

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

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Kaley, Robert Ph.D. BECHTOLD

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 12 Defendants.)

13
 14 DEPOSITION OF WITNESS, produced, sworn and examined
 on June 6, 1994, between 8:00 a.m. and 6:00 p.m. of that
 15 day, at the offices of Husch & Eppenberger, 100 North
 Broadway, St. Louis, Missouri, before Sheila C. Irvin, a
 16 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
 17 Missouri; taken on behalf of the Plaintiffs.

18 A P P E A R A N C E S

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

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

23 The Defendant, Westinghouse, was represented by
 Ms. Jeana D. McFerron of the law firm of Lewis, Rice &
 24 Fingersh, 8182 Maryland Avenue, Clayton, Missouri 63105.
 25

Kaley, Robert Ph.D. BECHTOLD

1 IT IS HEREBY STIPULATED AND AGREED, by and between
2 Counsel for the Plaintiffs and Counsel for the Defendants,
3 that this deposition may be taken in shorthand by Sheila
4 C. Irvin, a Certified Shorthand Reporter and Notary
5 Public, and afterwards transcribed into typewriting, and
6 transcript is to be read and signed by agreement of
7 counsel and consent of the witness.

8 oOo

9 DR. ROBERT KALEY,
10 of lawful age, being first duly sworn to tell the truth,
11 deposes and says on behalf of the Plaintiffs, as follows:

12 EXAMINATION

13 QUESTIONS BY MR. MURRAY:

14 Q. It's Dr. Kaley; right?

15 A. Yes.

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

19 A. Yes, I have.

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

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

5 A. Yes, sir.

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

14 MR. MURRAY: Off the record.

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

16 MR. CARNEY: Just to clarify, this is not
17 part of the 30B6 deposition. You have noticed Mr. Kaley
18 for his deposition as an employee of Monsanto, and that's
19 what we'll be taking here, and then if at a later point
20 you decide you want to follow up on some aspect of the
21 30B6, we can do that later.

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

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

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

1 Monsanto, and this deposition was given in May of 1987.

2 It's going to be my intent today to concentrate mainly on
3 the time subsequent to 1987 and talk to you about that
4 time period, but I understand that it may be difficult for
5 you to differentiate as to what may have occurred since
6 1987 and what happened before and that kind of thing. So
7 if you have any problems with that, let me know and, you
8 know, we can fix it; okay?

9 A. I'll do my best.

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

12 A. Okay.

13 Q. Now, are you still employed by Monsanto?

14 A. I am.

15 Q. And in what capacity are you employed now?

16 A. My title is director, environmental affairs.

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

19 A. No, sir.

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

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

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

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

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

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

15 A. That's right.

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

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

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

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

8 A. Things of that sort, yes, correct.

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

13 A. Yes.

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

18 A. There are those kinds of things, right.

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

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

1 as the source of PCB expertise within Monsanto.

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

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

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

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

11 Q. Other than that, though?

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

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

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

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

19 A. Yes.

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

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

8 A. That's correct.

9 Q. Is that a fair statement?

10 A. That's fair.

11 Q. Can you tell me what that difference was?

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

16 Q. Okay. That's basically where I got confused.
17 I couldn't tell if the higher levels were only related to
18 1254 or if they included 1242.

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

21 Q. Okay.

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

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

1 identify that for me.

2 A. I have seen this document, yes.

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

5 A. No, sir.

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

7 A. This document reflects some work that was
8 done by Dr. Christopher Rappe, R a p p e, in Sweden. At
9 whose request, I don't know, but one of the Fred gentlemen
10 on here apparently had been at the presentation where
11 Dr. Rappe had presented these data and was transmitting
12 that information to another researcher at Monsanto. This
13 is my guess well, my estimation would be this is in the
14 1980 time frame, 1982 possibly, possibly even later.

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

17 A. That's correct.

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

20 A. I don't know.

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

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

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

3 Q. All right. What about this 3010?

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

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

8 A. There are two There are two different
9 designations there. The ones that are numbered, for
10 instance, the top 2, 3, 7, 8 TCDF, that is a specific
11 congener of the tetrachlorodibenzofuran. The next line
12 with the little Greek Sigma, that means summation of all
13 the tetrachlorodibenzofurans. So if we want to look at
14 1254, the second column, .019 is parts per million is how
15 much 2, 3, 7, 8 tetrachlorodibenzofuran was present. On
16 the other hand, 1.4 parts per million of all of the
17 tetrachlorodibenzofurans taken in toto summed to that
18 amount. The same would be true then for the
19 pentachlorophenyls, hexa or excuse me the
20 pentachlorodibenzofuran and the hexachlorodibenzofuran.

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

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

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

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

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

8 Q. Can you tell me what that would be?

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

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

20 A. Yes, I do.

21 Q. Who is that?

22 A. Paul Michael.

23 Q. Who is he?

24 A. He's another analytical chemist at Monsanto.

25 Q. And you indicated that you do not know who

1 the Fred was, or you do know?

