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

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

REPORT OF PROCEEDINGS

Before the HONORABLE RICHARD P. GOLDENHERSH

April 9, 1985

APPEARANCES:

MR. REX CARR, Attorney at Law, and
MR. JEROME SEIGFREID, Attorney at Law,
On Behalf of the Plaintiffs;

MR. KENNETH HEINEMAN, Attorney at Law,
MR. JOHN MUSGRAVE, Attorney at Law, and
MR. JOSEPH NASSIF, Attorney at Law,
On Behalf of the Defendant.

PATRICIA A. GANDY, C.S.R.

Official Court Reporter

BE IT REMEMBERED AND CERTIFIED, that heretofore, on to-wit: April 9, 1985, the matter as hereinbefore set forth came on for hearing before the Honorable Richard P. Goldenhersh, Circuit Judge in and for the Twentieth Judicial Circuit, State of Illinois, and the following was had of record, to-wit:

THE COURT: Good morning. Mr. Heineman?

FURTHER CLARIFICATION EXAMINATION

BY MR. HEINEMAN

Q Dr. Paget, yesterday we were talking about the fact that in Department 236 at the Krummrich Plant in which the pentachlorophenol was manufactured that there were some people that contracted chloracne and there were some that did not; do you recall that, sir?

A Yes, sir, I do.

Q Now, to what do you attribute that phenomenon?

A Well, there are several---two major possible explanations. One, that the exposure of the various people differed, and even though although they were working in the same plant, they may quite reasonably have been exposed to different levels of a chloracnogen by being a little further away from somewhere where it was coming from or being a little more scrupulous about the use of protective equipment or washing or things like that. And the other possibility, of course, is that they may have varied in their sensitivity.

All animals, including human beings, vary in their sensitivity to toxins or to---indeed to therapeutic drugs---and so they may have varied in their sensitivity, they might have been less sensitive if they didn't get chloracne.

Q So that what may have been a toxic dose for one person or several may not have been a toxic dose for some of the others, assuming that they were exposed in the same way?

A That's a possibility, yes, certainly, sir.

Q Now, if I asked you to assume, sir, that a Monsanto employee named Joseph Starczyk worked in Department 236 had severe chloracne, moved to Department 237 where the ortho-chlorophenol, the dichlorophenol, and the parachlorophenol were manufactured, and his chloracne went away, what could you conclude from that fact?

A Well, you would have to conclude that he was then exposed to a level of a chloracnogen that was below his---the level which was toxic for him, yes.

Q Is it possible that there would not have been an exposure to a chloracnogen?

A That's entirely possible.

Q In that Department 237?

A Entirely possible, yes.

Q With respect to the other symptoms which Dr. Neal spoke to you about, would you expect any other symptoms, if

any there be, to appear absent the presence of chloracne?

A No, sir. The situation was clearly that if there were no chloracne, no other symptoms were to be expected.

Q Now, with respect to conversations with Dr. Neal, do you recall having conversations with Dr. Neal at any time in the Spring of 1979 concerning the Wright State---the claimed Wright State results?

A Yes, sir, I spoke with Dr. Neal on several occasions as I think I've already said about this problem. And this was the first person I consulted about the Wright State results.

Q And as I understand it, you don't recall discussing the subject at the April 27th Biohazards Committee meeting?

A Not specifically, no, sir.

Q Do you recall at some point discussing the subject with Dr. Neal?

A Yes, sir.

Q And what was Dr. Neal's impression, if he had one, relating to the Wright State results?

A Well, of course, this was an area in which he was keenly interested as a biochemist studying dioxins, and he didn't believe that these results could be valid, because he didn't think that the technology permitted the identification of TCDD, let alone 2,3,7,8 TCDD at that level in blood samples.

Q All right, sir. Now, I would like to ask you to look at Exhibit, Plaintiffs' Exhibit 1262, which I think may still be here. Here we go. Plaintiffs' Exhibit 1262, sir, and I would direct your attention to a paragraph at the bottom of the first page of that Exhibit which Mr. Carr asked you about yesterday. And that paragraph states as follows, does it not, sir, "In the absence of precise knowledge of human susceptibility, and in view of the extreme sensitivity of some species, it is obvious that very small amounts of TCDD in the human environment in certain circumstances of intimate exposure or of abuse or misuse or casual worker procedures may," the word may is underlined, is it not, sir?

A Yes, sir.

Q And in parenthesis it says, "we repeat may," and it is underlined again?

A Yes, sir.

Q "have significance," is that right? Now, when you are talking about small amounts of TCDD in the human environment, which may have significance, what kind of concentration are you talking about there?

A Well, it wholly depends, sir, on the circumstances in which they are present. And indeed, the concentration of the material to which human beings are exposed and from which one must assume the absorption of a dose, so really it can range

from parts per billion maybe if it were something which they were consuming on a regular basis, so you are getting doses of the order of micrograms per kilogram over a period, or it may be very much larger doses if it was something which human beings were not directly exposed or by derivative or composition of.

Q Now, is this essentially what is expressed in this paragraph? Is this the worst case analysis that you are talking about?

A Yes, sir, really it's what it is saying that when we don't know precisely how human beings may react to TCDD or indeed to any other toxin, the only prudent assumption is that they react as the most sensitive species. Saying, really, when one has no precise knowledge of human beings' exposure, sorry, of human susceptibility, when you come to evaluate possible exposures, you have to evaluate them on the basis of the most sensitive species. And, well, some species are very sensitive. That involves making some assumption about very low levels of material to which very sensitive species may be exposed.

Q Now, is that what you were talking about, sir, when you were discussing with Mr. Carr the subject of the difference between a clear, demonstrated hallmark such as chloracne, and other effects which might, one, none, all of the other effects, which might possibly be present because they had been reported at one time or another but not clearly demonstrated?

A That's exactly the distinction I was making, sir, yes.

Q Now, tell me how that factor would affect the judgment that you would be making, let's say in terms of talking to Harry Gilmer of the EPA?

A Well, sir, it means two things, really. In the worst case analysis, one should assume that the material which is present, the worst thing that it might be. Even though one is not sure that all the TCDD's that were reported were 2,3,7,8, and indeed it seemed unlikely that they were all that, but nevertheless one should assume that they were all 2,3,7,8 because that was the worst thing it could be. And secondly, when you made the evaluation of the hazard presented by some level of TCDD, one should not only be guided by the things that have been reported by various people reporting on TCDD exposure, which may or may not be accurate, in many cases probably not accurate, one should assume that human beings are not only susceptible as those reports, but even more you should assume that they are susceptible as the most susceptible animal species, in that case, the guinea pig. In that case, not is it safe in terms of those miscellaneous reports, but would it be safe for guinea pigs?

Q Now, on the occasions when you have had to make a determination of that kind, when you have been making a

judgment about a possible human hazard, have you applied this philosophy?

A Yes, sir, indeed.

Q And in doing so, have you made calculations, kinds of calculations that you have testified about here over the last several days?

A Yes, sir.

Q And when you make those calculations, what have you found in making up your mind as to whether or not there would be a possible human hazard?

A Well, if you make those assumptions, it depends on the precise calculation what the safety factor is, but we found that in any of the calculations we made, the human hazard, even if human beings were as sensitive as guinea pigs, had a safety factor of hundreds, thousands, hundred thousands, and sometimes millions between the dose which you could assume that a human being might get and the worst circumstances and what might cause hazard to human beings if they were as sensitive as guinea pigs.

Q And is it those calculations and those judgments that you make that give rise to decisions as to whether or not certain warning should be given or whether or not certain information should be made available?

A Absolutely, sir, yes.

MR. HEINEMAN: That's all the questions I have, Judge.

THE COURT: Okay. Mr. Carr, do you have any further questions?

MR. CARR: Yes, your Honor.

FURTHER CROSS EXAMINATION

BY MR. CARR

Q With regard to Dr. Taylor, if I understood you yesterday, you suggested that Drs. Taylor and Tiernan had no articles published and referred to in this document 1273?

A No, I don't think I said that. I think I said that the reference that is given at the point where the blood level of TCDD is referred to is the reference to the letter to the American Public Health Association.

Q And do you recall Mr. Heineman took you to an appendix and asked you whether or not any articles appeared in that appendix authored by Taylor or Tiernan, do you recall that, sir?

A No, sir, I don't recall that precisely.

Q You don't recall going to the appendix, what is it, Jerry, B? Appendix B, yes. The literature reviewed and asked about whether or not Taylor and Tiernan had any citations in that, any references, do you recall that, sir?

A Yes, sir.

Q Now, point of fact, you do know, or I assume you

know, that Taylor has probably, oh, ten or eleven articles in here, and Tiernan has nine or ten, you know that, don't you?

A Yes.

Q And you didn't mention that yesterday, did you, sir?

MR. HEINEMAN: We were talking about blood.

A We were talking about blood.

Q And were we not also talking about levels of tetrachlorodibenzo-p-dioxin in environmental and biological samples?

A No, sir.

Q We weren't? And that's not what Dr. Taylor has written on---as a matter of fact, if you look at Page 297, you see that Dr. Taylor wrote ten articles referred to on that page, referring to methods of detecting dioxin in various substances including Agent Orange and environmental and biological samples---

MR. HEINEMAN: You are referring to another section.

MR. CARR: Yes, a section you didn't refer to.

MR. HEINEMAN: Oh, of course I did.

BY MR. CARR:

Q Will you look and see if there are not ten articles by Dr. Taylor dealing with detecting various substances in the environment?

A Yes, sir.

Q TCDD in the environment?

A I haven't read through them all, but yes, sir, I can see one or two which refer to the detection of dioxins. I don't know---well, there is one here, the detection of tetrachloro-dibenzo-para-dioxin in herbicides, I don't see one referring to the detection of tetrachlorodibenzo-dioxin in blood, sir.

Q Well, Doctor, you know it is not captioned as such, but would you not read and see if he is not having articles that he's written on environmental samples and tissues? Go on down the list and refresh your recollection on that point.

A Well, sir, I don't see one which refers to the detection of tetrachlorodibenzo-dioxin in tissues either.

Q Well, sir, do you see where it talks about detection in environmental and biological samples, do you see that as far back as 1976?

A Yes, sir.

Q And are biological samples, does that include tissues?

A It includes a wide variety of things.

Q My question is does it include tissues?

MR. HEINEMAN: Objection. How can he conclude that without seeing the article? How does he know what the guy's writing about?

THE COURT: Overruled.

Q Does the word biological samples include tissues and

blood?

A It might, but does not necessarily.

Q I didn't say it necessarily did, does biological samples include tissues and blood?

A Oh, of course it could.

Q Now, you didn't mean to suggest, you and Mr. Heineman didn't mean to suggest to this jury that Dr. Taylor was somehow or another out of his field when he wrote the letter referring to detection of the TCDD in a particular biological sample, that is, blood, you didn't mean to suggest that, did you, sir?

A Sir, he said that the technologies didn't exist.

Q My question was, did you mean to imply that, or infer that to the jury that Dr. Taylor didn't know what he was talking about?

A No, sir.

Q As a matter of fact, you know, if you turn to the next page, you will see a number of articles written by Dr. Tiernan cited in the EPA Handbook, will you not, sir?

A Yes, sir, I don't see any that refer to the detection in blood.

Q Doctor, could you just please answer my question? There are a number of articles on the next page referring to the detection of various TCDD's in various substances, are there not, sir?

A Yes, sir.

Q As a matter of fact, there is one where he talks about detecting it in beef samples?

A Yes, sir, I saw that.

Q And beef sample is a living tissue, isn't it, sir?

A Not usually, no. Well, it has been alive, but it is not usually at the time you do it. Well, there is a difference, sir, because you can take a kilogram of beef, you can't very well take a kilogram of blood.

Q Doctor, the beef sample is a living, biological sample?

A It is a biological sample, yes, sir.

Q And, Doctor, he has given seminars, he's given lectures at various seminars as well, has he not?

A Yes, sir.

Q Now, Dr. Paget, is there any question in your mind but what Drs. Taylor and Tiernan are the preeminent specialists in detecting TCDD in biological samples?

A They are among them, yes, sir.

Q My question was not that. Is your answer yes, they are the preeminent authorities, specialists in the field?

A I don't think they are the preeminent ones, no, sir.

Q Do you know any above them, sir?

A No, sir.

Q Thank you.

(Plaintiffs' Exhibits 1157A, B and C were marked for identification.)

MR. HEINEMAN: Your Honor, my recollection is the jury has copies of that, is that correct?

MR. CARR: That is correct.

THE COURT: Which number?

MR. HEINEMAN: 1157.

THE COURT: Okay. I think that's right.

MR. CARR: That is correct, it has been admitted into evidence, your Honor.

BY MR. CARR:

Q Doctor, I'll ask you to glance at these Exhibits, 1157A, B and C. Do you recognize those as the three pages that make up 1157, do you not, sir?

A Yes, sir.

MR. CARR: I offer these Exhibits, 1157A, B and C, your Honor.

(Plaintiffs' Exhibits 1157A, B and C were offered into evidence.)

THE COURT: I will incorporate the same arguments and objections.

MR. HEINEMAN: Fine, Judge.

THE COURT: They are admitted.

(Plaintiffs' Exhibits 1157A, B and C were admitted into evidence.)

BY MR. CARR:

Q Doctor, when you had the discussion with Dr. Neal, do you recall, was that before or after, do you have a recollection of whether that was before or after the 19--- April 27, 1981 meeting of the Biohazards Committee?

MR. HEINEMAN: '79.

A That would be before, yes, sir.

Q And he told you, if I have written correctly, that he did not believe that they had the ability to find out if there was TCDD in the blood, he said he didn't believe the technology existed for detecting TCDD in blood, is that correct, sir?

A Yes, sir.

Q Sir?

A That's what I said, yes, sir.

Q Of course, do you know whether or not he knew about the Hummel article of 1977?

A I don't know, sir. He was an expert, and I presume he would know the literature.

Q He mentioned that it didn't exist. Well, you know that the Hummel article of Dow Chemical Company said that it did exist?

A I don't believe that's what that article says, sir.

Q Doctor, didn't we go through that once?

A Yes, sir. And that's the conclusion we came to.

Q We came to the conclusion that it was an article that spelled out how you go about detecting for the presence of TCDD in blood?

A It spelled out how to do it, it didn't do it, sir.

Q Excuse me, Dr. Paget, did the author of the article describe that, didn't we go through it, that he was describing how you can detect TCDD in blood?

A Dr. Taylor says that it does, too.

MR. CARR: Would you direct the witness to answer my question?

THE COURT: Doctor, you have to answer the question directly.

A Could you repeat it, sir?

(The previous question was read by the Court Reporter.)

A That's what the article purported to do, yes, sir.

Q And that was published in 1977, was it not?

A Yes, sir.

Q And Dr. Taylor in 1979 described how he did it with the blood from Walter Kidwell, didn't he, sir?

A Yes, sir.

Q Do you know whether or not Dr. Neal was aware of this report from the American Public Health Association and from Wright State University at the time he made the comment to you?

MR. HEINEMAN: Excuse me, your Honor. Did you say from the American Public Health Association?

MR. CARR: Yes.

MR. HEINEMAN: What report from the American Public Health Association?

MR. CARR: 1156, counsel. Plaintiffs' Exhibit 1156.

MR. HEINEMAN: Oh, I see. Okay.

BY MR. CARR:

Q Now, my question is, was he aware of the report from the American Public Health Association and from Wright State University to the effect that TCDD was detected in the blood of Walter Kidwell or the workers at the Sturgeon spill site?

A He would have been aware that it had been reported, because I would have told him. But I don't know at what stage he became aware of the precise report from either Wright State or from the American Public Health Association.

Q So when he made the comment to you, you don't know whether or not he knew that it was Wright State University that did it, and that the American Public Health Association had published, that is pronounced publicly, the results of the findings of Wright State University, is that correct?

A He would have known the first, but not necessarily the second.

Q He would've known that it was a public announcement by the American Public Health Association?

A No, he would've known that Wright State claimed to do the analyses, I don't know that he would've known that the American Public Health Association had pronounced on it, if they did.

Q Doctor, the initial publication came from the American Public Health Association, not from Wright State University.

A Yes, sir, but we all knew that Wright State had been claiming to do the analyses.

Q And you knew that when you reported to the Biohazards Committee that it was Wright State University?

A I believe so, yes, sir.

Q Yes. And did you at that time do an investigation to determine the expertise of the standing of Wright State University in this field?

A Wright State were known to be---

Q Excuse me. Did you do any investigation to determine the standing of Wright State University in this field?

A Not personally, no, sir.

Q All right. Now, Dr. Paget, you also said that---

strike that. I won't get to that yet. You were discussing yesterday with Mr. Heineman the fact that you have to have---ingest, I take it---a hundred micrograms per kilogram of body weight before you can---that's the threshold level I think you said----of dioxin for chloracne?

