COPY

IN THE MATTER OF:

Philip Metzel, et al.,
vs.
Texas Eastern Transmission Corporation, et al.

Cause No. 992-00215, Div. 1

Deposition of Robert George Kaley II, Ph.D.
7/28/00

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In The Circuit Court For The City Of St. Louis

TWENTY-SECOND JUDICIAL CIRCUIT

STATE OF MISSOURI

PHILIP METZEL, ET AL.,

Plaintiffs,

vs. NO. 992-00215, Div. 1

TEXAS EASTERN TRANSMISSION CORPORATION, et al.,

Defendants.

Deposition of ROBERT GEORGE KALEY, II, Ph.D., taken on behalf of the Defendants Texas Eastern Transmission Corporation and Texas Eastern Corporation, at the offices of Husch & Eppenberger, L.L.C., 100 North Broadway in the City of St. Louis, State of Missouri, between the hours of 8:42 A.M. and 12:38 P.M. on the 28th day of July 2000, before J. Bryan Jordan, Certified Court Reporter, Registered Merit Reporter, and Notary Public.

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ROBERT GEORGE KALEY, II, Ph.D.,
of lawful age, having been first duly sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, deposes and says in reply to oral interrogatories propounded as follows, to-wit:

EXAMINATION

QUESTIONS BY MS. SIMPSON:

Q: Good morning, Mr. Kaley. I introduced myself to you off the record, but for the record, my name is Kerry Simpson. I'm an attorney for the plaintiffs in this case, and I'll be asking you some questions here, today. You've been designated as Monsanto's corporate representative on issues of PCB toxicity? Is that correct?

A: Yes.

Q: Okay. Will you please state your name for the record?

A: Robert George Kaley, II.

MS. RUTTER: Kerry, one slight clarification on that. He is designated on both topics 2 and 4, both of which cover toxicity issues, and also as we noted yesterday, on issues of analytical chemistry pertaining to the discovery of PCBs in the environment in topic 2.

MS. SIMPSON: Thank you, Carol.

MS. RUTTER: Sure.

BY MS. SIMPSON:

Q: Mr. Kaley, have you ever given a deposition before?

A: Yes.

Q: Okay, so you kind of know the rules that pertain to depositions about not speaking over each other, you know, like waiting till I finish my question before you answer and I'll wait for you to answer before I ask my next question, and that you need to answer verbally because it's hard for the court reporter to take down nods of the head and things like that?

A: I understand.

Q: Okay. If I ask you a question today that seems a little confusing or, or you don't understand what I'm asking, please ask me to rephrase myself and I'll be happy to do that for you. Okay?

A: I will.

Q: You said that you had given a deposition before. On what occasions have you given depositions? Just generally; you don't have to give specific dates.

A: There have probably been a half dozen times that I've given depositions.

Q: And was that for, on behalf of Monsanto?

A: Yes.

Q: For litigation?

A: Yes.

Q: Could you please state your current address?

A: Yes, it's 1965, it's Schoettler Valley Drive, that's S-c-h-o-e-t-t-l-e-r, Valley Drive, Chesterfield, Missouri.

Q: And can you give me a general idea of your educational background?

A: Yes, I have a B.S. in chemistry from Purdue University, granted in 1968, and a Master of Science degree, an M.S. in analytical chemistry from the University of Illinois, 1971, and a Ph.D. in analytical chemistry from the University of Illinois, granted in 1974.

Q: And are you currently employed by Monsanto?

A: I'm currently employed by Solutia.

Q: And when did you begin with Solutia?

A: September of 1997, at the spin-off.

Q: At the spin-off? Okay, so prior to

Solutia, your employer was Monsanto?

A: That's correct.

Q: And what is your current position with Solutia?

A: Director, Environmental Affairs.

Q: And how long have you held that position?

A: With Solutia since September of 1997.

Q: Okay, and what was your position with Monsanto prior to the spin-off?

A: The same.

Q: The same? And how long did you hold that position with Monsanto?

A: I think since about 1992. I could be off by a year or so.

Q: And did you hold any position other than Director of Environmental Affairs with Monsanto?

A: Yes, I've had several positions.

Q: Okay, let's start this way. When did you begin your employment with Monsanto?

A: December of 1973.

Q: Okay, and what position did you hold then?

A: I was a senior research chemist.

Q: And for how long were you a research chemist?

A: I think in about 19, I want to say '77 or

'78, I was promoted to research group leader.

Q: Okay.

A: And about 19, maybe '81, I was promoted to senior research specialist.

Q: Okay.

A: In 1985, I changed directions a little bit. All of those were previously were laboratory positions.

Q: Okay.

A: In 1985, I transferred to a position in the Environmental Safety and Health Department. I was manager of something; I'm not -- but it's very similar to what -- you know, Manager, Environmental Affairs is not the right title but that hits, hits the nail on the head pretty close.

Q: Okay, and so then in 1992, you became Director of Environmental Affairs?

A: Right. That was a promotion to that.

Q: There was nothing in between 1985 and '92 that were changes?

A: No. There may have actually been a manager of something to a manager of something else but it was not, it was not a major responsibility shift.

Q: Okay, and during the time between 1973 and

1981, when you worked in the laboratory positions, what types of research did you specialize in?

A: Well, I was an analytical chemist, and most of my work involved gas chromatography, and then starting about 1975, mass spectrometry, also.

Q: Okay, and since you've switched to the environmental function, what sort of duties have you done?

A: I guess, basically, two primary duties. I have prime stewardship responsibility for products that are no longer manufactured, at the time by Monsanto and now by Solutia, and I also have responsibility to monitor and communicate developing science issues to management.

Q: Now, I understand -- strike that. Are you familiar with Monsanto's history of PCB production?

A: Yes, I am.

Q: Okay. Were you, yourself, involved in any of the testing or analysis of PCBs produced by Monsanto?

A: Yes, I was.

Q: Can you tell me what types of testing or investigations were done on, on PCBs by Monsanto that you were involved in?

A: That I was involved in? Yes: Primarily, using gas chromatography and gas chromatography connected with mass spectrometry to analyze a number of environmental types of samples for PCBs, including water, sediments, animal tissues, products.

Q: Okay, with respect to the types of samples you just discussed, water, sediments, animal tissues, can you give me kind of a general idea with respect to each, and maybe we could go through them individually, but as to what types of toxicity or environmental results were obtained in general? Just sort of -- well, let me try to rephrase it. Let's go this way. With respect to water samples, generally, what sorts of results did you see, such as degradability or solubility in water, those types of things?

A: With Counsel's permission, I think I can answer in a way that may answer your question but may not get in the same direction. Basically, there were probably three, let's say three different types of, of areas that I would work. One would be to look at environmental -- samples taken out of the environment and analyze for PCBs. Those could be waters from a stream; those

could be sediments from a stream, soils from some location; not too much, but they could be a sample of wildlife or a sample of fish that had been caught out in the environment, and the purpose of those analyses was to determine are PCBs present, and if PCBs are present, at what level are they present, and you know, I mean those, those answers could be anything, depending on, on what the particular samples were in. A fairly pristine environment, you would find, you know, nondetected PCBs; you wouldn't be able to measure the PCBs in the water, or the sediment, or the soil, or whatever. In areas where, for whatever reason, PCBs had entered the environment, you know, you would, maybe, find part-per-billion levels in water, part-per-million levels in sediment, and part-per-million levels in wildlife, so that was kind of one general area.

The other general area was as an analytical chemist, I provided support for research going on in the company, looking at the behavior of PCBs in the environment but in a controlled analytical system, so that for instance, if workers were studying the biodegradability of PCBs by whatever test method

they would do, I would take those samples and analyze those samples, provide the results back to those researchers so they could then say yes, this PCB degraded by 80 percent in 24 hours or whatever that might be, or if it was an animal study, you know, we fed this animal or somebody fed this animal a part per million of PCBs for six months, and based on my analysis, they would know the level in the animal got up to some part-per-million level or something.

Q: Okay.

A: So that was really a second responsibility.

Then the third responsibility along the lines of that would be to look at, at our various product lines and determine whether they, you know, had PCBs or basically any kind of chemical, but to look at our product lines to see whether there were materials in those product lines that -- you know, for instance, PCBs.

So those are the kind of the three areas, and the levels you would find are, you know, really depend on the history of those samples.

Q: Okay. To your knowledge, when did Monsanto -- you talked about in-house or in

controlled analytical system research products.

A: Yes.

Q: To your knowledge, when were those types of things begun for PCBs?

A: In the late 1960's.

Q: And is that around the same time that samples were begun to be taken from the environment, --

A: Yes, ma'am.

Q: -- as well?

A: Yes.

Q: Was there a particular event that prompted Monsanto to take environmental samples, or was that just part of what they normally did as research for their products?

A: No, Monsanto's initiation of many of these products was prompted by, by information coming out of Sweden in very late 1996 (sic) that suggested that PCBs or something very like PCBs were being detected in environmental samples.

MS. RUTTER: Excuse me. Just for the record, Dr. Kaley, I believe you misspoke. You said in very late 1996.

MS. SIMPSON: I believe so.

A: (Continuing) 1966. I'm sorry. Thank

you, Carol. Yes, 1966.

BY MS. SIMPSON:

Q: I was going to ask you about that myself because that's what I thought I heard, as well. In addition to conducting its own analytical, controlled analytical system studies, did Monsanto also hire, for example, an outside laboratory to either confirm the results that Monsanto was finding or to otherwise do additional testing?

A: Well, from an analytical chemistry point of view, specifically the answer to that is no, --

Q: Okay.

A: -- although we did exchange results with other analytical laboratories, but primarily, we were, we were, you know, by the time we got going in 1969 or 1970, really up to speed and, and running, we very quickly were recognized or the people at the time very quickly recognized as having probably more expertise than anyone else, so people tended to look to us as the experts for confirmatory results, rather than the other direction for the analytical chemistry.

Q: I understand.

Besides analytical chemistry analysis, did

Monsanto conduct any other types of analysis for PCBs?

MS. RUTTER: Objection to the overbroad and vague form of the question, but subject to the objection, you may answer if you understand it.

