IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF TEXAS

BEAUMONT DIVISION

CECIL SCOTT, ET AL]

v.] No. B-84-1103-CA

MONSANTO COMPANY]

VOLUME 2

VIDEOTAPE DEPOSITION OF

R EMMET KELLY M. D.

April 30, 1987

1300 Post Oak Boulevard

Houston, Texas

Jerry Kelley, Court Reporter

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Volume 2 of the Videotape Deposition of R. Emmet Kelly, M.D., taken on April 29, 1987, at 1300 Post Oak Boulevard, Houston, Texas, between the hours of 8:30 a.m. and 4:30 p.m. before Jerry Kelley, CSR No. 2004 and Notary Public in and for the State of Texas.

VIDEO OPERATOR: We're now back on the record. The time is 8:49 a.m.

MR. HENDERSON:

Q Before beginning -- recommencing your interrogation, Dr. Kelly, I just wanted to say that we've been here since before 8:30, it's now ten to 9:00. We had offered to start, and you agreed, at 7:30 this morning and then at 8:00. And, frankly, we're going to be awfully rushed in order to finish, and with your travel plans it may be necessary that -- that we have to call you back another day. Would you be willing to do that if we have to do that?

A Either that or do it in St. Louis.

MR. CRAWFORD: Well, we'll talk about that. I thought we had agreed to be here at 8:30. And we were

a little late, but that's --

MR. HENDERSON:

Q Dr. Kelly, I don't know if it was asked of you, but do you have a -- a formal piece that you call your curriculum vitae?

A Yes.

Q Do you have it with you?

A Not with me, no. But -- the lawyers do. I've sent it to them.

Q You've sent it to Monsanto?

A To --

Q Bistline?

A Yes, Bist -- no question Bistline has it.

MR. HENDERSON: Well, perhaps we -- you could check, either you, Walter, or you, Mark, could check quickly and find out if -- assuming that neither one of us has it, that you can get it to us quickly so we could look at it before the end of the day.

MR. CRAWFORD: We can call Shoebotham -- we can call Shoebotham's office at the break and see what --

MR. HENDERSON:

Q Specifically, other than those items that you included on your report and that which you testified to yesterday involving your educational background, do

you -- can you tell us if you've had any publications, if you've done any scientific -- primary scientific work resulting in any publications involving PCBs in particular?

A Not PCBs. I've had other publications, but no publications including PCBs.

Q Have there been any publications of yours involving the -- any of the polychlorinated hydrocarbons?

A No, sir.

Q I believe you've testified previously in the past, Dr. Kelly, that -- that while you were at Monsanto between 1936 and 1974, with the exception of the four years you were in the service of our country, that you had not ordered any epidemiological studies to be conducted by Monsanto. Is that true?

A In the sense of saying epidemiological studies, yes. We did have what was called a cancer index, which we kept a record of all the cancers occurring in our employees. But it was not a true epidemiological study.

Q The answer to the question, then, is that you did not order or arrange for or otherwise recommend the retention of any outside persons or indeed anybody within Monsanto itself to conduct what -- what I believe

you are referring to as a formal epidemiological study.

A That is correct.

MR. CRAWFORD: What years are we talking about? Was that limited --

MR. HENDERSON: 1936 to 1974.

MR. CRAWFORD: Is that correct, Doctor?

THE WITNESS: That's correct.

MR. HENDERSON:

Q The cancer index, was this something that was compiled at either the Krummrich plant or the Anniston plant, or were various other plants of the -- of the entire Monsanto complex?

A It was compiled at the general office from the group insurance records, which at one time included 95 percent of our employees and retired employees. And after sometime in those years it included a hundred percent of them.

Q When did that -- when did you begin to compile the numbers on the cancer index?

A I can't recollect whether that started in '38 or '40 or whether it started in '46 or '47. I don't recall.

Q Sometime either before you went into the service or shortly after you returned?

A That's correct.

Q Was there anything that triggered or, said another way, was there any particular reason why you began to compile the what you refer to as the cancer index?

A There seemed to be a considerable amount of talk about the occurrence of -- possible occurrence of malignancies in various population groups.

Q And those population groups would include persons exposed to chemicals generally and in particular to those exposed to polychlorinated hydrocarbons?

A No, sir, there were none --

Q I'm asking you -- I didn't ask you if there were any, I'm asking you: Were those the kinds of occupations that you wanted to survey to -- to either confirm or deny the relationship between the discussion regarding the possible malignancies resulting from chemical exposures?

MR. CRAWFORD: I don't understand the question.

A No, neither do I. Because I thought I answered it satisfactorily the first time. Would you repeat it?

MR. HENDERSON:

Q The question -- the question is: What was the reason -- strike that.

What were the exposures that you were concerned about that gave rise to the keeping of the cancer index?

MR. CRAWFORD: If you were concerned about exposures.

I don't think he has testified --

A There were no --

MR. HENDERSON: Excuse me, Mr. Crawford. I think that question is -- is -- is patently clear. And it seems to me that with a little bit of what you did yesterday and starting out this morning in terms of suggesting to the witness, if he doesn't understand a question, I think he can ask me. But he was ready to answer a question. And it just doesn't seem to me to be appropriate for you to be aiding the witness in any of this.

MR. CRAWFORD: Well, if I don't understand a question, and if I think you've loaded the question up with something he hasn't said, I have a right to say something about it.

MR. HENDERSON: Thank you.

THE WITNESS: I would like the question repeated.

COURT REPORTER:

"Q The question -- the question is: What was

the reason -- strike that.

"What were the exposures that you were concerned about that gave rise to the keeping of the cancer index?"

A I was not concerned about any particular exposures. I kept the cancer index on all hourly and all salaried employees by Monsanto.

MR. HENDERSON:

Q Why did you do that?

A I wanted to find out if there was any clustering of malignancies anyplace in the organization.

Q As a result of what?

A As a result of inquisitiveness. I had no -- no preconceived idea that there would be cancers anyplace, but I wanted to be sure.

Q Well, in 1942 were you -- or shortly thereafter were you aware of the publication of a book by Dr. Wilhelm Hueper on the -- on occupational and allied tumors?

A Yes.

Q Okay. And in that book Dr. Hueper, did he not indicate a cause-and-effect relationship between various chemical substances and certain cancers?

A I recall he -- he was particularly interested or I recall his amino compounds. He was -- he dwelt

quite a bit on that particular group of chemicals.

Q Beta naphthylamine and bladder cancer in particular?

A That's correct.

Q Was that one of the reasons why you had commenced doing your cancer index in and about sometime between 1942 and 1947?

A First of all, from 1942 to 1946 I was not there. So -- and I told you before I either started it from 1938 to '42 or from '46 on. I do not know if it was continued during the war. So I can't answer that question.

Q Would Dr. Hueper's work or the beginning discussions regarding Dr. Hueper's investigations have been one of the kinds of reasons which would have triggered your beginning to keep the -- what you refer to as the cancer index in Monsanto?

A Well, it might very well have been. It also might have been the association of malignancies and asbestos. It could be an awful lot of things.

Q But it just wasn't a chance type thing as you've suggested a moment ago. It had to do -- and I don't mean to argue with you. It had to do with something that had some scientific possibility. Isn't that true?

A Well, it certainly was a chance. There was certainly a reason I did it. And the reason I did it was to find out if we had any excesses of cancer in any of our particular plants.

Q Okay.

A Yes.

Q Monsanto is a chemical company, is it not?

A Among other things, yes, sir.

Q Now, who reviewed this cancer index -- strike that.

Did you monitor and review this cancer index as it was being compiled from and after when it commenced in -- before the war or shortly after the war, when you returned?

A Yes, I reviewed it practically every quarter.

Q And did you review it with anybody else?

A I can't recall whether I did or not.

Q Did you discuss it with Dr. Hueper?

A No, I did not.

Q Were you aware that at some point in the 1950s and the 1960s that he was the head of the National Cancer Institute investigating primary tumors resulting from, among other things, chemical exposures?

A Yes, I knew Hueper. I've talked to Hueper off and on. In fact, we had bladder cancers from amino

compounds.

Q Did you -- did you consult with anybody outside Monsanto regarding the statistics that you were compiling for nearly 40 years or perhaps more of this cancer index?

A I talked to some of the people at Du Pont who had epidemiologists, I talked to the medical director at Du Pont.

Q Did you go to any outside agency such as the Saranac Laboratory or -- or -- or the National Cancer Institute or any -- or any organization, the Industrial Health Foundation or any organization that -- that was equipped to look at statistics relating to possible links between exposures and cancers regarding this cancer index?

A No. With the exception that I told you I talked to the epidemiologists at Du Pont and the medical director of Du Pont.

Q Okay. Thank you. Did you share those cancer statistics with anybody within Monsanto?

A I'm sure I shared them with people in my department. But we didn't find any clustering, so I don't believe I shared negative information with other people.

Q Are you a trained epidemiologist?

A No, sir.

Q Well, up until -- when did Dr. Johnson come on board?

A Approximately 1956, if I remember.

Q Was Dr. Johnson a trained epidemiologist?

A No, sir.

Q What was the first date when Monsanto had on its medical staff a trained epidemiologist?

A You'll have to ask someone else. We did not have one up till December the 1st, 1974.

Q Did you ever make that recommendation?

A No, sir, I did not.

Q So that we're clear, did you ever make a recommendation to hire an epidemiologist prior to December 1974?

A No, sir, I did not.

Q So you would have consulted within your medical department, which at that time would have included Dr. Johnson, Elmer -- Mr. Elmer Wheeler and perhaps one or two other toxicologists whom you mentioned yesterday?

A Yes, sir.

Q Did you ever -- who did you report to up the ladder at Monsanto?

A It varied. Sometimes I reported to the

administrative assistant -- I mean the administrative vice -- or vice president for administration, sometimes I reported directly to the executive committee.

Q Did you ever tell members of the executive committee of the existence of the cancer index?

A I don't remember if I did or not.

Q Did you ever tell the vice president in charge of industrial relations of the -- of the existence of the cancer index?

A I might very well have.

Q Do you recall having done that?

A I can't recall whether I did or not. But as I said, I might very well have. After all, we had negative information.

Q You're saying that -- you're saying that as a -- as a person who is not trained in epidemiology?

A That's correct.

Q Okay. Where is -- did you have that cancer index in December 1974? Did you take it when you left Monsanto?

A No, I did not.

Q Did you leave it with your records?

A Yes, sir.

Q Do you -- have you had an opportunity to review that since December 1974?

A I have not.

Q Have you mentioned that to Mr. Bistline or any of the -- the lawyers representing Monsanto in this action?

A No, sir.

Q Did anybody ask you about the -- the -- the keeping of and the significance of the cancer index involved in this litigation?

A Repeat that.

Q Did anybody such as Mr. Bistline, Mr. Crawford, Mr. Hall, Mr. Shoebotham, Mr. Freeman or anybody else representing Monsanto in connection with this litigation ask you about the existence and the significance of this cancer index?

A No, sir.

Q Has any other lawyer or any other person since December 1974 discussed the cancer index with you?

A Not that I can recollect.

Q Is this the first time that you have ever brought it forward in any deposition?

A No, sir, it is not.

Q Do you know if that material has ever been produced to any other lawyer?

A I do not know.

MR. HENDERSON: We'll be making a -- we'll

ask you now, Mr. Crawford, to check into that and -- and indicate to us whether that cancer index exists, and we'll be making a motion on the record at this point, followed by some formal motion, to -- to secure the production of it.

MR. CRAWFORD: We'll take it under consideration.

MR. HENDERSON:

Q Would you provide us with the particulars on the case that you told us about yesterday where you were retained by the plaintiff on behalf of the railroader - who had contracted a -- a -- a lung problem as a result of the diesel fumes?

A Well, the particulars were --

Q When I say particulars, I don't mean to confuse you. What was the name of the plaintiff?

A I don't remember.

Q In which court was it filed?

A It was a compensation court in St. Louis someplace.

Q Do you have a copy of that deposition?

A No, I do not.

Q Do you have a copy of the transcript?

A No, sir. This -- I don't even remember how many years ago it was.

Q Approximately how many years ago was it?

A I don't remember.

Q Was it since you were --

A It was --

Q Was it since December 1974?

A To the best of my recollection, yes, it was.

Q Do you recall if you had provided the opinion to the plaintiff's lawyer regarding the plaintiff that the -- the pulmonary or lung condition from which the individual was suffering was related to his exposure to diesel fumes?

A Yes, I did.

Q And how -- I was going to ask you how you went about that, but I think I can be more precise. What -- what parameters did you consider in -- in ascribing the cause-and-effect relationship between the -- the exposure to the diesel fumes and the resulting lung condition?

A First of all, you have to have a scientific methodology. You have to have:

A. A product or a compound that will cause pulmonary irritation and, conceivably, pulmonary allergic response.

2. It must be in sufficient -- there must be sufficient exposure.

3. There must be an immediate response to the offending agent.

4. There must be no confounding variables present in this.

5. It -- it must occur and be documented in the literature in -- by independent observers.

6. There must be physical evidence of action on the target organ, in which case this was the lung.

Q Okay. I'm sorry. What was the -- I had sufficient exposure, immediate response, no confounding variables, documented by other observers, and the target organ. What was No. 1?

A History. Adequate history. Adequate documented history.

Q In that case how did you conclude that there was an adequate documented history?

A Because I spoke to the employee, I spoke to fellow employees, I spoke to individuals who did the -- in the management groups who carried out the same -- under whose supervision his type of work was carried out.

Q So I understand this, you talked to -- you talked to the employee --

A Yes.

Q -- and you talked to some number of

co-employees?

A A management group in railroads.

Q You talked to the management?

A Well, the superintendent of the roundhouse.

Q Do you remember who the lawyer was in that case?

A I don't remember who the lawyer was in that case.

Q How did you determine that there was sufficient exposure?

A Because I talked not only to this employee, I talked to employees of other railroads who worked in roundhouses, and they said that when you were backing up a diesel machine in a roundhouse you would get sprays from this diesel that would cover your windshield and would come into the -- the cab of the train.

Q What was the -- what was the immediate response to the -- the irritant agent?

A Wheezing.

Q Was this a long time or a short-term exposure?

A It was a repeated exposure. I cannot tell you how long an exposure the man had.

Q Okay. And the wheezing started immediately after the first exposure? Is that your understanding?

A No, it is not my understanding. The wheezing started sometime during his -- during his exposure. I don't know when. I don't know if it was the first time or the tenth time. I can't answer that.

Q And he was -- he was a person in his fifties or sixties who had worked for 20 years?

A I don't remember how long he worked. I believe he was something in his fifties.

Q Now, how did you document -- how did you conclude that -- that this -- this condition or the conditions were documented by other observers?

A Would you repeat that? How did I document that this condition --

Q Yeah. You said one of --

A -- was --

Q You said one of your criteria was that -- that -- that it -- the condition resulting from the exposure be documented by other observers. And I took that to mean medical or scientific literature supporting what your --

A Yes.

Q -- what conclusions you're reaching.

A There is medical literature that says that exposure to some types of petroleum fuels gives pulmonary irritation which is accompanied by wheezing.

Q Those would be in the -- in the category of case reports?

A Yes.

Q Okay. What's a case report, Dr. Kelly?

A A case report is a report of a medical case that has occurred in the individual's observation.

Q Okay. It's also called clinical epidemiology. Have you ever heard that describing a case report?

A I don't believe clinical epidemiology reports refers to individual case reports. I am not an epidemiologist, but I think a case report is far from clinical epidemiology.

Q So you don't consider yourself an expert in epidemiology?

A No, I am not an epidemiologist.

Q Now, the -- the effects of the chloracne or the -- or the skin condition was reported even earlier than you were first -- from the -- from PCBs even earlier than when you were first employed by Monsanto. Is that true?

A They had occurred from PCBs. Whether they were reported before 1936 I'm not certain. They had occurred before 1936.

Q Well, they had occurred in the -- in the

Swann company that Monsanto had --

A Yes.

Q -- purchased in 1932 --

A Yes.

Q -- or 1931. Is that true?

A That is correct. But whether they were reported in the medical literature or not I don't know. I understood that's what you meant by reporting.

Q Thank you. You're right, and I did, and I stand corrected.

You attended a -- a meeting of -- that was convened by Dr. Cecil Drinker in 1937, shortly after you were employed by Monsanto, to discuss the findings in his paper, did you not?

A I attended a symposium called by Dr. Drinker to -- at which the findings of his laboratory and experimental work were discussed. I do not believe it was just a question of discussing his paper. I do not know if his paper was written at the time of the symposium.

Q Did you ever see the -- the article after it was published?

A Yes.

Q Did you -- did you note that there was a -- there were several pages of discussion included after

the -- the conclusion of his report and the references?

A Yes.

Q And you'll recall that you were noted as being in attendance at that meeting.

A Yes.

Q And that was a -- that work by Dr. Drinker and others was a work that had -- that had come about as a result of some reported deaths due to PCBs from liver conditions. Is that true?

A If by PCBs you mean chlorinated naphthalene.

Q No, I mean -- I mean chlorinated naphthalene and -- and chlorodiphenyls.

A That is not correct.

Q Are -- are chlorodiphenyls the same as polychlorinated biphenyls, or PCBs?

A Yes. But all chlorinated -- all PCBs are not chlorinated diphenyl.

Q Isn't the -- the PC -- what are chlorodi -- what are chlorodiphenyls?

A There are two phenyl rings attached to each other with chlorine.

Chlorinated naphthalene is also two phenyl rings attached to carbon atoms, chlorinated. So chlorinated naphthalene is a PCB.

Chlorinated diphenyl benzene is also a PCB.

So the work that Dr. Drinker did was primarily with chlorinated naphthalene.

Q Which are -- which are PCBs?

A Which fall under the generic term, yes, PC -- no, it's not PCBs, because it's chlorinated naphthalene. Biphenyl is different than naphthalene. This is a chlorinated naphthalene. I can draw it for you if you want.

Q No, it's not important. Because I -- I wouldn't understand it anyway. And it really is not the thrust of my question.

What is -- what are the -- what are the possible effects from having a damaged liver, Dr. Kelly?

A It depends on the extent of the damage.

Q If the extent of the damage is great enough, it can cause death, can it not?

A Yes.

Q What's the -- what does the -- the organ known as the liver do in terms of the human body?

A It's the primary organ in almost all metabolism of foodstuffs. It has a great deal to do with enzyme production.

Q Well, you'll have to -- you'll have to explain that for -- for me and for the members of this jury. That is, enzyme production and metabolism and the

like in terms of what it actually does to the body or for the body. Can you do that?

A Well, it is the organ that changes the food we take in into chemicals that sustain all the cells of the body. It's a primary metabolic organ of the body.

Q Explain, then, what metabolism is, or the metabolic function.

A The metabolic function is the physiological process in which chemicals or foods which are taken in are changed into various chemicals that are taken by the blood to various organs -- other organs of the body.

Q Could I translate that and say that if -- if the liver isn't functioning properly that the -- the breakdown of the food products isn't -- isn't done properly and the chemicals that are produced by the -- by the metabolism that the liver provides then causes other organs not to be nourished properly?

MR. CRAWFORD: Why don't you ask him a question?

MR. HENDERSON:

Q Did you understand that?

A No, sir.

Q What is the -- could I translate what you've said to say that the other chemical functions or the chemical functions that are -- that are performed by the

liver, if the liver is damaged, aren't -- aren't done properly and other tissues aren't getting the proper nourishment? Is -- is that possible? Is that a proper translation?

A No, I don't believe it's proper, because you haven't defined the extent of the damage to the liver. Conceivably -- well, you just haven't.

Q Conceivably that's possible if the liver is -- is sufficiently damaged?

A If the liver is sufficiently damaged. You'll have to tell me how much is sufficient.

Q Well, I don't want to get into a debate quibbling about words. But all I was trying to establish was that if -- if the liver is damaged enough then the -- the normal -- the other body functions aren't working properly and someone can become very sick, somebody can become very tired, somebody can't perform in a normal fashion. And if the -- and if the liver becomes even more damaged then a person can die. Are all those true?

A I can't answer to a long question like that with one yes or no. Certainly if the liver is damaged enough a person can die.

Q Okay. If the liver is --

A If we start with that.

Q All right.

A That's the one end of the spectrum. If the liver is damaged -- if you take three drinks of alcohol, you get some liver damage. You have no clinical response to that. So even though there is some liver damage, there is no problem with the body or the other organs. Now, along that spectrum from the damage of three drinks of alcohol to death from acute liver atrophy, there could be a whole host of things depending on the amount of damage.

Q Okay. Now, include for me that whole host of things that can result from somebody who has a liver which is damaged, but damaged -- not damaged enough to cause death.

MR. CRAWFORD: That's a pretty broad question.

MR. HENDERSON: I think the doctor just said that there are a whole host of things that can result.

Q And I'm asking for you to list some of those -- that whole host of things. If indeed you can list all of them, please do.

A I can't list all of them. You could get jaundice, you could get cirrhosis of the liver, you could get swelling of the abdomen, you could get enlarged liver.

Q Now, those are the physical reactions. What does a person feel as a result of having a -- a damaged liver with a -- with an enlarged abdomen or a -- or a cirrhotic liver? What does a person feel?

A He might have no symptoms at all, and he might have -- he might have other symptoms, certainly.

Q What other symptoms might he have?

A He might have loss of weight. That's a sign, that's not a symptom. Again it depends -- tell me --

Q Can a person -- can a person experience fatigability as a result of a damaged liver?

A Yes.

Q Can a person be weak as a result of a damaged liver?

A Depends on the amount of damage, yes.

Q Can a person feel nauseous as a result of a damaged liver?

A It's questionable.

Q Can a person feel bad, the medical term I think may be malaise, as a result of a damaged liver?

A Again, depending on how damaged it is.

Q That can happen?

A If a person has sufficient damage to the liver, they can develop that symptom.

MR. HENDERSON: Would you pass those to the

court reporter, please.

COURT REPORTER: You want to mark them, I guess. Mr. Henderson, do you wish --

MR. HENDERSON: Yes, please.

[Exhibit 2 marked]

[Exhibit 3 marked]

[Exhibit 4 marked]

[Exhibit 5 marked]

[Exhibit 6 marked]

COURT REPORTER: Exhibits 2 through 6.

MR. HENDERSON:

Q Dr. Kelly, the -- the first article that you have before you that the court reporter has marked, I believe, as Exhibit 2 is an article. Do you -- have you seen it yet, before you handed it to your lawyer?

A Well, I'm getting it back.

Q Okay.

A I saw the title.

Q Because I can't ask your lawyer any questions, I have to ask you questions.

A No, I understand that.

Q This is an article entitled "Dermatitis from Synthetic Resins and Waxes" by Louis Schwartz. It was in June 1936, apparently senior surgeon of the United States Public Health Service. Do you see that?

A Yes, sir.

Q Are you familiar with Dr. Schwartz?

A Yes, sir.

Q Are you familiar with this article? Have you ever seen it before?

A Yes, sir.

Q Was that one of the articles that you had reviewed back in 1937 when you were first employed by Monsanto?

A I can't tell you when the first time I've seen this article. But I have seen it. Often.

Q You've seen it before this litigation began?

A Yes.

Q Right?

A Yes.

Q Now would you turn to Page 591? Do you know -- excuse me. Before I ask you that, do you know Dr. Schwartz to be a careful investigator?

A Well, first of all, he is dead. He is not living. Dr. Schwartz was the senior surgeon for the United States Public Health Service. I was not in a position to comment on his adequacy or inadequacy as a -- as an investigator. He did write books on the subject.

Q Okay.

Turning to Page 591, near the bottom of the first column it says: "The workers engaged in chlorinating the diphenyl, especially that part of the operation where the crude Aroclor is being redistilled to remove impurities, are affected with an acne-like condition of the skin. This also occurs in workers exposed to the fumes of the chloronaphthalenes, or Halowax." Do you see where I read?

A Yes.

Q Did I read that accurately?

A Yes, sir.

Q Did the -- the Aroclor that they're talking about is a Monsanto product, is it not?

A This was a Swann product.

Q Swann was bought by Monsanto?

A Yes. But when this occurred it was not Monsanto. It has not occurred in the Monsanto plants since Monsanto bought Swann.

Q I understand your advocacy on behalf of Monsanto, Dr. Kelly, but that really wasn't my question.

A No.

Q My question -- please, please.

A Yes, sir.

Q Okay. My question was: Is that the same air -- did you change the -- the chemical constituents

or were the means by which the aroclors were made from and after Monsanto took over Swann or were they essentially the same?

A They were not essentially the same, Mr. Henderson, because the particular batch of aroclors that is referred to in this particular document was -- showed up with a different color of -- of Aroclor, it was a different dielectric, it was bad Aroclor, it was sent back, and that particular batch is the one that he is referring to.