A That was my recollection, yes, sir.

Q The exact testimony that you gave was that the dose of which chloracne is known to occur or the threshold is one hundred micrograms per kilogram is your exact testimony?

A That was my recollection, yes, sir.

Q That's what you testified to?

A Yes.

Q Yes. Now, by that, you meant to convey to the jury that a dose of less than one hundred micrograms per kilogram would not cause chloracne, did you not, sir?

A Yes.

Q And a 50-pound child weighs approximately what, 25 kilograms, a little less?

A A little less than that.

Q Twenty-five kilograms, is that correct, sir?

A Yes, sir.

Q And a 50-pound child then would have to ingest 2500 micrograms of 2,3,7,8 TCDD before he would get chloracne, in round figures?

A Yes.

Q Is that correct, sir?

A Yes, sir.

Q And so that if he ate---2500 micrograms is 2500 parts per million, isn't it, sir?

A Yes, sir. Well, no, sir, I'm sorry. I am not sure.

Q If you contaminated something with 2500 parts per million, it would have in it---

A No, 25 micrograms is an amount, and parts per million is a concentration.

Q Okay, but you testified, if my notes are correct, that you would take in, ingesting of five grams of soil at 4.5 parts per billion, you would need 500,000 times that in order to get chloracne?

A That was, yes.

Q And you related it to the 4.5 parts per billion in five grams of soil, did you not, sir?

A That's---you have to convert it to an amount, sir.

Q And you did convert it to that amount?

A That's what I did, yes, sir.

Q And that would be 22 nanograms is what you testified to yesterday?

A That's my recollection, yes.

Q Well, now, actually that's considerably less than the

same calculation of a hundred micrograms per kilogram, is it not, sir?

A Yes, sir.

Q How much less is that?

A Well, a nanogram is a thousandth part of a microgram.

Q Well, do the same calculation for us using a hundred micrograms per kilogram level that you testified to initially, sir.

A Can I borrow a piece of paper? What would you like me to calculate, sir?

Q Well, calculate if you will how many---you hypothesized yesterday at 4.5 parts per billion in five grams of soil.

A Okay, sir.

Q Now, use instead of the value that you ended up with yesterday, use the initial value, the hundred micrograms per kilogram.

A Back to what the concentration in soil would have to be?

Q Yes.

A To a hundred micrograms per kilogram to a 50-kilo to a 25-kilo child.

Q No, I want you to do the same calculation that you did yesterday with Mr. Heineman using instead of the factor that you used with him, because I think you cut it down by

half, use the factor that you testified to originally, that is the hundred micrograms per kilogram.

A I'm sorry, I really don't understand the calculation you wish me to do.

Q Yesterday you stated for the jury that if one ate five grams of soil---

A Yes, sir.

Q You didn't specify the weight of that person.

A We were assuming an adult, a 70-kilo adult.

Q Is that what you were assuming?

A That's what I was assuming.

Q A 70-kilo adult would be 150 pounds, more or less?

A Yes, that's the standard.

Q So let's use that. Use the 100 micrograms per kilogram then and calculate for me how much there would be in this five grams of soil.

A Sir, a hundred micrograms per kilogram to a 70-kilo man is a hundred micrograms times 70 is the total amount, that's 7,000 micrograms, 7,000 micrograms, that's the total amount. And five grams of soil, that's five grams of soil is 5,000 milligrams, or 5,000,000 micrograms, that's 7,000 parts in 5,000,000 or approximately one part in 400, something like that.

Q Now, Doctor, convert it to---

A That's point one-fourth percent.

Q Convert it to the nanograms like you did for Mr. Heineman.

A I'm sorry. I don't think you are asking me to do a feasible calculation.

Q Well, you testified yesterday that it would have to be 22 nanograms in five grams of soil.

A Yes, sir. And you asked me if one took a hundred micrograms per kilo.

Q What factor did you use yesterday? Did you use the factor of 100 micrograms?

A No, sir. I calculated how much somebody might ingest if they swallowed five grams of soil containing an amount of TCDD or an amount of OCP.

Q And did you use the threshold level of 100 micrograms per kilogram to be causing chloracne?

A I didn't use the threshold level at all, sir.

Q Did you not testify that 22 nanograms in five grams of soil is 500,000 times less than what would be required for the threshold chloracne? Didn't you testify to that?

A Well, 22 nanograms, I understand what you are saying, you are querying the factor of 500,000, is that what you are querying?

Q I'm querying, Doctor, did you use the hundred

micrograms per kilogram factor in making that calculation?

A No, sir, not at all.

Q What did you use?

A I didn't use any factor. I said that the does would be 22 nanograms, which is 300 picograms per kilogram.

Q And you said that was 500,000 times less than required for the threshold chloracne?

A I compared that with the safety factor. I think it was of one-tenth of a microgram per kilogram. If you compared it to a hundred micrograms, it would, of course, be a hundred times larger.

Q It would be how much?

A It would be a factor of 5,000,000 times less.

Q So in order for the person to get chloracne, there would have to be 5,000,000 times the TCDD concentration than was apparent at the ten percent contamination?

A Yes.

Q And if there is 4.5 parts per billion in that soil, you would have to multiply that by 5,000,000 in order to get chloracne?

A Yes.

Q And that would be approximately 220,000,000 parts per billion?

A Well, that's 220---

Q 220,000,000 parts per billion?

A Yes, sir, without--

Q Now, in order for somebody that's going to consume five grams of soil, and that five grams of soil is one-sixth of an ounce, according to you he would have to--that soil would have to be contaminated with 220,000,000 parts per billion of 2,3,7,8 TCDD?

A Yes.

Q To reach the threshold level of chloracne?

A Yes, sir.

Q 220,000,000 parts per billion, and that would boil down to, if scratched out, that would be 220 parts per thousand, wouldn't it, sir?

A Yes.

Q That would mean that soil would have to be 22 percent 2,3,7,8 TCDD?

A Yes, sir.

Q So before somebody can get chloracne, they would have to eat 22 percent of five pounds, that's roughly five grams, they would have to eat one gram of pure 2,3,7,8 TCDD in order to get chloracne?

A Somewhere we have lost some factors of ten, I fear, sir, in those calculations.

Q No, Dr. Paget, these are the calculations that you

gave to the jury yesterday, and these are the calculations that you are giving to the jury today. You would have to eat soil that is 22 percent 2,3,7,8 TCDD in order to get chloracne, and chloracne is the only bad thing that happens from exposure to 2,3,7,8 TCDD, is that correct?

A No, I didn't say that, sir. That's the only clearly demonstrated thing that happens.

Q Well, we went through the long session the other day that it is the only thing that you know, the only thing that you believe, you said under oath that's the only thing that you believe is going to result to somebody being exposed to 2,3,7,8 TCDD?

A Yes, sir.

Q And a gram is, let's see, what is it, how many grains in an aspirin? Roughly five grains to an aspirin, isn't there, sir?

A Well, an aspirin tablet is about 300,000,000 grams, so that's one, well, there are one-fifteenths of five grams.

Q There are 65 grains in a gram, well---

A I'm not sure. I've forgotten grains so long ago, I'm not sure, but it's 325 milligrams.

Q There are 65 grains in a gram, I'm sorry, there are 15 grains in a gram, so if an aspirin is five grains, that means you would have to eat a third, you would have to eat one

gram, you would have to eat three aspirins, three pills the size of an aspirin of pure 2,3,7,8 TCDD before you would get chloracne, that's what your calculations add up to, Dr. Paget?

A I'm sorry, sir, I don't trust this calculation done under these circumstances.

Q Well, calculate it again, Dr. Paget.

A May I take my time?

Q Please do.

A The assumptions you wish me to make?

Q The assumptions that you made with Mr. Heineman yesterday. One hundred micrograms per kilogram of body weight is the threshold level of chloracne.

A Seven thousand micrograms is the dose, 7,000 micrograms---well, sir, if you assume that a 70-kilo man is going to ingest 100 micrograms per kilogram, which is the dose we were talking about, and that must mean that there is a 70 times 100 or 7,000 micrograms in what is ingested. Seven thousdand micrograms in five grams of soil is 7,000 parts, and 5,000,000 parts or seven parts in 5,000, which reduces to just a little over .1 percent, .14 percent.

Q Which is how many parts per billion in that soil?

A Well, .14 percent is 140 parts per thousand, or 140,000 parts per million.

Q 140,000 parts per million?

A 140,000 parts per million.

Q Per million?

A Yes.

Q So you are talking about 140 parts per billion then ---I'm sorry, 140,000,000 parts per billion?

A Yes, that must be true.

MR. HEINEMAN: Wait a minute, I'm lost here.

BY MR. CARR:

Q 140,000,000. We were at 220 parts per billion, now we're down to 140 parts per billion, and we've reduced it somewhat, but not a great deal.

A 140,000 parts per billion, it's .14 percent, there is no point in reducing it to parts per billion, it's .14 percent.

Q You said that was 140,000 parts per million, did you not, sir?

A Well, .14 percent is a 140,000 parts per million, or 140,000,000 parts per billion.

Q All right, that's exactly right.

A But it is still .14 percent.

Q So you have to have that soil, that man would have to eat soil contaminated with 140 parts per billion, and that comes down to 140 over a thousand, which is 14 percent?

A No, sir, that's .14 percent. It is 140,000,000 parts per billion, we just calculated that.

Q Well, you said 140,000, so it is 140---

A It is 140,000 parts per million, or 140,000,000 parts per billion, or .14 percent.

Q What you are saying is 140,000,000 parts per billion is what you are saying, Dr. Paget?

A It's .14 percent, it is 7,000 micrograms in five grams.

Q And that is how many parts per million, or how many parts per billion?

A That's .14 percent, .14 percent is 140 parts per thousand, or 140,000 parts per million, or 140,000,000---I'm sorry.

Q Dr. Paget, you are completely fouled up on your math.

A Well, I wouldn't be surprised.

Q 140 parts per thousand is it, sir?

A Well, it's .14 percent, so .14 percent is 140 parts per thousand.

Q No, Dr. Paget, 140 parts per thousand is 14 percent, not .14 percent, you misplaced your decimal point two places.

A No, 14 percent is 14 parts per hundred.

Q Yes, or 140 parts per thousand.

A I'm sorry, sir, you are losing me. .14 percent---

Q Take 140, put it over a thousand, and scratch off the last zero of each and you have 14 over a hundred, don't you,

Dr. Paget?

A Quite right. This is .14 percent, so it's 140 parts per thousand, 140 parts per ten thousand, you are quite right.

Q Now you are getting closer, Doctor.

A It is 140 parts per ten thousand, or 140,000 parts per ten million, or 140 or---wait a minute, let me put those right---that's 14,000,000 parts per billion.

Q 14,000,000 parts per billion.

A Or .14 percent.

Q So now we are down to 14,000,000 parts per billion, is that correct, sir?

A If my arithmetic is to be relied on, which it is quite obviously not under these circumstances.

Q So to eat, now, 14,000,000 parts per billion is a threshold level for chloracne?

A If you ate five grams of soil containing 7,000 micrograms of 2,3,7,8 TCDD, that would be correct.

Q Which would be contaminated with 14,000,000 parts per billion? Dr. Paget, you've got 50 percent of the workers at the pentachlorophenol Department 236 got chloracne. Now, are they being exposed to a product that has 14,000,000 parts per billion of 2,3,7,8 TCDD?

A I don't know, sir.

MR. HEINEMAN: In penta?

BY MR. CARR:

Q Anything they're working with. Doctor, according to Monsanto, 2,3,7,8 TCDD is not even in pentachlorophenol?

A And I believe that may be true, sir.

Q Now, Doctor, do you know any Monsanto product that contains 2,3,7,8 TCDD at the level of---or any product anywhere that's ever been manufactured to your knowledge at any time anywhere that contained 14,000,000 parts per billion of 2,3,7,8 TCDD?

A No, sir.

Q And, Doctor, you know there is a lot of people got chloracne, people at Nitro, West Virginia, got chloracne, people at Krummrich Plant got chloracne, are you saying that all these people had to ingest, had to eat something, had to take into their bodies, not just be exposed to it, and touch their skin, but get into their system 14,000,000 parts per billion of 2,3,7,8 TCDD, the product they are working with, they have to take it in?

A Yes---

MR. HEINEMAN: Objection, your Honor. He's comparing apples and oranges with this witness. He went from taking a dose up to a large amount, and now he is talking about that level in the product.

THE COURT: Overruled.

A Well, sir, the point about the calculation we've just gone through was it started with the assumption you consume five grams of soil, as you correctly pointed out, just about a sixth of an ounce, but those people are exposed to lower concentrations of vastly greater amounts, obviously.

Q Vastly greater amounts of which?

A Of the material from which they absorbed the dose.

Q Well, they have to get in their systems equivalent of soil that's contaminated or anything---it doesn't have to be soil, whatever they're working with has got to be contaminated and they have to get it in their system something that's contaminated with 14,000,000 parts per billion.

A They have got to get in their systems 7,000 micrograms.

Q And they are not going to take in pure 2,3,7,8, are they, sir? They are going to get it because it is going to be contaminating something, correct, sir?

A Yes, sir.

Q And this is 14---

MR. HEINEMAN: Are you talking about 1,400,000, Mr. Carr?

A In five grams of soil, sir.

Q Well, it doesn't have to be soil, it can be anything.

A In five grams.

Q In five grams. It has to be contaminated with 14,000,000 parts per billion of 2,3,7,8, doesn't it, sir?

MR. HEINEMAN: Well, now, your Honor, let me object. Witness continually said .14 percent.

MR. CARR: And I had him break that down to parts per billion, and he broke it down to 14,000,000 parts per billion.

MR. HEINEMAN: Well, I'm confused because----

MR. CARR: I'm sure you are.

MR. HEINEMAN: I get 1,400,000.

THE COURT: Objection overruled, I followed the calculations. Go ahead, Mr. Carr.

A Well, .14, it is still .14 percent whatever it is in terms of parts per billion, sir.

Q Dr. Paget, would you like to recalculate your figures?

A I can't see the point, sir.

Q Neither can I, because you came up with the 14,000,000 parts per billion.

A I said .14 percent, that's what I said.

Q Excuse me, and did you not also say 14,000,000 parts per billion contamination in that soil, sir?

A That's how I calculate it, not necessarily correctly.

Q Sir---

A I say that was the reasoning, I am not necessarily correct. I know the figure I am talking about is .14 percent.

Q Dr. Paget, I want you---you are testifying here under oath, you gave calculations to Mr. Heineman yesterday that I am working with, and I am asking you to do the same thing today that you did with Mr. Heineman, you said then it would be off by a factor of 500,000, the 22 nanograms, well that seemed like a lot to me, and this seems right in line with that, I don't see anything wrong with that, 500 times 22, 500,000 times 22 will come pretty close to this figure, the figure you gave yesterday was pretty close to what you gave to me.

A If it is the same as .14 percent, I agree.

Q I don't. I am taking your calculations. You are doing the calculations, I am putting them here. Now, these people at Sturgeon can go home and rest at night because that soil doesn't contain 14,000,000 parts per billion of 2,3,7,8, does it, sir?

A That's so, certainly, yes, sir.

Q And the workers at the Krummrich Plant can relax because there's never been any product made by anybody that you know of that contains that kind of 2,3,7,8 concentration, is that correct, sir?

A As far as eating five grams of the material, yes, sir.

Q It doesn't make any difference, they are not going to eat it, maybe it is going to get on their skin, so they can have a lot greater contamination of 14,000,000 parts per billion, it is not all going to be in---I think you said 10 percent goes into the skin?

A That's the rough figure, yes.

Q So they can have ten times that contamination on their skin?

A If all they were exposed to was five grams, yes, sir.

Q Five grams is a pretty lot, isn't it, sir?

A That's one-sixth of an ounce, as you pointed out.

Q I'm sorry?

A I said it is one-sixth of an ounce, as you pointed out.

Q Yes, so these workers at Krummrich Plant that got chloracne were exposed to something that contained the equivalent to 14,000,000 parts per billion---

A No, sir.

Q ---of 2,3,7,8?

A No, sir. It depends on the amount of material they were exposed to.

Q Well, whatever they are exposed to has to be contaminated to that extent.

MR. HEINEMAN: Objection, your Honor.

BY MR. CARR:

Q Whatever they are exposed to---

MR. HEINEMAN: Your Honor, he is comparing apples and oranges, and he is intentionally trying to confuse the witness. He knows that we are not talking about 2,3,7,8 when you are talking about pentachlorophenol. You are talking about totally different dioxins, and the contamination level may be completely different.

THE COURT: Overruled.

BY MR. CARR:

Q We know the other dioxins are a lot less toxic than 2,3,7,8, I think the most toxic one was 1,3,7,8, and I think it was supposed to be according to Dr. Wilson or somebody, I can't recall who now, one-tenth as toxic as 2,3,7,8. So these dioxins that these workers at the Krummrich Plant are being exposed to, if 2,3,7,8 isn't there, is a lot less toxic, isn't it, sir?

