UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

JOAN MAERTIN, Executrix of the Estate of Lothar Maertin, JOAN MAERTIN, individually and in her own right, et al.,	)	
v.	)	Civil Action L-95-cv 02849 (JBS)
ARMSTRONG WORLD INDUSTRIES, INC.,	)	Simandle, U.S.D.J.
v.	)	Rosen, U.S.M.J.
MONSANTO COMPANY and AMERICAN MINERAL SPIRITS COMPANY.	)	

DEPOSITION OF DR. KALEY

TAKEN ON BEHALF OF THE DEFENDANT/
ARMSTRONG WORLD INDUSTRIES, INC.

MARCH 3, 1999

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LIST OF EXHIBITS

LIST OF EXHIBITS (continued)

(Original exhibits to be attached to original transcript. One set of exhibits to be attached to Mr. Brian O'Connor's transcript.)

LIST OF EXHIBITS (continued)

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v.

ARMSTRONG WORLD INDUSTRIES, INC.,

v.

MONSANTO COMPANY and AMERICAN MINERAL SPIRITS COMPANY.

Civil Action L-95-cv 02849 (JBS)

Simandle, U.S.D.J.

Rosen, U.S.M.J.

DEPOSITION OF DR. KALEY, produced, sworn and examined on the 3rd day of March, 1999, between the hours of eight o'clock in the forenoon and six o'clock in the afternoon of that day, at the offices of Taylor*Schroeder Reporting & Video, 7494 Ethel Avenue, St. Louis, Missouri, before TAMMIE A. ST. ARBOR, Certified Shorthand Reporter and Notary Public within and for the States of Missouri and Illinois, in a certain cause now pending in the United States District Court for the District of New Jersey, wherein JOAN MAERTIN, Executrix of the Estate of Lothar Maertin, JOAN MAERTIN, individually and in her own right, et al. are Plaintiffs and Armstrong World Industries, Inc., Monsanto Company and American Mineral Spirits Company are Defendants.

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IT IS HEREBY STIPULATED AND AGREED by and between counsel for the Plaintiffs and counsel for the Defendants that this deposition may be taken in shorthand by Tammie A. St. Arbor, CSR and notary public, and afterwards transcribed into printing, and signature by the witness expressly reserved.

* * * * *

DR. KALEY,

of lawful age, produced, sworn, and examined on behalf of Defendant/Armstrong World Industries, Inc., deposes and says:

EXAMINATION

QUESTIONS BY MR. TURET:

Q. Morning, Dr. Kaley.

A. Morning.

Q. My name is Craig Turet. I don't believe we've met before today. I'm here as the attorney for Armstrong World Industries, Inc. which as I'm sure you know is a defendant in this case. Dr. Kaley, you've been through depositions before in your life, correct?

A. Yes.

Q. Have you ever been deposed as a 30(b)(6) corporate designee deponent?

A. No.

Q. You understand -- do you understand your testimony today is the -- is testimony as if you were Monsanto Company addressing certain issues, which we'll go through the notice of deposition.

A. Yes.

Q. Let me before we go forward show you a document that's been marked as T-1, and by the way, it's being marked T whatever for toxicity just like yesterday was PR for public relations.

Dr. Kaley, this is the notice of deposition which was served on Monsanto Company by us. Have you seen this before today?

A. I think I've seen it. I've not read it, I know it exists.

Q. And you understand on Page 2 up at the top you'll see that this is addressed to the persons designated by Monsanto as most knowledgeable regarding the toxicity of PCBs or PCB containing products or substances?

A. Yes.

Q. And you understand that's what you're here to testify about?

A. Yes.

Q. And in addition, it's addressed to Monsanto's knowledge concerning such toxicity at any time between January 1, 1930 and the present.

A. Yes.

Q. And you understand that time frame has been narrowed to 1940's I believe --

MR. DIMURO: '45.

Q. (By Mr. Turet) -- through the end of 1985, and it's your understanding that's also what you're here to address?

A. I don't know that I knew that specifically, but I'll take your word for it.

Q. Well, are you prepared today to be asked questions on behalf of Monsanto Company about Monsanto's knowledge of toxicity during that time period?

A. Yes.

Q. And down at the bottom you'll see there's a request for the production of documents asking for documents reflecting Monsanto's knowledge concerning toxicity to humans or any animal of PCBs or any product or substance containing PCBs. Have you brought any documents with you today?

A. No.

Q. And is it my understanding, is my understanding correct the documents responsive have already been produced in this litigation?

MR. DIMURO: The toxicity documents have been produced.

MR. TURET: But the toxicity documents are the

ones responsive --
MR. DIMURO: The toxicity documents relating to human health and safety have been produced.
MR. TURET: Human or animal?
MR. DIMURO: Animal to the extent it relates to human safety. No environmental documents as you know based on our agreement have been produced.
MR. TURET: That's not exactly correct. The documents you've produced have in large part been environmental documents. Today we're for toxicity. But my question is, is there some universe of animal toxicity documents that were not produced?
MR. DIMURO: Animal toxicity documents that relate to human health and safety have been produced.
MR. TURET: That's the first time I've heard it phrased like that.
MR. DIMURO: That's not the first time. Environmental documents --
MR. TURET: I'm not talking about environmental documents. I'm talking about animal toxicity.
MR. DIMURO: You didn't get any documents, and you haven't gotten them since day one in this litigation and you know that, that relate to environmental problems.
MR. TURET: Are you defining environmental problems to include animal toxicity?

MR. DIMURO: If it's animal toxicity related to human health and safety, you've got it.
MR. TURET: Explain to me what relates to human health and safety means.
MR. DIMURO: I'm not going to explain it. It's been gone over since day one. If you don't know by now, I'm not going to explain it.
MR. TURET: But aside from environmental pollution, we're talking about toxicity. This is directed to toxicity. I'm understanding for the first time you're making a distinction to that which relates to human health and safety which was not all that was asked for.
MR. DIMURO: That's all you were getting in this case and that's all you got in this case.
MR. TURET: So there are documents out there that relate to animal toxicity that were not produced because somebody's determined that it is not related to human health and safety; is that correct?
MR. DIMURO: If it didn't relate to human health and safety, you didn't get it.
Q. (By Mr. Turet) All right. Dr. Kaley, just a few background definitions so that we're all on the same page. When I use the term Monsanto, you understand that Monsanto would include what's now known as Solutia?
A. Yes.

Q. And you understand Monsanto as a term includes the Monsanto Company and any subsidiaries or divisions that are included within Monsanto?
A. Yes.
Q. And that also includes Monsanto Chemical Limited or companies within the Monsanto Company located in Europe or wherever in the world they may be located?
A. Yes.
Q. And when I refer to Armstrong today, you'll understand that Armstrong means Armstrong World Industries, Inc.?
A. Yes.
Q. And as to the term PCBs, you'll understand that means polychlorinated biphenyls?
A. Yes.
Q. Now, Dr. Kaley, what steps were taken to prepare you to address the issues as a corporate designee today?
A. Nothing very specific. I read a couple of, or skimmed a couple of depositions by Dr. Emmet Kelly who played a similar role earlier. And I reread some of the reports produced by Armstrong experts in this litigation.
Q. Have you gone back and looked at the documents that have been produced in this case that you've heard your counsel describe as toxicity documents?
A. No.

Q. Have you gone back and interviewed any current or former Monsanto employees to glean their knowledge about toxicity?
A. No.
MR. TURET: Why don't we mark this as T-2.
(Exhibit T-2 was marked for identification by the reporter.)
Q. (By Mr. Turet) Dr. Kaley, for the record you're being shown a document that's been marked as Exhibit T-2 which is Bates numbered MAE 049906 through 908 which is a December 30th, 1947 letter from Paul Benignus to Celanese Corporation of America. Have you seen that document before today, sir?
MR. DIMURO: You don't have any copies, Craig?
MR. TURET: No, I just brought the one with me.
A. I don't recall specifically having seen it before.
Q. (By Mr. Turet) Having looked at it, I will represent to you this has been produced by Monsanto Company in this case, you can tell by the Bates. Is it fair to say this letter is a response to an inquiry from Celanese Corporation to Monsanto about toxicity of Aroclors?
MR. DIMURO: I'll object.
A. I'm going to, I mean if you want to know that,

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I'm going to have to take some time to read it. I'm sorry, but I'm just going to have to take some time to read it. If you can point to language which suggests that's the case --

Q. (By Mr. Turet) Okay. I can start with the first sentence, as suggested by Dr. R. L. Jenkins in his letter to you on December 23, this is addressed to Celanese, we are pleased to report about Aroclor toxicity considerations.

A. That's fine, and I will agree that's what that says. It doesn't say this is in response to a specific request by Celanese. I'll take it at face value what it is. It's a letter from a former Monsanto employee to Celanese purportedly addressing Aroclor toxicity.

Q. Now on Page 2 there is, and I'll refer you to the sentence that begins in your letter of December 19th to Dr. Jenkins.

A. Yes.

Q. By the way, do you know who Dr. Jenkins is? It says at the top Dr. R. L. Jenkins, Anniston.

A. No, I don't.

Q. You asked whether studies had been made of the possible toxicity or dermatitis due to finished manufactured items containing Aroclors as an ingredient. Are there any documents from Monsanto that

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A. Did you say polychlorinated biphenyl?

Q. Yes.

A. That is true, those would not have addressed Aroclor 5460, but it is an Aroclor product. I don't know about PCBs, if there's anything on PCBs specifically, but the preceding paragraph says Aroclor, and certainly, 5460 falls within that designation.

Q. I just want to make sure, I think you've answered it, but I want to make sure. Had Monsanto as of this date, December 30th, 1947, conducted any tests toxicity tests, specifically on finished products that contained PCBs?

A. Not that I'm aware of at this point.

Q. Now, Mr. Benignus in this letter proceeded to list off commercial applications that were used as of December of 1947, typical large current outlets for Aroclors. Do you see those, they're numbered 1 through 19?

A. I see those, yes. What term did you use to describe them?

Q. You'll see in the paragraph it states the following commercial applications are some typical large current outlets for Aroclors.

A. All right.

Q. Now, there are, you'll see a No. 7 specifically

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address the issue of studies of possible toxicity or dermatitis due to finished manufactured products containing Aroclors as an ingredient back in 1947?

A. I'm not aware of anything specific.

Q. Now, the following paragraph responds to that inquiry with reference to patch tests done with Aroclor 5460. Do you see that?

A. Yes.

Q. What was Aroclor 5460 and specifically, did it contain PCBs?

A. No. It's a polychlorinated Terphenyl product. It may have had some low level of PCBs as a by-product of the manufacturer, but I don't know what level or whether this material did specifically or not, but it was generally a polychlorinated Terphenyl.

Q. Had Monsanto conducted any toxicity tests as of December 30th, 1947 on finished products that contained PCBs as an ingredient?

A. Well, based on the information in this paragraph, it appears that Monsanto or someone tested canvas painted with Aroclor 5460 and an oil modified alkyd resin.

Q. Okay.

A. I think those would be finished products.

Q. I understood you to say 5460 was not a PCB?

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references to plasticizers for nitrocellulose, ethyl cellulose and polyvinylchloride coatings.

A. Yes.

Q. And just to confirm, to your knowledge, let me withdraw that.

Just to confirm, had Monsanto conducted any toxicity testing on plasticizers and polyvinylchloride coatings that contained PCBs as of December 1947?

MR. DIMURO: I'll object to the form.

A. Was your question plasticizers and polyvinylchloride or as plasticizers in polyvinylchloride?

Q. I meant plasticizers in polyvinylchloride coatings.

A. Not that I'm aware of.

Q. And further along, No. 8, there's a reference to a, the use of plasticizers for Purion and Pliolite paints and coatings. And same question, had Monsanto as of December 1947 conducted any toxicity testing on thos types of paints and coatings that contained PCBs?

A. Not that I'm aware of.

Q. No. 13 refers to fire retardant paints and coatings. Same question, had Monsanto as of this date conducted any toxicity testing on fire retardant paints and coatings that contained PCBs?

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A. Not that I'm aware of.
Q. No. 19, the manufacture of dentures, same question.
A. Not that I'm aware of.
Q. I have no further questions on that one. Let me just take a couple of steps back.
MR. TURET: Let's mark these as T-3 and T-4 and T-5.
(Exhibits T-3, T-4 and T-5 were marked for identification by the reporter.)
MR. DIMURO: Can you identify these for the record?
MR. TURET: Yes, I will do that before I go on.
Q. (By Mr. Turet) Dr. Kaley, can you just for the record define, we've been talking about toxicity. Can you give me a definition of toxicity?
A. I think toxicity is, well, toxicity is basically a property of a material which can lead to some usually defined as adverse effect on a living system.
Q. And does that mean, does toxicity mean effect on the human system or is it something broader than that?
A. Something much broader than that. It's any living system would be my understanding.
Q. Would that include adverse effects on fish?
A. Certainly it may.

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Q. And I mean the concept, and does it also mean adverse effects on birds?
A. Yes.
Q. And does it mean adverse effects on plant life?
A. Yes. If there are any for a particular chemical?
Q. Right. No, I'm asking generally, so the term toxicity is clear.
A. Some chemicals can be toxic to plants. I don't know, there's no --
MR. DIMURO: Are you adopting Dr. Kaley's definition of toxicity? Because I notice you didn't provide one in your deposition notice.
MR. TURET: I'm not here to provide anything. I'm asking Dr. Kaley and making sure the record is clear on what the answers are addressing.
MR. DIMURO: And the record is not clear. You sent a notice of toxicity. Are you now asking that Monsanto adopt a definition given by Dr. Kaley? Or if you're going to use toxicity in this deposition, if you're going to use that word, it needs to be defined. Are you willing to accept Dr. Kaley's definition or do you have another one?
MR. TURET: I mean, the definition was clear enough in the notice for someone to be here to testify

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about toxicity. And you found somebody to appear for Monsanto, and that's Dr. Kaley, so if that's the definition Dr. Kaley is addressing, that's the definition we'll use for today's purpose.
MR. DIMURO: As long as you agree with that, that's fine.
MR. TURET: For today's purpose.
MR. DIMURO: If you don't, you run the risk of taking a deposition that has absolutely no meaning, but do what you want.
Q. (By Mr. Turet) Dr. Kaley, I've just had marked three different documents. Exhibit T-3 is a document that's been Bates numbered MAE 039937 through 966. It's entitled Aroclors Physical Properties and Suggested Applications. It's also application data bulletin number O-P-115.
The document that's been marked as T-4 is Technical Bulletin Number PL-311. It's been Bates numbered MAE 059877 through 93.
And document number T-5 has been -- is technical bulletin number O/PL-311. It's Bates MAE 056532 through 552.
A. I see that.
Q. Okay. Let's go back to the first of those, Dr. Kaley, the one that I think was T-3.

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A. Yes.
Q. The technical bulletin O-P-115. Now, as one looks at this, is there any way that you can tell what the date of this particular application data bulletin is?
A. I'm not sure. On Page 27 of the document, on the MAE 039964, there is, there is a small code at the bottom which I find difficult to read. Typically, the date can be surmised from that -- from that number, but there were different codes at different times. So number 1, I can't read it on my copy, and number 2, without reading it, I don't know whether the date may be coded in there or not. It may very well be.
Q. Fair enough. Okay. I would like to direct your attention to Page 19 which is the section that's entitled dermatology and toxicology.
A. Yes.
Q. Now, I'm going to take you through the different technical bulletins and ask you to sort of compare one dermatology and toxicology section with another section that addresses similar topics. What I'm going to ask you to do is put down the points that are included in this one, list them on a piece of paper, and we'll attach them as an exhibit, because it will make it easier as we go to the next to see if the points are the same or different that are being covered. So I want to do it in your

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language rather than mine.
A. Would you repeat that? I'm not sure I understand what you asked me to do.
Q. Sure. Starting with this particular bulletin, I'm going to ask you to make a list of the points that are being made in this section, whichever ones are significant, 1 through 2 or one through 21 or however many there are and we'll compare and go to the next bulletin and so forth. So why don't we at the top, I mean this is going to be Exhibit T-6.
MR. DIMURO: I'm going to object. If you believe they're significant points that you want to address, why don't you have Dr. Kaley identify them. I'm not going to have him go through the document and write them down. That's not his job.
MR. TURET: If you want he can tell me what they are.
MR. DIMURO: You can ask the questions. I'm not going to have him go through the document and write what he thinks is significant.
MR. TURET: I'm asking Monsanto to identify the significant points out of its own technical bulletins. What's the problem with that question?
MR. DIMURO: I don't know what the significant points are. I want you to ask him the questions.

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MR. TURET: I just did.
MR. DIMURO: I want you to ask him the questions.
Q. (By Mr. Turet) Dr. Kaley, would you tell me please, looking at the dermatology and toxicology section, list off for me, if you would prefer, I will write them down and number them and ask you what the points are sentence by sentence, what the points being made out of that section are.
MR. DIMURO: I'll object to that question.
THE WITNESS: Should I do it?
MR. DIMURO: If you can figure it out from his question, sure.
A. All right. I might add before I start this that based on this paragraph, which I don't recall having read before but may have, it does appear that a polyvinyl chloride free film was tested and patch tested. That would be some example of a finished product containing PCBs. So that would go to serve to correct one of my previous answers.
Q. (By Mr. Turet) What exactly is a patch test?
A. It's a test where a square of material or a piece of material is placed in contact with the skin on sometimes the arm, sometimes the back of an animal or in some cases a human, to see if there is a dermatological

Page 2

reaction.
Q. Is there any standard period of time on which it's left or is that defined within the particular patch test?
A. I think it would be defined by the protocol for the particular test. Okay. Based on the information in the first paragraph, a patch test was done with a material containing Aroclor 1254 and dioctyl phthalate and that test showed the film, that the film was not a primary irritant or sensitizer.
Q. Patch test was done with, I'm not that quick a writer.
A. A piece of film containing 11 1/2 percent Aroclor 1254.
Q. Okay.
A. And apparently about 11 or 12 percent dioctyl phthalate.
Q. Okay.
A. And under the conditions of the test, the conclusion was that the film was not a primary irritant or a sensitizer.
Q. And what, just so I understand, what is a primary irritant or a sensitizer? What are those two terms?
A. A primary irritant would be a material that

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causes some reaction on the skin by the very contact of that material with the skin so that you would get an immediate or within the test, a reaction caused by that material.
A sensitizer is a material which makes the skin more sensitive to the effects of some other agent, typically, materials can for instance, can sensitize to sunlight. So you would put the material on the skin, would not find a reaction or redness or rash, and but on subsequent exposure to sunlight, a rash might develop. That would be a sensitizer.
Q. So the patch test was done with a piece of film containing 11 1/2 percent of Aroclor 1254 and under test conditions, the conclusion was the film was not a primary irritant or a sensitizer, correct?
A. Correct.
Q. And what is the next point being made in the dermatology and toxicology section?
A. The next point, a patch test on Aroclor 1254 applied to gauze and then applied, placed in contact with the skin showed no primary irritancy or sensitization. So basically the same conclusion on 1254 alone as it was applied to gauze.
Q. Was not a primary irritant?
A. Right.

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Q. Or sensitizer?
A. Yeah. This one uses different words, but basically the conclusion is the same.
Q. And the next part?
A. The next part addresses patch tests using canvas coated with Aroclor 5460 which as we described earlier is not a polychlorinated biphenyl product.
Q. Since this case is about PCBs, I'll represent to you, I'll modify my questions so that we'll just talk about the parts that would relate to PCB products.
A. That's fine.
MR. DIMURO: I would note the witness is just simply reading from T-3 and you're simply writing down exactly what he's saying reading from T-3.
MR. TURET: That's fine.
A. The next paragraph which is the third paragraph, the first sentence says that if PCBs are spilled on the skin, the skin should be washed with soap solution. And the next sentence says that if a burn occurs from contact with hot Aroclors which would include PCBs as well as other materials, the burn should be treated the same as any ordinary burn.
Q. (By Mr. Turet) So if PCBs are spilled on the skin, the skin should be washed with soap solution. And if a burn occurs from contact with hot Aroclors the burn

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should be treated the same as an ordinary burn?
A. Correct. The third sentence expands on that, both of those a little bit saying if there's Aroclor adhering to a burned area --
Q. Okay.
A. -- it need not be removed immediately unless the treatment of the burn demands it.
Q. Okay.
A. And basically it says in which case use soap and water or repeated washings with a vegetable oil.
Q. So that's if there is Aroclor adhering to a burned area it need not be removed immediately unless the treatment of the burn demands it, in which case use soap and water or repeated washings with a vegetable oil. What is the next --
A. The next statement I believe is significant. It says at ordinary temperatures Aroclors have not presented industrial toxicological problems.
Q. (By Mr. Turet) And by ordinary, does that mean room temperature?
A. Yes, or maybe a little warmer than room temperature. Could be, I mean temperatures typically, that could occur environmentally, so it could be higher than at room temperature.
Q. Okay. Next.