Q Now, when he says in chlorinating the diphenyl, do you not agree that when something is referred to as chlorinated diphenyls that that would include aroclors?

A Aroclor is a chlorinated diephenyl, yes, sir.

Q Thank you. I thought your answer a little earlier was somewhat different. But if I heard it wrong, I apologize. Thank you.

Now, going to the top of Page 591.

MR. FREEMAN: Do you have an extra copy?

MR. HENDERSON: No. I just have one for the doctor and one for me.

Q In addition -- it says: "In addition to these skin lesions, symptoms of systemic poisoning have occurred among workers inhaling these fumes. Those

working with the chlorodiphenyls have complained of digestive disturbances, burning of the eyes, impotence and hematuria." Do you see where I read?

A Yes, I do.

Q Did I read that accurately?

A Yes, sir.

Q What's -- did I pronounce that right, hematuria?

A Hematuria.

Q What's hematuria?

A Blood in the urine.

Q Digestive disturbances. I guess you -- you can't define that any more than what the -- what the words say here, can you? What -- what would those be? Would you have any idea?

A I do not know what he would refer to.

Q Okay.

A But, sir, you also stopped, you know, when you were talking about hematuria. Because you -- it says: "The latter symptoms developed among a number of men making aminodiphenyl which is used in the manufacture of a rubber antioxidant."

Q Thank you.

A So this is not chlorinated diphenyl. Aminodiphenyl is not chlorinated diphenyl.

Q I thought it says: "Those working with the chlorodiphenyls have complained of digestive disturbances, burning of the eyes, impotence and" --

A Hematuria.

Q -- "hematuria."

A But then you have to say -- the next sentence says: The latter symptom," i.e., hematuria, "developed among a number of men making aminodiphenyl."

Q Thank you.

Going to Exhibit 3, this is the article entitled The Journal of Industrial Hygiene and Toxicology. Do you see that?

A Yes, sir.

Q And this was published in September 1937 and it's entitled "The Problem of Possible Systemic Effects From Certain Chlorinated Hydrocarbons." Do you see that?

A Yes, sir.

Q Now, that was the article that we spoke about a few moments ago that was -- the problems that were investigated by Dr. Cecil Drinker and others that -- that resulted in the -- in the publication of this paper, which includes the discussion starting at Page 300 and -- and continuing through Page 311. Is that true?

A Yes, sir.

Q And that's the discussion that -- the symposium that you attended whenever that was in 1937 or 1936. Is that true?

A Whenever it was I attended. I do not know the date of it.

Q Now, do you recall with -- without digging into this -- this article that this investigation began as a result of some deaths due to liver damage caused by certain chlorinated hydrocarbons?

MR. CRAWFORD: Why don't you ask --

MR. HENDERSON:

Q Is that true?

MR. CRAWFORD: Ask him a question rather than making a statement.

MR. HENDERSON:

Q Do you recall that this paper was -- this investigation resulting in this paper was -- was triggered by the deaths of three individuals from liver damage who had been exposed to certain chlorinated hydrocarbons?

A Yes, sir. It says that here.

Q Okay. And that -- this paper, if you'll look through it, among other things, talks about the various patients who -- who died as a result of the liver

damage. That starts on Page 283, the first page, and continues for several pages thereafter. Do you see that?

A Yes, sir.

Q Now, the way that -- that Dr. Drinker investigated this is that he not only gave the appropriate detail for those three workers that died but he also conducted various animal experimentations, did he not?

MR. CRAWFORD: I'm going to object to the form of the question. Can you ask him a question rather than this soliloquy we have going on, these -- these comments? Just ask him if that's his recollection or if he knows rather than just making statements. I think it's --

MR. HENDERSON:

Q Did you understand my question, Doctor?

MR. CRAWFORD: -- improper.

A I've forgotten it.

MR. HENDERSON: Okay.

Would you read it, please?

COURT REPORTER: "Now, the way that Dr. Drinker investigated this is that he not only gave the appropriate detail for those three workers that died but he also conducted various animal experimentations,

did he not?"

A Yes, sir.

MR. HENDERSON: Okay.

Q And those animal experimentations included both feeding and exposing the animals to the vapors of the -- of the various chlorinated hydrocarbons?

A Yes, sir.

Q And among those chlorinated hydrocarbons were included chlorodiphenyls. Is that true?

A No, sir.

Q Look at Page 297.

A Yes, sir.

Q Do you see where at the bottom or there near the -- near the bottom of the second column it says chlorinated diphenyl?

A Yes, sir.

Q And they fed the rats chlorinated diphenyls, did they not, according to this article?

A According to this article, Mr. Henderson, they fed what they thought was chlorinated diphenyl. In a subsequent article by Dr. Drinker, he stated that he -- on further investigation, he did not feed chlorinated diphenyl, he fed chlorinated diphenyl benzene. I will be happy to furnish you with his latter article, which I believe you already have. So that where Drinker has

been referring to chlorinated -- to chlorinated diphenyl, he was using something that was received from the Halowax Corporation that was not chlorinated diphenyl, it was chlorinated diphenyl benzene, an entirely different compound. And that he stated in an article in the same journal within one or two years afterwards, and he stated that I was surprised -- I meaning Drinker -- was surprised at the lack of toxicity in chlorinated diphenyl because we had considerable toxicity in the other specimen, and on further investigation it was not chlorinated diphenyl, it was - chlorinated diphenyl benzene.

Q Is chlorinated diphenyl benzene a chlorinated hydrocarbon?

A Yes, sir?

Q Is chlorinated diphenyl benzene a polychlorinated biphenyl?

A Yes, sir.

Q Thank you.

Is a polychlorinated biphenyl a PCB?

A Yes.

Q Thank you.

Dr. Kelly, would you go to Page 300, please?

A Yes, sir.

Q There was a person by the name of Dr. --

you'll have to help me with the pronunciation. Dr. von Oettingen?

A Von Oettingen.

Q Did you know him?

A Yes.

Q That Haskell Laboratory of Industrial Toxicology, is that that -- is that that Du Pont facility that you talked to people that you referred to earlier in some of your questioning?

A It is a Du Pont facility. I did not say that I talked to people at Haskell Laboratory. I said I talked to the medical director as well as their epidemiologist.

Q Did you ever talk to Dr. von Oettingen about PCBs?

A I don't recall. I talked to Dr. von Oettingen off and on in those early days, but I do not know if I talked to him about PCBs.

Q In the second paragraph -- do you know Dr. von Oettingen to be a reputable toxicologist?

A Yes, sir.

Q In the second paragraph in his discussion, the third -- the last sentence, starting with "Since," it says: "Since there is no animal which corresponds in all its physiological characteristics to the human being

it is important that such compounds be studied with different species of animals so that one can get a cross section of the potential dangers." Did I read that accurately?

A Yes, you did.

Q Do you understand and agree with what he, Dr. von Oettingen, says here?

A I understand what he said, yes.

Q Do you agree with that?

A Well, I think it all depends on a variety of factors about how many species of animals you use, what the exposures are liable to be. So I -- I think this has to be interpreted in light of several factors.

Q What he is saying is that if -- if -- if the rat when -- when challenged with a particular substance this demonstrates a damaged liver, that if you do the same with a guinea pig it may demonstrate a damaged kidney?

A Or it may demonstrate no damage at all.

Q True. And if you do it with a mouse it may be his lungs may be damaged. What he's -- so I'm trying to interpret it. And what I'm -- what I'm asking you is: Can -- if he did mice and rat -- mice and rats and guinea pigs, then he may see -- he may see nothing or he may see a whole different spectrum of problems,

depending on the species.

A There is -- he may. There is some species differentiation.

Q Okay. That's all. Thank you.

A There may be some species differentiation. I want to correct that. Yes, there may be.

Q Going to Page 304, and this is in reference to Dr. Schwartz again, he's the same Dr. Schwartz even though he's now -- no, I'm -- I take that back. He's the Medical Director of the Dermatoses Investigations in the United States Public Health Service, according to the -- his identification on Page 304. Do you see that?

A Yes, sir.

Q Now, he has something that I want to talk to you, ask you a few questions about regarding prevention. And it's in the second full paragraph. It states: "As far as prevention goes, I felt even before this investigation was undertaken that this substance, like any other poisonous substance, can be handled and used in industry provided proper safety precautions are taken, and I so advocated at the meeting in Pennsylvania when this was discussed."

I take it from -- that you -- you agree with that, do you not?

A Let me read this and then I will tell you.

I agree with his statement when he says "this substance," and he refers to Halowax here, "can be used in industry provided proper safety precautions are taken," yes, I agree with that.

Q That's essentially what you said yesterday. Is that true?

A That's correct.

Q Going to Page 310 of the same article, there's a reference to Dr. B. L. Vosburgh. Did you know Dr. Vosburgh?

A Yes.

Q Dr. Vosburgh, in 1936 or '37, was the medical director of the General Electric Company, was he not?

A Yes, he was.

Q How long did he -- how long was he with the General Electric Company in the capacity of medical director, if you know?

A I don't know.

Q Did you have some -- did you have discussions with Dr. Vosburgh at any time while you were medical director with -- with the Monsanto Company?

A Discussions about what? Anything?

Q Discussions about chemical substances and their possible -- and their potential hazardous effects.

A I may have. I don't recall any details.

Q Well, he was -- General Electric was one of Monsanto's customers, was it not?

A Yes.

Q You sold them some PCBs under -- what was the trade name of the PCBs that you sold to the General Electric Company?

A Pyranol. It was General Electric's patent. They discovered or invented the compound and we manufactured it for them.

Q What year did they -- what year did they discover that? Do you know?

A I don't know.

Q Did they discover Pyranol or Pydraul before Westinghouse patented Inerteen?

A First of all, Pydraul is not a transformer fluid. You mentioned Pyranol or Pydraul. Pydraul is not.

Q I -- I -- I beg your pardon. Is it P y r a n o l that GE patented?

A That is correct.

Q And -- and it's used in -- in -- for what -- for what function?

A A dielectric in transformers.

Q When did the -- when was that patented by General Electric, if you know?

A I don't know.

Q Was it prior to 1937?

A I still don't know. But I believe it was.

Q Okay.

Now, in his -- in his statement he says, "We have heard about the possibility of preventing liver damage and skin trouble among manufacturers of wires and cables and so forth, but like the old rhyme, every dog has fleas and the fleas have fleas, we also have customers who use wires and cables in tunnels, in enclosed spaces, splicing them together and doing all -- sorts of things. I am not at all certain that we know what the concentration of these chlorinated hydrocarbons is under those conditions."

Did I read that accurately?

A Yes, sir.

Q Now, what he is saying is -- is what -- what you said yesterday. Is that not true? That is, he's concerned about the people who are using the products that they manufacture. Isn't that true?

MR. CRAWFORD: If you know, Doctor.

A I don't know what he means about this. I don't think he said that. I'll read it back to you. "We have heard about the possibility of preventing liver damage and skin trouble among manufacturers of wires."

That speaks for itself. He's heard about them. "We have customers who use wires and cables in tunnels, in enclosed spaces. I'm not at all certain we know what the concentration of the chlorinated hydrocarbons is under these conditions." He hasn't said anything about preventing it. He's just said: We've heard about it and I don't know what the concentration is.

MR. HENDERSON:

Q If you know, as Mr. Crawford has -- has suggested if you know, if you know, do you believe that -- that Dr. Vosburgh is talking about the concerns of people who are using their products and what their exposures might be and whether or not they could be exposed to a potential toxic substance?

A I don't know what he meant by that paragraph.

Q Okay. Thank you. And weren't you concerned yesterday as you in your -- in the questioning by -- by Mr. Lacey about how the products were being used at Westinghouse and at the TVA and Ford, that is, the PCB products and their potential toxic hazardous effect?

MR. CRAWFORD: What's the question?

MR. HENDERSON:

Q While you were medical director of the Monsanto Company, were you not concerned about the use of your PCBs by -- by people using the products employed

by Westinghouse, TVA, Ford, General Electric, Ward Electric and all the others that you sold PCB products to?

A We were concerned that we had adequately given warnings and safe handling data and methods to prevent any ill effect --

Q And that's what --

A -- in our customers.

Q And that's what Dr. Vosburgh is concerned about for people using their products, is he not?

A He hasn't said that yet --

Q Okay.

A -- Mr. Henderson.

MR. HENDERSON: Thank you.

[Off the record discussion between plaintiffs' counsel]

COURT REPORTER: I just want to remind you that can be heard on the mike.

MR. HENDERSON:

Q Going to Exhibit 4, Dr. Kelly, there's a short piece entitled Chlorinated Naphthalenes and Diphenyls authored by Leonard Greenburg, M.D., who is with the Division of Industrial Hygiene in the New York State Department of Labor. And I represent to you that this article was published in the late 19 -- 194 --

well, it's at the bottom. It's 1943. Although there's nothing that I have that shows the date of publication or where it was published. Have you seen this before?

A Yes, sir.

Q Okay. Do you know Dr. Greenburg?

A Yes, sir.

Q What -- was Dr. Greenburg -- he's obviously a medical doctor. What was his area of specialty or expertise?

A His area of special -- of expertise was occupational medicine in regard to various chemicals. He worked a great deal with mercury. He reported a great deal about various occupational conditions that he had encountered in New York.

Q Have you seen this article in the last three months?

A Yes, sir.

Q Was this one of the articles that -- that the Monsanto lawyers reviewed with you?

A They didn't review it. They showed it to me.

Q Okay. Had you seen the article back in the 1940s when it was published?

A I don't know when it was published, but I've seen the article before this case, certainly.

Q Okay. Going to the second page, under

Conclusions, No. 1 says: "Chlorinated naphthalenes and diphenyls are in general highly toxic compounds and must be used with extreme care." Do you agree with that?

A No, sir, I do not.

Q Where do you -- how do you disagree with that?

A I do not consider chlorinated diphenyl to be generally highly toxic compound.

Q You consider it to be what, moderately toxic?

A Yes, sir.

Q Okay. Do you agree that even though it's -- moderately toxic in your view that it should be used with extreme care?

A Then again extreme, Mr. Henderson, is -- it's got to be defined. If you mean by that extreme care that you would use with a radioactive substance and use a space suit, no, I do not believe that. I believe that it should be used with care afforded an industrial chemical and that -- that the two -- that the care to avoid skin -- prolonged or repeated skin contact and to avoid breathing the vapors is care, is the care that's needed. Whether that's extreme care under your definition I don't know.

Q It's not my definition. It's what Dr. Greenburg said.

A Well -- well, then I don't know --

Q I mean --

A -- what Dr. Greenburg -- whether he considers that. I would not consider that to be extreme care.

Q The next sentence is: "Industrial hygienists should make every effort to see that such exposures are controlled insofar as humanly possible." Do you agree or disagree with that?

A Well, I agree that in 1943 that statement was correct. In 1974 I don't believe it would be correct, because we had a great deal of human exposure and industrial exposure with no ill effects. So I don't believe that statement --

Q That's what you had at -- that was your experience at Monsanto, wasn't it, Dr. Kelly?

A That was the experience at Monsanto, it was also the experience of the government people who checked epidemiologically PCB workers.

Q That was your -- your -- you're here to testify, as I understand it, regarding the experience of Monsanto as -- as you concluded it from 1936 to 1974. Is that true?

A Among other things, yes.

Q Now, in concept, do you agree or disagree with the statement "Industrial hygienists should make

every effort to see that such exposures are controlled insofar as humanly possible"?

A No, I don't agree with it. Because as far as humanly possible, you could put people in a space suit out there. And you don't need to do that. But that is humanly possible. You could put a man who was filling a transformer in a space suit and put an air line respirator on them. You could do that humanly, but that is not necessary.

Q Going to Recommendations on the next page, No. 3, just read that over about the foremen.

Did you read that No. 3?

A Paragraph 3? Yes, sir.

Q Do you agree that the foremen of all departments where the material is being handled should be apprised of the toxic nature of the material and instructed in safe handling practices?

A You have to refer that particular statement to his first statement under Recommendations, where he's talking about impregnating materials. Here he's talking about impregnating wire, which I understand it was discarded sometime along in that time.

Q Do you agree or disagree with Paragraph 3?

A I agree with it as far as his reference to impregnating materials, yes, sir. I disagree with it --

Q Do you -- do you -- with respect to --

A No, I agree with it that they should be apprised of the toxic nature of the material and instructed in safe handling procedures, yes, sir, I agree with that.

Q Okay.

If you would, Dr. Kelly, would you go to Exhibit 5? That's the February 1939 article appearing in The Journal of Industrial Hygiene and Toxicology. Is that correct?

A Yes, sir.

Q Okay. And that's one of the journals that the Monsanto Company subscribed to and received in and about that time. Is that true?

A Yes, sir.

Q And this is an article entitled "The Systemic Effects Resulting From Exposure to Certain Chlorinated Hydrocarbons" by this same Dr. Greenburg and others. Do you see that?

A Yes, sir.

Q Go to Page 38, which is the last page of the article. Do you see where it says Recommendations for Medical -- Medical Control at the top?

A Yes, sir.

Q Go to No. 2.

A Yes, sir.

Q Says, "Persons suffering from the typical acneform eruption should be removed from further exposure." Do you see that?

A Yes, sir.

Q Would the typical acneform eruptions be what you referred to yesterday and earlier today as chloracne?

A I'll have to read the article. I just can't pick out one sentence and say what he's talking about. So let's look at the article.

Q All right.

A Well, the first case is a 17-year-old girl who was exposed to chlorinated tri- and tetrachlornaphthalene. She had a papulo-pustular eruption present on her face. Whether that was chloracne or not I don't know. But it said here she has pigmentation. And that very well may have been chloracne. And if that is correct, she should have been removed from her operation, should not be allowed to come in contact with chlorinated naphthalene, which she was doing.

Let's go to No. 2. He was working in a wire factory coating wire with wax with the higher chlorinated naphthalenes. It doesn't mention anything

about chlorinated diphenyl in this particular operation. It doesn't say anything about whether he had a rash or not. He had an acute liver failure from inhalation of chlorinated naphthalene.

No. 3 worked as the same wire plant as No. 2. The only rash they talked about was healing exanthematous rash of the forearms. That is not chloracne.

Now, what was your question again, sir?

Q My question was: Do you agree that persons suffering from the typical acneform eruptions exposed to chlorinated hydrocarbons should be removed from further exposure?

A Yes, I think, depending on the amount of -- of the chloracne. Some cases are minor. I've seen very minor chloracne with insecticides. It was not necessary to remove them. But certainly --

Q Did you --

A Yes, sir, okay.

Q I'm sorry. Are you finished?

A That's enough.

Q Did you ever communicate that to General Electric?

A Communicate what?

Q That persons suffering from typical acneform

eruptions should be removed from further exposure.

A No, sir.

Q Did you ever -- did you ever communicate that to Westinghouse?

A No, sir. I'm sure their medical departments read the same articles I did.

Q Did you ever communicate that to the TVA?

A No, sir.

Q Did you ever communicate that persons suffering from the typical acneform eruption should be removed from further exposure either to Westinghouse, TVA or Ford?

A No, sir.

Q If you would -- what exhibit number is that, Doctor?

A Five.

Q Would you go to Exhibit 6, please? This is an article that was in The Review of Gastroenterology in the November-December edition, 1944. Do you see that?

A Yes, sir.

Q It's entitled "Hepato-Toxic Effects Following Occupational Exposure To Halowax (Chlorinated Hydrocarbons)." Is that correct?

A That is correct.

Q Have you had an opportunity to review this

article?

A I don't recall if I've seen it in preparation for this case. May I do it now?

Q Sure.

A Yes, sir, I think I've -- not in depth, but I've gone over it.

MR. CRAWFORD: Be sure you understand it, Doctor.

THE WITNESS: Yes.

MR. HENDERSON:

Q If there's any question I ask you, Dr. Kelly, that you don't understand, you take whatever time you need to review the article to --

A Thank you.

Q -- familiarize yourself sufficiently with it before you attempt to answer any question.

A I will.

Q Okay.

Would you go to Page 386? I don't want to read all of this into the record, but if you'll take -- just take an opportunity to review those three paragraphs starting at "Reports of Toxic Effects on Humans."

A Yes, sir.

Q What they say there, in effect, is that there

have been several reported cases -- ten, in fact -- that have demonstrated liver damage secondary to chlorinated hydrocarbons. Is that true?

A I'll have to see whether they're referring to the same cases or not, Drinker's three cases. Let me take this one at a time. He had three cases that had acute jaundice and liver failure after exposure to Halowax. There was no further definition of the Halowax. Halowax is in the main chlorinated naphthalene and some Halowaxes have ten percent chlorinated diphenyl, some have chlorinated diphenyl benzene.

Then he mentions, in addition to the other three cases, "We have learned of four other possible cases." But he gave no description.

Greenburg reported three additional cases following exposure to chlorinated naphthalenes.

Q Okay. So that's -- that's six -- six persons who died and four others that may be affected?

A Due to chlorinated naphthalenes.

Q Due to whatever the article says?

A Well, he said chlorinated naphthalenes.

Q Okay. Is that -- is my mathematics accurate? Six deaths and four other possibles?

A That's correct.

Q Okay.

A Then we have --

Q Do you have something else you want to say?

A Well -- beg your pardon.

Q Do you have something else you want to say? Because that was my question.

A Well, then he comes down to one nonfatal case, reported by Mayer and Smith, who was exposed to Halowax vapor and she developed jaundice.

Another case. He was exposed as a machinist in a factory to chlorinated hydrocarbons. I don't know what chlorinated hydrocarbons that was. It could have been tetrachlorethylene, it could be a lot of chlorinated hydrocarbons. But he died of acute toxic hepatitis.

Q Have you completed your review and answer?

A Yes, sir.

Q Okay.

Would you go to Page 396, the last page?

A Yes, sir.

Q There's a discussion that -- that -- by Dr. Alfred Angrist that's part of this -- part of the article. Do you -- did you know of or do you know of Dr. Angrist?

A No.

Q Within the last paragraph, starting with

"There is another aspect," would you tell me when you have finished reading that?

A Last paragraph?

Q Yeah.

A Yes, sir.

Q He's -- Dr. Angrist is talking about the synergistic action of the toxic chemicals. What is this -- what is synergistic action?

A Synergistic means that if you have one compound that produces a certain amount of toxicity and a second compound that produces a second amount of toxicity that the combined action may be more than simple addition.

Q Were you aware that Bennett, Drinker and Weiner had demonstrated synergism experimentally?

A In their paper they refer to given carbon tetrachloride and no liver poison to individuals that they had exposed to chlorinated diphenyl. Whether that was synergistic or additive I don't know.

Q Do you agree with that last sentence where it says, "Certainly no alcoholics should be employed for duties exposing them to such toxic agents"?

A If by alcoholics he means a chronic alcoholic, a person suffering from -- I don't know what he means by an alcoholic. If he means -- may I finish?

If he means by an alcoholic what is at present day referred to somebody who has alcoholic abuse, certainly they should not be.

Q What are the -- what are the modes of exposure to a substance such as PCBs, Dr. Kelly?

A Skin absorption and inhalation. Conceivably people could drink it, but -- but that is not a common exposure. The common exposure is skin absorption and inhalation.

Q But it -- but it can be ingested. Is that true?

A Oh, it could be swallowed, certainly.

Q Well, if somebody got it -- if somebody got it on their hands and lighted a cigarette and put it to his lips, it could be taken -- it could be ingested in that fashion, could it not?

A Some infinitesimal amount could be, yes, sir.

Q All of these -- all three of those modes of exposure were known back in the 1930s, were they not?

A At the time of Drinker's work, he gave animals -- I don't know if Drinker did skin absorption tests, but it was known -- so that ingestion was known -- industrial ingestion was certainly not a prominent thing then, isn't prominent now, never has been prominent. Inhalation exposure was known, yes,

sir.

Q The two principal ones that you referred to earlier, dermal or skin contact and inhalation of fumes, were certainly known 50 years ago?

A Yes, sir.

Q Can you -- if -- if a person tests at a certain number of parts per billion in the blood, is there -- do you have a way of comparing the toxicity of that -- let's say -- let's assume that it's 10 parts per million PCBs in the blood.

A Per million?

Q Per billion.

A Billion.

Q Per billion. PPB.

A Okay.

Q How does -- in terms of comparing the -- the potential toxic effect, how would -- would you be able to equate that with the same levels in the fat tissue?

A I wouldn't. Somebody might.

Q What would you do?

A Well, I don't know if you can look at a person with 40 parts per billion in the blood and say they've got X amounts parts per million in the fat.

Q No, I wasn't saying that.

A Oh. Well, you asked me to equate parts per

billion in the blood with parts in the fat.