A I don't know about the Krummrich Plant, sir. If they were different dioxins, yes, they would be less toxic.

Q And so for them to get chloracne, it would have to be a lot more exposure, it would have to be contaminated with the dioxin at a greater level than 14,000,000 parts per billion, wouldn't it, sir?

A No, sir, not at all.

Q It wouldn't? Why not, sir?

A Because you are talking about contamination that five grams of soil would have to have if you were to eat five grams of soil and get 7,000 micrograms. If you get 7,000 micrograms from a very much larger quantity of material---

Q Well, how much?

A The contamination rate would be less.

Q Well, how much more would they have to eat than five grams of soil, these workers, in order to get chloracne?

A It depends. You don't have to eat it, and you can absorb it over a period.

Q Okay, how much? They have to absorb it, they have to get it in their system in order to get chloracne, the equivalent of five grams of soil that would be contaminated to the level of 14,000,000 parts per billion 2,3,7,8, don't they, sir?

A They have to absorb 7,000 micrograms or thereabouts over---from the material to which they are exposed over some reasonably short period, yes, sir.

Q And by reasonably short period of time, you mean what, in 30 days?

A Something of that sort, I believe, yes.

Q So they have to take into their system the equivalent of five grams of soil that would have been contaminated with 14,000,000 parts per billion of 2,3,7,8 in 30 days time in

order to get chloracne?

A They have to take something like 7,000 micrograms, yes, sir.

Q Is the answer to my question correct, Dr. Paget, the one I am asking you, not the one you are answering?

A Yes, sir, that's the way I am stating it.

Q Thank you. And these workers so far as you know, they are not eating anything, are they, sir?

A I don't know anything about it.

Q They are under compunction, they are under orders to wash their hands and leave out their clothing and make sure that they don't ingest that material, aren't they, sir?

A I don't know, sir.

Q You don't know that? You are in the division of medicine and health, responsible for the health and safety of those workers, weren't you, Dr. Paget?

A But setting the rules---

Q Weren't you, Dr. Paget?

A Yes, sir.

Q And you don't know the rules for health and safety?

MR. HEINEMAN: Your Honor, I'm going to object to that. Mr. Carr's confusing the witness with two different things. Mr. Carr knows darn well that this guy was in DMEH from December the 29th, 1978, until the fall of 1979. Now,

when did the penta department close, Mr. Carr? Is that in evidence?

THE COURT: Objection is overruled.

MR. HEINEMAN: Before then.

BY MR. CARR:

Q Doctor, in the course of your practice for Monsanto, in order to adequately protect the workers, you have to know the rules for exposure as far as they are concerned, don't you, sir?

A No, sir.

Q You don't?

A No, sir.

Q Now, Doctor, if they are down in the material digging with their hands, they are going to get a different dose than if they are simply working with it with gloves on and with masks on and they take their gloves off and their masks off when they eat and everything else, isn't that correct, sir?

A Somebody has to be aware of that, it was not my responsibility to do that.

Q How can you adequately determine whether or not your workers are being exposed to risky levels of 2,3,7,8 or any other chemical without knowing the precautions that they are instructed to take, and the precautions that they do take?

A One has to say how much material they must not

absorb, and then from the concentrations you can work out what the permissible operating procedures might be.

Q Well, one way or another, these workers got chloracne, didn't they, sir?

A Yes, sir, they did.

Q And for them to get chloracne, they had to get into their system, they had to ingest, it had to come into their system, because the chloracne works from the inside out, it had to get into their system, that material that they were working with, pentachlorophenol, did they not, sir?

A Or some contaminant, yes, sir.

Q Well, the contaminant isn't going to fall out of the penta, it is going to be in the penta?

A They have to absorb it, yes, sir.

Q And that penta has to be the pure product, if they are taking it, it has to contain dioxins at greater level than 14,000,000 parts per billion, mustn't it, sir?

A No, sir.

Q Oh, no? What would it have to contain?

A That depends on the amount from which they absorbed it.

Q Well, if they absorb five grams in a month---

A If all they absorbed was that, and they had 7,000 micrograms in five grams, they might well get chloracne, yes, sir.

Q They would have to absorb something, the other dioxins they would have to absorb, they would have to be taking into their systems the equivalent of, let's see, 65 grains in an aspirin, they would have to be taking in the equivalent of 60 aspirins of this product per month in order to get chloracne, wouldn't they, sir?

A They would have to take in, yes, that's roughly, yes.

Q They are going to do that how, sir? How are they going to get it in their systems?

A I don't know, sir.

Q And it would have to be contaminated at a greater level, since there would have to be at least ten times the level of this?

A If all they took was five grams, yes, sir.

Q The dioxins that would be in that penta would have to have contained dioxin at least at the level of 140,000,000 parts per billion, wouldn't it, sir?

A If all they took was five grams, if all they were exposed to was five grams of material, yes, sir.

Q Not exposed to, you said it different, Doctor. Not exposed to, but ingest.

A Well---

Q They have to take into their system---

A Five grams.

Q Five grams in order to get chloracne, don't they, sir?

A If that's the contamination level, yes, sir.

Q Now, Doctor, then I take it, and you don't know of any amount of exposure where they would get, well if they take in less than five grams, it's got to have in it more than 140 parts per billion of dioxin, doesn't it? 140,000,000 parts per billion of dioxin, doesn't it, sir, if they take in less than five grams?

A If they take in less, yes.

Q If they take in more than five grams, it can come down by whatever factor we want to assume; if they take in a hundred grams a month, then we can divide this by a hundred, can't we, sir? No, divide it by 20?

A 20, yes, sir.

Q So divided by 20, they have to be working with, they have to be ingesting something that has slightly under a million parts per billion of dioxin content?

A I don't---yes, under those circumstances.

Q 140 divided by 20?

A Is something like 70.

MR. HEINEMAN: Why don't you use the calculator?

BY MR. CARR:

Q It would be about 7,000,000 parts per billion.

MR. HEINEMAN: Don't let Mr. Carr tell you, use the

calculator.

MR. CARR: Your Honor, is Mr. Heineman going to instruct the witness what to do?

THE COURT: Go ahead, Mr. Carr.

Q The amount of material, if they took in 50 grams a month of 140,000,000 parts per billion, that's what they would have to take in in order to get chloracne, wouldn't they, sir?

A They would have to take in 7,000 micrograms in whatever concentration they took it in.

Q No, no, no. If it's one-tenth the toxicity of 2,3,7,8, they would have to take in 70,000 micrograms, wouldn't they, sir?

A Yes, they would take in 70 milligrams.

Q And Doctor, since we---all the people then in the---since only 50 percent got chloracne in Department 236, the other 50 percent must have taken in less than 50 grams of the material they were producing, is that correct?

A That's a possibility, yes.

Q So they could take in 48 grams and not get chloracne?

A Well, it doesn't exactly work like that, but they have to take in---they would take in some acnogenic dose for them.

Q Dr. Paget, then inasmuch as the only danger from dioxin is chloracne, and you don't know---have you ever heard

of any soil anywhere that was contaminated to the level of 14,000,000 parts per billion of 2,3,7,8 TCDD?

A No, sir.

Q Then the concern that we have about Times Beach and Minker-Stout where it has, oh, levels ranging from less than a part per billion to maybe a hundred parts per billion or maybe even six hundred parts per billion in some places, actually all that concern that we have over that soil is misplaced, isn't it, Dr. Paget?

A I believe that, yes, sir.

Q The government has spent millions of dollars in just doing--just doing useless things, because that soil, none of that soil is contaminated at the level of 14,000,000 parts per billion, is it, sir?

A No, sir.

Q Now, Dr. Paget, do you really believe that the EPA and the CDC and everybody else that's concerned about the levels of dioxin in soil, do you really believe what you are saying here that it has to be contaminated to this extent before you have any concern?

A No, sir. I said if you were to take a chloracnogenic dose in five grams of soil or any other five grams, that was the level it would have to have.

Q Well, Doctor, you are talking about eating it, you

are talking about not just walking on it, not laying on it, not rubbing it on your face, not taking a bath, not putting it in your ears, but washing it out, you are talking about eating it, because you are only going to absorb ten percent of it in the soil from what you have given us. So you can wallow in soil that's contaminated to 14,000,000 parts per billion, wallow in it as long as you kept your mouth shut and washed your hands, didn't get it in you, you could wallow in it every day for the rest of your life, because it is only that which you take in in a 30-day period that has any consequence, no way could you absorb enough to get chloracne, isn't that correct?

A I don't know that.

Q Well, figure it out. If you were not going to absorb the ten percent that's on you, that ten percent doesn't get ingested immediately, it takes some time.

A If you had been wallowing in soil, I'm sure it would have more than five grams, probably a thousand more, a million times more than five grams.

Q Ingested, taken in.

A On your skin?

Q On your skin, Doctor, but we are talking about ingesting it.

MR. HEINEMAN: Well, you keep switching horses on him, Mr. Carr. Why don't you stick with one and let him answer?

BY MR. CARR:

Q Doctor, there really is no concern about soil that has a thousand parts per billion TCDD contamination, is there, sir?

A I don't think there is, no, sir.

Q There is really no concern that has a million parts per billion TCDD, is there, sir?

A I would be getting to be anxious about that, yes, sir.

Q Well, anxious, why? You are just one-fourteenth of the amount that you need to eat in five grams in order to get it, and nobody's going to go around, children may, indeed, on occasion ingest that. But all they're going to get is a little bit of chloracne, and that chloracne is going to go away as soon as they quit eating that dirt?

A I wouldn't want to see children getting chloracne.

Q Neither would I. But chloracne has been described in some places, your workers have been told on occasion that chloracne looks just like a case of teenage acne, your know that, too, don't you, sir?

A I don't know that.

Q You don't know that? We will demonstrate that.

MR. HEINEMAN: What evidence is there of that?

MR. CARR: There will be as soon as we have Dr. Rousch. There will be.

MR. HEINEMAN: Well, if there is no evidence of it now, I object to it, and I ask that the jury be instructed to disregard it.

MR. CARR: Your Honor, just as Mr. Heineman asked the witness to assume certain facts that are not yet in evidence, but he believes will be, I'd like for you to assume---

MR. HEINEMAN: Can you name an occasion when that occurred?

THE COURT: Objection is overruled.

MR. CARR: Just this morning, counsel.

MR. HEINEMAN: Pick one.

BY MR. CARR:

Q Dr. Paget, is the only problem that you are going to get from the dirt contaminated with 14,000,000 parts per billion of 2,3,7,8 TCDD is chloracne which is going to go away within a month of the time you are not exposed to it, why the concern about soil that has one part per billion or 45 parts per billion or a hundred parts per billion or 600 parts per billion which is just a small fraction of that, which is necessary to cause chloracne? Why concern about it?

A Well, I don't think there is concern about soil that contains one part per billion. In fact, I think that's been said as a safe level by the Center for Disease Control.

Q Doctor, you know as a matter of fact that they have

said that one part per billion is not a safe level, cannot be considered safe. You know that, don't you, sir?

A No, sir. I don't know that.

Q And my question went beyond just one part per billion. My question went to 45 parts per billion and a hundred parts per billion and 600 parts per billion, didn't it, sir?

A Yes, sir.

Q I direct your attention just to the statement that you just made that one part per billion is safe. Would you look at Exhibit 1255 and turn to Page 49 thereof. And for the record, 1255 is a document issued by the Center for Disease Control, Renate Kimbrough, one of the authors thereof. And it is dated 1984. Have you got Page 49?

A Yes, sir.

Q It says there, does it not, "In residential areas, levels at or above one part per billion TCDD in soil cannot be considered safe, and represents a level of concern." Doesn't it say that, sir?

A Yes, sir.

Q And doesn't it use the words, "levels at one part per billion TCDD in soil cannot be considered safe"?

A Yes, sir.

Q And now, has that corrected your thought on what the

CDC has said about the level of soil contamination?

A That statement---

Q Sir?

A That means the level is less than one part per billion can be considered safe.

Q Is that what that means, sir?

A Yes, sir.

Q No, it specifically doesn't say that at all. It says levels at or above one part per billion in soil cannot be considered safe.

A No, sir, and the converse---

Q Isn't that what it says?

A Yes.

Q And the converse is?

A The converse that levels below it can be considered safe.

Q And one part per billion, levels above one part per billion then are unsafe, right?

A That's what it says.

Q And something that has above one part per billion cannot be considered safe, can it, sir?

A Yes, sir. That's what it says.

Q Is that right? That's what it says, and that's what you believe, isn't that correct, sir?

A No, sir.

Q That's not what you believe?

A No, sir, it depends on the circumstances.

Q Oh, that's right, you believe it takes 14,000,000, don't you, sir?

A In five---

Q You used the word, you estimate that one part per billion 2,3,7,8 tetrachlorodibenzo is probably acceptable medically in santophen.

A Yes, sir.

Q And above, it follows that above one part per billion is not acceptable medically, isn't that correct?

A No, sir.

Q That doesn't follow?

A No, it doesn't, no, sir.

Q Now, Dr. Paget.

MR. CARR: Your Honor, I'm sorry. I have gone beyond eleven already.

THE COURT: Okay. We will take a short break at this time. I would remind you during all the breaks, this admonishment will hold, you are not to discuss this matter among yourselves or with anyone outside the jury panel or as of yet form any opinions or conclusions about the matters on trial. The Court will be in a short recess.

(Court was in recess.)

(Plaintiffs' Exhibit 1274 was marked for identification.)

MR. CARR: Your Honor, I'd offer Exhibit 1274 into evidence. It is Dr. Paget's calculation on the necessity of 14,000,000 parts per billion 2,3,7,8 for the material to be contaminated.

(Plaintiffs' Exhibit 1274 was offer into evidence.)

THE COURT: Any objection?

MR. HEINEMAN: Just a moment. No objection.

THE COURT: Fine. Admitted without objection, thank you.

(Plaintiffs' Exhibit 1274 was admitted into evidence.)

BY MR. CARR:

Q Doctor, I'll now hand you Plaintiffs' Exhibit 1194, which is a box containing Lysol. It has on the front of it the contents of the dibenzo-p-chlorophenol concentration of 4.5 percent. Would you look at that and see if that isn't correct, sir?

A Yes, sir.

Q Now, I would like for you to calculate, if you would, that's 4.5 percent of that bottle has the material in it that

is used, is prepared at Monsanto, that material is made for santophen, you understand that, don't you, sir?

A Yes, sir.

Q I'd like for you to calculate for me, if you would, the amount of contamination with 2,3,7,8 TCDD that would have to be in that 4.5 percent before ingesting the contents of that bottle, or the number of bottles you have to ingest in order to get chloracne at the level you have given us here.

MR. HEINEMAN: Well, I would object to that, your Honor. That's calling for too many unknowns, there is no way to make that calculation.

THE COURT: Objection is overruled.

A Also, you have to be aware if you drank the contents of this bottle you would die from poisoning, from the phenol.

Q Dr. Paget, that isn't the question that I am asking. I'm asking you, making the assumption that you wouldn't die, what's the level of contamination for that lysol that you would need with 2,3,7,8 before you would get chloracne?

A We are going to assume---

Q The calculation before, to make it easy for you, Doctor, you can round it off, your calculation before was based on soil with ten percent of OCP in it, and that is Lysol, the 4.5 percent of the santophen, so you just round off the 4.5 and make it much easier, just use the figure 5.

A I'll round it off to five, five percent of five grams at a hundred---

MR. HEINEMAN: You are asking him in the whole bottle?

A It's .14 percent.

Q Again, it's .14 percent, of course.

A Or, 1.4 million parts per billion, in fact.

Q 1.4?

A Yes, I made an error in calculation.

Q So you are telling us now you made an error?

A I made an error. I corrected it when I sat down here and looked at that. It's actually 1.4 million parts per billion, not 140. Well, I'm sorry, sir, I calculated incorrectly.

Q Well, you want to calculate it again?

A Yes, sir, can I do it with you?

Q You started out .14 percent, did you not, sir? Is that still the figure you are working from?

A That's .14 parts in ten---

Q Excuse me, Doctor, if you could just go with me, 1.4 percent.

A .14 percent, .14 percent, 7,000 micrograms in five grams.

Q .14 percent, correct, sir?

A 0.14 percent.

MR. HEINEMAN: You said 1.4, Mr. Carr, that's why he is correcting you.

Q Excuse me, .14 percent.

A .14 percent, yes.

Q .14 percent is 14 over a thousand, is it not, sir?

A Well, can I do it---

Q No, Doctor, if you don't mind, let's do it so that we can understand it.

A Well, I'm trying to do it so I can understand it, sir.

Q 1.4 percent would be---

A .14 percent.