Page 2

A. All right. The next paragraph addresses, if Aroclors are used at elevated temperatures, and suggests if Aroclors in general are used at elevated temperatures it gives the example such as 200 or 300 degrees centigrade in open systems.
Q. Okay.
A. But the methods must be designed to exhaust any vapors.
Q. Okay.
A. It goes on to specify that this applies most especially to the lower chlorinated Aroclors for which experimental work on animals indicates that a maximum saf concentration of vapors in work rooms is in the range of 0.5 to 1.0 milligrams per cubic meter of air.
Q. May I use MG slash M cubed, just to --
A. If you wrote that, I would understand what you meant.
Q. Okay. So if Aroclors are used at elevated temperatures in parenthesis such as 200 degrees or 300 degrees Celsius in open systems methods must be designed to exhaust vapors. Applies especially to lower chlorinated Aroclors for which experimental animals indicates the maximum safe concentration of vapors in the work room is in the range of .5 to 1.0 milligrams per cubic meter of air?

Page 2

A. Yes. It goes on then to suggest that for more highly chlorinated Aroclors such as Aroclor 1268, the allowable limit is about 10 milligrams per cubic meter and goes on to suggest that Aroclors of this type, meaning the more highly chlorinated Aroclors are believed to be of a much lower order of toxicity.
Q. I don't write fast enough.
A. Just read it, it's right there.
Q. Okay.
A. And then the final paragraph suggests that where Aroclor vapors may be encountered in the work rooms local exhaust ventilation together with general work room exhaust is recommended.
Q. So where Aroclor vapors may be encountered in work rooms local exhaust and ventilation together with general work room exhaust is recommended?
A. Yes.
Q. Let's just staple this and mark it as an exhibit and we'll leave it in front of you. I think you'll see why in a moment.
MR. TURET: Can we mark this as T-6?
MR. DIMURO: T-6 was the handwritten document of Mr. Turet.
(Exhibit T-6 was marked for identification by the reporter.)

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MR. TURET: Based on Dr. Kaley's comments from this section dermatology and toxicology; is that fair?
A. That's fine.
Q. (By Mr. Turet) Now, let's put that one aside and move on to the next document that's been marked as T-4, I believe it's PL-311. Now on the cover, this is the best copy that counsel was able to supply, this is the second copy, and it's difficult to read. There's a stamp on it that says revised April something. Can you make that out?
A. Well, unfortunately the one I can't make out is probably the most important. It's April 19 something 2. I don't know what the third digit is. I hesitate to guess.
MR. DIMURO: We don't want you to guess.
Q. (By Mr. Turet) Let me turn your attention to Page 13 of it. And I think you'll see there a line that you described before, there's a line that says WFW. Would that be Walter Waychoff?
A. I have no idea.
Q. And it says 4/62?
A. Yes.
Q. Does that indicate what the date of this revision was?
A. From what I've seen on the previous documents,

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that would indicate the date is April 1962, yes.
Q. Let's go back to the page before it, the toxicity and safe handling section.
MR. DIMURO: Just a point of clarification, if I may ask Dr. Kaley one question. Dr. Kaley, can you tell from this date whether it's, the section was done in '62 or there's a by line after the section. I notice it's not at the bottom of the document, so which are you saying, are you saying the section may be '62 or --
THE WITNESS: My conclusion based on this document and what other documents would be, my conclusion would be the whole document is. I understand the point you're trying to make, and I don't know specifically the answer as to whether it is only that page, that freight classification page or the whole document. But I've not seen it in this form with the specific initials you suggested it's somebody's name, that is the difference. And Mr. -- I don't know specifically, Mr. DiMuro's suggestion may be correct. It may only be this page, but I don't know for sure.
Q. (By Mr. Turet) Given it's part of the document, at a minimum we know it's on or around April of '62?
A. That's correct.
Q. Let's go back to the page before, the toxicity and safe handling.

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A. Okay.
MR. TURET: Can we go off the record for just one second?
(A discussion was held off the record.)
Q. (By Mr. Turet) Why don't we pick up where we left off. We were looking at Exhibit T-4, Technical Bulletin PL-311, the toxicity and safe handling section which is Page 12. Dr. Kaley, let's go through quickly, you have the list we put together from the last application data bulletin, let's see which things are and are not included in this version of PL-311. You see the first sentence that at ordinary temperatures Aroclor have not presented industrial toxicological problems. Would you agree that's No. 6 from the last list?
A. I'll agree with that.
MR. DIMURO: Mr. Turet's list.
MR. TURET: So the record is clear, your objection about my having written the list is on the record.
MR. DIMURO: It's your list. It's No. 6 on your list.
MR. TURET: It is my list, my handwritten list based on Dr. Kaley's comments. And unless we have to put that back and forth every time we refer to the list --
MR. DIMURO: That's fine. I also want him to

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have T-3 in front of him with your list on his comments. The only comment I was making is that he was looking at No. 6 on your list. It's your list. You wrote it, it's your list.
Q. (By Mr. Turet) Dr. Kaley, let's go through PL-311, which is the one that's in front of you.
A. Yes.
Q. Is the first sentence about at ordinary temperatures contained in the previous section on toxicity and safe handling?
MR. DIMURO: Previous section of which document?
Q. (By Mr. Turet) The list that is in front you that was derived from application data bulletin O-P-115 marked as T-3.
A. Yes.
Q. The next section which begins, the hazard of potential toxic exposure varies with the volatility, the lower chlorinated more volatile ones prevent more of a potential problem from the standpoint of both inhalation and skin contact. Is that also contained in the Exhibit T-3?
A. Those exact --
Q. The substance of it.
A. Yes, the substance is included, yes.

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Q. And the next sentence that begins when Aroclor compound and ends with work room exhaust, is that also included within Exhibit T-3?
A. Yes.
Q. The next paragraph vapor of the liquid Aroclor compounds at room temperature should not be breathed in a confined space and no vapor of any Aroclor compound evolved at elevated temperatures should be allowed to be dispersed into the general work room; is that also included?
A. I would say there's a little bit of difference. Certainly the elevated, the vapor of elevated temperatures should not be allowed to be dispersed into the general work room is worded a little differently because the previous documents says if there is Aroclor vapors in a work room the general work room exhaust is recommended. I think the thought is the same, the wording is a little different.
Q. And in Exhibit T-3 they referred to elevated temperatures in open systems?
A. Yes.
Q. And this one is talking about vapors evolved at elevated temperatures in general in the general work room?
A. But --
MR. DIMURO: Object to the form. You can

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and toxicology in general. And the second includes a separate section for inhalation.
Q. (By Mr. Turet) And for skin contact?
A. And for skin contact, yes.
Q. Now moving into the skin contact section, first one relates to a Schwartz patch test on 200 volunteers shows Aroclor 1254 was neither a primary skin irritant or a sensitizer. Was that also in the last exhibit, T-3?
A. It was in less specificity, but that addressed skin patch tests, yes.
Q. And the next sentence beginning continuous or repeated skin contact with the Aroclor compounds must be avoided by the use of gloves and protective garments because of the possible occurrence of a condition called chloracne. Was that included within T-3?
A. No, that does not appear to be in the previous document.
Q. The next sentence says although reports of this condition caused by Aroclor compound are rare, it can be produced by excessive skin contact. Was that included within the last toxicity section?
A. There was no discussion of chloracne in the previous document.
Q. And the final sentence in this paragraph, if any Aroclor compound is spilled on the skin, the skin should

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answer.
A. All I would say is that only in an open system would the vapors be allowed to be dispersed, so if it was a closed system, there wouldn't be vapors. So whether there's an open system, the fact that the second document, T-4, discusses not allowing them to be dispersed by implication suggests they're open systems. So if any difference, it's just in wording. The meaning is the same.
Q. (By Mr. Turet) Now, on the Exhibit T-3 which we've been through, there was the sentence that applies especially to lower chlorinated Aroclors for which experimental work on animals indicates the maximum safe concentration in the work room is in the range of .5 to 1.0. Is that also contained in Exhibit T-4?
A. Yes, there may be various minor wording changes but, yes, it's essentially the same.
Q. And then that's all under the section labeled inhalation; is that correct?
A. Yes, it is.
Q. And was there similar a breakdown of sections in the last bulletin to your knowledge?
MR. DIMURO: Speaking about T-3?
MR. TURET: Yeah, T-3.
A. No. The second one or the first was dermatology

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be washed in a usual manner with a soap solution. Is that included in the last technical bulletin we looked at, T-3?
A. Yes, it is.
Q. And the final paragraph down below, there's a reference to, well, is that the same substance that was communicated in the last one?
A. That's pretty much the same words, yes. Clearly, the thought is the same.
Q. Let's put that one aside.
MR. DIMURO: Which one?
MR. TURET: T-4. Exhibit PL, it's technical bulletin PL-311 T-4, and move onto T-5 which is --
MR. DIMURO: Just to let Dr. Kaley know, if you need to look at T-4 it's here.
Q. (By Mr. Turet) And T-5 indicates at the top, Monsanto Trade Literature Permanent File. Is that the same one you're looking at?
A. Yes.
Q. Now looking at the end of that document, Dr. Kaley, the second to the last page, there's a similar line that we saw in the last one that says 1/2/68. Does that indicate the date of this publication is January 2nd 1968?
A. I'm not sure about that. And the reason I say that is below the Bates number there's another

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designation, another series of numbers near the end. It says 0668 dash something. Based on my experience with other documents, that would suggest to me that document may have been a June 1968 document. So I would agree that based on what I can see in this document, it was issued sometime in 1968, but I don't know which of those particular numbers addresses the correct month.

Q. Okay. You'll find the toxicity and safe handling section on Page 18.

A. Yes.

Q. And I think you'll also find actually, if you look at the technical bulletin we just put aside, which was T-4 and put them side by side, rather than going sentence by sentence, do you see any differences that are significant?

A. I took the opportunity at the break to compare the two. I see a very minor wording difference at the end of the third paragraph under inhalation. It's basically a rearrangement of words. Those are the only differences in a quick reading that I saw.

Q. Which rearrangement of words, just so I'm following with you, the threshold limits?

A. Well, if you look at the last sentence, the threshold limits for an 8 hour working day set by the American Conference of Government Hygienists are 1.0

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A. I believe it's, on my copy it's the next to the last page. And I see that designation, yes.

Q. And does this indicate to you that this document was created on or about January of 1968?

A. I have the same comment, if you look to the other series of numbers under the Bates stamp, the last numbers say in my reading of this 0568. That might indicate to me it was produced in May 1968. So I would have the same comment. It appears it would be a 1968 document, but I can't designate the month as I sit here.

Q. As you look at the document we just put aside which is T-5 which had the same designation at the bottom and you look at the toxicity and safe handling section side by side --

A. Could you direct me to a page?

Q. Page 18 in the document we looked at.

A. I've got that open.

Q. Page 50, it looks like Page 50 in this one.

A. Yes, I have that.

Q. After looking at it, I'm going to ask you whether the toxicity and safe handling instructions are the same in both technical bulletins.

MR. DIMURO: T-5 and T-7?

MR. TURET: Correct.

A. I finished a cursory reading.

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milligrams of lower chlorinated per cubic meter of air and .5 of the more highly chlorinated such as Aroclor 1254 per cubic meter of air.

The other document ends .5 to 1.0 milligrams per cubic meter of air for the highly chlorinated such as Aroclor 1254, which is a rearrangement of the parenthetical phrase.

Q. But that seems --

A. That's what I said.

Q. Other than that, the toxicity and safe handling sections of these two technical bulletins, T-5 and 4 seem to be the same?

A. They appear to be with my cursory reading, yes.

Q. And yesterday, we had a document marked as Exhibit PR-5 which is Technical Bulletin O/PL-306 which I would ask you to take a look at, and again, asking you about two things, one, is see if there's anything in there that indicates to you what the date of the document is.

MR. DIMURO: Can you mark it?

MR. TURET: With a separate exhibit right next to it? Can you mark it as T-7?

(Exhibit T-7 was marked for identification by the reporter.)

Q. (By Mr. Turet) Specifically, if you turn to the very last page, do you see the 1-2-68?

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Q. (By Mr. Turet) Okay. And based on your reading of the two toxicity and safe handling sections, would you agree that they are the same?

A. Yeah. The only, again, there's the wording change that we talked about earlier is present in the last line of Paragraph 3 under inhalation.

I would also note that this document in at least one place specifically talked about Aroclor plasticizers versus Aroclor compounds which is consistent with the fact that it's a plasticizer bulletin.

Q. And does that language appear, just going quickly back to the document that was marked as T-3 which is the Aroclors physical properties and suggested applications --

MR. DIMURO: Does what language appear?

Q. (By Mr. Turet) Page 19, is there any reference to its use as a plasticizer there?

A. Well, the first paragraph talks about a skin patch test, talking about its use in a film, it says plasticizer with Aroclor 1254, so there is some mention of plasticizer uses.

Q. Agreed, but this isn't the inhalation section which you pointed out. Is that the analogy to the last sentence you're talking about, Aroclor vapors may be encountered in work rooms?

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A. Yes.
Q. Now, you've look at a few technical bulletins, as you sit here today, are there other technical bulletins that relate to the Aroclors as plasticizers that offer different toxicity and safe handling instructions?
A. Not that I'm aware of as I sit here right now.
(Exhibits T-8A and T-8B were marked for identification by the reporter.)
Q. All right. We can put all those aside. Let's mark this as T-8A and T-8B. They're two interoffice memos Bates numbered MAE 052506 to 508 and MAE 052509 to 512, and these are two interoffice memos from August 30th, 1949.
A. Should I take time to read these or do you have specific questions?
Q. I will direct you. Do you, first off, do you know what these two memoranda are?
A. Not specifically.
Q. Is it a format that was typical within Monsanto as a summary of toxicity for a particular product?
A. It's not a format I'm familiar with.
Q. Now, on Page 2 of the exhibit, is it 7A?
A. 8.
Q. I'm sorry, 8A, there's a paragraph, Paragraph F, there's a reference to a circular from P.G. Benignus to

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phosphate division salesmen describing the use of Aroclor 1254 as a plasticizer for sealing cracks in glass-lined tanks used in the brewing industry.
A. I see that paragraph or designation.
Q. Now what documents within Monsanto reflect toxicity testing done on the use of Aroclors in a sealant in the brewing industry?
MR. DIMURO: I'll object to the question.
A. Other than the documents that you're showing me here, I know of no other documents that reflect that.
Q. (By Mr. Turet) Okay.
A. We're looking at A and I'm referring to the first paragraph, or the designation number one on B which talks about sealant composition in beer tanks.
Q. Okay. And that's under oral ingestion of Aroclor 1254?
A. Yes.
Q. Does that confirm there had been some toxicity testing on oral ingestion involving Aroclor 1254 and sealants?
MR. DIMURO: I'll object to the form.
A. I would -- there had been a test done to determine whether taste or odor could be detected in beer when the sealants were used. I don't know whether -- I certainly wouldn't call that toxicity testing, and whether

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MCC, the statement that MCC considered that no toxicological problem was presented is based on any further follow up. I don't know the answer to that. The test as I see it described, I would not necessarily call it toxicity testing.
Q. (By Mr. Turet) Okay. Would you agree though that there was testing, there was taste testing done on the beer that was manufactured in a tank that had Aroclor 1254 as a sealant?
A. Based on this document, yes, I would agree with that.
Q. And by MCC, that's Monsanto Chemical Company?
A. That's what it means to me.
Q. And Monsanto in this document has concluded there was no toxicological problems as a result?
MR. DIMURO: I'll object to the form. You can answer.
A. The term they use is considered in this, so I would go with the wording there, but yes, based on their observation, there were no toxicological problems evident.
Q. (By Mr. Turet) Did Monsanto conduct any toxicity tests other than this one that involved ingestion of Aroclor 1254 as part of a finished product?
A. I'm not aware of any as I sit here.
Q. Did Monsanto conduct any toxicity testing that

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involved inhalation of PCBs from a finished product containing 1254 as of 1949?
A. In humans or animals?
Q. Either.
A. As far as I know, there was nothing done in humans. I'm not sure, I would have to go back to some of the other documents you've shown me. I don't know whethe the inhalation testing from the work done at the Kettering Institute in the '50's included any finished products, or not as I sit here, I don't know the answer to that. It may have.
Q. Other than the work done by the Kettering Labs?
A. As far as I know, no.
Q. Now down, as long as we're on 8B, there's also a section regarding dermatology of Aroclor 1254 in PVC.
A. Yes.
Q. And there's a reference to the free PVC film plasticized with 11 1/2 percent of Aroclor 1254 and a similar amount of dioctyl phthalate. Was that the skin patch test to which you referred before in the technical bulletin?
A. My understanding would be it would be the same test, yes. I don't know that specifically, but certainly the wording is similar enough and the experiment described is similar enough I would assume they were the same test,

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yes.
Q. When was this particular skin patch test conducted or any skin patch test by Monsanto that included a free PVC film?
A. I don't know the answer to that. Obviously, sometime before 1948 so -- I believe the patch testing was done in the late '40's. I don't know a specific date as I sit here.
Q. Did Monsanto conduct any other patch testing on a finished product that contained Aroclor 1254 as a plasticizer as of 1949?
A. Not that I'm aware of. As I sit here, I don't know.
(A short break was taken.)
MR. TURET: Why don't you mark this as T-9.
(Exhibit T-9 was marked for identification by the reporter.)
MR. TURET: And for the record, T-9 is a document Bates numbered MAE 052497 through 501. It's a December 4th, 1952 memo.
Q. (By Mr. Turet) Dr. Kaley, there's a reference in the first paragraph to Dr. Newman. Was Dr. Newman a medical director of Monsanto abroad, Monsanto Chemical Limited or Monsanto Europe?
A. I don't know.

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A. I see that.
Q. What was the discussion taking place back in 1952 between Dr. Newman and the sales department and wit certain customers that related to the problem of Aroclors and toxicity?
A. I would have to, assuming that that information is in the document, I would have to read the document. I can't answer that without taking time to read it.
Q. Okay. If you want to take the time to read it, please feel free.
A. Is the answer to that question in here?
Q. I'm not sure.
A. All right. I've read the document, or read it quickly.
Q. Would you agree, Dr. Kaley, that the enclosures or excerpts are various technical bulletins of Monsanto Chemical and Monsanto Chemical Limited?
A. Yes, I would.
Q. That relate to PCBs or Aroclors?
A. Yes.
Q. And does that help you to understand what the problem that's being discussed between Dr. Newman, the sales department, and certain customers was with regard to certain Aroclors and toxicity?
A. I would only be able to surmise, but it appears

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Q. Do you know who H.R. Newman was up at the top? Was that the same Dr. Newman?
A. I don't know specifically.
Q. Do you know who Dr. J.A. Gardner, Fulmer, was?
A. No.
Q. Do you know who Mr. D.V.N. Hardy of Fulmer was?
A. I have heard Mr. Hardy's name, yes.
Q. Who is Mr. Hardy?
A. He was an employee of Monsanto Limited, that's all I know.
Q. Do you know whether he had specific responsibilities related to toxicity?
A. I don't know that.
Q. Do you know if he had any responsibilities related to occupational medicine?
A. I don't know specifically.
Q. Okay. And how about M.L. Harden, H-A-R-D-E-N, the author of this document?
A. Don't know specifically.
Q. Do you know generally?
A. No. I would assume since he's writing on Monsanto Limited stationary he's an employee, but other than that, I don't know anything.
Q. You see the subject up at the top of the document is Aroclors dash toxicity?