Q I understand. And I -- let me rephrase it. If a -- if a person has 10 parts per billion in his blood, would that equate in terms of its toxic -- potential toxic effects to 10 parts per billion in the fat?

A You're using billion in both cases now?

Q Yes.

A Would you -- I want to be sure about this question. Repeat it, please.

COURT REPORTER: "I understand. Let me -- rephrase it. If a -- if a person has 10 parts per billion in his blood, would that equate in terms of its toxic -- potential toxic effects to 10 parts per billion in the fat?"

A First of all, 10 parts per billion in the blood does not equate to any toxic effect anyplace.

MR. HENDERSON:

Q That wasn't my question. We can -- we could --

A Your question --

Q We could make it -- what would you -- what do you say is the minimum level for toxic effects -- for potential toxic effects in a human of parts per billion in the blood?

A You said billion -- million this time?

Q I said billion.

A You said billion. Okay. It depends on how prolonged the level in the blood was. You have a higher level in the blood when it is being excreted, if it is going to be excreted. So if a person were to have -- pick a figure. I'd have to speculate. I can't answer that question.

Q Well, I don't -- I didn't want you to speculate in the first place, I just wanted you to compare whether or not the potential for toxic effects would be substantially the same for a person having the same levels of PCBs in his blood as in his fat.

MR. CRAWFORD: If you know.

A I don't know. I don't know. Because we've got to give me some levels in the fat and you've got to give me some levels as to how long it's going to be in the blood. I don't know.

MR. HENDERSON:

Q Is Mr. Crawford saying if you know --

A No.

Q -- does that tell you that you're to answer "I don't know"?

A No, he isn't telling me that. I'm not a puppet here. There are people with elevated levels in

their fat that show no toxic effects. So it's hard for me to equate your statement about potential toxic effects in the blood versus potential toxic effects in the fat.

Q In other words, you can't answer the question?

A I cannot answer your question.

Q Okay.

Yesterday you -- you used the phrase -- and I'll put it in context, because I need to know what it means. You used the phrase "definite possibility." Do you recall that?

A No, I don't.

Q Okay. I don't know if you -- I don't know if I copied this verbatim or not, but the sense that I had from some of your answers yesterday was that you -- in the -- in the context of examining periodically your employees, or employees of Monsanto, you indicated that you would recommend that they be examined more frequently if there were a definite possibility of chemically-induced problems. Do you recall that?

A I don't know whether I used those particular words, yes, but I recall.

Q Well, I recall you definitely using the words "definite possibility."

A Well --

Q And I'd like to know if you can tell me what you mean by that phrase or those two words.

MR. CRAWFORD: Well, you've got to put it in context with some question.

A Well, I could give you -- Mr. Henderson, we had a group of people that were exposed to chromic acid. Chromic acid causes nosebleeds. If we knew that this occurred, we knew that if people were left in long enough exposed to chromic acids in addition to their nosebleeds they would have perforation of the nasal septum. That had been reported in the literature. So there was a definite possibility that if a person had high enough exposure to chromic acid he could get a perforated nasal septum. So we looked -- there was a target and an action that was known. So we looked at these people oftener, because there was a possibility that they may have developed this nasal irritation which could lead to something worse.

MR. HENDERSON:

Q Well, in the 1930s, then, I take it by that definition that there was a -- a definite possibility of persons developing skin and liver problems some of which could result in death from exposure to chlorinated hydrocarbons.

A Where?

Q In the literature that we reviewed for the last hour. There was a definite possibility of persons exposed to chlorinated hydrocarbons of developing skin problems, namely chloracne, and certain liver problems.

A Not a definite possibility. If they were exposed in sufficient amounts, they would get it. If they were exposed in the wire drawing industry, they got it. But in other uses they did not get it. So there was not a definite possibility in those cases.

Q Do you -- are you saying, then, that there is a -- that there is a certain dose necessary for someone to be exposed to before that individual will contract some liver damage or hepatitis condition induced by PCBs?

A Yes, sir.

Q What is that dose?

A I don't think it's known in humans.

Q Okay.

And do you agree that individuals can vary one from the other in terms of what it might take for one individual to develop a certain problem as compared to another individual?

A There are cases of individual differences in susceptibility.

Q That's otherwise referred to sometimes as the host factor, is it not? Have you ever heard that expression?

A Not in this context.

Q Okay.

What is the Industrial Health Foundation or, something that you may have known it to be, the Industrial Hygiene Foundation?

I thought the first designation was the Air Hygiene Foundation, if I remember correctly. Whether it went to the Industrial Hygiene Foundation or something-else I don't know. It was a group in Pittsburgh that did some work in industrial environments, as far as I could tell.

Q Did you ever attend any of their meetings?

A Yes, I did.

Q Did you know Dr. -- did you know or do you know Dr. Dan Braun?

A Yes, sir.

Q How -- when and -- approximately what time frame and how frequently did you attend meetings of the -- of the Industrial Health Foundation or Air Hygiene Foundation or whatever name it went by at that time that you attended?

A I thought it was -- I attended two or three

meetings sometime in the late Forties, early Fifties. I'm not sure.

Q Okay.

Did you also receive at the medical department of Monsanto the Industrial Hygiene Digest that was produced and sent out monthly by the Air Hygiene Foundation or Industrial Hygiene Foundation?

A We received it. I don't know how long. I don't know if it came monthly or quarterly. But we received it for a few years.

Q What -- what can you tell -- what's your recollection of what those publications included?

A I don't remember. I thought they dealt mostly with dust and fumes. I'm not sure. I don't recall what they -- what they were.

Q Were you aware that the -- that the outfit which I'll refer to as the foundation in Pittsburgh, that the foundation also offered to its member companies literature searches based upon whatever articles that they had abstracted and had cataloged?

A No, sir. I have no recollection. I may have. I don't know.

Q Okay.

Did you ever avail Monsanto of any of the services of the foundation in Pittsburgh?

A [No reply]

Q If you recall.

A I don't recall.

MR. CRAWFORD: Are we near a breaking point? We've been going --

MR. HENDERSON: Anytime you want to break.

MR. CRAWFORD: -- pretty -- pretty good. Let's take one.

VIDEO OPERATOR: We're going off the record. The time is 10:27 a.m.

[Recess]

VIDEO OPERATOR: We're now back on the record. The time is 10:36 a.m.

MR. HENDERSON:

Q Dr. Kelly, did you ever attend any of the meetings of the Saranac Laboratory?

A We had a toxicological program up at Saranac Laboratory. I went to Saranac Laboratory three or four times. Whether or not there was a meeting at one of the times I went up there I just don't remember. I was there one time when there were quite a few other people, so whether I hitchhiked on to the meeting or not I don't know.

Q Did Saranac ever do any consulting work for Monsanto in terms of any of the -- the toxicological

effects of any of the Monsanto chemicals?

A Yes, sir.

Q Which ones? Which chemicals?

A Santocel.

Q Santa --

A Santocel. S a n t o c e l.

Q What is that?

A It's a polymorphous silica compound.

Q Did it ever do any work with respect to any of the Monsanto polychlorinated hydrocarbons?

A No, sir.

Q Did you ever have any meetings at Saranac regarding the polychlorinated hydrocarbons?

A No, sir.

Q Going back to the foundation in Pittsburgh --

[Exhibit 7 marked]

COURT REPORTER: Exhibit No. 7.

MR. HENDERSON:

Q You are looking at what has been marked as Plaintiff's Exhibit No. 7 and you are handing it to Mr. Crawford, who is sitting to your right, who is now reviewing it.

That, Dr. Kelly, I represent to you, is -- is one of the abstracts that came out of the deposition last week of Dr. Daniel Braun from the foundation in

Pittsburgh. And that would have been included in -- in one of the Industrial Hygiene Digests. According to what I understand how the testimony went with Dr. Braun in April of 1945, which is the date that's shown up to the right. Do you -- these, of course, would have been in a much smaller piece when they were abstracted in the digests that were sent to member companies. Do you remember any better now than you did while we were asking the few questions before the break of the composition of that Industrial Hygiene Digest?

A No, sir, I don't.

Q Do you remember -- do you remember anything about the abstracting of this article or the possible translation of -- of this article into the English language entitled "Toxicology of Some Chlorinated Aromatic Hydrocarbons"?

A Well, this is -- do I remember -- what is your question? Do I remember --

Q Have you ever had access to this article by translation into the English language?

A I don't recall if I ever did.

Q Do you recall having seen this -- this abstract?

A No, I don't recall having seen it. I don't know whose chlorinated biphenyl it is. This is a

European article, is it not?

Q Well, it appears to be. I don't know what the -- it says Farmakol i Toksikol. And I don't know what --

A Doesn't seem English.

Q -- language that is.

A Doesn't seem English. So presumably it's some European chlorinated diphenyl.

MR. CRAWFORD: I think in fairness he probably would need to see the article itself. I mean you've got an abstract and it's just pulled out of context somewhere and I think that's going to be pretty hard to identify.

THE WITNESS: Well, I haven't seen it and I don't know whose diphenyl it is, I don't know which diphenyl it is.

MR. HENDERSON:

Q Dr. Kelly, it says here about halfway down "Both chlorodiphenyl and trichlorobenzene caused leucocytosis followed by leucopenia." What's -- what is leucocytosis, if you know?

A Increase in white cells.

Q And what is leucopenia?

A Decrease in white cells.

Q What's the difference between chlorodiphenyl

oxides and chlorodiphenyls?

A One has an oxygen radical on which the other one doesn't. I could comment they used very high levels here, didn't they?

Q Is that what you want to comment about?

A Yes. They used three grams per cubic meter.

MR. HENDERSON: Bill, can you find these to hand to the witness? I'll show you which ones I want to give you.

MR. LITTLE: Yes. Can I walk in front of the camera?

MR. HENDERSON: Do you have these, Mr. Crawford, the ones that Dr. Kelly -- the medical reports that you brought over after the lunch break yesterday?

MR. CRAWFORD: I don't know.

THE WITNESS: I never got mine back.

MR. HENDERSON: Well, you look to your right. There's Mr. Crawford. He's responsible for it if --

MR. CRAWFORD: I don't think so. I think we must have left them up at the -- No. I don't know where they are.

MR. HENDERSON: Weren't you going to give those to the court reporter?

MR. CRAWFORD: Wait. Hang on.

MR. HENDERSON: Just hand the batch of them.

MR. FREEMAN: These are the same.

MR. CRAWFORD: Yeah.

MR. HENDERSON: Have they been marked?

COURT REPORTER: No, sir.

MR. HENDERSON: Would you mark those, please, Mr. Kelley?

COURT REPORTER: Do you want me to take the time right now to mark them individually?

MR. HENDERSON: No, no. I just want each group marked, Caves, Curtis, Evans and so on.

COURT REPORTER: Would you like to put them in that order? I don't know --

MR. HENDERSON: They should be already.

COURT REPORTER: Y'all may want to go off the camera while we do this.

MR. HENDERSON: Okay. Fine.

VIDEO OPERATOR: Off the record.

[Exhibit 8 marked]

[Exhibit 9 marked]

[Exhibit 10 marked]

[Exhibit 11 marked]

[Exhibit 12 marked]

[Exhibit 13 marked]

[Exhibit 14 marked]

[Exhibit 15 marked]

[Exhibit 16 marked]

[Exhibit 17 marked]

VIDEO OPERATOR: We're now back on the record.

MR. HENDERSON:

Q Dr. Kelly, you have now before you what have been marked as Exhibits 8 through 17. And if I might, to speed this up, these are the records that you were supplied by Monsanto of the various plaintiffs that are going to -- presently scheduled to go to trial on -- beginning June 8th, 1987, in Beaumont. Is that true?

A Yes, sir. They supplied me these, yes, sir.

Q These are ten -- these are ten individuals?

A Yes, sir.

Q Was this the -- was this the total supply of -- of medical records by Monsanto or by any of the lawyers representing Monsanto on these ten cases?

A This is all I've ever seen. In fact, I have not looked over the records of Dr. Busch, I believe, who was appended to the back. I haven't seen -- I haven't gone over his at all.

Q You just looked over the reports of the examining -- or the experts engaged by the plaintiffs?

A Well, I only looked at what I saw here and I made some notes about other medical records which I

would have liked to have seen.

Q So that I understand it, you're not in any position to offer any opinions one way or another on these particular individual cases at this time.

A At the present time, I am not.

Q And the only way you would be comfortable in doing that would be reviewing the -- the complete medical records of all these people?

A Yes, sir.

Q Would you need to do anything else to make yourself sufficiently familiar with all of the other -- with any of the other parameters that you told us about yesterday entering into your -- your criteria for determining causation in an individual case?

A I would talk to epidemiologists.

Q Would you want to review the epidemiological literature as well?

A Well, I don't think I would have the time between now and the trial to review the epidemiological literature, but I would ask for the epidemiologist who presumably has reviewed the literature and ask him for his opinion.

Q Now, going to what I would -- what I believe is marked as Exhibit 9, that's the -- this first sheet is the March 3, 1987, report of Dr. Daniel T.

Teitlebaum. Is that correct?

A Yes, sir.

Q And on the bottom of the -- of the first sheet you have some handwritten notes. Would you tell me what those are?

A One said the man has --

Q I'm asking you what your notes are.

A Beg your pardon.

Q I'm asking you what your handwritten --

A That's what I'm writing.

Q Yes.

A That's what I'm saying. I have two notes on -- on Mr. -- on Dr. Teitlebaum's report. The first has reference to his chronic obstructive pulmonary disease. And I wrote on that that he had 120 pack years of smoking.

Q I think you're -- I'm sorry. Are you looking at Howard Curtis?

A No. I'm looking at No. 9.

Q Which number -- what is No. 9?

A Junior Caves.

Q I'm sorry. Please look at Mr. Curtis.

A Whoops. The first one?

Q It may be the one that you have turned over.

A Oh, he's 8. He's 8. Yes, sir.

Q Would you indicate what your handwritten notes are?

A Yes. It said -- I -- said, "Where is the evidence about liver damage?" That's one handwritten note. The other, I circled the statement where it says "generated in the ovens in which transformers were baked." I'm not familiar with transformers being baked.

Q And to that you said "This is nonsense"?

A I think so, yes, sir.

Q Where's -- what evidence would you want about the liver damage?

A I would want a history, I would want all -- any previous hospitalization, I would want the amount of -- his history of alcoholism, I would want liver enzymes. None of which I see here.

Q With reference to the -- the breakdown of the PCBs, you -- you do understand, do you not, that phosgene can be created at certain temperatures at PCBs?

A I'm not certain of that, sir. You'll have to ask someone else about that.

Q Would you go next to the -- the report of Ralph Evans?

A Yes, sir.

Q Is that Exhibit 10?

A Yes, sir.

Q What is that note that you have down to the -- in the right-hand margin at the bottom of the page?

A It says: "What is different?"

Q Okay.

Would you go to Mr. French, please?

A Yes, sir.

Q Is that Exhibit 11?

A Yes, sir.

Q You have written at the end of the -- one, two, three -- fourth paragraph, you say, "Where is this evidence?" Do you see that?

A Yes, sir.

Q Does that refer to the carcinogenicity or the cancer-causing of PCBs?

A It refers to a statement "The carcinogenicity of polychlorinated biphenyls undoubtedly contributed to this skin disease." And my question on that was: "Where is this evidence?"

Q Okay.

Going to Mr. Hutchens' report, which if it's following should be Exhibit 12. Do you have Mr. Hutchens' report?

A Yes, I do.

Q Is that Exhibit 12?

A Twelve, yes, sir.

Q Down at the -- near the bottom of the -- the first page of Dr. Teitlebaum's report it says: Exposure to benzene and known leukemogen, and to PCB, a probable human carcinogen, makes it highly unlikely that these -- makes it -- makes it highly likely that these two substances were synergistically involved in the causation of his leukemia.

And to that you wrote above the first line, "but not leukemia." What did you mean by that?

A Well, he states that he has got leukemia. He states that he had chronic lymphocytic leukemia since 1977. And PCB has not been linked to linked epidemiologically with leukemia in humans.

Q Have you read the -- have you read the recent articles by Brown and Bertosse?

A Yes, sir.

Q Is exposure to benzene a known leukemia -- a known substance that causes leukemia?

A Yes.

Q I take it that you don't have any dispute about PCB being a probable human carcinogen.

A I have a great deal of doubt that it's a human carcinogen. In fact, I don't believe it is.

Q Going to the report on Mr. Toon, what is that

exhibit number?

A Sixteen.

Q What are your handwritten comments on Mr. Toon?

A Said, "Westinghouse, Bloomington," on the first page; nothing on the rest.

Q That's your only comment on Mr. Toon?

A It's the only one I wrote down. I may have other comments if I study it more carefully.

MR. HENDERSON: Would you have those attached as part of the exhibit, Mr. Kelley.

COURT REPORTER: Yes, sir.

MR. HENDERSON: Specifically those that Mr. Crawford has. And provide back to Mr. Crawford copies of those. Because there are --

Q There are highlights on those, are there not --

A Yes, sir.

Q -- Dr. Kelly?

A Yes, sir.

MR. HENDERSON: And -- and some of them you -- those wouldn't -- I can represent to you did not appear on the copies that I have.

May I see those a moment, Mr. Crawford?

MR. CRAWFORD: Sure.

MR. HENDERSON: Mr. Kelley, would you mark these as the next four exhibits, which should be Exhibits 18, 19, 20, and 21.

[Exhibit 18 marked]

[Exhibit 19 marked]

[Exhibit 20 marked]

[Exhibit 21 marked]

COURT REPORTER: Exhibits 18 through 21.

MR. HENDERSON:

Q Dr. Kelly, would you identify Exhibit 18 for the record, please?

A It is a report from Scientific Associates in St. Louis, Missouri, dated November the 10th, 1953, which refers to the acute oral toxicity of Aroclor 1254.

Q Is Aroclor 1254 one of the polychlorinated biphenyls manufactured and sold by Monsanto?

A Yes, it is.

Q Would you refer to Page 3 of that report, please --

A Yes, sir.

Q -- Dr. Kelly? Under the category Discussion --

A Yes, sir.

Q -- there's a reference in the last sentence of the first paragraph that says, "There was moderate

diarrhea, lethargy and poor appetite in all of the animals."

A Yes, sir.

Q What -- what significance -- strike that. Isn't the significance of that is that those symptoms can -- I emphasize the word "can" -- occur in humans by exposure to Aroclor 1254?

A Can? If somebody took a lethal dose of this by mouth they could get diarrhea, lethargy and poor appetite, yes. But that -- you've got to relate that to the dose. They were killing these animals. Half of them died.

Q Well, the -- the diarrhea and the lethargy and the poor appetite were demonstrated before their deaths, surely, weren't they?

A Certainly. But they had a toxic dose that would have killed them in what, three days? One to six days. So -- the majority of the deaths occurred in two to six days. Certainly that's a poisonous dose they were given by mouth.

Q Going to Exhibit 20, would you identify that for us, please?

A Twenty is a report from the Younger Laboratory on the acute toxicity of Aroclor 4465, dated July the 3rd, 1962.

Q Okay. Is that one of the aroclors that was sold by Monsanto?

A Yes, sir. Aroclor 4465.

Q And that's the -- one of the polychlorinated biphenyls, or PCBs?

A It's a mixture of biphenyls and terphenyls.

Q It's one of the PCBs?

A Yes. But it's -- you said before -- it's terphenyls also. It is terphenyls as well as -- as biphenyls.

Q I understand.

Go to the last -- I'm sorry, not the -- it would be Page 4, with the identification number at the bottom of SCM 002625.

A Yes, sir.

Q There is a discussion, and these again were lethal doses. It says: "Toxic symptoms included lethargy and reduced appetite after several days. Those succumbing developed tremors and anemic-like appearance several days before death." Do you see that?

A Yes, sir.

Q What are tremors or tremors?

A A tremor is an involuntary muscle movement.

Q What causes a tremor?

A It could be caused from anything from

nervousness, fright, or, in the case of animals, immense doses. Five grams per kilogram to an animal, which would be the equivalent of 350 grams to a 70-pound individual by mouth. Ten ounces of it.

Q You reviewed an article published in one of the dermatology journals authored by Dr. Tindall associated with the United States Air Force Academy?

A Did you say have I reviewed it?

Q Yes.

A I don't know. May I see the article?

Q Well, I don't have it. I'm just asking you if you recall it. I'm not going to ask you any questions --

A I do not recall it.

Q -- about it other than that.

Dr. Kelly, have you read the -- have you reviewed the toxicological literature with respect to PCBs including -- of course, including those in those toxicology reports that were produced for Monsanto at its request?

A [No reply]

Q Let me break that down. You are aware of the toxicology reports, a sample of which you've just reviewed and about which I've asked you a few questions, from Scientific Associates, Younger, Industrial Biotest

and others that Monsanto retained and gauged over the years?

A Yes, sir, I reviewed the articles, the reports from toxicological laboratories that were sent to me during the time I was with Monsanto. I may have seen some articles or reports that were furnished Monsanto subsequent to my departure. And if you show me those articles, I can tell you whether I reviewed them or not.

Q Did you review the -- the -- the toxicological literature in the published medical and scientific journals between 1936 and 1974?

A I reviewed some of them. I didn't review the ones in foreign languages. I depended on our toxicologists in the latter years to do a lot of reviewing.

Q Since your retirement in 1974, have you reviewed the -- the toxicological literature regarding PCBs that has -- that has developed since 1974?

A I've seen some articles on it. I can't say that I have reviewed the entire scope of all the articles that have been printed about PCB. But I've seen any number -- a good number of them.

Q Have you -- did you review the -- the literature -- the epidemiological literature while --

regarding PCBs and their possible adverse health effects during the time between 1936 and when you retired in 1974?

A I do not recall any epidemiological reviews. I may have seen some of them, I don't know. If you show me the article, I'll tell you whether I reviewed it. I do not remember which ones I reviewed. But if you show me any article, I'll tell you if I've seen it before.

Q Do you recall specifically for us now, if you can, what articles you have -- epidemiological articles you have reviewed since 1974 in connection with PCBs? -

A I've reviewed Dr. Gaffey's epidemiological review, I've --

Q Dr. Gaffey is the --

A Epidemiologist at Monsanto.

Q When did he -- when was he hired?

A Sometime after 1974.

Q Who was the coauthor of -- of the -- the report that Dr. Gaffey authored?

A I don't know.

Q When did you review that?

A Sometime in the last two to three years.

Q Have you reviewed any of the -- do you know if Dr. Gaffey's report has been published?

A I don't know.

Q Have you reviewed any of the epidemiological work in the -- in the open literature?

A I've read some of them, yes, sir. I can't recall which ones I've read, but, again, if you show me an article I'll tell you if I've read it.

Q In particular have you -- do you recall having read the series of articles coming out of the -- the rice oil poisoning case -- cases in -- in Japan?

A Yes, I've read those.

Q Have you also read the series of articles coming out of the -- a similar incident in Taiwan some years later?

A Yes, sir.

Q When did you first review the articles that -- that have come out of the Yusho poisoning incident in the late 1960s in Japan?

A Sometime within three to six months after it was published.

Q Would that have been in the early 1970s, prior to your -- while you were still the medical director of the Monsanto Company?

A I can't tell you. If you show me when it was published, I'll tell you when I read it.

Q No, I was -- I was not asking you whether you read it. I was asking you about when you read the Yusho

articles.

A Well, I answered by saying I read it three to six months after it was published. I do not know the date it was published.

Q Do you recall reading the -- any of the articles by Fishbein and others at the Mount Sinai School of Medicine regarding their work in connection with the capacitor workers?

A I don't recall that. I may have. But again if you show me the article I will tell you. But I do not recall it.

Q Do you remember any of the articles -- do you remember having read any one of the two or three articles by Maroney in connection with the electrical workers?

A I've read it at some time. I'm not familiar with the details at the present time. I recall the name.

Q Dr. Kelly, do you accept the -- the definite possibility of a relationship between exposures to PCBs and chloracne?

A It depends again on how much you quantify the exposure.

Q Well, if a person is -- if a person is -- is exposed to PCBs and develops chloracne, do you accept

the -- the definite possibility of a relationship between the two, that is, the exposure and the chloracne?

A If he is exposed in a sufficient amount. If the chloracne occurs in a time frame relative to his exposure.

Q What is that time frame?

A Something within three to six months after his exposure.

Q After chloracne --

A Depending again on the dose.

Q Well, if the chloracne occurs within three to six months after his exposure to PCBs and he has had no other known confounders, that is, anything else that may have caused the chloracne, do you accept the relationship between the exposure and the chloracne?

A If he has no other confounders, if he has a definite demonstrable exposure, if he has a sufficient high enough level of exposure, and if the chloracne is diagnosed by a reputable dermatologist on the basis of looking at it while he has the chloracne rather than looking at it from a historical point of view, then there is a possibility that he got it from PCB if there were no other chlorinated hydrocarbons such as agricultural chemicals that this man was exposed to.