A: Well, I can interpret it. I mean, we did do toxicology testing.

BY MS. SIMPSON:

Q: Okay.

A: That kind of testing, or biodegradation testing for those kinds of things, yes.

Q: And for toxicology testing or biodegradation testing, did you also use, say, for example, contract laboratories? In other words, did Monsanto hire outside laboratories to help with that testing, or was it solely done inside Monsanto?

A: The, the bio -- excuse me, biodegradation testing was done exclusively within Monsanto. The toxicology testing was contracted out to, to various laboratories.

Q: Do you remember any of the names of those laboratories that Monsanto contracted with for toxicology testing?

A: Yes.

Q: Can you tell us some of those that you recall?

A: In some of the early days, there were two labs in St. Louis that were used, Younger Laboratories, Y-o-u-n-g-e-r, and Scientific Associates.
We also, in the late 1960's and early 1970's or through the 1970's, used a laboratory called Industrial Biotest, and I believe there was also at least one study, assuming you are limiting your question to PCBs, done by Litton Bionetics.

Q: And thank you; I was limiting my question to PCBs. Litton Bionetics?

A: Bionetics, yes, B-i-o-n-e-t-i-c-s.

Q: Thank you, and when Monsanto received reports from these outside laboratories on the toxicology testing, was that during a time that you, yourself, were working on the analytical chemistry testing?

MS. RUTTER: Objection to the overbroad and vague form of the question.

A: Well --

MS. RUTTER: You may answer.

A: (Continuing) From the date of my employment, the answer is yes.

BY MS. SIMPSON:

Q: Okay, so you had occasion to review some of those reports?

A: Yes, at least portions of them.

Q: Portions. Do you recall what toxicological effects, what types of toxicological effects were seen in, for example, fish through the PCB testing that was done on fish samples?

MS. RUTTER: Object to the overbroad and vague form of the question.
If you can answer the question, please do so. If you need to have it rephrased, please ask her to rephrase it.

A: Let me answer the question as I understood it, and I'm sure it will lead to other questions. I don't remember any specific toxicological tests performed by Monsanto, or by outside laboratories for Monsanto, on fish.

BY MS. SIMPSON:

Q: Do you recall toxicology testing being performed on mammals for or on behalf of Monsanto?

A: Yes.

Q: Can you tell me generally the types of toxicological results you were seeing in mammals?

A: All right, I'm going to -- I'll answer very broadly through the broad time frame. I might point out that some of the other, the early studies that -- at, for instance, Younger Laboratories and Scientific Associates, were done before the 1966-1969 time frame. Some of those were done as early as the 1950's.

Q: Okay.

A: Those tests were, primarily, would use testing on rats, and possibly rabbits, to look at what we call acute effects, effects basically resulting after a single and usually very large exposure, and part of those involve, you know, testing to see how much PCBs or other products it would take to actually kill rats. Rabbits were typically used as models for skin, dermatological conditions, so materials would be applied to rabbits to see if there were skin effects. In general, in these types of tests, PCBs were found to be slightly to nontoxic. In other words, it would take huge amounts of PCBs to cause rats to die, for example, and huge amounts, relatively, to -- of rabbits to see dermatological effects.

Later studies involved more chronic

testing, which is feeding over a long period of time. Those were primarily done with rats, typical, or laboratory animal. There were also, I believe, a few studies done on dogs, and at least one study sponsored by Monsanto on monkeys.

Q: In the feeding studies that were performed, the, I think you called them chronic, --

A: Yes.

Q: -- were there any biological changes noted in those animals?

A: Yes.

Q: What types of biological changes?

A: In rats, over long periods of time with some of the PCBs, there were changes in the liver. With monkeys, for example, there were effects on reproduction. I don't recall specifically whether there were reproductive effects in rats or not. There may have been.

Q: Okay. How about the -- I think you said there were some tests done on dogs?

A: You know, frankly, I don't know. My recollection is, is that the effects seen in dogs were minor, if at all.

Q: Okay.

A: I don't recall being, being impressed by the -- having any specific recollection of any specific results in dogs.

Q: Did Monsanto conduct or contract for any of these types of tests on humans? Like, for example, a skin application test like was done with rabbits?

A: I do not believe so. I don't think there were -- there were -- some products have been tested with skin patches on humans. I don't recall that Monsanto did that for PCBs.

Q: Do you recall if any outside researchers did something like that?

A: Not specifically. I seem to have some vague recollection that may have been done, but I don't have a specific recollection.

Q: And I'm going to assume, there, that no feeding studies were done on humans --

A: That's correct.

Q: -- with PCBs.

A: That's correct.

(Plaintiff's Exhibit 34 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been

marked as Plaintiff's Exhibit 34. If you'll take just a moment to review that.

(Witness peruses said document.)

MS. SIMPSON: Is there a photocopying error?

MS. RUTTER: Yeah, I think there's a photocopying error.

A: I think there's a document attached to the back of mine that is separate.

MS. SIMPSON: That's correct. You can just pull that off.

A: (Continuing) I have leafed through this document.

BY MS. SIMPSON:

Q: Okay. Can you identify for the record, if you have seen that document before, what Exhibit 34 is?

A: I do not recall having seen this document before.

Q: Okay. On the third page of this document, I understand that you have not seen this document before, but I just want to clarify what it is about.

A: Sure.

Q: In the first -- on the third page of the actual document, --

A: I'm sorry. Okay.

Q: -- in the first paragraph, under "Description," where it says, "Products covered by this report," --

A: Yes.

Q: -- and it discusses Pyranol numbers 1476, et cetera, --

A: Yes.

Q: -- is Pyranol a PCB-containing product?

A: Yes, Pyranol is a General Electric name for their fire retardant dielectric fluids, and most, if not all of them, did contain PCBs.

Q: And by "dielectric fluid," what do you mean?

A: It's a fluid, it's a fluid used in electrical equipment to provide insulation from -- in, for instance, transformers and capacitors.

Q: Okay, and so understanding that you don't recall having seen this document before, would -- I'll submit to you that we obtained this document from the production of documents given by Monsanto in this case. Would this report indicate to you -- strike that.

I understand that prior to Monsanto producing PCBs, there was a purchase of another company by Monsanto, Swan Chemical Company? Is that correct?

A: That's correct.

Q: And Swan Chemical was the original manufacturer of PCBs? Is that correct?

A: That's correct.

Q: So Monsanto took over production from Swan Chemical?

A: That's correct.

Q: So, then, looking at this document, would it be your understanding that at least as early as 1934, some sort of testing was being done on PCB-containing products, with the date on this document being September 29, 1934?

A: Yes, I think this document indicates that performance testing was being done on the materials, to look at their performance as dielectric fluids.

MS. SIMPSON: Okay. Would you mark this as Plaintiff's Exhibit 35?

(Plaintiff's Exhibit 35 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've just been handed what's been marked as Plaintiff's Exhibit 35. If you'll take a moment to have a look at that document, as well.

(Witness peruses said document.)

MS. RUTTER: Ms. Simpson, for the record, we appear to be missing a page of the document. I don't know if that's a photocopier or stapling error. I go through page 5 and it has "General Summary" at the bottom of mine, 060028.

MS. SIMPSON: There is another page 6. Are you all missing page 6?

MS. RUTTER: Yes.

MR. MOELLER: I don't have it.

MS. SIMPSON: That must have been a photocopying error. I can give you the page 6 off of this one and you can have a copy made of it.

MS. RUTTER: Let's get that copied real quickly.

MS. SIMPSON: That was through inadvertence.

MS. RUTTER: That type of thing happens fairly frequently.

(Pause.)

(Discussion off the record.)

BY MS. SIMPSON:

Q: (Continuing) Dr. Kaley, have you had a chance to review Exhibit 35?

A: Yes, I have.

Q: And do you recognize that document?

A: Yes, I have seen this document in the past.

Q: Okay. Initially, just for a kind of clarification question, can you tell me what 4465 is where it says at the top of the second page, "Report on 4465"?

A: Yes. My understanding of the nomenclature system used by Swan originally and then by Monsanto would indicate that this product is a blend of polychlorinated biphenyls and polychlorinated terphenyls that had an average chlorination level of 65 percent chlorine by weight.

Q: Now, if you turn to the page Bates labeled at the bottom 002626 of that document, --

A: Yes.

Q: -- under the heading "Experiments," the first sentence begins, "Exposure to chlorinated

diphenyl," d-i-p-h-e-n-y-l, as opposed to biphenyl. Can you tell me the difference between those two?

A: Yes. There really is no difference. "Bi" is Greek for 2 and "di" is Roman for 2, and it was basically in the early days they were called chlorinated diphenyls, and at some point, they became chlorinated biphenyls, so there's really no -- they're synonymous.

Q: Thank you. I wondered if that was talking about a different compound, but that does clarify it.

A: I might point out, though, that there is, and as I pointed out, the product he was really testing was a mixture of chlorinated diphenyls or chlorinated biphenyls and chlorinated terphenyls, so it is somewhat misleading for him to talk about chlorinated diphenyl. There were other materials in that product.

Q: Okay. Can you explain the difference to me between a biphenyl and a terphenyl?

A: Yes. I don't know whether you are familiar with the structure of chlorinated biphenyls, but they're basically two benzene rings connected to which chlorines are attached. A

chlorinated terphenyl is three benzene rings which are connected with various levels of chlorine attached.

Q: Okay, I have seen some of the drawings of the compound structure, so that helps me to understand this a little better. Thank you. Can you tell me who, if you know, Dr. Cecil Drinker is?

A: Yes, Dr. Drinker was a physician, a medical doctor who worked at Harvard University.

MS. RUTTER: Kerry, I need to just take a quick break to locate a document.

MS. SIMPSON: Sure.

MS. RUTTER: I'll be right back.

(Pause.)

(Plaintiff's Exhibit 36 mark'd for identification.)

MS. SIMPSON: Okay, we're back on the record.

BY MS. SIMPSON:

Q: This report that's Exhibit 35 is dated in 1938. Do you recall when it was that Monsanto purchased Swan Chemical Company's business?

A: Yes, 1935.

