 incident, isn't that correct, sir?

21 A. I don't know that, but it could be.

22 Q. And those are many years later, isn't that, if
23 their porphyrins were caused to be abnormal by exposure back
24 in the '40's or the '50's, and they still have it in 1984

1 when you took it to Mayos clinic, isn't that --

2 A. Those aren't my numbers.

3 Q. Sir?

4 A. I didn't take those to Mayo.

5 Q. You sent them to Mayo?

6 A. No, sir.

7 Q. Somebody for Monsanto sent them to Mayos, when I
8 say you, I don't mean you specifically, I mean agents,
9 employees, attorneys, doctors, whatever it is,
10 epidemiologists, whatever it is, somebody in behalf of
11 Monsanto?

12 A. No, sir.

13 Q. Doctor, you at Monsanto sent those to Mayos?

14 A. No, sir.

15 Q. Who did?

16 A. Carnow.

17 Q. Carnow sent those?

18 A. Yes, sir.

19 Q. From the Nitro workers?

20 A. Yes, sir.

21 Q. And you talked to Dr. Ellefson about Carnow's?

22 A. Yes, sir.

23 Q. So Carnow was the one that sent those to Mayos?

24 A. Yes, sir.

1 Q. And you discussed it with Mayos?

2 A. Yes, sir.

3 Q. And, even knowing that you still wrote on it
4 porphyrin abnormalities?

5 A. By his definition, yes.

6 Q. You do know that those were then urine samples of
7 the Nitro workers that Dr. Ellefson has called abnormal from
8 exposures that happened many many years before, do you not,
9 sir?

10 A. No, sir.

11 Q. You don't know that?

12 A. No, sir.

13 Q. Well, didn't they say that they were in the '49
14 accident, some of those, and that had no other exposure other
15 than the '49 accident, or at least had no exposure since
16 1969?

17 A. Yes. Yes, sir.

18 Q. And that was exposure that would have ended ten
19 years, I'm sorry, '69 and '84, fifteen years before those
20 tests were run, isn't that correct, sir?

21 A. Yes, sir.

22 Q. The very latest exposure that any of those people
23 could have had to dioxin in the manufacturing process at
24 least, would have been then fifteen years old, wouldn't it,

1 sir?

2 A. Yes, sir.

3 Q. Now, isn't something that persists and lasts for
4 fifteen years called chronic?

5 A. If indeed this lasted that long.

6 Q. Yes, indeed, assuming that it's lasted for fifteen
7 years, isn't that chronic?

8 A. Yes.

9 Q. And if this was caused by dioxin and it's lasted
10 for fifteen years, wouldn't those abnormalities be considered
11 then a chronic result of exposure to dioxin?

12 A. Yes.

13 Q. Yes. Now, Doctor, do you have any evidence, any
14 proof, anything that those men got their chronic porphyrin
15 abnormalities from some source or some cause other than the
16 dioxin exposure?

17 A. Dioxin doesn't cause all those things.

18 Q. Excuse me, Doctor, could you answer that question,
19 please, sir?

20 A. Would you repeat the question?

21 (Court Reporter read back the previous question.)

22 A. My answer is dioxin doesn't cause those things.

23 Q. Doctor, I want you to assume that Dr. Ellefson has
24 testified in this case in a deposition that dioxin will cause

1 those porphyrin abnormalities that are on this board?

2 A. Yes, sir.

3 Q. Now, assuming that, sir, is there anything that you
4 know of, other than the exposure of those men to dioxin, that
5 could account for their porphyrin abnormalities some fifteen
6 years after their exposure?

7 MR. HEINEMAN: Excuse me, Your Honor. Mr. Carr,
8 when you are asking him to assume that, you are asking him to
9 assume those types, obviously Dr. Ellefson didn't testify in
10 this courtroom about those individuals.

11 MR. CARR: Not about those individuals, he
12 testified that each of those findings of those abnormalities
13 that the copro and the porphyrin bilinogens and the uros,
14 all, they all have either the porphyrin bilinogen uro or
15 copro, that each of those are indication of intoxication
16 porphyria and that each can be caused by exposure to dioxin.
17 I'd like for you to assume that he has testified to that,
18 sir. Now, is there anything that you know of, sir, other
19 than the fact that those men were exposed to dioxin fifteen
20 years before to account for those porphyrin abnormalities?

21 A. Dioxin doesn't cause that.

22 MR. CARR: Your Honor, would you direct the witness
23 to answer my question?

24 THE COURT: Dr. Roush, you have to answer the

1 question as is posed to you. You have to answer it taking
2 into consideration those factors that have been told to you
3 as matters that you must assume, and that either by not
4 objecting or by my overruling an objection I've agreed that
5 you have to assume.

6 A. I understand.

7 THE COURT: So please answer the question as it is
8 posed to you, the question with the assumptions.

9 A. Would you repeat that for me?

10 (The Court Reporter read back the previous question.)

11 A. No, sir.

12 Q. Now, Doctor, I also asked you this morning about
13 what Monsanto required from other chemical companies when it
14 purchased chemicals from others, and I think I promised you
15 that I would show you some documents to support the statement
16 that I made. And, do you recall, sir, being asked by various
17 employees of Monsanto to give them what you would, whether or
18 not you would consider that marketing a product with no
19 detectable 2,3,7,8-TCDD would be appropriate, do you recall
20 anything like that, specifically talking about ROUNDUP?

21 A. Yes, sir.

22 Q. You do recall that?

23 A. Yes.

24 Q. I hand you now what's been marked Plaintiff's

1 Exhibit 1489, and ask you if you recognize that as a company
2 confidential query that was addressed to you dated August
3 12th, 1983?

4 A. Yes, sir.

5 Q. Offer 1489 into evidence, if it please the Court.

6 MR. HEINEMAN: What's the number, I'm sorry?

7 THE COURT: 1489.

8 MR. CARR: 1489, I believe.

9 MR. HEINEMAN: Your Honor, we would object only on
10 the basis that it's our understanding that it's somebody
11 else's product, 2,4-D, that's being talked about here, and I
12 don't think it's relevant to the issues in this case.

13 THE COURT: Okay. Objection is overruled. 1489 is
14 admitted over objection.

15 Q. Doctor do you recognize 1489 A as being the second
16 page of that exhibit?

17 A. Yes, sir.

18 MR. CARR: Offer 1489 A, as well, Your Honor.

19 THE COURT: Same objection?

20 MR. HEINEMAN: I didn't know what 1489 --

21 THE COURT: It's the second page of 1489.

22 MR. HEINEMAN: Blow-up?

23 THE COURT: Blow-up.

24 MR. CARR: Yes.

1 MR. HEINEMAN: Same objection.

2 THE COURT: I'll incorporate those objections. Same
3 ruling.

4 Q. Doctor, to put this exhibit in appropriate
5 perspective, it points out that Monsanto planned to market
6 something, a mix of ROUNDUP and 2,4-D in Brazil and the
7 United States, starting in -- apparently wanting to do it
8 some time after August of '83, isn't that correct, sir?

9 A. Yes, sir.

10 Q. And, who is Mr. Harness, who is Robert Harness?

11 A. I'm not sure what his title is, he's with the
12 Agricultural Division.

13 Q. In any event, he was concerned about whether or not
14 2,4-D might cause any possibility of health and environmental
15 effects, was he not, sir?

16 A. Yes, sir.

17 Q. And, because of that, he asked you whether or not a
18 product that we could buy from Dow that would have no
19 detectable limits, no detectable 2,3,7,8-TCDD, and no more
20 than 10 parts per billion of all the other dioxins, whether
21 or not that would present any unreasonable adverse risk to
22 human health or the environment, did he not, sir?

23 A. Yes, sir.

24 Q. Apparently he was concerned that whether or not

1 even if there was, even no more than 10 parts per billion of
2 all the other dioxins, whether or not that would present a
3 health hazard, wouldn't it, sir?

4 A. Yes, sir.

5 Q. And, you also got about the same time, I suppose
6 you asked your toxicologist what he thought about it, did you
7 not, sir, Mr. Levinskas?

8 A. He did that before I saw it.

9 Q. Well, you got it on the 12th, I've got a memo of
10 his dated the 18th, so that couldn't very well be, but I
11 won't quarrel with you on it. Handing you now Plaintiff's
12 Exhibit 1490, I'll ask you do you recognize that as a memo
13 written to you by Dr. Levinskas, I suppose he's a Ph.D.,
14 Levinskas?

15 A. Yes, sir.

16 MR. CARR: Offer that exhibit into evidence.

17 THE COURT: Any objections?

18 MR. HEINEMAN: Same objection as with respect to
19 1489, Your Honor.

20 THE COURT: Fine, I'll incorporate those
21 objections. Same ruling. It's admitted over objection.

22 Q. Doctor, you recognize 1490 A as being a blow-up of
23 1490?

24 A. Yes, sir.

1 MR. CARR: Offer 1490 A into evidence, if it please
2 the Court.

3 THE COURT: I'll incorporate the same objections.

4 MR. HEINEMAN: Yes, please, Your Honor.

5 THE COURT: Admitted over objection.

6 Q. Doctor, the thing that is being inquired of by
7 those exhibits is not just for a product to be sold in
8 Canada, but it's for a product to be sold in the United
9 States and Brazil, isn't that right, sir?

10 A. Yes, sir.

11 Q. And so, somebody at your plant is wanting to use
12 something manufactured by Dow that has no detectable levels
13 of 2,3,7,8-TCDD in the United States, aren't they?

14 A. At the one part per billion detection level.

15 Q. Isn't that correct, sir?

16 A. At the one part per billion detection level.

17 Q. Is the answer to my question yes, sir, with that
18 addition to it?

19 A. Yes, sir.

20 Q. You say yes when you add that?

21 A. That's correct.

22 Q. All right, fine. Doctor, handing you now
23 Plaintiff's Exhibit 1491, I'll ask you if that isn't your
24 response to the memo that was addressed to you by Mr.

1 Harness?

2 A. Yes, sir.

3 MR. CARR: Offer 1491 into evidence, if it please
4 the Court.

5 THE COURT: Any objections?

6 MR. HEINEMAN: If you would please incorporate the
7 same one, Your Honor.

8 THE COURT: Sure, so incorporated. Same ruling.

9 Q. Doctor, do you recognize 1491 A as a blow-up of
10 1491?

11 A. Yes, sir.

12 MR. CARR: Offer 1491 A into evidence.

13 THE COURT: I'll incorporate the same ruling.

14 Q. Now, Doctor, prior to the time -- strike that.
15 Doctor, I hand you what's been marked as Plaintiff's Exhibit
16 1492 and 1492 A, I'll ask you whether or not both 1492 A is a
17 page from 1492, I'll ask you whether or not both of those
18 documents are documents by Monsanto dealing with ROUNDUP?