Q Okay. My questions are going to -- are going to have you assume that all of these other factors are -- are taken into account. Because I'm really not interested in whether or not in a -- in a particular case the chloracne is a cause or is not a cause. I'm asking you if you accept the definite possibility that PCBs can cause chloracne.

A Yes, it can.

Q Okay. That's all I'm asking you.

A Again, in sufficient dose.

Q You can add all the things that you want to add and I'm not -- I'm not -- I'm not gonna hold you to any of those. I'm just asking you, and I think you've answered the question --

A But I amended it by saying, Mr. Henderson, that you have to have a sufficient dose. If a man is exposed to a -- a small amount of PCBs, under the allowable limits, he will not get chloracne.

Q I understand.

A All right.

Q I'm only asking -- the word is -- it seems to me the word I'm asking is can. All I'm asking is: Can PCBs cause chloracne?

A In sufficient amounts, yes. You've got --

Q I -- I -- I asked you -- let's assume that

there are sufficient amounts to which he has been exposed. Now I'm asking you: Can PCBs cause chloracne?

A Yes. But that's a different question than you asked me before. PCBs cannot cause -- cause chloracne if a man is exposed to a tenth of a milligram per cubic meter. Can't cause it. If he is exposed to three, four, five milligrams per cubic meter over a prolonged period of time it could cause it, yes, sir.

Q Well, let's go back to the tenth of a -- one tenth of a milligram per cubic meter. Is that what -- is that the --

A That's what I used.

Q Okay. What if he has that exposure and in three to six months he's had no other exposure and he develops chloracne. Are you -- are you saying that -- that the exposure that he had three to six months earlier had nothing to do with the development of the chloracne?

A It may or it may not have.

Q Okay.

Do you -- do you accept the -- that exposure -- in sufficient quantities -- do you accept the fact that exposure in sufficient quantities can cause liver damage?

A Yes, sir.

Q Do you accept that PCBs in sufficient quantities can cause other forms of systemic toxicity?

A No, I do not.

Q Do you accept the fact that PCBs and/or their breakdown products in sufficient quantities can cause pulmonary or lung conditions?

A What breakdown products?

Q Phosgenes. Chlorine.

A First of all, I do not know the industrial relationships in which phosgene is formed from breakdowns of PCBs. And I do not know how much phosphene -- phosgene could be -- could occur. I do not know that. It has not been reported in -- to the best of my knowledge, in any quantification. So I can't answer your question. Could I have the question over? See what I'll answer.

COURT REPORTER: "Do you accept the fact that PCBs and/or their breakdown products in sufficient quantities can cause pulmonary or lung conditions?"

A If PCBs are broken down into phosgene and chlorine or hydrochloric acid fumes in sufficient quantities, they could cause lung problems. Then I said there was no report of industrial situations where that obtained.

MR. HENDERSON:

Q Well, if I showed you -- your opinion might be different about what's in the literature if I were able to show you something where pulmonary or lung problems associated with PCBs had been reported?

A Certainly they have been reported. And they have been discounted also in the literature.

Q Who has discounted them?

A Kimbrough.

Q Are you aware -- when did Kimbrough -- when did -- are you referring to the -- the toxicologist pathologist at the -- in Atlanta?

A Yes, sir.

Q Renate Kimbrough?

A Yes, sir.

Q And she reported -- she discounted the pulmonary effects due to PCBs --

A Yes.

Q -- in something that she has written?

A Yes, sir.

Q When was that?

A Sometime this year.

Q In what journal was that?

A I don't recall.

Q Who showed you that?

A Mr. Crawford.

Q When did he show you that?
A When?
Q Yes.
A Last two days.
Q Do you have a copy of the article?
A No, I don't.
MR. HENDERSON: Do you have a copy of the article?
MR. CRAWFORD: I can get you one.
MR. HENDERSON: Okay. Thank you. When can you get it?
MR. CRAWFORD: I don't know. I'll try to get one this afternoon. It's over at Shoebotham's.
MR. HENDERSON:
Q Do you accept the -- the fact that PCBs in sufficient quantities can cause neurological conditions?
A No, sir.
Q Have you read the reports from -- from Yusho in that regard?
A Yes, sir.
Q Do you reject those?
A No. There were other things in there besides PCBs. There were --
Q Do you --
A -- benzofurans.

Q All right. Do you accept the -- the fact that dibenzofurans can cause -- dibenzofurans in sufficient quantities can cause neurological conditions?

A I would have to review the literature. I'm not prepared to answer that yes or no at the present time.

Q Well, you had reviewed the literature sufficiently to reject out of hand the PCBs, but -- but you're not prepared to give us an answer on the furans?

A That is correct. Because I recall them stating that there were a large -- a considerable amount of benzofurans, and they related the untoward conditions to benzofurans rather than PCBs.

Q Do you accept the fact that PCBs or dibenzofurans in sufficiently -- in sufficient quantities can cause gastrointestinal disorders?

MR. CRAWFORD: You say either/or or --

MR. HENDERSON: Either -- or. Or.

MR. CRAWFORD: One or the other?

MR. HENDERSON: One or the other.

MR. CRAWFORD: So that's two questions.

MR. HENDERSON: Well, no, it's one question with an or.

A Can I answer one at a time? Will you give me two questions if there's --

MR. HENDERSON:

Q You can answer however you want.

A All right. I'll answer however I want. What's the question?

COURT REPORTER: "Do you accept the fact that PCBs or dibenzofurans in sufficiently -- in sufficient quantities can cause gastrointestinal disorders?"

A Benzofurans have been known to cause gastrointestinal problems. What the mechanism is or the particular gastrointestinal disorder I don't -- I can't answer at the present time. PCBs have not, in my experience, been associated with the causation of gastrointestinal disorders. Whether or not in sufficient quantities -- in acute episodes where the liver is overwhelmed, they certainly could cause gastrointestinal disorders in that context.

MR. HENDERSON: Thank you.

Q Do you accept the fact that PCBs or dibenzofurans in sufficient -- either in sufficient quantities can produce certain immunological effects?

A Like which immunological effects?

Q Do you know whether or not any immunological effects can be caused by PCBs or dibenzofurans in sufficient quantities?

A It is my impression that benzofurans can

cause immunological defects when given in sufficient quantities. I am not familiar with any evidence that would show that PCBs in sufficient quantities could cause it. I have no recollection of that at the present time.

Q Is -- is your support for your statement about the possible relationship of furans and immunological defects based in part at least on the Yusho experience?

A It's been based part on that and part on the reviews of the Yusho experience by other people.

Q Is there any other support that you can lead us to that would provide the basis for -- for your statement that furans can cause -- taken in sufficient quantities can cause immunological defects?

A No, sir.

Q Do you know who Dr. Harold Klawans is?

A No, sir.

Q Have you had the opportunity to review any of his -- have you reviewed any papers of Dr. Klawans, either published papers or papers to be published?

A I can't say. If you show me one of his papers, I'll answer it. I -- I don't know.

Q Have you reviewed any papers -- have you reviewed any medical or scientific literature indicating

that certain neuromuscular problems have been associated with exposures to PCBs or dibenzofurans or dibenzodioxins?

A Let us take these one at a time. I know that dibenzodioxins have been associated with epidemial literature as stating they have neurological changes or neurological symptoms and neurological occurrences. The dibenzodioxins. I do not know of -- recall or have not reviewed any with PCBs. I don't know of -- of those. Any of those. I may have reviewed some on the dibenzofurans. I -- I don't -- can't answer that.

Q So my question is clear, I asked you about neuromuscular problems and you indicated neurological. Are you distinguishing between neurological and neuromuscular or do you want -- excuse me -- or do you accept the fact that neuromuscular problems can come from neurological disorders?

A Well, if you have a neurological disorder, if you have a peripheral neuritis, you may have muscular problems associated with it if that peripheral neuritis is in a muscular nerve.

Q Okay.

Have you observed or have you seen reported in the open literature the relationship of PCBs or dibenzofurans in sufficient quantities and certain

musculoskeletal problems?

A No, sir, I have not reviewed those.

Q Have you seen the reports in the Yusho -- do you recall the reports in the Yusho series of articles regarding the presence of joint pain?

A I have a vague recollection, but I can't be positive about it.

Q If there were, would that be a musculoskeletal problem?

A Well, then again it depends on what you mean by musculoskeletal problem. If a person has a joint pain for two weeks, he does not have a -- and it goes away, he does not have a musculoskeletal problem. But it obviously has happened to the skeleton, because the joints are part of the skeleton. So by your definition you could consider that. I wouldn't consider temporary joint pain a musculoskeletal problem.

Q If the joint pain continued for some months on a regular, perhaps frequent, basis, you would consider that a musculoskeletal problem?

A And led to skeletal changes, yes, sir.

Q Did you work with phosgene in the -- in the second world war?

A I was around where it was, if that's what you mean. I was there when they filled phosgene shells.

Q Were you aware of the -- of the potential toxic effects of exposure to phosgene?

A Oh, yes.

Q What were those?

A Pulmonary edema.

MR. HENDERSON: I'm about to ask for a break, so -- Okay. Having lost my microphone and having it put back on by the able attendant, I'm going to ask for a few-minute break in order to consult and determine if I have any more questions.

MR. LACEY: Do you want to go ahead and take an early lunch break, Walter, at this point and try to maximize our time?

MR. CRAWFORD: That may be a good idea. Because you say it's a problem.

MR. LACEY: Why don't we shoot for 12:15.

MR. CRAWFORD: Well, why don't we take an hour? Because we've been at it pretty hard here for three hours.

MR. LACEY: I'm just recognizing we're going to have a real hard time finishing up today. Whatever y'all want to do.

MR. CRAWFORD: What have you got? How much? You are going to --

MR. LACEY: Quite a bit.

MR. CRAWFORD: Okay.

MR. LACEY: I'm letting Tom get his questions on the expert issue out of the way, but we've still got quite a bit --

MR. CRAWFORD: He's done a good, efficient job. I'd like to see you --

Tom, can you give me Klawans' articles, too? Would you do that? I'd like to just take a look at them.

MR. HENDERSON: I don't have them with me.

MR. CRAWFORD: Okay.

MR. HENDERSON: We're trying to get the -- we're trying to get the prepublication, that which he is presenting over --

MR. CRAWFORD: Yeah, I'd like to see that. I'll get -- I'll get the Kimbrough thing to you, too.

MR. HENDERSON: Can you get that? Can you have that sent up to me?

MR. CRAWFORD: I think so. Yeah, I can do that.

MR. LACEY: Do you have all the exhibits that we had here yesterday --

MR. CRAWFORD: Yeah.

MR. LACEY: -- that were --

MR. CRAWFORD: Well, I don't know. No, not

all of them.

MR. HENDERSON: Is this still on?

MR. LACEY: Yes, it should be.

All the documents that you had here yesterday that were provided him, I'm not through with those. So we need to have those back.

MR. CRAWFORD: Now, wait. They were mostly --

Are we off the record?

MR. LACEY: No, we're on the record. And we need to stay on the record.

There were a group of documents that were brought over yesterday and identified as all the documents he had been supplied by you-all, and we still need to have those here this afternoon.

VIDEO OPERATOR: We're now going off the record. The time is 11:38 a.m.

[Recess]

VIDEO OPERATOR: We're now back on the record. The time is 12:30 p.m.

FURTHER EXAMINATION BY

MR. LACEY:

Q Dr. Kelly, yesterday before we took the nighttime recess you were going to do some calculations

and have that information for us on the relationship between exposures in parts per million for the categories of highly toxic, moderately toxic and slightly toxic. Have you done that?

A Yes, I have. I have done it in a different sense, because you would have to get a toxicologist to calculate dry weight to average weight. But I happen to have here a tabulation of toxicity classes in which it lists extremely toxic up to one milligram, which means a taste, probable lethal dose for a man, a taste or one grain. To put that in context, a small aspirin tablet—is five grains, although it's not all aspirin, there's starch in it.

Highly toxic is one to fifty milligrams. And that would mean the probable lethal dose for a man is one teaspoon.

Moderately toxic is 50 to 500, which is calculated probable lethal dose for a man is one pint -- is one ounce, sorry.

Slightly toxic goes from .5 to 5 grams per single oral dose per kilogram. That's a -- one pint.

Practically nontoxic is 5 to 15 grams per kilogram. Probable lethal dose for a man is a quart.

Relatively harmless is 15 grams and above.

This is from the Society of Toxicology, by

Harold Hodge and James Sterner from Eastman Kodak. And I'll be happy to give you a copy of it.

Q Fine. Why don't you hand --

A If I can get it back.

MR. LACEY: Why don't you hand that to reporter and we'll let him mark that as the next exhibit.

[Exhibit 22 marked]

COURT REPORTER: Exhibit 22.

MR. LACEY:

Q Dr. Kelly, is Exhibit 22 the source you've -- used to give me the information you've just elucidated?

A Yes, sir, it is.

Q Now, that had an additional category you didn't tell me about yesterday of extremely toxic. Correct?

A Yes, sir.

Q What sort of things are in the extremely toxic category?

A Sodium fluoroacetate, which is Parathion, which is a -- an insecticide, a generic name for Parathion. They may have listed other compounds in there -- sodium fluoroacetate is the only one they list.

Q Okay. Is that -- is there a way to translate that into a parts per million or a parts per billion?

Did you do that in terms of --

A Well, I tried to, but you'll have to get a toxicologist. Because I could tell you how many grams a person eats a day in a standard diet, but I do not know -- that's dry weight. And I don't know how that is -- is -- corresponds to your total intake.

Q Okay.

Now, you mentioned at some point in your examination about the patenting of PCBs. It's my understanding that the process for the manufacture of PCBs was patented by the Swann Chemical Company. Is -- that your understanding?

A No. If I mentioned about patenting, I should withdraw any knowledge of the patent. I don't know anything about when it was patented, who patented what. I do know that General Electric had a patent on the material that we manufactured for them. When they got it I don't know.

Q You're not aware of the fact, then, that was a use patent for the use as dielectric, but not a patent that even entitled them to manufacture it?

A I don't know the details of the patent.

Q Are you aware of any PCBs actually being manufactured by General Electric?

A Now or ever?

Q Well, in the period of time you were employed by Monsanto did they manufacture PCBs for commercial purposes?

A I don't know whether they did or not.

Q As far as you know, Monsanto was the sole supplier of PCBs to General Electric, were they not?

A As far as I know.

Q Despite whatever the patent arrangements may have been?

A That's correct.

Q And you really don't understand what those - patent arrangements are on behalf of GE or Monsanto or Westinghouse or anybody else?

A That's correct.

Q Okay.

You mentioned something about space suits and people wearing space suits. What do you mean when you talk about a space suit?

A Well, a space suit is a totally-enclosed, impervious garment.

Q Are space suits sometimes used in connection with the handling of chemicals?

A Sometimes they are, yes, sir.

Q Okay. And in fact isn't it correct that space suits are used today in handling spills of PCB

materials?

A They may be. They may be. I do not know. The EPA may demand that. I don't know.

Q You haven't kept up with the developments in the PCB business enough since your retirement to know what the law requires with regard to their safe handling?

A I haven't kept up with the details. But I do know that there was no manufacturer of the material in the United States since 19 -- the middle of 1970s. So during that time -- following that time there have been regulations put out by EPA and OSHA as to what people should wear. Whether I agree with those regulations is a different point of view.

Q Well, my question to you is whether you knew enough about those regulations to tell me whether they required the wearing of this thing that you called a space suit.

A I'm not familiar enough with the regulations, no, sir.

Q Okay. You don't know what level of protection, if any, that they required, then, in handling PCBs?

A No, I don't know the levels.

Q Okay.

When did space suits become available?

A They were available during World War I -- or World War II when they were used in places where they were making components for the atom bomb, radioactive materials.

Q Okay. So they've been around since World War II?

A Yes, sir.

Q Are they used in industrial applications at all?

A [No reply]

Q Commercial production I mean. Say in chemical plants.

A They may on certain spills. I do not know of them being used routinely except in some radioactive installations.

Q Okay.

You or people working for you were responsible for the precautions actually exercised in the Monsanto production facilities for PCBs, were you not?

A No, sir. We were responsible for setting forth the precautions and the procedures. The actual implementing of the precautions and procedures were -- was a function of the safety department of manufacturing

installations. Manufacturing people.

Q Let me try to make my question clear. You or your group would recommend, for example, the wearing of gloves if that were necessary. Correct?

A Yes, sir.

Q You would recommend the availability of protective clothing by the plant, if necessary?

A If necessary.

Q You would recommend showers on company time, if necessary?

A I do not believe we would recommend whether-- it was company time or not.

Q You would just recommend that there be showers?

A That's correct.

Q And whether or not it was on company time was a plant decision?

A That's correct.

Q You would recommend the availability of special creams to put on the skin of workers. Correct?

A No, sir. Protective creams really have not been particularly effective, so we wouldn't recommend them.

Q I see. Would you then recommend the withdrawal of protective creams so that they wouldn't

give a false sense of security?

A It would depend on the operation.

Q Who determined whether a particular operation within a particular plant was considered a toxic department or not? Your group?

A First of all, I do not know whether particular -- particular plants -- particular departments were considered toxic. I don't know what that appellation means -- meant in an individual plant. When I came with the Queeny plant, there were some departments where aniline was used, they were considered toxic departments. But I didn't hear that word used for any except those few departments at the Queeny plant.

Q Did you have anything to do with the labeling of the departments as toxic departments or not having such a label?

A I had a lot to do with unlabeling them.

Q I see. So you went around and unlabeled departments from being toxic departments?

A Yes.

Q Okay. And what was the effect of your doing that?

A Nothing.

Q I see. I guess it might make workers who worked in that department feel a little bit better about

it that they weren't working in a toxic department.

A Well, I don't know. But the -- our experience was such that it was not --

Q I see.

A -- a toxic department.

Q I see.

Let me show you a document, 998 through 1002, which relates to plant operating instructions, dated August 29th, 1946. Among other things, that document deals with plant precautions, does it not?

A Yes, sir.

Q For the manufacture of the PCB aroclors. Correct?

A Yes, sir.

Q And that document was put out after you became the head of the medical department, was it not?

A Well, it was dated after I became the head of -- of that. I don't know if this was existing beforehand and this was a rewrite of the same thing or a second edition of the same thing. The date is after I became medical director, yes, sir.

Q Well, unless somebody misdated it, that particular document was put out after you became head of the medical department. Correct?

A This one that I'm holding in my hand, yes.

Q Yes. And one of your functions as the head of the medical department was to review and comment on the plant precautions that were taken with regard to various manufacturing operations of Monsanto. Correct?

A Yes.

Q Let me look at the document with you briefly if we can. Let's try to work our way through it.

MR. CRAWFORD: Have you got another copy of this?

MR. LACEY: No, I don't. They're all documents that you-all produced to us, Walter.

May I see it?

MR. CRAWFORD: Sure.

MR. LACEY: Thank you.

Q This document talks about toxicity, does it not?

A Yes, sir.

Q And aroclors are defined as toxic materials. Correct?

A By their definition, yes, sir.

Q Well, this is a Monsanto definition, is it not?

A That's right. I do not know who wrote -- Mr. Smith and Mr. Soffranko, I don't know who those people are.

Q Well, at least we do know that Monsanto is putting out for its own internal use a document in August of 1946 that identifies aroclors as toxic materials. Correct?

A No. Two people at some plant, I don't know which plant this is, put out this document. I don't believe that that means Monsanto is putting out this document. Mr. Smith and Mr. Soffranko at a particularly unnamed plant put this out.

Q I see.

A I don't recall if I've ever seen this document before.

Q Okay. Well, let me -- let me go ahead and finish looking at it with you here, if we could. It indicates that to prevent toxicity clean change of clothes is furnished daily to each employee and time is allotted at the end of each shift for bathing. In addition, one should wash his hands and face before eating. Was that the Monsanto policy for people working in the Aroclor department in 1946?

A I can't answer that. I don't remember whether it was or not. This may have been at this particular plant. I don't know which plant it was, so I can't tell you.

Q How many plants could it possibly be?

A The Anniston plant and the Krummrich plant.

Q Okay.

It also indicates that a spare change of clothes is kept in a case mounted in the actual Aroclor portion of the plant. Correct?

A Yes, sir.

Q Also indicates that personal safety equipment was provided to employees. Correct?

A Yes, sir.

Q And in their department --

A Please, not in my ear.

Q Oh, I'm sorry.

In their department they got goggles, spectacles, rubber-covered gloves, canvas gloves, rubber shoes and a fume respirator. Correct?

A Yes, sir.

Q Do you recall which plant had those things supplied in the Aroclor department?

A I don't know.

Q Okay. There was also a gas mask in the department as well. Correct?

A Yes, sir.

Q Let me show you another document from Monsanto, beginning at 999 -- I'm sorry -- beginning at 990 and continuing through 997. Now, this is a document

dated April 1955 regarding the process for producing aroclors at both the Anniston and the Krummrich plant. Correct?

A Yes, sir.

Q Now, this document was put out almost ten years after the medical department had been functioning and you were medical director. Correct?

A Yes, sir.

Q And you would have examined both the Anniston plant and the Krummrich plant, including the Aroclor departments, on several occasions before this document was put out.

A Yes, sir.

Q Correct?

A Yes, sir.

Q Let me take a look at that document with you as well, if we could. By the way, there's a distribution list that included people in Newport. Is that in England?

A Yes, it is.

Q Okay. Did they also have a PCB manufacturing facility by this time?

A They had one. I do not know the time frame they had it.

Q Okay.

A But these people are at Newport.

Q Okay.

In this document, at the page that's numbered 991, there's a discussion of toxicity. Correct?

A Yes, sir.

Q And it describes the fact or states that there are many literature references to harmful effects of the type of chloracne resulting from exposure to chlorinated diphenyls, especially in cases where people working with small electrical components had been exposed to the fumes -- do you want to look at that with me?

A I want to see who wrote this, yes, first.

MR. LACEY: Feel free.

MR. CRAWFORD: Be sure and read through it, Doctor.

THE WITNESS: It doesn't say who wrote it.

MR. LACEY:

Q Actually --

A Mather. Mather wrote it.

Q Who is Mr. Mather?

A I haven't the slightest idea.

Q I see. That very clearly is a Monsanto document put out for use in connection with the production facilities at the two United States plants,

is it not?

A It is -- I can't answer that, too, because this talks about the process. I do not know who Mr. Mather is. I notice that there was no distribution to the medical department on this. So whether I've ever seen this before or not, I have no recollection. But it certainly was not sent to the medical department. And when you say put out by Monsanto, these are obviously Mr. Mather's opinions, whoever he was, and I've never -- I don't recall ever seeing it.

Q Well, every document put out by Monsanto is some employee's opinion, isn't it?

A Yes, it is. But when it goes outside the company it is a Monsanto opinion from the corporate point of view. If it's an internal memorandum, it could very well be just an individual's ideas about either historical or his thoughts on it. So I cannot vouch for the accuracy of their many literature references to harmful effects of the type of chloracne resulting from exposure to chlorinated biphenyls, because I only know of the -- of the references in 1936 where they all -- everybody referred to the same episode. There was one at the Swann Chemical Company, there was another one in the heat transfer agency that was reported, and there may have been one more. So I know three. But I don't

know if they all occurred before 1955.

Q Well, in fact, he gives his references at the bottom of the page, doesn't he? And he does give several references.

A Well, I don't see any references here as far as chloracne. The first one he talks about is synthetic drugs, the second reference has to do with the safe concentration of aroclors in the air, third is the allowable limits, fourth is the MCC bulletin, mentions systemic effects arising from the oral injection of aroclors. I think Mr. Mather is an Englishman.

Q It goes on -- it goes on to mention here that chloracne is sometimes accompanied by gastric troubles and there are literature references to liver trouble.

A Even -- certainly there are literature references to liver troubles. But I do not know any documentation where it says that chloracne is sometimes accompanied by gastric troubles. You would have to ask Mr. Mather, wherever he is, for that.

Q Let me ask you about this last paragraph down here which talks about how things were actually operated in the plants. You visited the Krummrich plant on an annual basis to inspect how they operated, did you not?

A Yes, I did.

Q And you visited the Anniston plant?

A Yes, I did.

Q On a yearly basis to see how they operated?

A Yes, I did.

Q He indicates that from the start of Aroclor manufacture at the Krummrich plant -- now, that's the one that's there in Illinois just across from St. Louis. Correct?

A Yes.

Q The operators have been supplied a clean change of clothes every day and time has been allotted at the end of the shift for bathing. Is that statement factually accurate?