Q: Okay, and would you know whether -- strike

that.
Do you know if this report done by Dr. Drinker was done at Monsanto's request, or would it have been something that was started prior to Monsanto purchasing Swan Chemical?

A: I honestly don't know the answer for sure.

Q: Okay. Do you know the reason behind having inhalation experiments done on this particular PCB and polychlorinated terphenyl blended product?

A: I have a general understanding of, of the knowledge that was developing in this time frame from Dr. Drinker's work and observations that had been made primarily in the cable pulling industry, so I could make a surmise to that, but as regard to this specific product and this specific report, I don't know what prompted the request for this specific product to be manufactured -- or to be tested by Dr. Drinker.

MS. SIMPSON: Okay.

MS. RUTTER: And counsel, just for the record, Dr. Emmett Kelly testified in detail about Dr. Drinker, and his reports, --

MS. SIMPSON: Okay.

MS. RUTTER: -- and the deposition

designations, and that testimony is being put forth by Monsanto. I'll have the page numbers in a minute.

MS. SIMPSON: That's fine.

MS. RUTTER: At pages 85 through approximately 91 of the Dr. Kelly transcript which I've previously provided to all counsel of record --

MS. SIMPSON: Okay.

MS. RUTTER: -- and which I'll likely have marked as an exhibit at some point in time during the day.

MS. SIMPSON: Okay.

BY MS. SIMPSON:

Q: And Dr. Kaley, if you'll turn to the page of Exhibit Number 35, Bates labeled at the bottom 002627, --

A: I have that.

Q: -- you see in the first paragraph where it discusses, the second sentence of the first paragraph where it says, "Rat sacrifice after six-week exposure showed slight liver damage which advanced during the next two months"?

A: I see that.

Q: And then the following sentence says, "The

changes consisted in slight to moderate swelling of the liver cells, increased granularity, and many mitotic figures"?

A: Yes, I see that.

Q: Can you tell me what is meant by increased granularity in liver cells?

A: Well, primarily -- I'm not a toxicologist, --

Q: Okay.

A: -- but my understanding is that if you look at the cells under a microscope, you will actually see little granularities, little granules in the cells, themselves.

Q: Which are not normally present?

A: Well, there are normally a few.

Q: Okay.

A: But Dr. Drinker apparently noticed an increased number of those.

Q: More than what would be normal?

A: Right.

Q: Do you know, understanding that you are not a toxicologist, but do you know what "mitotic figures" means?

A: I really -- mitosis is cell division, so I assume it has something to do with cell division,

but specifically what he's addressing, I don't know.

Q: Okay. Do you see in the third paragraph on that same page where it says, "In considering the entire matter, it seems to us that the chlorinated hydrocarbons, if inhaled in sufficient concentration, might cause a slight degree of liver" -- ""Of damage to the liver"?

A: Yes.

Q: Do you know if, based on this report, a specific limit was established by Monsanto Company for a concentration of these types of products in the air?

A: Well, I noticed in the report, he does make a recommendation as to a limit. I don't know specifically if Monsanto instituted that limit at that time, but --

Q: Okay.

MS. RUTTER: And once again, Counsel, I would note for the record that these Dr. Drinker reports are addressed specifically by Dr. Emmett Kelly in his deposition, who personally knew Dr. Drinker, and discussed these reports with him, and has testified under oath about the reports --

MS. SIMPSON: Okay, thank you.

MS. RUTTER: -- from firsthand knowledge.

BY MS. SIMPSON:

Q: Okay, I'm going to now hand you what's been marked as Plaintiff's Exhibit 36, which is a different report by Dr. Drinker.

A: Okay.

Q: And understanding that Dr. Kelly's deposition addresses these reports, would you go ahead and just take a moment to look over that and see if you recognize that document?

A: Yes.

(Witness peruses said document.)

A: (Continuing) Okay, I've looked at it briefly.

Q: Okay, on the page labeled at the bottom Bates number 004171, would you turn to that page, please?

A: Okay.

Q: What is Chlorcosane? Am I saying that right?

A: I don't know.

Q: You don't know?

A: (Shakes head in negative manner.)

Q: I just thought I'd ask you because I

didn't know.

A: That is not a term I've seen before. Then if you'll turn to --

Q: Okay.

A: I would say I don't believe it's polychlorinated biphenyl.

Q: Okay.

A: That is not a term I'm familiar with from PCB, --

Q: Okay.

A: -- my PCB knowledge.

Q: Would you turn to the page that's Bates labeled at the bottom 004173?

A: Yes.

Q: At the very top of that, that page, this begins a discussion about a compound number 1268? Is that correct?

A: Yes.

Q: Do you know if that is what's now called, or -- strike that.
Do you know if that is referring to the compound that was previously known as Aroclor 1268?

A: I would turn it around. I would say it's probably subsequently known as Aroclor 1268.

Q: Okay.

A: Yes, I'm sure that's the case.

MS. SIMPSON: Okay, I have nothing further on that document.

(Plaintiff's Exhibit 37 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been marked as Plaintiff's Exhibit 37. Would you take a moment to review that document?

A: Okay.

(Witness peruses said document.)

A: (Continuing) Okay.

Q: Do you recall ever having seen that document before today?

A: Yes, I believe I have, actually. I'd forgotten it when I made my previous statement about skin tests, but I have seen this document.

Q: Okay.

A: Maybe that was the vague recollection.

Q: May be. Now, the date at the top of the document shows 30.8.49. Now, I'm going to assume that's European dating and the date of this document is August 30, 1949? Is that correct?

A: I have no reason to doubt your assumption. I would assume that's correct, yes.

Q: Okay.

A: It doesn't make sense any other way.

Q: Now, if you look, when you looked through the document, did you notice the recommendations for maximum safe limits --

A: Yes.

Q: -- of the various products that it discusses?

A: Yes, I did.

Q: Do you have any knowledge of whether those limits were adopted by Monsanto for things such as vapors in the workplace? PCB vapors in the workplace?

A: I don't have specific knowledge whether they were adopted officially or not.

Q: Can you tell me if you know who M. N. Strachan is? Do you know who he is?

A: I don't remember that name specifically, no.

Q: Now, would this document indicate to you, then, that dermatological testing and oral ingestion testing was being done on the Aroclor products at least as early as 1949?

A: I would certainly say that dermatological testing was being done.

Q: Okay.

A: The skin patch testing would clearly imply that to me. The oral ingestion statement of Aroclor 1254 basically does not suggest that somebody was taking Aroclor and feeding it to a human being. It would suggest that the Aroclor 1254 was incorporated into a lining or some sort of they called a sealing composition and that beer was placed in that test vehicle, and after some period of time, the beer was examined to see whether you could smell or taste the Aroclor product. They found you could not, --

Q: Okay.

A: -- so that's my understanding of the test, not that people were tasting Aroclor 1254 but they were tasting beer that had been placed in a vat containing a sealant with Aroclor 1254 in it.

Q: Okay. Does Aroclor 1254 or any of the other Aroclor products have a smell?

A: They have a slight odor, yes.

Q: Okay, and this may seem a silly question, but do they have a taste?

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

Q: Okay.

A: I might also add that 35 degrees is somewhat above room temperature, so this is a heated beer vat, so --

Q: Okay.

A: -- that would be a possibility of an odor with a warmer material.

Q: So is what you are saying that when you heat the Aroclor products, you can smell them more --

A: Yes.

Q: -- than when they are at room temperature?

A: Right.

MS. RUTTER: Kerry, I need to make a quick call to ask somebody to get me something. It will just take two seconds.

MS. SIMPSON: Okay.

(Pause.)

(Plaintiff's Exhibit 38 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been marked as Plaintiff's Exhibit 38. If you'll take just a moment to look over that.

(Witness peruses said document.)

A: Okay, I have reviewed it briefly.

Q: Okay, have you seen that document before?

A: Yes, I have.

Q: And am I correct in stating that the date of this document is September 1, 1953?

A: That is correct.

Q: Who is Mr. E. Mather?

A: That's a name I don't know.

Q: Or who was --

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

Q: Don't know that one?

A: No, I don't. He was in Europe, so I'm really not familiar with the -- Ruabon was our Monsanto facility in Belgium -- not Belgium, Ruabon, Wales.

MS. RUTTER: Wales.

A: Ruabon in Wales.

MS. RUTTER: Off the record.

(Discussion off the record.)

BY MS. SIMPSON:

Q: Do see the second paragraph of this document where it says, "As I am sure you know,

Aroclors cannot be considered nontoxic"?

A: That's correct. I see that.

Q: This memo discusses the use of Aroclors in paints and other types of mediums like heat exchange mediums; is that correct?

A: Yes, the second, or the third paragraph actually discusses heat exchange medium, and then the last paragraph discusses use as plasticizers in paints.

Q: Okay. Do you know what uses other than heat transfer mediums or heat exchange mediums in paints the Aroclors were used for?

A: No, I know some, maybe not exclusively all, but I certainly know some additional, yes.

Q: When they say heat exchange medium, is that the same idea as using it in, like, a transformer or a capacitor?

A: Not really, no.

Q: Okay, can you explain the difference?

A: Yeah. A heat exchange medium is basically an industrial system where you need to get, you need to heat, for instance, a vat of material but that vat might be flammable so you don't want to, you don't want to apply heat directly to the vat in the form of flame or something like that

because you could have a fire or explosion, so what you do is you heat a fluid in a separate location where you can apply heat directly to that fluid, then you pump that fluid to, for instance, coils around that vat so the hot fluid actually heats the material in the vat rather than a direct flame. It's much the same as a radiator in a car is a heat exchange system.

Q: Okay.

A: It kind of works the other direction but you basically take -- the heat of the engine is transferred into the water to the coolant, the antifreeze, it's pumped to the front to the radiator where the air cools that fluid then takes it back so it can keep the engine cool, so a radiator in a car is a heat exchange system kind of in reverse because you are getting rid of heat but it's the same, it's the same system.

Q: Okay. In the last paragraph of Exhibit 38, it talks about, it says, "We do not recommend that they be used in paints," referring to the Aroclor products, so do you know if the Aroclors were actually used in paints, or did whoever would have purchased Aroclor products for paints follow Monsanto's recommendation?