2 A. I do know.

3 Q. Who was that?

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

5 Q. He's an analytical chemist at Monsanto?

6 A. That's correct, yes.

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

15 A. No, I have not.

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

18 A. Since 1987 or since I did my work?

19 Q. Since you did your work.

20 A. There has been some done, yes.

21 Q. And by whom was that done?

22 A. By Paul Michael.

23 Q. And describe for me what he did.

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

1 the PCDF contents in those one or two samples.

2 Q. Do you know what his results were?

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

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

7 A. Yes.

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

10 A. Yes, I do.

11 Q. Why?

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

15 Q. Okay. When was that done?

16 A. About 1982.

17 Q. Was that feeding study done?

18 A. Yes, it was.

19 Q. Were the results published?

20 A. Yes, they were.

21 MR. MURRAY: Off the record.

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

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

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

8 A. Not to my knowledge.

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

13 A. Not to my knowledge.

14 Q. Do you know whether or not

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

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

22 A. Well, if that was my testimony, it was either
23 in error The original work that was done in the early
24 1970s to reproduce the work of Dr. Vos, V o s, from the
25 Netherlands, dibenzodioxins were looked for at that time,

1 and none were found.

2 Q. And that was your work?

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

4 Q. Okay. Who is Dr. Mieure?

5 A. An analytical chemist at Monsanto.

6 Q. When was that work done?

7 A. Probably 1971, maybe 1972.

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

12 A. I have seen this document, yes.

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

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

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

21 A. Yes, it is.

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

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

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

3 A. That's correct.

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

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

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

13 A. Yes.

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

17 A. Possibly partly, yes.

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

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

1 analytical methodology.

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

9 A. Yes.

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

13 A. Not to my knowledge.

14 Q. What about furan contamination?

15 A. Not to my knowledge.

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

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

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

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

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

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

6 A. Yes.

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

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

14 Q. Okay. What about dioxin?

15 A. None were detected.

16 Q. Was that study published?

17 A. It's published as an EPRI report.

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

19 A. Yes, I do.

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

23 MR. CARNEY: Okay. What is that again?

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

1 A. Yes, EPRI.

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

4 MR. CARNEY: Okay.

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

9 A. I have seen this document, yes.

10 Q. And tell me what that document is.

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

13 Q. Do you know who wrote it?

14 A. Not positively.

15 Q. Okay. Do you have a guess?

16 A. I believe I might know who it is.

17 Q. Who is that?

18 A. It looks like Jim Mieure's handwriting.

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

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

23 Q. Okay.

24 A. I don't know the specific year.

25 Q. All right. You said late 1970s?

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

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

8 A. Yes.

9 Q. And came from?

10 A. Yes.

11 Q. And Anniston, Newport and Krummrich?

12 A. Yes.

13 Q. What is in Newport?

14 A. That's in Great Britain.

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

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

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

24 A. Yes.

25 Q. When was that work done? Are these results

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

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

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

8 A. I believe Dr. Mieure did.

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

11 A. That is correct.

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

14 A. The Monsanto Therminol FR products were pure
15 PCBs.

16 Q. Okay.

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

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

22 A. I believe it was, yes.

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

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

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

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

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

6 A. Basis, right.

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

10 A. Yes.

11 Q. Leaked into a manufacturing process of rice
12 oil?

13 A. That's correct.

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

18 A. That's basically correct, yes.

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

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

25 Q. All right. And these were actual furan

1 numbers, PCDFs?

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

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

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

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

17 A. Yes, I believe they were.

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

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

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

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

1 Q. Based upon the indentation?

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

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

6 A. Yes, I've seen this.

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

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

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

14 A. That's right.

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

18 A. Yes, that is correct.

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

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

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

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

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

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

17 Q. Okay. They have listed here next to Aroclor
18 1242, 2, 3, 4. What does that indicate?

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

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

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

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

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

11 (Whereupon, a short break was taken.)

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

15 A. You want to look?

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

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

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

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

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

1 me what that is?

2 A. I have seen this document, yes.

3 Q. Okay. And what is that?

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

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

11 A. Well

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

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

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

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

24 Q. Is it used in the manufacture of Aroclors?

25 A. In the Aroclor 5400 series, the terphenyl

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

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

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

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

13 A. Almost exclusively plasticizers.

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

16 A. Not to my knowledge.

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

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

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

22 A. Yes, he was.

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

25 A. I believe he was manager of applied sciences.

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

3 A. Well, I wasn't there in 1970. When I came in
4 1973, he was the second above me in command, yes. My boss
5 reported to Dr. Keller.

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

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

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

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

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

22 A. No, I do not believe they do.

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

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

4 MR. CARNEY: These are Kaley's notes?

5 MR. MURRAY: Yes.

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

8 Q. (By Mr. Murray) And I seem to remember
9 seeing something like that, and that's why I'm saying I'm
10 90 percent sure I've got them. I don't know whose
11 handwriting they're in, but they are handwritten notes;
12 right?