MR. HEINEMAN: Objection, your Honor. If he is asking this man to do the calculation, then why doesn't he let this man do it the way he wants to do it?

THE COURT: Overruled. It is proper, what he is doing.

BY MR. CARR:

Q Doctor, your initial calculation is .14 percent, correct, sir?

A Yes, sir.

Q Of whatever material that we are talking about?

A Yes, sir.

Q If it contains .14 percent of 2,3,7,8 TCDD it will cause chloracne?

A If it was in five grams, sir. We are talking about five grams.

Q All right.

A As the material, yes, five grams of material.

Q Well, we will take the five grams, if the five grams contains .14 percent of 2,3,7,8 TCDD, then that's going to cause chloracne?

A A single dose might well.

Q All right. And 1.4 percent is over a hundred, isn't it, sir?

A No, .14 percent---

Q Would you just---1.4, sir.

A Well, you keep saying 1.4, and I say .14 percent.

Q Doctor, would you please wait a moment? I am perfectly aware of where the decimal point is in these two figures. I can see that. I put it there. I know where it is. 1.4 percent is over a hundred, isn't it, sir?

A 1.4 over a hundred is 1.4 percent.

Q And .14, if we put 14 over a thousand, what do we have, sir?

A That's .14 percent, yes.

Q .14 percent?

A No, that's 1.4 over it, and a thousand is 1.4.

Q 1.4 over a hundred is 1.4 percent.

A 1.4 in ten squared.

Q Dr. Paget, forget about the ten squared.

A Is 1.4 percent.

Q That's right, Doctor. And move the decimal point over one place, do we not, sir? Move over one place, and we add a zero, don't we, sir?

A All right, sir. No, .14 over a hundred is .14 percent. 1.4 over a hundred is 1.4 percent, .14 over a hundred is .14 percent.

Q Yes, but if we eliminate the point, Doctor, move the point over one place, eliminate the point, we add a zero.

A No, sir.

Q No?

A One 14 parts per thousand is 1.4 percent.

Q Sure it is. That's exactly right. 14 parts per thousand is 1.4. If you multiply 1.4 times a thousand, what will you get, Doctor?

A You will get, well, you've got 14, in fact---

Q And that's 14 out of a thousand, isn't it, sir?

A That's 1.4 percent---well, 14 out of a thousand is 1.4 percent, I'm sorry, sir, 14 parts per thousand is 1.4 percent, not .14 percent.

Q I agree, Doctor, and we are talking---

MR. HEINEMAN: Well, you've just been using different

figures with him, Mr. Carr. You told him 1.4 over a hundred---

MR. CARR: Yes, sir, that's 1.4 percent.

A Yes, and 1.4 over a hundred is 1.4 percent, and 14 over a thousand is .14 percent.

Q Yes.

A So we are talking about 1.4 percent and not .14 percent.

Q All right. .14, and we put that over a thousand, what will you have, Doctor?

A Well, I'm not sure. ...14 over a thousand, what you are trying to convey by that, sir.

Q Doctor, .14 percent is less than one percent of a hundred, isn't it, sir?

A Yes, sir.

Q It's a little more than a tenth?

A Yes, sir.

Q And we end up then with 1.4 parts per thousand, do we not, sir?

A 1.4 parts per thousand, right.

Q Is that correct, Doctor?

A Yes, sir. That's the way I wanted to do it.

Q All right. Fine. And so we end up then with what? What is our final calculation, Doctor?

A 14 parts per 10,000; 140 parts per 100,000, or 1,400

parts per million, and so on, and we come to 1.4 million parts per billion.

Q 1.4?

A Million parts.

Q Well, Doctor, let's even work with that figure, all right? That's 1,400,000, isn't it, sir?

A Yes.

Q So now the contamination that's necessary in five grams of soil has been reduced by a factor of ten. It's now 1,400,000 parts per billion?

A Yes.

Q All right. And we can eliminate the other calculation and use---no we can't, because we are out of paper. We will put it back on this one, with your permission, and we will put a scratch through that one and put in its place, reduce it by a factor of ten, 1.4, make that a zero---a comma, rather---now, is that correct, Doctor? Do you now go with this figure?

A Yes, sir.

Q All right. We've got down some 240 parts per million to 14 million parts per billion to 1,400,000 parts per billion in the soil to be consumed?

A For one dose to be absorbed from five grams to give you chloracne.

Q Or absorbed over a period of a month?

A Yes, sir.

Q Because it does accumulate in the body?

A Yes, it does.

Q And every day as you eat some soil, that 2,3,7,8 goes to the fat, a portion of it, doesn't it, sir?

A That's believed to be so, yes, sir.

Q As a matter of fact, wouldn't one have to be---how much of that 2,3,7,8 is being taken from the soil, Doctor? It's not all taken from the soil, is it, sir?

A No, sir.

Q There have been some recent studies that indicate that of the soil you consume only thirty percent is actually 2,3,7,8 comes out of it. Are you aware of these studies?

A I believe that's so, yes, sir.

Q So actually you would have to multiply that by three, wouldn't you, sir?

A Yes, sir.

Q If it is in soil?

A Yes, sir.

Q So actually it's not the soil would have to be contaminated with 4,200,000 parts per billion in order to cause chloracne, wouldn't it, sir?

A If one dose of five grams were to cause chloracne, yes, sir.

Q All right. So actually we are now back up to 4,200,000 parts per billion in soil because two-thirds of the 2,3,7,8 that's in that soil is going to pass out and not be stored and therefore won't be there long enough to cause any problems?

A Yes, sir.

Q So you have to get in your body, accumulate it, these 7,000 micrograms that you are discussing for a 70-kilogram, 150-pound man, correct, sir?

A Yes, sir.

Q So actually this is the final figure we are talking about, 4,200,000 parts per billion, according to your now most recent calculations, is that correct, sir?

A Yes, sir.

Q All right. Now, Dr. Paget, a child, of course, say a child that weighs one-third the man's weight, say he weighs 50 pounds, which would of course---he could take in one-third of that content, correct, sir?

A Yes, sir.

Q So a child would have to eat in a month's time either soil that's contaminated, five grams of soil that's contaminated with 12,600,000 parts per billion in the five grams of soil, or would haveto eat 15 grams of soil contaminated with 4,200,000 parts per billion, is that correct, sir?

A No, sir, the child would eat less, I presume, if the child is smaller, a smaller dose would produce chloracne.

Q Oh, why yes, I tripled it instead of dividing it, correct. So he could eat one and a third grams of soil contaminated with 4,200,000 parts per billion in order to get chloracne?

A Well, strictly, one and two-thirds.

Q Well, one and two-thirds, isn't that correct, Doctor?

A Yes, sir.

Q Now, do you know any product at Monsanto that could be---or any other product anywhere that would be capable of contaminating soil with 4,200,000 parts per billion of 2,3,7,8 TCDD?

A No, sir.

Q There isn't any? You've never read or heard of any manufacturing process anywhere that could cause soil to be thusly contaminated, isn't that correct, sir?

A That's so, sir.

Q And therefore, no soil that a child is likely to play in contaminated with 2,3,7,8 can cause chloracne, isn't that correct, sir?

A By the absorption of one five gram, or one and two-thirds gram dose, yes, sir.

Q Now, if they eat more than---well, they would have to

eat soil that contains a thousand parts per billion, how many grams of soil would they have to eat, Dr. Paget, contaminated with a thousand parts per billion of 2,3,7,8 in order to get chloracne?

A About 50 milligrams.

Q 50 milligrams?

A Yes, sir.

Q I thought five grams would---you would have to eat five grams containing 4,200,000 parts per billion?

A I made the same mistake that you made, sir. I divided and should have multiplied, so let me multiply instead of dividing.

Q Surely.

A Well, with reservations about my arithmetic, about 210 grams.

Q 210 grams?

A Yes, sir.

Q At a thousand? Now, Doctor, your man has to eat five grams of soil with four million---now I've reduced it to 1,000 parts per million---per billion---I've reduced it by 4,200 parts. So wouldn't you multiply by 4,000 times the five or the 4,000 times the one and two-thirds grams?

A Well, 4,000 times one, yes. I'm sorry, you're quite right, yes, sir.

Q So, 4,000 times two grams, you would eat 8,000 grams of soil?

A Yes, sir.

Q A 50-pound child would have to have ate---

A Over a period, yes.

Q In a period of a month?

A Yes.

Q 8,000 grams of soil, if there is 30 grams to the ounce, how many pounds of dirt would he have to eat to get chloracne?

A About 16 pounds, about eight kilograms, about 16 pounds.

Q So do you know of any child anywhere that has---have you ever heard of a child eating 16 pounds of dirt a day?

A No, sir.

Q And have you ever heard of any soil---

A It is not a day, sir. It is in a month.

Q In a month's time?

A I'm not sure that that's not possible. It is about a half a pound a day.

Q Have you ever heard of any soil that's been contaminated as much as a thousand parts per billion?

A No, sir.

Q So then really all this concern that we have had

about the dioxin sites in Missouri where their contamination levels are many, many times lower than a thousand parts per million, really all of that we've just been barking up the wrong tree; haven't we, Dr. Paget?

A I think a lot of that concern is misplaced, yes, sir.

Q And the CDC's concern, you wouldn't really be concerned about contamination of 1,000 parts per billion in the soil for children, and the CDC's concern of one part per billion is way off base?

A Well, sir, of course in any estimation you could include considerable safety factors. We have been talking about a dose that would cause chloracne.

Q Dr. Paget, that this chloracne is going to go away a month after the child quits eating dirt. Now, every child---and every child that I know of gets acne at some time or another in his life that lasts from sometimes for years. I had acne that lasted for many years, all through my teenage years and into my manhood. Now, that's not unusual to have acne?

A That's very common, yes.

Q And if chloracne is really nothing worse than a case of teenage acne, what's the concern, Doctor?

A Well, sir, one doesn't want children to have---I'm sure you, having been a sufferer, you would agree that if you

could prevent acne it would be something that's very highly desirable. It is a dreadful disease.

Q Is it highly desirable that they would condemn an entire town and move the people out just so the kids wouldn't get a case of acne, Doctor?

MR. HEINEMAN: Excuse me. He is asking this witness to speculate or give his opinion of propriety of the actions of the EPA or the U.S. Government at Times Beach, that's irrelevant and immaterial to this lawsuit, and I object to it.

THE COURT: Overruled. I think it is relevant and material.

A Well, sir, if you include a safety factor in the calculations we have been doing and the safety factor of a thousand fold might not be inappropriate for this sort of thing, and I think you would agree that--

Q Doctor, we are not even talking of a safety factor of a thousand fold, because the thousand is what I gave you hypothetically. You are talking about soil that has to be contaminated to 4,200,000 parts per billion. We are not talking about a safety factor of a thousand, are we, Doctor?

A We were talking about that concentration being such as would be required to give chloracne from one dose of five grams, sir.

Q Or a lot of little doses over a period of a month

adding up to five grams.

A Amounting to five grams.

Q And, Doctor, we are not talking about a safety factor here. What you are saying to us as a representative of Monsanto is that there is no concern about soil until it reaches the level of 4,200,000 parts per billion in the soil?

A No, I didn't say that, sir. I said that that's the dose which would surely give chloracne, and if one has to---

Q No, you said that was a threshold level. You didn't say would surely give, you said that is the threshold level for chloracne, isn't that correct, Dr. Paget?

A Yes, sir, that's the dose at which I was quite wrong to say surely. This was the dose at which chloracne might be expected, yes.

Q And in a lot of people it would take a lot more than that to cause chloracne, and in some people, according to your testimony here before, they are just not going to get chloracne, no matter how much 2,3,7,8 TCDD they ingest?

MR. HEINEMAN: Objection, your Honor, it mischaracterizes his testimony.

THE COURT: Overruled.

A I don't believe I ever said that, and if I said that, it was not correct.

Q Well, you did suggest that the chloracnogenic response

varies from person to person.

A Yes, sir.

Q And what you have given us was the threshold level for the most sensitive person, didn't you, sir?

A Yes, sir.

Q So there has got to be---and since there are some people that have chloracne and some people that don't, fifty percent of the people there didn't have chloracne. Apparently, and from the facts that we know as far as their exposure and what they took in, apparently half the people there didn't get chloracne, and presumably they were working in the same area, you know nothing to the contrary, isn't that correct, Dr. Paget?

A That's correct. I know nothing to the contrary.

Q So the threshold dose of 4,200,000 for a 70-kilo man eating five grams of dirt in a period of a month would have to be increased for those less sensitive, correct, sir?

MR. HEINEMAN: Objection, your Honor, that's not the threshold dose. He is using the wrong term again.

THE COURT: Overruled.

Q Isn't it the threshold dose, Dr. Paget?

A That's under the very special circumstances---

Q And it is a threshold dose?

A Of eating that five grams of soil.

MR. HEINEMAN: In soil, Mr. Carr, you get 7,000

micrograms of a dose.

Q And, Doctor, this threshold level is for the most sensitive human beings, isn't it, sir?

A That's the 7,000 micrograms as the level at which one might expect most sensitive people to get chloracne.

Q And these people that ingest that amount of soil contaminated---or any other product in the same five grams of anything---it doesn't have to be soil, would not get chloracne and they wouldn't get anything else, and so they don't need to worry about it?

A No, sir, because one likes to incorporate very large safety factors.

Q Well, why? The only thing they are going to get is chloracne, isn't that correct, Dr. Paget?

A I wouldn't say that even ordinary acne is something that you could describe as---

Q Well, Doctor, isn't the only thing that they are going to get is chloracne?

A That's what I believe, yes, sir.

Q And so we have indeed then spent these years of concern about 2,3,7,8 TCDD in exposure to children and to human beings, really what we're really talking about is acne, that's all we are really talking about, that's our only concern, is that correct, Dr. Paget?

A No, sir.

Q Do we have other concerns because of exposure to 2,3,7,8, Doctor?

A Well, until the situation is completely understood, yes, of course one has to have concerns.

Q Do we have concern that very low doses might accumulate in a period of time, doses, insignificantly small fraction of 4,200,000 parts per billion, just might cause cancer in somebody, do we have that concern, Doctor?

A One has a concern about---

Q Doctor, do we have that concern with relation to 2,3,7,8 TCDD?

A Until the factor is studied, yes, of course one has that concern.

Q It's been studied for a number of years, and we still have that concern?

A Yes, sir.

Q And should we not be concerned about very low doses over a period of time causing neuropathies?

A One should be concerned about the possibility that it causes anything, including things that we don't even know about.

Q Excuse me, Doctor, could you just direct your attention to the ones that I am talking about? Should we have concern that very low doses over a period of time will cause

peripheral neuropathy?

A That depends on what you mean by very low doses.

Q Any doses?

A No, not any doses.

Q Doctor, haven't we established that the EPA has not yet established a no-effect level for 2,3,7,8 exposure?

A I don't know that, sir.

Q You don't know that?

A No, I don't.

Q Now, Doctor, would you assume that it's been testified here by toxicologists that---you are a toxicologist, aren't you, sir?

A Yes, sir.

Q Don't you keep up on what the EPA pronounces?

A Well, I don't know that they have not established an effect level. I know that they haven't established a maximum safe level.

Q Well, have they established a minimum safe level?

A I don't think they ever do that for anything.

Q Well, the question is have they established a no-effect level that you know of, Dr. Paget?

A No, sir.

Q And, Doctor, they are not willing to say that any dose of 2,3,7,8 TCDD, no matter how small, may not have effects

upon man, isn't that correct, sir?

A I don't know that, sir, no.

Q You don't know that, Dr. Paget?

A No, sir.

Q Well, have they announced a level of which it is safe?

A No, sir, and that's different.

Q All right. And, Doctor, they can measure down to the million parts per billion, can't they, sir? They have the capacity to do these same calculations that you do?

A Oh, yes, sir.

Q And, Doctor, shouldn't we be concerned then about very low doses causing loss of libido, for instance, in man?

A I don't know, sir.

Q My question is not whether you know, my question is shouldn't we have concern about that?

MR. HEINEMAN: Well, I object to it. If he doesn't know, how can he answer the question?

THE COURT: Overruled.

A It depends on what you mean by very low doses.

Q Low dose is a lot, lot, thousands and thousands of times smaller than 4,200,000 parts per billion?

A That's not a dose, sir.

Q It is if you eat in five grams of soil, Dr. Paget.

A That's the dose we expect might very well cause chloracne, so one would want to have a very large safety measure between that dose and---

Q Doctor, we are not now talking about---

MR. HEINEMAN: May he answer the question, your Honor?

MR. CARR: If he answered the question I asked, I wouldn't mind.

MR. HEINEMAN: I would like a little courtesy in the Courtroom.

THE COURT: Overruled. It was not responsive.

MR. HEINEMAN: I think it was responsive.

A Could you repeat the question, please?

