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IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS
STATE OF MISSOURI

JUDITH BECHTOLD, wife of/and STEPHEN E. BECHTOLD, ELIZABETH TAMEWITZ, as Personal Representative of her deceased husband, KENNETH F. TAMEWITZ, KELLIE LEE TRISLER, as Personal Representative of her deceased mother, NINA TRISLER, PHYLLIS GOODMAN, as Personal Representative of her deceased husband, CHARLES GOODMAN, JR.,	)	
Plaintiffs,	)	
vs.	)	Cause # 922 00911
MONSANTO COMPANY and WESTINGHOUSE ELECTRIC CORPORATION,	)	
Defendants.	)	

DEPOSITION OF DR. ROBERT KALEY
Taken on behalf of the Plaintiffs
June 6, 1994

WALLER REPORTING, INC.
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DEPOSITION OF WITNESS, produced, sworn and examined on June 6, 1994, between 8:00 a.m. and 6:00 p.m. of that day, at the offices of Husch & Eppenberger, 100 North Broadway, St. Louis, Missouri, before Sheila C. Irvin, a Certified Shorthand Reporter and Notary Public within and for the State of Missouri, in a certain cause pending in the Circuit Court of the City of St. Louis, State of Missouri; taken on behalf of the Plaintiffs.

A P P E A R A N C E S

The Plaintiffs were represented by Mr. C. Joseph Murray of the Murray Law Firm, 909 Poydras Street, New Orleans, Louisiana 70112.

The Defendant, Monsanto, was represented by Mr. Thomas M. Carney of the law firm of Husch & Eppenberger, 100 North Broadway, St. Louis, Missouri 63102.

The Defendant, Westinghouse, was represented by Ms. Jeana D. McFerron of the law firm of Lewis, Rice & Fingersh, 8182 Maryland Avenue, Clayton, Missouri 63105.

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 Sheila C. Irvin, a Certified Shorthand Reporter and Notary Public, and afterwards transcribed into typewriting, and transcript is to be read and signed by agreement of counsel and consent of the witness.

oOo

DR. ROBERT KALEY,

of lawful age, being first duly sworn to tell the truth, deposes and says on behalf of the Plaintiffs, as follows:

EXAMINATION

QUESTIONS BY MR. MURRAY:

Q. It's Dr. Kaley; right?

A. Yes.

Q. Dr. Kaley, my name is Joe Murray. I represent the plaintiffs in this action. Have you ever been deposed before, sir?

A. Yes, I have.

Q. Of course you have. I know of at least one time. You are aware then that any question that I ask that you don't understand and would like to have me rephrase it, simply ask me to do so. I'll be happy to do so. You're entitled to explain any answer that you give. If you want to give an explanation, I would simply request

that you give the answer first and then the explanation so that I will be clear on the record. This lady is going to be taking down everything that's said, so it's necessary for you to answer out loud.

A. Yes, sir.

MR. CARNEY: Joe, before we start, as I understand it, he's been designated as to one aspect on the 30B6 deposition and that I think you've asked for him or you may want him as an individual witness. Can we I'd like to keep that dichotomy because there are different consequences to his testimony if he's the 30B6 deponent on something as opposed to just taking his deposition.

MR. MURRAY: Off the record.

(Whereupon, an off the record discussion was held.)

MR. CARNEY: Just to clarify, this is not part of the 30B6 deposition. You have noticed Mr. Kaley for his deposition as an employee of Monsanto, and that's what we'll be taking here, and then if at a later point you decide you want to follow up on some aspect of the 30B6, we can do that later.

MR. MURRAY: Let's go off the record again.

(Whereupon, an off the record discussion was held.)

Q. (By Mr. Murray) Dr. Kaley, I have reviewed a deposition that you gave in a case entitled Scott versus

Monsanto, and this deposition was given in May of 1987. It's going to be my intent today to concentrate mainly on the time subsequent to 1987 and talk to you about that time period, but I understand that it may be difficult for you to differentiate as to what may have occurred since 1987 and what happened before and that kind of thing. So if you have any problems with that, let me know and, you know, we can fix it; okay?

A. I'll do my best.

Q. All right. I just don't want to waste time on going through everything that's already been asked.

A. Okay.

Q. Now, are you still employed by Monsanto?

A. I am.

Q. And in what capacity are you employed now?

A. My title is director, environmental affairs.

Q. When did you begin Well, let me phrase it to you this way. Was that your title in 1987?

A. No, sir.

Q. Tell me what's happened since 1987 with regard to your career at Monsanto.

A. I guess at the time I was manager of environmental technical support doing largely the same things that I'm doing now, but with less responsibility for people management. So I've had, as I recall, since

that time two promotions, both, as I said, largely to reflect increased responsibility for people management. Little change in my technical responsibilities.

Q. Okay. How would you describe your duties today?

A. My primary duty is to serve as a resource within our, it's environmental safety and health group, now, for technical information on a variety of issues, some of which relate to products that Monsanto no longer manufactures.

Q. Which, as I remember your testimony, that was basically the same duties that you had back then, only you only had, I think, one or two people in that who were doing that same kind of work?

A. That's right.

Q. Is it your testimony today that that department has grown?

A. Well, no. It's just that I've moved up through the department. My boss at that time has since retired, and I basically assumed his responsibilities, so the department actually has shrunk. It's just that rather than having my At the time I think my responsibilities were largely focused on PCBs in 1987, and that responsibility has broadened to some other materials, but the department has probably shrunk rather than expanded.