19 A. Yes, sir.

20 MR. CARR: MR. CARR: I'll offer 1492 A into
21 evidence which is a page from 1492.

22 MR. HEINEMAN: I'm confused. I have 1492.

23 THE COURT: A.

24 MR. CARR: 1492 is the original full document, 1492

1 A is a page therein. I'm not offering the full document,
2 just the pertinent page. Offer those exhibits, Your Honor.

3 THE COURT: Do you have any objections?

4 MR. HEINEMAN: If you would please incorporate the
5 same objection, Your Honor.

6 THE COURT: Sure.

7 MR. HEINEMAN: As to 1492 A.

8 THE COURT: Sure. Admitted over objection. Same
9 ruling.

10 Q. Now, Doctor, the last exhibit just referred to at
11 the bottom of the page says, "Notes: (1) Must have no
12 detectable 2,3,7,8-TCDD isomer and less than 0.01 ppm total
13 for all detected dioxin isomers, when analyzed by a method
14 with a limit detection of 0.001 parts per million for each
15 isomer." You see that, sir?

16 A. Yes, sir.

17 Q. Now .001 parts per million is 10 parts per billion,
18 is it not, sir?

19 A. Yes, sir.

20 Q. And .001 parts per million is one part per billion,
21 is it not?

22 A. Yes, sir.

23 Q. And those specifications that Monsanto established
24 from the product that it was going to buy from Dow were

1 specifications that you at Monsanto set for Dow before you
2 would agree to buy their product, isn't that correct, sir?

3 A. I don't know, but I assume that's right.

4 Q. Well, I'm not asking you to assume anything,
5 Doctor. Would you mark this. Hand you now what's been
6 marked Plaintiff's Exhibit 1493 and see if you recognize that
7 as a memo dealing with this product dated June the 13th,
8 1983?

9 A. Yes, sir.

10 Q. Offer 1493 into evidence, if it please the Court.

11 THE COURT: Any objections?

12 MR. HEINEMAN: Let me read it for a moment, please,
13 Your Honor.

14 THE COURT: Sure.

15 MR. HEINEMAN: Your Honor, if the Court would
16 incorporate the same objection as with respect to the prior
17 documents relating to this questioning.

18 THE COURT: Sure. They are so incorporated. Same
19 ruling. It's admitted over objection.

20 Q. Doctor, this document 1493 written by Dr. Richark
21 C. Dirks. Who is he?

22 A. He is one of the toxicologists that work for Dr.
23 Levinskas.

24 Q. And Dr. Levinskas works for you?

1 A. Yes, sir.

2 Q. So he's one of your, one of the persons that you
3 supervised, direct and control, is he not?

4 A. Yes, sir.

5 Q. Those other people's names, who is E. J. Brandt?

6 A. I'm not sure of her title, she works for the Ag
7 Division.

8 Q. Those other people that are named there are all
9 people that are either toxicologists or connected with the
10 sale of this product?

11 A. Yes, sir.

12 Q. Doctor, the fourth paragraph of this document
13 dealing with a potential source of concern that the author of
14 this document, I suppose, Monsanto itself had with a possible
15 contamination of that which it was going to buy from Dow with
16 dioxin. Isn't that correct, sir?

17 A. Yes, sir.

18 Q. And, it points out that while Dow has agreed to
19 meet Monsanto's specifications, that is, no 2,3,7,8-TCDD, and
20 not more than 10 parts per billion of the other dioxin
21 isomers, it points out that you are going to check those
22 shipments from Dow yourself, in your ultra trace laboratory
23 in Dayton, doesn't it, sir?

24 A. It was the recommendation that they do it.

1 Q. Yes, now, why would they want to do that in view of
2 the fact that the statement that we believe Dow to be a
3 completely responsible company, why would Monsanto want to
4 check this product being sold by Dow?

5 A. To insure they had met that standard.

6 Q. To insure that it has no 2,3,7,8-TCDD for one
7 thing, isn't that correct?

8 A. No, at one part per billion sensitivity.

9 Q. Well, that's what you can check it for, that's the
10 way you check it. Did you have sensitivity better than one
11 part per billion, sir, in your instruments?

12 A. We can go into parts per trillion.

13 Q. Parts per trillion I thought, Doctor, was in the
14 tissue and things of that sort?

15 A. I can't answer that.

16 Q. In any event, you didn't want to see, to have any
17 product that had any 2,3,7,8 in it, did you, sir, so far as
18 you could tell?

19 A. Yes.

20 Q. Now, the statement that you believed Dow to be a
21 completely responsible company, do you mean by that or is it
22 meant by Monsanto in this document that a responsible company
23 would not ship out something that has 2,3,7,8-TCDD in it but
24 that perhaps an irresponsible company might do so.

1 MR. HEINEMAN: Object to the form of the question,
2 Your Honor, calling for speculation and conclusion as to what
3 the author of this document meant.

4 THE COURT: Overruled.

5 A. No, sir.

6 Q. That's not what you mean by this document then, is
7 that right, sir?

8 A. No, sir.

9 Q. Well, when you say we consider, "We believe Dow to
10 be a completely responsible company, however, in the present
11 social climate considering dioxins, we consider it prudent to
12 acquire first-hand knowledge, first-hand information,
13 first-hand Monsanto information regarding dioxin levels in
14 this product." You see that sentence, sir?

15 A. Yes, sir.

16 Q. That means that while you think Dow is responsible,
17 you believe they are completely responsibility -- it's
18 possible that they could ship you something that has got
19 detectable levels of 2,3,7,8-TCDD in it, isn't that right,
20 sir, you want to check and make sure that doesn't occur?

21 A. Yes, sir.

22 MR. HEINEMAN: Doctor, please, let me make my
23 objection. Your Honor, may my objection with respect to
24 calling for this witness' speculation with respect to what

1 the author of the document intended be a continuing one
2 throughout the course of this examination on this document?

3 THE COURT: It's noted as a continuing objection.
4 It is overruled. I don't believe it calls for speculation.
5 It is noted as a continuing objection.

6 Q. (by Mr. Carr) Now, would a company that's
7 irresponsible -- would a company that's irresponsible ship
8 dioxins out, sir, in its product, they knew that the product
9 had dioxins in it? Irresponsible company ship that stuff
10 out?

11 A. I don't know.

12 Q. You don't know whether an irresponsible -- isn't
13 that, sir, what Monsanto is -- something that you want to
14 make sure doesn't happen to you? That while you believe Dow
15 is a completely responsible company, you just want to make
16 sure that they remain responsible and you don't want to take
17 any chances, you want to check for yourself to make sure that
18 no 2,3,7,8-TCDD is in that product? Isn't that exactly
19 what's going on there, Dr. Roush?

20 A. No, sir.

21 Q. That isn't what's going on?

22 A. No, sir.

23 Q. What is going on if you are not wanting to protect
24 yourself against the possibility that Dow might irresponsibly

1 ship you some 2,3,7,8 contaminated product?

2 A. To do analyses at one part per billion is hard.

3 That's all that says.

4 Q. Oh, that's all that says?

5 A. Yes, sir.

6 Q. What -- why did they use the word responsible
7 there?

8 A. Because we believe they are good capable company.

9 Q. Well now, responsible doesn't mean capable, sir.
10 Responsible means one that recognizes its obligations to the
11 customer and recognizes its obligations to the public, that's
12 the way responsibility is used in this context, isn't that
13 correct, sir?

14 A. No, sir, not to me.

15 Q. You don't think that's what they are talking about,
16 about what you are talking about, not they, but what your
17 company is talking about when you say, "We believe Dow to be
18 a completely responsible company, however, in the present
19 social climate concerning dioxins we consider it prudent to
20 require first-hand Monsanto information regarding dioxin
21 levels in this product." Aren't you at Monsanto talking
22 about, sir, the possibility that this completely responsible
23 company might somehow or other evade or avoid its
24 responsibility and ship you something that's got dioxin in,

1 it and you want first-hand information if that might occur?

2 A. Not in the least.

3 Q. You don't think that the word -- well, what do you
4 think that you are actually protecting yourself against here,
5 sir?

6 A. An analyzing of dioxin at one part per billion is
7 difficult.

8 Q. Well, that's a given, sir, but it says, although
9 Dow has agreed to meet the specifications for dioxin levels
10 in 2,4-D, we strongly recommend that your company continue,
11 Monsanto continue to monitor dioxin levels in the 2,4-D
12 supplied by Dow. Why would you strongly recommend that you
13 monitor those levels, even though Dow has agreed to do it,
14 sir?

15 A. I don't see where it says strongly recommend.

16 Q. Well, if you would look at the fourth line of that
17 paragraph, sir.

18 A. Yes, sir.

19 Q. You see that?

20 A. Yes, sir.

21 Q. Now, Doctor, would a responsible company ship
22 dioxins out to customers knowing that it's got dioxins in
23 there and knowing the customer doesn't know it?

24 A. This --

1 Q. Would a responsible company do that?

2 A. This will have dioxin in it.

3 Q. Would a responsible company do that, sir?

4 A. Yes.

5 Q. And you have no concern about that and you think
6 responsible companies would ship dioxins out to its customers
7 without telling them about it?

8 A. This isn't talking about it.

9 Q. It most certainly is, Doctor, if you specify with
10 Dow that there is to be no detectable 2,3,7,8 up to one part
11 per billion level, if you tell them that there isn't to be
12 any in your product and not to be more than 10 parts per
13 billion, of all the other so-called less toxic isomers, then,
14 if they are going to be responsible to you, they are going to
15 ship just that to you and nothing more, isn't that correct,
16 sir?

17 MR. HEINEMAN: Object to the form of the question,
18 Your Honor. He used the term there isn't going to be any and
19 that's clearly misleading based upon what the document --

20 Q. Any detectable at the level of one part per
21 billion, Dr. Roush?

22 THE COURT: With that modification, objection is
23 overruled.

24 A. Not by intent.

1 THE COURT: I'm sorry, I didn't hear your answer.

2 A. Not by intent they won't.

3 Q. And by intent, with intent comes knowledge, doesn't
4 it, sir?

5 A. Yes.

6 Q. You have to have knowledge, don't you, sir?

7 A. Knowledge for what?

8 Q. That it's there, for you to be guilty of an
9 intentional act, you have to know that you are doing it. It
10 can't be an accidental kind of thing, can it, sir?