MR. CARR: I'd like the Court to instruct the jury that they should disregard what Mr. Heineman just said and did. They should not be influenced by comments that counsel makes that are completely improper to a Court that's making its ruling, and I would ask the jury to disregard what he just said.

THE COURT: The jury is so instructed. When I make a ruling, that stands.

MR. HEINEMAN: Your Honor, with my respect to the Court---

MR. CARR: Your Honor, I suggest it is not respectful to the Court for him to say what he said.

MR. HEINEMAN: Your Honor, it was respectful to the Court. I believe I have a right---I am certainly not questioning this Court's rulings with respect to the evidence in the case.

MR. CARR: What did you just do if you didn't question his ruling?

THE COURT: Mr. Heineman, the point is that the time to express your opinion as to a ruling is before it is made when the point is being argued before the ruling is made. I would assume if you made the objection that your opinion is, however it is expressed in the objection, it does not need to be repeated after the ruling has been made, which is what you did in this particular case. I'd let it go before, but counsel did properly note it, and I am instructing the jury to disregard it.

MR. HEINEMAN: Very well, sir.

THE COURT: Please read the question back.

(The previous question was read by the Court Reporter.)

BY MR. CARR:

Q Doctor, have you ever at Monsanto or anybody that you know of, have you ever advised the EPA or the Center for Disease Control or OSHA when they came to the plant that they are way off base in their concern about human and worker safety?

MR. HEINEMAN: Excuse me, your Honor. May I object? He is changing the question and abandoning the question that he just asked.

THE COURT: I assume if he hasn't followed it up he is abandoning the question.

MR. HEINEMAN: He is not asking the witness to answer that question? All right.

THE COURT: Go ahead.

A No, sir. I have never advised the EPA about their concern, no, no, sir.

Q Well, do you know if Monsanto has?

A I don't know, sir, no.

Q Do you know if--well, you know, Doctor, that there are immense sums of money being spent relative to the dioxin problem, you are aware of that?

A Yes, sir.

Q And you are aware of the Agent Orange case involving millions of dollars, and you are aware of the Times Beach cleanup and Minker-Stout cleanup costing millions of dollars? You are aware of all those--

MR. HEINEMAN: Your Honor, I object to this. It is nothing but a speech to the jury. He is just trying to inflame the jury. It has nothing to do with the merits of this lawsuit and I object to it.

THE COURT: Overruled. I think it's properly a subject of the question.

A Well, it depends what you mean by aware, sir. Some of these I have the same awareness of any reader of the newspaper has, and that's all.

Q Well, that's enough. Monsanto presumably, you among others read the newspapers, don't you, sir?

A Yes, sir.

Q And you know what's going on here. Have you ever, you at Monsanto during the period of time that you were on this case and a toxicologist, did you ever advise---well, OSHA was there, OSHA was there during the time you were a toxicologist and they made a report during the time you were a toxicologist working for the Krummrich manufacturing process. Did you tell OSHA, well, that's only 150, only 150 or 120 parts per billion in that soil. And you don't need to rope off that space there, those workers aren't going to get down there and eat five grams of soil a month, and even if they did, it's only got 150 parts per billion of 2,3,7,8 in it? Did you ever tell OSHA they were concerned about nothing?

MR. HEINEMAN: Your Honor, I'll object. The witness has already testified that he was not involved in the OSHA situation at all.

THE COURT: Overruled.

A No, sir.

Q Doctor, you did have a meeting in which you discussed the 2,4 dichlorophenol being produced and marketed at the Monsanto plant, didn't you, sir?

A I'm sorry, sir, there may as well have been such a meeting, yes.

Q Let me hand you a letter that we received yesterday afternoon at 1:30.

(Plaintiffs' Exhibit 1275 was marked for identification.)

Q I'm handing you what's been marked Plaintiffs' Exhibit 1275 and ask you to look at that and see if you don't recognize that as involving you and where you made an evaluation. You recognize that as a memo involving you?

A Yes, sir.

MR. CARR: I offer 1275 into evidence, if it pleases the Court.

(Plaintiffs' Exhibit 1275 was offered into evidence.)

THE COURT: Any objection?

MR. HEINEMAN: Your Honor, we have previously objected in this case to any information relating to 2,4 dichlorophenol as not being relevant to the merits of the issues in this case. We would continue that objection with respect

to this particular document, and of course we have previously objected on other grounds which the Court has ruled on, which is why Mr. Carr got the letter yesterday afternoon.

THE COURT: Fine, okay. It is admitted over objection. Gentlemen, could I see you at the bench for just a minute, please?

(Plaintiffs' Exhibit 1275 was admitted into evidence.)

(The following proceedings were held at the bench.)

THE COURT: Before we get into this, it is close to noon. I want to break now. Before that, I want to tell you. You submitted something in camera yesterday. One letter, a memorandum or however you characterize it---

MR. HEINEMAN: Yes, I think that's right.

THE COURT: I want you to produce that except for the part on legal fees, the footnote on legal fees. You can white that out if you want, but the rest of it has to be produced.

MR. HEINEMAN: The whole thing, you mean?

THE COURT: There is one section on legal fees, have you seen the document?

MR. HEINEMAN: I think I've got a copy. I've only looked at it very casually.

THE COURT: Okay. For the record, I want you to

produce all of it except the part on legal fees. If you don't understand which parts I mean, I will take you in Chambers and show you the part.

MR. HEINEMAN: Would you please?

THE COURT: Okay. And we will break for lunch at this time and I want it done by 1:30.

MR. HEINEMAN: That's no problem.

(The following proceedings were held in open Court.)

THE COURT: Ladies and gentlemen, we are going to break for lunch at this time. The admonishments that I gave you earlier would apply during this break also, and we will resume at 1:30. Thank you for your attention and cooperation. The Court is in recess for lunch.

(At this time Court was in recess for lunch.)

(The following proceedings were held in Chambers.)

THE COURT: Okay, what are we doing back here?

MR. HEINEMAN: The thing I talked to you about right before lunch, about making the record.

THE COURT: Right. We will have to do that. That will just take a minute.

MR. HEINEMAN: The Judge, the Court has ordered that we turn over to Mr. Carr a portion, or turn over the document which was submitted for the Court's review in camera on Friday

with certain portions deleted. We would ask before we turn this over to the Court, obviously, we have taken the position that this information besides being privileged is totally irrelevant and not calculated to lead to the discovery of admissible evidence which I am assuming the Court has already considered in making its ruling.

THE COURT: Right.

MR. HEINEMAN: We would ask the Court at this time to stay its Order to turn this over and to certify this question for appeal so that we might be able to take it up before this information is disclosed to the attorneys for the Plaintiffs.

THE COURT: Do you have anything you wish to say, Mr. Carr?

MR. CARR: Yes, your Honor. They could have taken that position a year ago if they wanted to. We're very close, hopefully, just a few days away from resting. And there is no time to delay the trial of this case while they take that up on appeal.

THE COURT: Anything else you want to say?

MR. HEINEMAN: No, your Honor. This document was not responsive to any other request of Mr. Carr's other than the most recent occasion when the Court ordered us to produce anything that had the word dioxin in it. It was subject to

that Order that this document was turned up, and it's clearly not related to any of the other requests that Mr. Carr has made. Therefore, it's only very recently that it's turned up, fairly recently that it's been responsive to any ordered production. And therefore, we can't help the shortness of time. We're stuck with it just as everyone else is, and we still make the request to the Court.

THE COURT: I am denying the request. First of all, I think it has been covered in prior requests. Number two, I think it is relevant and material, and in fact is probably relevant and material to the matters in the section of the trial that we are in at this time. And you could have taken this position on this document a long time before. I don't think that there is any substantial compelling or just reason to delay enforcement of this. I am ordering you to turn it over, and I am denying your request for a stay to allow you to appeal to the Appellate Court on it. Okay?

MR. HEINEMAN: That's it.

(The following proceedings were held in open Court.)

MR. CARR: I need to pass Exhibit 1275 to the jury at this time.

THE COURT: Fine.

BY MR. CARR:

Q Doctor, this Exhibit deals with, as we started to get into before lunch, a meeting that was held on the 22nd--- apparently on the 11th of May, 1979, and again on the 22nd of May, 1979, is that correct, sir?

A Yes, sir.

Q And you were one of the participants at either one or both of these meetings, is that correct, sir?

A Yes, sir.

Q And you were asked to give your judgment to evaluate the 2,4,6 trichlorophenol that is present in many of the chlorinated phenols produced by Monsanto, isn't that correct, sir?

A Yes, sir.

Q And you, of course,knew that the 2,4,6 trichloro-phenol is also present and was present in the orthochlorophenol crude that was manufactured in this case---

A I don't know.

Q You don't know that?

A No.

Q Well, you do know that there was tricholorophenols in that product, don't you, sir?

A I believe there were other chlorophenols, sir. I don't know which ones were present, no.

Q Well, there is an Exhibit in evidence that indicates

that trichlorophenols were present in the OCP tank car. Would you accept that, please, sir?

A Yes, sir.

Q For the purpose of this. And the 2,4,6 trichlorophenol or any trichlorophenol for that matter would be considered an impurity, wouldn't it, in the product you are putting out?

A Yes, sir.

Q And you of course also, now back in the trichlorophenols there can be tetrachlorodibenzo-p-dioxins, you know that, don't you, sir?

A I believe that, yes, sir.

Q And the 2,4 dichlorophenol that's being manufactured, of course, is being sold to customers and it contains levels of 2,4,6 trichlorophenol and also contains levels of dioxin at that time. You knew that, did you not, sir?

A I didn't know the levels of dioxin, no, sir.

Q Well, I didn't ask you if you knew the levels of dioxin. You knew it did contain levels of dioxin, didn't you?

A Yes, sir.

Q And at that point in time, you of course had in your mind the levels of contamination that would have to be 2,3,7,8 TCDD before you would consider it something that could cause chloracne, you had that in your mind at that time, did you not,

sir?

A Yes, sir.

Q And you were asked to give an opinion as to whether or not a hazard existed relative to the 2,4 dichlorophenol that was being sold, were you not, sir?

A Yes, sir.

MR. HEINEMAN: Objection. Oh, you mean in this matter?

MR. CARR: Yes.

MR. HEINEMAN: All right. I thought you meant back in '79.

MR. CARR: This was in '79, counsel. This meeting was in May of '79.

MR. HEINEMAN: Well, I thought you meant February.

BY MR. CARR:

Q You were asked to give an opinion at that time as to whether or not the impurities in the 2,4 dichlorophenol was being manufactured and sold to your customers were of a nature as to pose a substantial risk of injury to the health of the ultimate users or the environment, isn't that correct, sir?

A No, sir.

Q Would you direct your attention to the last paragraph on this document, Page 1275, last paragraph on the first page?

A Yes, sir.

Q Are you discussing there whether or not 2,4 dichlorophenol as being in produced and marketed represents a substantial risk to---

A That's what the meeting was about. That's not what I was asked to evaluate.

Q You were asked only to evaluate only the 2,4,6 trichlorophenol?

A I was asked to evaluate just specifically an NCI bioassay report on the carcinogenicity of the material on the 2,4,6.

Q Well, did you offer an opinion then on just the NCI bioassay study dealing with 2,4,6 trichlorophenol?

A That's what I was asked to evaluate, yes, sir.

Q And you did not evaluate any other impurity or the risk that might be associated with other contaminants in the 2,4 dichlorophenol other than the 2,4,6 tripchlorophenol contaminant?

A No, sir, that's what I was asked to evaluate.

Q Well, did anybody at that meeting, did you not discuss the fact that dioxins are known to be in the 2,4 dichlorophenol when you all determined whether you should or should not notify the EPA as to the existence or nonexistence of a substantial risk?

A I didn't, no, sir.

Q Was it even discussed at those meetings?

A I can't recall, no, sir.

Q Dr. Paget, if you all knew dioxins were in 2,4 dicholorophenol, you all knew that, did you not, sir?

A I am not sure what was known at that time, sir, in May. I certainly wouldn't have known what specific dioxins were there.

Q Well, you would have known that it contained the tetradioxins that elute at the same retention time as 2,3,7,8 TCDD?

A I'm not sure whether that was known or not, sir.

Q Well, please accept my word for it that it was not known, and there are existing Exhibits in evidence that reflect that.

A If you say so, yes, sir.

Q And was it---you had to know that in order to give an opinion as to whether or not a hazard exists?

A Sir, I was not asked to give an opinion as to whether a hazard existed, but only to evaluate---

Q Well, didn't you---what did you do then just at that meeting, ignore the fact that TCDD's and other dioxins were in 2,4 dichlorophenol?

A I don't know what other people did, but my participation in that meeting was limited to evaluating the NCI bioassay

report.

Q Well, Doctor, you know from your experience and knowledge as a toxicologist that 2,3,7,8 TCDD is thousands and thousands of times more toxic than 2,4,6 trichlorophenol, you know that, don't you, sir?

A I don't know about thousands and thousands. I know it is more toxic, yes, sir.

Q Doctor, wouldn't the fact that the 2,4 dichlorophenol that is being manufactured by Monsanto contains more than just 2,4,6 trichlorophenol as an impurity, that it also contains tetradioxins that elute the same way as 2,3,7,8 TCDD elutes, the same retention time, don't you consider that that presence of the tetras in that 2,4 dichlorophenol poses a greater threat to the ultimate user, to the house of the user or the environment than the possible effects of 2,4,6 trichlorophenol?

A I don't know what the concentrations were, sir. This meeting was to consider the 2,4,6.

Q There were chemists at that meeting, there was J. D. Wilson. He was there, he is an organic chemist. Did you inquire of Mr. Wilson, Dr. Wilson, if any chemists as well were asked to determine whether or not we should notify the EPA about 2,4 dichlorophenol, are there possibly TCDD's in this that we should consider, did you ask that, Dr. Paget?

A No, sir.

Q Did anybody ask that at that meeting?

A I don't recollect whether they did or not, sir.

Q Dr. Paget, at this point in time you were surely aware of the program that was being undertaken, it had been under way since March, at least, to determine the TCDD content of the various products, and you had reports by this time, a number of reports, and you are taking it up to the Biohazard Committee. Surely at that meeting you were aware of the fact that there could be something in your 2,4 dichlorophenol that could be of a greater hazard to the health of the people than just 2,4,6 trichlorophenol, surely you were aware of that, were you, sir?

A I don't know, sir. I don't know what was discussed other than the evaluation of this 2,4,6 trichlorophenol from the NCI which was what the meeting was called to discuss.

Q Now, Doctor, there was further mentioned in this memo that in order to prevent possible misuse of the product by a customer, it is recommended that the responsible business group send a letter to its customers for this product referring to the NCI bioassay describing the present 2,4,6 trichlorophenol content of the product, and the plans which are under way to improve the purity of the product. Now, do you know whether or not the customers were sent such a letter?

A No, I don't, sir.

Q And if such a letter were sent, do you know whether or not they discussed and told the customers that there is more than just 2,4,6 trichlorophenol in this product, there is in addition, tetrachlorodibenzo-p-dioxins in this product, do you know whether or not that was ever done?

A No, sir.

Q Now, Doctor, did you have meetings at Monsanto in which you discussed with others your opinions as to the amount of 2,3,7,8 TCDD that would be necessary to ingest before one would get a case of chloracne, was that discussed by you and others?

A At this meeting, sir?

Q Not at that meeting, at any meeting?

A I'm sure it was, yes, sir.

Q And all of the actions that were taken by the---or the actions that were taken by Monsanto that you know of, they had in mind this premise of yours as to the toxicity of dioxin?

MR. HEINEMAN: Let me object to the form of the question calling for sheer speculation.

THE COURT: Overruled.

Q Do you know that, Dr. Paget?

A No, sir, I don't know that.

Q You don't know what it was or was not?

A No, sir.

Q You do know that you expressed that opinion?

A I expressed what opinion? I'm sorry, could you say what opinion you assume I expressed?

Q You expressed your opinion as to the amount of dioxin it would take in order to cause chloracne. We have discussed it a greater part of the morning.

MR. HEINEMAN: Object. It is vague and indefinite, expressed to whom, when, vague and indefinite, your Honor.

THE COURT: Overruled. I think that was clarified in the questions prior to that one. Overruled.

Q Could you answer that question?

A If I have been asked my opinion, I would have given it.

Q My question is, you did give that opinion, did you not, sir?

A I can't recall when I gave it or on what occasions, no, sir.

Q Well, did you discuss this subject with Dr. Rousch?

A I'm sure I did, yes, sir.

Q And did he agree with you, or you and he in agreement as to the amount of dioxin it takes to cause acne to occur?

A I'm sure we would've been, yes, sir.

Q Have you learned anything from Dr. Rousch since that time that he has perhaps changed his mind as to the level of

dioxin contaminant necessary before one gets the condition called chloracne?

A I don't believe we discussed this, sir.