I just have more people that are reporting to me rather than me reporting to them.

Q. Okay. So basically what you do is consult with people within Monsanto regarding environmental regulations and on procedures to use to make sure you're in compliance with those regulations and things of that sort?

A. Things of that sort, yes, correct.

Q. Okay. All right. With regard to PCBs in general, and I guess dielectric fluid in particular, are there still occasions when you may have to be called in to consult on issues involving those chemicals?

A. Yes.

Q. And would all those relate to, I guess, uses outside of Monsanto? In other words, things that have been in use for a while and people call you and want to know what to do with it?

A. There are those kinds of things, right.

Q. Are there ever any occasions when you may have to consult with somebody within Monsanto regarding the use or handling or disposal of PCBs?

A. Well, there is another gentleman who reports to me that has those kinds of responsibilities, also, so I may consult with him, but that's still within our organization, so probably not. I think we're looked upon

as the source of PCB expertise within Monsanto.

Q. Would those occasions relate to transformers, capacitors and things of that sort already in use in the Monsanto plants?

A. Yes, to the extent that we have any, yes.

Q. Okay. I'm wondering if there are any other occasions wherein you might need to consult with somebody within Monsanto regarding PCBs.

A. Well, there are occasions when the attorneys have questions. I sometimes talk to the attorneys.

Q. Other than that, though?

A. But other than that, other than technical questions related to other subjects that have some peripheral involvement with PCBs, not usually, no.

Q. How many people work in that department in the, I guess, environmental affairs?

A. I think there are about 13 of us now.

Q. Okay. And are you in charge of all 13?

A. Yes.

Q. Now, there are a couple of questions that I want to get into that are not time framed specific because I wasn't clear based upon the deposition and some addendums apparently to the deposition about some of your answers. So specifically I'm talking about your test that you ran on, I think it was Aroclor 1242 and 1254 with

regard to dibenzofuran contamination. As I remember the deposition testimony, you indicated that you believed, and obviously you didn't have the documents in front of you at that time, that the contamination was in the two parts per million range. As I reconstructed, there was a subsequent addendum to the deposition where you testified differently.

A. That's correct.

Q. Is that a fair statement?

A. That's fair.

Q. Can you tell me what that difference was?

A. Well, basically it was the finding in my file, the paper that I had forgotten which reported some results on Aroclor 1254 where the levels were somewhat higher than my original testimony reflected.

Q. Okay. That's basically where I got confused. I couldn't tell if the higher levels were only related to 1254 or if they included 1242.

A. At the time, and my recollection is the higher levels only are 1254.

Q. Okay.

A. The 1242 levels have been consistently around the two part per million level, as I recall.

Q. Okay. I'm going to show you a document which is marked BEC114355 and 114364, and see if you can

identify that for me.

A. I have seen this document, yes.

Q. Were those the notes that you had just referred to?

A. No, sir.

Q. No? What does that What is that document?

A. This document reflects some work that was done by Dr. Christopher Rappe, R a p p e, in Sweden. At whose request, I don't know, but one of the Fred gentlemen on here apparently had been at the presentation where Dr. Rappe had presented these data and was transmitting that information to another researcher at Monsanto. This is my guess well, my estimation would be this is in the 1980 time frame, 1982 possibly, possibly even later.

Q. This Dr. Rappe, this was independent research he conducted on PCB samples?

A. That's correct.

Q. Were those samples obtained from Monsanto? Do you know?

A. I don't know.

Q. Do you know whether or not they were Aroclors?

A. Based on the designations 1254 and 1260 at the top, those two materials presumably were Araclors. The two materials designated A40 and A50 were not

Aroclors. Those are Klophen products which is a PCB of German manufacture.

Q. All right. What about this 3010?

A. That, I don't know what that is.

Q. Okay. Are these various numbers on the, on the far left of the document, are those various congeners of furans?

A. There are two There are two different designations there. The ones that are numbered, for instance, the top 2, 3, 7, 8 TCDF, that is a specific congener of the tetrachlorodibenzofuran. The next line with the little Greek Sigma, that means summation of all the tetrachlorodibenzofurans. So if we want to look at 1254, the second column, .019 is parts per million is how much 2, 3, 7, 8 tetrachlorodibenzofuran was present. On the other hand, 1.4 parts per million of all of the tetrachlorodibenzofurans taken in toto summed to that amount. The same would be true then for the pentachlorophenyls, hexa or excuse me the pentachlorodibenzofuran and the hexachlorodibenzofuran.

Q. And this bottom line here where it says total CDBFs, how does that differ from the, from these little?

A. Well, if you add up all of the summation signs, if you add all of the tetrachloro's, all of the pentachloro's, all of the hexa's, all of the hepta's and

the octa's, each one of those numbers added up should total the 16.4 parts per million.

Q. Okay. I understand. I know that your specialty and certainly your designation is not toxicology, but do you know in general terms which one of these congeners may be more toxic than others?

A. I have some general knowledge of that, yes.

Q. Can you tell me what that would be?

A. One of those pentachlorophenyls, and as I sit here right now I keep saying phenyls. One of those pentachlorodibenzofurans is thought to be the most toxic by toxicologists. I don't really remember whether it's the 1, 2, 3, 7, 8 or the 2, 3, 4, 7, 8, but one of those two, and then the 2, 3, 7, 8 tetrachlorodibenzofurans is thought to be also relatively more toxic than the other congeners.

