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IN THE COURT OF COMMON PLEAS
FIRST JUDICIAL DISTRICT OF PENNSYLVANIA
CIVIL TRIAL DIVISION

- - -

In Re:

PAOLI RAILROAD YARD : JANUARY TERM, 1990
PCB LITIGATION : NO. 1046

- - -

November 16, 1990

- - -

Oral deposition of ROBERT G. KALEY,
II, Ph.D., held in the offices of KOHN SAVETT,
KLEIN & GRAF, P.C., 2400 One Reading Center, 1101
Market Street, Philadelphia, Pennsylvania 19107,
commencing at 10:00 a.m., on the above date,
before McKinley Wise, Registered Professional
Reporter and Federally Approved Reporter of the
United States District Court.

- - -

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I N D E X

WITNESS

PAGE NO.

ROBERT G. KALEY, II, Ph.D.

By Mr. Cohen

11

- - -

E X H I B I T S

NO.

DESCRIPTION

PAGE NO.

Kaley-1	Curriculum Vitae	14
Kaley-2	Document	87
Kaley-3	Document	101
Kaley-4	Document	110
Kaley-5	Document	155
Kaley-6	Document	159

- - -

plaintiff on the subjects required by paragraphs 2(d) and 2(e), of Discovery Order No. 1, which reads as follows:

"2(d) Monsanto Company, by the individual, with knowledge of the chemical makeup of PCB based dielectric fluid, and transformer fluid sold for use at Paoli Rail Yard" and;

"2(e) Monsanto Company, by the individual, with the knowledge of the product purity of Monsanto's products that contain PCBs."

We will object to any questions propounded on subjects not covered by the foregoing designations.

Monsanto states, as it has previously at these proceedings that it did not manufacture electrical equipment sold for use at the Paoli Rail Yard or anywhere else, and has no information that would allow it to identify with specificity the dielectric fluid and transformer fluid sold for use at Paoli Rail Yard by any other company other than Monsanto, and we have

1 supplied, in connection with Federal
2 litigation and by reference in that
3 litigation, such records as we have in the
4 Federal litigation and by reference that
5 that litigation what PCBs were sold to other
6 companies for shipment to Paoli.
7

8 I would like to further state that
9 we are not quite certain as to the meaning
10 and intent of the word "purity," but we
11 assume it means with respect to possible
12 ingredients in these products containing
13 PCBs, other than PCBs, or it's consumers,
14 and in that respect, we have designated a
15 witness, the witness we have, who is most
16 knowledgeable with respect to other possible
17 ingredients in PCB-containing product. That
18 witness is here as Dr. Robert Kaley.

19 MR. COHEN: So do I understand your
20 statement to mean, Mr. Malin, that that
21 witness is here today to offer testimony
22 without objection, based upon what your
23 understanding of Discovery Order Number 1
24 is?

25 MR. MALIN: I have just put it on

the record, yes.

MR. COHEN: Let me ask you this, sir.

Is it also my understanding of your recent statement that you intended to include General Electric Company as one of the other parties with respect to whom you have produced documents evidencing sales of Monsanto products to that company?

MR. MALIN: Whatever is shown by the documents that we have produced in the Federal litigation. If it shows sales to General Electric, as I believe it does, the shipments at Paoli, then, of course, it would be in reference to that. I don't know what that has to do necessarily with this witness, per se.

MR. COHEN: What it has to do with this witness is this, sir. You are aware of the testimony that has previously been given that this litigation which shows that General Electric Company sold a product under their own trade name, which I believe is called Pyranol, which, in fact, was a

1 mixture of other products including a
2 product manufactured by Monsanto Company
3 known as Aroclor.
4

5 And that General Electric Company
6 manufactured Pyranol or Pranol (sic), as it
7 was called, for sale and use in transformers
8 that either went directly to the Paoli Rail
9 Yard, directly to Penn Central Corporation
10 or some other operating entity that had
11 control over the Paoli Rail Yard at the
12 time, or to some other manufacturer of
13 assemblies of transformers that went onto
14 rail cars or other rail cars themselves.

15 MR. MALIN: I am not going to
16 quibble over what the prior testimony was,
17 but my recollection of it was General
18 Electric or Mr. Rouse indicated that
19 possibly that GE had bought PCBs from
20 Monsanto and either mixed them with other
21 chemicals or blended them themselves and, as
22 I recall, he wasn't quite sure, but I don't
23 want to be held to that at the moment. I
24 don't want to review that testimony here.

25 MS. DUGGIN: Let me say for the

1
2 record, on behalf of General Electric, that
3 I think the Rouse testimony stands for
4 itself.

5 I think we could spend a lot of time
6 debating the meaning of manufacture, and I
7 will not take the time to go into all that
8 here, but I do want to note General
9 Electric's objection to characterizations of
10 the testimony and its actions that may not
11 be accurate at this time.

12 MR. COHEN: What I was getting to,
13 Mr. Malin, was your statement that at the
14 outset that you were going to restrict this
15 witness' testimony. I'm trying to
16 understand the scope of the restriction,
17 considering as it would seem appropriate to
18 the testimony of other witnesses in this
19 litigation regarding their consumption of,
20 mixture of, and in subsequent resale of
21 Monsanto products.

22 MR. MALIN: Well, I think we ought
23 to proceed with this witness' deposition,
24 and if the question comes up, we deal with
25 it at that time. We will deal with it at

that time.