Q Well, at any event, you all decided at that meeting that you did not need to notify the EPA and that you did not need to notify the customers as to anything other than the 2,4,6 trichlorophenol content of the products, is that correct, sir?

A That's so, yes, sir.

Q And you of course, you are aware of the fact that the 2,4 dichlorophenol goes into products such as Weed-B-Gon and 2,4 D that we have. I don't think I've discussed it with you, but that Mr. Musgrave has discussed with witnesses prior to the time you took the stand. You knew that had taken place, I take it?

A I'm sorry, I'm not sure what you are asking.

Q Well, I am not sure that I put it in a frame that you could properly answer, Dr. Paget. You are aware of the fact that we had discussed in this case that Weed-B-Gon and 2,4 D contains Monsanto product called 2,4 dichlorophenol?

A No, sir, I am not aware of that.

Q You are not aware of that?

A No.

Q Well, do you know that 2,4 dichlorophenol goes to

customers who use it in making the products known as 2,4 D or Weed-B-Gon?

A Yes, sir.

Q All right. And you do know that ultimately, the product is going to be used by the---well, by the homeowner, by people that have farms, by all kinds of people that are involved in controlling dandelions and other weeds?

A Yes, sir.

Q And you do know that it's going to be sprayed on the lawn, it's going to be mixed in gallons of water, for instance. I think if you looked at that Weed-B-Gon can you will note that it takes four teaspoons of Weed-B-Gon to a gallon of water.

A I don't know it, but I believe that might be the case.

Q And do you know that the Weed-B-Gon contains nearly eleven percent of the 2,4 dichlorophenoxyaceitic acid?

A I don't know, but if you will tell me so, I will believe it, yes.

Q And you do know that customers will be ultimately exposed to that content either on your lawn or on their dirt, or somehow they can come in contact with it?

A Yes, sir.

Q Now, would the same percentage that is .14 percent that you gave us for the soil contaminants, and you mentioned it for the Lysol, would that same percentage work for the

2,4 dichlorophenol that has 2,3,7,8 TCDD in it?

MR. HEINEMAN: Your Honor, let me object to the form of that question as being so vague and indefinite. We are talking about different material, different substances, different amounts. I can't imagine how anybody could figure that out.

THE COURT: Overruled.

A You would have to tell me what assumptions you wish me to make, sir.

Q Well, is the toxicity of 2,3,7,8 TCDD affected by the substance that it contaminates?

A Not as far as I am aware, no, sir.

Q If you get it into your system, it doesn't make any difference whether it's on grass and you eat the grass, or on the dirt and you eat the dirt, or if it's on the grass and you lay on the grass as Mr. Kidwell fell to the ground in Sturgeon, or if you---however you come in contact with that. If it gets into your system, whether you eat it or inhale it or drink it, it gets into your system, and it has this same effect, doesn't it, sir?

MR. HEINEMAN: Let me object, your Honor. That's eight different questions in one. And Mr. Carr surely knows the differences in concentration, whether it's on grass or whether it's in soil or in water or some place else. It's

misleading and it's eight different questions in one, and I object.

THE COURT: Overruled. It is a proper question. It's one question.

A You would have to let me know what assumptions about the spread of the diluted material over the ground I should make before I can even begin to answer that question, sir.

Q Doctor, does it make a difference to you in determining whether or not chloracne is going to be caused---you have to take in, no matter how you get it, the same amount of 2,3,7,8 TCDD, don't you, sir?

A Yes, sir.

Q For an average 150-160 pound man, you have to take in 7,000 micrograms, don't you, sir?

A Yes.

MR. HEINEMAN: We are talking about a one-shot dose now.

Q Or in an accumulative dose over a period of time, isn't that correct?

A Over 30 days or so, yes, sir.

Q Isn't that correct, sir?

A Yes, sir.

Q So it really doesn't make any difference how you get that 7,000 micrograms in your system, does it, sir?

A Not in the strict form in which you absorb it. The amount of the material you absorb of course affects you whether you take 7,000 micrograms on---

Q Well, I certainly agree with that, Doctor. I didn't suggest there was anything different. You have to have it into your system whether it comes from eating it as I suggested to you earlier or whether it comes from eating the grass, eating the soil, drinking the gallon of water that has it in it. How many gallons of water would you have to drink in order to get 7,000 micrograms of 2,3,7,8 TCDD if you assume that it's got ten percent 2,4 dichlorophenol in the Weed-B-Gon and that four teaspoons go into a gallon of water?

A And how much 23,7,8 TCDD am I to assume that there was in the original material?

Q Any level that you want. Say 50 parts per---let's do the same way we did the soil. You had 45 there. Say it's 45 parts per billion that goes into the 2,4 dichlorophenol that goes into Weed-B-Gon.

A Well, sir, you have to bear with me while I make this calculation, because it is more complicated than any we've done so far.

Q All right. Round them off so it will be easier for you. If you want to use 45 or 50 might be easier.

MR. HEINEMAN: Do you want to include the fact of

any dilution of 2,4 di becoming 2,4 D?

MR. CARR: Sure, that'll be fine.

MR. HEINEMAN: Do you have that figure?

MR. CARR: Mr. Musgrave said assume that that was all 2,4 dichlorophenol in that Weed-B-Gon can, and that's okay, I will accept that.

MR. HEINEMAN: I understand from Mr. Musgrave that that's inaccurate.

MR. CARR: Well, Mr. Musgrave put it on the board and just assumed that it was all 2,4, he is the one that did the calculations on the Weed-B-Gon, if my memory serves me right. And he didn't give any factor of dilution other than the dilution when it gets into the gallon of water which we have to work with in a moment. And if you want to assume that it's further diluted, assume that it's diluted another 50 percent, it's fine with me, Doctor.

A It's three teaspoons in a gallon.

Q Four teaspoons in a gallon?

A Three teaspoons in a gallon.

Q No, four teaspoons, and according to the directions of course some customers use a lot more than that and some use less, I suppose. But take the four teaspoons per gallon.

A You would have to drink, I think, 25 gallons, sir.

Q To get 7,000?

A Micrograms.

Q Micrograms?

A Yes.

Q If it contained 50?

A If the original dichlorophenol contained 50 parts per million and if you assume that it's diluted in the manufacture of the Weed-B-Gon by 50 percent, I have 25 parts per million, and the raw material of Weed-B-Gon, if you like, and that would mean there was 2.5 parts per million.

Q No, you left out a calculation because it diluted further in the can by ten percent. It's only ten percent of the can.

A Yes, I'm coming to that. So that material in the can, the total can, would contain 2.5 parts per million. It's diluted ten percent in the can.

Q 2.5 parts per billion?

A 2.5 parts per billion, not million. I'm sorry, I have to assume 50 parts per million.

Q No, 50 parts per billion.

A Oh, I'm sorry. Well then, that will make it very much more, of course.

Q Indeed it will. 25,000 gallons.

A Yes, sir, that would be just exactly a thousand times more.

Q Yes. So one could get, if you had your product contaminated with 50 parts per billion of 2,3,7,8 TCDD, you would have to drink, somebody would have to drink, 25,000 gallons of water before he could get chloracne?

A If he drank the diluted Weed-B-Gon, yes, sir.

Q Once he drank the diluted Weed-B-Gon and 25,000 gallons of water is a pretty good sized swimming pool, isn't it, sir?

A Yes. I don't know about a swimming pool, but it is a fair sized amount.

Q That would be a swimming pool about 20 by 30, wouldn't it?

A I don't know. I don't own a swimming pool, unfortunately.

Q That is your calculation as to the amount, and that's predicated, that's based upon the same figures that you used to arrive at the 4,200,000, or I'm sorry, 1,400,000 parts per billion in soil. You got to it at exactly the same way, didn't you, sir?

A The same type of calculation, yes, sir.

Q And of course then the people at Monsanto knowing how the 2,4 dichlorophenol is being used, they would know that it would be physically impossible for anybody to drink in a month's time 25,000 gallons of water, isn't that right, sir?

A Yes, sir.

Q Yeah. So, and even if you had 2,4 dichlorophenol that contained 150 parts per billion of 2,3,7,8 TCDD, they would have to drink 8,000 gallons of water of that nature, wouldn't they, sir?

A Of the diluted Weed-B-Gon, yes, sir.

Q And again that's something that a person probably won't drink that much in his lifetime.

A I don't know about that, sir, but---

Q In any event, you at Monsanto all operated on this premise when you made a decision that this does not contain a substantial hazard to the people involved.

MR. HEINEMAN: What premise, Mr. Carr?

MR. CARR: That it would take 25,000 gallons of water, not swimming in it, but drinking 25,000 gallons of water before you would get chloracne.

MR. HEINEMAN: Now, are you asking, Mr. Carr, if that was the only consideration?

BY MR. CARR:

Q I'm asking if that was a consideration that you used when you determined whether or not you were going to notify the customers?

A At this meeting, sir?

Q Yes, at that meeting. And any subsequent meeting.

I asked you yesterday whether or not there was a plan on the part of Monsanto to withhold this information relative to what dioxin was in the products, withhold it from the workers, withhold it from the people at Sturgeon, withhold it from your 2,4 dichlorophenol customers, withholding from your Lysol santophen customers, from the employees in the plant. I asked you yesterday, was that answer yesterday you were part, in fact, of such a meeting that discussed whether or not customers should be notified, weren't you, Dr. Paget?

MR. HEINEMAN: Okay, your Honor, the witness has testified that he was asked to comment on the 2,4,6 study and that he didn't remember the other aspects of the meeting. If I am---I may be mistaken, but that's what I thought I heard him say.

THE COURT: You're objecting on this?

MR. HEINEMAN: I am objecting to this, besides the fact that Mr. Carr just gave a speech, and I would request--- I would object to the speech. I request that the jury be instructed to disregard it.

THE COURT: It was a proper question, number one. And number two, your objection is overruled.

BY MR. CARR:

Q Dr. Paget, was this meeting that you had in May one of a series of meetings held by Monsanto personnel at which

you arrived at the Monsanto policy on what you should or---or would not---surely not should, what you would tell these people that I mentioned, your employees, your customers, and the people at Sturgeon, or the public at large?

A Not as far as I am aware, sir, no.

Q There were other meetings held, sir, weren't there?

A I don't know, sir.

Q Well, you held a meeting later in June where you discussed the position that you all were going to take. You gave that to your Senior Vice President, Mr. Throdahl, didn't you, sir?

A That was a paper to discuss the establishment of an ultra-trace laboratory, sir.

Q You also discussed the very small amounts of TCDD in the human environment of certain circumstances of intimate exposure may have significance, didn't you, Doctor?

A Yes, sir.

Q Somebody could drink, insofar as the 2,3,7,8 TCDD concentration is concerned, somebody could drink the entire bottle of Lysol or drink the entire bottle, entire can of Weed-B-Gon and not suffer any ill effects, not suffer any chloracne, not suffer anything so far as you know from the 2,3,7,8 TCDD that might be in there, isn't that correct, Dr. Paget?

A Yes, sir. It is not a course I would advise.

Q Dr. Paget, just what then did you have in mind the exposure might be where you said in Plaintiffs' Exhibit ~~1267~~ 1262, "In the absence of precise knowledge of human susceptibility and in view of the extreme sensitivity of some species, it is obvious that very small amounts of TCDD in the human environment in certain circumstances of intimate exposure or of casual worker procedures may, and we repeat may, have significance." What amounts did you have in mind, sir? What kind of exposure did you have in mind if you could drink the product and not suffer any consequences from?

A I was referring here to the method of analysis in assuming one was dealing with the most sensitive species, and circumstances where an exposure might occur, we would have to assume that the human being, where we didn't know the precise sensitivity of the human being was as sensitive as the most sensitive species.

Q You said here, "It is obvious that very small amounts of TCDD in the human environment may have significance in certain circumstances of intimate exposure." How intimate can you get if you take your product and drink it?

A You can't get much more intimate than that, sir, no.

Q And you believe from what you have said in this room today, and you at Monsanto believe that you could drink that

product and suffer no consequences? You wouldn't even get chloracne, isn't that correct, sir?

A I think that's true, yes, sir.

Q And, Doctor, please, what is the very small amount then of TCDD in certain circumstances of intimate exposure? What intimate exposure did you have in mind?

A Well, for example, drinking it, sir.

Q And is that the only intimate exposure you had in mind?

A Applying it as though cosmetic, perhaps.

Q Applying Weed-B-Gon or Lysol as a cosmetic?

A No, sir, this was not confined to Weed-B-Gon or Lysol. There was a situation where any of our products might contain TCDD in this particular instance.

Q Now, Doctor, the customer could---and you talk about abuse or misuse. A customer could take the entire can of Weed-B-Gon and pour it in a gallon of water and drink that gallon and he wouldn't get chloracne, would he, sir?

A No, sir, I don't believe he would.

Q How much more customer abuse could you have other than taking the entire can and putting it in a gallon of water?

A We are not talking about---

Q Take the entire can and put it in a quart of water.

MR. HEINEMAN: Why don't you let him answer the

question before you interrupt him?

A We are not talking about only Weed-B-Gon. We are talking about any conceivable product at that time or any time thereafter.

Q Well, you are talking about Lysol, that's another product?

A Yes, sir.

Q And you are not making pentachlorophenol at that time, so you are not talking about the wood preservative?

A No, sir.

Q You are talking about santophen that goes out and gets into Lysol, and you are talking about 2,4 D that goes out and gets in Weed-B-Gon, and you are talking about orthochlorophenol that goes out, and others make it into pentachlorophenol for a wood preservative, and you are talking about parachlorophenol and 2,4 D that may be used in oil well drilling, and things of that sort, is that correct, sir?

A Yes, sir.

Q Now, what abuse could a worker have, how could a worker possibly be exposed to levels under what circumstances in the plant, under what circumstances could that customer possibly be exposed to levels of 2,3,7,8 TCDD that could cause him harm?

A I don't know, sir.

Q Well, you must have had in mind, because you said it was obvious. So you must have known something. You said it is obvious that very small amounts---this is what you said in June of '79, not what you are saying now in March---what month are we in? We are not in March, April of '85. Doctor, what are the certain circumstances of intimate exposure that could have significance?

A I don't know, sir. I wouldn't know then until they were---

Q What did you have in mind in 1979 where you said it's very obvious, it's obvious, not very obvious, it's obvious that very small amounts of TCDD in the human environment in certain circumstances of intimate exposure or of abuse or misuse or casual worker procedures may have significance? What did you have in mind, Doctor?

A Well, in casual worker procedures where people worked without the indicated protective clothing.

Q Well, Doctor, how is that going to hurt them? They have to absorb 7,000 micrograms in a month's time of pure 2,37,8 TCDD to even get a case of teenage acne.

A I don't think you get teenage acne, you get chloracne.

Q Chloracne, which has been described by you as having the same results---not by you, but by your company---is that

it looks just like a case of adolescent acne.

A Well, I don't know that, sir.

Q Well, Doctor, assume that I can prove what I say in this Courtroom. Would you assume that, please? Because if I don't prove it, the jury will hold me to account for it.

MR. HEINEMAN: Why don't you show it then?

MR. CARR: Because I'm saving it for Dr. Rousch.

A Well, sir, I will make that assumption.

Q And, Doctor, under what circumstances can the worker take in that level of 2,3,7,8 TCDD in your product when you have only the maximum that I have seen by anybody is the University of Nebraska saying that your 2,4 dichlorophenol had 2,600 parts per million in it, how could they possibly be hurt by that?

A We are not talking about specific products, sir. We were talking about establishing a general policy about dioxins and establishing a laboratory which would enable us to know under any circumstances with any product that's then or at any time in the future, what the dioxin levels were, and circumstances where we would have to make a worst case anaylsis and assume that human beings were exposed to some level of dioxins that might be relevant to the most sensitive species, for example, the guinea pig.

Q Now, Doctor, you are not talking about detecting it

in this paragraph that I read to you and Mr. Heineman has read to you. You are talking about the small amount, very small amounts of TCDD. Well, let's start---define, please, what you mean by very small amounts of TCDD. Do you know 1,400,000 parts per billion---

MR. HEINEMAN: Were you about to say, Mr. Carr, that he wasn't referring in the paragraph to extreme sensitivity of some species, because it is certainly there.

Q Could you please answer my question, Dr. Paget?

A We were talking about levels of dioxin that might be hazardous, for example, guinea pigs---

Q No, you are talking about humans here. You are saying very small amounts of TCDD in the human environment, didn't you use the words human environment?

A Yes, sir.

Q You didn't say animal environment?

A Yes, sir, but in the same sentence---

Q Dr. Paget, please, if you would, I want to know what is the very small amounts of TCDD in the human environment? What small amounts do you have in mind?

A It depends on the precise circumstances.

Q Give me the small amounts that you had in mind, whatever the circumstances may be.