Q. And do you know who Paul is on this first sheet where it looks like it was notes as being written to Paul from Fred?

A. Yes, I do.

Q. Who is that?

A. Paul Michael.

Q. Who is he?

A. He's another analytical chemist at Monsanto.

Q. And you indicated that you do not know who

the Fred was, or you do know?

A. I do know.

Q. Who was that?

A. Fred Hileman, H i l e m a n.

Q. He's an analytical chemist at Monsanto?

A. That's correct, yes.

Q. Part of what I was going to talk to you about today was if any further research has been done with regard to furans and other contaminants in Aroclors, and I guess now probably is as good a time as any to get into that subject. Do you know since you did your work Well, first of all, have you done any work yourself other than the initial test that you ran regarding any furan contamination in the Aroclors?

A. No, I have not.

Q. Do you know if anybody else at Monsanto has done any additional tests?

A. Since 1987 or since I did my work?

Q. Since you did your work.

A. There has been some done, yes.

Q. And by whom was that done?

A. By Paul Michael.

Q. And describe for me what he did.

A. Well, basically he looked at a few samples or maybe even one or two samples of Aroclor 1254 to measure

the PCDF contents in those one or two samples.

Q. Do you know what his results were?

A. Not specifically. They were consistent with previous data.

Q. That's what I was going to ask. Were they consistent with what you found?

A. Yes.

Q. Okay. Do you know why he did that additional work?

A. Yes, I do.

Q. Why?

A. We were preparing to initiate a feeding study of cattle with Aroclor 1254, and we wanted to know what the PCDF content of the feeding material was.

Q. Okay. When was that done?

A. About 1982.

Q. Was that feeding study done?

A. Yes, it was.

Q. Were the results published?

A. Yes, they were.

MR. MURRAY: Off the record.

(Whereupon, an off the record discussion was held.)

Q. (By Mr. Murray) Back on the record. Because of my limited involvement in this case over the last year, I'm not sure whether we have the studies that you've

referred to, Dr. Kaley, so I'm making a request on the record from Monsanto that if we have not yet been, not already been provided with those studies, that we do, that we get a copy of them; all right? Anybody else at Monsanto To your knowledge, has there been anybody else at Monsanto to your knowledge who has done any additional work on determining the furan content of Aroclors?

A. Not to my knowledge.

Q. What about Do you know whether or not any work has been done at Monsanto with regard to dioxin, using the generic term, contamination of any Aroclor product?

A. Not to my knowledge.

Q. Do you know whether or not

A. Are you talking subsequent to 1975 or '76 when I was doing my work? I need to know the time frame.

Q. I think you testified, and I could be wrong about this, but as I remember your testimony, you said that Monsanto had never looked for dioxins in any of its Aroclor product, and so I guess my question is not limited to timing.

A. Well, if that was my testimony, it was either in error The original work that was done in the early 1970s to reproduce the work of Dr. Vos, V o s, from the Netherlands, dibenzodioxins were looked for at that time,

and none were found.

Q. And that was your work?

A. No, that was work by Dr. Mieure.

Q. Okay. Who is Dr. Mieure?

A. An analytical chemist at Monsanto.

Q. When was that work done?

A. Probably 1971, maybe 1972.

Q. Let me show you a document. I don't see a BEC number on this document, Tom, so I'm just going to identify it with an SCM number, 037110. Ask if you've seen that before.

A. I have seen this document, yes.

Q. Can you describe to me what that document is?

A. Well, this is a document from Dr. Robert Keller to Mr. William Papageorge describing or attached to apparently a report by Dr. Mieure summarizing the analyses in 1970 of Monsanto's attempts to detect dibenzofurans and dibenzo para dioxins in Monsanto Aroclor products.

Q. Is that the work that you were just talking about?

A. Yes, it is.

Q. All right. Do you know of any other work done by Monsanto looking for dioxin contamination in Aroclor products?

A. I do not know of any other, no.

Q. Okay. This is the, I guess, the summary of the work that was done by Dr. Mieure; correct?

A. That's correct.

Q. Have the testing methods improved since October of 1970 to the extent where you believe that you would be able to detect dioxin contamination at under one to five parts per million?

A. Possibly an order of a magnitude or so, maybe even less. They have certainly improved since 1970, no question.

Q. Did they improve between the time this testing was done and when you made your tests?

A. Yes.

Q. Okay. Would that explain why Dr. Mieure did not find any detectable levels of furan contamination and you did?

A. Possibly partly, yes.

Q. Do you know of any other reason why your test would be, would show different results than his?

A. Well, it's potential Some of the samples that we analyzed were clearly different than some of the samples that Dr. Mieure analyzed. There were some slight differences between samples in the dibenzofuran contents, so I think those two factors would depend on the sample, but largely would depend on the improvements in the

analytical methodology.

Q. Okay. I know you testified in 1987 that to your knowledge, Monsanto never ran any tests on Inerteen PPO, I believe is the designation for it, and I'm specifically talking about the blend of Inerteen which contained the, I think it's I forget the chemical name for it, but it's the chlorinated benzene. Is that the right

A. Yes.

Q. Okay. To your knowledge, has any testing ever been done by Monsanto on that particular product to determine dioxin contamination?