11 A. There will be dioxin here.

12 Q. Doctor, don't get on another point, we know that
13 there will be, that there may be. We don't know that there
14 will be dioxin in the -- 2,3,7,8 dioxin in this product, but
15 we know that it may be, don't we, sir, but let's not get into
16 that point, sir. I'm talking about one part per billion.

17 A. Yes, sir.

18 Q. Dow has been required by Monsanto to ship the
19 product with less than 1 part per billion by detectable
20 levels, haven't you, sir?

21 A. Yes, sir.

22 Q. And that's what you expect to get from Dow, don't
23 you, sir? Isn't that right, sir?

24 A. That's what we hope to get.

1 Q. That's what you will get if they live up to their
2 responsibility to you, isn't that correct, sir?

3 A. If their detection method is good.

4 Q. Well, by definition, they are required to have a
5 detection level that is capable of doing this, isn't that
6 right? Don't you require them to do it?

7 A. They will do the best of their ability.

8 Q. Don't you require them to do that, sir, isn't that
9 part of the contract agreement, isn't that part of your
10 specifications that they have the capacity to do it, sir?

11 A. Yes, if it doesn't, we won't accept it.

12 Q. And how will you know it, sir, if you don't check
13 it yourself?

14 A. Won't.

15 Q. You take it upon their responsibility, don't you,
16 sir?

17 A. If we do it without analyzing.

18 Q. Now, they would be irresponsible if they shipped
19 you dioxin products, dioxin containing products knowing that
20 dioxin was in it, wouldn't they, sir?

21 A. If it was over that limit, yes.

22 Q. Yes, and now a responsible company won't do that,
23 will they, sir?

24 A. Not on purpose.

1 Q. Well, but if you did it by accident and you learned
2 that you had accidentally shipped that product, a responsible
3 company would call up the customer and say, hey, we
4 accidently -- we didn't meet the specifications or we
5 actually had a lot of dioxin in this shipment and we didn't
6 know it was there, but we know it now, take protective
7 steps. That's what a responsible company would do, wouldn't
8 they?

9 A. If they found out they had shipped it.

10 Q. Yes, if they found out they had shipped it. That's
11 exactly what they would do, wouldn't they, sir?

12 A. Yes, sir.

13 Q. You know for a matter of fact, Dr. Roush, that
14 Monsanto shipped products all through 1979, and prior to '79
15 that contained very high levels of dioxin, and you also know
16 that it did not notify any of its customers of that fact, you
17 know that, too, don't you, Dr. Roush?

18 A. We notified customers.

19 Q. What customers did you notify, sir, in '79?

20 A. I'm not sure what, when we --

21 Q. Yes. Doctor, what customer did you notify in '79
22 that the product you were shipping then --

23 A. I don't know.

24 Q. You didn't notify any, Dr. Roush, and you know that

1 for a fact, don't you?

2 A. No.

3 Q. Sir?

4 A. I wasn't involved in that.

5 Q. Has anybody ever told you that you informed any
6 customers that what they were getting had dioxin in it?

7 A. Yes.

8 Q. Who told you that?

9 A. But I'm not sure what time.

10 Q. Who told you that, Dr. Roush?

11 A. I can't answer that.

12 Q. Nobody told you that Dr. Roush, isn't that a
13 correct fact, sir?

14 A. I don't know.

15 Q. Now, Doctor, you at Monsanto are concerned that Dow
16 will not do to you that which you did to others in '79, isn't
17 that correct, sir?

18 A. I'm sorry, would you ask that question again.

19 (Court Reporter read back the previous question.)

20 A. No, sir.

21 Q. Doctor, isn't this a strong recommendation that you
22 check, that your people at Dayton, your ultra trace
23 laboratory that you spent a lot of money to set up, that you
24 check what Dow sends to you even though you say they are

1 responsible? You are not even going to take their word for
2 it, you are so concerned that some dioxin might come into
3 your plant and come into your product, that you want to make
4 sure, that your laboratories in on top of it and check to
5 find out, isn't that exactly what this says, sir?

6 A. Yes, sir.

7 Q. And you want to make sure that no dioxin is shipped
8 to you, don't you, sir, at the levels mentioned in your
9 specifications?

10 A. Yes, sir.

11 Q. But, however, you also know that you did that to
12 your customers in 1979? You know that you sold them and
13 shipped them products that contained not one part per billion
14 of 2,3,7,8-TCDD but hundreds of parts per billion of
15 2,3,7,8-TCDD, you know, millions according to Nebraska
16 analysis, you know that, don't you, sir?

17 MR. HEINEMAN: Object, Your Honor, I don't believe
18 the evidence supports that.

19 THE COURT: Objection is overruled.

20 A. Yes, we shipped.

21 Q. Doctor, this method that is the subject of this
22 memo would protect Monsanto against that happening to you,
23 wouldn't it, sir, if they followed it out, if you checked
24 that which was sold to you by Dow, you would find out if you

1 had it shipped to you, so you would get protection by this
2 device?

3 A. Yes, sir.

4 Q. And it would protect Monsanto from that which
5 occurred to Monsanto's customers and to others in 1979, isn't
6 that correct, sir, if you did it, if you followed out what
7 was recommended here. Isn't that correct, sir?

8 A. No, sir.

9 Q. It wouldn't protect you from what happened to your
10 customers?

11 A. I don't know what happened to my customers.

12 Q. Your customers got shipped products that contained
13 TCDD, sir, and thousands of other parts per billion of other
14 dioxin isomers, that's what happened to your customers in
15 '79, sir?

16 A. Yes, sir.

17 Q. And you know that happened to your customers, don't
18 you, sir?

19 A. Yes, sir.

20 Q. If you followed this device, the method with Dow,
21 that wouldn't happen to you, would it, sir?

22 A. No, sir.

23 Q. Why don't you want that to happen to you, Dr.
24 Roush, and willingly let it happen to your customers in '79?

1 Now, I ask you, Dr. Roush, is what you did in '79 the act of
2 a responsible company?

3 A. Yes, sir.

4 MR. HEINEMAN: Objection, Your Honor, which
5 question does he want answered, asked two in a row?

6 MR. CARR: Either one or both.

7 THE COURT: Go ahead, Dr. Roush.

8 MR. HEINEMAN: I'm sorry, I didn't hear the Court.

9 THE COURT: Objection is overruled. I told him to
10 go ahead. I'm sorry. I'm having trouble with speaking.

11 Q. (by Mr. Carr) Doctor, how many of your customers
12 in '79 had the ability to check the product that Monsanto was
13 sending to them? How many of your customers had Monsanto's
14 ability?

15 A. I don't know.

16 Q. You don't know that any had that ability, do you,
17 Dr. Roush?

18 A. Not officially.

19 Q. Well you don't have any knowledge that any of your
20 customers had any capacity, any capability of checking for
21 dioxin in your chlorinated phenols, you know that, don't you,
22 sir?

23 A. Yes, sir.

24 Q. You had no knowledge that any of them had such an

1 ability, did you, sir?

2 A. Not personally.

3 Q. They relied upon Monsanto to test the product, did
4 they not, sir?

5 A. Yes, sir.

6 Q. Because they didn't have the ability. Now, Doctor

7 --

8 MR. HEINEMAN: Object to that statement, Your
9 Honor.

10 Q. Isn't that correct, sir.

11 THE COURT: Objection is overruled. Answer the
12 question, please, Doctor.

13 A. No.

14 Q. They didn't rely upon Monsanto?

15 A. No.

16 Q. Upon whom did they rely, sir? Who was checking the
17 dioxin content for them?

18 A. No one.

19 Q. Monsanto was checking it?

20 A. Yes. Yes.

21 Q. And Monsanto is a responsible company, isn't it,
22 sir?

23 A. Yes, sir.

24 Q. And, isn't it the duty of a responsible company to

1 protect its customers from contaminants?

2 A. Yes, sir.

3 Q. But Monsanto didn't do that, did it, in '79?

4 A. Yes.

5 Q. Doctor, did it tell any of its customers that they
6 had received dioxin in the product that you know of?

7 A. I don't know.

8 Q. Well then, you don't have any knowledge that it did
9 do it?

10 MR. HEINEMAN: Mr. Carr, would you speak up, sir, I
11 can't hear you.

12 Q. You have no knowledge that they did do it, do you,
13 sir?

14 A. Yes.

15 Q. Oh, you do have knowledge? What knowledge do you
16 have, sir, that they informed customers in '79 of that?

17 A. I don't know in '79, I can't relate to the dates.
18 I know we did tell customers.

19 Q. '79 was when the Sturgeon spill occurred. '79 was
20 when because of the Sturgeon spill you started checking all
21 your products. '79 was the year you found all of your
22 chlorinated phenols had parts per billion of TCDD in it.
23 That's the year, Dr. Roush.

24 A. Right.

1 Q. In that year, do you have any knowledge that
2 anybody, any of your customers were informed that your
3 products had 2,3,7,8-TCDD in it or any other form of TCDD, to
4 your knowledge, sir?

5 A. No, sir.

6 Q. Doctor, you also know that a clean-up service, or
7 do you know that a clean-up service that came into Sturgeon,
8 Missouri, some months after the spill, took a soil sample to
9 your laboratories, to your people and said we are getting
10 something funny in this, we don't know what it is, we don't
11 have the capacity to tell what it is? We would like for you
12 to analyze it. Are you aware that that occurred, sir?

13 A. I don't recall.

14 Q. In early '79?

15 A. I don't recall.

16 Q. May of '79?

17 A. I don't recall.

18 Q. You have no knowledge about that, sir?

19 A. I don't recall anything.

20 Q. Do you know whether or not -- well, if you don't
21 have any knowledge, you don't know. Would Monsanto in your
22 judgment have a responsibility to tell that clean-up service
23 that you've got something there that may be 2,3,7,8-TCDD, it
24 has all the characteristics of it? Reckon they'd have that

1 responsibility if they were asked by somebody, you had no
2 legal obligation to them, the clean-up people were not
3 employed by Monsanto, although you did subsequently use that
4 service to do some work for Monsanto, the O. H. Materials
5 people, I'm sure you are aware of that?