MS. RUTTER: Let me just object to the form of the question because it mischaracterizes the statement in the document.
Subject to that objection, Dr. Kaley, you may read the document as it's actually stated.

A: What is document says is, "We do not recommend that they be used in paints which might be applied in confined or unventilated areas, particularly if the paints might be used on heated surfaces," and I think that's consistent with, with the knowledge from the 1930's that you want to avoid situations to the extent you can where PCBs are heated, which increases the vapors in the atmosphere and then especially in an unventilated area where those vapors have nowhere to go.

Q: Okay.

A: So it doesn't recommend they don't be used in paint, it recommends they don't be used in paint in these specific areas.

Q: Okay, so were they used in paint?

A: Yes, they were.

Q: Okay.

A: But again, I would say they were primarily used in industrial paints. They were not used in, to my knowledge, in home paint, --

Q: Okay.

A: -- so if you were painting your wall in your home -- probably the biggest paint customer is the U.S. Navy; a lot of battleships were painted with paints containing PCBs.

Q: Okay.

A: That's an example of the applications those paints were used.

Q: Okay. Do you see in the third paragraph of Exhibit 38, the last sentence of that paragraph --

A: Yes, I see it.

Q: -- discusses the clouds of breakdown products?

A: Yes.

Q: What sort of breakdown products come from the Aroclors?

A: Well, primarily, the breakdown of Aroclors results in hydrochloric acid, HCl. In fact, that's really how they work, as flame retardants.

Q: Okay.

A: If, if you burn mineral oil, you get hydrogen, and hydrogen gas is explosive. When you get, when you burn PCBs, what they basically do is they form hydrochloric acid, and that is a

nonflammable material and that quenches the flame, so that's really the basis of their activity, is flame retardants.

Q: Okay.

A: And that hydrochloric acid is very irritating.

Q: Are there any other breakdown products for PCBs besides hydrochloric acid?

A: Well, yeah, there certainly are, and he talks about any industrial oil or chemical, you are going to get carbon dioxide, those other kinds of, you know, soot and those other kinds of combustion products, --

Q: Okay.

A: -- but I know the highly irritating, that is clearly from the hydrochloric acid.

MS. SIMPSON: Okay.

(Plaintiff's Exhibit 39 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been what's been marked as Plaintiff's Exhibit 39. If you'll take a moment to look over that document.

(Witness peruses said document.)

A: Okay, I reviewed it briefly.
Q: Okay, have you seen that document before?
A: I have seen similar documents. I don't know whether I've seen this specific one or not.
Q: Okay. This says that it is in regard to OS-95. Do you know what product that is?
A: I don't know what the chemical composition of that is, no.
Q: So you would not whether that is a PCB product?
A: As I sit here right now, no.
(Plaintiff's Exhibit 40 mark'd for identification.)
BY MS. SIMPSON:
Q: Dr. Kaley, you've been handed what's been marked as Plaintiff's Exhibit 40, and I would ask you to take a look at that document.
(Witness peruses said document.)
A: I reviewed the document briefly.
Q: Okay, have you seen this document before?
A: I don't know that I've seen it. I've seen similar documents. I don't specifically recall this particular document.
Q: Okay. This document says that it is a

reference to a product called Pydraul 625? Is that correct?

A: Correct, yes.

Q: Is that a PCB product?

A: Pydraul 625 contained PCBs but it contained a number of other materials, too, which I don't know specifically right now.

Q: Okay.

A: The Pydraul fluids were hydraulic fluids and were exclusively blends of PCBs with other materials.

Q: Okay. If you turn to the very last page of that document, --

A: Yes.

Q: -- am I correct the date reads September 29, 1958?

A: Yes, you are correct.

Q: Does this document review the inhalation experiments with Pydraul 625?

A: That's correct.

Q: Is that what those are?

A: Yes.

Q: On the last page of this document, it has a heading at the top called "Summary"?

A: Yes.

Q: And then it discusses group A exposure to moderate mist and the results, a summarization of the results there, then group B, exposure to, looks like heavy concentration for 15 minutes total, --

A: Yes.

Q: -- and then group C, heavy concentration for an hour total? Is that correct?

A: Yes.

Q: And do you see under each of those headings where some sort of irritation was noted in each of those exposures?

A: Yes.

MS. RUTTER: I object to the overbroad and vague form of the question. The document speaks for itself as to its conclusions.

BY MS. SIMPSON:

Q: Do you know if these, the types of irritations that are noted on this page, have generally been noted as a result of PCBs, or could these be from the other substances in that product?

MS. RUTTER: I object to the incredibly overbroad and vague form of the question.

MR. MOELLER: Well, I'll join in that

objection, and further object to the form of the question on the basis of it calling for speculation and conjecture, in that you are asking the witness to compare these results with other unspecified results at unknown concentration levels with unspecified Aroclors, and asking him to make those kinds of comparisons is strictly calling for speculation and conjecture.

MS. SIMPSON: I'll rephrase the question.

BY MS. SIMPSON:

Q: Which Aroclor is contained in Pydraul 625?

A: I'm sorry, I don't know the answer as I sit here.

(Plaintiff's Exhibit 41 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been marked Plaintiff's Exhibit 41. If you'll take a moment to review that document.

A: Okay, I've reviewed the document.

Q: Have you seen this document before?

A: I don't recall having seen it before, no.

Q: Do you know who H. Sidi is, H. S-i-d-i, shown there on the first page of the document?

A: No, I don't.

Q: Never heard of him?

A: No, I have not.

Q: At the bottom of the first page of this document, it says that the, what's the start of the paragraph that runs over to the next page, do you see where I'm at?

A: Yes.

Q: It says that "In mixtures of chlorinated biphenyls such as those found in commercial products will not reset" -- or "react," I'm sorry, "with acids, alkalis, or water under normal to moderately rigorous conditions. They are insoluble in water, glycerol, and the glycols." Is that correct?

A: Yes.

MS. RUTTER: I'm sorry, are you asking him if is that correct, have you accurately read the document?

A: (Continuing) Yes, I was answering the question have you accurately read it.

MS. SIMPSON: Yes.

MS. RUTTER: I just wanted to make that clear.

A: Yes, it has been accurately read.

BY MS. SIMPSON:

Q: Okay. Is it correct that PCBs are insoluble in water?

A: They are, they are very, very, very slightly soluble in water.

Q: Okay.

A: They are, for industrial purposes, insoluble in water.

Q: Okay.

A: But they do have a very slight water solubility.

Q: So by "slight water solubility," what do you mean by "slight water solubility"?

A: For example, the solubility of Aroclor 1242 in water is about 20 parts per million.

Q: So it will dissolve to that extent in water? Is that what you mean?

A: Well, I mean technically, you are correct, but usually, a dissolution is like you take salt and put it in a glass of water, you can get a lot of it in. It is dissolving in there, but 20 million parts per million is a very low number. I mean, you wouldn't be able to see any effect on the water, or as in the beer, taste any effect or anything like that.

Q: Okay.

A: I mean, it's trivially small amounts.
Q: Okay. So the amounts of the Aroclors that don't dissolve or that don't --
A: It dissolves fine. I mean, that is the correct term.
Q: Okay.
A: It just --
Q: Do they float or do they sink?
A: They sink.
(Plaintiff's Exhibit 42 mark'd for identification.)
BY MS. SIMPSON:
Q: Dr. Kaley, you've been handed what's been marked Plaintiff's Exhibit 42, and I would ask you to take a moment and review that.
(Witness peruses said document.)
A: I've briefly reviewed this document.
Q: Okay. Have you seen this document before?
A: Yes, I have.
Q: Who is Robert Metcalf?
A: He was a professor -- I'm not sure of what -- at the University of Illinois.
Q: Okay. Do you know when you would have

seen this document? Would it have been shortly after you began your employment with Monsanto?

A: Probably not. It probably would have been sometime after about 1985, when I had more direct responsibility for knowledge of PCB issues.

Q: Okay. Do you have any reason to disagree with the statement in the second paragraph on the first page, the fourth sentence, which begins, "Because of the apparent"? Do you see that?

A: Yes.

Q: The sentence reads, "Because of the apparent high stability of PCB, amounts entering the environment would be degraded very slowly, and it seems possible that at least ten million pounds annually may become environmental contaminants." Did I read that correctly?

A: You read it correctly.

Q: Do you have any reason to disagree with that statement?

MS. RUTTER: Objection to the incredibly overbroad and vague form of the question and lack of foundation.

A: Without knowing his thought process, I really can't agree or disagree.

BY MS. SIMPSON:

Q: Is it correct that Monsanto is the only or was the only U.S. producer of PCB?

MS. RUTTER: Objection. I'm going to allow him to give his opinion on that if you will agree that he's not speaking as the company spokesperson on that, that issue.

MS. SIMPSON: That's fine.

MS. RUTTER: Mr. Papageorge has testified about that before Dr. Kaley, so -- okay, he's not company spokesperson, you are just asking Dr. Kaley as Dr. Kaley.

MS. SIMPSON: That's fine.

BY MS. SIMPSON:

Q: Is that your understanding?

A: Monsanto was by far the major producer of PCBs for commercial use within the United States.

Q: Okay.

A: There certainly were other manufacturers and continue to be.

Q: Okay. Is this statement about PCBs degrading very slowly in the environment correct?

MS. RUTTER: Objection to the incredibly overbroad and vague form of the question: Calls for speculation and conjecture. It's basically a hypothetical question without stating the proper

bases for being able to respond to the question.

MR. MOELLER: Same objection.

MS. SIMPSON: Well, I disagree in that we've read the statement into the record. The statement reads, "Amounts entering the environment would be degraded very slowly," and I'm asking him if that is a correct statement.

MS. RUTTER: We haven't even established that he knows the person who wrote the document. Once again, total objection. It's a grossly overbroad and vague generalization.

MS. SIMPSON: Okay.

BY MS. SIMPSON:

Q: (Continuing) Dr. Kaley, to your knowledge, how do PCBs degrade in the environment?

MS. RUTTER: Once again, I would object to the overbroad and vague form of the question on grounds that PCBs is a very broad nomenclature, but subject to that objection, Dr. Kaley, if you believe you can answer the question, you may do so. If you need to have it rephrased or need more information in order to answer it, please just so state.