A. Not to my knowledge.

Q. What about furan contamination?

A. Not to my knowledge.

Q. Do you know whether any testing has been done on that particular product outside of Monsanto to determine contaminant levels of furans and/or dioxins?

A. I don't know specifically. It's possible, but I don't know specifically.

Q. When you say that, are you remembering something vaguely?

A. Well, there has been some work done by EPRI, the Electric Power Research Institute in the 1980s where they looked at a variety of electrical fluids. It is

conceivable that Inerteen PPO was among those fluids. I just don't know.

Q. Do you remember what the results were of that study in general terms? Were any contaminants found in those, in any of those fluids?

A. Yes.

Q. And what levels Let's talk, first of all, about furans.

A. Right. There were two results. One was that the levels of furans were largely consistent with what was reported in the literature, and the second result was that those levels were not increased by in service use of the fluids.

Q. Okay. What about dioxin?

A. None were detected.

Q. Was that study published?

A. It's published as an EPRI report.

Q. Okay. And do you have a copy of that?

A. Yes, I do.

Q. And I'll just make this general request, also, Tom. If we haven't already been provided with that, I would request that we get a copy of that.

MR. CARNEY: Okay. What is that again?

Q. (By Mr. Murray) It's an EPRI Is it EPRI report?

A. Yes, EPRI.

MR. MURRAY: Discussing furan and dioxin contamination of dielectric fluids.

MR. CARNEY: Okay.

Q. (By Mr. Murray) Let me show you a document. Again there's no BEC number on this document. I think it's a Stroh document, STR number 006389, and ask if you can identify that.

A. I have seen this document, yes.

Q. And tell me what that document is.

A. Well, it's a handwritten note summarizing some results of chlorodibenzofurans in PCB products.

Q. Do you know who wrote it?

A. Not positively.

Q. Okay. Do you have a guess?

A. I believe I might know who it is.

Q. Who is that?

A. It looks like Jim Mieure's handwriting.

Q. I won't hold you to that. I understand that you're just, you're making your best guess. And do you know when that note was written in a general time frame?

A. I don't. I think it was the late 1970s.

Q. Okay.

A. I don't know the specific year.

Q. All right. You said late 1970s?

A. Yes. The reason I know that is because they're talking about a Rhesus feeding study, and that study wasn't done until the late 1970s, so

Q. I was going to ask you about that. Apparently when this was compiled, he had information, and I'm making a guess on this, but is this, are these places that are listed here places where Aroclor was made?

A. Yes.

Q. And came from?

A. Yes.

Q. And Anniston, Newport and Krummrich?

A. Yes.

Q. What is in Newport?

A. That's in Great Britain.

Q. Okay. He's got under here 1974 75 range, five to 33. Is that the work you did?

A. No, that was the work that I believe Dr. Mieure did. That's the work that was discovered subsequent or was, the paper was refound subsequent to the Scott deposition.

Q. He's got a list here of what he calls used Therminol with a number of 90. I guess that's parts per million?

A. Yes.

Q. When was that work done? Are these results

something that he just, he did in this time frame?

A. No, these are compilations. Some of the results aren't even ours. The Yusho oil are not even Monsanto analyses. These are just a compilation of representative data through a longer time frame.

Q. All right. Do you know who did the work on the used Therminol?

A. I believe Dr. Mieure did.

Q. Okay. Therminol is a heat transfer fluid. Is that correct?

A. That is correct.

Q. Is it pure PCB, or is it a blend of PCBs and something else?

A. The Monsanto Therminol FR products were pure PCBs.

Q. Okay.

A. Well, with a correction. There may have been low levels of anticorrosive agents or something, but they were largely PCBs. I would have to check to be sure.

Q. And was the Therminol that he tested a Monsanto product?

A. I believe it was, yes.

Q. What number are we talking about with regard to chlorination of the Therminol products?

A. I don't know specifically what that one was.

Q. Okay. You don't know if it's 1242, 54, 60?

A. I don't know that one. No, I do not.

Q. Now, for the Yusho oil, he's got a listing of five parts per million and the Kanechlor 400, is that basis?

A. Basis, right.

Q. 5,000. As I understand what happened there, the PCB product which in that case, I believe, was Kanechlor?

A. Yes.

Q. Leaked into a manufacturing process of rice oil?

A. That's correct.

Q. So what he's saying is that the Kanechlor that leaked had a level of 5,000 parts per million and the resulting oil that was consumed had a level of five parts per million?

A. That's basically correct, yes.

Q. Do you know where he got the 5,000 number from?

A. Yes. It's basically a calculation from analyzing the levels of dibenzofurans in the oil and the levels of PCBs in the oil and just ratioing those two numbers.

Q. All right. And these were actual furan

numbers, PCDFs?

A. Well, those are numbers That 5,000 number is a result of a calculation. The 5,000 was never measured in any fluid. It's a result of a calculation as I described it.

Q. So they get that number from estimating how much PCB oil leaked into the rice oil and then extrapolating it back backwards?

A. Basically true. As I said, they measured the amount of dibenzofurans in the rice oil. They measured the amount of PCBs in the rice oil, and when you ratio those numbers, which all PPM means is it's just a ratio, when you ratio those two numbers, the 5,000 is the result of that calculation.