A You can't prove it by me. But he obviously knows more about what happened in 1956 than I do. And I would accept this statement as very probably factually accurate.

Q Well, he's not talking about just '56. He's saying ever since the Krummrich plant started that's been the case, isn't he?

A That is what he's saying. But I have no independent recollection if this is correct. It very probably is correct, but I don't know.

Q Which was the larger and more modern plant, the Krummrich plant or the Anniston plant?

A Well, you have to talk about the department.

Q Okay. Let me -- let me make my question --

A Anniston is an older plant.

Q Let me make my question more specifically, then. Which department that made PCBs at the Krummrich plant versus the Anniston plant was the larger department?

A I don't believe I can answer that, because I don't know the relative tonnage produced at both of the plants.

Q Which department that made PCBs at the two plants was the more modern department?

A The Krummrich plant was newer. Whether the manufacturing installation there was any different than at the Anniston plant I don't know.

Q Okay.

He goes on to say that operators are advised to wash hands and face before eating. Is that factually correct?

A I don't know what you mean by "is that factually correct?"

Q Were the operators, at the direction of the medical department, advised to wash their hands and face before they ate? Or is that a matter about which the medical director, the medical department of Monsanto gave no attention?

MR. CRAWFORD: Well, okay, let's -- which question do you want him to answer?

MR. LACEY: Well, either he knows --

THE WITNESS: Please not so loud.

MR. LACEY: I'm sorry.

MR. FREEMAN: Mr. Lacey, you are bothering me standing over the witness on camera with a loud voice in his ear. If you would like to take a few minutes, we'll be glad to let you have the opportunity to make a copy of the document, you can sit in your chair --

MR. LACEY: We don't -- we don't have the time to make the copies. I'll try to not speak quite so loudly, but we need to look at the document together.

Q Is it factually correct --

MR. FREEMAN: We just took an hour break to make copies. You had these copies marked before the break. And if you want to take the time, you are more than welcome. I just don't like you standing over the witness hollering at him.

MR. LACEY: I don't want to take the time.

Q What time do you have to leave today?

A My plane leaves at 5:20.

Q Can you stay over tomorrow with us?

A Impossible.

Q Why not?

A Because I have appointments in St. Louis that I've had long before I had this.

Q Okay.

Now, my question to you is: Did the medical department direct that the operators be advised to wash their hands and face before eating?

A I do not ever recall advising anybody to wash their face before they ate. Certainly we have advised people to wash your hands before you eat.

Q Okay.

Now, it goes on to say that the Anniston — operators do not have the same issue of clean clothes. Do you know why the people in the southern plant in Alabama did not get the same daily issue of clean clothes that the people did in the Krummrich plant there in Missouri?

A Unless it was a plant fringe benefit that was given to the employees at the Krummrich plant and the Anniston employees did not have the same -- did not require the same issue of clean clothes. After 1936 no cases of chloracne ever -- after 1934 no cases of chloracne occurred at the Anniston plant, no cases occurred in the Aroclor departments of the Krummrich plant. So whether they had change of clothes or not doesn't make any difference. There were no chloracne

cases in either plant.

Q The point is, you really can't explain the difference in treatment, then?

A Well, the Anniston people didn't need it and --

Q Well, did the Krummrich people need it?

A I -- no, I don't believe they needed it. But I think because of plant policy it may very well be that the Krummrich plant were giving change of clothes to everybody.

Q Let me -- let me direct your attention to the page numbered 994 under Health and Safety, where it says: "At Anniston no special protective clothing is provided for the diphenyl and Aroclor operators. A daily change of clothing was provided in the past, but this practice ceased before the war." So they had had it in the past and then they stopped. Correct?

A That's what this says. I do not know if that is true. They might very well have had the daily change of clothing when they had that episode of the chloracne when they found out that by changing the benzene specifications and changing a small amount of ventilation and changing housekeeping the daily change of clothes was not needed, as proven by the fact they never got any chloracne, Mr. Lacey, from the time of

this one episode until they ceased manufacturing it. They didn't have it.

Q Did you in your plant visits between 1938 and 1942 recommend to the management of the Anniston plant that they cease providing daily clothing to the workers there who worked in the PCB department?

A No, sir, not that I can recall.

Q Okay.

The next paragraph talks about ointment to be provided to men who can put it on before they start work. Correct?

A That's what -- that's what that recommends, yes.

Q Monsanto made those ointments available to its workmen, did it not?

A Presumably at the English plant they did. I don't recall them ever making it available at any other plant.

Q Actually, that's talking about the Anniston plant, is it not?

A Oh, no, it isn't. It says Mr. Pennington of Newport reporting on his tour writes --

Q On his American tour. He was touring the Anniston plant and the St. Louis Krummrich plant, wasn't he?

A Well, I'm looking over it more carefully. I don't know what -- what plant he is referring to. I don't ever recall seeing tins of cold cream, ointment, theatrical quantity, present in any Anniston -- either the Anniston or the Krummrich plant.

Q I see.

A I would not have recommended it.

Q I see. What was the purpose of making those creams available to the employees?

A I haven't the slightest idea. I would not have recommended it.

Q I see. Is it your opinion that people who are reputable in the business of medical concerns and toxicology would not recommend creams to try to block out the absorption, the skin absorption, of chemicals people were working with?

A Depends on the chemical. If you have a chemical that is soluble in fat, I think creams make it worse.

Q I see.

Also notes, then, in the third paragraph under Health and Safety that emergency showers are provided on each floor of the diphenyl building, and safety notices are widely used. Is that correct?

A Yes, it is.

Q And then the fourth paragraph talks about the St. Louis Plant B. Now, that's the Krummrich plant, isn't it?

A That's correct.

Q It talks about the Aroclor building is rated as a toxic department. Correct?

A That's what it states.

Q Okay. And at that place, that is, the Krummrich plant, each operator is provided with a complete set of clothes, comprising a hat, a coat, trousers, combination underclothes, socks and rubber shoes. Correct?

A That's what is stated.

Q In fact, that clean change of clothing, except for the shoes, is placed in the operator's locker in time for the following shift. So when he comes in each day all that clothing has been prepared for him by Monsanto. Correct?

A That is what is stated there.

Q In fact, men working over, working extra shifts, are given a clean set of clothing for the beginning of the second shift, aren't they?

A That's what he states.

Q They also provide canvas gloves and goggles, and ply hand barrier cream is available for use when

necessary.

A I told you I never saw barrier creams in any Aroclor department.

Q Did you visit the Aroclor department?

A I certainly did.

Q Of the Krummrich plant on a regular basis?

A Yes, I did.

Q Would these people be hiding that stuff from you for some reason?

A I would know no reason why they would be hiding it.

Q Now, at the St. Louis Plant B it also notes that 20 minutes paid time is allotted for bathing at the end of the shift. Correct?

A That's what is stated, yes, sir.

Q And there are instructions that hands and face should be washed before eating. Correct?

A That's what this states, yes, sir.

Q And it finally concludes that employees in toxic departments are given an annual medical examination and a lung x-ray every three years. And that would include the employees of the PCB department of the Krummrich plant. Correct?

A Yes, if they call that a toxic department. And according to him, they called it a toxic department.

Q Well, do you have any reason why Mr. Pennington, who was employed by Monsanto in England, in making a tour of the American PCB plants, wouldn't correctly report?

A I have no idea. But I did not hear the words "toxic department," to the best of my recollection, referred to in context with any departments outside of the Queeny plant in St. Louis.

Q I see. Did you ever attempt to have the PCB department at the Krummrich plant declassified as a toxic department?

A I said I never even knew that they had it.

Q I see.

A I don't -- realize I did not get a copy of this article in 1955.

Q I see.

Did you continue to review the departments at the Krummrich and the Anniston plants that made PCBs from the middle Fifties on up through the 1960s?

A After we had industrial hygienists I may have not reviewed all the departments in the Krummrich plant until they ceased operations.

Q Okay. But somebody in your department would have?

A Yes.

MR. LACEY: Let me show you another document, if I might.

MR. CRAWFORD: David, if you are going to walk over, can you bring that last one and let me look at it and get the numbers off of it?

MR. LACEY:

Q This is a document that is called the Organic Chemical Division Research Report No. 3281, dated February 16th, 1966, Document No. 7393 through 7435. Do you recognize that type of document?

A I recognize the type of document. I don't -- recognize this particular document.

Q Okay. Those documents were put out by the research department of Monsanto, were they not?

A Yes, they were.

Q Would you consider those documents a Monsanto document?

A This is an internal Monsanto document.

Q Well, is that just somebody's opinion or does that rise to a level of being a little bit more than just some one man's opinion?

A Well, it was written by one person, a research chemist, Mr. --

Q But that's a form --

A Huh?

Q That's a formal report, is it not?

A It's a formal research report, certainly.

Q In fact, it's the final version. Doesn't it indicate it's gone through the approval process and is the final version?

A It's the final version of how to fractionate Aroclor 1142 for improving product stability, yes, as far as that's concerned. They're talking about a particular research problem and they're saying "This is our report on how far we fractionate Aroclor 1142," yes, sir.

Q Okay. And that would be an official Monsanto document, then, would it not?

A No, it isn't an official -- it's a research document put out by Mr. Lee for internal purposes reporting on how to fractionate 1142.

Q Let me look at Page 7411 with you, or Document No. 7411, where the toxicology and hazards are discussed. Do you see that section of the report by Mr. Lee?

A Yes.

Q And he indicates that Aroclor has a medium toxicity range for liquid ingestion and a high toxicity for vapor inhalation. Correct?

A That's what he indicates, yes, sir.

Q He indicates that Aroclor can cause dermatitis, systemic poisoning from the fumes, and yellow atrophy of the liver. Is that correct?

A Yes, sir, that's what it states.

Q He also recommends extreme cause, those are his words, extreme caution?

A At elevated temperatures, yes, sir.

Q Okay. Now, again, you would not consider that to be an official Monsanto document?

A That is a research document put out by a research chemist whose expertise in -- in medical matters has certainly not been established. I don't know who he is, I've never seen that report before, it is not an official medical department document.

Q I see.

Was one of the reasons that all the information that went through the medical department with regard to toxicology and safe handling was so that you could make sure it went out consistently with what you personally thought?

A Consistent with what was correct.

Q I see.

A So that we did not have chemists, advertising people, anybody else sending out information.

Q I see.

Certainly there's an eye hazard. If you get it on your skin, it's a -- it's an irritant to the skin. Certainly that's true.

Q I see.

Let me show you another document, entitled "The Standard Manufacturing Process for Pydraul A-200 in Department B-246," with a 10/66 date on it, document 5707 through 5754. Let me ask you first if you would consider that an official Monsanto document.

A It depends -- you're the man using the term "official Monsanto document." You'll have to explain to me what you mean by an official Monsanto document and -- I'll be able to tell you whether this corresponds to your definition.

Q I guess my question is whether it's a document that Monsanto would put out and expect people to rely on and use within the Monsanto organization.

A It is a document -- this is a document that is primarily designed to discuss the manufacturing process for Pydraul A-200. Now, this again is written by manufacturing people. There is no information here that has ever been submitted to the medical department or the medical department had any input in it. So I cannot tell you whether -- this is not the type of a thing we would put out to our workers.

Q That's the type of thing that would go out to the supervisors who were responsible for what the workers did, isn't it?

A This? I don't know who this goes to. This is a process -- manufacturing process. Whether that goes to manufacturing people, whether it goes back to research people I just don't know.

Q Can you agree with me, Dr. Kelly, that one of the most important things that Monsanto would want to do is to make sure that its workmen who are making any chemical for the company were adequately protected so - they wouldn't be harmed by the chemicals they were - working with on the job?

A There is no question about it. And there is no question that in the case of chlorinated biphenyls that is absolutely what happened. They were protected while they were working on the job.

Q And one of the ways to do that is to make sure that the people who are responsible for supervising the units where the materials are manufactured have the proper instructions and carry out the proper instructions to -- to ensure that the workmen remain safe, isn't it?

A That's correct.

Q And that document contained in it the

information that went to the people who operated the units, who told them how to make the product and also how to try to protect the workmen from getting sick?

A No, it did not go to the people who manufactured -- the workers. This does not go to the workers.

Q No. It goes to the supervisors of the unit who knew how to operate it and what they were to do, didn't it?

A I don't know who this went to. You will have to ask the people who -- to whom this document was sent. It went to research, the general superintendent and the technical production manager. I don't know the purpose of this document.

Q I see. Well, maybe we can -- maybe we can look at the table of contents and help you figure it out. It describes the process, has the flow sheet for the process, describes the equipment used, the materials used, the raw materials, the finished goods, the constant, utilities, the personnel, how to package it, how to ship it, how to dispose of the waste, how to control it, and also discussed the safety and toxicology to go with it, didn't it?

A That's in the table of contents, yes. I have not looked at --

A And that's -- beg your pardon.

Q Did you give those instructions in writing?

A We gave them in bulletins, yes. We sent them out in bulletins.

Q The same sorts of bulletins we looked at yesterday?

A No. There were other bulletins that we sent out. We sent out bulletins from the -- anytime an official -- a bulletin came out from -- Monsanto made safety data sheets of their own that they sent out. They had safety -- to their employees. They had reprints from the American Conference of Industrial Hygienists. When they arrived, we sent those out to the plants. So those were bulletins that you did not show me yesterday.

MR. LACEY: I'm not sure I've seen those bulletins that went to describe the safety, if the ones that we're looking at now don't contain that information. Let me show you --

MR. CRAWFORD: What is the safety data sheet?

THE WITNESS: Well, Monsanto had about 200 safety data sheets that -- on their own products that we sent out to the plants.

MR. CRAWFORD: Just describes the product?

THE WITNESS: Described the safety and safe

handling data of the product.

MR. CRAWFORD: Okay.

MR. LACEY: Let me see if I can't find something maybe that will look like that.

Q Are you telling me that a material safety data sheet was the only type of document that you used to communicate with the plant employees about the safe handling of your products?

A No, that is not correct. Whenever a new product was put in at the plant, it received letters from us, the plant received letters from us detailing - the safety, the toxic properties and safe handling of - the various products. Of the various raw materials and finished product.

Q Let me show you another document, which is reference the standard operating instructions for drumming and flaking, Monsanto Company Anniston plant, October 1969, Document No. 8481 through 8639. And I want to direct your attention to the page 8602 and ask you whether that page 8602 is the type of data sheet you're talking about putting out to provide the plant with information on their products.

A No, sir.

Q I see.

A There's no relationship at all.

Q I see. Okay. Because that document right there has information on all sorts of aspects of the problem except it doesn't say anything about toxicology, it says just call the medical department. Right?

A Yes. It shows that these people knew that they got the information from the medical department and we supplemented this -- this physical properties. This is talking about physical constants.

Q I see. Okay.

Let me see if I can find another document. Maybe this is -- is what you're talking about. Let me show you a document 19732733. Is that the sort of safety sheet you're talking about?

A No, sir. This is a later one that was --

Q I see.

A -- put out to customers in response to Labor Department OSHA requirements that we list certain things. This is not the type of thing that I said was a Monsanto medical department safety data sheet. This is not it.

Q I see. Well, describe for me what a Monsanto medical department safety data sheet looked like.

A It looked like this without the lines in it. It had paragraphs, it had -- it was not a filled-in form. It started with the product, it said, "This is

what the physical characteristics of it is, this is what the toxic characteristics of it is, this is what our plant experience has been, this is how to prevent any ill effect."

Q I see. And to whom was that provided?

A To the safety department, to the medical departments and to the manufacturing superintendents of the plants.

Q What provision did you make to get information to the individual operators in the plant?

A That was the responsibility of both the safety department and the line manufacturing operators.

Q I see. Let me ask you to look at that particular material safety data sheet you have there. Can you tell me whether that relates to a toxic or nontoxic chemical?

MR. CRAWFORD: That's not a material safety data sheet, is it?

MR. LACEY:

Q What does it say at the top? Material safety data sheet?

A United States Department of Labor.

Q And right below that the title of the document is --

A Yes, Department of Labor. We're talking

about two different things now, remember.

Q I'm just asking you to take a look at that material safety data sheet.

A Yes, I am looking at it.

Q That relates to a nonhazardous chemical, does it not?

A It's nonhazardous by the definition in 29 CFR Section 15, Federal Register, 1501-2.

Q Okay. And it was permissible to dispose of that material the same as motor oil, wasn't it?

A Yes, sir.

Q This was not a PCB-containing material, was it?

A I don't know what this -- what OS 45 is.

Q I see. Well, don't we know that you couldn't dispose of PCBs just like motor oil by the date of that document?

A Yes, certainly. But you asked me -- I do not know what this is.

Q No. My question to you was: We know it wasn't a PCB material, don't we?

A If this document is correct, we know it wasn't. But it's easy enough to find out what OS 45 is. I can't say that this is a PCB or not a PCB without knowing the chemical --

Q Well, let me ask it this way.

A -- structure of it.

Q Let me ask it this way. If this was a PCB-containing material, the directions for safe handling and disposal are incorrect, aren't they?

A That is correct.

Q Okay. And if we assume the information on the document is correct, that the material referred to there is a nonhazardous material --

A From the standpoint of the definitions in the Federal Register, yes, sir.

Q Look on over on the next page where it talks about spill or leak procedures. Doesn't it say there to clean up like other nonhazardous liquids?

A Yes. But that refers back to the first page, where it says not hazardous by these definitions.

Q Right. And up at the top it indicates it's impossible to get overexposure at ambient temperatures, doesn't it?

A Yes, sir.

Q And down in the special precautions section it indicates respiratory protection is not necessary. Correct?

A Yes, sir.

Q Protective gloves are not necessary?

A Yes, sir.

Q No other protective equipment is needed. Correct?

A Yes, sir.

Q And then it references: Even though in special precautions -- even though no special precautions appear necessary, it still recommends good industrial practice as to housekeeping and personal hygiene. Correct?

A Yes, sir.

Q Further recommends avoidance of prolonged and repeated skin contact. Correct?

A Yes, sir.

Q That was something that you recommended at Monsanto for every chemical, even the nonhazardous chemicals.

A Yes, sir.

Q Correct?

A Yes, sir. Industrial chemicals are not meant to be put on your skin.

Q Right. But if someone simply sees the direction "avoid prolonged or repeated skin contact," that in and of itself doesn't tell them whether they're dealing with a hazardous or nonhazardous chemical, does it?

A Well, certainly it does. This has been prefaced with by the statement that says although no special precautions appear necessary. We never said that about PCBs or any hazardous chemicals.

Q That wasn't my question, Doctor.

A Well, yes, but you were giving me a loaded question.

Q Your answer is not responsive. Let me ask my question again.

A Do it, please.

Q Simply seeing the phraseology "avoid prolonged and repeated skin contact" would not tell a person whether the chemical he was working with was a toxic or nontoxic chemical, would it?

A Yes, it would if there were no other qualifications on it. This states that, but there are qualifications.

Q I see. So you're telling me when I see the phrase "avoid prolonged or repeated skin contact," I can't tell whether it's a toxic or nontoxic chemical without looking for other information. Correct?

A That -- no, not necessarily. This particular phrase just tells you what you shouldn't do.

Q And that's true for every chemical Monsanto manufactured, wasn't it?

A No, I don't believe so.

Q What chemicals did you not give advice to avoid repeated and prolonged skin contact?

A I can't tell you. But there are any number of labels that we had on chemicals that did not have that particular phrase on it.

Q I see. I see. But we do know at least with regard to some chemicals that you considered nonhazardous you nevertheless said to avoid repeated and prolonged skin contact?

A But I qualified it that you are not reading the whole statement, Mr. Lacey.

Q I'm just trying to understand your use of those terms. And you use them even for nonhazardous chemicals, don't you?

A With qualifications.

MR. LACEY: Okay.

MR. FREEMAN: Mr. Lacey, are you using the words "toxic" and "hazardous" as synonyms here? You've used those very frequently interchanging.

MR. LACEY: The witness, I'm sure, is having no trouble with it. If you've got a problem with it, you might want to talk with the witness about it after the deposition is over.

Q Now, are you aware of the fact that the --

tell me about what the National Institute for Occupational Safety and Health is.

A It's a government body that regulates safety and -- in the workplace.

Q And do they make recommendations for the safe handling of chemicals in the workplace?

A Yes, they do.

Q Are you familiar with the recommendations that they made for the safe handling of PCB-containing materials?

A Who, NIOSH --

Q Yes.

A -- itself? Well, NIOSH is a research arm. They put out a -- recommendations which have to be approved by OSHA.

Q My question to you is: Are you familiar with the recommendations that NIOSH made for the safe handling of PCBs in the workplace?

A Yes, I am.

Q Okay. Those recommendations were considerably more stringent in protecting workmen from exposure to PCBs than the recommendations that had previously been made by Monsanto, weren't they?

A I don't know. Will you show me them?

Q Sure. Happy to. Let me show you a document

1209 through 1441. And I direct your attention to 1220 and following.

-- A What about -- what do you want me to comment on in this?

Q Well, you asked to see the document.

A Yes. I couldn't very well comment without seeing it.

Q Okay.

A Now, do you want me to go through the 200 pages?

Q No, I think probably that would be a little bit much. Maybe we can take a look here at some of the specific recommendations. One of the recommendations had to do with concentrations in the environmental -- and what it talks about is the workplace air. Correct?

A Yes, sir.

Q And the recommendations there are no greater than one microgram of PCBs per cubic meter of air. Correct?

-- A That's what they recommended, yes, sir.

Q The Monsanto recommendations ranged from a number about a thousand times higher than that, did it not?

A Yes, sir.

Q Okay.

A Now let me tell you -- first of all, where is the date on this? Do we have one? September '77. This was a recommended standard. OSHA is the regulatory arm of the United States Government. They have not accepted the standard.

Q Well, do you know what the standard is?

A The standard was accepted by the American Government Industrial Hygienists of five-tenths milligrams per cubic meter in the case of 1242 and one milligram per cubic meter in the case of 1254. I may have them reversed.

Q That's the OSHA standard?

A No, that's -- OSHA has not made a standard, to the best of my knowledge.

Q Oh, I see.

A They have not accepted this standard, however.

Q But the government standard recommended by the National Insitute for Occupational Safety and Health is a thousand times lower than that promulgated by Monsanto to its customers. Correct?

A Yes. But also Monsanto has promulgated the standards set by the American Government Industrial Hygienists Association, which is a authoritative group of industrial hygienists whose standards were in great

part accepted by OSHA all the way through, and OSHA has not accepted this particular standard.

Q Didn't accept the association of hygienists standards that were a thousand times higher, either, did they?

A No, they didn't. They haven't accepted any standard.

Q By the way, that group of industrial hygienists, is that primarily made up of people who work for companies like Monsanto as industrial hygienists?

A It's made up exclusively of people who work for the government. Monsanto people or General Electric people are not in it. It is city, state and government employees, as the name implies.

Q I see.

Let me direct your attention now to the section of the document that deals with labeling and posting. Here they're talking about labeling and a warning label on PCB processing or other equipment and on PCB storage tanks or containers. Correct?

A Yes, sir.

Q And they recommend that warning labels be readily visible. Correct?

A Yes, sir.

Q And the warning label reads: Polychlorinated

biphenyls (PCBs). Danger. Contains polychlorinated biphenyls. Cancer suspect agent. Use only with adequate ventilation. Do not get in eyes, on skin or clothing. Correct?

A Yes, sir.

Q That wasn't exactly the warning that Monsanto was giving, was it?

A In 1977, I don't believe we were even making the material.

Q My question to you is --

A Well --

Q That's --

A This is the thinking of NIOSH in 1977. And you -- Monsanto was not manufacturing PCBs in 1977. And I didn't have PCB processing or other equipment or on PCB storage tanks. So, no, they did not use this.

Q Well, actually, Monsanto was still making PCBs in 1977, wasn't it?

A I don't know. Were they?

Q I believe they were.

A I can't answer that.

Q I believe they were. And they were still selling PCBs in 1977, weren't they?

A You'll have to ask someone else. I can't answer.

Q I see, I see.

They also recommended warning placards to be affixed in readily visible locations in or near PCB work areas. Correct?

A Yes.

Q And that placard was similar to the warning sticker that said: Polychlorinated biphenyls (PCBs). Danger. Cancer suspect agent. Authorized personnel only. Do not enter unless area is adequately ventilated. Do not get in eyes, on skin or clothing. Correct?

A Yes, sir.

Q Then they went on to talk about personal protective equipment --

A But remember again, Mr. Lacey, the sister body of this organization in the Labor Department did not accept this standard.

You're asking me: Did Monsanto accept it?

I'm saying to you: No, they didn't.

But I asked you: Did OSHA accept it?

And you haven't answered me. But I'll have to say OSHA did not accept it and required that these standards be put on.