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to have something to do with customer inquiries about toxicity of Aroclors. Other than that, I don't have any specific information and really can't glean anything from this document.
Q. Okay. On the top of Page 2, Mr. Harden states that he would sum up his reaction to the question of toxicity by saying the risks had been exaggerated in some quarters. I'll ask you about the rest of that in a minute. What does that mean, the risks have been exaggerated with regard to Aroclors and toxicity back in 1952?
A. I don't know what Mr. Hardy was addressing.
Q. And what is meant by common sense precautions such as one would take in handling most organic chemicals are all that is required?
A. To me, that would mean use the precautions such as exemplified in the attachments to this paper.
Q. And so the common sense precautions are the ones set forth in the toxicity and safe handling sections of the different technical bulletins?
A. Yes.
MR. DIMURO: Referred to in T-9, is that what you're referring to?
A. Those attached to T-9. My reading would be he was attaching those as the kind of common sense

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precautions that ought to be taken.
(Exhibit T-10 was marked for identification by the reporter.)
Q. (By Mr. Turet) Okay. Dr. Kaley, you're being shown a document that's been marked as Exhibit T-10, Bates numbers MAE 033722 through 734 which is an interim report on Aroclor in gases.
A. Yes.
Q. Now, Dr. Kaley, is this interim report a form which you're familiar?
A. Not specifically, no.
Q. Are you, is it fair to say that an interim report was an interim research report produced within Monsanto back in the 1953 time period?
MR. DIMURO: I'll object to the form.
A. I think that's a fair conclusion, yes.
Q. (By Mr. Turet) And on Page 2 of the document that you're being shown --
A. Right.
Q. -- you'll see research department phosphate division Anniston, Alabama?
A. Yes.
Q. Anniston, Alabama was one of the Monsanto facilities where PCBs were manufactured, correct?
A. That's correct.

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A. That would have been one of the functions of that department. The name's changed through the years and it's hard to really define without asking him specifically. But certainly, by the title of that department, that would be one of the responsibilities for that group of people.
Q. (By Mr. Turet) Okay. As you flip ahead to the page in this report that says No. 1 at the top --
A. All right.
Q. -- and as I think you'll see in the introduction section, would you agree that Dow Chemical Company expressed an interest in 1953 in using Aroclors as a plasticizer in paint, siyrene Latex paint systems?
A. Yes.
Q. Would you agree also that Monsanto's plastics division in their Springfield laboratories had done some testing on the vaporization of PCBs out of paint?
MR. DIMURO: I'll object to the question. You can answer.
A. The document says the plastics division Springfield laboratory indicated that the use of such paints under certain conditions had been tested. It doesn't necessarily say they did the testing, but they're certainly aware of some testing.
Q. (By Mr. Turet) So it was either done by them or

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Q. There's a list of 18 copies that were disseminated within Monsanto. Do you see that?
A. Yes.
Q. Actually 16, and one of the recipients is Emmet Kelly, the medical director at Monsanto at the time; is that correct?
A. Correct.
Q. And Paul Benignus was another who we saw earlier referred to in one of the documents?
A. Yes.
Q. Now, are any of the other gentlemen on this list ones you recognize as having been involved in either toxicity matters or medical department matters?
A. No. Then again, I wouldn't characterize Benignus necessarily as being involved in those. He was primarily involved in marketing. He was not a part of the medical department, so Dr. Kelly's the only one that I do recognize as being specifically involved in the medical department.
Q. Now, on the letter you saw earlier today, the 1947 letter signed by Paul Benignus, it says product development department. Was the product development department one which considered new uses for existing products?
MR. DIMURO: I'll object to the question.

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someone else that they were monitoring?
MR. DIMURO: Objection.
A. Or that they were aware of the testing. I don't know whether they were monitoring them or not.
Q. (By Mr. Turet) Let me refer you ahead to Page 2 under the references section. There's a Monsanto Chemical Company plastics division confidential report on Aroclor Vapor in Air from Paints. Is that -- does that help in concluding whether there were or weren't tests performed?
A. There was never any doubt the tests were performed. This indicates to me that Monsanto had some direct involvement. It could mean they did the testing, or in this case, they had some role in seeing that testing was undertaken, yes.
Q. If it's a confidential report done based on research and it's a confidential Monsanto Chemical Compan report, does that confirm the testing was done in-house as opposed to outside the company?
A. No, not necessarily.
Q. Have you seen the document, this report on Aroclor vapor in air from paint?
A. I don't know whether I seen this specific document or not. I don't have a specific recollection of seeing this document.
Q. Okay. Now, up -- in the back in the

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introduction section, there's the statement that for this reason Dow is dubious about the use of Aroclors for this application. Do you see that?

A. I see that.

Q. And this, for this reason they're talking about, it's referring to the findings of the plastics division that vaporization occurred from paint; is that right?

A. Yes. It's referring to the fact that under the conditions of the test the use of the paints in enclosed areas under certain conditions, and I don't know what conditions those particularly were, resulted in Aroclor concentrations above some accepted safe maximum limit for continuous exposure, yes.

Q. Now, this was, this report relates to further research that was being done by Monsanto on the use of Aroclors in paint, correct, this isn't the same research that was done in the Springfield facility, right?

A. Based on the introduction, and without having read the rest of the report, it appears to be. And I wouldn't call it research. It appears to be testing done to determine the concentration to which operators at the Anniston Plant are exposed.

Q. And what is the stated purpose of this further testing that's being done at the request of the sales department? If you look at the second paragraph, the

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introduction --

A. I think the --

Q. The sentence that begins --

A. Okay. This sentence that you're, I wouldn't call it a stated purpose, but it appears based on the good health of our workers at Anniston, if one could determine the Aroclor exposure to which they were exposed on a daily basis. That might give some basis for saying that, to determine whether the conditions under which the paints were applied in the previous test were comparable to those worker exposures.

Q. So in other words, they were trying to do testing that would demonstrate that other, whatever the level of vapor, as it gets out of paints, it would not pose a threat to those who applied the paints?

MR. DIMURO: Objection.

A. I think they were trying to determine whether the exposures that the workers were exposed to were above or below what they determined in those rooms under those specific testing conditions. It doesn't, I mean without knowing above or below, you can't draw the conclusion that you were drawing, that they pose no harm. They were trying to see whether that information would be useful to make some comparison to those levels.

Q. (By Mr. Turet) Well, back at this time, 1953,

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is it fair to say there was a level that was recommended for the vapors of PCBs in the air that was included in the technical bulletins on behalf of Monsanto?

A. Yes. Based upon Monsanto's testing, there had been some discussions and estimations of safe maximum levels as the term is used in this particular document. ACGIH adopted those levels. They're still in use today, so, yeah, there was some, based on that testing, there was some awareness of what were accepted maximum levels, whether those were -- well, I won't say anymore.

Q. And back in 1953 accepted levels were 1.0 milligrams per cubic meter for the lower chlorinated Aroclors and .5 milligrams per meter cubed for Aroclor 1254; is that correct?

A. That's what they are today. I don't know specifically how they were phrased back at that time, but that's the -- that's certainly ACGIH's recommendation.

Q. In the summary section, am I understanding this correctly that the plastics division had found concentrations in the range of 1 to 5 milligrams per meter cubed? Referring you specifically to the third paragraph.

A. I'm sorry, I'm going to take time to read this summary just so I know everything that's in there.

Q. That's fine. Well, is my understanding of this

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research correct that the plastic division of Monsanto had found levels of between 1 milligram and 5 milligrams per cubed meter of air -- PCBs based on the application of paint containing PCBs?

A. I'm sorry, point me to where you're referring to.

Q. Two places. One is the last paragraph on Page 1.

A. All right. Yes.

Q. And other is on Page 5.

A. Right. I remember that. I'm having trouble sorting out what's in the plant and what's in the paint. Okay. Yes, it does say that the plastics division did report concentrations in the 1 to 5 milligrams per cubed meter range but certainly the context is important here in that the author of this report is saying it's difficult to believe those numbers are correct based on the results they found in the testing at the plant.

And I might add at this point, those kinds of determinations in the '50's were very crude and difficult to do. There was hardly any way, I can't even imagine, as an analytical chemist, I can't imagine they were able to do those kinds of measurements. So I think the conclusion he is drawing is entirely appropriate.

Q. Okay. But would you agree that that was the

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results of testing that was performed at the time back in 1953?
A. That was the report of the -- from the people who had done that testing, yes.
Q. And that was Monsanto's conclusions at the time; is that correct?
A. That was what -- well, I don't know about conclusion. That was the report from that particular set of tests, yes.
Q. Of Monsanto?
A. Yes.
Q. And these additional tests that are being done in Anniston, Alabama, and I'll direct you to the conclusion section of the report, found that the Aroclor vapor concentrations are almost never below the 1.0 milligram per cubed meter level and often reach even 5 milligrams per cubed meter of air; is that right?
A. That's what the report is in the plant, yes.
Q. And this particular report closed with the recommendation that more testing be done of the air where, let me withdraw that. This closed with the recommendation that further samples of the air at the Aroclor plant be done; is that right on, Page 5?
A. Yes, the first recommendation is that air sampling be continued to obtain more complete data.

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Q. And the second recommendation was that Aroclor containing paint be obtained and applied so that the room could be tested for vapors; isn't that right?
A. Well, it says that they, yes, generally, yes, that they recommended a sample of the paint be secure and that that room be painted, that that testing be done to see if the earlier concentration report with that finding could be duplicated.
Q. They wanted to know what the levels were going to be when they applied PCB containing paint, correct?
A. They had the original report which suggested what the levels were. The author of this report suggested that it's difficult for him to conceive that could be correct. So he was, this recommendation was proposing an experiment to see if those numbers, that result could be duplicated.
Q. Isn't it fair -- is it fair to say there is a difference between an interim report and a final report?
A. Yes.
Q. And the final report includes all the data leading up to the end of the set of tests? In other words, there's no further testing that's recommended or that's to be done when you get to the final report?
A. I wouldn't say that's true at all.
Q. What is the difference between an interim report

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and a final report?
A. Well, I think you've properly characterized the difference. An interim report is obviously the report along the way of a particular set of experiments. The final report would be the conclusion of this set of experiments. But a final report could certainly include a recommendation that further testing is necessary.
Q. Have you seen a final report on the testing of Aroclors in the air that's reflected in this interim report from 1953?
A. Not that I'm aware of.
Q. Did Monsanto prepare a final report?
A. I don't know the answer to that as I sit here.
Q. Let me -- also, there was a question posed and you indicated you didn't remember offhand what the permissible level or recommended level was back in --
A. I just don't remember how it was phrased, whether it was specific to Aroclors or not, but go ahead.
Q. The first document we looked at today that was written by Mr. Benignus said that the permissible level for Aroclor 1254 was .5 milligrams per meter cubed. This would be T-2 on the first page.
A. Well, that's a 1947 document referring to Drinker work, but the time of this other work, 1953, my understanding is it very well could have been the results

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from the Trion work were known and that ACGIH looked at those levels and set new levels. So I wouldn't refer to this document to determine what the acceptable levels were in 1953. I would have to go back and check.
Certainly, that's what this document says, but I don't know if those are the levels being referred to in the 1953 document. I'm not quibbling about the numbers. Certainly, the OSHA numbers today, that .5 per meter cubed for Aroclor 1254 and 1.0 per meter cubed for Aroclor 1242 are the acceptable levels.
Q. And those are also the ones in the toxicity and safe handling sections?
A. Yes.
Q. I just wanted it clear, there wasn't a sudden blip up from .35 for 1254 and coming back down or something like that.
A. No.
MR. TURET: Mark this as T-11, please.
(Exhibit T-11 was marked for identification by the reporter.)
Q. (By Mr. Turet) Dr. Kaley, you're being shown a document that's been marked as Exhibit T-11 which is Bate numbers MAE 052485 and it's a September 1st, 1953 memo from Elmer Wheeler.
A. Yes.

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Q. Now obviously Elmer Wheeler was in the medical department back in 1953?
A. Yes, he was.
Q. And E. Mather at Ruabon, was he in the medical department of Monsanto abroad?
A. I don't know.
Q. Do you know who E. Mather was?
A. I've heard the name. Other than to say the name, I can't really broaden that.
Q. Okay. Up at the top in terms of recipients, it's addressed to some of the names we saw previously, Dr. J.W. Barrett, London.
A. Yes.
Q. He was the who authored Exhibits 8A and 8B I believe. No, it was addressed to him, pardon me. The two memorandum related to summary on toxicity on Aroclors.
A. Okay. I'll take your word for that.
Q. Do you recognize any of the names up there as being people who were involved in the medical departments of Monsanto's affiliates abroad?
A. No, I don't.
Q. In this document, this is -- there's a reference to a Mr. Beauregard having asked the Monsanto medical department to comment on a particular letter relating to Aroclor toxicity, if you look at the heading.

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A. I see that.
Q. First of all, who was Mr. Beauregard?
A. I don't know.
Q. What was the substance of the letter that related to Aroclors and toxicity back in 1953?
A. I don't know. You're talking about the letter referred to above or this letter?
Q. The letter referred to above.
A. I don't know.
Q. Do you know what the toxicity in Aroclors issue is that's referred to in this memo?
A. Not specifically. Without surmising from the contents of this memo, I don't know.
Q. Would you agree that at least in the last paragraph one of the toxicity issues being raised is focus on the use of Aroclors as plasticizers in the emulsion paints?
A. Yes, I've read that paragraph.
Q. Okay. Would you agree that's one of the Aroclor toxicity issues that's the subject of the memo, is the use of Aroclors as a plasticizer in emulsion paints?
A. Well, it's more on a side to the memo than a subject to the memo, but it says they were watching the use of Aroclors as plasticizers in emulsion paints, yes.
Q. Now, Mr. Wheeler states that we, referring to

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the medical department of Monsanto, do not recommend they be used in paints that might be applied in confined or unventilated areas. And I recognize I'm not reading the whole sentence, just focusing on that part, what testing had Monsanto done as of September of 1953 with regard to the use of Aroclors in paints in confined or unventilated areas?
A. Other than the work we previously discussed, I don't know of any additional.
Q. So the plastics division in Springfield that we saw and the Anniston, Alabama testing, there's no other testing you're aware of?
A. Not as I sit here right now, no.
Q. Now, there's, Mr. Wheeler specifically refers to this being a case of worrying about the exposure of painters who may apply such materials day in and day out rather than worrying about those who might occupy the room during or shortly after the paint had been applied. See that?
A. Yes.
Q. Now I understand that the basis for worrying about exposure to painters has to do with the testing that had been done. What is the basis for not being concerned about those who might occupy the room during or shortly after?

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A. Well, the maximum contaminant levels, and now the OSHA TLV's or whatever, the threshold limit values or whatever the proper term is for OSHA, apply to a level which is acceptable for a worker to be exposed to five days a week on an eight hour day. So those limits are specifically established to protect workers who are exposed day after day to those kinds of levels.
By implication and more than that, by common sense, if it's someone who was exposed to that kind of level for a period of an hour or day, there would be no concern about the toxicity levels whatsoever because people can be exposed to levels similar to that over long periods, in fact, throughout their work career.
Q. Doesn't this indicate that the medical department has no concern about vapor levels in a room that had already been painted with Aroclors?
MR. DIMURO: Objection.
A. Well, all I can say is what it says, and it says that the focus of the worry is on people who were painting day after day in these spaces and not someone who happens to be in the room for one day while it's being painted or enters the room the day after it's painted and that's their only exposure. So it doesn't address that. I understand your question to be about people occupying a room for some period of time after the paint was applied.

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It doesn't address that.
Q. (By Mr. Turet) Was that a concern of Monsanto back in September of 1953, the exposure to people who would be in a room painted with an Aroclor containing paint?
MR. DIMURO: Object to the form. You can answer it.
A. Based on the information available to Monsanto and other people about levels in newly painted rooms and the conclusions or the statement of the worry here, I would say that Monsanto would not have particular worries about persons occupying that room that had been painted after the paint had dried for any period of time.
Q. (By Mr. Turet) And had it done any testing of the level of vapors that persisted beyond the initial application of the paint with PCBs?
MR. DIMURO: Object to the form.
A. I'm not aware of any specifically. But again, the conclusions of the testing that the level in a newly painted, confined room under the test conditions were at or marginally above the accepted levels would certainly indicate once the paint dried, those levels would be well below levels of concern from a worker point of view.
Q. (By Mr. Turet) Or an occupant?
A. Or occupant point of view, yes.

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(Exhibit T-12 was marked for identification by the reporter.)
Q. For the record, the document marked as T-12 is a February 12th, 1954 memo from R. Emmet Kelly, M.D. Bates numbered MAE 052491.
A. Okay. I've quickly read that document.
Q. Is it apparent from this document that Monsanto knew at least after February of 1954 that at levels of 7 milligrams per cubed meter exposure to Aroclors in the air there was some liver damage found?
A. In animals, yes.
Q. In animals?
A. Yes.
Q. Okay. And at least as of February of 1954, there was additional tests being done to determine whether lower levels could lead to liver damage in animals?
MR. DIMURO: Objection.
A. There's a statement we are now running this at lower levels, so the presumption would be that they are doing whatever tests, similar tests to do whatever they did to determine 7 milligrams per cubed meter caused liver damage, yes.
Q. (By Mr. Turet) Based on the timing of this, would that be the Kettering Lab testing?
A. Without having -- I don't know.

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Q. Dr. Kelly states that in the second paragraph that in painting a room we have found 1 to 2 milligrams per day or so but after that the level drops down to nothing. Other than the two sets of studies that we referred to already, the plastics division study or test and the Anniston, Alabama test, are there any bases for that statement?
MR. DIMURO: Objection.
A. Well, the Anniston, Alabama test was not painting rooms. It was looking at exposures to workers in the operating plant. So with that exception aside, I know of no other information other than the plastics division test that would be the basis for this conclusion.
Q. (By Mr. Turet) Okay. And Dr. Kelly goes on to state their real concern is somebody would develop hepatitis and then on questioning would recall that perhaps he had been in a room painted with Aroclors and that a jury might believe it if he claimed that the Aroclors had caused the liver damage, I'm sorry, caused the hepatitis.
A. Well, I don't see anything in here about a jury, but his concern as expressed in this document is that someone would become ill with hepatitis for some other reason than exposure to Aroclor, recall they smelled it in the room, and there might be some association by that.

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Q. I apologize, the jury comment is in a different document. I didn't mean to inappropriately suggest there was something there. I have no further questions on that one.
(Exhibit T-13 was marked for identification by the reporter.)
Q. (By Mr. Turet) For the record, Dr. Kaley, you're being shown a document that's marked as Exhibit T-13, Bates numbered MAE 052484. It's a March 15th, 1954 Monsanto memorandum.
A. Okay.
Q. Now this is -- this memorandum is authored by an A.M. Ellenburg?
A. Yes.
Q. Is that the same A.M. Ellenburg that was on that interim report we looked at before?
A. Presumably, I don't know.
Q. Dr. Ellenburg says the final report on the problem of checking the concentration of Aroclor vapor in the air has been written and is now in the process of being typed and from the next sentence, there's a reference back to the interim report we already looked at.
A. Yes.
Q. Was there a final report issued on the Aroclor

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vapor in the air following up on that interim report?
A. I don't know specifically.
Q. You haven't seen one?
A. No, not that I recall.
Q. Now Mr. Ellenburg also says no work has been done since last October on the project but that the final report was being based on information accumulated before; is that correct?
A. Yes, basically, that's correct.
Q. Now, here, Dr. -- Mr. Ellenburg says in Paragraph 3 that in connection with the use of Lustrex Latex Paint containing Aroclor 1248 that the sampling operation shows that the concentration falls off in a few days to a limit of less than 1 milligram per cubic meter after a few days. Do you see that?
A. With that particular Lustrex Latex Paint, that's what the memo says, yes.
Q. Was there any comparable testing on paints that contained Aroclor 1254?
A. I'm not aware of any.
Q. Was there any comparable tests done on paint containing Aroclor 1260?
A. Not that I'm aware of as I sit here.
Q. Now, did the report or this testing follow the air levels that existed after a drop below 1 milligram per

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cubic meter?
A. Based on the information available in this memo, there's no information that that would be the case.
Q. Down below, Mr. Ellenburg states the opinion that with regard to the use of Aroclors in paint that each paint would have to be tested in a room and that if the odor is present then caution would have to be exercised before the paint is distributed freely for household use. Do you see that part?
A. Yes, I do.
Q. And was any testing done by Monsanto on any of the individual types of paint containing a PCB product?
A. I'm not aware of what paints were out there, whether any were even being marketed at that point. Everything I've seen today on the documents you've shown me that I know about would suggest this was all testing. There was not necessarily any paints out there in the market. I think it expresses his opinion that based on these tests that you would continue to test any particular material and the particular paint that it was suggesting to be used in.
Q. So this is just theoretical testing, not based on actual uses of Aroclor in paint?
A. Not that I know of.
Q. Okay. Now up above at the top, you'll see this

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is sent to Mr. E. Mather at St. Louis?
A. Yes.
Q. You may remember he was listed as Ruabon previously and they also sent the letter on to Elmer Wheeler in the medical department in St. Louis?
A. Yes.
Q. And it also went on to H. K. Nason?
A. Yes.
Q. And who was H. K. Nason at the time?
A. Again, a name I recognize but I don't know what his role was.
Q. Now, I guess I'll -- I have not copied it and attached it as an exhibit, but if you would prefer I do, I would be happy to do so. This which is a memorandum March 18th, 1954 from E. Mather sent down to J. W. Barrett and others. If you'll look at the document that you just put aside --
MR. DIMURO: You're not marking this?
MR. TURET: Well, we'll make a copy and do it if you want me to, but I'm going to ask Dr. Kaley if he would agree that E. Mather in St. Louis forwarded on the substance of the previous exhibit onto others at Monsanto abroad.
MR. DIMURO: He forwarded this?
MR. TURET: If you put them side by side.