Q. And the Rhesus feeding study numbers, were those to your knowledge Monsanto products?

A. Yes, I believe they were.

Q. Okay. What are these designations down here, K1 02 602?

A. That's a lot number from the manufacturing process.

Q. Okay. And do you know what level that was? Was that a 1242, 1254, 1260?

A. I believe all of these are Aroclor 1254 or 54 percent chlorinated anyway. That's my assumption.

Q. Based upon the indentation?

A. Right, because it's indented. I believe that's right.

Q. Let me show you another document, again with an SCM068517, and ask if you can identify that.

A. Yes, I've seen this.

Q. All right. Tell me generally what that is.

A. Well, this is another report summarizing the work that Dr. Mieure did in 1970 subsequent to the report by Dr. Vos out of Europe, and it was the summarization of Monsanto's attempts to reproduce Vos's determinations.

Q. Same tests that we previously talked about, just a different report on it?

A. That's right.

Q. And this number for this document is SCM number 068617, and that appears to be a report by you. Can you look at that and confirm that for me?

A. Yes, that is correct.

Q. Tell me about that document. That appears to be summarizing a seminar or something you went to?

A. It's a trip report I wrote following a meeting of analytical chemists in Georgia in May of 1975.

Q. Okay. And again, these results appear to basically confirm the same thing that you already had. Is that

A. Well, that's not quite right. These were some results coming out of the FDA research labs in which they suggested that there were chlorodibenzofurans being found by them in Aroclor products, and up to that point no one had measured or determined chlorinated dibenzofurans in PCB products, and so this was the first hint, and when we went to that meeting, I think the thrust of my summary was that although they were giving a talk, that their analytical data was relatively weak and certainly did not constitute a confirmed finding, and there were no measurements of dibenzofurans in Monsanto Aroclor products.

Q. This was before you did your work then, huh?

A. It's before we actually succeeded in measuring chlorinated dibenzofurans in any of our products, that is correct.

Q. Okay. They have listed here next to Aroclor 1242, 2, 3, 4. What does that indicate?

A. That's correct. Well, those numbers are the number of chlorine atoms they reported on the dibenzofuran molecule. So that for Aroclor 1242, their data suggested that they were finding dichlorodibenzofuran, trichlorodibenzofuran and tetrachlorodibenzofuran in Aroclor 1242. Those have nothing to do with concentrations.

Q. That's what I was going to ask you. That has nothing to do with parts per million or anything like that?

A. Right. They did not present any quantitative data on those materials.

Q. Okay. Apparently they did give a general statement, though, that they were finding them in one to several parts per million range?

A. That's what it says. Yes, that's reflected in the documents, yes.

(Whereupon, a short break was taken.)

Q. (By Mr. Murray) We'll go through the rest of these documents, Dr. Kaley. This was numbered STR000068. I can't tell if that's 38 or 36.

A. You want to look?

MR. CARNEY: Why don't we just identify the title of it.

A. Okay. This is a typed document titled "Chlorodibenzofurans in PCBs."

Q. (By Mr. Murray) That's basically the same thing we looked at in the handwritten notes, isn't it?

A. That is a typed version of that document, yes, it is.

Q. Okay. Same thing. And this document has a BEC number 106332. Can you take a look at that and tell

me what that is?

A. I have seen this document, yes.

Q. Okay. And what is that?

A. It's a memo from Mr. William Papageorge to Mr. Savage summarizing some analytical work that Dr. Mieure did on starting materials in the Aroclor process.

Q. Is the conclusion that was reached based upon those tests that at least some of the furan contamination is present in the component parts of PCBs?

A. Well

Q. If that's the right term. I'm sure it's not.

A. This material, this analysis was looking at non chlorinated materials, and the dibenzofuran they're talking about here is the parent dibenzofuran molecule, not chlorinated dibenzofurans, and it was reported to be detected in Santowax R which was a terphenyl product, not a biphenyl product. But with those qualifications, yes, it did report the presence in that Santowax R.

Q. Is Santowax R used in the manufacture of biphenyls?

A. No, it's used in the manufacture of polychlorinated terphenyls. That's my understanding.

Q. Is it used in the manufacture of Aroclors?

A. In the Aroclor 5400 series, the terphenyl

product line, yes. Not in the Aroclor 1200 biphenyl product line, no.

Q. All right. I didn't realize that there was a distinction. The 1254 product series is terphenyl?

A. No. 1254, the materials starting with 12, the 1200 series are chlorinated biphenyls, so Aroclor 1254 is a chlorinated biphenyl. There was another series of materials, the 5400 series, for instance, Aroclor 5442 which is a chlorinated terphenyl product, and that was the product line in which Santowax R was a starting material.

Q. What was the 5400 series used, what products did they make out of that?

A. Almost exclusively plasticizers.

Q. Okay. Were any dielectric fluids made from the 5400 series?

A. Not to my knowledge.

Q. And finally, this last document is marked MON091303. Are you familiar with that one?

A. I'm not sure that I've seen this previously.

Q. This letter appears to be addressed to Dr. R. E. Keller. Was he a Monsanto employee?

A. Yes, he was.

Q. What was his position at Monsanto, if you know, in June of 1970?

A. I believe he was manager of applied sciences.

Q. How did that Was that a supervisory position over you?

A. Well, I wasn't there in 1970. When I came in 1973, he was the second above me in command, yes. My boss reported to Dr. Keller.