6 MR. HEINEMAN: Excuse me, Doctor, let me object to
7 the form of the question. Mr. Carr -- if he's attempting to
8 tell, ask if witness to assume what it was that Orville Hicks
9 testified to about the sample that was run, he's misleading
10 the witness because Mr. Hicks said that there were too many
11 interferences to make a determination as to what was in the
12 product.

13 MR. CARR: This isn't what Orville Hicks testimony
14 -- Orville Hicks testified he had levels 2,3,7,8-TCDD
15 exceeding not more than 600 parts per billion, per trillion.

16 MR. HEINEMAN: Interferences, Judge.

17 THE COURT: Well, whichever way the testimony came
18 down, your objection is overruled. I don't think that
19 objection related at all to the question. Answer the
20 question, please, Dr. Roush.

21 A. Would you repeat the question?

22 Q. Let me reform it, Doctor, because it was an
23 involved question. Wouldn't Monsanto have the moral
24 responsibility, if not a legal responsibility, if it accepted

1 a soil sample and said, yes, we will test it for you,
2 wouldn't it have the responsibility of telling that person
3 the results of the test?

4 A. Yes.

5 Q. Do you have any knowledge, sir, that the O. H.
6 people were ever told the results of the test?

7 A. I'm not even sure.

8 Q. You don't even know what I'm talking about, do you,
9 sir, isn't that correct, sir?

10 A. Yes, at least I'm not sure of the relationship.

11 Q. As a matter of fact, Dr. Roush, you, your
12 department of medicine and environment, have paid precious
13 little, if any attention at all, to the problems of Sturgeon,
14 Missouri, isn't that correct, sir?

15 A. No, sir.

16 Q. Did you do anything other than have a meeting in
17 July of '79 to discuss the odor problem in Sturgeon,
18 Missouri?

19 A. Dr. Paget was responsible for that time.

20 Q. My question is did you do anything besides that?

21 A. I don't know what Dr. Paget did.

22 Q. Doctor, if you don't know that, why would you tell
23 us that you did have a concern when you don't know what they
24 did, and what I'm telling you is they had a meeting in July.

1 of 1979 discussing the odor problem in Missouri, and somebody
2 said the thing to do is blacktop it all, put asphalt over it,
3 that was the extent of what you had concern for the people of
4 Missouri, unless I'm mistaken, do you have any other
5 knowledge of anything else that you all did?

6 MR. HEINEMAN: I object if he's representing to the
7 doctor that all Dr. Paget did, that's a misstatement.

8 THE COURT: Objection is overruled.

9 MR. CARR: What else did he do?

10 MR. HEINEMAN: He testified for three days about
11 it, Mr. Carr.

12 MR. CARR: Wait a second.

13 THE COURT: Wait, back and forth, gentlemen, the
14 objection is overruled. Answer the question, please?

15 A. Would you restate it?

16 Q. Do you have knowledge of anything that Monsanto did
17 for the people of Sturgeon from say March of 1979 up to the
18 present time, other than have one meeting in which people at
19 Monsanto discussed whether or not blacktop should be put over
20 the stinking soil in Sturgeon, Missouri?

21 A. No, sir.

22 THE COURT: Mr. Carr, is this a good point?

23 MR. CARR: Yes, Your Honor.

24 THE COURT: Ladies and gentlemen, we will take a

1 short recess at this time. The admonishments that I've given
2 you earlier will apply during this break also. Court is in
3 recess.

4 (Following a recess, these proceedings were had in open
5 court.)

6 Q. Doctor, this ROUNDUP and 2,4-D package mix, was
7 this to be mixed with water or how was it to be applied to
8 the fields, diluted?

9 A. I don't know, I'm sure it was diluted.

10 Q. Actually what it is, it's a powder and you put it
11 in?

12 A. Dilute it at great level.

13 Q. Great level?

14 A. Yes.

15 Q. So that when you actually are putting it out on the
16 field, then you are putting it on the field, and if you've
17 got no more than 10 parts per billion of all dioxin
18 contaminants, you would actually be putting out in the field
19 there a very small fraction of that 10 parts per billion,
20 wouldn't you, as it actually goes on the soil on the farmer's
21 land?

22 A. We talking about pints per acre?

23 Q. Talking about what actually would come out, then is
24 diluted down so it would be much much lower than 10 parts per

1 billion in the final solution, wouldn't it, sir?

2 A. Yes, sir.

3 Q. And if there were some level of 2,3,7,8-TCDD in the
4 product that's mixed by Monsanto and sold by Monsanto while
5 less than one part per billion and it actually got out into
6 the soil, it would be a very small fraction of what ever.
7 might be in there in the parts, less than 1 part per
8 billion. That means it's in the parts per trillion, so it
9 would be a small fraction of a part per trillion that actually
10 got into the soil, wouldn't it, sir?

11 A. Could be up to a part per billion.

12 Q. Well, not if you diluted it.

13 A. No, sir.

14 Q. I'm talking about what happens to it when you
15 actually dilute it?

16 A. Yes, sir.

17 Q. Come out to have small fraction of that one part
18 per billion, wouldn't it, sir?

19 A. That's right.

20 Q. Doctor, why would Monsanto want to establish this
21 kind of a no detectable level at one part per billion and not
22 more than 10 parts per billion of all the other dioxins, in
23 this package mix, according -- because according to this memo
24 it's going to be sold in the United States and in Brazil and

1 there were no legal requirements as to that were even close
2 to that level, was there, sir?

3 A. No legal requirements.

4 Q. Yes.

5 A. But we can't sell this material without getting
6 approval from EPA. EPA makes a final decision.

7 Q. Had EPA set any kind of level that would be say for
8 sale in the United States at no detectable 2,3,7,8-TCDD at
9 one part per billion detection limits?

10 A. They decide each one of those on their own basis.

11 Q. Excuse me, my question is, Dr. Roush, has the EPA
12 ever set such a level to your knowledge on any product that's
13 put into the farmer's hands for putting on the soil on
14 anyplace else?

15 A. Not to my knowledge.

16 Q. There are no legal requirements for that. Can it
17 be that Monsanto was concerned about safety of the user of
18 that product when it set the limit at less than one part per
19 billion of detectable 2,3,7,8-TCDD?

20 A. No, sir.

21 Q. You weren't concerned about the safety of anybody?

22 A. No, sir.

23 Q. And, when you use the words safety in your memo of
24 August 19th, 1983, you mistakenly use those words, is that

1 correct, sir?

2 A. It has to do with --

3 Q. You didn't mean to say you were going to consider
4 the safety factor or whether or not it could be safely used
5 as a package, you misused those words, didn't you, sir?

6 A. Yes, sir.

7 Q. Yeah. So actually, you had no -- you weren't
8 setting this limit for anything other than a public relations
9 employee, isn't that correct, sir?

10 A. No, sir, has to do with what they think the
11 direction of Government in terms of what is considered
12 whether they are going to allow us to waive a tolerance, the
13 tolerance in Canada today is one part per billion.

14 Q. Doctor, we are talking about the United States,
15 talking about a memo that went to you saying this was going
16 to be sold in the United States and Brazil. There are no
17 such levels. You are asking an opinion for the safe use of
18 the package that had that kind of a level. As a matter of
19 fact, your whole thing was aimed at whether or not that was
20 safe, wasn't it, sir? Whether or not there was a safe level?

21 A. No, sir.

22 Q. And you just inadvertently used the words safe in
23 Exhibit 1491?

24 A. Well, that was --

1 Q. You used the words safe once, twice, three times,
2 you've got four paragraphs in that memo and you use the word
3 safe or safely or safety in three of those four paragraphs
4 and you are telling us that whether or not that was, that
5 level was safe had nothing to do with your decision, sir?

6 A. No, sir.

7 Q. You are not telling us that?

8 A. The question they asked --

9 Q. You are not telling us that, Dr. Roush?

10 A. No, sir.

11 Q. Dr. Roush, I would remind you that your testimony
12 here is under oath.

13 A. Yes, sir.

14 Q. Dr. Roush, and this memo 1491, in which you are
15 asked for an opinion, and you are asked for an opinion
16 whether or not this was a safe level?

17 A. Yes, sir.

18 Q. That's what the man asked you and your response was
19 you think it is a safe level, you are saying under oath that
20 your response had nothing to do with the safety of the
21 product?

22 A. No, sir.

23 Q. Then it did have to do with the safety of the
24 product then, didn't it, sir?

1 A. It was related to the safe use, yes.

2 Q. Doctor, was your judgment that considering that
3 dilution factor the safe product for use would have to have
4 no detectable levels of 2,3,7,8-TCDD at a detection limit of
5 1 part per billion, isn't that correct, sir?

6 A. No, sir.

7 Q. Doctor, isn't that the level that you set and
8 required Dow to meet?

9 A. What do you mean by you?

10 Q. You at Monsanto, sir, as I have meant you from the
11 beginning, you at Monsanto set that level because that is
12 what you considered in 1983 to be the level of safety, that
13 is no detectable 2,3,7,8-TCDD at one parts per billion?

14 A. No, sir.

15 Q. Isn't that exactly why you set that level, Dr.
16 Roush?

17 A. No, sir.

18 Q. Was it related to safety at that level, Dr. Roush?

19 A. It is tolerance.

20 Q. Was it related to safety at that level, Dr. Roush?

21 A. No, sir.

22 Q. Dr. Roush, you just got through telling us ten
23 seconds ago that it was related to safety, now you are
24 telling us it's not related to safety, which is the truth,

1 Dr. Roush?

2 MR. HEINEMAN: Object, Your Honor, the prior
3 questioning related to the use of the board in the memo not
4 the level.

5 THE COURT: Objection is overruled, question of
6 safety was involved.

7 A. We had no question about the safe use of this.

8 Q. Doctor that isn't what I asked you.

9 A. I'm sorry.

10 Q. This level was set because it was related to
11 safety, was it not, sir?

12 A. No, sir.

13 Q. Doctor, didn't you just tell us that this memo that
14 you are asked whether or not this was a safe use?

15 A. Yes, sir.

16 Q. And didn't you at Monsanto -- didn't they ask
17 undetectable 2,3,7,8-TCDD at one part per billion, is that a
18 safe use, and didn't you tell them that it was?

19 A. Yes, sir.

20 Q. And didn't you also say 10 parts per billion of all
21 the others would be a safe level in your judgment?

22 A. Yes, sir.

23 Q. And it was directly connected with safety that you
24 set that level, was it not, sir?

1 A. No, sir.

2 Q. Doctor, why would you set a level for 2,3,7,8
3 contamination and dioxin contamination if it's not connected
4 with safety? What other conceivable reason can there be?
5 The remotest reason can there be for you to say or to limit
6 the amount of dioxin that's going to be in your product other
7 than the health and the safety of the people to whom it might
8 be exposed?