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A. This, the document you're not marking appears to be a retyping or transcription of the T-13 and forwarded to additional people, some of I guess -- some of whom, yeah, are in Europe. Yes, I will agree with that without specifically checking it word for word.
Q. (By Mr. Turet) I'll represent to you that it, I mean at least it starts with quotes at the beginning and ends with quotes at the end. I have not looked word for word either.
MR. DIMURO: Whatever's there is there.
A. They appear to be the same.
(Exhibit T-14 was marked for identification by the reporter.)
Q. (By Mr. Turet) Dr. Kaley, for the record. You're being shown a document that's been marked as T-14 which is Bates numbered MAE 052513 through 521.
A. Okay.
Q. And you'll notice that this is also authored by D.V.N. Hardy who we've seen on several of the previous exhibits.
A. Yes.
Q. And you'll notice as you, the substance of the this at the top is Aroclors dash toxicological examination?
A. Yes.

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Q. And I think you would agree as you look at the list of CC's they're many of the same names we keep seeing in terms of Dr. Newman, Dr. Gardner and the addressee, Dr. J. W. Barrett.

A. Yes, we have seen those names before.

Q. Now, would you agree that the substance of this relates to the reports of the Kettering Laboratory that related to a measurement of Aroclor 1254, I'm sorry, let me withdraw that question.

Would you agree that this relates to a set of reports that were issued by the Kettering Laboratory which measured the toxicity of animals of prolonged exposure to Aroclor 1254 vapors at a particular level?

A. Yes, I would agree with that in general. At least the first page, yes.

Q. And the level of Aroclor 1254 in the air that those animals were exposed to is 1.5 milligrams per meter cubed?

A. I'm sure there were other levels other than that particular one, but it expresses that that level, 1.5 per cubed meter there was slight or positive signs of injury in test animals.

Q. And Monsanto was aware of the results of that testing, correct?

A. Yes.

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Q. In fact, was Monsanto a sponsor of that testing?

A. Yes.

Q. Now, Mr. Hardy, or Dr. Hardy, whichever he may be, indicates that at least abroad there was a safety factor that was built in when extrapolating from animal toxicity to human toxicity. Do you see that part?

A. Yes, I see that.

Q. Is it your understanding at least as of that time period that that was the common practice abroad?

MR. DIMURO: I'll object to the form.

A. Other than what he says using the words recognized practice to employ safety factor of 10, I don't have any further information on it.

Q. (By Mr. Turet) Would you agree that Mr. Hardy states the observation in this memo, that taking the Kettering results one would have to apply an Aroclor 1254 air level of .15 if one was assessing a safe level for humans?

MR. DIMURO: Is there a particular paragraph you can direct him to?

A. Well, what he is saying is that based on that recognized practice in, apparently in Europe that that number would be at .15 milligrams per cubic meter, yes.

Q. (By Mr. Turet) Now, at least after this point in time, August 1955, had any testing been done by Monsanto or otherwise on animals being exposed to Aroclor 1254 vapors below 1.5 milligrams per meter cubed?

A. I'd have to go back and look at the Trion publication or reports or whatever. I don't know as I sit here whether it was lower or not.

Q. All right. Well, on the second page of this particular memo, Mr. Hardy essentially looks at the results of the Kettering labs and his observations about the safety factor of 10 and then compares it with the air levels that had been found from paint that contained Aroclor 1248. Do you see that?

A. Yes, I see that.

Q. The first full paragraph on Page 2 refers to analytical work in a room painted with Aroclor 1248 plasticized Lustrex Latex paint?

A. Yes.

Q. Am I correct in saying that Mr. Hardy is expressing concerns that at the levels of PCBs out of that type of paint would exceed the levels that could be extrapolated out of the Kettering study?

A. Well, expresses a concern is your words, but certainly he is suggesting that the levels, based on that testing, the levels in a room painted under the conditions of the test with that particular paint could lead to levels of .5 milligrams that can prevail for a month. So

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the document says what it says.

Q. As you read -- you read the document now, do you --

A. I'm reading as we go along with the questions. I wouldn't say I read the whole document, but go ahead.

Q. Why don't you read to the end because I don't want you to misunderstand?

A. Okay. I finished reading the document.

Q. Just to go back a step, I may have asked a question that was off base. On Page 2 what Mr. Hardy is saying here is our own analytical work with a room painted with Aroclor 1248 plasticizer Lustrex Latex paint offers evidence that Aroclor concentrations of the order of .5 milligrams per cubed meter could last for a month, and that's separate from whatever study had been done by the plastics division in the U.S., correct?

A. I don't know the answer to that. That very well could be the same study. They're both Monsanto document and it could very well be the same study. I just don't know the answer to that.

Q. Mr. Hardy suggests that as of this date in 1955 there was no analytical technique that was able to pinpoint with reasonable precision concentrations of PCBs in the air below .5 milligrams per meter cubed, correct?

A. That's consistent with the point I made before,

yes.
Q. So if the levels are .49, you don't get an accurate reading; is that correct?
MR. DIMURO: Objection.
A. You know, I don't know the -- how they were doing this, the method specifically, but .49 is completely out of the range of region. The answer is you couldn't tell the difference between .2 and .6. The lack of precision was such they had some comfort at .5 that anything below that, whether it was .4, to talk about the second decimal place is beyond the "pale." It's a much more gross lack of precision than the difference between .49 and .50.
Q. So the difference between .4 and .5 couldn't be distinguished based on existing analytical methods, reliably?
A. I don't know exactly. I wasn't there, obviously, and I didn't mean that to sound smart. I don't know exactly what they're talking about. I don't know if they meant they couldn't detect .4 or whether the precision was so bad they couldn't tell .4 from .3. I don't know specifically, but certainly I will concur that in the '50's the methods available to do vapor concentration were very crude and it is not surprising to me there were analytical difficulties measuring low levels

of PCBs in air.
Q. So is it fair to say based on those limitations on the analytical methods, that there was no way to determine what the level that was going to persist into the future would be?
MR. DIMURO: Objection.
Q. (By Mr. Turet) Do you understand my question?
A. Yes, I do. I think that's basically a reasonable conclusion. I think that's not inconsistent with what he says, so --
Q. And farther down in this memo, Mr. Hardy also expresses concerns about the idiosyncracy factor; isn't that right, down in the middle paragraph?
A. Yes.
Q. And what he's referring to there is the fact that the focus typically is on average humans as opposed to someone that may have a heightened sensitivity to a particular chemical?
A. That's what he's referring to, yes.
Q. And all of those factors that we've talked about including the idiosyncracy factor lead him to address in this memo the issue of whether Monsanto Chemical Limited should withdraw its recommendation that PCBs be used as an ingredient in paint, right?
A. Right. And especially since the MCC and United

States had already withdrawn that recommendation or never made a recommendation to begin with, that's right.
Q. He specifically says that, well, okay, I understand what you're saying. What documents are there that reflect that Monsanto Chemical in the USA withdrew a recommendation for the use of Aroclors in paint?
MR. DIMURO: Objection.
A. Other than that, I don't know of anything specifically. But certainly, this one addresses that position.
Q. (By Mr. Turet) If there was a technical bulletin, I'm sorry, did you finish.
A. Yes.
Q. If there's a technical bulletin reference that recommends the use of a particular Aroclor PCB containing plasticizer as an ingredient in paint, would you agree that a withdrawal of that recommendation would be necessary subsequently to make this sentence accurate?
MR. DIMURO: Objection. That goes beyond the scope of the deposition notice.
A. Well, what the statement says is that apparently MCL, the English division, had a recommendation that Aroclors -- not that Aroclors might be used as plasticizers in Lustrex Latex paints. In withdrawing that recommendation, they would be lining up with MCC, but I

don't know that, whether that specifically means that they're lining up with MCC and not having a recommendation for these particular paints or with a more broad position of MCC, that PCBs should not be used in certain kinds of paints.
It goes on to talk about in the document about PVA paints. I'm not sure exactly what PVA is, and talks about ordinary paints, so there's a lot more going on in the paint industry on the various different types of paints that I'm just frankly not aware of what the difference between the Lustrex Latex is. Certainly, as he goes on into the next paragraph he talks about ordinary paints, the rate of volatilization will be greatly reduced, so there's some differences in the paint formulations I'm not qualified or able to speak about.
And I don't know of any other -- back to your original question, I don't know of any documents where there's a recommendation or withdrawal of a recommendation, but I think based on this, you could make the conclusion that MCC in America was not recommending plasticizers for Lustrex Latex paints.
Q. (By Mr. Turet) Was not recommending Aroclor PCB plasticizers as an ingredient in Lustrex Latex paints in of August of 1955?
A. Right.

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Q. And MCL is now revisiting the issue, deciding whether or not to withdraw its recommendation?
A. Yes.
Q. Now, you're right, in that last paragraph on the same page, Mr. Hardy refers to still having to examine the position of Aroclors in ordinary paints.
A. Yes.
Q. By that he means examining the extent to which the use of Aroclors in ordinary paints lead to PCB vapors in the room, correct?
A. Presumably, yes. It's saying those exact words. That would be a logical conclusion, yes.
Q. And Mr. Hardy is also saying he would think in that next sentence that because he argued previously that the rate of volatilization would be greatly reduced if it was used in ordinary paints?
A. Yes.
Q. Because that's the argument he made before, that's what he's saying?
A. Yeah, right.
Q. By the rate of volatilization, we're talking about the rate at which PCBs are able to vaporize out of ordinary paints, correct?
A. Yes.
Q. And get into the air and create vapor levels?

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A. Yes.
Q. And Mr. Hardy is saying it now seems possible a hazardous concentration could be attained in a room in which a large area is painted with Aroclor containing paint, correct?
A. That is basically what that sentence says, yes.
Q. Did Monsanto ever recommend to any of its customers that it not use Aroclor 1254 in paints due to concerns about vaporization of the PCBs into the air?
A. I don't know.
Q. No further questions on that one. I'm going to take a quick break.
(A short break was taken.)
(Exhibit T-15 was marked for identification by the reporter.)
Q. (By Mr. Turet) Dr. Kaley, I'm showing you a document that's been marked as T-15, a September 8th, 1955 memorandum from J. W. Barrett.
A. Okay.
Q. And it's been addressed to H. K. Nason in St. Louis?
A. Yes.
Q. Again he's, and you recognized him as somebody --
A. It was a name I knew, but didn't know a role.

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Q. As an employee of Monsanto?
A. Yes.
Q. And you may want to read this one through.
A. Yeah, I am. Thank you. Okay, I've read it.
Q. Okay. First off, would you agree with me that in this letter Mr. Barrett is communicating that they are very much concerned with the toxicology of Aroclors particularly since their sales of Aroclors are just beginning to take off abroad?
A. That's I think a fair characterization of the first paragraph, yes.
Q. And down in the third paragraph, there's a reference to the chief medical officer, Dr. H.R. Newman. Does that help in recalling who he was?
A. I'll take the document's word for it that's who he was, so I'm willing to move forward with that.
Q. And here in the aftermath of the Kettering Lab's results, Dr. Newman was coming to St. Louis to meet with Dr. Kelly who was medical director of Monsanto in St. Louis, correct?
A. You're characterization of in the aftermath sounds like it was a causal factor. I don't know -- he was coming to St. Louis. I don't know if it had anything to do with the fact that the Kettering Lab results had become available or not. It could have been a side

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issue. But he was certainly coming to St. Louis.
Q. Going to the paragraph before it, is it fair to say that Mr. Barrett is saying they recently received the results from the Kettering Labs which represents entirely new data on Aroclor toxicity?
A. That's again a fair characterization of the first sentence of that paragraph, yes.
Q. And having read it, would you agree with me that the general sentiment from Mr. Barrett is results about -- the results of the Kettering Lab which is prompting the meeting of the medical director?
A. No, I would agree he's expressing certain -- it might have been a normal yearly meeting and this was going to be discussed there. Based on the term fortunately, I don't think it prompted it at all.
Q. Now, Mr. Barrett is expressing particular concern because a very large proportion of their present sales of PCB containing Aroclors went to surface coating uses; is that right?
A. That's what the document says, right. It says it's important to us because of that reason, yes.
Q. And Mr. Barrett is suggesting to Mr. Nason in St. Louis that additional toxicity testing be undertaken on PCB containing Aroclors, is he not?
A. He's saying they are considering that, yes. He

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is saying they are considering it.
Q. And they're inviting input from St. Louis as to whether to go forward?
A. Well, they're saying they would certainly discuss it with St. Louis. I don't know if they're inviting input.
Q. And Mr. Barrett goes so far as to say quite a lot more data is needed and they're willing to go forward and obtain it if you think that's a reasonable suggestion, doesn't he?
A. That's what the document says, yes.
(Exhibit T-16 was marked for identification by the reporter.)
Q. I want to show you another document. Dr. Kaley, have you had, for the record, T-16 -- for the record, T-16 is a document that's been Bates numbered MAE 052494 through 495. It's a September 20th, 1955 memorandum from R. Emmet Kelly, M.D. Dr. Kaley, have you had a chance to look at T-16?
A. Yes, I have.
Q. And would you agree that Dr. Kelly, the medical director of Monsanto is responding to the memo from J. W. Barrett that was marked T-15?
A. Yes, I would agree with that.
Q. And Dr. Kelly offered apparently, it's

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particular applications containing Aroclor 1254; is that correct?
A. I think that's a fair characterization, yes.
Q. And that's whether it's industrial applications of one sort or another or painting?
A. Yeah. It certainly suggests if it's -- I mean it does show applications could be painting, but I think the real distinction is industrial application or household or -- so a consumer application. It would suggest -- I think this suggests you would do more careful testing and require lower limits of exposure for households.
Q. Was it the position of Monsanto back in September of 1955 that -- that it was to review each new Aroclor's proposed use from the point of view of determining whether it was going to be for industrial exposure versus household exposure?
MR. DIMURO: Objection.
A. Well, based on the contents of this memo, and in general, to the extent that Monsanto knew about a particular application, and that wasn't always the case, but to the extent they were answering specific questions about specific applications, I think they would review the kind of information that Dr. Kelly discusses here.
Q. (By Mr. Turet) Mainly whether it's going to be

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Dr. J. W. Barrett, some general information about Aroclor 1254 and its toxicity?
A. Well, he certainly commented again on the results of the determination of air levels. I don't know that it's general toxicity -- I wouldn't characterize it as general toxicity information but --
Q. Okay. At least some of his comments related to Aroclors and toxicity?
A. Yes.
Q. And would you agree with me also that Dr. Kelly goes on to state to Mr. Barrett that he doesn't see any particular advantage in doing further testing on the release of -- I'm sorry, further toxicity testing on Aroclor 1254 at this time?
A. I would say that the sense is I don't know how you would get any particular advantage of doing more work. That would suggest to me back to the previous memo he's talking particularly about inhalation testing not toxicity testing in general.
Q. Would you agree that what he's saying is he doesn't see any particular advantage in further inhalation testing from Aroclor 1254?
A. Yes.
Q. And Dr. Kelly specifically recommends he thinks the focus should be on testing air concentrations based on

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used in a household versus an industrial setting?
A. That would be one of the evaluation considerations involved of that particular use, yes.
Q. What other consideration would go into the evaluation of that particular use?
A. Whether the product performed appropriately, what the purpose of the product was, and other various uses.
Q. What about -- how about a toxicity standpoint, putting aside whether it actually works well in a particular application, what consideration would there be other than you mentioned industrial versus household?
A. I think they would look at potentially the root of exposure and those types of considerations. That would be one I think.
MR. TURET: Let's mark this as T-17.
(Exhibit T-17 was marked for identification by the reporter.)
Q. (By Mr. Turet) For the record, Dr. Kaley's being shown a document that's been marked as T-17, Bates MAE 052486 through 489. And it is a December 6th, 1955 memorandum from D.V.N. Hardy.
A. Okay.
Q. Now, again, Dr. Kaley, this is coming from the same D.V.N. Hardy we've been seeing?

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A. Yes.
Q. And it's to Dr. J. W. Barrett?
A. Yes.
Q. And it relates to Aroclors toxicological examination?
A. Yes.
Q. And it's addressed to Dr. Gardner and Dr. Newman and these others we've been seeing?
A. Yes.
Q. Now would you agree that according to this document that Dr. Kelly either had asked or was about to ask the American Conference of Governmental Industrial Hygienists to increase the permissible level of Aroclor 1254 to 1 milligram per meter cubed?
A. Again, question of words, but certainly the paragraph suggests that MCC and Dr. Kelly would be part of this and are going to submit the reports in support of a claim that those, that the two maximum permissible levels of concentration should be adopted, and the one for Aroclor 1254 is 1 milligram per meter cubed.
Q. And by the way, in that first paragraph at the end, there's a statement that Dr. Newman has discussed with Dr. Kelly the significance of the Kettering results in relation to MCC thought and policy.
Is that a reference back to the meeting that was

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about to take place with Dr. Newman coming over to meet with Dr. Kelly?
A. The times of the previous documents could suggest that that could be the case. I don't know that specifically, but the timing is consistent with that.
Q. Now, on the second page, the second paragraph, I should preface it by saying there is a paragraph in between the first page and second page that talks about the Monsanto Chemical Company recommendations as to toxicity levels.
Going into the next paragraph, it says that there will be no impact on the Monsanto Company policy regarding the use of Aroclors in paints since Monsanto Chemical Company have long ceased to use the Aroclor for that purpose.
A. Yes.
Q. Does that help you to recall whether at one point Monsanto recommended the use of Aroclors, PCBs containing Aroclors in particular?
MR. DIMURO: Objection.
A. It doesn't help me recollect whether they did or not, but certainly based on this sentence, the fact that they've ceased recommending, it would suggest at one point they did recommend it, yes.
Q. (By Mr. Turet) How does Monsanto withdraw the

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recommendation for a particular use of a chemical based on toxicity?
A. I would think there were various ways of doing this. I don't know how specifically this one may or may not have been done.
Q. What are the various ways of withdrawing a recommendation based on toxicity considerations?
A. Just the decision of recommending the uses in product bulletins, there could have been a communication to either salespeople or distributors to cease those recommendations. There could have been communications with customers, any number of ways of doing that. How it was done here, I have no idea.
Q. So if one was to look at a technical bulletin that was older and a technical bulletin that was newer and the particular recommendation exists in the older one but doesn't exist in the newer one, that's an example of a withdrawal of a recommended use?
MR. DIMURO: Objection. I think that's beyond the scope of the deposition notice. You haven't related anything to toxicity for the recommendations --
MR. TURET: This whole line of questioning is intended --
MR. DIMURO: It needs to be put in those terms.
MR. TURET: Let me rephrase the question then.

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Q. (By Mr. Turet) So if one looks at an older technical bulletin that recommends a particular use of a product and a newer technical bulletin that doesn't recommend the use of that product, is that an example of a withdrawal of a recommendation based on toxicity considerations?
MR. DIMURO: I'll object to the form of that question. I think it's an incredible hypothetical.
A. My answer to that would be that a toxicity consideration could have been one of the reasons for that recommendation no longer being there, but there could have been many others.
Q. (By Mr. Turet) Fair enough. And where a withdrawal of a recommended use is based on toxicity consideration, are those toxicity considerations communicated by Monsanto to its customers?
MR. DIMURO: I object to that question as also being beyond the scope of the notice because we're now talking about general toxicity and not specific to PCBs, but I will allow the Doctor to answer if he can.
A. I would think that would depend on a specific case. I don't know there's a general answer to that question. If there was, I don't know.
Q. (By Mr. Turet) So it could be communicated to customers or it might not be?