Q. Okay. The person writing this letter at least appears to be J. G. Vos. Is that the person that you had mentioned earlier who had done the initial work on furan contamination in Aroclors?

A. Yes, it is. Well, in PCBs generally, not specifically Aroclors.

Q. To your knowledge, was Dr. Vos's work the first work done in that area?

A. It was certainly the first work reported in the literature, yes, on chlorinated dibenzofurans in PCB products.

Q. A number of the documents that I showed you today contain Let me ask you that question. Do any of the documents that I've shown you today contain your notes that you went back to subsequent to your May of '87 deposition?

A. No, I do not believe they do.

MR. MURRAY: All right. I'll state on the record that, Tom, I'm probably 90 percent sure I've got those notes, but there's that ten percent doubt in my

mind, so I'd like to, if I can, go back and check, make sure I've got them. If not, I'll ask for a copy of those notes as well.

MR. CARNEY: These are Kaley's notes?

MR. MURRAY: Yes.

A. Well, they're not my notes. They're summary sheets of analyses.

Q. (By Mr. Murray) And I seem to remember seeing something like that, and that's why I'm saying I'm 90 percent sure I've got them. I don't know whose handwriting they're in, but they are handwritten notes; right?

A. Yes. In general I believe that's right, yes.

Q. Okay. I don't have them. I thought I had them here, but I do not. A couple of general questions, Dr. Kaley, to help me in my own mind understand the chemistry of PCBs. I have read a lot and heard a lot of testimony about congeners of PCBs. Can you give me a layperson's explanation of what that is?

A. Yes.

Q. Tell me, please.

A. Okay. The term congener is of fairly recent origin, and it's being used to describe a single member of a class of related compounds. In other words, there are 209 different ways to put chlorine atoms on the biphenyl

molecule, depending on the number of chlorine atoms and the position of those atoms, and each one of those 209 unique chemicals is one of the congeners of PCBs. It's kind of like a chemical cousin kind of concept.

Q. Well, if I've got a jar of PCBs sitting on the table.

A. Yes.

Q. How do I know which congeners are in that jar?

A. You have to analyze them with a capillary column gas chromatograph.

Q. Would you expect the results of what congeners are in this jar to be different if I've got 1242 versus 1254?

A. There will be some differences in the actual congeners present, and there will be differences in the amounts of congeners, of some of the congeners that are present in both, so the answer is yes and no.

Q. Let me see if I can understand that. All right. I've got 1242 here and 1254 here.

A. Yes.

Q. Knowing the chemical properties of each one of these jars or the material contained in each of those jars, can you predict ahead of time which congeners are likely to be in which jars and which percentages?

A. Not specifically, no. I could have some general idea, but not specifically.

Q. But it goes beyond something it goes beyond a random chance?

A. It does go beyond random chance, yes. It's going to be dependent upon the physical chemistry of the process you use to make those materials.

MR. CARNEY: He could probably do it to a 95 percent confidence.

Q. (By Mr. Murray) Is that true?

A. No.

Q. I didn't think. Do you have any understanding of the As you told me in general terms before, certain congeners of furans are more toxic than others. Is that same thing true with PCB congeners?

A. Yes.

Q. Seeing those two jars of one 1242 and one 1254, is there any way for you to predict which of those more highly toxic congeners would be in either one of those jars? You understand my question?

A. Yes, I understand your question. The answer will get very convoluted because the toxicities differ by the end point of the toxicity. In other words, what are you calling a, what are you calling toxicity? Are you calling it the animal gets sick or the animal dies? And

it may vary, but for the end point that you're looking at. I can go on from there, but it'll get more convoluted rather than less. There's no easy answer to that question. It depends on the particular toxicity you're talking about.

Q. Would at least part of the answer be that there are at least some of those more toxic congeners in each one of those jars?

A. There may be varying amounts. Again, it's hard to talk about toxic congeners without an end point in mind.

Q. Are you saying that death versus harm?

A. Some illness well, or some specific, some specific illness.

Q. All right. Some specific thing like chloracne? I mean, is that something that you could take and give me an answer about?

A. Well, I was more talking about animal studies. With regard to chloracne in humans, I don't know the answer to that.

Q. All right. Is it predictable as you are making 12 Let's limit ourselves right now to 1242. Is it predictable ahead of time in the manufacturing process to know which congeners are going to come out of the end batch?

A. To a certain extent.

Q. You know generally that it's more likely to have an A congener versus a B congener?

A. Well, let me try to explain.

Q. Okay.

A. Depending on the chlorination level, you will have some idea of the level of chlorination, in other words, how many chlorines are on the ring. You're going to have more chlorines per ring on average in Aroclor 1260 than you are in Aroclor 1242 because there's more chlorine in the process. So to that extent you know. You also know that it is more likely to get a biphenyl molecule with some chlorines on both rings rather than to get a biphenyl molecule where all the chlorines are on one ring and no chlorines on the other ring. So that to that extent, you can make some predictions. So there are, there are concepts which would allow you to kind of guess what the distribution might look like, but you wouldn't know with any specificity.

Q. And in addition to the amount of any one particular congener varying from batch to batch, it also is true that the percentage of the higher chlorines versus the lower chlorines could vary from batch to batch?