9 A. Only to deal with tolerances.

10 Q. Tolerances for what purpose, Dr. Roush? For safety
11 and health?

12 A. No, sir.

13 Q. What other purpose can there be to set such levels,
14 Doctor, other than safety and health?

15 A. To relate it to accepted standards.

16 Q. For what purpose, Doctor, what are the standards
17 for, what do they relate to, why do they set the standards
18 for safety and health, isn't that correct, Doctor?

19 A. No, sir.

20 Q. Why do they set the standards, just because you've
21 got people that got nothing to do?

22 A. If they have got, all they are trying to define
23 safety factors.

24 Q. What they are doing it for, for safety factors,

1 aren't they, sir?

2 A. Yes, sir.

3 Q. And that's what you did it for, safety factor,
4 that's the reason you set that level?

5 A. No, sir.

6 Q. What other reason could you possibly have had,
7 Doctor?

8 A. So that we --

9 Q. Other than health and safety?

10 A. So we would meet their standards.

11 Q. No, this was a standard that you were setting for
12 Dow. This was a package that you were preparing for sale in
13 the United States and in Brazil. It was a standard that you
14 set. Why did you set that standard except for its
15 relationship to safety and health, Dr. Roush?

16 A. Because we thought that's where the standards were
17 going to be.

18 Q. For what purpose would those standards be set
19 there, Doctor?

20 A. Mixture of things.

21 Q. For safety and health and for absolutely no other
22 reason. What other reason would the EPA or the FDA or France
23 or Brittain or Canada or Dow or Monsanto or anybody else set
24 a level of 2,3,7,8 except for the health of the people to

1 whom it might be exposed, and for the wildlife and
2 environmental health?

3 A. Because it's feasible? Why would you care if it's
4 -- not for -- doesn't effect the health and safety, why would
5 you care, you don't do things just because it's feasible, all
6 kind of things are feasible that you don't do, what other
7 reason is there for doing it? Feasibility just means you can
8 do it, why would you do it, Doctor?

9 A. Unnecessary contaminant.

10 Q. Doctor, why would it be called a contaminant? Why
11 would it be unnecessary? Would why would you want to get rid
12 of them except for health and safety?

13 A. It's for a further level of safety.

14 Q. Exactly right. It's for a level of safety, isn't
15 it, Doctor, and it has been all afternoon, and you have known
16 from the beginning that it had to do only with one think and
17 that is safety, isn't that right, Dr. Roush?

18 A. No, sir.

19 Q. Dr. Roush, what else does it have to do with other
20 than health and safety?

21 A. Tolerances.

22 Q. Tolerances relating to what, Doctor, whose
23 tolerances?

24 A. Government's tolerances.

1 Q. For what purpose do the Government set tolerances?

2 A. Just to lower the amount that's out there in the
3 environment.

4 Q. Why do they want to lower the amount that's out
5 there?

6 A. So they don't have to worry about it.

7 Q. Why do they worry about it, Doctor?

8 A. Because it's an unneeded thing and possibly toxic.

9 Q. Possibly toxic?

10 A. Right.

11 Q. Doctor, as far as toxic is concerned, you know it's
12 toxic, the problem is how much is it going to be before it
13 harms you, before it harms every human being in the bloody
14 country, that's the problem, Dr. Roush; that's the reason the
15 Government is concerned about the tolerances; that's the
16 reason they're worried; that's the reason that Monsanto is
17 setting the limit, isn't that correct, Dr. Roush?

18 A. I don't know why they are going to one part per
19 billion.

20 Q. You are back now saying that you don't know why
21 Monsanto --

22 A. No. No. No. No. Why the tolerance has gone to
23 one part per billion.

24 Q. You don't know why not?

1 A. No, sir.

2 Q. You are saying it's because the Government is
3 worried, and what are they worried about? They are worried
4 about the health and safety, aren't they, Dr. Roush, aren't
5 they worried about the health and safety?

6 A. Not at one part per billion.

7 Q. And why do they set the level there? Why did you
8 set the level at no detectable, got to be less than one part
9 per billion?

10 A. One part per billion is right.

11 Q. Less than, got to have no detectable 2,3,7,8 and as
12 a matter of fact Dow told you that their product has only six
13 parts per trillion of 2,3,7,8-TCDD in it. But you set the
14 level not that low, you set the level at less than, at no
15 detectable 2,3,7,8-TCDD. But back to my question, Doctor, my
16 question is that level is set for the reasons of health and
17 safety, isn't it, Dr. Roush?

18 A. No, sir.

19 Q. It's set because Monsanto was legally required to
20 set it, is that the answer, sir?

21 A. No, sir.

22 Q. Set because Monsanto wanted to pay more for a
23 product that is more greatly refined and it costs more to
24 create a product that has no 2,3,7,8 in it, Monsanto wanted

1 to pay Dow money for that 2,4-D, is that right, sir?

2 A. No, sir.

3 Q. It's at the level because you just flipped a coin
4 and said this is the level we are going to set it, got
5 nothing better to do today?

6 A. No, sir.

7 Q. Why did you set the level except, Doctor, that it's
8 related to health and safety?

9 A. Its magnitude to the safety factor.

10 Q. It's related to health and safety, isn't it, sir?

11 A. No, sir.

12 Q. You can't say it's a magnitude of the safety factor
13 without at the same time saying -- that means it is related
14 to safety, isn't it, sir?

15 A. Yes.

16 Q. Isn't it, sir?

17 A. It is related to safety but not at that level.

18 Q. Doctor, you set it at that level because it was
19 your belief that that is the level at which it can be safely
20 used and that is?

21 A. No, sir.

22 Q. That's exactly what you said?

23 A. No, sir.

24 Q. You said it's my opinion can be used safely as a

1 package with that level, did you not, sir, those are your
2 words?

3 A. Yes, sir, I said there is no reason to question the
4 safe use at this mix.

5 Q. That's right, at that level? At a higher level
6 there may be indeed reason in your judgment to question it,
7 isn't that right, sir?

8 A. No, sir.

9 Q. Or there is no reason to set a level at any level
10 then, is that what you are saying, Dr. Roush, because I'm
11 confused?

12 A. Yes, sir.

13 Q. So what you are saying is that any level of dioxin
14 in the product is okay?

15 A. Well, there has never been reported any --

16 Q. Excuse me, Doctor, could you answer that question,
17 any level of dioxin in the product is okay, thousand parts
18 per billion?

19 A. Of what?

20 Q. Of dioxin in your product?

21 A. Which dioxin?

22 Q. Any dioxin.

23 A. Not to 2,3,7,8.

24 Q. Then there is a factor with 2,3,7,8, is that right?

1 A. No, sir.

2 Q. Sir?

3 A. No, sir.

4 Q. Then there is not a factor of -- you can put any
5 amount of 2,3,7,8 in your product and it's safe?

6 A. There has never been any --

7 Q. Excuse me, Doctor, is that what you are saying?

8 A. No, sir.

9 Q. Then there is some level of 2,3,7,8 in the product
10 that you say is unsafe, is that right, sir?

11 A. No, sir.

12 Q. Then that isn't right, then there is no level that
13 you consider unsafe?

14 A. No, sir.

15 Q. Is there a level that you consider unsafe?

16 A. Of what?

17 MR. CARR: Your Honor, would you direct the witness

18 --

19 THE COURT: Dr. Roush, answer the question.

20 A. I am trying to, sir.

21 THE COURT: Well, listen closely, because what you
22 just asked has been in the last ten questions.

23 A. I understand that.

24 THE COURT: Please ask the question one more time,

1 Mr. Carr

2 (Court Reporter read back the previous question)

3 A. No, sir.

4 Q. That isn't right then?

5 A. No, sir.

6 Q. Then there is no level of 2,3,7,8-TCDD that is,
7 that all levels of 2,3,7,8-TCDD is safe then, is that
8 correct?

9 A. No.

10 Q. Then what level is unsafe, sir?

11 A. Of 2,3,7,8 in 2,4-D?

12 Q. That's what I'm talking about.

13 A. There isn't any 2,3,7,8 in 2,4-D.

14 MR. CARR; Your Honor, would you direct the witness
15 to answer the question.

16 THE COURT: Dr. Roush, answer the question that is
17 asked of you and not another question, or go off on a
18 tangent. I'm ordering you to answer the question that's
19 asked of you.

20 A. I'm sorry sir, I thought I was.

21 THE COURT: You were not, and you haven't been the
22 last few questions. The Court Reporter read this question
23 back one more time. From now on listen to the question and
24 answer only that question.

1 A. I'm trying.

2 THE COURT: Read back the last question.

3 (Court Reporter read back the previous question.)

4 A. 50 ppm, maybe.

5 Q. 50 parts per million?

6 A. Right.

7 Q. And you are even -- you even said maybe as far as
8 that's concerned?

9 A. Yes, sir.

10 Q. And, Doctor, why, if that is your judgment, why did
11 you at Monsanto require Dow to have 2,4-D sold to you that
12 has no detectable 2,3,7,8-TCDD at a one part per billion
13 level?

14 A. Because we want to meet tolerances.

15 Q. Why did you want to meet the tolerances, Doctor?

16 A. Because the Government is going to set them.

17 Q. Have they set them, sir?

18 A. United States has not as yet.

19 Q. Why would they set them, Doctor? Why would they
20 set those levels of no detectable levels of 2,3,7,8-TCDD for
21 the safety of the people to whom there are going to be
22 exposed, isn't that right, sir?

23 A. Yes, sir.

24 Q. And that's the reason that you set the level of no

1 detectable 2,3,7,8-TCDD is because you believe the Government
2 is going to set that level as the level that you may not
3 exceed in 2,4-D, isn't that correct, sir?

4 A. Yes, sir.

5 Q. And they are going to set that because they believe
6 that that is the level at which it becomes unsafe, isn't that
7 correct, sir?

8 A. No, sir.

9 Q. Why else would they set it, sir, if it's not at the
10 level that above that would become unsafe? What other
11 earthly reason could they have at saying no 2,3,7,8 at a
12 level of 1 part per billion detection limits if it wasn't for
13 safety purposes, if you get above that it may be unsafe?