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A. That's probably a fair characterization, yes. That's again generally speaking, that's not necessarily specific to PCBs or anything. That was intended as a general answer to a general question.
Q. Would your answer be any different if we focus on PCBs?
A. Not necessarily, no.
Q. Is the answer the same or is it not the same if we're talking about just PCBs?
A. I think it's the same.
Q. Now, the second sentence of the same paragraph that we came out of on Page 2 says that Monsanto Chemical Limited has continued to offer Aroclors for use in paints on the basis that the evidence for rejection was slim and the risk is reduced by resorting to the use of more highly chlorinated Aroclors. Just to clarify, Aroclor 1254 is a more highly chlorinated Aroclor as the term is used at Monsanto, isn't it?
MR. DIMURO: Objection. More highly chlorinated than what?
A. That's essentially what my answer would be, that in some consideration it could be a more highly chlorinated or it could be a lower chlorinated depending on what you're comparing it to. It could go either way.
Q. (By Mr. Turet) Have you seen the term used

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within Monsanto highly chlorinated PCBs versus non-highly chlorinated PCBs?
MR. DIMURO: I'll object to the form of that question.
A. I don't know I've seen that specifically. I've seen more highly chlorinated versus less chlorinated. I've used those myself.
Q. (By Mr. Turet) What does that mean as you've used it?
A. It's relative to what you're talking about. Compared to Aroclor 1221, it's more highly chlorinated. Compared to 1268, it's less chlorinated. And I think in some of the documents today, you see those differences. I think in some of the documents Aroclor 1254 has been among those considered more highly chlorinated, but it certainly talked about 1268 being the more highly chlorinated compared to 1254. So it depends on the particular context in which the discussion is being made.
Q. Let's go back to the question that what documents reflect Monsanto Chemical Limited continued to offer Aroclors for paints back in December of 1955.
MR. DIMURO: I'm going to object to that question as being beyond the scope of the notice. Documents pertaining to sale of Aroclors by Monsanto Limited? I'll let you answer it Doctor, but note my

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objection.
A. I don't know.
Q. (By Mr. Turet) Are there any documents that reflect the basis as its stated here for continuing to offer Aroclors for use in paints by Monsanto Chemical Limited?
A. Not that I'm aware of.
Q. Are there any documents that would form a basis for concluding that risk is reduced by resorting to the use of more highly chlorinated Aroclors in paints?
A. Well, I think that that refers back, for instance, to the previous paragraph where it talks about a more highly chlorinated Aroclor such as Aroclor 1268, which I didn't really -- that substantiates my previous answer suggesting it has a much higher allowable limit and therefore there would be less concern. In addition, it would be less volatile so it's more likely for that to reach that allowable limit. So I think we've seen in other documents that similar argument posed in those exact words, but to the extent we've seen them today, there are other documents that support that.
Q. You lost me on that.
A. Your original question was is there any other documents which support the contention the risk is reduced by using highly chlorinated Aroclors such as 1268. As

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stated in the previous paragraph, I think there are other documents today which make that same argument, that Aroclor, because Aroclor 1268 is more highly chlorinated and has a higher limit, it might be more appropriate.
Q. Was it the position of Monsanto back in December of 1953 that risk would be reduced by using a more highly chlorinated PCB product in paint?
MR. DIMURO: Object to the form of the question.
A. I don't know where you got that date from.
Q. (By Mr. Turet) That's the date of this letter.
A. I thought it was 1955.
MR. DIMURO: You said '53.
Q. (By Mr. Turet) Let me restate the question.
A. That's fine. I wanted to be sure you were looking at the same document. Now you'll have to read the question back, I'm sorry.
Q. Do you want me to restate it again with the right date?
A. That would be fine.
Q. Was it the position of Monsanto back in December of 1955 that the risk of volatilization could be reduced by resorting to the use of more highly chlorinated Aroclors in paint?
MR. DIMURO: Object to the form of the

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question.
A. The risk of volatilization, I mean that just following from the physical properties, I don't know if it was a position or policy or not. I don't have any document which states that if that's what you're asking.
Q. (By Mr. Turet) That is what I'm asking, but you're saying the general properties of the more highly chlorinated PCBs lead to that conclusion?
A. Right. They have very much reduced vapor pressures, yes.
Q. In fact, the next sentence says that was thought to have the dual advantage of using a material of the; A, lower intrinsic toxicity; and B, lower vapor pressure. Is that consistent with what you were just saying?
A. Yes, it is as a matter of fact, thank you.
Q. Now, just so I'm clear, what is vapor pressure exactly?
A. Vapor pressure is a property which measures the tendency of a material to evaporate or to move from the liquid phase or the solid phase into the vapor phase.
Q. So if one has a lower vapor pressure, it vaporizes more slowly?
A. That's correct.
Q. Now, the next sentence from Mr. Hardy says its now clear that toxicity increases with the degree of

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chlorination and that this effect may cancel or even outweigh the advantage due to decreased vapor pressure. Am I understanding him to say there that higher chlorinated PCBs are more toxic even though they may vaporize more slowly?
A. That's what the sentence says. I would add though that he is, he's basing that only on the two Aroclors that are being discussed here 1254 and 1242 and to the extent there's any intent to extrapolate to other Aroclors, I don't know what his thought would be, but I would disagree with it.
It's my understanding he's only talking about those two materials, but to the extent he's talking about other materials, I'm not sure I would agree with what his statement is. I do not believe the more highly chlorinated materials in most cases are less toxic.
Q. Is Aroclor 1254 more toxic than Aroclor 1242?
MR. DIMURO: I'll object to the form of the question:
Q. (By Mr. Turet) I'm trying to understand what you said a moment ago.
A. Okay. Under the conditions of this particular test, the inhalation toxicity test, where they were looking at liver damages and end point, the results of this test would suggest that Aroclor 1254 was slightly

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more toxic than Aroclor 1242. And in another test with another end point, Aroclor 1254 might be more or less toxic than Aroclor 1242.
And where I was really going was that if you were to look at Aroclor 1268, my guess would be under any conditions of tests Aroclor 1268 would be less toxic than both of those other two materials.
Q. Now in the last paragraph on this Page 2, there's a reference to a recent decision by ICI to discontinue their uses of Aroclors in ordinary paints. Fair to say Monsanto was aware that ICI had ceased to use PCB containing Aroclors in paints somewhere prior to December of 1955?
A. Well, subject to the assumption that the Aroclors that they're talking about are PCB containing Aroclors which it doesn't state that, that's what the sentence says, yes.
Q. Is it fair to say the entire letter --
A. The subject of this letter is polychlorinated biphenyls, yes.
Q. So when they're talking about the discontinuance of the use of Aroclors in ordinary paints by ICI, is it fair to conclude from that that we're talking about PCB containing Aroclors?
MR. DIMURO: I'll object to the form.

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A. No, I don't agree with that. It may be fair to assume that. I don't know if it's fair to conclude that.
Q. (By Mr. Turet) Okay. Would you agree that --
MR. DIMURO: I've got to take this call. If you wouldn't mind, Gerard will sit in for a moment.
(Mr. DiMuro exited the deposition room.)
Q. (By Mr. Turet) Now, would you agree that at least Mr. Hardy is expressing some concern after his discussion about PCBs with ICI's decision to discontinue the use of Aroclors in ordinary paints?
A. Well, without taking a lot of time to read it in detail, I don't know that he's expressing concern with that decision. He's discussing that decision.
Q. Would you agree he's expressing that their decision might also reflect the line that might be taken by other customers at Monsanto?
A. Yes, that's what that sentence says, that it's an indication that that line might be taken, yes.
Q. And would you agree also that Mr. Hardy sugges that ICI's decision was influenced at least in part by information received from the medical director at Monsanto, Dr. Kelly?
A. It says that, yes.
Q. And Dr. Kelly's comments included the statemer on Page 3 that it is our belief that at room temperature

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not enough can get into the air to cause any trouble.
A. That's what it says, yes. Under the conditions that he discussed, I mean, you know, if it's not being sprayed etc., etc.
Q. Aroclor fumes at room temperature very probably would not present any hazards, right?
A. Right, but mist or spray is another problem entirely and that's the basis for the recommendation.
Q. Now --
A. Let me just clarify to be sure we're both -- what I'm saying is, it is Dr. Kelly's express belief that vaporization of PCBs at room temperature would not give a high enough level into the air to cause any trouble.
Q. When used in paint?
A. Well, that's what this discussion is based on. It doesn't say that specifically, but that's basically the source of discussion, yes.
Q. And based on all this discussion by Mr. Hardy, including the reference to ICI to discontinue the use of Aroclors in paint, there are some recommendations which Mr. Hardy makes at the end. Do you see them?
A. Yes.
Q. And those recommendations are that Monsanto Chemical Limited continues to sell Aroclors for use in the manufacture of paints based on chlorinated rubber, right?

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A. Yes. That very specific kind of paint which I think there was specific advantages for, yes.
Q. And also continue to sell Aroclors for production of paints intended for exterior application, correct?
A. Yes.
Q. But all others, all other possible uses of Aroclors in paint are no longer recommended?
A. That's correct, yes.
Q. That would include for interior use?
A. Yes.
Q. Okay. Now, the only other thing, I'm sorry, I skipped over this, Page 3 down at the bottom, one of ICI's comments in an apparent letter to Monsanto was that air saturated with cold Aroclor could be at or above the maximum permissible concentration; is that correct, you'll see it goes on to the next page.
A. That's what it says, but it would be very difficult to saturate cold air with Aroclors.
Q. But that's what Monsanto is told by ICI, back in --
A. Under the specific conditions where the testing created a saturated atmosphere, that is what the report apparently said, yes.
(Mr. DiMuro returned to the deposition room.)

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Q. (By Mr. Turet) Are there any documents still in existence which reflect this exchange of letters between Dr. Kelly and ICI?
A. Not that I'm aware of.
(A lunch break was taken.)
(Exhibit T-18 was marked for identification by the reporter.)
Q. (By Mr. Turet) Okay. Now, Dr. Kaley, for the record you're being shown a document marked as Exhibit T-18 which is Bates numbers MAE 051971 and it's dated November 14th, 1955. Dr. Kaley, the person who has signed this memorandum, Jack Garrett, he was a member of the medical department back in 1955?
A. That's correct.
Q. And this is directed to a gentleman at the Krummrich Plant?
A. Apparently, yes.
Q. And the Krummrich Plant was the St. Louis plant of Monsanto where PCB was manufactured?
A. Actually, it's across the river from St. Louis in Sauget, but generally it's the St. Louis area plant, yes.
Q. And Department 246 is the portion of the plant where the PCBs were manufactured?
A. Based on what I think is correct, and this memo,

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I would agree with that.
Q. Now, in this document -- let me withdraw that.
Would you agree that the medical department is stating the opinion that eating of lunches should no longer be allowed as of November 14, '55 in the Department 246 where Aroclors were manufactured?
A. Again, it doesn't say no longer. It says should not be allowed. Presumably, that means it had been allowed before that, but I don't know that for sure.
Q. And Mr. Garrett lays out the reasons for reaching that opinion. One of them is because Aroclor vapors and other process vapors could contaminate the lunches unless they were properly protected.
A. That's what item one says, yes.
Q. And did the Krummrich Plant institute a policy in November '55 or soon thereafter that forbid the eating of lunches within the department?
A. Presumably so, but I don't know that to be a fact.
Q. Do you know for a fact that there was a prohibition against eating lunches in that department at some point in time?
A. I think I seen that in a Krummrich document. I'm not positive of that, but I may have seen that. It sounds familiar to me.

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Q. And so at least the medical department of Monsanto as of November '55 was aware that PCB vapors in the air could contaminate food products being eaten in the room?
A. Well, Aroclor and other vapors. I mean they state that it's, you know, it's long been their opinion of they shouldn't be eating in there, so it's not necessarily specific to PCBs. The policy is, you know, addressed on this particular document to the PCB department, but it basically says they shouldn't be doing it in any process department.
Q. And is that true because of toxicity consideration, that one does not eat lunch in a room where there are PCB vapors?
MR. DIMURO: Object to the question.
A. In the most general sense, yeah. I mean, I think it's just, it's basically the fact that you shouldn't be eating in a place where there's high concentrations of chemical due to manufacture, so arguably, yeah, I guess that has to do with toxicity in the general sense. But I don't know if it has to do with any specific toxicity.
Q. (By Mr. Turet) You mentioned high PCB vapors, but presumably Monsanto was following the recommendations of this technical basis --

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A. Well --
Q. Let me finish my question, to use exhaust to get rid of whatever vapors might be generated in the manufacturing process, correct?
A. I was using high with reference to in an industrial situation as opposed to a non-industrial situation. So whether they were using this, I'm sure they were using the controls to keep the levels within the OSHA guidelines, not OSHA at that time, but the ACGIH guidelines at this time. I was really discriminating against a non-industrial situation. The level certainly in the manufacturing department even if they're under the TLV's are going to be higher than they would be, you know, outside of the industrial manufacturing situation.
Q. One would expect?
A. Almost guaranteed.
MR. TURET: Let's mark this as T-19.
(Exhibit T-19 was marked for identification by the reporter.).
Q. (By Mr. Turet) For the record, T-19 is a document with Bates numbers MAE 053216 dated July 18, 1961. Dr. Kaley, who is Chuck Eby?
A. Eby. He was an employee that worked in our Washington office at one point or another.
Q. Are there any documents before this July 18th,

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1961 document that referred to the possible detection of PCBs in chickens leading to chick edema?
A. Not that I'm aware of.
Q. Okay. Had you seen this document before today?
A. I've seen this document, yes.
Q. And what did Monsanto do upon learning that there was going to be a study released in the Journal of Poultry Science showing that Aroclor 1242 had seemingly gotten out of paint and into chicken coops?
MR. DIMURO: I'll object to the form. You can answer.
A. I'm not aware of any specific action.
Q. (By Mr. Turet) Did Monsanto do any testing of its own to determine whether PCBs could get out of paint as applied in chicken coops?
MR. DIMURO: Objection to form. You can answer.
A. Not that I'm aware of, no.
Q. (By Mr. Turet) Did Monsanto do any toxicity testing on chickens to determine the ramifications of PCBs getting out of paint and into the chickens?
MR. DIMURO: Object to the form. You can answer it.
A. Monsanto, at some point did do toxicity testing on chickens, yes.

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Q. (By Mr. Turet) Was that in about 1969, 1970?
A. That's correct.
Q. You're thinking the Industrial Bio-Test studies?
A. Yes.
Q. Were there any studies before the Industrial Bio-Test studies on PCBs in chickens?
A. Not that I'm aware of.
MR. TURET: Let's mark that 20.
(Exhibit T-20 was marked for identification by the reporter.)
Q. (By Mr. Turet) For the record, Dr. Kaley, you're being shown a document marked as T-20 which is dated October 23rd, 1961 and it's Bates numbered in another matter PRR 019171. Dr. Kaley, I'm sorry, have you skimmed it?
A. I'm in the process of it.
Q. Let me know when you're done.
A. Okay.
Q. Now, this is another memo from Chuck Eby in the Monsanto office in Washington also to Howard Bergen in St. Louis and this one refers to the FDA again looking into the issue of chick edema and having asked for samples from Monsanto; is that correct?
A. I don't know about your characterization of again, but it says they are -- they're hot on the trail of

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a chlorinated compound X which is a causative factor of chick edema. The FDA had been involved in studies of chick edema for some time and they actually in the second paragraph --

Q. Says he's back on the trail?

A. Okay.

Q. Now, what had happened between July of 1961 and October of 1961, had the FDA looked into the issue of the possible connection between PCBs and chick edema and abandoned that inquiry?

MR. DIMURO: Objection.

A. I have no idea.

Q. (By Mr. Turet) Is there anything to your knowledge that was reported between July of 1961 and October of 1961 on the cause of chick edema?

A. I don't know whether the O'Dell article had been published. Without seeing it and seeing the date, I don't know if it had been published in that time frame or not. Other than that, I wouldn't know anything.

Q. Just so I ask it to cover the whole time period, I asked you before whether Monsanto had done any testing on PCBs in paint and the possible connection to chick edema. Did Monsanto do any testing on or after October of 1961 as to the ability of PCBs to get out of paint and cause chick edema in chickens?

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MR. DIMURO: Objection. You can answer it, Doctor.

A. Not that I'm aware of.

Q. (By Mr. Turet) Now, this document from Mr. Eby suggests that Aroclors had been used as extenders or insecticides against roaches, etc. in the poultry field?

A. Yes.

Q. And was he correct in that regard?

A. I'm not sure. My understanding has always been there were investigations of the potential use for PCBs as extenders, but those were either -- never occurred at all or were never widely occurring. So I don't know whether he's correct or not on that. That is not necessarily my understanding of the situation with PCBs as pesticide extenders.

(Exhibit T-21 was marked for identification by the reporter.)

A. Yeah, that -- just to go back to that last, the last paragraph suggests that it, and my understanding has always been that the -- that investigations of that use were by USDA, the Department of Agriculture, and in the last paragraph of this previous document, T-20 is consistent with that. Beltsville is the USDA laboratory, yes.

Q. Okay. By the way, that document also was

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forwarded to Mr. Hunt and, I'm sorry, Dr. Hunt and Dr. Kelly in the medical department?

A. Yes.

Q. Okay. Back to the document marked as T-21, that's document Bates MAE 053218, June 24th, 1964 memorandum from M. M. Johnson, M.D.

A. Yes.

Q. Now Dr. Johnson was a member of the medical department at the time at Monsanto?

A. I don't know the answer to that.

Q. Given the first sentence --

A. Presumably, yeah, given the first sentence, he was certainly acting in Dr. Kelly's absence. So presumably he was, yes.

Q. And this is addressed to J. M. Campbell at MCL in London?

A. Yes.

Q. Who was Mr. Campbell if you know?

A. I don't know.

Q. Apparently Mr. Campbell, if I'm reading this correctly, had inquired as to Aroclors in regard to this chick edema issue?

A. Apparently, so, yes.

Q. In this document, Dr. Johnson refers to the meeting of the Federation of American Societies for

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Experimental Biology in April of 1964 and a paper that was presented there as to chick edema disease-like symptoms. Do you see that reference?

A. Yes.

Q. What did the studies say? Let me withdraw that.

Did Monsanto know about the connection between exposure to PCBs and development of chick edema disease-like symptoms back in June of 1964?

MR. DIMURO: Objection.

A. Presumably, they knew whatever they had learned from the O'Dell publication. That was mentioned in the previous documents and they presumably had this document and learned whatever was in there.

Q. (By Mr. Turet) And Dr. Hunt from the medical department was at whatever that presentation was?

A. That's the conclusion that could be drawn from this. Yes, well, yes, okay, that's correct.

Q. Now, Dr. Johnson states that Aroclors apparently can produce some chick edema but are not nearly so potent as the real chick edema factor. What was the real chick edema factor that he's referring to?

MR. DIMURO: Objection. You can answer it if you know.

A. It was some combination of chlorinated

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"diabenzo" dash P dash dioxins and chlorinated diabenzo furans.
Q. (By Mr. Turet) Is it fair to say as of June 24th, 1964 Monsanto knew that the dioxins and furans could cause chick edema?
MR. DIMURO: Objection.
A. I'm not sure that I would have. I don't know as I sit here today at what date that identification was made. I'm speaking from what I know today about that factor, what they were calling factor X at FDA in the early '60's when the final determination of the identities of those materials was made, so --
Q. (By Mr. Turet) Would you agree that the medical department of Monsanto knew as of June 24th, 1964 that Aroclors can produce some chick edema?
MR. DIMURO: Objection.
A. That's what the document says, yes.
Q. (By Mr. Turet) Is there some other date at which you know that, that Monsanto knew more about this in connection between PCBs and chick edema?
MR. DIMURO: Objection.
A. I'm not sure I understand your question.
Q. (By Mr. Turet) Well, in --
A. I mean the answer is going to be no anyway, but I don't know that I understand your question.