MR. LACEY: I'm going to object to the last part of the answer as nonresponsive to the question.

MR. CRAWFORD: Well, David, just a second. Before you go on with all this ad nauseum, a couple of observations here. First of all, you're asking him about standards from NIOSH that apparently were not adopted and you are also asking him about standards that were promulgated after he was no longer with the medical department. So I really don't know what you're -- where you're going with all this, but I -- I think it's probably improper.

MR. LACEY: Well, let me ask you this, Dr. Kelly.

Q There's no reason that Monsanto couldn't have made the same recommendations that were made by NIOSH with regard to protection of workers in the workplace, is there?

MR. CRAWFORD: That's speculative.

MR. LACEY: No, that's a simple matter of the English language in writing it down and sending it out.

MR. CRAWFORD: Well, you're asking him to speculate.

MR. LACEY: I'm not at all.

Let me make the question clear, since Mr. Crawford believes it calls for speculation.

Q You as the medical director of Monsanto had the power to draft Monsanto documents on toxicology and

safe handling to provide for the same levels of air concentrations that NIOSH recommended, didn't you?

MR. CRAWFORD: He wasn't medical director when those came out.

MR. LACEY: I'm not talking about now. I'm talking about when he was medical director.

Q You could have in 1950 promulgated the same air concentration standards that NIOSH suggested, couldn't you?

MR. CRAWFORD: NIOSH wasn't around in '50.

MR. LACEY: You know, we're going to be at — this a long time, Walter, if you don't let him answer — the question. The question is -- let me rephrase it so it's real simple.

MR. CRAWFORD: Well, you've been screaming at the witness now for an hour --

MR. LACEY: I haven't been screaming at the witness for an hour.

MR. CRAWFORD: -- and dropping documents on him. I suggest we get on to something that's -- that's relevant.

MR. LACEY: I think this is highly relevant, I think the jury is going to find it highly relevant.

Q Now, you could have in your documents that the medical department prepared for Monsanto in the

1950s and 1960s recommended that air concentrations of PCBs be controlled so that the concentrations were no greater than one microgram per cubic meter of air, couldn't you?

A I could have if I believed that was accurate.

Q And the difference and the reason you didn't is because you don't have the same belief as apparently the drafters of this document did. Correct?

A And also the same belief that OSHA did as far as the combined belief of every government industrial hygienist. They all put it -- they all approved the label -- the concentrations that we adopted. We went with the current thinking of all the government industrial hygienists who worked for the U. S. Government, the states and the cities, and they put out and still put out, to the best of my knowledge, the same levels that Monsanto used.

Q OSHA never approved the standards or levels recommended by Monsanto, did they?

A No. And they never approved the standards recommended by NIOSH either.

Q And the reason they didn't is because the manufacture, sale and distribution of PCBs was banned in this country. Correct?

A I don't know the reasons they didn't. You

would have to ask people from OSHA.

Q That made it unnecessary, didn't it?

A I don't think so. Because you have just said that there are still PCBs around.

VIDEO OPERATOR: Excuse me. We need to take a short pause.

[Recess]

VIDEO OPERATOR: We're now back on the record. The time is 1:42.

MR. LACEY:

Q Dr. Kelly, let me hand you a group of documents numbered 15252 through 15377. I believe all these documents are labels of one type or another. I'll ask you to briefly review those for me and see if you recognize those types of labels.

A That one, too. Yes, sir.

Q Those are all warning labels or labels of some sort, whether they're warning labels or not, that Monsanto put on products containing PCBs, are they not?

A Yes, sir. I'm not sure about all the Pydrauls. Some of the ones have not -- I'm not sure about them. They don't mention the fact that they contain chlorinated hydrocarbons. But there may be other labels that would define it.

Q If I could get all these labels back in front

of you, I'd like to have some help from you in establishing when these labels were used. And in particular if we can sort out maybe early from late or into the decade by which they were used, what was used in the Forties, what was used in the Fifties, what was used in the Sixties, what was used in the Seventies, that will help us understand the type of information that you were arranging to have put into the hands of your customers about any health hazards.

A I don't believe I'll be able to help you in dating it.

Q I see. Well, I thought you were responsible for reviewing the literature and making sure that the warning labels had the appropriate warnings as to what the literature at any point in time contained.

A Well, yes, but that is a different statement than do I know when this label was dated.

Q I see. Do you know when the labels were used?

A No, I don't know when these labels were used.

Q You can't give me any help at all with trying to identify which of these labels might have been used in the Forties versus which ones might have been used in the Seventies?

A The ones that talk about environmental

contamination were certainly late in the game. They were presumably in the Seventies.

Q Okay.

A Late Sixties.

Q Can you separate out those that talk about environmental contamination from those that don't? Maybe we can at least get two stacks of documents.

A Well, that many.

Q Okay. The group you are handing me now are ones that are --

A Presumably later than the others.

Q Okay.

A Assumedly -- assuming that the -- where they mention environmental contamination that would be later.

Q We in fact know that has to be later, don't we?

A Well, yes. Later than what? Some of the others without --

Q Later than the mid-Sixties, don't we?

A Yes, sir, I think so.

Some more.

Q Have you got them separated now into two groups, one group which you believe is after the mid-1960s, where environmental matters are --

A Have come to the surface, yes.

Q Have come to the surface? And the other of which is before that time?

A To the best of my knowledge, yes.

Q Okay. And have you handed me all of those that are after environmental matters came to the forefront?

A Of this group you sent me -- you gave me, yes.

Q Yes. To help us distinguish between those of the group that I gave you which are after the mid-Sixties and those which may not be because they have nothing about environmental matters, can you give us the numbers of the documents there that you have separated out as being possibly before the time that environmental concerns came to the fore? And you don't need to read the SCM letters, you can just read the last digits to help us identify them.

A 15295.

15352.

15351.

15353.

15354.

15355.

15356.

15357.

Whoops. Got another one here.

Q Okay.

A 15345.

15346.

15347.

15348.

15349.

15350.

15344.

15338.

15339.

15340.

15341.

15342.

15343.

15358.

15360.

15359.

15361.

15362.

15363.

15364.

15368.

15367.

15370.

153 -- 15281.

15283.

152 -- whoops. There's another one. One for you.

15272.

15252.

15255.

Q You've now listed the numbers of the different labels in this first group that we've looked at that do not reference environmental matters and therefore may be before that matter came to the forefront. Correct?

A Correct.

Q Are you able to tell within that group any order or sequence that those labels would have been used in?

A No, sir, I'm not.

Q I see. Some of those labels reference specific Monsanto products that contain PCBs, do they not?

A Yes, sir.

Q And we at least would know with regard to a label that referenced a specific product that it wouldn't exist before that product went to the market?

A Yes, that's correct.

Q Okay. Otherwise you -- you can't tell us anything about them?

A No, I can't.

Q Okay.

There are a couple of labels in that group that are very general. I notice the one on the top there is a rather general label, doesn't reference a specific product. Correct?

A Yes, sir. It does not. It just says chlorinated diphenyl technical. It doesn't say anything more than that.

Q And the next document in the group that's laying there is likewise a very general document. Correct?

A Yes, it is.

Q Are those the types of labels that were first used on PCBs, very general labels?

A I don't know. I can't -- I can't put these into a time frame at all.

Q Let me get you to identify by document number those documents that have the least information in this group, those that we just looked at. Can you give me the document numbers on those two we just looked at?

A Do you mean these --

Q Yes.

A These two documents? The least information?

Q Well, they have the least -- they have less said on them than the rest of them. Correct?

MR. FREEMAN: He just wants the number, the SCM number of those first two documents.

A Oh. 15253. 15254. They have -- they do not describe which Aroclor it is. They do have a second page with them. Caution labels.

MR. LACEY:

Q When you started to work at Monsanto and took over, as you said, the de facto job of medical director in about '38 or so but without your portfolio, were you involved in looking at the information that went on products and out to customers about health matters?

A Sometime along in that time I did. But it was a gradual accumulation of duties. I cannot tell you when -- when I did. It was certainly much less formal than when I came back in '46.

Q By '46 you very definitely had that responsibility as a formal responsibility?

A Well, whether it was formal or not, I was there all day and people -- I think with our increased toxicological information it became -- whether it was formalized or not, the medical department was furnishing information and people would come in to us with it. And

we had an accord with the labeling supervisor for the corporation who -- who saw us frequently.

Q You had mentioned that when questions arose regarding health and toxicological matters sometime in the 1940 time frame the word had gone out that those questions were to come to you. Correct?

A Correct.

Q And the information that went into technical bulletins or product bulletins that were published with regard to toxicology and safe handling had to be approved by you?

A Yes, sir.

Q Did the labels that went on containers of products have to likewise be approved by you?

A Yes, sir. I believe that's correct.

Q So then the labels that went on PCB products did not go out unless they had been approved by you as appropriate with regard to health effects and safe handling?

A Unless there were no change in -- there could be graphic changes in the label.

Q Graphic changes?

A Yes. In other words, there could be different logos or different typing or that -- different printing. But if the text of toxicological statements

or safe handling statements were changed it would have to come to us -- from us.

Q Who decided what the label looked like?

A Somebody in the art department.

Q Okay. Who decided what the substance of the information on the label was?

A That was a division of responsibility. The people who -- the marketing people decided on some of the material. The safe handling and toxicity data or precautions was the medical department's responsibility.

Q So you had the final say on the toxicology - and safe handling?

A Yes, sir.

Q And the marketing department had the final say on the portion of the label that dealt with things --

A I can't be sure. I don't know who did it.

Q Somebody other than the medical department?

A That's correct, certainly.

Q But you are certain that your department was responsible for the toxicology and safe handling information?

A And caution statements, right.

Q Okay.

A With the exception of fire or explosion.

Q Okay. Now, is there some consistency within the chemical business about the terminology used on these labels?

A I don't know whether there is any consistency now. At the time of my contact -- my employment with Monsanto there was some consistency as far as the information about chlorinated hydrocarbons was concerned.

Q What was the source of that consistency that you recall?

A I don't recall. I -- I just don't recall. -

Q How did you select, for example, whether to- say danger or warning or caution or -- or what -- what criteria did you use in trying to make the decision how to word the information on toxicology, health effects, safe handling?

A I think the nature of the compound, the physical nature of it, its proposed use.

Q With regard to these labels, I know that many of them say caution as opposed to, say, danger or as opposed to, say, warning. Why did you choose the word "caution"?

A Well, we used it because we considered it strong enough that the label was protecting our customers and there were no problems.

Q Was there something stronger than caution that you could have used?

A Sure. We could have said danger, we could have said warning. If we wanted to be -- we could put skull and crossbones on. I don't think there's any particular level that people put skull and crossbones on. But there are other things you could use.

Q Was it your decision to use the word "caution" on these labels?

A Where it appeared, yes.

Q Okay. And the details of the handling precautions beyond the word "caution," were those also your choice of words?

A You'll have to show me the label and I'll tell you.

Q Well, any label in this stack that you have got here.

A All right. Let's take this one right here.

Q Surely.

A Caution. Avoid prolonged and repeated contact with the skin. Avoid prolonged breathing of vaporous dust. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. If clothing becomes soaked with fluid, launder before wearing again.

Yes, that's certainly from me. Now, I do not know if the format "Caution. Contains chlorinated hydrocarbon" was an industrywide type of -- of warning label. I don't know. I don't know if that came from there and we followed their format. But the rest of it certainly was approved by me.

Q Okay. And do you know at what point in time those sorts of labels were being used?

A I don't.

Q Okay. These labels weren't dated, were they?

A I don't know. There are some codes down here, but I don't know what they mean.

Q I see.

A 1040-240-7-54-53. I don't know what that means. I don't know if that's dated or not.

Q I see. Those aren't your numbering schemes?

A Mine?

Q Yes.

A I had nothing to do with anything except the -- the precautionary statements.

Q What -- what was the purpose of having a label like that on the product that went out?

A Well, several. One to tell people what was in it.

Q All right.

A No. 2. To tell them about the size of the -- the amount in there.

-- No. 3. To give them precautions as to safe handling of the material.

4. To give -- well, that's really three. That's about it. Those were some of the reasons.

Q To tell them what the product was, to tell them how much was in it and to tell them how to handle it safely?

A That there may be -- that there are other things that the marketing people had in their mind when they put a label on. But as far as the -- as the medical department was concerned, I can only say that we put -- we were responsible and the purpose of the medical department was to put on safe handling procedures and cautions to protect the user against any ill effects.

Q And it was your intention, to the extent you put on information regarding toxicology and safe handling, that the words that you used be sufficient to convey to the purchaser what you intended that they should do by the way of safe handling. Correct?

A Yes, sir.

Q Did you ever undertake as the medical department of Monsanto to actually go into customers'

facilities and observe how the product was being used so as to figure out whether the labels were accomplishing your purpose?

A In these products here we're talking about?

Q Yes.

A No, I did not.

Q Did anyone in your department?

A I -- they may have gone into the departments, not for the -- the primary purpose of seeing whether the individuals were following the labels. We were sending these compounds to General Electric, Ford, TVA, Allis-Chalmers, who were, as I said, pretty sophisticated - manufacturers. And we sent it to them, we sent them the -- the product bulletins, and we expected them to follow the procedures outlined. We did not go in and check them, no, sir.

Q Well --

A As far as I know.

Q Okay. My question was not so much whether you expected them to follow the procedures outlined, but whether or not the way you wrote up what you wanted to be accomplished or what you thought needed to be accomplished was in fact communicating to the customer what you intended for it to communicate.

A Repeat that, please.

Q Let me see if I can give you an example. For example, the word "avoid prolonged contact," to you did that mean if you got some on your skin you should wash it off immediately?

A To me it would mean wash it off within five minutes, ten minutes.

Q Okay. My question, then, would be: Did you go, for example, into a customer's plant to ensure what they meant by that was -- or they didn't interpret that to mean wash it off at the next break or at the lunch break and let it stay on the skin for two or three hours?

A No, sir, it did not.

Q My question to you was whether you went into customers' plants to see if they might be misinterpreting what you intended by prolonged contact. For example, five or ten minutes versus two or three hours.

MR. FREEMAN: He's already answered the question he was not in any customers' plants to do that. You can answer the question again, I guess.

A I think I said no, I did not.

MR. LACEY: Okay.

Q Were you ever able to determine whether your customers were interpreting your labels the same way you

intended them to be interpreted?

A Well, I think from the empirical point of view I was, because we had -- there was no ill effects of any workers getting -- from exposure to PCBs as reflected by reports in the literature as reports from our sales and marketing people as reports from these individuals back to us. We had no records of any ill effects. There were no records of any medical conditions that surfaced in the literature.

Q So you concluded that because you didn't hear anything that meant people were understanding the directions you gave and following it. Correct?

A Yes.

Q Okay.

Let me show you another group of labels. Let me get those back here and we'll get them all batched together. Nos. 445 through 4 -- strike that.

Let me show you another group of labels, Nos. 444 through 460, and ask that you do the same thing. I think they may be already somewhat in sequence.

A Do the same thing? I do not know what you mean by do the same thing.

Q To separate out those that would be involving environmental problems and therefore assuredly after the

mid-Sixties versus those that have no reference to the environmental problem.

A I am handing you those that to the best of my information represent labels that were used when environmental contamination became important.

Q Okay. And the reason you are able to separate these out is because they talk about protecting the environment?

A Yes. And disposal procedures.

Q And those were not things that anyone would have any reason to put anything on the label about - before it came to Monsanto's attention that there was a problem of PCBs in the environment and their persistence. Correct?

A Correct.

Q Okay. Now, which ones of that group, then, are ones that don't talk about the environment and therefore potentially earlier labels?

A Three zeros 444, 445 --

COURT REPORTER: Excuse me. The three zeros threw me off.

THE WITNESS: 000444, 000445, 000446.

COURT REPORTER: Thank you.

MR. LACEY:

Q Now, with regard to the actual warnings or

labeling about potential health effects and safe handling, from your standpoint, was there ever any reason for the labels to get more detailed in that regard than they initially were?

A Repeat that, Mr. Lacey.

Q Yes. Was there ever any reason for the labels that talked about how to handle PCBs safely or that warned about any adverse consequences of PCBs to get more detailed than they were in the 1940s or Fifties?

A If -- was there any reason for them?

Q Yes. To become more --

A Real reason or projected reason or possible reason?

Q Whatever.

A Well, if something had occurred to show that in our customers we were having -- they were having ill effects with our product, there may have been a reason to be more detailed about it. But this did not occur. And to answer your question, no, I didn't see any reason for more detailed.

Q Okay.

Let me show you one of the documents that you've handed back to me and -- it's document 460 -- and ask you to take a look at the caution statement

there on that document and compare it with the caution statements on the earlier documents that you have identified which did not contain the environmental warnings.

A Yes, sir.

Q Do you believe that that statement on the later document contains more detail about appropriate handling procedures to protect a person using PCBs from possible harm as a result of working with them?

A Well, it has practically the same information. It says caution. Both say caution. Contain chlorinated hydrocarbon -- carbons. It says harmful substance if taken internally or in prolonged contact with the skin. We say on the other labels avoid skin contact, prolonged skin contact. They talk about skin irritation. Eyes. We didn't mention eyes in the other one, but it says causes irritation of the skin and eyes. Then they have several pages -- several sentences about avoiding spills and contamination of other products. Keep container tightly closed. Do not eat or smoke while using. Avoid breathing vapors, mist or fumes. Do not wear contaminated clothing. I would say the only thing they've added here is: Do not eat or smoke while using and causes irritation of the skin -- of the eyes.

Q There's a reference to not wearing contaminated clothing, is there not?

A Yes, sir.

Q Was that in the earlier label?

A It's in some labels I've seen. Discard or launder clothing before use. I don't know if it was in the earlier ones.

Q All right. Launder clothing before use?

A Reuse, I think is -- I thought I saw in some of the labels.

Q You would take that to mean exactly the same thing as do not wear contaminated clothing?

A Yes, sir.

Q You wouldn't understand do not wear contaminated clothing to mean that if you spill some on you you ought to immediately change clothing?

A It depends how much you spilled on you.

Q I see.

A If you had a teaspoonful, you wouldn't. But if you were doused with it, both legs were sprayed on it, you would get rid of that, certainly.

Q Okay. And you feel that both the early labels and the late labels would communicate that concept?

A I think so.

Q Okay.

Now would you hand me those others there and we'll put them together.

You mentioned your customers to whom this material went. Were the warning labels for the benefit of even customers like General Electric and Westinghouse and TVA and Ford -- did they get warning labels on their products?

A They got the same -- the labels that -- yes, they got the warning labels on them.

Q And did they look to you as the manufacturer of that chemical for advice as to how to handle it and how to use it safely?

A No, sir. They knew all about how to handle and use PCBs.

Q You don't recall them then ever looking to you for information on how to handle the chemicals?

A No, sir, I do not recall it.

Q I see.

A It may have occurred, but I -- I do not recall it.

Q Okay.

Would people in your department have talked with you before they were involved in providing information to customers about how to properly handle

chemicals?

A They may and they may not have. In many instances they would not. If they knew what to do, they would go ahead and do it.

Q Now, Inerteen was a Westinghouse product, was it not?

A Yes, it was.

Q Let me show you a letter, No. 25320 through 25322, dated October 23rd, 1959, from Elmer Wheeler to Wilbur Speicher -- I'm not sure if I've pronounced that correctly -- with Westinghouse.

A Yes, sir, I've seen this letter before.

Q When did you see that letter?

A I've seen it -- oh, gosh. Sometime while I was with Monsanto.

Q Did you talk with Mr. Wheeler before he sent that letter out?

A I don't remember if I did or not.

Q Okay.

That letter was sent to Westinghouse by Mr. Wheeler in response to questions for more information about Inerteen, was it not?

A I'll have to read it.

Q Maybe if your lawyers can let you look at it we can move ahead here.

A I don't see the earlier correspondence on it. That doesn't seem to be on it.

Q I provided to you what Monsanto has provided to me.

A There was a letter of October the 21st which seems to have not -- to have been discarded. So obviously he inquired about the safe use of trichlorodiphenyl, a mixture of 40 percent trichlorbenzil -- benzene and 60 percent hexachlorodiphenyl, yes, sir.

Q And that's what Monsanto provided to Westinghouse as Inerteen PPO. Correct?

A Yes, sir.

Q And while we don't have the letter to which Mr. Wheeler is responding attached to it, it's clear from the response that is given by Mr. Wheeler that they had asked for some information on the safe handling and toxicology of that product, is it not?

A Yes, sir.

Q And Mr. Wheeler's response here is considerably more detailed than the information on toxicology and safe handling given in one of our technical bulletins or product bulletins we looked at, is it not?

A Yes, it is.

Q Does that letter suggest at all to you that Westinghouse might be looking to Monsanto for assistance in understanding the toxicology and the safe handling procedures for the PCB products that you supplied to them?

A This might have been a new PCB to them and they wanted to know what the information was about this. I -- I don't -- I don't think I could say what else it suggests to them. I don't know how -- Mr. Speicher was an industrial hygienist and he asked some specific questions about when you should use exhaust ventilation. It said here, of course, "I have been told your company has had some 20 to 25 years experience with the products discussed above." And he suggested that Mr. Ford, the manager of Transformer Manufacturing Engineering at your Sharron plant would be a source of information regarding your experience with Inerteen.

Q And yet the industrial hygienist at Westinghouse was looking to Monsanto, the manufacturer of the chemical, for the information, was he not?

A He was. But it was obvious that other people in Westinghouse had the information, because we referred them to two people that --

Q Well, actually, Mr. Wheeler didn't just write back and say, "I received your letter, please talk to

Mr. Whoever," did he?

A No, of course not.

Q He supplied all the information?

A What he asked, yes.

Q One of the things that's a reality of a -- of a large company like a Monsanto or a Westinghouse or a Ford is that what one individual knows may not be known to another individual in the company.

A That can occur, yes, sir.

Q I mean you've indicated to me in some cases here that you don't know about everything that everybody else at Monsanto was doing.

A That's correct.

Q And you would certainly recognize that that problem would be the same one at large customers that you had. Would you agree with me?

A It could be that some people in large customers didn't know what other people knew about a product, yes, sir. It could occur.

Q For example, where was the headquarters of Westinghouse? Do you know?

A Pittsburgh.

Q And the headquarters of Ford?

A Outside Detroit.

Q And the headquarters of the TVA?

A Knoxville.

Q Just because any one individual in Detroit or outside Detroit with Ford or with Westinghouse in Pittsburgh or with the TVA in Knoxville knew particular information about a product supplied by Monsanto would not necessarily mean that Monsanto could reasonably assume everybody in the company knew that same information, would it?

A They could reasonably assume that the people who were responsible for the use of the product would know about it, yes, sir.

Q I see.

Well, would people in Monsanto reasonably assume, then, that you would know about all the safety precautions that were being taken with regard to Monsanto workers in the units that manufactured PCBs?

MR. FREEMAN: I object to the form of the question. It calls for an assumption of what somebody else knew and outside this man's knowledge.

MR. LACEY: You can go ahead and answer the question.

A Can I have the question again?

MR. LACEY: Certainly.

Will you read it back, please?

COURT REPORTER: "Well, would people in

Monsanto reasonably assume, then, that you would know about all the safety precautions that were being taken with regard to Monsanto workers in the units that manufactured PCBs?"

A What people in Monsanto? Everybody?

MR. LACEY:

Q Yeah.

A The 55,000 employees they have?

Q That people would assume that you as the medical director would know about what was going on in manufacturing units and in the efforts to protect the workers' safety.

A I think the people in Monsanto recognized the fact it was the medical department's responsibility to protect the workers and they would assume that we had inaugurated, instituted procedures to protect these workers, yes, sir, I believe they would.

Q And that you as the medical director would know the details of that?

A I may not know all the details, but I would know that procedures had been instituted.

Q Okay. But knowing the details, that wouldn't be a reasonable assumption, would it?

A I don't know. It might be reasonable to some people, not reasonable to others.

Q Okay.

Let me show you another letter, dated February 12th, 1969 from Mr. Wheeler to a Mr. Bindschadler with Westinghouse, document 25326, 25327, also supplying additional or technical information on a PCB product from Monsanto to Westinghouse.

A Yes, sir.

Q Again, this appears to be provided in response to a request for information about a PCB product. Correct?

A Yes, sir.

Q And Westinghouse is looking to Monsanto for information about those products.

A I do not know exactly how long Mr. Bindschadler was with Westinghouse, whether he was a new employee there, whether he knew anything about the workings of the organization, and he probably thought the easiest thing is to write Monsanto and find out from them, because again we referred to them that they had many years of experience in handling and using these, and in a -- in a sense -- well, stating that their experience is wider than ours in terms of exposure levels. So again I don't know what he was asking in this letter of February the 3rd to the safety department. This is a safety man. And the medical

department at Westinghouse certainly knew about the safe handling procedures for -- for their transformer fluid. Whether Mr. Bindschadler was an old-time employee there and knew I don't know, and I don't know what specific questions he asked in this letter to Waiger, the safety man.