14 A. No one.

15 Q. That's the sole and only reason they would have to
16 set such a level, isn't that right?

17 A. Plus feasibility.

18 Q. Sir?

19 A. Feasibility.

20 Q. Doctor, feasibility only means that you are capable
21 of making the product at that level?

22 A. Yes, sir.

23 Q. Feasibility means that what you are saying is the
24 Government will not require you to do something that is

1 impossible. They will require you to not sell the product if
2 they consider it unsafe, if you cannot make it safe, isn't
3 that correct, Doctor?

4 A. Yes.

5 Q. Now, and Monsanto knows that they must not or
6 should not sell products that got 2,3,7,8-TCDD in it, isn't
7 that correct, Doctor, for safety purposes?

8 A. No, sir.

9 Q. No? Doctor, you set this level because it was
10 related to safety. You set the level because you believe
11 that the level to be established by the Government was --
12 could be less than one part per billion, did you not, sir?

13 A. Yes, sir.

14 Q. Now, do you agree that would be the proper level to
15 set?

16 A. If it's feasible.

17 Q. If you can make the product down to 1 part per
18 billion, you do agree that that's the level that should be
19 set, correct, sir?

20 A. Yes, sir.

21 Q. And that is for safety purposes, correct, sir?

22 A. It's related to safety.

23 Q. Well, it's related to safety in the sense that that
24 product is safe whereas a product with more than that may be

1 unsafe?

2 A. No, sir.

3 Q. Doctor, you cannot have it, I submit to you, sir,
4 you cannot have it both ways. You cannot say that that is
5 the level that you are setting if feasibly it can be done for
6 safety purposes. Sir, we know that a person can drive under
7 some circumstances at 100 miles per hour and do it safely, we
8 know that. But we know also that if you do it long enough or
9 under certain conditions it is extremely unsafe. Therefore,
10 we set speed limits at lower than that, don't we? We set
11 speed limits that we consider that you can in general safely
12 drive, even though under some circumstances you can't drive
13 those limits, like through school zones and things of that
14 sort. You understand that, don't you, sir?

15 A. Yes, sir.

16 Q. Those are limits for safety purposes, does not
17 mean, does it, sir, that everybody that's going to be exposed
18 to one part per billion of 2,3,7,8-TCDD is going to come
19 falling down sick? What it means is that there is a
20 possibility of harm to a sufficient number of people that one
21 should guard against that risk, if you can possibly do it,
22 isn't that what that means, sir?

23 A. For this tolerance?

24 Q. For any tolerance that you may set.

1 A. No, sir.

2 Q. Doctor, why set a tolerance if it isn't for that
3 purpose?

4 A. It's related to it but the safety --

5 Q. Doctor, if it's related to it, it is for that
6 purpose. You can't have it both ways. It either is related
7 to it or it is not related to it, isn't that right, sir?

8 MR. HEINEMAN: Objection, Your Honor, he cut the
9 witness off. Ask the Court to allow the witness to answer
10 the question.

11 THE COURT: Objection is overruled.

12 A. It is related.

13 Q. Yes, it is. How long have you all at Monsanto
14 known that that one part per billion is related to safety?

15 A. 55 ppm is unsafe.

16 Q. Excuse me, Doctor, I've asked you how long have you
17 at Monsanto known that one part per billion is the safe
18 level?

19 A. It is not the safe level.

20 Q. Doctor, you are aware that Dr. Paget told Dr.
21 Wilson that one part per billion in, what was it, in
22 Santophen?

23 A. Santophen.

24 Q. Was probably medically acceptable. You've known it

1 at least then since Dr. Paget expressed that opinion, haven't
2 you?

3 A. Yes, sir.

4 Q. That was July the 9th of 1979, wasn't it, sir?

5 A. Yes, sir.

6 Q. Now, Doctor, if you would look to Plaintiff's
7 Exhibit 1490 that you have in your hands, it was written by
8 George Levinskis?

9 A. Yes, sir.

10 Q. This has to do with the toxicity and the safety of
11 Monsanto's products, does it not, sir?

12 A. Yes, sir.

13 Q. And it's discussing the safety of 2,4-D, isn't
14 isn't it, sir?

15 A. Yes, sir.

16 Q. And it's talking about the level of 2,3,7,8 in
17 2,4-D in regard to the safety of Monsanto's products, isn't
18 it, sir?

19 A. No, sir.

20 Q. Doctor, look at the last paragraph in the section
21 called caveats, it's the first, second, third, fourth, fifth
22 paragraph on the page, says, it should be recognized that
23 others can and some will disagree with conclusions Monsanto
24 reaches about the safety of its products, doesn't it, sir?

1 A. Yes.

2 Q. And it's discussing the safety of what products,
3 sir?

4 A. 2,4-D in this case.

5 Q. And it's discussing what level of dioxin
6 specification for 2,4-D?

7 A. None at all.

8 Q. Doctor, would you look at the paragraph under
9 decisions where it is, where it says it's concluded that the
10 proposed specifications is environmentally acceptable and
11 will not pose any unreasonable risk to health or the
12 environment? Do you see that, sir?

13 A. Yes, sir.

14 Q. Aren't they talking there about risks to health?

15 A. Which one, the --

16 Q. The paragraph I just read to you, don't they use
17 the word risks to health, sir?

18 A. Yes, sir.

19 Q. And isn't he talking about the safety of the 2,4-D,
20 sir?

21 A. In that he is, yes.

22 Q. Yes. Now, during the particular paragraph that I
23 want to direct your attention to, is the one that says,
24 fourth paragraph where it says the repeat studies are more

1 comprehensive and may turn up previously undetected adverse
2 findings. This has occurred in some of our repeat studies on
3 Monsanto products.

4 A. Yes, sir.

5 Q. What is Levinskas referring to where you have
6 determined there were adverse findings in relation to
7 Monsanto's products? That you had not -- where you did some
8 repeat studies?

9 A. Our problem with Lasso.

10 Q. With Lysol?

11 A. Lasso.

12 Q. Lasso. And, Lasso, is it related to chlorinated
13 phenols in any way?

14 A. No, sir. No, sir.

15 Q. Well, that's one product, and the word here is
16 products. What other product, sir?

17 A. I'm sure that's what he was referring to.

18 Q. Doctor, Lasso is one of your products?

19 A. Very important product.

20 Q. Well, it may be, and I'm not quarreling about that,
21 but what I'm interested in is whether or not the word
22 "products" includes more than Lasso, because it is a plural
23 word.

24 A. There are other Ag products related to Lasso that

1 we have also detected adverse effects on, repeated lifetime
2 feeding studies.

3 Q. Are you -- do you have studies relating to
4 chlorinated phenols that repeat studies have furnished up
5 previously undetected adverse findings?

6 A. No, sir.

7 Q. Doctor, I'll remind you, are you not aware of the
8 chick edema studies, didn't we talk about those?

9 A. Yes, sir.

10 Q. And, you are aware of what happened in your chick
11 edema studies that Dr. Wright asked to be performed?

12 A. Aware of what?

13 Q. The findings of the laboratory that said they were
14 borderline positive and your people told them to strike out
15 the words borderline and just say that they were technically
16 okay, do you recall that, sir?

17 A. Yes, sir.

18 Q. Isn't that one of the products that Dr. Levinskas
19 is referring to?

20 A. No, sir.

21 Q. No?

22 A. No, sir.

23 Q. All right. Doctor, with respect to the work that
24 is done when you dismantled -- you recall dismantling

1 Department 2,3,7, sir?

2 A. Yes, sir.

3 Q. Now, when you did that, you put that out for bids
4 to certain people, did you not, sir?

5 A. I don't know, but I would suspect they did.

6 Q. Well, your department had something to do with
7 discussing the safety standards to be met by the people that
8 were going to tear the plant down or change it?

9 A. I think that's right.

10 Q. Now, you of course would have advised that worker
11 for the that company of the dangers that might be associated
12 with tearing Department 2,3,7 down, wouldn't you, sir?

13 A. Yes, sir, I would think so, I don't recall the
14 specifics.

15 Q. You know that if you didn't tell them of the
16 dangers that you knew that existed, that there could be some
17 responsibility on your part, or do you know that, sir?

18 A. Yes, sir.

19 Q. Yeah. Let me hand you a document, sir. I hand you
20 what's been marked Plaintiff's Exhibit 1494 and ask if you
21 agree that is a document prepare by a J. Lind, dated
22 September 30th, 1983 deals with the dismantling of Department
23 2,3,7? I'm not asking you to read the entire document,
24 Doctor, I just want you to agree that it is such a document

1 so that we can move on with it?

2 A. Yes, sir.

3 MR. CARR: Offer 1494 into evidence, sir, if it
4 please the Court.

5 THE COURT: Any objections?

6 MR. HEINEMAN: Well, Your Honor, I object. There
7 is no foundation laid. We don't know -- I assume that J.
8 Lind is a Monsanto employee, but he hasn't asked that.

9 MR. CARR: I don't think I need to show that it's
10 in that document, but is J. Lind a Monsanto employee, Dr.
11 Roush?

12 A. I think so.

13 MR. CARR: Yes.

14 THE COURT: Anything else?

15 MR. HEINEMAN: Same objection, Your Honor, no
16 adequate foundation laid for its admission.

17 THE COURT: Objection is overruled. It's admitted
18 over objection.

19 Q. (by Mr. Carr) Doctor, do you recognize 1494 A
20 as being Paragraph 2 and Paragraph 3 on the second page of
21 that exhibit?

22 A. Yes, sir.

23 Q. And 1494 B as a blow-up of 1494 A?

24 A. Yes, sir.

1 Q. Offer 1494 A and B as well, Your Honor.

2 THE COURT: Same objection?

3 MR. HEINEMAN: I'm sorry, I couldn't hear Mr. Carr
4 and the witness. Which paragraphs are they?

5 MR. CARR: That one and that one. (indicating)

6 MR. HEINEMAN: Third and the fifth?

7 MR. CARR: Second and the fourth.

8 MR. HEINEMAN: Well, Your Honor, if the Court will
9 incorporate my prior objection to the document itself.

10 THE COURT: Sure.

11 MR. HEINEMAN: And in addition to that, I think the
12 exhibit is misleading because it leaves out the part that's
13 in the middle.

14 MR. CARR: The jury has the entire exhibit, Your
15 Honor.

16 MR. HEINEMAN: Which entire exhibit?

17 MR. CARR: The entire exhibit that contains 1494 A
18 and 14 -- those paragraphs.

19 MR. HEINEMAN: 1494 was passed to the jury?

20 MR. CARR: It was offered and admitted into
21 evidence.

22 MR. HEINEMAN: Okay, I just didn't know that it was
23 passed.

24 THE COURT: Okay, objection is overruled then.

1 Q. (by Mr. Carr) Doctor, under the first page shows
2 that the Hayden wrecking company was contracted to dismantle
3 this equipment, was it not, sir?