A: I'm comfortable saying that the

degradation of PCBs is a very complex issue, and as you may or may not know, there are 209 separate compounds that can be called PCBs, and each of those PCBs has its own physical and chemical properties and each of it also has its own environmental properties, so some PCBs are very rapidly degraded in the environment, some PCBs are moderately rapidly degraded in the environment, some PCBs are very slowly degraded in the environment, and really, it depends specifically on the chemical nature of each compound.

(Plaintiff's Exhibit 43 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's marked as Plaintiff's Exhibit 43, and I'd ask you to take a moment to review that.

(Witness peruses said document.)

A: Yes, I've reviewed it briefly.

Q: Have you seen that document before?

A: I honestly don't recall.

Q: Is it correct that the date on the top of the first page of this document is 10/29/69?

A: That is correct.

Q: This document refers to Professors Widmark and Jensen of the Institute of Analytical Chemistry at Stockholm, Sweden. Is that -- are those the professors who earlier you testified that something was -- that some information was obtained from Sweden?

A: That's correct.

Q: Came out of Sweden? Would those be the professors where that information originated?

A: Yes.

Q: Okay. Do you see the last sentence of that paragraph that's got the heading over it which reads, "Problem, definition and timing"? The last sentence of that paragraph reads, "Monsanto confirmed PCBs in mid 1969 and confirmed the adequacy of work by Widmark and Jensen and others -- a worldwide ecological problem"? Did I read that correctly?

A: You read that correctly.

Q: Did Monsanto consider PCB pollution a worldwide ecological problem?

MS. RUTTER: Objection to the overbroad and vague form of the question, lack of foundation. We haven't even established who the author of this document is.

MS. SIMPSON: Well, I will submit that this document came to us from Monsanto's documents, document production.

MS. RUTTER: Just because there is a document in Monsanto's files, we haven't established any author of this document. I would -- your question is grossly overbroad and vague and calls for speculation and conjecture, and there is lack of foundation.

BY MS. SIMPSON:

Q: (Continuing) You can answer the question.

A: I don't know who wrote this document. From the, from the form of the document, I would say that whoever wrote it certainly had that consideration. I don't, you know, I don't know whether that was an individual opinion or more widely held. This titled "Executive Summary." I don't know what it's an executive summary of, necessarily, so whoever wrote this apparently had that opinion.

MS. SIMPSON: Okay.

(Plaintiff's Exhibit 44 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been

marked as Plaintiff's Exhibit 44. If you'll take a moment to review that.

(Witness peruses said document.)

A: I've reviewed the document briefly.

Q: Have you seen that document before?

A: I don't believe I have.

Q: Who is -- if you turn to the last page of that document, who is Jack Garrett, if you know?

A: Jack Garrett was, was an industrial hygienist employed by Monsanto.

Q: Is he still living?

A: No, he's not.

Q: This indicates that he was a manager in industrial hygiene? Is that correct?

A: That's what it indicates.

Q: Do you know if that was his position?

A: I have no reason to doubt that it was.

Q: Okay, I understand this is dated September -- or December 15, 1969, and you did not work for Monsanto in that time?

A: That's correct.

Q: Do you know of Homer Research Laboratories, which is the addressee of this letter?

A: Not specifically, no.

Q: No? There is a sentence about midway down in the first paragraph on the first page that refers to higher chlorinated biphenyls; do you see that?

A: I don't see it right now. I did. I remember seeing it before. Yes, I see it now. Yes, I have it now.

Q: Do you see it? Okay.

A: Yes.

Q: When it refers to higher chlorinated biphenyls, is that referring to, like, the percentage of chlorine content?

MS. RUTTER: Well, I would object to the form of the question, in that you are asking him to speculate as to what Mr. Garrett, the author of the memo, meant by that. If you want to ask him what his understanding is, I think that would be a more appropriate question. My objection is it calls for speculation and conjecture as phrased.

MS. SIMPSON: Okay, I'll try to rephrase it.

BY MS. SIMPSON:

Q: Is it correct that some of the PCBs -- strike that. I'm trying to think how to rephrase

it.
It's my understanding that PCBs have various levels of chlorine in them; is that correct?

A: That is generally correct. It could be correct in two ways, but yes.

Q: What is the term used for PCBs with a higher concentration of, a larger percentage of chlorine?

MS. RUTTER: I object to the overbroad and vague form of the question, but Dr. Kaley, if you can answer the question, please feel free to do so.

A: Let me try. The biphenyl molecule, itself, can have some, none, or one chlorine atom on the molecule up to ten chlorine atoms on the molecule, and at -- if it has one chlorine on the molecule, then you would say it's less highly chlorinated or lowly chlorinated. If it has ten chlorines on the molecule, it's as highly chlorinated as it can be, and some are in the middle as a break point, I guess, where someone could determine these are more highly chlorinated, these are less highly chlorinated. Now, that's true of the individual molecules.

What I meant by it's correct in two ways is that the Aroclor product line, which was each product, contained a varying percentage of chlorine, and the higher-numbered products contained more chlorine on an average basis than the others, so, I mean your question kind of is stuck in the middle of whether you are talking about chlorines on individual biphenyl molecules or percentage of chlorine in Aroclor PCB products.

Q: I see, so is what you are telling me, for example, Aroclor 1254, does it have more, or less chlorine than, for example, Aroclor 1232?

MS. RUTTER: Objection to the overbroad and vague form of the question, but Dr. Kaley, if you can provide an answer, please do so.

BY MS. SIMPSON:

Q: (Continuing) Because you said the higher number Aroclors.

A: Right. On average -- well, not on average, Aroclor 1254 is a complex fixture of PCBs containing biphenyls with a varying number of chlorines on the molecule, but on average, it has 54 percent chlorine by weight in the product.

Q: Okay.

A: It contains more chlorine by weight than

Aroclor 1232, which is only 32 percent weight -- it is only 32 chlorine by weight on average in the product, but there are, there can be individual PCB types of molecules that could occur in both products.

Q: I understand.

A: Okay.

Q: So is it correct, then, that the last two digits of the Aroclor number refer to the chlorine, or percentage chlorine content?

A: With the exception of one material which was Aroclor 1016. It is not true for that particular material.

MS. SIMPSON: Okay.

(Plaintiff's Exhibit 45 mark'd for identification.)

(Plaintiff's Exhibit 46 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what have been marked as Plaintiff's Exhibits 45 and 46. If you'll take a moment and kind of have a brief look at those.

(Witness peruses said documents.)

A: Yes, I've reviewed them briefly.

Q: Okay. Have you seen these documents before?

A: Yes, I have.

Q: Is it correct that --

A: I might add, these are just the first pages of more extensive scientific papers.

Q: Yeah. My question was going to be would it be correct that that first indented paragraph would be a sort of an abstract --

A: That's true.

Q: -- of these articles?

A: Yes, I'm sorry for interrupting. That is a correct term, it is an abstract of a paper.

Q: Okay. Do you know if these articles or studies were received by Monsanto?

MS. RUTTER: Objection to the overbroad and vague form of the question.

A: Well, I certainly know at some point in time, they were received by Monsanto. I don't know the specific date that they were.

BY MS. SIMPSON:

Q: Okay. Would it be correct that -- strike that.

Who is J. G. Vos, if you know?

A: Well, I know to the extent that he's identified on the paper and that he was a, apparently, a veterinarian but certainly, a professor at the University of Utrecht in the Netherlands.

Q: Okay, how about J. H. Koeman on Exhibit 45?

A: I believe I understand that he was someone working in Dr. Vos' laboratory. I don't know that specifically.

Q: Okay.

A: But no other affiliation is given for him in the abstract or the title of the abstract, so I think that's a fairly safe assumption.

Q: Okay, and how about R. B. Beems on 6?

A: I've seen the name Koeman before. Beems, I don't know the name, but I would make that same assumption.

Q: Okay.

The studies discussed in these abstracts, were those outside studies or were these something that Monsanto contracted for, if you know?

A: No, they were done independent of Monsanto contract.

Q: Okay, but these would indicate that some

studies were being performed in late 1969 and 1970 regarding toxicity of polychlorinated biphenyls?

MS. RUTTER: I object to the overbroad and vague form of the question, but you may answer.

A: Well, the publications are in 1970 and 1971, so certainly, those two time frames, I don't know for sure that it was going on in 1969. Presumably, it was. It usually takes a period of a year or two to do the work and get a paper published, so again, a safe assumption, but I don't know specifically that the work was going on in 1969.

MS. RUTTER: And once -- that response, I think, calls upon me to say for the record that I would object to any extensive line of questioning about these two documents, since they are incomplete.

MS. SIMPSON: Well, I don't have any other questions about those two documents, so --

MR. MOELLER: Kerry, whenever you get to a convenient breaking point, whether now or five or ten minutes, I would like to take a short break, if that's okay.

MS. SIMPSON: Now would be fine.

(Recess.)

THE WITNESS: Can I make a statement before we start? I believe I spoke this morning when we were discussing the solubility of Aroclor 1242, the water solubility? I believe I may have said 20 parts per million, and it's actually 20 parts per billion in water.

MS. SIMPSON: Okay.

THE WITNESS: So if I did misspeak, which I'm sure I did, it should be 20 parts per billion in water.

MS. SIMPSON: Okay.

(Plaintiff's Exhibit 47 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been marked as Plaintiff's Exhibit 47. If you'll take a moment to look over that.

(Witness peruses said document.)

A: Okay, I've looked at it briefly.

Q: Okay, have you seen this document before?

A: I have seen it before, yes.

Q: Do you recall when you would have seen that?

A: On this one, probably, frankly, sometime shortly after my -- after joining Monsanto.

Q: Okay.

A: Within a year or two.

Q: Is it correct that that was published in April of 1972?

A: That's correct.

Q: Did you, when you first saw this article, do you recall whether you reviewed it at that time, or were you just familiar with it, or had knowledge of it?

MS. RUTTER: Objection to the form of the question.

A: I don't recall.

BY MS. SIMPSON:

Q: Would you have seen this article in connection with your position as a senior research chemist?

A: Yes.