Q We do see again, though, Mr. Wheeler providing information from Monsanto to its customer Westinghouse on a PCB product, do we not?

A Yes, sir.

Q In response to a request from the customer --

A Yes, sir.

Q -- for information. And as you've pointed out, sometimes there's a change in employees. And that happens in large corporations, does it not?

A Yes, it does.

Q And again that just reiterates or demonstrates the need to continue to supply information to make sure that when new employees come on board they have the same information that they need, doesn't it?

A No, it doesn't. I mean it -- it means that the company, Westinghouse, should inform their new employees. It doesn't mean that Monsanto should inform every new employee that goes with Westinghouse something that has been going on. We expect that a company like

Westinghouse which has had all the information available on their own copyrighted product would tell their new employees.

Q Let me show you another document, dated September 27th, 1967, from James G. Bryant to a large number of people, including Mr. Pappageorge and others, document 25282. It references a visit by Monsanto to the Anniston, Alabama, PCB plant of Monsanto, does it not?

A Yes, sir.

Q And it indicates that Westinghouse employees are coming there to try to learn more about how to handle PCBs in order to avoid toxicological problems, doesn't it?

A Repeat the question. I was reading this. I'm sorry.

Q Let me. I'll repeat it for you. The memo clearly indicates that employees of Westinghouse were coming to Monsanto's Anniston, Alabama, PCB plant to learn more about how to handle PCBs in order to avoid dermatological and toxicological problems?

A Yes, sir, that's what it says, the prime purpose is to discuss the best methods for handling Aroclor 1242 to avoid problems of dermatitis and toxicology.

Q So once again we see Westinghouse looking to Monsanto as the manufacturer and supplier of the chemical for information about how to handle the chemical. Correct?

A Well, at this particular plant, this may be when they started using the material, so they came to us rather than going to their own headquarters.

Q The point is, that clearly shows that Monsanto was looking to -- I mean Monsanto was being looked to by Westinghouse, in particular the people in Bloomington --

A The people from Bloomington, yes.

Q -- for information on how to handle the chemical to avoid toxicological --

A Yes, sir.

Q -- dermatological problems?

A Yes, sir.

Q Let me show you another document. This one does have attached to it the original correspondence from Westinghouse to Monsanto, some memos about making responses, along with the Monsanto response. The entire package is document 25286 through 25297. And you might look at the last part first, because it shows the question letter coming in, and then going forward you see the response. That one does have the letter from

Westinghouse to Monsanto attached, does it not?

A Yes, sir.

Q And that's a request for information from Westinghouse to Monsanto about the PCB products that Monsanto supplied to Westinghouse. Correct?

A I have to read it.

Q Okay.

A Because this occurred after I left Monsanto. This is dated 1975.

Q Fine.

A Well, this again, as I said, is a letter from Westinghouse to Monsanto in 1975 following the publicity concerning PCBs in the environment. The workers had asked -- had brought up several concerns. So they did come to us asking these concerns -- to get answers to these concerns, yes, sir, they did.

Q And Monsanto provided a response to each one of those questions to Westinghouse --

A Yes, they --

Q -- for their use. Correct?

A Yes, they did.

Q In each of these letters that we've looked at we see Westinghouse coming to Monsanto as the manufacturer of PCBs to get additional information about the toxicology and/or safe handling of the chemicals

that Monsanto supplied to Westinghouse, don't we?

A We see individuals in Westinghouse getting -- asking for information.

Q Of Monsanto?

A Of Monsanto. This is individuals, and this does not mean that these people represent the body of toxicological information in Westinghouse.

Q Well, companies can only work through individuals, can't they?

A Yes, certainly.

Q And each of these individuals was asking that question on behalf of his employer Westinghouse. Correct?

A Yes. He is asking questions --

Q And each --

A -- that were -- some were -- these were new questions about supposed conditions due to the environmental publicity about PBCs in this case.

Q You're talking about the last one?

A Yes, the last one.

Q The others didn't -- weren't the result of environmental publicity, were they?

A No, they were not. But I do not know what they were the result of. I do not know whether that was the result of a man figuring out it was easier to get it

from Monsanto than his own company. I don't know.

Q I see. By the way, do you know whether or not Westinghouse even had a medical director or not?

A Yes, I believe they did. I really -- I believe they did. I feel quite sure they did. I can't tell you his name, but --

Q Do you recall giving a deposition in a case called Charles Wright versus Monsanto Company --

A Yes, I do.

Q -- in the Eastern District of the United States of Texas, Beaumont Division, back on September 28th, last year?

A Yes.

Q Have you reviewed and signed that deposition yet?

A I can't answer that.

Q Okay.

A When was the deposition?

Q It was taken on September 26th, 1986. I note that it must have been typed up a little bit late, because the signature sheet provided for it to be notarized in 1987. So I assume it wasn't typed up until early this year.

A I don't know whether I signed it or not.

Q Okay. Do you recall being asked there:

What about with Westinghouse? Would you have had contact with Westinghouse medically? Do you recall being asked that question?

A Well, if you show it to me. I don't recall it.

Q Okay. Let me show you the deposition. Let me bring it over here. Beginning at Line 10: What about with Westinghouse? Would you have had contact with Westinghouse medically?

And then the lawyer there interposes an objection. And then there's an answer. Says: You can answer it.

Then your answer starts right here, and you say: No, I don't know if Westinghouse had a medical director or not.

A Well, I didn't recall whether they did. I still don't recall whether they did, but -- my impression is they did, but I couldn't answer that positively.

Q I see.

A I knew positively General Electric had one, I knew positively Ford had one, I knew Westinghouse had a very large industrial hygiene group. My belief would be that they had a medical director, but I didn't know.

Q That would be speculation on your part?

A It would be speculation.

Q I see.

Now, even companies with medical directors might look to Monsanto for information on PCB products supplied by Monsanto to those companies, mighten they?

A Yes, they might.

Q That wouldn't really be surprising to you, would it?

A No, it wouldn't.

Q Do you recall an inquiry from Ford Motor Company asking for specific information on a PCB product?

A I don't recall it, but show me the correspondence. It may refresh my memory.

Q Surely. Let me show you a package of documents here that's numbered 25330 through 25333. And the first one is a handwritten note apparently to Elmer Wheeler, although it just says Elmer. There's a -- the second sheet would indicate it went to Mr. Wheeler.

And then there's a response that was actually written to that question that you prepared and signed. Correct?

A Well, it appears to me that these people were not using Pydraul at this time. Because it says Ford looks bigger and bigger as a Pydraul potential. So it

appears that Mr. Falls, whoever Mr. Falls was, wanted to know about the safe handling of Pydraul before he started using it.

Q And they were looking to Monsanto as the supplier for information on that. Correct?

A Certainly. They were a new customer and they were looking for it, so we sent them the toxicity and safe handling bulletin on it, yes, sir.

Q And that should have been sufficient to satisfy their needs without doubt. Correct?

A That should have been sufficient to satisfy their needs?

Q Yes. I mean what I'm saying is the letter that you sent them along with the materials that you sent them would have been what they would have needed to answer any questions they had about that product. Correct?

A Yes, I think so.

Q And that product, of course, was a PCB product, was it not?

A I don't know if Pydraul 312 is or not. I --

Q I see. You don't recall?

A I don't recall.

Q Okay.

Let me show you another document, dated April

25th, 1968, document 25334, 25335. That memo indicates, does it not, that the information in the letter that you sent to Ford was not considered adequate by them? Does it not?

A That's what this reported, yes, sir.

Q So apparently the standard literature that you sent out was not something that Ford found sufficient to meet their needs for information.

A This is my letter to them. The standard information was this letter. Let's see what happened. Well, he asks some things that were -- would certainly not be common if this is what he was concerned about. He asked three things:

He would like it explained that the Pydraul fluid would contain the same components as Pydraul 312. In other words, we gave them the safe handling bulletin that was -- or the safety data sheet on Kettering, and he just said, "Look, I want to be sure this is the same stuff." Well, I didn't say this Pydraul 312 is the same as was used at -- at Kettering, if that's what he was complaining about.

No. 2. What are the actual chemical constituents of the decomposition vapors of Pydraul 312? Well, he wanted to know that. That wasn't included in it.

information that was in the technical materials.

A That's correct.

Q Let me show you another letter, dated May 7th, 1968, from Mr. Wheeler to Mr. Falls, document 25336, 25337. This is the letter that was written back in response to the memo that we've just looked at, is it not?

A Yes. Well, this he wrote back and said that: We checked the decomposition and didn't find any phosgene in it.

Q Also, were you able to tell from that response whether the material contained PCBs or not?

A Well, it said: The chlorinated hydrocarbon components of our -- of our fire -- of our fire-resistant fluids are not the simple short chain organic compounds. So conceivably that would refer to aromatic diphenyls. But I'm sure along with all this information he had product bulletins about discussing whether it's PCBs in it or not. But this is pretty clear.

Q It does or does not contain PCBs?

A What?

Q It does or does not contain PCBs?

A I would think if it's -- this fire resistant in 1968, it contained PCBs.

Q One of his specific questions was: What were

the chemicals that went into Pydraul 312? Correct?

A That was presumably answered by somebody else. We answered the phosgene part. We answered whether or not --

Q I see.

A -- phosgene would be liberated or not by decomposition.

Q So that letter is only a partial response?

A Presumably, yes.

Q Okay. And the way you responded was by citing some tests that you had earlier done on some PCB chemicals. Correct?

A Yes, sir.

Q And so if the materials were not PCB chemicals then the relevance of your response would be limited, at best?

A That's correct.

Q Okay.

Do you have any thoughts about why someone would be concerned about phosgene gas being liberated from PCBs?

A There is no explanation for people's concerns. It could be -- he might have heard it during a golf game and somebody would say it, a competitor might have said it. I don't know what the reasons for

his concerns are. But it seems like we dispelled it.

Q Okay.

Let me show you another set of correspondence from Ford. And here we have the backup question and the response, along with a form, 25338 through 25341.

A Yes, sir.

Q Apparently, even though you thought you had dispelled the concerns, they come back for yet more information on Pydraul 312.

A No, that is not correct at all, Mr. Lacey.

Q I see.

A What Ford Motor Company was doing in this particular case is getting their own form questionnaire on all the products that were supplied to them. So they sent it to us to fill out the form for them. This, by the way, is a phosphate ester-based fluid.

Q What other chemicals does it contain?

A Contains chlorinated hydrocarbon, but this -- the base product is phosphate ester. So it presumably is not a PCB.

Q You don't think it has any PCBs in it?

A Well, they said it's phosphate based. I think you would have to look up -- certainly the catalogs would show 312. I can't tell you, but they say it's phosphate based.

Q I see.

A And this occurs all the time. People decide, I am going to have my own clinical safety questionnaire on all the products, and we send it to anybody that sells us anything, and say: Fill it out. That's not a question of saying we don't know the information, we don't have the information, but we want it completed by your people with particular attention to the decomposition -- information on the decomposition products.

Q That was the same question it asked earlier, wasn't it?

A Well, somebody else asked, yes. Somebody else at Ford asked.

Q Ford is still coming back with the same question about decomposition products on the same product, isn't it?

A No. They're coming back asking a considerable amount of information. All sorts of -- of information as far as the details of the toxicity, flash point, specific gravity, the whole business. Does it decompose violently? It asks any number of questions on here. What are the products. In the event of fire, how to put it out. Corrosive action. All sorts of questions.

Q Okay.

The Pydraul that was being discussed in this exchange of correspondence with Ford was a hydraulic fluid, was it not?

A Let me have it back.

VIDEO OPERATOR: Excuse me. While he's looking at that I need to take a short pause.

MR. CRAWFORD: Why don't we go ahead and take a break since it's just about 3:00. Okay?

MR. LACEY: Fine.

A It's a hydraulic, yes.

MR. CRAWFORD: That answered that.

VIDEO OPERATOR: We're going off the record. The time is 2:56 p.m.

[Recess]

VIDEO OPERATOR: Okay. I'm ready.

MR. LACEY:

Q One of the reasons that people would be concerned about the decomposition products of hydraulic fluid is that in the die casting process those hydraulic fluids would likely be heated under use circumstances. Correct?

A Yes, sir.

Q And that's something that you had been aware of since at least November of 1962. Isn't that correct?

A What was the question?

Q You had been aware at least from the date of that memo of the fact that hydraulic fluids used in the auto manufacturing business could be heated by the dropping of molten metal into fluids that might accumulate around the machines.

A In this particular case, yes.

Q Yes. And obviously the questions that Ford was asking about decomposition products at high temperatures would indicate that they anticipated the same thing might occur in their facilities.

A That's correct.

Q Okay.

Now what decomposition products would you expect from that type of event that was described in the communication that you had with General Motors and the circumstances that were questioned about by Ford?

A I'd have to check it. I'd have to check the temperatures involved, I'd have to check which -- which hydraulic fluid it was.

Q I see.

Now, the Tennessee Valley Authority also looked to Monsanto for information about its products, did it not?

A Do we have letters from them?

Q Yes.

A Just happen to have one?

Q Surely. We've already seen, have we not, that there was substantial correspondence between Westinghouse and Monsanto with Westinghouse inquiring for information about Monsanto products? Correct?

A I was reading this. Sorry.

Q We've already seen substantial correspondence back and forth between Monsanto and Westinghouse where Westinghouse was inquiring about additional information on Monsanto-supplied PCB products. Correct?

A We -- I reviewed two letters from Westinghouse.

Q I see.

A I think it was two letters.

Q And we've seen correspondence back and forth between Ford and Monsanto inquiring about information on Monsanto products. Correct?

A We received correspondence from one individual at Ford who was contemplating using a -- a Pydraul -- a Monsanto product. So he's asking for information about it.

Q We see the same thing here with regard to the TVA, do we not?

A Well, I don't know if they were using this at

all. I mean are they contemplating it? I don't know. They apparently asked what it was. And he asked, really, for the composition of the material, which we couldn't tell.

Q You could tell, but you wouldn't give out.

A Well, I think we legally weren't able to because a second company was involved.

Q I see.

Then there's further correspondence with the Tennessee Valley Authority with regard to this Pydraul product. Let me hand you document 25350.

A Is that December the 9th? What number is that? What date is that? November the 14th. Is there a question before me, sir?

Q Yes. They were writing again requesting additional information, and that is the response that is being given by Monsanto to the TVA. Correct?

A They wanted to find specific answers to specific questions, yes, that were not -- presumably not covered in the bulletin.

Q And again they looked not to any in-house source of information or doing any in-house testing or anything like that, but rather looked to Monsanto as the manufacturer of the chemical?

A I don't know what they did as far as looking

in-house. I -- I certainly know they wrote us a letter.

Q Yes. Looking for answers to their questions. Correct?

A Specific questions, yes, sir.

Q Let me see if I can understand the outside laboratories that were used by Monsanto to conduct testing, in particular animal testing. At one point in time you used the Younger Laboratories?

A Yes, sir.

Q And then at a later point in time you used Industrial Biotest Laboratories?

A Yes, sir.

Q Why the change from Younger to Industrial Biotest?

A Younger Laboratory was only efficient as far as running acute testing. It was where we needed to get information about the acute hazard of a product for -- for use in shipping or use in small quantities. For example, we had a package deal that we used for all new products that were going out to research people, to -- small amounts where we ran an acute LD 50, we dropped it in their eyes to see the eye irritation, we put it on the skin, we put it -- we had it breathed by animals at ambient temperatures at saturated atmosphere. So it was an acute testing laboratory. That's all they were able

to do. They were not sophisticated enough for long-term feeding or pathology or anything else.

Industrial Biotest Laboratory was an extremely sophisticated laboratory that was in high repute by all the chemical companies including the -- also including the government, the FDA. Any number of government agencies used Industrial Biotest Laboratory. We used them for long-term feedings and for -- for laboratory work where residual analysis of tissues had to be done.

We also used other laboratories. We used -- Saranac Laboratory for chest things, we used Kettering-Laboratory for inhalation and for other testing. We used Hazelton Laboratories, we used Woodard Laboratories, we used a lot of laboratories.

Q Were there other laboratories that could perform the same types of tests that Industrial Biotest Laboratories could?

A There were -- Hazelton Laboratory might have been able to, Woodward might have been able to. They were not as convenient to us as Biotest. Chicago is a lot easier to get to than Washington.

Q Now, you told me yesterday, I believe, that one Monsanto employee worked at Industrial Biotest for a while, and that was -- who was that?

A Paul Wright.

Q Was Mr. Wright the only Monsanto employee who went from Monsanto to Industrial Biotest and then came back to Monsanto?

A That was the only one I know of. To the best of my knowledge, that's correct.

Q Was Mr. Wright working --

A Dr. Wright, really.

Q Oh, Dr. Wright? Okay.

A Ph.D. He's a Ph.D.

Q Was Dr. Wright working in your department when he left Monsanto?

A No. He was working in agricultural department.

Q Okay. As a toxicologist?

A As a research chemist.

Q Is there a relationship between being a toxicologist and a research chemist?

A Well, a research chemist in agriculture -- in the agricultural field knows a great deal about physiology, and a toxicologist knows a great deal about physiology. So I think it was an excellent preparation for him to go into toxicology, to become a toxicologist.

Q Did Mr. Wright work with your department while he was at Industrial Biotest?

A I don't know what you mean by with my department.

Q Well, you told me that Industrial Biotest did work for many companies.

A That's right.

Q I guess I'm trying to find out whether Mr. Wright was the person who was on the Monsanto account at Industrial Biotest.

A I can't answer that. I -- they had probably 15 people in the same bracket as Mr. -- as Dr. Wright. So I can't say whether he did -- and we had quite a -- number of compounds up there. So he may have worked at some, he may not have worked at some.

Q Let me show you a couple of letters and ask if they refresh your recollection any at all about whether Mr. Wright worked on Monsanto products while he was at Industrial Biotest.

A Well, he certainly worked on teratology studies with three different aroclors in September of 1971.

It appeared he was going to work on -- do some analytical work on urine specimens that we sent up there from our workers in one of our operations.

Q Which operation?

A Decatur, Alabama. And he did some work -- he

presumably looked over the protocols on the Thermonol and phosphate ester feeding studies.

MR. CRAWFORD: Doctor, do you know about this personally or is this just something you are looking at the correspondence and guessing about? I mean do you know that or not?

THE WITNESS: Oh, yeah. I mean this occurred while I was there.

MR. CRAWFORD: That's fine.

THE WITNESS: Sure.

MR. CRAWFORD: I just want to be sure --

THE WITNESS: I'm not guessing, no. I know Paul -- I mean this refreshed what he was working on, but I think you have to realize what a laboratory is. They've got a lot of different section heads. And products from Monsanto might be worked on by five different section heads. He was not as an advertising man doing a whole account for one company.

MR. LACEY:

Q What was the purpose of sending tests like this out to independent laboratories?

A Several reasons:

1. Unless you had a large enough flow of products coming, it was inefficient to have the variety of specialists that you needed to carry out all the

very -- all the details that you needed to do.

No. 2. You had an objective point of view from an independent laboratory. That may or may not be important. Sometimes it was thought to be important, sometimes it wasn't.

But I would say the major point is, unless you could keep your own laboratory busy all the time, they would be sitting around the payroll without compounds to test.

Q Did Monsanto have enough work to keep the laboratory busy?

A Which laboratory? A laboratory?

Q Yeah.

A They did after about 1975 or '76, when they built one after I left.

Q Prior to that time there had not been enough work to keep a laboratory busy?

A That was one of the reasons. And we didn't have the specialists that were needed in the various fields.

Q Did you feel that having a former Monsanto employee work at an independent laboratory on Monsanto products compromised that objectivity you talked about as being one of the reasons you would send things to an independent lab?

A Not in the least.

Q Okay.

Now, if I understood correctly, Mr. Wright came back to Monsanto from Industrial Biotest.

A That's correct.

Q And when he came back, he came back into your department?

A That's correct.

Q And he came back into your department as the manager of toxicology, did he not?

A I don't know if that was his title. He came back there under -- I think Dr. Levinsksas was there at that time. And Dr. Levinsksas was the head. So whether he was a manager and Dr. Levinsksas was a director I don't know. But Levinsksas was the top toxicologist that we had.

Q Let me show you --

A But I don't know when he came.

Q Let me show you a couple of letters that reference his title, just to refresh your recollection, one written to him and one from him.

A Well, the first -- well, in 1975, when he was manager of toxicology, Dr. Levinsksas was a supervisor. I don't know whether Dr. Levinsksas was called director of toxicology and Wright was a manager or not, but

Levinsksas was the No. 1 and Wright was the No. 2.

Q Okay. He had, at least at that time, the title of manager, whatever that meant?

A Yes, that's correct.

Q Was that a responsible position that Mr. Wright came back to?

A Yes.

Q Would the position he came back to at Monsanto be a better position than the one he left, one with more compensation and more -- higher in the organization, so to speak?

A I don't know what salary he was getting at Biotest. I don't know the reasons he wanted to come back, whether it was family or whether he found --

Q I'm sorry. I don't mean at Biotest. I was trying to compare what he was when he left Monsanto with the position he came back to, whether that was a promotion or an improvement in position.

A I think it was.

Q When Dr. Wright came back to Monsanto, he continued to work then from the Monsanto side with Industrial Biotest on its work with Monsanto products. Correct?

A I can't be sure whether he continued to work there or whether -- we had a Dr. Hunt at that time. He

died someplace along the way. I'm not sure of that. We had a Fred Yohannsen who came at that time. I do not remember whether Dr. Wright was the go-between, as it were, between Monsanto and Industrial Biotest. I can't answer that.

Q Those last two letters I showed you are correspondence to and from Industrial Biotest with Mr. Wright involved, are they not?

A Yes, that's correct. But we had -- one of our toxicologists would go up there on monthly visits. So I do not know if Paul did that.

Q Okay.

Who else might have been the toxicologist from Monsanto that would have made monthly visits to Industrial Biotest?

A Dr. Hunt before he died.

Q Okay.

A He died up there, by the way.

Q At Industrial Biotest?

A At the airport.

Q How old a man was Dr. Hunt?

A Younger than I.

Q Heart attack or something, I guess.

A Yes, a heart attack in the airport. And Fred Yohannsen, who was a young toxicologist, I do not know

exactly when he came, he came before I left, obviously, and he might very well have inherited the job of going up and following the testing at Biotest. And Paul may have done some, too.

Q Would it to you compromise the objectivity to have a Monsanto person reviewing Industrial Biotest work who had previously been involved in Industrial Biotest work there?

A Not in the least. I had perfect confidence in -- in Paul's scientific ability and intellectual honesty.

Q What was the -- the point of sending a persen from your department up to Industrial Biotest each month?

A To see how our various projects were getting along, to see if anything was happening that might require some changing in the test procedures.

Q Did you yourself ever go to Industrial Biotest?

A Yes, I was there about three or four times.

Q Was there actual -- I guess laboratory would be the right thing to call it there in Chicago?

A Northbrook up north of Chicago.

Q Okay. Did you ever physically go and observe their laboratory?

A Yes, certainly.

Q How did -- how did the sort of -- the sort of studies that they were doing work? What was in the laboratory or what happened?

A Well, it depends on what studies they were doing. If they were doing feeding studies, two-year feeding tests, they had a group of dogs and rodents in different cages and fed them various levels of materials and weighed them and did laboratory studies on them. And then during the -- the span of the experiment would sacrifice some of the animals, and sacrifice all of them at the end of them. If it were inhalation, it would be the same type of work, only using inhalation.

Q Did you ever observe any of the animals that were actually being used in Monsanto studies to ensure that they were being appropriately handled and all that sort of thing?

A I observed them, but I didn't observe them from the standpoint of telling them their business. Because they were the most reputable laboratory in the united -- commercial laboratory in the United States.

Q But I mean from your own perspective you were looking to make sure things were being done correctly?

A Well, you cannot on an afternoon visit check up on five or six products to be sure everything is done

correctly. Generally you have to take the -- you have to have confidence in Dr. Calandra, who was the head of the laboratory, and the other people that I knew up there. But from what I saw, it looked fine to me.

Q I mean you kept your eyes open while you were walking through to see if there were any problems, didn't you?

A Well, yes. But I doubt if I would have recognized them either.

Q What about your -- your own toxicology people like Dr. Hunt? Were they in a position to better evaluate whether or not there might be any problems in the testing that was going on?

A Yes, I think so. They were toxicologists, certainly.

Q And was one of the reasons they would go up there on a monthly basis just to make sure that everything was going well in the testing?