4 A. I don't know anything about the company, but
5 someone did it.

6 Q. Well, it's identified on the very first page, is it
7 not, sir?

8 A. I said yes.

9 Q. See that?

10 A. Yes, sir.

11 Q. And this document instructs the contractor what
12 they are to do with regard to safety and hygiene, doesn't it,
13 sir?

14 A. Yes, sir.

15 Q. And you advised this contractor that there are
16 certain chlorinated dioxins that are suspected by some
17 scientists as being a cause or a contributor to certain types
18 of cancer, do you see that, sir?

19 A. Yes, sir.

20 Q. Now, what you are telling this contractor and those
21 others that were informed that dioxins that are associated
22 with Department 2,3,7 can either cause a cancer or can
23 promote -- that is the words we have been using either
24 initiate the cancer, or can promote the cancer, don't you,

1 sir?

2 A. No, sir.

3 Q. You are telling them that there are scientists that
4 you consider to have some repute, otherwise you wouldn't give
5 them space in this document, that there are some scientists
6 that believe that dioxin can cause or can promote certain
7 types of cancer, aren't you telling them that, sir?

8 A. No, sir.

9 Q. Doctor, are you reading the same page that I'm
10 reading?

11 A. Yes, sir.

12 Q. Have you read the sentence, "In addition certain
13 chlorinated furans and chlorinated dioxins are suspected by
14 some scientists as being a cause or a contributor to certain
15 types of cancer." Did I read that correctly?

16 A. Yes, sir.

17 Q. And isn't that what you are telling this
18 contractor?

19 A. That some scientists believe that, yes.

20 Q. And those scientists, you are pointing out, -- well,
21 for instance, you would not, if there was a disreputable
22 scientist or a scientist whose views you didn't respect, you
23 wouldn't adopt that and put that in a document of this sort,
24 would you, at Monsanto?

1 A. We didn't adopt that.

2 Q. Excuse me, Doctor, you all prepared this document,
3 you at Monsanto prepared this document, did you not, sir?

4 A. Mr. Lind did.

5 Q. He is a Monsanto employee, is he not, sir?

6 A. Yes, sir.

7 Q. And he would contact the necessary people? Is he a
8 toxicologist?

9 A. No, sir.

10 Q. He would contact the toxicologists and the doctors
11 at Monsanto to find out what there might be in Department
12 2,3,7 that contractors should be warned against, wouldn't he,
13 sir? Your department would be the source of his knowledge
14 and information, wouldn't it, sir?

15 A. Probably, but not necessarily.

16 Q. Well, Doctor, you are customarily -- your
17 department is customarily part of the process, it's the
18 protocol, it's the requirement that in areas like this, your
19 department be contacted, more specifically the toxicologist
20 in your department, isn't that correct, sir?

21 A. No, sir.

22 Q. Isn't that a requirement of Monsanto?

23 A. No, sir.

24 Q. Doctor, all those memos that we have had here that

1 were submitted to your department, they weren't submitted
2 because that's the company policy to do that?

3 A. I don't like to -- don't know what you are
4 referring to when you say all those.

5 Q. Doctor, this one that we just talked about where
6 Harness wrote you a memo wanting to know about the safety of
7 2,4-D in 2,3,7,8, isn't it company policy that your
8 department be consulted in that respect?

9 A. Not all things, no, sir.

10 Q. I didn't say on all things, on things dealing with
11 safety and health?

12 A. No, sir.

13 Q. And what is the policy of Monsanto?

14 A. The plant has a responsibility for what they do and
15 they ask for our help when they need it.

16 Q. Well, and they need it when they get into an area
17 that they have no expertise, don't they, sir?

18 A. That's a judgment you have to make.

19 Q. We will indeed. They have to determine in
20 responsible fashion whether or not they know enough about the
21 toxicity of dioxins to write this memo, if they don't have
22 that knowledge, it is the company policy that they are to
23 detect those that have, consult, contact those that have the
24 knowledge, isn't that right, Dr. Roush?

1. A. Yes, sir.

2 Q. And they, from whatever source in your company that
3 they got this knowledge, they stated to this representative
4 that is going to do this work for you, that certain
5 scientists suspect that chlorinated dioxins can either cause
6 or contribute to cause certain types of cancer, don't they?

7 A. That's a statement of fact, yes, sir.

8 Q. Sir?

9 A. That's a statement of fact.

10 Q. Yes. And, those are reputable scientists?

11 A. No, sir.

12 Q. Sir?

13 A. Doesn't say that.

14 Q. Excuse me, I'm asking are not their reputable
15 scientists that believe that, sir?

16 A. I don't know what they believe.

17 Q. Doctor, you just got through telling us that there
18 are scientists that believe this, and now you are saying you
19 don't know what they believe?

20 A. I don't know if they are --

21 Q. Doctor, are there scientists, reputable scientists
22 that Monsanto has faith in, sufficient faith at least to put
23 it in a document of this sort that dioxins and furans may
24 cause or will cause cancer?

1 A. No, sir.

2 Q. Doctor, you have said it here in this memo, in this
3 contract, not even a memo, it's a contract. You at Monsanto
4 have so stated it, do you see that, sir?

5 A. Yes, sir.

6 MR. HEINEMAN: I agree with his analysis of what is
7 stated there. I think it's misleading to the witness.

8 THE COURT: Objection is overruled.

9 Q. Doctor, you do agree that it is so stated in this
10 memo, don't you?

11 A. Yes, sir.

12 Q. Sir?

13 A. Yes, sir.

14 Q. And this is a Monsanto statement, isn't it, sir?

15 A. Mr. Lind's statement.

16 Q. This is a Monsanto statement, isn't it, sir?

17 A. Yes, sir.

18 Q. And Monsanto has stated to this contractor those
19 things that I have just read?

20 A. Yes, sir.

21 Q. Monsanto has also stated that the chlorinated
22 dioxins are known to cause Chloracne, liver, and nerve
23 changes and possible other injury at certain concentrations,
24 you see that, sir?

1 A. Yes, sir.

2 Q. Now, that's Monsanto telling those people that they
3 are known to cause Chloracne, liver and nerve changes?

4 A. Yes, sir.

5 Q. And, that is something that is known, isn't it,
6 sir, it's something that Northwestern had in its Exhibit 1267
7 and in that table, isn't it?

8 A. Yes, sir.

9 Q. Now, those nerve changes, those nerve changes are
10 changes that occur over a period of time, aren't they, sir?

11 A. Over a month, maybe.

12 Q. What chlorinated dioxins are known to cause nerve
13 changes, Dr. Roush?

14 A. 2,3,7,8.

15 Q. Any other chlorinated dioxins that are known to
16 cause nerve changes?

17 A. The only one I know.

18 Q. And what chlorinated dioxins are known to cause
19 liver damage?

20 A. Certainly 2,3,7,8 and the liver effects in
21 pentachlorophenol has never been clarified whether those are
22 due to the dioxin content or not. That's never been worked
23 out.

24 Q. Well then, Doctor, you do acknowledge then in this

1 document, that dioxin can cause liver and nerve changes,
2 don't you, sir?

3 A. Yes, sir.

4 Q. And from the nerve changes can come a host of
5 problems, can't there, sir? You can have peripheral
6 neuropathies, peripheral neuritis, sensory impairments, sight
7 hearing, smell. You can have psychiatric problems from those
8 nerve changes, can't you, Doctor?

9 A. Yes, sir.

10 Q. From the liver changes, you can have a whole host
11 of problems, can't you, sir?

12 A. What do you mean by a host of problems?

13 Q. Many problems.

14 A. I don't know about that.

15 Q. That relate to the liver, all of those things can,
16 the internal problems can come from liver damage, can they
17 not, sir? By all of those I mean those that are listed under
18 internal in Exhibit 1267 A?

19 A. Liver damage means hepatic enzymes. Probably fat
20 is related. That's up above the porphyria cutanea tarda,
21 maybe hyperpigmentation as well.

22 Q. Can't you have pancreatic disorders, cardiovascular
23 disorder, carbohydrate metabolism problems all indirectly
24 related to liver changes?

1 A. Not that I know of.

2 Q. Well, at least you will agree and have finally
3 agreed that dioxin can cause those things, haven't you,
4 Doctor?

5 A. Some of those things, yes.

6 Q. And, Doctor, that's a lot more than just Chloracne,
7 the liver and the nerve changes, isn't it, sir?

8 A. Those are all acute effects.

9 Q. Doctor, does it say that here, that this, those are
10 just acute effects, and you don't need to worry about them,
11 they will go away shortly? Where does it say that, Doctor,
12 did I miss that?

13 A. It doesn't say that.

14 Q. No, it doesn't say that because it means to say
15 that liver changes and nerve changes and injury can come
16 about, doesn't it, sir?

17 A. Yes, sir.

18 Q. Doctor, it also tells the person there that because
19 of this possibility of exposure of those chemicals they have
20 got to wear rubber shoes, rubber gloves and disposable
21 coveralls?

22 A. Yes, sir.

23 Q. Sir?

24 A. Yes, sir.

1 Q. That's in order to protect those people from this?

2 A. Yes, sir.

3 Q. From this dioxin?

4 A. No, sir.

5 Q. No?

6 A. No, sir.

7 Q. Doctor, doesn't it say -- doesn't it say due to the
8 possibility of exposure to the above chemicals, doesn't it
9 say that, sir?

10 A. Yes, sir.

11 Q. Did I misread that? And the above chemicals refers
12 to those things described in the -- in the second paragraph,
13 isn't that right, sir?

14 A. Yes, sir.

15 Q. So, and that is dioxins, as well as furans, isn't
16 it, sir?

17 A. That's not the reason that they are wearing
18 protection.

19 Q. Doctor, that's the words that's in this document
20 isn't it, sir, whether you agree with it or not, you tell
21 those people due to the possibility of being exposed to those
22 chemicals, you've got to wear this kind of clothing?

23 A. Yes, sir.

24 Q. And that's because if they don't wear this kind of

1 clothing, they might get injured, they might ingest those
2 chemicals, including the dioxins, isn't that right, sir?