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Q. Let me ask it in a more open-ended way and maybe I can refine it backwards. What did Monsanto know as of 1969 about any possible connection between exposure to PCBs and chick edema?
A. I don't think -- I mean there continued to be an occasional paper in the literature about chick edema. One or more of those may have mentioned PCBs and referred back to the earlier data, but as far as I know, the O'Dell paper and apparently this Federation of American Societies for Experimental Biology papers, but I don't know of any specific studies on Aroclors and development of chick edema symptoms.
Q. Do you know of any that happened after 1969?
A. Well, the Monsanto studies certainly indicated that PCBs had some toxicity to chickens. I frankly don't recall if edema was one of the end points that was noted in those chickens.
Q. Did the Industrial Bio-Test toxicity tests on chickens include ingestion of PCBs as well as inhalation?
A. My recollection would be that it was ingestion. I could be wrong. If you have other information, that's fine, but I think they were ingestion. They were feeding studies.
MR. TURET: Mark this one as, actually, let me see if we had it yesterday. Can we mark this one as

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T-22.
(Exhibit T-22 was marked for identification by the reporter.)
Q. Dr. Kaley, you're being shown a document that's been marked as Exhibit T-22 which yesterday was marked as PR --
A. 3.
Q. -- 3, and that is a January 26th, 1967 letter from David Wood of Monsanto to George Buchanan of Monsanto.
Very quickly, Dr. Kaley, I just want to refer your attention to Page 2. You'll see a section that was underlined by someone whom I don't know, that's not in connection with this litigation, that says Jensen, referring to the Swedish scientist, stated that he had been approached personally by several workers and these workers were quite worried as to the possible effects on their health. What, if anything, did Monsanto do upon learning that some workers had reported to Mr. Jensen, Professor Jensen concerns about the toxicity of PCBs?
A. Well --
MR. DIMURO: Objection.
A. I mean, this is part of the start of a whole series of activities on Monsanto's part with regard to the detection of PCBs in the Swedish environment. I don't

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know whether they did anything specific with regard to this underlined statement or not.
Q. (By Mr. Turet) Okay. I have no further questions on that one.
MR. TURET: This one is T-23.
(Exhibit T-23 was marked for identification by the reporter.)
Q. Dr. Kaley, you're being shown a document that's been marked as T-23. It's Bates numbered MAE 053518 dated July 31, 1968.
A. Yes.
Q. Okay. This memo refers to an article that appeared in the New Scientist Magazine in December 15th o '66; is that right?
A. Yes.
Q. And it's directed to the two members of the medical department, Dr. Kelly and Elmer Wheeler, among others?
A. Yes.
Q. And specifically, would you agree with me when I say that Mr. Paton is criticizing the article as being biased and implausible?
A. He says it's most opinionated.
Q. Would you agree that Mr. Paton was belittling the article?

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MR. DIMURO: Objection. You've taken Mr. Paton's deposition. You've asked him about this document, and you're not going to ask Dr. Kaley to interpret what Mr. Paton is saying.

A. It's certainly not flattering.

Q. (By Mr. Turet) The theory which he expresses on how PCB finds it way into fish and later humans proved to be correct, didn't it?

A. I have not read that article or recall reading that article. I don't know what the theory it's propounding is.

MR. DIMURO: Also notice the article is not attached to T-20.

MR. TURET: As produced, it was not attached, that's correct.

MR. DIMURO: That doesn't mean you don't have the article.

Q. (By Mr. Turet) Would you agree that the PCBs that made it into the waterways and made it into fish -- withdraw the question.

I have no further questions on that one.

MR. TURET: T-24, please.

(Exhibit T-24 was marked for identification by the reporter.)

Q. (By Mr. Turet) For the record, Dr. Kaley,

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you're being shown an exhibit that's been marketed T-4. It's Bates numbered MONS 072195, and I'm not quite sure what the month of this is. It appears to be 10 or 12/24/68. Have you read it, Dr. Kaley?

A. No. I'm having trouble reading the last three lines. I don't know what they say.

Q. If I were to suggest to you it says Dr. R.E. Kelly says burning of NCR paper a problem here along with others and signed by Howard Bergen --

A. I'll take your representation. Well, yeah, that seems to be correct. It's certainly possible that's what it says.

Q. And what was the earliest that Monsanto concluded that incineration of NCR paper would lead to the release of PCBs into the environment?

MR. DIMURO: Objection.

A. I'm aware of no documents before that addressing this issue. And this doesn't necessarily refer specifically to the problem as you define it, so I don't know specifically what Emmet may have talked about what the problem was.

Q. (By Mr. Turet) Would you agree the first sentence refers to Monsanto having to protect themselves on this toxicity issue?

MR. DIMURO: You're taking part of the sentence.

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Q. (By Mr. Turet) To give you a feel as to why Monsanto has to protect themselves on this toxicity question. Is that --

A. That seems to be what it says, yes.

Q. And the second sentence, would you agree that Dr. R.E. Kelly says burning of NCR paper a problem here along with all others?

A. That's what it says.

Q. And do you conclude that those two sentences were intended to go together meaning that the burning of NCR paper and the toxicity question are being linked in this memo by Howard Bergen?

MR. DIMURO: Objection.

A. There is apparently some linkage, yes.

Q. (By Mr. Turet) And H. L. Minckler, was he an executive of Monsanto back in '68?

A. I don't know what his position was.

MR. TURET: That's 25.

(Exhibit T-25 was marked for identification by the reporter.)

Q. (By Mr. Turet) For the record, Dr. Kaley is being shown a document marked as T-25 which is Bates numbers MAE 053009. It's a January 14, 1969 memorandum from D. A. Olson of Monsanto?

A. Yes.

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Q. Dr. Kaley, this is addressed to a gentleman whose name I'm not even going to try to pronounce at MMK Tokyo. Do you have an understanding as to whether MMK was Mitsubishi Monsanto Joint Venture back in 1969?

A. I understand that was the case, yes.

Q. And that was a joint venture that was based in Japan?

A. I believe that's true, yes.

Q. And in the first paragraph, when they're referring to the Bran Oil poisoning incident, is that the Yusho incident?

A. Yes.

Q. Now D. A. Olson sent on some materials according to this memorandum to Mr. Hoshino?

A. I'll accept that.

Q. And he comments about the enclosures, there are few regulations and little information on human toxicity, and he goes on to state that this is because we do not envision the use of Aroclor as either a direct or indirect food additive and have little justification for the expense of the toxicity testing which would be required.

Dr. Kaley, was it the position of Monsanto that additional toxicity testing was not merited back in January 1969 because the expense of the toxicity testing made it unneccesary or unjustified?

A. No. What that means is that if a material is, if the intended use of a material is either as a direct or indirect food additive, there is a very extensive battery of tests which were required and still are required by FDA to be undertaken so that any material that was intended for these uses had to undergo that battery of tests.

Since the Aroclor products were not intended to be used in those kinds of applications, those tests would not be necessary and you wouldn't do them if you weren't going to make an application for that food contact use.

Q. What types of tests would have been done if Aroclor was intended to be a food additive back then as opposed to an industrial chemical?

MR. DIMURO: Objection. I'll note this question goes beyond the scope of the notice.

A. They were basically extractability tests.

Q. (By Mr. Turet) What's an extractability test?

A. You basically put the, you formulate the product that would be in contact with the food and put it in contact with a variety of solvents to see how much of that material migrates from the -- for instance, the film of the can lighting into those various solvents.

Q. So that would be if it was going to, if it was going to be contained in a paint that was going to come in contact with food, you would do extractability tests in

order to get -- I haven't phrased that well.

Extractability tests would be appropriate if the finished product containing Aroclors were to come in contact with food?

A. If it was -- that was the intended use, yes.

Q. Were extractability tests also done if the finished product were to be in proximity but not touching the food?

A. My understanding would be not necessarily, no.

Q. And I know I've asked this generally, but we're talking about back in January of 1969, or can you --

A. Yes.

Q. If you need to broaden the time frame, I'm not trying to focus you on --

A. I think that was the case then. And to my knowledge, that's still the case now.

Q. So it was true in '69 and true in 1970 and thereafter?

A. As far as I know.

Q. Now, down in the last paragraph, there's a statement that we, like you, are vitally concerned that no governmental action in Japan be taken which would be harmful to Aroclor. And what does that mean, as to action taken which would be harmful to Aroclor?

A. I think they were concerned based on this single

unique incident that there might be governmental action in Japan which would lead to someone deciding that PCB products in general were not suitable for heat transfer applications.

Q. And this too was forwarded to Mr. Wheeler in the medical department, correct?

A. He's on the CC list, yes.

(Exhibit T-26 was marked for identification by the reporter.)

Q. For the record, the document being marked as T-26 is a March 3rd, 1969 letter from Elmer Wheeler of Monsanto. It was marked yesterday as PR-6. I'll direct you to a couple of fairly specific spots if it would be helpful on Page 2.

A. Okay.

Q. There is a statement by Mr. Wheeler that the Swedish and American scientists had implied that PCBs are highly toxic chemicals and this is simply not true. Is it fair to say that was Monsanto Company's position back in March of 1969?

A. Yeah, I think that whole paragraph is a fair characterization of Monsanto's position, yes.

Q. That PCBs are not toxic unless they are mishandled or misused?

A. They're not highly toxic and they are not toxic

unless they are mishandled or misused.

Q. And, Dr. Kaley, would you agree that it would not be a mishandling or misuse for a customer to use an Aroclor product as recommended in a technical bulletin put out by Monsanto?

MR. DIMURO: I'm going to object that this goes beyond the scope of the notice. He's here to talk about toxicity, not uses of PCBs. Note my objection. You can answer it.

A. In general, I think that's a fair assumption, yes.

(Exhibit T-27 was marked for identification by the reporter.)

Q. (By Mr. Turet) Dr. Kaley, you're being shown a document that's marked as T-27.

A. Yes.

Q. And it was marked yesterday as PR --

A. -- 4.

Q. And it's a chronology that was signed by R.E. Keller of Monsanto at the bottom and I'll represent to you he was deposed in this case and indicated it was his document.

A. Okay.

Q. On the chronology which has been marked as T-27 on December 29, 1966, there's a reference regarding a

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Widmark letter to somebody who's been blanked out of this document dash Monsanto. Is there a document in the possession of Monsanto today from Professor Widmark from back in 1966?

MR. DIMURO: I'm going to object because we don't know if the name has been blocked out as you say or if that's the way it was typed. Subject to that, you can answer the question.

A. I don't think there is such a letter. This may be a mischaracterization of the exchanges around that time frame. I don't know. I don't know of this particular Widmark letter at that time, no.

Q. (By Mr. Turet) And this is the same Professor Widmark from Sweden that participated with Professor Jensen in the Jensen and Widmark studies?

A. Yes.

Q. And down at the end you'll notice the little entries that led to this letter, would like to work with Monsanto toxicologists on problem. Did Professor Widmark approach Dr. Monsanto about working with them on the discovery of PCBs in Sweden?

MR. DIMURO: I'm going to object to the form of that question. You can answer.

A. I haven't seen documents which would substantiate that. I don't know if that's true or not.

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is probably not a toxicity study. I don't -- I'm not aware of that specific study, but there's nothing in there that says it would be toxicity, I don't know.

Q. On the next page there's an entry on May 3rd, 1968 that says Newell letter to Hunt. Dr. Hunt was the medical department St. Louis, correct?

A. Presumably that's who that was addressing, yes.

Q. And Dr. Newell was medical department in London, correct?

A. I'm not sure of that.

Q. That was the chief medical director we had seen earlier I believe.

A. I'll accept that as your representation. Newell doesn't sound right.

Q. It says -- I apologize it says Chairman Department of Agriculture and Environmental Toxicology.

A. Yeah, it was another name.

Q. What toxicological study, if any, was done back around May of 1968 that was brought to the attention of the medical department?

MR. DIMURO: I'll object to the form of the question.

A. I have no information other than what's presented here. And it says enzyme induction was stimulated.

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Q. (By Mr. Turet) Did the Monsanto toxicologists end up working with Professor Widmark on what's referred to here as the chlorinated biphenyls problem?

MR. DIMURO: I'll object to that question also. You can answer.

A. Monsanto personnel certainly had discussions with Dr. Widmark and/or Dr. Jensen. I'm not aware of whether any joint work was ever carried out, no.

Q. (By Mr. Turet) Now, under the February 21, 1967 entry, the second one in particular, there's a reference to Kelly letter to Wilde, no need to contact Swedish people. What is that?

A. I don't know.

Q. Now, the October 21, 1967 entry Holmes, Simmons, Tatton, is that a toxicity study?

A. Without looking at it specifically, I would say no. I think it's just an occurrence of PCBs in the environment study. I don't think there's toxicological information in that paper as I recall.

Q. How about the November 2nd, 1967, there's a reference to Richardson letter to Hardy confirmed by GC slash mass Aroclor 1254 in eggs from a hundred parts per million feeding studies confirmed Government Labs. Is that a reference to a toxicity study?

A. Based on the information there, I would say that

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Q. (By Mr. Turet) What does that mean?

A. Any material or most materials, all materials when introduced into an animal body, the body reacts to those materials in some way. And one of the ways is that enzymes are caused to be formed as a reaction to that material being in the body. Typically, those enzymes help the body metabolize that material so it can be excreted or dealt with.

Q. Is there any toxicological significance to finding enzyme induction?

A. Well, certainly toxicologists are interested if PCBs or other chemicals induce enzymes. That's a piece of information that is useful to them. So to that extent, yes, there is toxicological information. Enzyme induction does not necessarily indicate toxicity or an adverse effect as it is an effect.

Q. Now, the notes here also under this same Newell letter to Hunt suggest that Newell recommended tests in corroboration with Monsanto rather than seek government support. Is that an accurate reference, did whoever Newell was approach Monsanto with a request to corroborate on toxicity testing?

A. I haven't seen that letter. I can't answer that.

Q. And there's also a reference, medical department

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recommended no action.
A. Again, I don't know whether that's the case or not.
(Exhibit T-28 was marked for identification by the reporter.)
Q. (By Mr. Turet) Dr. Kaley, for the record, you're being shown a document that's marked as T-28 which was also marked as an exhibit yesterday which is an October 2nd, 1969 report of the Aroclor Ad Hoc Committee. It's Bates numbered MONS 036720 through 732. This is a document you've seen before today, isn't it, sir?
A. Yes.
Q. Now, on the page that says No. 2 up at the top, entitled probability of success --
A. Yes.
Q. -- the ad hoc committee concluded that little could be done to refute the identification of Aroclor 1254 and 1260 as a nearly global, in the first paragraph, as nearly global environmental contaminant leading to contamination of human food in parentheses particularly fish, the killing of some marine species in parentheses shrimp, and the possible extinction of several species of fish eating birds. Now was the position of Monsanto at the time the same as the position of the ad hoc committee?
A. Well, number one, I think this is a draft

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report, so I'm not sure what the final report said, but --
MR. DIMURO: And the question is, is the position of Monsanto the same as the position of the ad hoc committee with respect to this first, with respect to the sentence that you read?
Q. (By Mr. Turet) So their conclusion was that there was little probability that any action could be taken that will prevent the growing incrimination of the specific PCB's near this global contaminant, etc.?
A. My feeling would be the specifics are somewhat overdramatized, but I think the general conclusion that there's little can be done that's going to prevent the growing incrimination is probably a general position, yes.
Q. As of October of 1969?
A. Whenever this draft was prepared, yes.
Q. And down at the bottom, the notes indicate toxicity towards certain species is high. Was that also consistent with the position of Monsanto at the time?
A. Well --
MR. DIMURO: I object.
A. We've talked, it says toxicities relative, nonspecifically what this person was talking about nor what his definition of high was, and the words are there. And under some definitions, I assume that obviously PCBs were more toxic to some species than others. So on a

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relative basis it was higher to some species than others.
Q. (By Mr. Turet) Putting aside higher, would Monsanto agree that PCBs were a high toxicity to certain species?
A. I can't put aside higher. I don't know specifically what species they were talking about, whoever wrote these notes nor what that person might consider to be high, higher, low, lower. So you know, I'm not, I can't say anything more than what I already said that certainly the toxicity is higher to some species than others so --
Q. What is this species that toxicity was established to be highest as of October of 1969?
A. Well, my recollection and based on this document is certainly shrimp. Juvenile shrimp did seem to be extremely more susceptible to the higher levels of PCBs. I think that's one where Monsanto would agree that toxicity appears to be under the conditions of the test higher in that species than for some other species.
Q. Is there any point at which Monsanto would agree that there's such a thing as high toxicity to a particular species?
MR. DIMURO: I'll object to the form of that question.
A. I don't think it could be answered in the

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abstract. If someone wants to give a definition of what high toxicity is, it may or may not fall within that range.
Q. (By Mr. Turet) Now on Page 5 of the same report, fourth paragraph down, there is a statement made in this report that it has also been recognized there could be vapor losses, but it was felt that these were of perhaps of less significance than the vapor losses in plasticizer applications. What were the vapor losses in plasticizer applications that were envisioned in this report?
MR. DIMURO: Objection.
A. I don't know specifically.
Q. (By Mr. Turet) Did Monsanto know as of October of 1969 that there were significant vapor losses from plasticizer applications that were likely?
MR. DIMURO: Objection.
A. Well based on this document and I think other things we've discussed today, we understood that in certain applications there could be vapor losses on a relative basis. Those vapor, whoever wrote this feels that those vapor losses are potentially more. They use the word significant, than the losses from other applications. I kind of lost where your question was exactly, but --

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Q. I'm trying to --
A. The word significance is used here. I don't know, again, that's kind of a relative term. It doesn't say that they're of concern, it says they're of significance. So whether there's more potential there, I mean a plasticizer application, I think a plasticizer application is basically an open application compared to applications like transformers or capacitors where they're closed, so certainly the potential for vapor loss is higher and therefore potentially more significant in the closed applications.
Q. As of October of 1969, did Monsanto know whether vapor losses could occur from surface coatings containing PCBs?
MR. DIMURO: Object to the form of the question.
A. I think they would certainly have known that there was a potential at some level from some surface coatings based on the results where they had looked at paints, for instance, where they did, were able to measure vapor from paints where they were drying.
Q. (By Mr. Turet) You're talking about the ones we looked at earlier from the plastics division?
A. Yes.
Q. As of October of 1969, had Monsanto done any

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other testing to determine the extent to which vapors escaped from surface coatings containing PCBs?
A. Not that I'm aware of.
Q. And as of October of 1969, had Monsanto done any testing to determine the extent to which PCBs would escape from finished products that contained PCBs?
MR. DIMURO: Objection. You can answer it.
A. Not that I'm aware of.
Q. (By Mr. Turet) Now understand, I'm asking both vaporized and escape in other media.
A. As far as particular tests on what you're calling particular finished products, I'm not aware of any testing.
Q. Now, there's also in this last paragraph references to possible sources of air environmental contamination from essentially, if I'm reading it correctly, incineration of materials that have Aroclors in them. Am I reading that correctly?
A. Basically, yes.
Q. And when was the earliest that Monsanto had knowledge that PCBs could get out of finished products that contained PCBs through incineration?
MR. DIMURO: Objection.
A. I'm not sure what you mean by get out of, but I don't know the specific date when that knowledge was

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there. You showed me the document earlier where they mentioned incineration of NCR paper.
Q. (By Mr. Turet) That's Howard Bergen?
A. Yes, that handwritten note, so around the late 1960's apparently there was some awareness that that could be a potential problem.
Q. [illegible] that the date you're referring to?
A. I don't remember what the date on that document was. '68, '69 time frame based on that document, if it was 1968, and this one, it's a potential, it says a possible source, it doesn't say a source. So there was a recognition of the potential.
Q. What testing did Monsanto do to determine the extent to which PCBs escaped from products that were being incinerated?
A. I'm not aware of any.
Q. I have no further questions on that document.
(Exhibit T-29 was marked for identification by the reporter.)
Q. Dr. Kaley, you're being shown a document that's been marked as Exhibit T-29 and was marked yesterday as PR --
A. 12.
Q. -- 12. It's the minutes of the meeting of the

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corporate development meeting from November 17th, 1969. You'll notice, Dr. Kaley, that this is a three-page meeting minutes and then there's a whole attachment, PCB presentation to the corporate development committee, which was produced together, but I recognize they're two separate documents.
A. Okay.
Q. Now, going back to I guess it's the second page, that is marked FIS 000891.
A. Yes.
Q. Now there's a reference to a plan of action that's being presented to the corporate development committee.
A. Yes.
Q. And there's a statement that in plasticizer uses evidence is not available as to whether Aroclors escape from end products either through leaching or by dispersal in burning.
A. There you have it, you already knew the answer before you asked the question.
Q. Does that confirm that Monsanto --
A. Based on the information presented in this document, it appears it was still, the potential was still known, but there wasn't specific evidence that that vapor, or that loss occurred.