A. Well, we're talking about two different things now. Batch to batch means with a particular

product line. When you say batch to batch

Q. Yeah, I am. I'm sorry. I didn't mean batch to batch. I'm talking about

A. Okay. Yes.

Q. I'm talking about 1242 versus 1254.

A. Right.

Q. And so even though they call this 1254, it's actually a combination of various chlorinated atoms, some being real high and some being low?

A. That's correct, right.

Q. And so the same is true with 1242?

A. Absolutely correct.

Q. And these 42 versus 54 numbers are actually the averages sort of?

A. This is the average amount of chlorine on a percentage weight basis in the molecule, that's exactly correct.

Q. And is that same concept true with regard to congeners?

A. Well

MR. CARNEY: I'm going to object to that question because

MR. MURRAY: You don't understand the concepts I'm talking about?

MR. CARNEY: I don't understand it. If you

understand it.

A. Well, my answer was going to be no.

Q. (By Mr. Murray) It's not?

A. Because it doesn't A congener is a specific PCB atom with a particular number and arrangement of chlorine atoms around that I'm sorry chlorinated biphenyl molecule, a specific number and arrangement of chlorine atoms around that biphenyl molecule, so you can't have a distribution of a congener. There may be A congener may be present in either Aroclor 1254 or Aroclor 1242, or it may be present in both at some different concentrations.

Q. Well, that's the point I'm making, though. Is that

A. I'm glad I answered your question, whatever it was.

Q. I think that's what I'm trying to understand.

A. Right. If you look at

Q. Is that any particular congener may or may not be present in either 1242 or 1254 out of that group of 209?

A. Well, let me answer yes with the proviso that if it's an Aroclor 1254 in one batch of 1242, the chances are overwhelming that it'll be present in another batch of Aroclor 1242. So within the product line, the congener is

relatively constant, but the products themselves will differ, 1254 from 1242, on the amounts of any particular congener.

Q. Has any work been done to determine what specific congeners are in 1242 versus 1254?

A. Yes.

Q. All right.

A. But not at Monsanto, but yes, it has been reported in the literature.

Q. Okay. When was that work done?

A. It's been done probably since about 1985.

Q. All right. Would that have been the first time that was done to your knowledge?

A. And reliably reported in the literature, yes.

Q. Who did that work?

A. Oh, gosh. It's been done by three or four different groups. I'm trying to think. I think one report is by a guy named There's a Japanese group that has done it. I believe his name was Wakimoto, W a k i m o t o.

MR. CARNEY: Safe.

A. Safe was involved in some work making the standards, but I'm not sure he's actually done the analyses. I believe some work's been done by Brian Bush in the state of New York, B u s h. There are a couple

other reports.

Q. (By Mr. Murray) Okay. And are those reports consistent with the, with regard to the congeners found in 1242 versus 1254?

A. Not entirely.

Q. Okay.

A. It's a very difficult analysis, and it depends on lots of different things.

Q. But at least theoretically you would expect that if one sample of 1242 has been measured to have these congeners in it, that that would remain consistent through all of the various batches of 1242?

A. Reasonably consistent.

Q. Right?

A. There may be some slight difference, but you would expect it to be reasonably consistent, yes.

Q. Now, you were asked back in 1987 about specific transformer fires that you were aware of, and you talked about the Binghamton fire and the two fires in Tulsa, Oklahoma and you think fires in maybe Chicago and Miami. Since that '87 time period, have you become aware of any other transformer fires?

A. I don't think transformer fires, no.

Q. Okay. Have you become aware of any other fires of PCB dielectric fluids where they were involved

with the fires?

A. Well, I think I'm aware of another fire, and I'm not sure of the circumstances, whether it was dielectric fluids or not. I don't really recall.

Q. Can you tell me about that fire?

A. There was a fire at State University of New York at New Phalz, I think. P h a l z, I think is how you spell it. That's the only one I'm aware of.

Q. Where Were any measurements taken of furans and dioxins after that fire?

A. I believe they were, yes.

Q. And were the results of those measurements generally consistent with what had been found previously?

A. Yes, they were.

Q. Okay. Both furans and dioxins were found?

A. No, just furans, as I recall.

Q. Just furans?

A. Right.

Q. You would agree that in that Binghamton fire, at least there were dioxins found in the suet?

A. Yes, there were.

Q. All right. And you're saying that in that State fire, there were no dioxins found?

A. That's my recollection as I sit here today.

Q. But you're not sure whether that was,

certainly couldn't tell whether this was an Aroclor product versus some other type of dielectric fluid?

A. I don't know as I sit here today. I don't know whether that's been reported or not.

Q. We probably shouldn't have taken a break because now I don't remember if I asked you this question before, but let me ask it again because it's a short one. I know we talked about Monsanto running particular tests on any of this fluid with regard to looking for dioxin contamination. Do you know whether or not any work outside of Monsanto has been done to determine if any PCB product is contaminated with dioxins?

A. Yes.

Q. And first of all, what were the results of those tests or those studies?

A. No one who has looked has reported detection of chlorinated dibenzofurans in Monsanto Aroclor products.

MR. CARNEY: You said dibenzofurans.

A. Did I say furans? Chlorinated dibenzodioxins in Aroclor products.

Q. (By Mr. Murray) Do you know whether or not any work has been done specifically on Inerteen PPO or any other blend of Aroclors and trichlorobenzene?

A. My answer will go back to the reference I made to the EPRI report. It's certainly possible in there

that one or more of those test samples was a blend of PCBs and chlorobenzenes. As I sit here today, I'm not positively sure.