3 A. Yes, sir.

4 Q. Now, Doctor, along the -- continuing with your
5 program of trying to discover as much as possible about the
6 health of your workers and your public relations program, you
7 at Monsanto in the Fall of 1979 entered upon a program to
8 ascertain the health status of the Krummrich employees who had
9 worked in the pentachlorophenol and in the chlorophenol
10 departments in the past years prior to that time, isn't that
11 correct, sir?

12 A. Yes, sir.

13 Q. And, you engaged Dr. Suskind to do that work, did
14 you not, sir?

15 A. Yes, sir.

16 Q. And, this study that he was to do was 100 percent
17 paid for by Monsanto, was it not, sir?

18 A. Yes, sir.

19 Q. And along the way, you determined that you needed
20 to get the full cooperation of your employees at the
21 Krummrich plant, didn't you, sir?

22 A. Yes, sir.

23 Q. And you engaged on a program of, for want of a
24 better word, public relations with your employees to induce

1 them, to persuade them, if you will, to participate in this
2 study by Dr. Suskind, did you not, sir?

3 A. I don't know what you mean by that, but we did
4 invite them to participate.

5 Q. And you sent them out letters and you sent them
6 out. By you I mean at Monsanto, questions and answers to
7 give them information, did you not, sir?

8 A. Yes, sir.

9 Q. All right. I hand you now what's been marked
10 Plaintiff's Exhibit 1495, and ask you to read that and ask if
11 it is not Monsanto's document dealing with Suskind health
12 study of the Krummrich plant employees. Do you recognize it,
13 sir?

14 A. Yes, sir.

15 Q. Offer that exhibit, if it please the Court.

16 THE COURT: Any objections?

17 MR. HEINEMAN: No objection, Judge.

18 THE COURT: Admitted without objection.

19 Q. (by Mr. Carr) Now, Doctor, to put this in
20 perspective, it's described as the first draft of the list of
21 questions and answers to be used as a guide in responding to,
22 respond to questions that may come from employees and the
23 press, isn't that correct, sir?

24 A. Yes, sir.

1 Q. And, let me advise you in advance that it was not
2 the final draft, that there was two other drafts and I'll
3 work up to the final one in time, so that you will be fully
4 advised of where I am going. The letter, however, that is
5 attached there, September of '79, the second document, was
6 the letter that was ultimately sent, was it not, sir?

7 A. I don't know.

8 Q. You don't know that?

9 A. No..

10 Q. Do you have any -- let me put it another way, do
11 you have any knowledge to the contrary, sir?

12 A. No, sir.

13 Q. The letter simply says that Suskind and a team of
14 independent medical experts is going to examine those plant
15 employees beginning October the 3rd, and that they are going
16 to let the employee's family physician know the results and
17 you say some things about that it involves people in
18 Department 2,3,6 penta and Department 2,3,7 chlorophenol?

19 A. Yes, sir.

20 Q. And the next page gives some information that you
21 are to respond whoever has asked the question by the
22 employee, is to respond. Now, the second question is of some
23 -- I'd like to direct your attention to that. If asked the
24 question what is the skin disorder connection notice to

1 employees, the person answering the question is supposed to
2 say that it's Chloracne, which is a skin condition similar in
3 appearance to acne in adolescence, is that right, sir?

4 A. Yes, sir.

5 Q. And, are you not telling -- the person is asking
6 the question that is really something like teenage acne?

7 A. No, sir.

8 Q. You are not telling him that?

9 A. I don't think so.

10 Q. What are you saying, if the only thing you relate
11 it to or equate it with is a skin condition that is similar
12 in appearance to acne in adolescence, isn't that teenage
13 acne, Dr. Roush, that you are talking about?

14 A. Yes, sir.

15 Q. And you are saying Chloracne is similar in
16 appearance to teenage acne?

17 A. That's what the public relations man said.

18 Q. Doctor, once again, they get their information from
19 you, don't they, sir?

20 A. Yes.

21 Q. And this memo on this question and answer was sent
22 to you, wasn't it, sir? You look on the first page, you are
23 the fourth person named?

24 A. Yes, sir.

1 Q. Did you ever correct that misstatement?

2 A. I don't think I did, I don't recall.

3 Q. You let the employee be told that Chloracne is a
4 disorder and they were told that, were they not, sir, that
5 it's a disorder similar to teenage acne?

6 MR. HEINEMAN: Similar in appearance, Mr. Carr.

7 Q. Weren't they told that?

8 A. Similar in appearance.

9 Q. This is what the public relations people said and
10 you went along with it, didn't you, Dr. Roush?

11 A. Yes, sir.

12 Q. Doctor, there is also questions asked whether or
13 not chlorophenol is a hazardous material, and all you say
14 there in question number, answer number 8 that it can cause
15 burns, it's a toxic product that requires worker protection
16 such as gloves and eye protection, doesn't it, sir?

17 A. Yes, sir.

18 Q. You make no mention of any other problems that can
19 be caused by dioxin exposure such as liver changes or nerve
20 changes or cancer, do you, sir?

21 A. No, sir.

22 Q. Doctor, do you not believe that your employees are
23 entitled to have the knowledge that Monsanto has about those
24 products, those substances that they are working with?

1 A. Yes, sir.

2 Q. And Monsanto had then and has now the knowledge
3 that dioxin can cause liver and nerve changes, did it not,
4 then and does it not now have that information?

5 A. Yes, sir.

6 Q. Did it tell the employees that about dioxin in this
7 statement, sir?

8 MR. HEINEMAN: You mean in number 3 asks about
9 chlorophenol?

10 Q. In this document, sir?

11 A. We thought chlorophenol will do.

12 Q. Doctor, if you look at question number 12, you are
13 asked what are the symptoms of dioxin poisoning, and you say
14 significant exposure to certain isomers of dioxin can result
15 in Chloracne, a skin condition similar in appearance to that
16 of acne in adolescence, do you not, sir?

17 A. Yes, sir.

18 Q. Do you make any mention about porphyria?

19 A. No, sir.

20 Q. Make any mention about peripheral neuritis?

21 A. No, sir.

22 Q. Make any mention about cancer?

23 A. No, sir.

24 Q. Doctor, you knew at the time this memo was written,

1 that all of those things have been attributed to dioxin
2 exposure, did you not, sir?

3 A. Yes, sir.

4 Q. But, you didn't tell your employees, did you, sir?

5 A. No, sir.

6 Q. Don't you believe they are entitled to that
7 information, Dr. Roush?

8 A. Not necessarily on this little questionnaire.

9 Q. My question is do you believe they are entitled to
10 that information?

11 A. Yes, sir.

12 Q. Did they ever get that information, Dr. Roush?

13 A. Their supervisors would tell them that.

14 Q. Did they ever get that information, sir?

15 A. I don't know.

16 Q. Doctor, in point of fact, you know that they were
17 never told the existence of dioxin exposure other than
18 necessity could cause something that is similar to teenage
19 acne, isn't that a fact, sir?

20 A. No, sir.

21 Q. Well, can you direct me to the document, to the
22 memo, to the newsletter, to the plant bulletin, to anything
23 where you told those people that are working for you that,
24 have worked for you for so many years, that they could get

1 cancer from this, or they could get porphyria from this, or
2 they could get peripheral neuropathies from this?

3 A. The plant knew it and --

4 Q. Yeah, I knew the plant knew it, my question is can
5 you direct me to the document, sir, the plant bulletin, the
6 newsletter, the question, answer, statement, anything at all
7 that Monsanto ever published and distributed to its workers
8 where you told them what you knew about dioxin?

9 A. No, sir.

10 Q. Doctor, you also in this document -- and I'll
11 demonstrate though, that you did not tell them finally that
12 there was found to be -- this is question number 11 that
13 there was dioxin found in the product by OSHA at 300 parts
14 per billion 2,3,7,8, you see that where the tentative answer
15 is there, sir?

16 A. Yes, sir.

17 Q. Now, what was stated in the question was from OSHA
18 did find and did announce to you that they had found dioxin
19 at this level, didn't they, 2,3,7,8-TCDD at this level,
20 didn't they, sir?

21 A. Yes, sir.

22 Q. But now, in this memo, at least, you tell your
23 workers that we have analyzed it or you are going to tell
24 your workers that we have analyzed it and go down to 10 parts

1 per billion, and we didn't find, didn't indicate the presence
2 of it, isn't that right, sir.

3 MR. HEINEMAN: Objection, Your Honor, that isn't
4 what it says. Says analysis of a recent product sample that
5 was ---

6 THE COURT: Objection is overruled.

7 Q. (by Mr. Carr) Did you ever tell them or are they
8 told in this document, sir, that you sent it to University of
9 Nebraska and you did your own analysis of those from this
10 spill, and you found the tetra-dioxins at the level of 2700
11 and the 487 parts per billion? You don't tell them that in
12 this document, do you, sir?

13 A. No, sir.

14 Q. You suggest to them that you did have a third test
15 that showed 18 parts per billion, don't you, sir?

16 A. Yes, sir.

17 Q. But in your ultimate -- Your Honor, I'm sorry, it's
18 four o'clock.

19 THE COURT: Okay. Ladies and gentlemen, we will
20 break for the day. As I said we are not going to be in
21 session Monday. So we will resume Tuesday morning at nine
22 o'clock. Besides the regular admonishments that I have given
23 you during any break in proceedings during the day, I want to
24 remind you over this weekend break you are not to read,

1 listen to, or watch anything about this case in particular,
2 or subject matter in general in any of the media, print or
3 electronic. Thank you for your attention and cooperation.
4 Have a good weekend. We will see you Tuesday. Court is
5 adjourned.

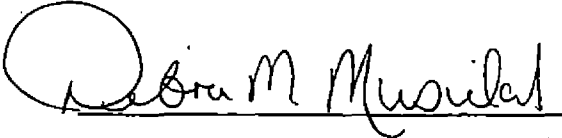
6 COURT ADJOURNED:
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STATE OF ILLINOIS)
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TWENTIETH JUDICIAL CIRCUIT) SS
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COUNTY OF ST. CLAIR)

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

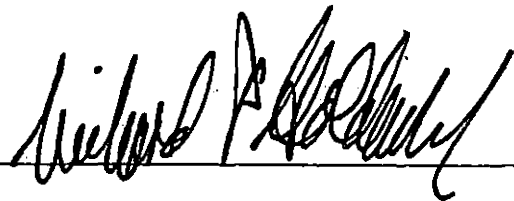
Dated this 16 day of July, 1985.


Debra M Musielak

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

10 Dated this _____ day of July, 1985.

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16 HON. RICHARD P. GOLDENHERSH
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