Q: And we had previously talked about who Dr. Vos was, and you said he was a veterinarian?

A: Well, he's a professor at the Institute of Veterinary Pathology.

Q: Okay.

A: So I don't know for a fact that he has,

like, a degree, was a doctor of veterinary medicine, but he was a professor at that veterinary institute.

Q: The study that's reported in this article, was that an outside study?

MS. RUTTER: Object to the form of the question.

BY MS. SIMPSON:

Q: (Continuing) I mean, Monsanto was not connected with that study, were they, to your knowledge?

A: Well, this is, this is basically what's called a review article.

Q: I see.

A: Basically, what Dr. Vos is doing is reviewing his work and other people's work in summarizing the toxicology of PCBs in mammals or birds, and without specifically going through the reference list and seeing whether any of the reference studies were studies that were either done by or sponsored by Monsanto, I can't, I can't answer your question specifically. We certainly were not responsible for Dr. Vos preparing this review.

MS. SIMPSON: I understand. Thank you.

(Plaintiff's Exhibit 48
mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been marked Plaintiff's Exhibit 48, and I'd ask you to take a moment to review that document.

A: I'm familiar with this document.

Q: Okay. Do you know when this -- strike that.
Was this document prepared by someone at Monsanto?

MS. RUTTER: Objection to the overbroad and vague form of the question.

A: To my knowledge, yes.

BY MS. SIMPSON:

Q: Okay, do you know when this document would have been prepared? I, personally, did not find a date on it, but do you have an idea?

A: Yes, I have an idea it was around 1980. There's actually a back. This is a document that had a back cover.

Q: Oh, okay.

A: The back cover was not reproduced.

Q: Okay.

A: And I think it had a little number that

indicated, to my recollection, it was 1980.

Q: Okay.

A: And it certainly was -- I'm just noticing there's a reference to it in the last page that is here, there is a reference to a symposium or seminar in 1979, so that would have said it couldn't have been before about 1979, so that's consistent with my recollection.

Q: Okay. Would you know what, I guess I would call it department would have prepared this type of report?

A: Well, this was prepared by a committee. It was prepared by a variety of people --

Q: Okay.

A: -- with, with the various expertises that are addressed in here.

Q: Okay, so, like, there would have been a committee of someone from each department that's represented in the -- is what you are saying?

A: Right. I mean, the medical department, and toxicology, and product stewardship, and each of those would have had some input into the preparation of the document.

Q: Okay, did you personally have any input into this document?

A: No, not in the direct preparation of it.
Q: Okay, did someone in your Environmental Affairs Division have an input in this document?
A: Yes.
Q: If you turn to the page that's Bates labeled at the bottom 001500 --
A: Coincidentally, that's where I was.
Q: -- in the center of the page, it has a small chart, there?
A: Yes.
Q: And it refers in the paragraph containing that chart says, "In 1963, Monsanto received reports of subacute rabbit dermal studies that it had sponsored on several chlorinated diphenyls"? Did I read that correctly?
A: You read that correctly.
Q: Are those some of the tests that we've already talked about where you told me about dermal tests on rabbits?
MS. RUTTER: Object to the vague, overbroad, and vague, and confusing form of the question, but you may answer.
A: These are the, the types of tests that I was describing, yes.
BY MS. SIMPSON:

Q: Okay.

A: I mean, I don't know what specific tests, but those were the kinds of tests I was describing earlier.

Q: That's what I was asking.
You had told me earlier that testing was performed on rats, rabbits, monkeys and dogs. Did I leave anything out?

A: I recall that's what I told you. I don't --

Q: Do you recall testing done on chicken?

A: Yes, I believe some testing was done on chickens.

Q: And was that, the testing done on chickens, performed by Monsanto or sponsored by Monsanto?

A: The specific recollection I had, it was sponsored by -- there was testing on chickens done at Industrial Biotest sponsored by Monsanto.

Q: Okay.

A: I think your specific question asked for studies on mammals, and of course, a chicken isn't a mammal, so --

Q: You may be correct; it is.
If you'll turn to page that's Bates

labeled number 001503 of that document, --

A: Okay.

Q: -- there is a paragraph towards the top of the page that has a heading over it, "Potential Carcinogenicity -- Animal Studies." Do you see that?

A: Yes, I do.

Q: Have PCBs been determined to be carcinogenic?

MS. RUTTER: Objection to the grossly overbroad and vague form of the question. Are you asking about animals? Are you asking about humans?

BY MS. SIMPSON:

Q: Okay, in animal studies.

MS. RUTTER: Same objection to the overbroad and vagueness of the question, but Dr. Kaley, if you can answer it, please do so to the best of your ability.

A: There have been a variety of studies done by a variety of people testing whether various PCB formulations are carcinogenic in animals, primarily in rats. Some of those studies have been positive in their results, some of those studies have been either equivocal or negative in

their results.

BY MS. SIMPSON:

Q: Okay.

A: I would -- I think the general understanding today is that PCBs are carcinogenic in, in laboratory rodents --

Q: Okay.

A: -- and upon long-term, high-level exposure.

Q: Okay. Have there been any studies, to your knowledge, of whether some PCBs might be carcinogenic in humans?

A: There have been a variety of epidemiological studies testing that hypothesis, yes.

Q: Okay, and to your knowledge, have any of those studies been positive?

MS. RUTTER: Well, objection to the overbroad and vague form of the question.

BY MS. SIMPSON:

Q: You can answer.

A: There have been approximately a dozen studies done of testing whether PCBs are carcinogenic in humans. A review of those studies, critical review of those studies

indicates that there is no consistent, convincing evidence that PCBs are carcinogenic in humans. There are, in individual studies, there are excesses for individual types of cancers in certain cohorts, but if you look at the other cohorts for that specific type of cancer, you don't see that cancer in the other cohorts, so I mean epidemiology is a very complex system because you don't have a controlled experimental system, so it's not unusual to see a, a chance finding in one study that isn't confirmed in other studies. That's why I talk about consistent, convincing evidence, so if you go to some individual study, you might find an excess for one particular kind of cancer but it's, it's not repeated in those other studies.

I might add that all, most of those studies have been done since this document was, was produced.

Q: Okay.

A: In fact, the largest and most recent is generally a completely negative study.

Q: Okay, so they've been done since --

A: Since about 1980.

Q: Since about 1980?

A: Yes.

Q: Okay.

I'm going to hand you what was marked yesterday as Plaintiff's Exhibit 5, which -- and Carol, correct me if I'm misstating what's in this -- it contains invoices and sales summaries for purchases by Texas Eastern of their, their fluids that they purchased from Monsanto; is that correct?

MS. RUTTER: I probably would have phrased it a little bit differently, but I think we stipulated on the, we discussed yesterday on the record -- could we go off the record for a minute?

MS. RUTTER: Yes.

(Discussion off the record.)

BY MS. SIMPSON:

Q: (Continuing) And I just want you to see on there that the documents that were purchased by Texas Eastern were OS-81 and MCS-153, and I might add that this cover page is just a summary document that's not -- has been established as not being a Monsanto historical document.

A: Okay.

Q: Okay?
(Plaintiff's Exhibit 49
mark'd for identification.)
BY MS. SIMPSON:
Q: (Continuing) Dr. Kaley, you've been handed what's been marked as Plaintiff's Exhibit 49, and I'd ask you to take a moment to review that document.
(Witness peruses said
document.)
A: Okay, I've reviewed the document.
Q: Okay, have you seen that document before?
A: Yes, I have.
Q: Okay, and is it correct that this is -- that this regards toxicological investigation of OS-81 and OS-83?
A: That is correct.
Q: And OS-81 would be one of the products contained -- shown on Exhibit 5 as purchased by Texas Eastern?
A: That's correct.
Q: Now, the date on this document is February 26, 1957? Is that correct?
A: That's correct.
Q: If you'll turn to the page that's Bates

labeled at the bottom 004751, do you see that that Table 1 refers to OS-81?

A: Yes, I do.

Q: Because the OS-83 I'm not going to ask you about, so --

A: I understand.

Q: Can you explain to me what LD sub 50 means?

A: Right. LD50 -- well, LD50 means lethal dose, at which 50 percent of the test animals died.

Q: Okay.

A: Or obviously, "lethal" means died, and this "oral" means it was done by oral submission; they were actually fed the materials.

Q: Okay. I just wondered what the number at the bottom meant.

A: Right.

Q: Would this study have been something that -- strike that.
If you flip back to the first page of the document, --

A: Okay.

Q: -- do you see there where it says, "Tests conducted for"?

A: Yes.
Q: And then it says "Monsanto Chemical Company, St. Louis, Missouri"?
A: Yes.
Q: I believe you testified earlier that Younger Laboratories was one of the laboratories that Monsanto contracted with for toxicology testing? Is that correct?
A: That's correct.
Q: So this would then be a report that Monsanto requested Younger Laboratories to perform?
A: It would have been a -- yeah, I mean it would have been a test that Monsanto requested --
Q: Okay, the --
A: -- them to perform, and this is the report of that test.
Q: If you would turn back to that page we were just looking at, 004751, --
A: Yes.
Q: -- you see the very last sentence on that page?
A: Yes, I do.
Q: Where it states, "At autopsy, there was liver damage, moderate kidney congestion, and

gastrointestinal inflammation"? Did I read that correctly?

A: You did.

Q: Were you personally involved in any testing done on this product, OS-81?

A: Not that I recall.

Q: So you would not be able to state whether those findings would be consistent with anything you found, since you've not done any testing?

A: I would not be able to make that statement.

Q: Are you familiar with any testing performed by Monsanto on this product, OS-81?

A: I don't have any specific recollection of any, no.

Q: Okay.

MS. RUTTER: Kerry --

A: Let me ask, I assume you mean by that toxicological testing.

BY MS. SIMPSON:

Q: Yes.

A: Because I'm sure there was performance testing, and physical property testing, and those kinds of things, but I'm not aware of any toxicological testing performed by Monsanto.

MS. SIMPSON: Okay, that's what I was referring to, yes. Sorry about that.

MS. RUTTER: Ms. Simpson, by that question, you are referring to OS-81 as the chemical blend OS-81 specifically?