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

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

20 A. Yes.

21 Q. Tell me, please.

22 A. Okay. The term congener is of fairly recent
23 origin, and it's being used to describe a single member of
24 a class of related compounds. In other words, there are
25 209 different ways to put chlorine atoms on the biphenyl

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

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

7 A. Yes.

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

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

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

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

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

21 A. Yes.

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

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

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

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

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

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

11 A. No.

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

16 A. Yes.

17 Q. Seeing those two jars of one 1242 and one
18 1254, is there any way for you to predict which of those
19 more highly toxic congeners would be in either one of
20 those jars? You understand my question?

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

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

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

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

12 Q. Are you saying that death versus harm?

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

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

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

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

1 A. To a certain extent.

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

4 A. Well, let me try to explain.

5 Q. Okay.

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

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

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

1 product line. When you say batch to batch

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

4 A. Okay. Yes.

5 Q. I'm talking about 1242 versus 1254.

6 A. Right.

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

10 A. That's correct, right.

11 Q. And so the same is true with 1242?

12 A. Absolutely correct.

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

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

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

20 A. Well

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

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

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

1 understand it.

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

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

4 A. Because it doesn't A congener is a
5 specific PCB atom with a particular number and arrangement
6 of chlorine atoms around that I'm sorry chlorinated
7 biphenyl molecule, a specific number and arrangement of
8 chlorine atoms around that biphenyl molecule, so you can't
9 have a distribution of a congener. There may be A
10 congener may be present in either Aroclor 1254 or Aroclor
11 1242, or it may be present in both at some different
12 concentrations.

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

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

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

18 A. Right. If you look at

19 Q. Is that any particular congener may or may
20 not be present in either 1242 or 1254 out of that group of
21 209?

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

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

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

6 A. Yes.

7 Q. All right.

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

10 Q. Okay. When was that work done?

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

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

14 A. And reliably reported in the literature, yes.

15 Q. Who did that work?

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

21 MR. CARNEY: Safe.

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

1 other reports.

2 Q. (By Mr. Murray) Okay. And are those reports
3 consistent with the, with regard to the congeners found in
4 1242 versus 1254?

5 A. Not entirely.

6 Q. Okay.

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

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

13 A. Reasonably consistent.

14 Q. Right?

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

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

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

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

1 with the fires?

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

5 Q. Can you tell me about that fire?

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

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

11 A. I believe they were, yes.

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

14 A. Yes, they were.

15 Q. Okay. Both furans and dioxins were found?

16 A. No, just furans, as I recall.

17 Q. Just furans?

18 A. Right.

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

21 A. Yes, there were.

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

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

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

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

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

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

13 A. Yes.

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

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

18 MR. CARNEY: You said dibenzofurans.

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

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

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

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

4 Q. Okay. And now that you mentioned that
5 report, I know that I did ask you those questions already.
6 I apologize. All right. Based upon your work as well as
7 other people's work with regard to furan contamination,
8 would it be your opinion that those same levels of
9 contamination could be found generally in any batch of
10 1242 or 1254 that was made during the years that they were
11 made?

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

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

22 A. No, I have not.

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

25 A. To some extent, yes.

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

4 A. Not on unused Kanechlor fluid, no.

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

8 A. I have an opinion, yes.

9 Q. What is that?

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

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

18 A. Okay.

19 Q. Do those windows still apply?

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

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

25 A. That would be my testimony today depending,

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

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

13 A. Yes.

14 Q. To create the same level of contamination?

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

22 Q. Okay.

23 A. Excuse me. Those two temperature ranges.

24 MR. MURRAY: Dr. Kaley, I appreciate your
25 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)

Kaley, Robert Ph.D. BECHTOLD

1 STATE OF MISSOURI)
)
2 COUNTY OF JEFFERSON)

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

8 DR. ROBERT KALEY,

9 who was by me first duly sworn to testify to the truth and
10 nothing but the truth of all knowledge touching and
11 concerning the matters in controversy in this cause; that
12 the witness was thereupon examined under oath and said
13 deposition is a true and correct record of the testimony
14 given by the witness.

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

21 IN WITNESS WHEREOF, I have hereunto set my hand and
22 Seal this 13th day of June, A. D., 1994.

23 MY COMMISSION EXPIRES SEPTEMBER 26, 1996.

24 _____
25 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. Please return the signature page and corrections promptly for forwarding to all parties and attachment to the original, which can then be filed with the Court in a timely manner. Absent hearing from you within 30 days or receipt of corrections, we will assume that you no longer desire the opportunity for review of the transcript, and the original will be filed. Please call if you have any questions.
 Sincerely,
 Sheila C. Irvin
 Enclosures
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Kaley, Robert Ph.D.

BECHTOLD

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