A That was one of the reasons. Whether that -- I don't know if that was the primary reason. I think the primary reason was to see if there should be any changing in the manner of testing, report back. Because the people whose products we were investigating were always saying, "How are things going with product X?" So you couldn't get a report back until certain periods

so you could come back and say, "The animals are looking fine, they're healthy, they're gaining weight," et cetera, et cetera.

Q Giving sort of an oral report to your own businesspeople about what the results looked like?

A That's correct.

Q Did you do that after you made your visits, give some shorthand summaries of what you saw?

A No, I think I went up there primarily on budget reasons. We were going to do this product. We would talk it over and decide whether or not we would -- what it's liable to cost us and then come back and tell them.

Q Did you have budget restraints with regard to the extent of the research work you might do?

A Well, you always had a certain budgetary allowance that you wanted -- that you had to do. You couldn't spend a million dollars on a particular agricultural chemical, you had to come back and say, "We are going to recommend two-year feeding tests on this products in two species and it's going to cost X hundred thousand dollars."

Q Who made the decision about the depth with which to study the products and therefore the expense involved? Was that basically your decision?

A Well, I think it was a -- a decision on a number of people's parts. It was a decision -- you have to make a commercial decision, you have to make a decision from the standpoint of the laboratory itself, you have to make a decision along with members of the FDA or the agricultural department who are going to ask you for what studies they think they need on this particular product.

Q And when you say studies that they're going to need, for whom are the studies being done ultimately?

A For Monsanto.

Q And you're talking about people who are going to decide what studies are needed. Is that a medical department decision or are there other people who are involved?

A Sure, other people made the decision. Let me tell you about the people inside Monsanto. The people who are coming out with a particular product and say, "I am going to have a soybean herbicide and this looks promising." So I go up there and find out from the government what they want to be done and then I take these things up to Calandra. And sometimes Calandra would go to the government with me. And we would come back and say to the man with the soybean herbicide, "This is going to cost $600,000." And he said, "Well, I

don't think this looks this promising."

Q Okay.

A And he may wash it out.

Q Okay.

A But if he said, "Well, that's all right, this looks good, let's go right ahead with it," that's fine.

So decisions were made from a medical point of view as to what was needed, that was made on -- in confluence with the laboratory doing it, with our own toxicologist and myself and the government authorities.

Q So representatives of IBT would go with representatives of Monsanto to Washington or wherever the government offices might be to even negotiation on the extent of study required for a product?

A They did at times, yes.

Q Did people at Monsanto consult with people at IBT about how to phrase and word their reports and what to report and what not to report in their studies?

A Do you mean did they edit their reports?

Q Yes. That's a way of putting it.

A Well, we would get back their reports. They may have suggested changes in phraseology, but they certainly didn't suggest any changes in the data.

Q Don't you think that making changes in the way the report is initially prepared by the outside

independent lab compromises the independence of their work?

A No, I don't think so. I think it's just like saying: Do you say a glass is half full or half empty? You are just talking about the same thing and you are using a different phrase to express the -- the same physical characteristic of the glass.

Q So it was perfectly acceptable from your perspective as the medical director to have personnel working for you edit and rephrase reports prepared by your independent testing labs?

A I am not saying that they edited it. I am saying that at times there may have been some rephrasing because they didn't appreciate the way the material was going to be used or -- so that was the only rephrasing that I can think of.

Q And you as the medical director would approve of that type of work on the part of your subordinates to assist in rephrasing reports?

A Well, I presume you have some -- some correspondence there. I'll be happy to comment on it. If you have some correspondence where we suggested some changes in wording, I'll be happy to comment on it.

Q My question to you is whether or not that was something that was acceptable for your employees who

reported to you to do or not acceptable.

A It was acceptable if our toxicologist decided on stating, "I think these data should be presented in this the way," yes, that was acceptsable.

Q It would not be acceptable, I take it, to change the substance of the report.

A It would be completely unacceptable.

Q Okay.

Do you recall yesterday when we discussed the information on safe handling and toxicology of PCBs that was put out in England by your English people?

A Yes.

Q The great detailed document?

A Yes.

Q And you discussed with me the fact that you didn't think that much detail was required in the United States?

A Yes. Or would be read.

Q Okay.

Let me show you three documents. And I believe they're each versions of -- in different dates of the same document, which is titled The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry. One that was put out in 1954, a 1956 version, and a 1960 version, documents 1967 through

2051, 2052 through 2138, and 2139 through 2252. Each one of those has a section at the end on toxicology, dermatology, safe handling. You might want to take a brief look at that.

A Yes, sir, I have read 12 -- December '54.

Q Was that information supplied by you in that section?

A Yes, I think so.

Q Now, have you actually seen that entire document, the type of document it is?

A I very probably have during my course of time with Monsanto.

Q That is a very detailed technical document, is it not?

A Yes, it is.

Q The section on dermatology and toxicology, however, is not much more detailed than the sections that you put in the ordinary technical bulletins or product bulletins, is it?

A I don't know. I'll have to look.

Q Please do.

A Well, it describes that skin patch testing that's not an irritant or a sensitizer, it says what to do if it's spilled on the skin, the skin should be washed of accidental burns, it states keeping the hands

out of the liquid and handling it in a well-ventilated hood. It is considered to be more detailed as far as what should be done when sampling. So it is somewhat more detailed, yes, sir.

Q None of it is as detailed as the information that was contained in that bulletin put out by the UK for the UK, was it?

A No, it is not.

Q Now, the rest of that book is very detailed, is it not?

A Yes, I think so.

Q Is there any reason why it would not have been appropriate to put in the same sort of detail on dermatology and toxicology in that type of detail book that was used in the UK?

A It wasn't needed.

Q So your answer then, if I understand it, is that there just wasn't any circumstance under which the detailed information of the type put out by the British Monsanto people on PCBs was necessary. Correct?

MR. FREEMAN: I object to the form of the question. You're misinterpreting what the doctor's answer to the prior question was.

MR. LACEY: Well, let me ask it again so I won't misinterpret it.

Q Was there any circumstance in the United States that would ever be appropriate to give as much detail on the safe handling and toxicity of PCBs as was given by the Monsanto group in the United Kingdom?

A I do not know if any of those circumstances occurred, because I do not know of any histories of ill effect in the electrical industry when they followed the instructions we gave them.

Q Well, if you didn't have a history of ill effect, you would not think then that there would ever be the need in the United States for the same level of detail given in the United Kingdom. Correct?

A That's correct.

Q Even in a very detailed document of the type that Mr. Benignus wrote and that you have in front of you now?

A Well, I don't know why it is detailed in there. These details must be important from the standpoint of -- of use. But the detail is not important in the standpoint of protection, because we protected people by that particular section.

Q Okay. And it was, in your mind, perfectly adequate for that?

A Yes, sir.

Q Okay.

I want to hand you a group of documents. And what I'm interested in doing is not discussing the substance of the documents with you but rather to find out from you whether this group of documents were all documents that would have been available to Monsanto at or about the time of the date of the documents. Some of them are reports that appear to have been done specifically for Monsanto by people like Scientific Associates, Younger Laboratories and others. Others appear to be studies that I cannot directly link to Monsanto. But let me just give you the documents and - I'll reference them.

The first one is 2593 through 2596. Is that a document that would have been available to people at Monsanto at or about the time of the date of the document?

A I cannot answer that, because that is a 1934 and they deal with Swann Chemical Company. That was two years before I came to work.

Q Okay.

A And it was also some time before Monsanto took over Swann.

Q Would that document have been available to you prior to 1940 at Monsanto?

A It might very well have been. I'm sure I saw

Flynn's report sometime in my time at Monsanto, yes, sir.

Q Before your service in World War II?

A I don't know when I saw it.

Q I see.

Let me show you document 21745 through 21753 and ask if that would have been available to people at Monsanto at or about the time of the document.

A Well, this has got two documents on it.

Q That's the way the document was provided to me by Monsanto.

A Well --

Q You may speak -- if you can't answer it as to one and can as to the other, that's fine.

A This second one, 21750, is a report on the chronic toxicity of three polychlorinated biphenyls in albino rats. I do not see a date on it, but it was sent to Dr. Levinsksas. So that would be sometime in the Seventies, either before or after I left the company.

Q Okay. What about the earlier document?

A The earlier document is the program of a symposium on chlorinated hydrocarbons that was held by Drinker in June 1930 -- 1937.

Q 1930 or 1937?

A June 30th, 1937. It was available to

Monsanto because I was at the symposium.

Q Okay.

A The third one is a truncated article with two pages. I don't know how many pages are supposed to be in the article.

Q I have no idea either. That's what was provided to me by Monsanto.

A I don't know the date, but if they -- it appears that it was 1936 in -- in the Archives of Dermatology and Encephalology. And that would have been available to Monsanto because of our interest in anything relating to chloracne.

Q Okay.

A But that is not the complete document.

Q Okay. Again, that's what's been provided to me. But the complete document would have been available to Monsanto?

A Yes, sir.

Q At about the time it was published?

A Yes, sir.

Q Let me next show you a report to Monsanto dated September 15th, 1938, by Cecil Drinker, document 2846 through 2856. Would that have been available to Monsanto at about the time the document is dated?

A Oh, yes. It was a report to us.

Q Yes.

Let me show you another document, also a report to the Monsanto Chemical Company by Cecil Drinker, dated September 15th, 1938, document 2857 through 2870. Would that have been available to you at about the time the document was dated?

A Yes.

Q Let me show you another document by Mr. Drinker, which was printed in The Journal of Industrial Hygiene and Toxicology in May of 1939, document 21622 through 21722, and ask whether that document would have been available to you at about the time of the date it was published.

A You've -- you've given me several different articles in this one batch.

Q Well, can you separate them out for us? I'm just again grouping the document the way it was presented to me. But if we've got a problem, let's take them one by one and get them sorted out.

A We certainly have a problem.

Q Okay.

A Because it starts off with Drinker's article for May of 1939.

Q Would that have been available to Monsanto at or about the time it was published?

A Yes, it would have, yes.

Q Okay.

A In fact, this is the article -- it's an important article, because this shows that --

Q Let me -- let me just suggest to you we're trying to move as quickly as we can. I've got specific questions.

A Okay. Fine. That's an important article.

Then there's a metabolism --

MR. LACEY: I'm going to object to the responsiveness of that comment, but ---

A -- of chlorinated naphthalenes from The Journal of Biological Chemistry. Whether or not that would come to the medical department I don't know. In those years we did not subscribe -- I did not review The Journal of Biological Chemistry.

MR. LACEY: Okay.

Q What other documents do you have there?

A A report to Monsanto Company by Drinker on September 15th, 1938. That obviously came to us.

Q Okay.

A An article by people, plus Drinker, from The Journal of Industrial Hygiene and Toxicology. That would -- dated 1938. That would have been available to us.

Q Okay.

A Get back to the symposium on chlorinated hydrocarbons. My answer to that is the same as the one before.

Q Whatever happened there, it was available. Correct?

A Yes.

Then we have a paper by Drinker again in June of '37 that was available to us.

More discussion about the symposium in September of '37.

Q That would have been available?

A That was available.

And then a report on a preliminary report of the dermatological and systemic effects of exposure to hexachloranaphthalene and chlorodiphenyl by the Commonwealth of Pennsylvania. That might very well have not been available to us. We don't follow all the state publications.

Q Okay. Does that complete that group?

A Yes, it does.

Q Let me hand you another document, dated December 22nd, 1949, addressed to you, document 4050 and 4051. That would have been available about the time of the document, would it not?

A Yes. That was work we had done.

Q Okay.

-- Next a report of February 19th, 1951, by Scientific Associates, documents 19337 and 338.

A Yes, sir.

Q The next document, another report by Scientific Associates, April 17th, 1951, 19339, 340. Would that have been available about the time of the document?

A Yes, sir.

Q Let me hand you another document, dated July 14th, 1951, document 19341, 342. Would that have been available about the time?

A Yes, it would.

Q Let me hand you another document, dated March 11th, 1953, document 4074 through 4155, and ask whether that would have been available to you at about the time it was dated.

A Yes. This was work carried out by Kettering Laboratory for Monsanto.

Q Okay.

Let me hand you a January 13th, 1954, Scientific Associates document, 19381 through 386, and ask if that would have been available to Monsanto at about the time of the document.

A That was available to Monsanto.

Q Another Scientific Associates document, September 13th, 1954, 19279 through 284, and ask if that would have been available to Monsanto at about the time of the article.

A Yes, it would.

Q Another Scientific Associates document, February 1st, 1955, 19343 through 19348. Would that have been available to Monsanto at about the date of the document?

A Yes, it would.

Q Another Scientific Associates, February 3rd, 1955, document 19447 through 19452. Would that have been available about the date of the document?

A Yes, it would.

Q Another document, dated June 22nd, 1955, from the Kettering Laboratory on the toxicity of the vapor of aroclors 1252 and 1254, document 3778 through 3879. Would that have been available to Monsanto at about the date of the document?

A Yes, it would have.

Q Another document, entitled Toxicity of the Vapor of Aroclor 1242 and 1254, dated June 28, 1955, by the Kettering Laboratory, document 3704 through 3777. Would that have been available to Monsanto at about the

date of the document?

A Yes, it would have.

Q Another document from the Kettering Laboratory, dated July 5, 1955, entitled "The Toxicity of a Mist Generated by the Aspiration of Pydraul," document 19238 through 19253, and ask: Would that have been available at about the date of the document?

A Well, this one I can't be sure of, because they are talking about two products, one that's not Monsanto's and one is Monsanto's. It does not say that they sent it to Monsanto. I know we used it, but I -- I cannot be certain on this one.

Q You don't know how or when that would have come into Monsanto's files?

A It might very well have come into Monsanto's file if this came from Monsanto's file.

Q I will represent to you that Monsanto has produced that document to me from their files, or represented that it comes from their files.

A If Monsanto said that came from their files, I would accept the fact that it -- it was available to Monsanto.

Q And it would have come into Monsanto's files at about the time the study was done. Correct?

MR. CRAWFORD: If you know.

A Presumably. I can't answer that definitely, because I don't know.

-- MR. LACEY:

Q That work was done -- what chemical was it that was a Monsanto chemical being evaluated in that study?

A It was a Pydraul that was being evaluated against a Potosaf 271, which is from a different company, I don't know which company it is. And they were testing both of them to see which -- which one might be the more toxic or not. So I -- I can't be positive on it.

Q Is that the sort of thing that you had done from time to time, comparing your products to someone else's products?

A Well, if someone else were using a product and our marketing people said, "Look, we like your product but we would like to know if it is the same ballpark figure of toxicity," we would have gone ahead and done it and compared it with the product. So I say it could very well have been done work for Monsanto, but I can't be positive, because it doesn't say it was sent to Monsanto.

Q Well, did the other Kettering Laboratory reports that you indicated were sent to Monsanto

actually say they had been sent there?

A No. But I remember these.

Q I see.

A And these are all Monsanto products, whereas this has a product of a different company.

Q I see.

Was the Kettering Laboratory in the business of doing work for a fee?

A The Kettering Laboratory, yes, of course. They were not philanthropic.

Q So somebody paid them for that report and that work?

A Certainly somebody did. Kettering Laboratory is a department of University of Cincinnati Medical School.

Q Let me show you another document, a Scientific Associates documented dated July 13th, 1955, document 19289 through 19294, and ask if that was available to Monsanto --

A Yes.

Q -- at about the time of the document.

A Yes.

Q I'll show you another document, a Scientific Associates document dated September 26, 1955, 19295 through 297, and ask if that was available to Monsanto

at about the time of the document.

A Yes, it was.

Q I'll show you another document, from Younger Laboratory, dated August 3rd, 1956, Document No. 19453 through 19459, and ask if that was available to Monsanto at about the time of the document.

A Yes.

Q I note that some of these documents have things handwritten up in the left-hand corner with letters and numbers and the like. What does that mean? Do you know? I noted that on those Kettering reports — and I see it again on that one.

A It must be the filing system that they use. K for Kettering. I don't know what 54 means, whether that is Aroclor 54 or the year '54. But it could be because it's dated '55. Then 050, I don't know. It must be the filing system that they used.

Q I see. And they would -- these reports would come to the medical department, would they not?

A Yes.

Q The report there was some question about had that same identification on it, did it not, the K for Kettering indicating some type of filing system?

A May I see it? It looks like just -- it says K 49. I can't answer that.

Q It has the same type of numbering these other Kettering reports do, doesn't it?

-- A The others are three numbers. K 54-050. This is K just plain 49. I don't know.

Q I see.

Let me show you another Younger Laboratory report, dated February 26th, 1957, document 19206 through 19215, and ask if that would have been available to Monsanto at about the time of the document.

A Yes, it would.

Q Okay.

Let me show you another document, a report of the United States Department of the Interior on the toxicity of certain chemicals, dated March 1957, document 21547 through 21621, and ask if that would have been available to Monsanto at about the time of the document, date of the document.

A Well, here we have another half a dozen reports in here.

Q I see. Okay. Well, do you want to sort those out for us?

A The first one starts with toxicity of fish. That is 021547. That could have been -- by the Department of Interior. That could have been available to Monsanto.

Then we have 21550, Toxicity of Vapors of Aroclor 1242 and 1254 which was available to Monsanto because that was a publication of work done for Monsanto.

Then we get a photostat of Frank Patty's book, Department of Toxicology. That would have been available to Monsanto. We had the book.

MR. LACEY: Okay.

MR. CRAWFORD: What's the date on that, Doctor?

THE WITNESS: It's hard to say. There's a — handwritten second edition. It says approximately 1955. But I don't know.

MR. CRAWFORD: Okay.

THE WITNESS: Then there's also in this same one what appears to be a 1955 publication from the National Institute of Health by von Oettingen.

MR. LACEY:

Q Would that have been available to Monsanto?

A It could have been in our library.

MR. FREEMAN: What's -- what's the identifying number on that document, Dr. Kelly?

THE WITNESS: 21570.

Then we have a letter to me from Meigs. That certainly was available.

A letter back from me to Meigs. Certainly available.

-- And his paper, which was available.

And then a copy of a 1949 edition of Industrial Toxicology, which was also present in our library.

MR. LACEY:

Q And so it would have been available?

A Yes.

Then there is an article in here by Frederick Flynn on industrial exposure to chlorinated hydrocarbons that may have been available to us, I don't know. I find it hard to -- to get the date on it, because in the front it's penciled in 1946, but the references are '44 and '41. But it would be easy enough to find out.

Q Can you tell where that article appeared?

A Yes. American Journal of Medicine.

Q That was out of a periodical that you reviewed --

A Not the American Journal of Medicine. That was not one of my common ones.

Q Okay.

A And then the other one was by Miller, public health report dated 1944. That would have shown up when I was in the service. I can't comment on when or where

that was available to Monsanto.

Q Would it have been available to Monsanto after you came back from the service and tried to catch up on the periodical literature relating to Monsanto products?

A It would have been.

Q So by 1946 or '47 it would have been. Correct?

A Correct.

Q Okay.

A Then there's the Schwartz paper in 1943.

Q Would that have been available to Monsanto at least by the time of your return from the service in your review of literature?

A I would believe so.

Then Greenburg's paper in 1939. That would have been available to Monsanto.

That's it.

Q Did you review the journal Industrial Medicine in connection with your literature review at Monsanto?

A Yes.

Q And did you catch up on any wartime issues of that, when you came back to Monsanto, as it related to Monsanto products?

A I can't remember. But we -- we were still subscribing to it, so I'm sure I looked through the index to see what was happening.

Q You actually had that as a periodical you received on a regular basis in your library?

A That's correct.

Q And that receipt continued throughout the war years?

A To the best of my recollection.

Q Okay.

Let me show you a document dated July 9th, 1957, from Younger Laboratories, 19353 through 19355, and ask if that was available at about the date of the document.

A Yes.

Q Another Younger Laboratories report, February 22nd, 1958, 19314 through 19320, and ask if that was available at about the date of the document.

A Yes.

Q Another Younger Laboratories report, dated September 29th, 1958, document 19298 through 19305, and ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratories report, dated

October 20th, 1958, 19460 through 19463, and I'd ask if that was available to Monsanto at about the date of the document.

A Yes, it was.

Q Another Monsanto -- I'm sorry. Another Younger Laboratories document, dated December 8th, 1958, document 19321 through 19328. I'd ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratories report, dated June 6, 1962, document 3974 through 3977, ask if that - was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratories report, dated June 13th, 1962, document 4156 through 4159, and ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratory report, dated June 19th, 1962, document 4070 through 4073, and I'd ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratory report, dated June

25th, 1962, document 2589 through 2592, and ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratory report, dated July 9th, 1962, document 2601 through 2604, and ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Younger Laboratory report, dated July 17th, 1962, document 19349 through 19352, and I'd ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Let me ask you, there are a lot of Younger Laboratory reports here bunched together, is there some reason you had a big group of work done there in the 1962 time frame?

A I can't remember. I don't know why we did, whether there were freight classifications had changed at that time. These were all acute studies. So that I don't know why we did it. But there would be reasons similar. We may have had to reclassify them as far as freight is concerned or something, I don't know.

Q Okay.

I have another Younger Laboratory report, dated March 4th, 1963, document 2564 through 2571. Would that have been available to Monsanto at about the date of the document?

A Yes, it was.

Q Another Younger Laboratory report, March 4th, 1963, 19260 through 19267. Was that available to Monsanto at about the date of the report?

A Yes.

Q Another report to Monsanto, dated March 28th, 1963, by Industrial Biotest, document 2892 through 2907, and ask if that was available to Monsanto at about the date of the document.

A Yes.

Q Another Industrial Biotest report, dated March 29th, 1963, document 2875 through 2891, and ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Industrial Biotest report, dated March 27th, 1963, document 3928 through 3943. I'd ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Industrial Biotest report, dated

June 13th, 1964, document 19140 through 19147, ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated July 20th, 1964, 19363 through 19380. I would ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated August 11th, 1964, document 19216 through 19223. I'd - ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated November 12th, 1964, document 19148 through 19155. I'd ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated January 10th, 1966, document 19156 through 19164. I'd ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated

November 19th, 1966, document 19275 through 19278, ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated November 9th, 1966, document 19310 through 19313, ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated November 19th, 1966, document 19306 through 19309, ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated November 9th, 1966, document 19165 through 19168. I'd ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory document, dated November -- I'm sorry, dated October 13th, 1967, document 19169 through 19176, ask if that was available to Monsanto at about the date of the report.

A Yes.

Q Another Younger Laboratory report, dated

that book.

Q Okay.

A December '58. That was in there.

Q Okay. And what document number does that begin at?

A 21538.

Q Through --

A Through 546. 21546.

MR. LACEY: Okay.

MR. CRAWFORD: David, we're going to need to shut it down here pretty quick. I was thinking about some way to streamline this stuff you're doing right now. Maybe you could give me the other documents that you want dated and maybe we could just write you a letter and agree that we had them on that date. Would that do it? That may streamline --

MR. LACEY: Well, if we can do that for these reports, that will be fine. We've got quite a few that we've got to get identified and established from this man that they were available for Monsanto. So if the information contained in them were part of the information base that Monsanto had --

MR. CRAWFORD: Let me suggest that if you could give us the numbers of the documents and tell us what you want that we might be able to do that without

SIGNATURE OF WITNESS

-- I, R. Emmet Kelly, M.D., solemnly swear or affirm, under the pains and penalties of perjury, that the foregoing 489 pages contain a true and correct transcript of the testimony given by me at the time and place stated, with the corrections, if any, and the reasons therefor noted on a separate sheet of paper and attached hereto, and that I am signing this before a Notary Public.

R. Emmet Kelly, M.D.

THE STATE OF]

Subscribed and sworn to before me, the undersigned authority, by the said R. Emmet Kelly, M.D. on this the day of , 1987.

Notary Public in and for the State of

THE STATE OF TEXAS]

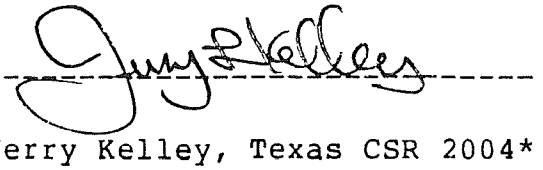
CERTIFICATE

I, Jerry Kelley, a Certified Shorthand Reporter, hereby certify that the foregoing testimony was given before me after the witness had been duly sworn.

I further certify that the foregoing is a true and correct copy of the transcript of the proceedings.

I further certify that I am neither attorney for, related to nor employed by any of the parties or any attorney of record in this cause, nor do I have a financial interest in the matter.

Witness my hand in Houston, Texas, on May 1, 1987.



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*My Certificate Expires
December 31, 1988