MS. SIMPSON: Correct.

MS. RUTTER: Okay.

(Plaintiff's Exhibit 50 mark'd for identification.)

BY MS. SIMPSON:

Q: Dr. Kaley, you've been handed what's been marked as Plaintiff's Exhibit 50, and I'd ask you to take a moment to look over that document.

(Witness peruses said document.)

A: I've reviewed it briefly.

Q: Okay, have you seen that document before?

A: I don't recall specifically. I don't, I don't know.

Q: Are you familiar with the product contained on that document, MCS-153?

A: In general terms, yes.

Q: And the date of this document is November 9, 1966; correct?

A: That's correct.

Q: And again, this would have been a study requested by Monsanto Company to be performed by Younger Laboratories?

A: That's correct.

Q: And if you'll turn to the second page of that document, --

A: All right.

Q: -- there's a heading where it says, "Summary"?

A: Yes.

Q: MCS-153?

A: Yes.

Q: Now, where that says, "Oral LD50," that's the same type of test that we just talked about in the other document, oral lethal dose at which 50 percent of the animals die?

A: That's correct.

Q: Is that correct? Now, this document indicates that MCS-153, on the oral LD50 test, there's a sentence there that says the compound was classed as practically nontoxic by oral ingestion in male and female rats?

A: Yes.

Q: And then under subparagraph B, that shows a skin absorption test?

A: Yes.

Q: And that would be the type of test that you told me about that had been performed on rabbits?

A: Correct.

Q: And this compound is stated to be classed as mildly toxic by skin absorption in rabbits?

A: That's, that was Younger's interpretation, yes.

Q: Okay. Are you aware of any toxicological testing such as these done by Monsanto, itself?

A: I'm not aware of any, no.

Q: On this particular product?

A: On this, yeah. We wouldn't have had that capability till after this product was -- ceased being manufactured, so --

Q: All right. Now, you told me earlier that in general, PCBs sink in water?

A: That's correct.

Q: Other than the small part of them that are dissolved?

A: Yes.

Q: In your experience, once PCBs sink, do they stay where they are?

MS. RUTTER: I object to the grossly

overbroad and vague form of the question. It's essentially a hypothetical question in disguise without giving the witness sufficient facts and circumstances necessary for him to formulate a reasonable response to the question. It's asking for gross generalizations and it calls for speculation and conjecture.

MR. MOELLER: I join in that objection and add a further objection: Lack of foundation.

MS. RUTTER: Subject to all of those objections, Dr. Kaley, if you believe that you can respond to the question as phrased, please do so. If you need to ask to have it rephrased, you are free to do that, as well.

A: Let me try an answer and then see where it goes. If I were to take some PCBs and drop them in the bottom of this glass and cover the glass so the water didn't evaporate, and I would come back later, whether that's a day, or a week, or a month of time, the PCBs would still be in the bottom of that glass other than the small amount that was dissolved.

However, if you take PCBs and put them in an environmental system, then there are lots of forces operating on those PCBs, and whether they

would stay or not stay is going to be determined by just a wide variety of environmental conditions --

BY MS. SIMPSON:

Q: Okay.

A: -- and the length of time that you are talking about that has lapsed since they were put in that system.

Q: So if you are talking about PCBs that are placed in the type of system like you just described, would it be a correct statement that there's a possibility that they could migrate from their original location?

MS. RUTTER: Whoa. I have several objections to form. First of all, I -- the phrase "the type of system you just described," since his answer was multifaceted, I think that's an extremely vague predicate to the question, and once again, it's an overbroad and vague hypothetical that doesn't give him the necessary facts in order to make the type of statement requested. It's seeking broad generalizations, it's calling for speculation and conjecture, and there's lack of foundation.

MR. MOELLER: Yeah, I would like to join

that objection and add a further objection on foundation, that with all due respect to Dr. Kaley and his credentials in analytical chemistry, I think that question calls for an opinion on environmental fate of transport, hydrogeology, hydraulics, et cetera, and I don't think he's been qualified or designated as an expert in those areas.

MS. SIMPSON: Well, considering the fact that Monsanto has not designated anyone in those areas --

MS. RUTTER: Nor did you ask for such a designation, Counsel, but --

MS. SIMPSON: If Dr. Kaley could attempt to answer the question, I'd appreciate it.

MS. RUTTER: Do you need to have the question read back, Dr. Kaley, subject to all the objections?

A: I guess I would like you to try another question. I mean, when you asked the question, I was going to answer about the stuff with the glass of water, so it wouldn't have even been clear which system you were talking about, so I guess if you could, rephrase the question.

BY MS. SIMPSON:

Q: Okay. If PCBs were to enter a water system such as a stream, and understanding that it may depend on the type of soil, or speed of the water and things like that, can PCBs be carried by the water?

MS. RUTTER: Objection to the grossly overbroad and vague form of the question. It's once again a hypothetical, doesn't provide all sorts of information that any witness or series of witnesses would require in order to make an informed and reasonable response. It's calling for gross generalization, speculation and conjecture, and lacks foundation.

MR. MOELLER: And I would join in that, join in that objection and further expand upon my foundation objection by noting that we're going beyond environmental fate at transport and now going into rivering systems, which would require expertise on channel geometry and river morphology, two other areas where this witness has not testified to having any expertise.

MS. SIMPSON: Well, I would disagree, in that Dr. Kaley has been designated by Monsanto as having knowledge of environmental concerns relating to PCBs, which its transport in the

environment would come within an environmental concern.

MS. RUTTER: Ms. Simpson, I filed objections to the extreme overbreadth of your designation, and Dr. Kaley was, indeed, designated in a good-faith effort to move forward with this deposition, but we made it very clear that his area of expertise is analytical chemistry, not all of these various other areas of expertise that seem to be inextricably interwoven into your question.

MR. MOELLER: Nobody has instructed him not to answer yet, so have at it, subject to the objections.

MS. RUTTER: Do you need to have the question read back, Dr. Kaley, or are you able to answer it, or do you need to have the question rephrased?

THE WITNESS: I believe I can formulate an answer.

MS. RUTTER: All right, subject to all of the objections of both counsel of record, please do so.

A: When PCBs have reached the environment, and your suggestion in a river, there are a

variety of forces acting upon those PCBs, some natural, some biological, some, you know, with regard to climate that under certain circumstances can cause some portion of the PCBs, whether a trivial amount or a significant amount, to, to be transported through a variety of systems, so, you know, it depends greatly on the individual system and the forces acting on it, but you know, to say, you know, one molecule won't go somewhere different than where it got put in the environment, you can't say that. That may very well happen, and it may be a lot more than one molecule, so, I mean there is no doubt that under certain circumstances, PCBs can be transported in environmental systems, but that degree of that transport varies greatly and is very dependent on the conditions in that system.

BY MS. SIMPSON:

Q: Thank you.

Has Monsanto conducted any tests regarding the biodegradability of Aroclor 1242?

A: Yes.

Q: Can you tell me what results were found in those tests?

MS. RUTTER: Well, I would object to the

overbroad and vague form of the question. The tests would speak for themselves, but subject to that objection, if you have a basis for answering that question, Dr. Kaley, you certainly may, or if you need to have the document in front of you, you may request that Counsel give it to you, as well.

MR. MOELLER: I further object on grounds of best evidence.

BY MS. SIMPSON:

Q: (Continuing) You may answer.

A: Subject to, to modification on seeing the actual document because I don't know the numbers, but my understanding of the biodegradability of Aroclor 1242 is that the majority of the components of the specific PCBs congeners present in Aroclor 1242 are completely to moderately biodegradable in environmental systems.

BY MS. SIMPSON:

Q: And I would ask the same question regarding Aroclor 1248.

MR. MOELLER: Same objections.

MS. RUTTER: Yes, same objections. Do you need to have a more complete question presented to you, Dr. Kaley, or --

THE WITNESS: I believe I understand what

she means.

MS. RUTTER: Okay.

A: Because Aroclor 1248 does contain a higher percentage of chlorine, it is going to be less degradable than Aroclor 1242 on an overall basis, but there are certainly many of the individual congeners in Aroclor 1248 that would be degradable in fairly reasonable time frames in the environment.

MS. SIMPSON: Okay. I believe that's all I have.

MS. RUTTER: Off the record.

(Discussion off the record and recess.)

(Defendant's Exhibit Monsanto C mark'd for identification.)

MS. RUTTER: Back on the record.

EXAMINATION

QUESTIONS BY MS. RUTTER:

Q: Dr. Kaley, I've handed you what's been marked as Monsanto Exhibit C. Could you please identify the document for the record?

A: Yes, this is a published document written by Dr. Cecil Drinker from the Harvard School of

Public Health, and it's labeled as a reprint from the Journal of Industrial Hygiene and Toxicology in May 1939.

Q: Dr. Kaley, did you know Dr. Emmett Kelly while he was alive?

A: Yes.

Q: He was Monsanto's medical director for many years; is that correct?

A: That's correct.

Q: And you are aware, are you not, that in connection with this litigation, we have designated to Plaintiff's counsel certain portions of Dr. Kelly's deposition in another circumstance on -- in relation to toxicity and safe handling issues? Is that correct?

A: Yes, I'm aware of that.

Q: And before coming to the deposition today, you had read through those designations; is that correct?

A: That's correct.

Q: Okay. You are aware, based on your review of Dr. Kelly's deposition designations, are you not, that at one time, there was some confusion about whether a product labeled "Chlorinated Diphenyl" by Dr. Drinker in one of his test

reports was, in fact, chlorinated diphenyl?

A: That's correct.

Q: And is it your understanding that document that's now been marked as Monsanto Exhibit C is a document that, in fact, reports on Monsanto Aroclor 1268 as taken off a Monsanto production line?

A: Yes, that's correct.

Q: Okay, and that is -- Dr. Kelly testifies about this subject in some detail in his deposition that's been designated for use in this case; is that correct?

A: Correct.

Q: Okay. Who is Dr. Robert Keller, Dr. Kaley?

A: Dr. Robert Keller is an analytical chemist now retired from Monsanto who was, at the time I was hired and previously, manager of an analytical chemistry group at Monsanto.