A One would want to analyze reliably---

Q I didn't ask you that. I want to know what are the very small amounts that you had in mind when you used the words in this paragraph.

A Of the order of parts per billion or parts per million, yes.

Q The order of parts per million or parts per billion?

A Or parts per million.

Q What parts per million?

A I didn't have a specific number in mind, sir. That was a document suggesting---

Q Would one part per billion meet your definition of a very small amount of TCDD in the human environment?

A One part per billion in some circumstances is a very small amount.

Q My question is, would one part per billion meet your specification of very small amount?

A That is a very small amount.

Q Well, Doctor, that can't possibly cause anybody any harm, and you would have to eat tons of dirt.

A I didn't say that it caused harm, sir.

Q Well, Doctor, you are saying it here. It may have significance, what you mean by that surely is significance from a health viewpoint.

A No, sir.

MR. HEINEMAN: He didn't say it was one part per billion there.

Q Isn't that what you have in mind, Dr. Paget?

A No, sir, that isn't necessarily what I have in mind.

Q What are the very small amounts in your opinion where they have intimate exposure before it would have significance?

MR. HEINEMAN: Objection, that has been asked and answered.

Q My question is not what you know, what did you have in mind at that time, Doctor?

A Any small amount, sir, but depending on the circumstances----

THE COURT: Overruled.

Q Would one part per billion have a deleterious effect upon human beings?

A I don't know, it depends on the circumstances.

Q Any circumstances.

A Personally, I don't think one part per billion would have an ill effect.

Q Then, one part per billion would never under any circumstances pose any hazard to human beings?

A Not any circumstances I can imagine, no, sir.

Q And what about a hundred parts per billion?

A Well, I think that if you drank a gallon of water

every day containing that, you could eventually get a body burden that might lead to chloracne.

Q Doctor, we just went through---were you drinking water that contains---you would have to have 25,000 gallons, you could drink the pure thing and not get chloracne, and now you are saying something different.

A No, sir, I am saying you could drink that every day of your life---

Q How much would you accumulate if you drink in a month's time? Is dioxin going to accumulate over a lifetime, Doctor?

A I don't know, sir.

Q Well then, Doctor, why are you saying that if you don't know that?

A I don't know that.

Q A hundred gallons of water, or rather a gallon of water a day containing a hundred parts per billion is going to give you chloracne?

A No, sir.

Q Then, why did you say it, Doctor?

A No, that was a---I misspoke.

Q Well, tell me what is the level that you consider in your product could cause---what are the very small amounts that could cause---that could be significant?

A Well, significance doesn't mean necessarily a health effect, sir.

Q Well, what does it mean, Doctor, if we are not talking about the human health environment? What other significance are we talking about?

A We are talking about the circumstances as for example now where we are debating about very small amounts, which I don't think---

Q Doctor, we're debating small amounts only because it has a deleterious effect on the health of human beings. We don't care about it in the other context, do we, sir?

MR. HEINEMAN: Objection. Would you please let the man answer the question before you start shouting at him again?

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

Q Doctor, was there any context in which you want to talk about TCDD other than human health effects that has any relevance whatsoever?

A Yes, sir, of course there are.

Q What, sir? Give them.

A Well, for example, if ill-informed people make statements about our products, we would like to know from our point of view what is in those products.

Q And, Doctor, they are making those statements only because of the health effects of what they believe, isn't that right, sir?

A If they are ill-informed, they are ill-informed about the health effects as well.

Q Isn't there any other conceivable thing at all that 2,3,7,8 could do to hurt anything other than health effects?

A I don't know of any, sir.

Q Well then, Doctor, why do you say those things? You are talking about here, you are talking about 2,3,7,8.

MR. HEINEMAN: Are you going to let him answer the question?

Q What do you talk about, then? Why are you concerned about very small amounts of TCDD in the human environment if you are not concerned about the health?

A Because I would be concerned about what people might say about the product, and we would like to know precisely what the facts are about a product.

Q And why would they say it about the product, Dr. Paget?

A Because they are ill-informed.

Q And why would it be of concern to you? Why would you care if they said oh, there is a lot of 2,3,7,8 in there if it isn't because it would injure somebody or if they are saying it

would injure somebody, what other reason would you have?

A We would want to know what the facts are before we rebut them.

Q I understand that. But you are talking about the subject of human health, whether they are ill-informed or fully informed, you are talking about human health, aren't you, sir?

A Yes, sir.

Q Now, Doctor, give me anything other than health where it has any relevance whatsoever.

A Well, that's not strictly to do with health, sir. If we don't believe there is a health hazard, somebody else says there is---

Q Doesn't that have to do with health if you don't believe it is a health hazard, Doctor?

MR. HEINEMAN: Objection. He keeps interrupting the witness.

Q If he is exposed to it and he says healthy, aren't we talking about health, Dr. Paget?

A Well, of course, sir.

Q Now, Dr. Paget, I want you to tell me then what are the very small amounts of TCDD that you believe could under some circumstances have significance on humans' health.

A It depends what people said about the product.

Q What they say can't affect your health. They can tell

you all day long that 2,3,7,8 is bad stuff, it's not going to make you sick. It's only going to make you sick if you get exposed to it and if you take it in and then you've got to take it in in certain levels high enough to give you acne. Doctor, that's what you were talking about. I want to know, sir, and forget about the uninformed public. I want to know what you are talking about when you said very small amounts of TCDD in the human environment may have significance, what were you talking about?

MR. HEINEMAN: Object. It's been asked and answered.

THE COURT: Overruled. It has not been answered.

A I was talking about very small amounts, sir.

Q Were you talking about one part per billion in santophen that goes in nurseries?

A I would like to know that---

Q Are we talking about one part per billion that goes in nurseries, sir?

A I would like to know that, yes, sir.

Q You were talking about it, weren't you, sir?

A Yes, sir.

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

(An off-the-record discussion was held at the bench.)

THE COURT: Ladies and gentlemen, we will take a short recess at this time. The admonishments that I gave you earlier will apply during this break also. The Court is in recess.

(At this time Court was in recess.)

MR. CARR: I have no further questions of the witness, your Honor.

THE COURT: Okay, Mr. Heineman. Do you have any further questions?

MR. HEINEMAN: Yes, sir.

FURTHER CLARIFICATION EXAMINATION

BY MR. HEINEMAN

Q Dr. Paget, Mr. Carr was asking you to compare the dose that someone might receive from a one-shot exposure to five grams, either by eating it or by rubbing it on their skin, with the exposure that one would get or one might have gotten in the pentachlorophenol, Department 236, do you remember that, sir?

A Yes, sir.

Q Now, of course, in the pentachlorophenol Department, what you had was the continual manufacture of a product, isn't that right, sir?

A Yes, sir.

Q Is that your understanding?

A Yes, sir.

Q So what you would have is if there were a contaminant present, you would have a continually regenerated source of that contaminant, wouldn't you, sir?

A Yes, sir.

Q So that one might be exposed to small amounts in large amounts of material over a very long period of time, might one not?

A Yes, sir.

Q And if there was some material that went out, then they would manufacture some more?

A Yes.

Q So a worker in that department would continually be exposed to small amounts of material, is that right?

A Yes, sir.

Q And there is a big difference, is there not, sir, in dose? As I recall your description of dose, you said that was a measure of the concentration times the area in which---

A Times the volume.

Q Times the volume, yes. And so that if the concentration is very small---

A Yes.

Q ---and the volume is very large---

A Yes, sir.

Q ---there can be a dose---

A Yes, sir.

Q ---derived from that. And there can be a dose derived from an amount that's very small, and a concentration that's very large?

A Yes, sir.

Q Right?

A Yes, sir.

Q So you could have a lot of this material in a very small amount, and if somebody took all of that small amount, they would get a large dose, wouldn't they?

A Yes, sir.

Q And if somebody had a little bit and was exposed to a great deal of material, they would have a large dose?

A Yes, sir.

Q So you can talk about wallowing around in dust as opposed to taking one five-gram sample and eating it, right?

A Yes.

Q And wallowing around in dust might very well expose you to a great deal more?

A Especially if you did it every day, day-in and day-out.

Q And especially apropos to this, to the penta comparison that you had a product that was continually being generated day after day after day, correct, sir?

A Yes, sir.

Q But I think what Mr. Carr wants to have you forget, sir, that at Sturgeon there was just one amount, right?

A Yes, sir.

Q And that amount either was carted off by trucks---

A Yes, sir.

Q Or was blown away in the wind?

A Yes, sir.

Q Or was washed down the stream?

A Yes, sir.

Q But whatever was there, there was not more than at the moment about three grams?

A At the very most that was the amount there the night of the spill, yes, sir.

Q Now, you recall, sir, that the Kligman thing, the Kligman study that you relied on was a skin test, isn't that right?

A Yes, sir.

Q So the Kligman study wasn't one involving oral ingestion as far as you know?

A No, sir.

Q You told us that in terms of concentrations claimed to be in Times Beach soil, now those aren't doses, are they, sir?

A No, sir.

Q They are not doses until somebody takes that soil and actually gets an exposure to it and then actually you measure how much of that contaminant in that soil actually gets into the body, right?

A Yes, sir.

Q But with respect to the levels in soil at Times Beach, I gather from what you told Mr. Carr that it's your opinion that those levels should not be your concern?

A That's exactly what I believe, yes.

Q Now, with respect to the Center for Disease Control report which is Exhibit 1255, you have that in front of you, don't you, sir?

A No, sir, I don't.

Q Plaintiff's Exhibit 1255?

A No, sir.

MR. CARR: Here it is.

Q Let me hand that back to you, sir. Now, as I recall, you said that it was your impression that the Center for Disease Control report said that one part per billion of TCDD in soil or less---

A Yes.

Q ---would be considered safe or of no concern, is that right?

A That was my understanding, yes.

Q And Mr. Carr read to you from Page numbered 49?

A Yes.

Q In that report, didn't he, sir?

A Yes, sir.

Q And he asked you to read that sentence that said, "In residential areas, levels at or above one part per billion TCDD in soil cannot be considered safe and represent a level of concern."

A Yes.

Q Now, would you look at Page 48, the page just before that.

A Yes, sir.

Q It says here, "We have concluded that residential soil levels greater than one part per billion TCDD pose a level of concern."

A Yes, sir.

Q Correct?

A Yes, sir.

Q So that that would be consistent with what you originally reported, isn't it?

A Yes, sir.

Q And it also goes on to say, "The appropriate degree of concern for which management decisions are made should also consider an evaluation of the specific circumstances at each

contaminated site," isn't that correct, sir?

A Yes, sir.

Q Now, as I understand it, sir, you don't agree with CDC that anything above one part per billion concentration of TCDD in soil is necessarily a concern?

A No, sir, I don't agree.

Q And indeed, what they did here was to set a level, and they attempted to set a level below which there would not be any concern, and above which they said they would not consider it safe and it might represent a level of concern.

A They said you would have to make specific decisions in each specific case, yes, sir.

Q Now, if I can direct your attention to the page of this report numbered 74.

A Yes, sir.

Q You see that paragraph right there in the middle of the page, just above the part that's labelled "Risk Assessment"?

A Yes, sir.

Q And they say for the sake of brevity extreme total daily dose estimates were compiled for two divergent levels of TCDD soil contamination, one part per billion and 100 parts per billion, based on the assumptions set forth above, at an initial soil contamination of one part per billion in residential areas, the average daily TCDD dose to an individual over

a 70-year lifetime would be 44.6 picograms?

A Yes, sir.

Q Now, sir, they're saying that at the one part per billion level which is the level over which they would develop a degree of concern, that one part per billion in soil would give rise to 44.6 picograms of TCDD dose taken in by an individual every day for 70 years?

A Yes, sir.

Q Correct?

A Yes, sir.

Q Didn't you compute what the parts per billion or what the dose would be of 45 parts per billion in 69,000 parts per million of OCP?

A Yes, sir.

Q The level of that?

A That was, I think, 300 and some femtagrams per kilogram, yes.

Q And you and Mr. Carr agreed on some figure being based upon if you assumed that there was a ten percent contamination of the soil with the OCP, if you assumed ten percent and there wasn't a single level found by Western Environmental Services, or OH materials, which was ten percent, they were all below that, right?

A Yes, sir.

Q So if you assume there was ten percent OCP in the soil, that the dose from that in a 5-gram sample would be 22 picograms?

A Yes, sir.

Q Now, a 5-gram sample of a seven percent OCP solution would, in soil, would burn you, wouldn't it?

A Yes, it would indeed, sir, yes.

Q So somebody wouldn't eat five grams of OCP with---or soil with OCP in it, would they?

A No, sir.

Q Because it would burn them?

A Yes, absolutely.

Q Now, even with seven percent or with ten percent, 22 picograms, that is one-half?

A Yes.

Q Of the level that the CDC says you could eat every day for 70 years?

A Yes, sir.

Q Is that right?

A Yes, sir.

Q Now, let me direct your attention to Page 50 of that report, sir. Do you see that?

A Yes, sir.

Q I'm looking at the first full paragraph at the top of

the page starting with the words, "The method".

A Yes, sir.

Q It says, "The method used for conducting a risk assessment and identifying a level of concern for TCDD in soil is complicated by many uncertainties, namely, insufficient data on the toxicology of TCDD, insufficient information about exposure of people to soil, and insufficient information about intake of TCDD by humans from such soil."

A Yes.

Q It does say that, sir?

A Yes, sir, it does.

Q Nevertheless, despite those uncertainties, the Center for Disease Control said that at one part per billion and below, or even if you take that part that Mr. Carr read to you, below one part per billion, there would be no level of concern?

A Yes, sir.

Q Now, I want to get into, again, if I may, your position paper, which is Plaintiff's Exhibit 1262. Do you have that before you there, sir?

A Yes, sir.

Q Now, Mr. Carr went over with you again and again and again the last paragraph on that page, did he not, sir?

A Yes, sir, he did.

Q Now, would you tell the jury what you mean by the

term significance and how that relates to the worst case analysis that you have told the jury about before?

A Yes, sir. Of course, the word significance in this paragraph meant significant to Monsanto, and it could be significant in several respects and an obvious one which Mr. Carr went on about is if that level were of health significance in relation to the people that were exposed to it. But it could also be significant if for example somebody alleged that there was an amount of material in our product that was possibly damaging, that could be significant because we would wish to allay the concern from a basis of certain knowledge about how much was there. It could also be significant if for example we wanted to understand exactly what was happening in a particular process that could be significant. We would also want to know, even although we believed that there was no conceivable hazard to human beings, when we did this analysis which was called the worst case analysis, we would want to know, would that level that we found in an environment or in a product or wherever, would it be something which would be significant if the human being was as sensitive as the most sensitive species which we knew, and since as I said in the beginning of the paragraph, some species are very sensitive, we would have to look at very small amounts. Now, that's not to say that we believed those small amounts would be injurious to human beings,

but we needed to know the amounts before we could make a certain judgment. You can only make certain judgments from--certain judgments you can only be certain in your judgment if you can be a little clearer about it. You can only be certain in your judgment if you know the exact facts, and this paper recommended that we put ourselves in a position to know the precise facts about dioxins and products in the environment.

Q Now, sir, when you were making your decisions in 1979 with respect to what Harry Gilmer had to be told up there, you engaged in a worst case analysis, didn't you, sir?

A Yes, we did, sir.

Q And you weren't talking about whether or not how much material would be required to cause chloracne as opposed to anything else?

A Yes, sir.

Q You wanted to be sure that if you assumed any person exposed to that had the sensitivity of the most sensitive species, namely a guinea pig, would the amount of 2,3,7,8 present in that product conceivably harm them? Isn't that what you were analyzing?

A That's exactly the worst case analysis, yes, sir. And moreover, that if you assume that all the dioxins were 2,3,7,8, which was not clear at that time, that those were the worst assumptions we could make, and those were the ones we

did make.

Q And those assumptions on a 5-gram intake of soil would give rise to femtagrams of dose?

A Depends upon the precise concentration in the soil, but certainly in the order of femtagrams or occasionally picograms, yes.

MR. HEINEMAN: That's all I have, your Honor.

THE COURT: Okay, Mr. Carr?

MR. CARR: Nothing, your Honor.

THE COURT: Okay, Dr. Paget. You may step down. Thank you, sir.

MR. CARR: I'd like to recall Mr. Kaley to the stand, your Honor.

THE COURT: Okay, gentlemen, could I see you at the bench?

(The following proceedings were held at the bench.)

THE COURT: Any offers of proof or anything outstanding with this witness before we let him go?

MR. HEINEMAN: Let me check to be sure.

THE COURT: Okay. Are there any with you, Mr. Carr?

MR. CARR: No. There's none for them either.

MR. HEINEMAN: None, your Honor.

THE COURT: Okay, fine. Thank you.

(The following proceedings were held in open Court.)