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Q. And to your knowledge, was any testing done by Monsanto to conclusively determine either leaching or dispersal in burning?
A. Not to my knowledge.
Q. Flip ahead to the page that says FIS 001001.
A. Okay.
Q. This is a chart in one of the materials being presented to this corporate development committee.
A. Okay.
Q. And it refers to possible contamination sources. And although I recognize the copies that were produced are a little difficult to read, I think you'll see that there are a list of different applications and a list of different manners in which there may be contamination under the source column. And in that column that indicates as to whether Aroclor 1254 and/or 1260 are used in that application?
A. Yes.
Q. Now, under the first couple, there are references to coatings used from marine paints and water tank linings and swimming pool paints. Do you see that?
A. Yes.
Q. And you see also in the far column these are applications for which Aroclor 1254 or Aroclor 1236 are used?

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A. Yes.
Q. And source of potential contamination was leaching, correct?
A. Yes.
Q. Now, so it's clear, at least as of November of 1969, those had been identified by Monsanto as potential contamination sources, correct?
MR. DIMURO: Objection. Beyond the scope of the notice. You can answer it, Doctor.
A. As far as I can tell from this document, yes.
Q. (By Mr. Turet) Again, no testing had been done by Monsanto to conclusively determine the extent to which leaching occurred out of those coatings?
MR. DIMURO: I'm going to object to the question as being beyond the scope of the notice. I'm going to allow the Doctor to answer, but you're getting far field of toxicity here. You're now asking if tests are performed to determine leaching. I'll let him answer but note my objection.
A. Not that I'm aware of.
Q. (By Mr. Turet) And the next item is carbonless copy paper, but it says is not an application which uses Aroclor 1254 or 1260, correct?
MR. DIMURO: Same objection. You can answer it.

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A. Correct.
Q. (By Mr. Turet) The one that has the wax modification listed as potential source of vaporization and it is an application for Aroclor 1254 and 1260, correct?
A. Just what the document says, yes.
Q. And again, there's no testing that's been done by Monsanto to conclusively determine whether vaporization happened from wax modification of PCBs?
MR. DIMURO: Same objection.
A. I'm not aware of such testing.
Q. (By Mr. Turet) And the next one down is emulsion adhesives which also contained Aroclor 1254 and 1260, correct?
A. That's what the document says, yes.
Q. And source of potential contamination was contact with product via packaging or incineration, is that --
A. Yes.
Q. And again, to your knowledge Monsanto had done no testing to conclusively determine whether contamination was occurring from emulsion adhesives with Aroclor 1254?
MR. DIMURO: Same objection.
A. I have no knowledge of such testing.
Q. (By Mr. Turet) And the last one, sealants, used

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for automotive, I think it says construction although it's difficult to read.
A. I think it's transmission.
Q. Okay. Or joint sealants?
A. I think it's one word. I think it's transmission joint sealants.
Q. Okay.
A. Because I think that was one of the applications that I'm aware of, so I think it was transmission joint sealants.
Q. And that's an application in which Aroclor 1254 or 1260 was used?
A. That's what this document says, yes.
Q. And the potential contamination source was long term leaching?
A. That's what the document says.
Q. And again, to your knowledge -- not to your knowledge. Again, Monsanto had done no testing to conclusively determine whether long term contaminati occurred from sealant that used Aroclor 1254?
MR. DIMURO: Same objection.
A. I have no knowledge of such testing.
Q. (By Mr. Turet) Now if you would flip ahead to the pages, I guess it's Bates numbered at the bottom FI 001012 number 3 at the top, this section specifically

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relates to terms of toxic or harmful effects from the presence of PCBs.

I think you'll find, if you go back to the beginning, that there is a -- there's a reference to, here you go, on the very first page of the PCB presentation, I'll represent to you there's a statement that in a few moments Elmer Wheeler will describe the problem in detail.

A. Where are you?

Q. I flipped back to the beginning. I could tell you were trying to look for the source of the document.

A. I was trying to get some idea of what it was purported to be and who might have said it.

Q. There's reference at the beginning that Elmer Wheeler was to be one of the presenters to the committee that day, but let me direct you back to the document to Page 001012.

A. All right.

Q. And the presenter states that in terms of toxic or harmful effects from the presence of PCBs, we can make these statements supported by a growing amount of toxicological research data.

A. I see that.

Q. The first one is Aroclors are not highly toxic from an acute standpoint to man, animals, birds or fish.

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Was that Monsanto's position as of November of 1969?

A. Yes, I assume it was. It was so stated and that's consistent with my understanding, yes.

Q. Is it your understanding that that remained Monsanto's position throughout 1970 as well?

A. I would agree with that, yes. Basically, I agree with it now.

Q. Did that remain Monsanto's position all the way through, the notice goes through the end of 1985?

A. As a -- basically, a general assessment, I think that's true. I think we talked earlier and I think I saw something in here, PCBs are particularly toxic to shrimp. I think there are some exceptions where it might not necessarily be true. But in general, I believe that. Then for the time period you have framed, I believe that is a generally accepted statement within Monsanto, but there were certain exceptions to that.

Q. Such as shrimp for example?

A. That's one that apparently is pointed out here. Not apparently, but it is the one that's pointed out here.

Q. Now, No. 2 says from a chronic toxicity standpoint the PCB's may be considered moderately toxic to man, animals and fish. In that context what does moderately toxic mean?

MR. DIMURO: I object.

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A. I was going to say in quotes, the fact that he has in it quotes suggests that maybe he didn't know what it meant when he said it. I don't know what the basis of that is, what the end point is he's talking about. I don't know.

Q. (By Mr. Turet) Is it a term of art in the toxicological field to refer to a particular chemical as moderately toxic?

A. There are a variety of classification schemes that have been proposed from time to time or been used from time to time. I believe that moderate is in some of those schemes, but I don't know number one, whether they're consistent with one another and what the specific guidelines, the high and low toxicity of those might be, so I don't have any specific information what this might mean.

Q. I have no further questions on that document.

(Exhibit T-30 was marked for identification by the reporter.)

Q. Dr. Kaley, you're being shown a document that is entitled possible customer questions on PCBs publicity Bates numbers MAE 034803 through 814.

A. Yes.

Q. And I'm going to direct your attention specifically to the page that's numbered 034809.

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A. Okay.

Q. Now, under toxicity, you'll see that there's a question posed if PCB is a danger to fish and birds, how about humans. And the answer, the amounts being found in the environment are not considered a factor to humans or fish. The whole question is on chlorinated pesticides relating to birds. Now was that the position of Monsanto as of January of 1970?

MR. DIMURO: Objection.

A. Based on this document, I think that's probably, I mean whoever wrote this, that's their representation. I think it's probably a fair representation. Again, I think there are possible exceptions to that, but in general, I would think that is basically a correct position.

Q. (By Mr. Turet) Now, Question 2 under toxicity, there's a question posed, are Aroclor 1254 slash 1260 etc. more toxic than other Aroclors, why. And the part of that question I want to ask you about is the one that says the alleged PCB problem is not really related to degree of toxicity. Do you see that?

A. Yes.

Q. Was that -- did that accurately reflect the position of Monsanto back in January of 1970?

MR. DIMURO: I'm going to object to it. I mean, there's a whole couple of sentences before that last

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sentence and I don't know if it needs to be put into context. Subject to that, he can answer it:

A. I mean, I think certainly, and I know you're not asking about the first two sentences in that answer I think, but I would say that I think those are consistent with what I said before, there's no easy answer to are the more highly chlorinated more toxic than the lower chlorinated. I think it is consistent with that.

With regard to the third sentence, I'm not sure if you're asking me if that's allegedly Monsanto's position or the statement is Monsanto's position. If you want to clarify that, or you just want to talk about the whole sentence --

Q. (By Mr. Turet) How about the statement that the PCB problem is not really related to the degree of toxicity?

MR. DIMURO: It says the alleged.

Q. (By Mr. Turet) I understand, but when I put alleged in --

A. I had a question whether he was focusing on the alleged or not. If we remove that word alleged, I would think that is in general a true statement. It's personally with regard to the differences between 1254 and 1260. The environmental occurrence of PCBs which led to all these issues that we're talking about here in this, I

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don't know what the date of this is, but late 1960's early 1970's time frame was focused on the fact that it was Aroclor 1254 and 1260 that were being detected in the environment as opposed to the more, the lower chlorinated material, Aroclor 1242. And so the problem was focused on the premise of those materials on the environment and not really focused on relative toxicity, if that made any sense.

Q. Yes, that makes sense.

A. Good.

(Exhibit T-31 was marked for identification by the reporter.)

Q. For the record, T-31 is an exhibit that's dated March 30th, 1970. It's a memorandum from R. Emmet Kelly to William B. Papageorge.

A. Yes.

Q. Okay. Dr. Kaley, down at the bottom, you'll see that Dr. Kelly had emphasized what he called a very serious point, when are we going to tell our customers not to use any Aroclor in any paint formulation that contacts food, feed, or water for animals or humans. Are there any other instances within Monsanto where that same concern was voiced before March 30th of 1970?

MR. DIMURO: Objection. That question goes beyond the scope of the notice and I will also note that

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you did depose Mr. Papageorge on this document. Subject to that, you may answer the question.

A. Without going back and reviewing specific documents, I don't know for sure. But I know that these kinds of discussions, maybe not this specific, but were being held within Monsanto. And, in fact, within months of this document, the company, you know, essentially ceased sales for these kinds of applications. So I don't know if there are specific documents that talk about those discussions. But certainly, I would, I think that there are discussions like that in some of those minutes of those meetings of potential actions where there's contact with other kinds of materials.

Q. (By Mr. Turet) Had Monsanto at any time before March 30th of 1970 told its customers not to use any Aroclor in any paint formulation that contacts food, feed, or water for animals or humans?

MR. DIMURO: I'm going to object to that question as being beyond the scope of the notice.

A. I don't know.

Q. (By Mr. Turet) You notice the last sentence of that paragraph Dr. Kelly says that it may be that some of the customers will assure themselves on the basis of non-extractability that a particular formulation might be safe, but I think we should make a blanket recommendation

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against these uses. Just going back to the question I asked you before, you talked about extractability as being one type of test to determine whether PCBs or other substances could get out of a product and into something that was in contact with it?

A. Yes.

Q. So when Dr. Kelly is talking about customers assuring themselves on the basis of non-extractability that a particular formulation might be safe, is that meaning that PCBs wouldn't get out of paint that contacted feed or food and into the feed or food?

MR. DIMURO: Object to the form of the question. Also object to the question as being beyond the scope of the notice. Doctor, you can answer it.

A. I think paint is too specific. I think. But generally, your characterization is correct. If what I think, what it suggests is that customers may formulate PCBs into a product which is going to be in contact with food, feed, or water and that they might very well do those FDA extractability tests and find that PCBs did not migrate from those products and therefore, as he says, convince themselves or assure themselves that such a formulation might be appropriate.

Q. (By Mr. Turet) And would you agree that Dr. Kelly is saying that Monsanto should tell its

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customers not to use Arocior in any formulation that comes in contact with food or feed or water or animals or humans?

A. That's, yes, that's what Dr. Kelly is saying.

(Exhibit T-32 was marked for identification by the reporter.)

Q. Dr. Kaley, just for the record, you're being shown a document that's been marked as T-32, Bates numbers MAE 049443 to 446. It's an April 28th, 1970 letter from John Mason of Monsanto to Representative Ryan.

Now, again, on Page 2, the paragraph that begins it should be emphasized the apparent PCB problem relates only to the possible effect on some species of birds, do you see that?

A. Yes.

Q. And I asked you this out of another document, but is that a fair representation of Monsanto's position at the time?

MR. DIMURO: I'll object to the form.

A. I think to the extent that the toxicity isn't implied in this, I think it would be a fair representation that the apparent PCB problem with regards to toxicity, to wild life species relates to the possible effects on birds. I think there were other concerns with regard to its presence in other media, but they did not appear with

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a few possible exceptions to be a toxicity issue.

Q. (By Mr. Turet) And the sentence that follows it, that manufacturing and use experience for thirty years, earlier animal toxicity studies and the interim reports on current extensive toxicological studies with various species of animals indicate that there is no threat to the public health. Again, on the issue of toxicity, was that Monsanto's position as of April of 1970?

A. Yes, I believe that's a fair characterization.

Q. And down at the very, very end of that page, where it says when used in other products the Aroclors are usually present in only very small quantities and when used alone they are normally in closed systems and consequently represent no hazard to human health, and again it concludes, that it's incorrect to assume there is a health hazard to the public, in that same, in that sentence that follows, is that an accurate statement of Monsanto's position as of April of 1970?

A. Yes, I believe that's a fair representation.

Q. I have nothing further on that document. I'll tell you what, off the record for a second.

(A short break was taken.)

(Exhibits T-33A and T-33B were marked for identification by the reporter.)

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Q. (By Mr. Turet) Dr. Kaley, for the record, you're being shown two documents that have been marked as T-33A and T-33B. The first is Bates numbers MAE 048640; the second is marked 048716. Would you agree that these are labels, warning labels that had been applied to Aroclor 1254 by Monsanto at some point in time?

A. Yes, I'll agree to that.

Q. Now, the one that's been marked as 33A, actually, I should look --

A. That's one without the environmental label.

Q. Okay. And is that, Dr. Kaley, as to the exhibit that's been marked as T-33A, you'll note that the caution is shorter than the one that appears on 33B.

A. Are you talking about number of words or actual, physical measurement? I'm sorry, yes.

Q. I know, it's been a long day.

A. 33B does have an additional wording concerning, warning the recipient of this label to go to extreme measures, extreme care to prevent entry into the environment.

Q. This I will represent to you was produced in its present form to us. Would you agree that the one that is marked as 33A was used prior to May of 1970 whereas the one that is marked as 33B was printed in or after May of 1970?

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MR. DIMURO: I'm going to object as being beyond the scope of the notice. If the Doctor knows, he can answer the question.

A. I will note that those, those designations are hand-printed on these labels. That's what they say. It is consistent with the actions that Monsanto was taking based on documents we've discussed previously today. They're vital warning labels to the product labels, yes. I don't know the exact dates, whether they're correct or not. I'll take your word and the document's word for it.

Q. (By Mr. Turet) Take the document's, because my only knowledge comes from the documents.

Are there any other toxicity warnings other than these that were placed on containers of PCBs back in 1969 or 1970 to your knowledge?

MR. DIMURO: I'm going to object to the question as being beyond the scope of the notice, but I'll permit the Doctor to answer if he knows.

A. I don't know specifically.

(Exhibit T-34 was marked for identification by the reporter.)

Q. (By Mr. Turet) Okay. Dr. Kaley, you're being shown a document that's been marked as Exhibit T-34 whic is a July 16th news slash press release from Monsanto.

A. I would note it's 1970.

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Q. I'm sorry?
A. You just said July 16th, I just wanted to note it was 1970.
Q. Yes. Correct. Now on the second page, Dr. Kaley, up at the top, there's a quote attributed to Howard Minckler, company vice president and general manager of the organic division that Monsanto is not aware of any scientific data that indicates PCBs may cause birth defects. The results of comprehensive toxicity studies sponsored by Monsanto in using the usual species of laboratory animals failed to produce such effects. Does that accurately reflect the knowledge of Monsanto as of July of 1970?
A. As far as I know, yes.
Q. Okay. Did Monsanto learn at any time after July of 1970 that, in fact, PCBs could cause birth defects in humans?
A. In humans?
Q. Yes.
A. No.
MR. DIMURO: Objection.
A. There is no such knowledge as of today, as of 1985, as of today, there is no information that PCBs cause birth defects in humans.
Q. No further questions on that one.

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(Exhibit T-35 was marked for identification by the reporter.)
Q. Dr. Kaley, you're being shown a document that's Bates numbered MAE 040935 through 949 and it's been marked as Exhibit T-35. And that's technical bulletin O/PL-306A.
A. Yes.
Q. Now, if you flip ahead in this technical bulletin, Dr. Kaley, to the page, I guess it reads 12 in the bottom left corner and says toxicity and safe handling.
A. Yes.
Q. You're going to love this, you could even take O/PL-306 which is --
A. All right.
Q. -- which was marked as T-7 and flip ahead I think, it was Page 50.
A. Okay.
Q. And as you put the two side by side, would you agree with me that the entire Page 50, the entire toxicity and safe handling section of 306 was incorporated into 306A and more material was added on the following page as well?
A. Okay. I will take your word without checking each word. I'll take your word for the fact that the

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inhalation and skin contact sections are word for word or essentially so, and on it, on the next page in T-35 there is a section entitled environmental hazards.
Q. Okay. As to the first part, I don't want you to take my word for it. I don't want you to look at it word for word, but at least generally does it appear --
A. The first words of each paragraph appear to be the same.
MR. DIMURO: If you notice any difference and you want to bring it to his attention, he'll look at it.
Q. (By Mr. Turet) So the environmental hazards section is the part that's been added in 306A?
A. Apparently so, yes.
Q. No more questions on that one.
(Exhibit T-36 was marked for identification by the reporter.)
Q. And for the record, the document being shown and that's been marked as T-36 is an October 28, 1970 press query Bates numbered MAE 033947 through 949.
Dr. Kaley, I'll direct you to the second page where it states the question, State of Ohio officials say that PCB can build up in the liver and kidneys and in fatty tissues, but to their knowledge it doesn't harm humans. Farmer's son had been drinking raw milk containing PCB could this have caused the problem. And

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the answer from Monsanto, this is a Monsanto document, is we agree with Ohio officials that humans exposed to PCB by the environment would not attain levels at which it could be harmful. Does that accurately reflect the position of Monsanto as of late October 1970?
A. I believe so, yes.
Q. Now down below it says question has Monsanto any evidence that PCBs could affect humans.
A. I'm sorry, I was pondering.
Q. A little bit lower, it says question has Monsanto any evidence that PCBs could affect humans. And the answer is there's no evidence that an environmental exposure, PCB could harm humans. Again, that -- is that an accurate statement of Monsanto's position back in October of 1970?
A. I believe so, yes.
Q. Now, it then goes on to address an incident in late 1930 where there was an accidental exposure at excessive levels which resulted in liver damage; is that correct?
A. I'm not sure I would agree with that. I mean the exposure in late 1930's was a mixture of PCB and polychlorinated naphthalenes, and I'm not sure there is an exposure to PCBs per se that resulted in that liver damage so that may be slightly incorrect. But generally, that's

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correct.
Q. I have no further questions on that one.
(Exhibit T-37 was marked for identification by the reporter.)
Q. Okay. For the record, the document you're being shown that's been marked as T-37 and yesterday was marked as an exhibit during the deposition as well is Bates numbers MAE 032743 through 744 and this too is a press query dated February 19th, 1971.
Now, Dr. Kaley, you'll note that this press query contains a question from the Chemical Week author and an answer from Monsanto that says first let me say that PCB has never been considered to be a highly toxic material. There are many examples of common products which are more toxic than PCB. For example, iodine, lye, gasoline, insecticides, paint thinner, lighter fluid, and various cleaning compounds. Is that an accurate statement of Monsanto's position back in February of 1971?
MR. DIMURO: Objection.
A. Without specific knowledge of the toxicities of those various other materials, I think certainly I would agree with the first sentence that PCB has not been considered to be a highly toxic material. I don't really know the relative toxicity of PCB on an acute basis to these other things, but it could very well be true.

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Q. (By Mr. Turet) Are there documents within Monsanto that evaluated on a comparative basis the toxicity of PCBs and the toxicity of some of these other common household items?
A. Not that I'm aware of.
Q. And later in that same answer there's a comment that the problem is not its toxicity, but its persistence. Again, in terms of toxicity, we addressed this before, does that accurately reflect Monsanto's position as of February of 1971?
A. I think that is generally a true statement, but there are some exceptions to that.
Q. Now also down below there's a comment that if PCBs had been introduced today, meaning February of 1971, we would also do more extensive toxicity studies including not just acute toxicity but also subacute parentheses chronic studies, show effects over longer exposure times at lower exposure levels. Is that an accurate statement of Monsanto's position in February of 1971?
MR. DIMURO: Objection. You can answer it.
A. Yeah, I think I would say that's a fair characterization based on what Monsanto and the rest of the chemical industry was learning about the potential for environmental persistence and the effects that could have, so I think they's a fair statement, yes.