Q: And you know and have worked with Dr. Keller?

A: Yes. He was my supervisor's supervisor when I joined the company.

MS. RUTTER: Okay, I'm going to ask the court reporter to mark this as Monsanto Exhibit

D.

(Defendant's Exhibit Monsanto D mark'd for identification.)

BY MS. RUTTER:

Q: Dr. Kaley, could you please identify Monsanto Exhibit D for the record?

A: Yes, this is a letter to Mr. Ford at Monsanto Chemical Company in St. Louis, Missouri, from Gunnar Widmark, who we've talked about earlier as a professor or doctor of analytical chemistry at the University of Stockholm.

Q: And is this report dated December 29th, 1966?

A: Yes, it is.

Q: So the presumption is that Monsanto would not have received that until sometime in early 1967?

A: I would -- yes, I think since it came from Europe and was very, very late in 1966. I think that is correct.

Q: Okay. Now, you testified in response to some questioning by Ms. Simpson that in very late 1966 or early 1967, it was suggested that PCBs or something like PCBs had been detected in the

environment in Sweden; is that correct?

A: Yes.

Q: Okay. What, if any, issues relating to that report were investigated by Monsanto's analytical chemistry department or any other individuals at Monsanto upon receipt of this report by Monsanto in approximately early 1967?

A: Yes, upon receipt of this report and its distribution to the interested parties at Monsanto, Dr. Keller and others, but Dr. Keller specifically with regard to analytical chemistry, undertook to contact Dr. Widmark in an attempt to understand the findings that are just briefly outlined here, and in fact, what his finding was based on, the kinds of equipment that he was using to make those identifications, and a variety of issues around analytical chemistry.

Q: What type of equipment did Dr. Keller ascertain that Dr. Widmark had used?

A: Well, some of the work that Dr. Widmark had done had been done with gas chromatography using an electron capture detector, but the specific information reported in this letter was using a, a, basically, a new combination of gas chromatography and mass spectrometry.

Q: Was that a piece of equipment that you could just buy off a shelf?

A: No, not at that time. It is now but it was not at that time. It was, it was really a combination of two basically incompatible analytical techniques.

Q: Okay. What, if any, issues confronted Monsanto in attempting to ascertain the accuracy of what Dr. Widmark thought he was seeing in Sweden?

A: Well, there were, there were many, including, basically, the understanding the equipment and how that equipment could be obtained and brought to bear on the issues in question. There were also questions at this time in the question whether the materials had even been correctly identified as polychlorinated biphenyls, and so -- and whether the amounts that people were talking about were, were correctly measured, so there were a number of issues that had to be dealt with.

Q: Between early 1967 and 1969, did Monsanto send several delegations or groups over to Europe to meet with various scientists and other people to, to study and analyze the issue?

A: Yes, they did.

Q: And do you know, did Monsanto during that same time period appoint an ad hoc committee to study and analyze the issue?

A: Yes, that was a very early response, was to put together a team of, of people, analytical chemists, medical people, business people, to follow the progress of this issue as it developed through that time frame.

Q: Okay. What were the chlorination levels of the PCBs or the substances that might be PCBs that were being reported in the environment starting in early 1967 through 1969? Actually, that's a bad question. Let me start over. What was the chlorination level of the substances being reported in the environment during that, during whatever time period they were being reported between 19, early 1967 to 1969?

A: Right, during that time frame, there were consistent reports that the materials being detected in environmental samples were materials that had at least five chlorines on the biphenyl molecule and higher, and those materials roughly corresponded to things like Aroclor 1254 and Aroclor 1260.

Q: Okay, so during those early years between 1967 and 1969, it was the higher chlorinated type of materials that were being reported?

A: Well, assuming your definition of "higher" starts at five parts per molecule, then that's correct.

Q: When you arrived at Monsanto in 1973, Dr. Kaley, what was the status of the reports of PCBs in their environment at that time?

A: Right, really, it hasn't changed very much in those four or five years. By far, most of the reports of, of PCBs in the environment were of materials that resembled Aroclor 1254 or Aroclor 1260. The only exception to that were samples that were taken from, for example, a General Electric capacitor plant where they were using Aroclor 1242, and if those materials were getting into the environment, you would find, you know, Aroclor 1242-type materials there, but that was really kind of an exception.

MS. RUTTER: Okay. I don't have any further questions.

MS. SIMPSON: I don't have anything.

MR. MOELLER: I have nothing.

(Whereupon, at 12:38 P.M.,

the deposition was concluded.)

COMES NOW THE WITNESS, ROBERT GEORGE KALEY, II, Ph.D., and having read the foregoing transcript of the deposition taken on the 28th day of July 2000, acknowledges by signature hereto that it is a true and accurate transcript of the testimony given on the date hereinabove mentioned.

ROBERT GEORGE KALEY, II, Ph.D.

Subscribed and sworn to me before this day of 2000.

My Commission expires: .

Notary Public

jj

State of Missouri)
) SS.
City of St. Louis)

I, J. Bryan Jordan, a Certified Court Reporter in and for the State of Missouri, duly commissioned, qualified and authorized to administer oaths and to certify to depositions, do hereby certify that pursuant to Notice in the civil cause now pending and undetermined in the Circuit Court of the City of St. Louis, State of Missouri, to be used in the trial of said cause in said court, I was attended at the offices of Husch & Eppenberger, L.L.C., in the City of St. Louis, State of Missouri, by the aforesaid witness and by the aforesaid attorneys, on the 28th day of July 2000.

The said witness, being of sound mind and being by me first carefully examined and duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, thereupon testified as is shown in the foregoing transcript, said testimony being by me reported in shorthand and caused to be transcribed into typewriting, and that the foregoing pages correctly set forth the testimony of the

aforementioned witness, together with the questions propounded by counsel and remarks and objections of counsel thereto, and is in all respects a full, true, correct and complete transcript of the questions propounded to and the answers given by said witness; that signature of the deponent was waived by agreement of counsel. I further certify that I am not of counsel or attorney for either of the parties to said suit, not related to nor interested in any of the parties or their attorneys.

Witness my hand and notarial seal at St. Louis, Missouri, this 7th day of August 2000.



J. Bryan Jordan
Certified Court Reporter
State of Missouri
My License expires January 1, 2001.

COURT MEMO

CIRCUIT COURT OF THE CITY OF ST. LOUIS

STATE OF MISSOURI

PHILIP A. METZEL, ET AL.,

VS. CAUSE NO. 992-00215

TEXAS EASTERN TRANSMISSION CORPORATION, ET AL.

CERTIFICATE OF OFFICER AND

STATEMENT OF DEPOSITION CHARGES

(Rule 57.03 (g) (2) (a) & Sec. 492.590 RSMO 1985)

DEPOSITION OF ROBERT GEORGE KALEY, II, Ph.D., TAKEN ON BEHALF OF THE DEFENDANT TEXAS EASTERN TRANSMISSION CORPORATION AND TEXAS EASTERN CORPORATION, July 28, 2000.

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IN WITNESS WHEREOF, I have hereunto set my hand and seal this 7th day of August, 2000.



_____

J. Bryan Jordan
Notary Public State of Missouri
(St. Louis City)
My Commission expires July 20, 2002

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Robert George Kaley II,
Deposition Correction Sheet
Metzel v. Texas Eastern et al.
Deposition of July 28, 2000

Page 2, Line 17 Should read: Taken on behalf of plaintiffs

Reason for assigned change: transcription error

Page 19, lines 14 – 18 Should read: see Monsanto document production for fish studies performed on Monsanto's behalf

Reason for assigned change: Didn't recall fish studies at time of question but such studies are included in the documents produced

Page 22, lines 8 – 11, 14 – 16 Should read: see correction made at page 36, lines 17 - 21

Reason for assigned change: recollection refreshed by document

Page 25, line 3, 6, 9 Should read: Swann

Reason for assigned change: spelling

Page 27, line 15 Should read: Swann

Reason for assigned change: spelling

Page 30, line 5 Should read: Swann

Reason for assigned change: spelling

Page 43, line 6 Should read: What *this* document says ....

Reason for Change: spelling

Page 51, line 14, lines 20 - 21 Should read: 20 parts per *billion*

Reason for assigned change: Misspoke – corrected on the record at page 67, lines 2 – 12

Page 62, line 20 Should read: complex mixture not fixture

Reason for assigned change: spelling

Page 63, line 2 Should read: 32 *percent* chlorine by weight

Reason for assigned change: omitted word

Page 77, line 20 Should read: products not documents

Reason for assigned change: context

Page 81, lines 14 – 15, 24 – 25 Should read: (add) but toxicity testing was performed on Monsanto's behalf on Aroclors 1248 and 1242.

Reason for assigned change: The question is limited to OS 81, the blend, and to tests performed internally at Monsanto rather than by outside laboratories on Monsanto's behalf. The answer is accurate as stated, but certainly toxicity testing was performed on the Aroclor components of the OS 81 blend.

Page 84, line 12 Should read: (add) but toxicity testing was performed on Monsanto's behalf on Aroclors 1242 and 1232.

Reason for assigned change: The question is limited to MCS 153, the blend, and to tests performed internally at Monsanto rather than by outside laboratories on Monsanto's behalf. The answer is accurate as stated, but certainly toxicity testing was performed on the Aroclor components of the MCS 153 blend.

Page 88 line 18 Should read: riverine

Reason for assigned change: spelling

Robert George Kaley, II, PhD.

WATER_PCB-SD0000046955

COMES NOW THE WITNESS, ROBERT GEORGE KALEY, II, Ph.D., and having read the foregoing transcript of the deposition taken on the 28th day of July 2000, acknowledges by signature hereto that it is a true and accurate transcript of the testimony given on the date hereinabove mentioned.

Robert George Kaley, II, Ph.D.

ROBERT GEORGE KALEY, II,
Ph.D.

Subscribed and sworn to me before this day of 5th day of Sept. 2000.

My Commission expires:

MARY K. MC BRIDE
NOTARY PUBLIC - STATE OF MISSOURI
MY COMMISSION EXPIRES 2/12/2002
ST. LOUIS COUNTY

Mary K. McBride
Notary Public

jj