ROBERT C. KALEY,

(being recalled as an adverse witness under Section 2-1102 of the Civil Practice Act, having previously been duly sworn, on oath testified as follows:)

CROSS EXAMINATION

BY MR. CARR

Q Dr. Kaley, you understand, of course, that you are still under oath?

A Yes, I do.

Q And you understand you're being called today because Dr. Wilson is unavailable and I want to prove some Exhibits by you that I had in mind to prove by Dr. Wilson, do you understand that as well?

A That is my understanding, yes.

MR. CARR: I'd like to pass 1120 to the jury. It's already in evidence.

THE COURT: Fine.

Q Dr. Kaley, you recognize 1120 as a report authored by Dr. Hileman that was---a copy of which was sent to Mr. Ward, Mr. Wilson, to Mr. Mieure, to yourself, and to Tom Taulli?

A Yes, that's so indicated.

Q And appended to 1120 is what is described as 1128. Do you see that, sir? That's the table that's attached to it.

A Okay. It's not so marked, but I will take your word for it. I will take your word for it that it is marked that way up there.

Q Yes, it is.

A May I take a few minutes to read it? I am not familiar with the contents of this.

Q Oh, sure. Doctor, I'm not going to ask that many questions about it.

A Fine, I just wanted to be familiar with it.

Q Do you understand that this is the spill sample number three that was referring to the material that spilled in February of '79 in the Department 237?

A Yes, I would have that understanding.

Q And at that time in February of 1980, this document identifies the various isomers that was found on January the 11th or whenever it was found, it was at least reported by Dr. Hileman on January the 11th, and identifying various isomers, isn't that correct, sir?

A Well, I think the memo says materials which coeluted at those retention times, with that proviso.

Q Well, at that time you had these standards, the 1,3,6,8; 1,2,3,4; 2,3,7,8; and 1,2,7,8?

A That's correct.

MR. HEINEMAN: Your Honor, I object to this. Excuse me, Mr. Carr, I object to this line of questioning. We have been through the same set of questions with about four witnesses on this document. Now, if he intends to prove documents, that's one thing. But this document is in evidence, these are the same questions that's been asked before, I object. It's repetitive and he is intending to unduly prolong the examination of witnesses here.

MR. CARR: Your Honor, Dr. Hileman could not identify this as being the material from the spill. He objected to me asking questions of Dr. Hileman about the spill. He knew nothing about any spill, and all I was going to do with this witness was identify that this was from the spill and that these isomers were discovered.

THE COURT: Go right ahead, objection overruled.

MR. CARR: And if it were not objected to at the time of Dr. Hileman, I would not have had to do this.

BY MR. CARR:

Q Doctor, now these were identified at that point in time in January 1980 connected with those spill samples, the 2,3,7,8 isomer in the level of 120 parts per billion.

A Okay, it's a material which coelutes with 2,3,7,8. It is not identified in the body of the memo, it specifically

says that the recovery for 2,3,7,8 was based only on the high level spike, because the low level spike was concealed by TCDD isomer coeluting with 2,3,7,8. So we are back to the same coelution.

Q This was not a coelution question. He identifies it in this document as 120 parts per billion.

A Material that is coeluted, it is stated in the memo.

Q I don't care whether it is coelution, he identifies it here as coelution.

A As a material which coelutes with 2,3,7,8, yes.

Q And, Doctor, we of course have gone through the University of Nebraska examination, and at the bottom of this page he also talks about the 400 parts per billion of TCDD present, correct, sir?

A Yes. He makes a statement it is approximate total of 400.

Q Which is in reasonable agreement with spill samples number one and spill samples number two?

A That's what the words say, yes.

Q Thank you. Doctor, I now hand you Plaintiffs' Exhibit 1256 and ask leave to pass copies of that to the jury, if it please the Court?

THE COURT: That's already been admitted, I believe.

MR. CARR: Already in evidence.

THE COURT: Fine, you may pass it to the jury.

MR. MUSGRAVE: You don't mean this is in evidence, do you, Mr. Carr?

MR. CARR: I assume it is, is 1256 in, Jerry?

MR. SEIGFREID: Yes.

BY MR. CARR:

Q That is the number on that document, isn't it, Dr. Kaley?

A Yes, that's the way it is marked on this particular document.

Q Is there any question about it? You recognize that as a report sent to Monsanto by the University of Nebraska?

MR. MUSGRAVE: Mr. Carr, I have 1256 as Monsanto Biohazards Committee meeting of February 19, 1979.

(Plaintiffs' Exhibit 1276 was marked for identification.)

Q I hand you now what's been marked Plaintiffs' Exhibit 1276, Dr. Kaley. Do you recognize that as the 2,4 dichlorophenol samples that were sent to the University of Nebraska for analysis and their report on those samples?

A There is no identification of the samples other than by numbers.

Q Well, that may be, but I'm asking you, don't you know, Dr. Kaley, that those were samples sent to University of

Nebraska, I think we have some Exhibits in evidence, yes, that were sent to the University of Nebraska for analysis, 2,4 dichlorophenol from the spill sample.

A I really can't testify to that, that that is what this is.

Q Now, Doctor, did you go to the University of Nebraska in August of 1979?

A I think it was July, yes, I did go, yes.

Q July? And did you not at that time either send or have sent to them or know they were already sent samples from the 2,4 dichlorophenol spill?

A Okay, I certainly did not. I think Brian Ward may or may not have, he was there at the same time I was, and I am frankly not totally positive about what samples Brian had. They were independent visits that happened to coincide.

Q Now, Doctor, I didn't ask you whether or not you were totally positive. Do you recognize that as a report to the Monsanto Industrial Chemical Department?

A Yes.

Q And do you recognize that it's dated September 11, 1979?

A Yes.

Q And it is a report, that's reporting on some samples analyzed, is it not, sir?

A That's correct.

Q And of chlorinated phenols?

A It isn't so stated in here, and I'm--that I can find.

Q Do you recognize some of the same numbers, Doctor, on Exhibit 1169A under the column of the University of Nebraska column?

A Yes, I do.

Q And that talks about the DCP reserve sample?

A Yes, it does.

MR. CARR: I offer 1276 into evidence if it please the Court.

(Plaintiff's Exhibit 1276 was offered into evidence.)

MR. MUSGRAVE: If the counsel offers this with regard to 2,4 DCP, make the same objection that we have been making previously with regard to that. It's irrelevant and immaterial and has no bearing on the issues in this lawsuit.

THE COURT: Okay, fine. It is admitted over objection. Your objection is noted for the record.

(Plaintiff's Exhibit 1276 was admitted into evidence.)

BY MR. CARR:

Q And, Doctor, the Exhibit, this report has in written, typed form the same information that appears or some of the

same information at least that appears in 1169A, does it not, sir, with regard to the University of Nebraska?

A Yeah, the numbers---some of the numbers are the same, the sample designations are different and some of the numbers aren't the same.

Q Well, the sample designations are the same, it has 2,4 D too here, does it not? And the sample over here has 2,600 parts per million?

A This one doesn't say 2,4 D, but, yes, that's correct.

Q And then the next column is the third sample. It has 27 under the University of Nebraska, it has got 2700 parts per million. And over here, I'm sorry, per billion. And over here it is described as 2,700 parts.

A Yeah, but on that document it's got additional information.

Q Dr. Kaley, I am perfectly aware of that. All I'm attempting to do is to get you to agree that these figures that are entered into this Exhibit 1169A also appear on 1276.

A Okay. Those three specific numbers do appear on this 1276 that I am looking at, yes.

Q Now, Dr. Kaley, I hand you now what's marked---not been marked anything yet, but would you mark it please?

(Plaintiffs' Exhibit 1277 was marked for identification.)

Q 1227, do you recognize that, Dr. Kaley---oh, I'm sorry, 1277.

A I don't have a specific recollection of this document, no.

Q Well, do you recognize what it's discussing?

A I do recognize the sample numbers. I think it had come up in my previous testimony, yes.

(Plaintiffs' Exhibit 1278 was marked for identification.)

Q Doctor, handing you now Exhibit 1278, it can help you identify that particular Exhibit. Dr. Kaley you recognize your handwriting on the table in that Exhibit, the table attached?

A I'm sorry, there is no handwriting on the table I have.

Q Oh, you didn't get one with handwriting on it. I thought I handed you another one. The number of this should be---we will have to renumber this 1278. Handing you now a new Exhibit 1278 and ask you if you recognize your handwriting on that Exhibit. Do you recognize that, Dr. Kaley?

A Yes, I recognize that as my handwriting.

(Plaintiffs' Exhibit 1278A was marked for identification.)

Q Do you recognize that Exhibit 1278A as being that

table but without handwriting?

A Yes, that's correct.

MR. CARR: I offer 1278 and 1278A, if it please the Court.

(Plaintiffs' Exhibits 1278 and 1278A were offered into evidence.)

THE COURT: Any objections?

MR. MUSGRAVE: You say you offer?

MR. CARR: Yes.

MR. MUSGRAVE: Is that the handwriting?

MR. CARR: Yes.

MR. MUSGRAVE: So you are going to have one with and one without the handwriting?

MR. CARR: You have one with the handwriting.

MR. MUSGRAVE: I wanted to see if he has the same one you gave me, Mr. Carr. Your Honor, I would object to 1278 and 1278A in that it would appear from what Mr. Carr has shown us here that this deals with at least the one sample, a santophen residue, which has nothing to do with this lawsuit. It is irrelevant and immaterial. The other samples are not identified in this document, 1278, and for that reason, there has been no showing that it would have any relevancy or materiality, and we would object on that basis.

THE COURT: Objection is overruled. Both of them

are admitted over objection.

(Plaintiffs' Exhibits 1278 and 1278A were admitted into evidence.)

BY MR. CARR:

Q Now, Doctor, the Exhibit that's on the board that has the concentration that has the same retention time as 2,3,7,8 has 56---I'm sorry, 560,000 parts per billion, does it not?

A No, that's parts per trillion.

Q Per trillion, does it not, sir?

A Yes, 560,000 parts per trillion, yes.

Q And that is the santophen residue that's described in the other Exhibit that I gave you a moment earlier?

A Yes, that is the same sample designation number according to my handwriting on this sheet.

Q And the next line, that has got the 380 parts per trillion is MB 758, that is santophen, is it not, sir?

A I have no way of knowing that.

Q You have no way of knowing that?

A Not without some documentation.

Q Well, let me show you Plaintiffs' Exhibit 1131 which is already in evidence and ask you to look at that and see if that doesn't help you identify that sample.

A According to this document, 758 is described as santophen 1, that's correct.

MR. CARR: Your Honor, I'd like leave to pass that Exhibit to the jury. It will be the one that has the handwriting on it, I forgot to do that.

THE COURT: 1278?

MR. CARR: Yes.

THE COURT: Okay.

MR. CARR: Your Honor, I note I haven't offered 1277 into evidence. I'd like to offer that. I don't know, did I pass one to the Court? It looks like that, your Honor.

(Plaintiffs' Exhibit 1277 was offered into evidence.)

THE COURT: Yes, I've got mine. Any objections to 1277?

MR. MUSGRAVE: Same objection. Again, relevancy and materiality dealing with santophen.

THE COURT: Okay. It is admitted over objection.

(Plaintiffs' Exhibit 1277 was admitted into evidence.)

MR. CARR: And ask leave to pass it to the jury, your Honor.

THE COURT: Fine.

(Plaintiffs' Exhibit 1277A was marked for identification.)

BY MR. CARR:

Q Doctor, 1277A is a blowup of 1277, is it not?

A Yes.

MR. CARR: I offer 1277A into evidence as well, your Honor.

(Plaintiffs' Exhibit 1277A was offered into evidence.)

MR. MUSGRAVE: Same objection as to 1277, your Honor.

THE COURT: Fine. Same ruling.

(Plaintiffs' Exhibit 1277A was admitted into evidence.)

BY MR. CARR:

Q Doctor, this report, have you read enough of that memo to identify that the 759A is santophen residue that they tested and that 758 is santophen?

A Yes, santophen flakes, yes.

Q And they tested the 758 on two times and found that which coelutes with 2,3,7,8 at 380 parts per trillion and 440 parts per trillion, did they not, sir?

A Yes, that's correct.

MR. CARR: Your Honor, that's all the questions that I have of Dr. Kaley.

THE COURT: Do you have any questions?

MR. MUSGRAVE: Just a couple.

CLARIFICATION EXAMINATION

BY MR. MUSGRAVE

Q Dr. Kaley, referring you back---well, while we're on it, let's just take a look at Plaintiffs' 1278. This is this University of Nebraska report. As you indicate, that is in parts per trillion, isn't it?

A Yes, it is, that's correct, parts per trillion.

Q And the blowup that Mr. Carr here has, 1278A, doesn't have parts pertrillion indicated on it any place, but the handwritten notes that you identified as your handwriting on the original document do have it?

A That is correct.

Q Did you get that information from the body of the report, Plaintiffs' Exhibit 1278?

A I really don't remember where I got it to make that original---

MR. CARR: It describes it in the Exhibit that I gave him earlier.

A Yeah, parts per trillion.

Q All right. Now, again, on the blowup, Mr. Carr doesn't show your handwritten notes to be samples five and six that would be the MB 758, is that correct?

A That is correct.

Q And was there a blowup of the other table that he just looked at from Plaintiffs' Exhibit 1131, is there a

blowup of that, Mr. Carr?

MR. CARR: I'm sorry, what, counsel?

MR. MUSGRAVE: Is there a blowup of Plaintiffs' Exhibit 1131 of the last table, Table 2? Did you ever blow that up?

MR. SEIGFREID: Yes.

MR. CARR: It should be somewhere, 1131A if you find it.

MR. MUSGRAVE: I would like to have it.

THE COURT: Why don't we just take a 10-minute break and you can find it and set it up?

MR. MUSGRAVE: Fine, your Honor.

THE COURT: We will take a short break at this time, ladies and gentlemen, The admonishments I have given you earlier will apply during this break also. The Court is in recess.

(At this time Court was in recess.)

MR. MUSGRAVE: Your Honor, we determined 1131A was in fact not a blowup but a xerox copy of the same table and it had been previously passed to the jury, and I took the liberty to repass it to the jury so we could move on.

THE COURT: Fine, thank you.

BY MR. MUSGRAVE:

Q So the jury does have in front of them Table 2 from

Plaintiffs' Exhibit 1131A, which is what, Dr. Kaley, I think you had previously referred to as being, that is Plaintiff's 1131A, being the analysis that Orville Hicks did of this sample in his report dated July of 1979, is that correct, sir?

A Yes.

Q And this Table 2 for MB 758 he reports total tetras, does he not?

A Yes.

Q That's what's reported under the Cl 4 column?

A That's correct.

Q And he reports a less than 20, and is that parts per billion that he is reporting?

A Yes, that is correct.

Q Now, in this instance, this is once of those instances where the ND does not appear before the less than 20?

A That's correct.

Q And that again indicates that there was an interference there and he could not reach the level of detection that he could not identify what he was seeing because of the interference?

A That is correct.

Q So if anything was there, he was saying here it was less than 20 parts per billion?

A Yes, that's correct.

Q Now, with regard to that same sample that was analyzed by the University of Nebraska in Plaintiffs' 1278 which is up here on the chart, shown up here on the chart as Plaintiffs' 1278A, again that would be sample five and six, I assume they ran a replicate, ran it once and then ran a replicate as six.

A We actually submitted two samples as replicates.

Q Incidentally, you indicated you had been in Nebraska coincidental to Brian Ward going and took some separate samples?

A That is correct.

Q So you do know about those samples?

A That is correct.

Q Now, these two samples then are shown, or the reports are in parts per trillion.

A That's correct.

Q Now, the column here, 2,3,7,8 TCDD column, they are reporting isomers that coelute with 2,3,7,8, is that correct?

A Yes, that's what the footnote 1 says.

Q So in September of 1980---well let me---strike that.

MR. CARR: '79, counsel.

Q Yes, strike that. University of Nebraska appears to have a lower level of detection than Monsanto?

A That's correct.

Q All right. But nonetheless, in September of 1979 they were not isomer specific, were they?

A No, they were not.

Q Now, who prepared these samples? Do you recall who prepared these samples?

A They would have been prepared by Orvill Hicks in our laboratory.

Q Do you know why Monsanto prepared them as opposed to Nebraska?

A At the time it was my understanding Nebraska didn't have any experience with separating the dioxins from phenolic type materials, so we used our own extracts.

Q Now, going back though to their report. What they report here, for instance, sample five as 380 parts per trillion, what does that translate to in parts per billion?

A Well, .38 or approximately .4, almost half a part per billion.

Q A half a part per billion?

A Yes.

Q So that was below our levels of detection in July of 1979, Monsanto's?

A That's correct.

Q And the sample six which is the replicate sample, it reported 440 parts per trillion of isomers coeluting with the 2,3,7,8 standard, is that correct?

A That's right.