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Q. (By Mr. Turet) No further questions on that one.
Dr. Kaley, did Monsanto keep track of the medical examinations of its own employees over the course of years?
MR. DIMURO: Objection. Beyond the scope of the notice. You can answer it, Doctor.
A. I'm sure they did.
Q. (By Mr. Turet) Do you know specifically whether Monsanto tracked the medical conditions of those employees that were employed in Department 246, the one that manufactured PCBs at the Krummrich Plant?
MR. DIMURO: Same objection.
A. Well, my understanding would be that all employees at the Krummrich Plant or any plant were given yearly physicals and to the extent records were kept, they would, you know, those records would be there. I don't think there was any specific, if you're asking was there specific attention paid to the Department 246 employees, I think the answer to that is no.
MR. TURET: I'll mark this as an exhibit.
(Exhibit T-38 was marked for identification by the reporter.)
Q. (By Mr. Turet) Dr. Kaley, you're going to be shown a document marked as Exhibit T-38 which is Bates

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number MAE 021600 which is a May 10th, 1972 letter from Emmet Kelly to Dr. Clarence Davies.
MR. DIMURO: For the record, the highlighted portions on the document T-38 are your own.
MR. TURET: Yes, and I fully expect to substitute a clean copy for the transcript.
A. Okay.
Q. (By Mr. Turet) Is it fair to say that Dr. Kelly at some point in time at least conducted a review of the medical conditions of the various employees at Department 246 over time?
A. Yes, I was answering the question with regard to general procedure, I was going to, I almost said something. I know subsequent to some point in time, this work was done and, in fact, later, a small epidemiology study was done looking at those workers also. So, I'm sorry. I was going to go back and ask was your question stated around that particular date. I wouldn't have known this exact date but the answer to your question is, yes, Dr. Kelly did do a specific examination of the workers employed with the polychlorinated biphenyls in the Sauget Plant.
Q. Was there any increase in incidents found of cancer in those employees?
MR. DIMURO: Objection.

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A. With regard to this 1972 document, a cursory reading tells me, I don't see any reference to cancer specifically in here. With regard to the later study in 19 whatever it was, the late 1970's, I don't -- there was no elevations in cancer specifically attributable to the PCB exposure. I believe there was a slight excess in lung cancer, but there's an excess in St. Clair County, Illinois and that was felt accountable for that excess.

Q. (By Mr. Turet) Other than that one type of cancer, was there any increase of any other type of cancer found among the Department 246 employees?

A. My recollection is, no, but I would qualify that that was a very, very small study. It had essentially no statistical, you know, statistical -- bearing weight there -- there just weren't enough workers.

(Exhibit T-39 was marked for identification by the reporter.)

Q. (By Mr. Turet) Dr. Kaley, you're being shown a document that's been marked as T-39 and it's a document that is dated December 6th, 1974 from Frederick Johannsen of Monsanto to George Roush.

A. Yes.

Q. And George Roush was the medical director back in 1974?

A. Yes.

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Q. Now down at the bottom there's a handwritten notation, our fate may be decided one way or another in six months. I hope your feelings that it is not carcinogenic are born out. Do you know who that handwritten notation comes from?

A. I see initials W.R., I can -- I mean I know there is a W.R. that it could have come from, but I don't know his handwriting well enough to know if that's his.

Q. Who is W.R. that it could have come from?

A. It could have been William Richard. I don't know for sure though.

Q. Was there a concern back in Monsanto back in December of 1974 that PCBs could be proven to be carcinogenic within the next six months?

A. Well, based on that note and based on the fact that we were doing carcinogenic studies and were aware that other people were, I think there was obviously interest in the outcome of those studies.

Q. Okay. But my question was, was there concern about the possibility that the studies to be released within the next six months could show carcinogenicity?

MR. DIMURO: Objection. Answer it if you can.

A. That is certainly a potential or possible interpretation of that handwritten note. It's not inconsistent with what it says. I mean, the six months

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comes from apparently a note up -- let me read this.

The note specifies that Aroclor 1254 has been under tests at NCI and that the histopathology completed within the six months, which I think is the trigger for that six month date, and it notes when that study came out that Aroclor 1254 was not carcinogenic.

Q. Okay. I have no further questions on that document.

(Exhibit T-40 was marked for identification by the reporter.)

Q. (By Mr. Turet) Dr. Kaley, you're being shown a document that's been marked T-40. It's Bates number MAE 051600 through 608 and it is a PCB Q and A preparedness information dated August 14th, 1975.

Dr. Kaley, if you'll direct your attention specifically to the second page of this Q and A memorandum --

A. Okay.

Q. -- you'll see Question 6, it's been reported that PCBs have produced carcinogenic responses in laboratory rats. There have also been occasions where the material has contaminated animal feed which is later accidentally fed to cattle and chickens. What effect has or will this have on the people who unknowingly ate the PCB infested food Isn't there a chance they might develop

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cancerous tumors.

And the answers provided in this particular Q and A document are that, you know, we know of only one PCB test in one animal strain that tends to suggest a possible carcinogenic relationship and our data does not confirm this test. Taking that sentence, is the one test to which this refers the study done by Renate Kimbrough?

A. I'm sure it is.

Q. And what was the particular PCB product that was tested in the study?

A. Aroclor 1260.

Q. And what was the particular cancer that she had alleged was found in the lab rats under that study?

A. Liver cancer, hepatocellular carcinoma.

Q. What did Monsanto do to prove or disprove the results of this study?

MR. DIMURO: Objection. Beyond the scope of the notice.

A. I mean there was nothing Monsanto could do to prove or disprove the results of that study. The results of that study spoke for themselves. Monsanto had early on in 1968 and 1969 commissioned feeding studies of a variety of Aroclors at IBT. The results of those studies suggested that PCBs were not carcinogenic. There were discussions I know with Dr. Kimbrough and other

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pathologists after her paper was published, and there is an on-going discussion as to whether -- what the results are vis-a-vis one another, but there was no way for Monsanto to go to prove or disprove another study.

Q. (By Mr. Turet) Now Monsanto commissioned certain pathologists to take a fresh look at the Kimbrough samples or the Kimbrough results?

A. I'm not sure of the exact, who commissioned who but I know there was a review of the relative pathologists of those studies conducted. I'm not sure if Monsanto did it or the government did it or who did what.

Q. Do you know if any of the pathologists retained to review the Kimbrough findings found that she was correct?

MR. DIMURO: Objection.

A. I have no doubt that they found that she was correct. I think there's no doubt that the rats in her studies showed evidence of a hepatocellular carcinoma.

Q. (By Mr. Turet) Is there any question as to -- do you know one way or another whether Dr. Kimbrough ultimately changed her conclusions from that study?

A. I'm sure she did not.

Q. As of today, does Monsanto believe that exposure to Aroclor 1260 can cause liver cancer?

A. Yes, Monsanto believes that exposure to -- high

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level exposure to Aroclor 1260 in laboratory rats can cause liver cancer under conditions of some tests, yes.

Q. And does Monsanto take the position that exposure to Aroclor 1260 under any circumstances can cause liver cancer in humans?

MR. DIMURO: Objection.

A. Monsanto's position was and is that based on the available human evidence of worker populations exposed to a variety of Aroclors, including Aroclor 1260, that there's no consistent evidence that PCBs or Aroclor 1260 specifically cause liver cancer in humans.

Q. (By Mr. Turet) Am I understanding you correctly, did Monsanto accept the findings of Dr. Kimbrough at the time that --

A. There was -- there were discussions to try to elucidate the differences between Dr. Kimbrough's studies and the studies Monsanto commissioned at the Industrial Bio-Test laboratory. Without knowing the specifics as I sit here today, I think there were, those discussions were held and my understanding, my recollection of the basic conclusion was that Dr. Kimbrough's studies did, in fact, show those carcinogenic and the Monsanto studies did not. And for whatever reasons, there was in inconsistencies. It could have been strain of rat or any number of things. You know, I don't have any evidence or knowledge that

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Monsanto disputed, I mean obviously, we -- we would have preferred the material not be carcinogenic in rats under the conditions of those tests.

I think we had questions about her study and the pathology of those tumors, but once those had been resolved, I don't know if there was any on-going doubt. Her results were what they were and certainly, today, I certainly accept the results of those studies at face value.

Q. Okay.

A. As I do the Monsanto studies. Or the other studies that have been done.

Q. Now, at the end of the answer to No. 6 which we were just referring to, it says we are not aware of any case relating PCBs to cancer in humans. And is that an accurate statement of Monsanto's position back in August of 1975?

A. Yes.

Q. And is that -- was that still Monsanto's position up and through, all to the end of 1985?

A. Basically, yes. Let me qualify, and I don't know exactly when the studies were or weren't published, but there have been epidemiology studies published which one or another may state an elevation of a particular cancer at a particular cite. Those studies taken as whole

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show no consistent information that PCBs are carcinogenic in humans. So in any case, I think clearly there's never been a case where someone could say with specificity that PCBs caused cancer in this individual human being that has never been done. There have been studies where there have been particular elevations in a particular population between a particular cancer but this finding has not been substantiated in other studies.

(Exhibit T-41 was marked for identification by the reporter.)

Q. Dr. Kaley, you're being shown a document which is Bates numbers MAE 004888 through 889 and it is a July 18th, 1978 letter from R. C. Isham to Mr. Thomas Dustin of the Izaak Walton League.

Anyway, and just to confirm, I'm not going to go through this with every single document, but, just a couple of examples, you'll notice in the middle paragraph of the first page it says there is no evidence that PCBs cause cancer. And was that the position of Monsanto as of July 18th of 1978?

A. The next sentence says PCBs have very low acute toxicity to man. I'm assuming that sentence was meant to apply to human beings although it doesn't say so specifically. With that assumption, I think that is Monsanto's position. I think by then there was certainly

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evidence that PCBs caused cancer in laboratory rats, and that would be Aroclor 1260 specifically caused cancer in laboratory rats. But with regard to humans, yes, I think that was a correct statement.

Q. And the sentence a little farther down quotes from the Federal Register in finding that according to a summary of the report included -- withdraw the question.

Farther down there is a reference to a summary of a report which had been released in the Federal Register Aroclor 1254 was not carcinogenic to rats under the test conditions; is that right?

A. Well, there was an announcement in the Federal Register that was the results of that study, yes. That was in fact the conclusion I mentioned to you earlier.

Q. And this was, and the position being communicated from Monsanto to the Izaak Walton League in July of 1978 was these are the medical facts?

A. That sentence is in this document, so yes.

Q. Okay. And again that the primary concern over PCBs involves the persistence in the environment and their build-up in the food chain not carcinogenicity?

A. True then; true now.

MR. TURET: Mark that as T-42.

(Exhibit T-42 was marked for identification by the reporter.)

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Q. Dr. Kaley, you're being shown a document that's been marked as T-42.

A. Yes.

Q. And it is a statement from Monsanto dated October 15th, 1979. Specifically, I'll refer you to Page 5 of the document.

A. Okay.

Q. You'll see in the middle there has never underlined, never been a documented case of human death or irrecoverable harm from PCBs.

A. Yes.

Q. Was that the position of Monsanto back in October of 1979?

A. I'm sure this was the position then. It's the position now.

Q. So at least all the way through 1985?

A. Yes.

Q. No further questions on that document.

A. Again, assuming the irrecoverable harm also refers to humans as does human death.

Q. Okay.

(Exhibit T-43 was marked for identification by the reporter.)

Q. And, Dr. Kaley, you're being shown a document that's been marked as Exhibit T-43 Bates numbered MAE

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007032 to 033.

A. Yes.

Q. And this is a note to the editors from Monsanto Company dated September 23rd, 1980?

A. Yes.

Q. Entitled PCB hazards facts and fallacies?

A. Yes.

Q. I want to direct your attention to, I think I've asked you about not being human cancer causing enough times. Can you flip to the second page?

A. Yes.

Q. The top sentence begins there has never been a single documented case in this country where PCBs ever caused serious human health problems. Now is that an accurate statement of Monsanto's position back in September of 1980?

A. Well, I guess, I'm sure that if you asked somebody with a case of chloracne whether that was a serious health problem he or she might say it was, but with the exception of chloracne, I believe that that was the case, yes, attributable to PCBs, yes.

(Exhibit T-44 was marked for identification by the reporter.)

Q. Dr. Kaley, you're now being shown a document that's been marked as T-44, it's Bates numbered MAE 006686

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to 87, you'll see it's also a note to the editors dated September 11, 1980.

A. Yes.

Q. It's entitled PCB and cancer, what are the facts?

A. Yes.

Q. And I'll refer you to the second page, in particular all the way just before the summary where it says they, referring to PCBs, are considered only mildly toxic on an acute basis when ingested by humans about on the same order as common table salt.

A. Yes.

Q. Did that accurately state the position of Monsanto back in September of 1980?

A. I believe so, yes. I hate that analogy, but I think's that some basis and fact for that, it's been used elsewhere, so I think it's basically true.

Q. Is it fair to say without belaboring this that PCBs were not cancer causing and PCBs had not irreversibly injured any human beings other than chloracne?

A. That's not irreversible. I question the term serious, not irreversible injuries. Chloracne is irreversible, but some people consider it to be serious.

Q. PCBs are not carcinogenic to humans, PCBs have not caused serious injury to humans except chloracne as a

possible exception, have not cause irreversible harm to humans, and are not acutely toxic when ingested by man on the order of table salt. Are those the same positions that were held by Monsanto and communicated all the way through until 1980?

A. I believe so, yes.

MR. TURET: I have no further questions at this time.

MR. DIMURO: Adam? Carolyn?

MS. O'CONNOR: I don't have any questions.

MR. O'CONNOR: I have no questions.

MR. DIMURO: I may have some. I just want to take a two-minute break.

EXAMINATION

QUESTIONS BY MR. DIMURO:

Q. Doctor, I want to put in front of you what Mr. Turet marked as T-44 and ask you to take a look at the third paragraph under here. Are the facts, does this refresh your recollection as to whether Dr. Kimbrough's study was reviewed by anybody?

A. Yes. This document states Dr. Kimbrough's 1975 PCB study was subjected to extensive independent review by the Eppley Institute for Research in Cancer and this document --

Q. And what did the Eppley Institute find according

to the writer of T-44?

A. This document states that this review did not concur with her diagnosis, i.e., her findings were not confirmed. That's not necessarily consistent with the recollection I mentioned earlier, but could very well be the case.

I would however go on to state that I think Dr. Kimbrough's findings then are consistent with other studies of Aroclor 1260 fed at high doses to laboratory rats.

MR. DIMURO: I don't have any further questions.

MR. TURET: I have no further questions.

NOTARIAL CERTIFICATE

STATE OF MISSOURI)
)
CITY OF ST. LOUIS)

I, Tammie A. St. Arbor, Certified Shorthand Reporter and a duly commissioned Notary Public within and for the States of Missouri and Illinois, do hereby certify that there came before me at the offices of Taylor*Schroeder Reporting & Video, 7494 Ethel Avenue, St. Louis, Missouri,

DR. KALEY,

who was by me first duly sworn to tell the truth and nothing but the truth of all the knowledge touching and concerning the matters in controversy in this cause; that the witness was thereupon carefully examined under oath and said examination was reduced to writing by me; and that this deposition is a true and correct record of the testimony given by the witness.

I further certify that I am neither attorney nor counsel for nor related nor employed by any of the parties to the action in which this deposition is taken; further that I am not a relative or employee of any attorney or counsel employed by the parties hereto or financially interested in this action.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 5th day of March, 1999.

Tammie A. St. Arbor, CSR

STATE OF MISSOURI)
)
CITY OF ST. LOUIS)

I, DR. KALEY, do hereby certify:

That I have read the foregoing deposition;

That I have made such changes in form and/or substance to the within deposition as might be necessary to render the same true and correct;

That having made such changes thereon, I hereby subscribe my name to the deposition.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this day of , 19 , at

DR. KALEY

My Commission Expires: _____

Notary Public: _____

Signature Page to Witness _____

Witness Letter Sent to Witness _____

DR. KALEY
NAME OF DEPONENT

DEPOSITION CORRECTION SHEET

In re: Maertin, et al. vs. Monsanto, et al.

Reported By: TSA

Upon reading the deposition and before subscribing thereto, the deponent indicated the following changes should be made:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

SIGNATURE OF DEPONENT

Taylor * Schroeder Reporting & Video
7494 Ethel Avenue
St. Louis, Missouri 63117

Phone (314) 644-2191

March 3, 1999

Dr. Kaley

RE: Maertin, et al. Vs. Armstong, Monsanto & American Mineral Spirits

Dear Dr. Kaley:

Please find enclosed a copy of your deposition taken on March 3, 1999 in the above-referenced case. Also enclosed is an original signature page and errata sheets.

Please read the copy of the transcript, indicate any changes and/or corrections desired on the errata sheets, and sign the signature page before a notary public.

Please return the errata sheets and notarized signature page to my office at the above stated address within thirty days of the receipt of this letter and deposition.

Please do not hesitate to call me at 314/644-2191 with any questions.

Sincerely,

Tammie A. St. Arbor, CSR

Enclosures

cc: Mr. Taylor
Mr. DiMuro
Mr. O'Connor
Ms. O'Connor
File

-B-

-D-

-P-

-T-

STATE OF MISSOURI)
)
CITY OF ST. LOUIS)

I, DR. KALEY, do hereby certify:

That I have read the foregoing deposition;

That I have made such changes in form and/or substance to the within deposition as might be necessary to render the same true and correct;

That having made such changes thereon, I hereby subscribe my name to the deposition.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 1st day of April, 1999, at St. Louis, Missouri.

Robert Kaley

DR. KALEY

My Commission Expires: 8/4/2000

Notary Public: Rae Quintero

Signature Page to Witness _____

Witness Letter Sent to Witness _____

DR. KALEY
NAME OF DEPONENT

DEPOSITION CORRECTION SHEET

In re: Maertin, et al. vs. Monsanto, et al.

Reported By: TSA

Upon reading the deposition and before subscribing thereto, the deponent indicated the following changes should be made:

Page 14 Line 13 Should Read: manufacture
Reason assigned for Change: transcription error

Page 51 Line 13 Should Read: styrene latex
Reason assigned for Change: transcription error

Page 54 Line 8 Should Read: basis, that
Reason assigned for Change: transcription error

Page 58 Line 5 Should Read: secured
Reason assigned for Change: transcription error

Page 60 Line 1 Should Read: Treon
Reason assigned for Change: misspelling

Page 61 Line 14 Should Read: He was the one who
Reason assigned for Change: missing word = one

Page 62 Line 22 Should Read: it's more an aside
Reason assigned for Change: transcription error

SIGNATURE OF DEPONENT

DR. KALEY
NAME OF DEPONENT

DEPOSITION CORRECTION SHEET

In re: Maertin, et al. vs. Monsanto, et al.

Reported By: TSA

Upon reading the deposition and before subscribing thereto, the deponent indicated the following changes should be made:

Page 68 Line 17 Should Read: Presumably; I don't know
Reason assigned for Change: transcription error

Page 75 Line 3 Should Read: Treon
Reason assigned for Change: misspelling

Page 88 Line 13 Should Read: route
Reason assigned for Change: transcription error

Page 98 Line 16 Should Read: more toxic
Reason assigned for Change: misstatement

Page 113 Line 1 Should Read: dibenzo (both occurrences)
Reason assigned for Change: transcription error

Page 121 Line 22 Should Read: lining
Reason assigned for Change: transcription error

Page 133 Line 11 Should Read: more significant than in the
Reason assigned for Change: transcription error

SIGNATURE OF DEPONENT

DR. KALEY
NAME OF DEPONENT

DEPOSITION CORRECTION SHEET

In re: Maertin, et al. vs. Monsanto, et al.

Reported By: TSA

Upon reading the deposition and before subscribing thereto, the deponent indicated the following changes should be made:

Page 137 Line 24 Should Read: "1236" should read "1260"
Reason assigned for Change: transcription error

Page 167 Line 25 Should Read: site
Reason assigned for Change: misspelling

Page 168 Line 4 Should Read: human being; that has
Reason assigned for Change: punctuation

Page 172 Line 16 Should Read: basis in fact
Reason assigned for Change: transcription error

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

Page Line Should Read:
Reason assigned for Change:

SIGNATURE OF DEPONENT