Q. Okay. And now that you mentioned that report, I know that I did ask you those questions already. I apologize. All right. Based upon your work as well as other people's work with regard to furan contamination, would it be your opinion that those same levels of contamination could be found generally in any batch of 1242 or 1254 that was made during the years that they were made?

A. Okay. If I understand your question to be do I believe that the levels that have been reported both internally in Monsanto and externally by other researchers are a fair representation of what may have been the chlorinated dibenzofuran content of Monsanto Aroclor products, it's my feeling, it's my opinion that those numbers are representative, yes.

Q. Okay. Have you had an opportunity, Dr. Kaley, to review the deposition that you gave in the Scott case any time recently?

A. No, I have not.

Q. Okay. You are aware of the work that has been done measuring PCDF contaminations in Kanaclor?

A. To some extent, yes.

Q. The specific work that was done on Kanechlor never found anywhere near 5,000 parts per million contamination, did it?

A. Not on unused Kanechlor fluid, no.

Q. Do you have any knowledge or any opinion as to how the Yusho Kanechlor may have gotten contamination that high?

A. I have an opinion, yes.

Q. What is that?

A. Well, it's my opinion that in a heat, in the heat transfer system which apparently had a leak allowing either air or oxygen in and being under thermal stress for long periods of time, those levels of dibenzofurans were created in the PCBs.

Q. You, as I remember your deposition, gave a couple of windows, temperature windows wherein PCDF may be created in the presence of oxygen and heat.

A. Okay.

Q. Do those windows still apply?

A. Yes. I don't know of anything that's changed since 1987. I don't recall specifically what I said, but

Q. It was one level at around 300 degrees centigrade and another one around six or 700.

A. That would be my testimony today depending,

and those depend on the conditions and those windows differentiate the heat transfer application where you have relatively low temperatures, around 300 degrees for extended periods of time, days and weeks, in the case of Yusho probably months or years, to allow those levels to be created versus an incomplete combustion situation around 650 degrees centigrade where you get creation of low levels of dibenzofurans over a much shorter time period, seconds or minutes probably.

Q. So the distinction between those two windows would be that the lower window would require a much longer period of time?

A. Yes.

Q. To create the same level of contamination?

A. Well, in the incomplete combustion situation, I don't think you get anywhere no one's ever reported that you get anywhere near the level that, for instance, was surmised in the Yusho incident, but basically your statement is correct that it's a question of length of time of exposure to heat over the difference in those two time ranges.

Q. Okay.

A. Excuse me. Those two temperature ranges.

MR. MURRAY: Dr. Kaley, I appreciate your time, sir. That's all the questions I have.

_____
WITNESS

Subscribed and sworn to before me this _____ day of _____, A. D., 1994.

MY COMMISSION EXPIRES _____.

_____
NOTARY PUBLIC

(SI Bechtold vs. Monsanto)

STATE OF MISSOURI)
)
COUNTY OF JEFFERSON)

I, SHEILA C. IRVIN, a Certified Shorthand Reporter and a duly commissioned Notary Public within and for the State of Missouri, do hereby certify that there came before me at the offices of Husch & Eppenberger, 100 North Broadway, St. Louis, Missouri,

DR. ROBERT KALEY,

who was by me first duly sworn to testify to the truth and nothing but the truth of all knowledge touching and concerning the matters in controversy in this cause; that the witness was thereupon examined under oath and said 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 13th day of June, A. D., 1994.

MY COMMISSION EXPIRES SEPTEMBER 26, 1996.

_____
SHEILA C. IRVIN,
Notary Public, within and
for the State of Missouri

IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS
STATE OF MISSOURI

JUDITH BECHTOLD, wife of/and STEPHEN E. BECHTOLD, ELIZABETH TAMEWITZ, as Personal Representative of her deceased husband, KENNETH F. TAMEWITZ, KELLIE LEE TRISLER, as Personal Representative of her deceased mother, NINA TRISLER, PHYLLIS GOODMAN, as Personal Representative of her deceased husband, CHARLES GOODMAN, JR.,	)	
Plaintiffs,	)	
vs.	)	Cause # 922 00911
MONSANTO COMPANY and WESTINGHOUSE ELECTRIC CORPORATION,	)	
Defendants.	)	

CERTIFICATE OF REPORTER
AND STATEMENT OF DEPOSITION CHARGES
(Rule 57.03(g)(2)(a) & Sec. 492.590 RSMO 1985.)

Deposition of DR. ROBERT KALEY, taken on June 6, 1994.
Total number of pages: 49

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June 13, 1994
Mr. Thomas M. Carney
100 N. Broadway Ste. 1300
St. Louis, MO 63102
Re: Bechtold vs. Monsanto
Dear Mr. Carney:
Enclosed please find a copy of Dr. Kaley's deposition transcript, correction sheets & original signature page. If errors are found in the transcription of the deposition, they should be noted on the correction sheet with page and line numbers indicated, how it should read, and reason for change (i.e., misspelled, clarification), noting at the top of the sheet the proper page numbers (i.e., page 1 of 1). If there are no corrections we would appreciate it being noted on the original signature page that no corrections were made. After review of the deposition and the noting of any changes, the original signature page should be signed before a notary and returned in the enclosed self addressed, stamped envelope along with any correction sheets.
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Sincerely,
Sheila C. Irvin
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