- - -

EXAMINATION

- - -

BY MR. COHEN:

Q. Dr. Kaley, my name is Arnold Cohen, and I represent, along with my co-counsel, Joseph Kohn, who is seated here at the table today, the plaintiffs in this -- a number of the plaintiffs in this litigation that is proceeding regarding the events that transpired at the Paoli Rail Yard.

I am going to be asking you some questions here today, and I'm sure you're aware you're required to answer those questions to the best of your ability and as truthful as possible.

If, during the course of these proceedings, I should ask you a question that you do not hear, will you be kind enough to indicate that, so that we will know that you did not hear the question and I will be glad to restate it, as necessary, until you do hear it?

A. Yes, I will.

Q. In the event that I should ask you a question that you do not understand, would you

1
2 please be kind to enough indicate that you did not
3 understand the question, and I will be glad to
4 restate the question, if I can, so that you do
5 understand the question?

6 A. Yes, I will.

7 Q. You do understand, do you not,
8 Doctor, that in the event that you answer
9 questions, I certainly will assume that you both
10 heard and understood the question?

11 A. Yes.

12 Q. If during the course of these
13 proceedings I should misuse a technical term or
14 term of art that you are familiar with, would you
15 be kind enough to indicate that I have misused it,
16 or at least you believe that I misused it so that
17 we do not have a question on the record that is an
18 improper question with respect to your
19 understanding of the question?

20 A. I will try to do that.

21 Q. I'm sure you can appreciate the fact
22 I'm a layman; I believe, I do not have an
23 understanding of the terms as you do, but I
24 believe that because you are a scientist we may
25 have different understanding of terms.

A. I understand.

Q. Or indeed I may have no understanding of the terms as you understand.

You understand, sir, that all of your responses must be made in a verbal fashion because the court reporter, while I'm sure he's quite skilled and capable, cannot be relied upon to necessarily transcribe in words gestures, or grunts or some other indication other than a verbal response.

A. I understand.

MR. MALIN: Mr. Cohen, in order to perhaps help expedite these proceedings, I have prepared a copy of Dr. Kaley's CV which may help you in going through his background and perhaps speed up these proceedings.

MR. COHEN: Let the record reflect that I have been shown a document that bears the legend "Robert George Kaley, II," at the top. This is the first time I have seen this document

In any event, it has been represented to be the curriculum vitae of the witness, and we can mark it at this time as Kaley

Exhibit 1 or such other designation.

- - -

(Curriculum Vitae marked as Exhibit
Kaley 1 for identification.)

- - -

BY MR. COHEN:

Q. Can we have your full name, sir?

A. Robert George Kaley, II.

Q. I have a document that has been
marked as Kaley Exhibit 1. Is the address
reflected there as your home address your current
home address?

A. Yes, it is.

Q. And is the address that is reflected
there as your work address your current work
address?

A. Yes, it is.

Q. Why don't you tell me so I don't
have to just read that and ask you all about it.
Why don't you just give me a summary of your
education, starting with your graduation from high
school?

A. I graduated from high school in
South Bend, Indiana, from John Adams High School

in 1964.

The following fall I entered Purdue University, graduating in June of 1968 with a BS in Chemistry.

Entered the University of Illinois, receiving a Master's degree in Analytical Chemistry in February of 1971.

And a Ph.D. in Analytical Chemistry in January of 1974.

Q. Your employment record starts with September of 1968.

Did you have any employment, professional employment prior to that time?

A. I had summer jobs during my undergraduate schooling, yes.

Q. Were any of those summer jobs with the Monsanto Company?

A. No, they were not.

Q. Were they with any company associated in any way, to your knowledge, with any of the parties to this litigation?

A. I do not know.

MR. MALIN: Excuse me. You have to tell him who the parties to the litigation

are.

MR. COHEN: All right.

BY MR. COHEN:

Q. Monsanto Company, General Electric Company, Westinghouse Corporation, Budd Company, and the railroads associated with the Penn Central Corporation, which I believe was called Penn Central Corporation in the period 1964 to '68?

A. Not to my knowledge, no.

Q. Amtrak.

MR. COX: It was called the Pennsylvania Railroad and Penn Central Transportation Company.

MR. MALIN: Yes; the merger wasn't until '71.

MR. COHEN: '71 was the merger? So it was Pennsylvania Railroad.

MR. COX: The merger was prior to '71. I thought your question meant prior to '68.

MR. COHEN: No, '64 to '68.

MR. COX: I believe it was the Pennsylvania Railroad in '64.

BY MR. COHEN:

Q. All right, Pennsylvania Railroad, we know that in --

A. No.

Q. Amtrak, Conrail did not exist.

MR. COX: To the best of my knowledge.

MR. COHEN: SEPTA was PTC?

MR. COX: Perhaps.

BY MR. COHEN:

Q. According to this document you first started employment with Monsanto Company in December of 1973?

A. That's correct.

Q. What were your duties at that time?

A. I was an analytical chemist in a larger group of analytical chemists providing services to the Monsanto Chemical Company, as it was known at the time.

That's incorrect. It was Monsanto Industrial Chemical Company at the time.

Q. What was your work as an analytical chemist?

A. Pardon me?

Q. What was your work; what did you

1
2 actually do?

3 A. I was primarily involved in doing
4 analyses of a variety of samples for polychlorides
5 biphenyls or PCBs.

6 Q. What types of analyses were you
7 doing, can you tell me?

8 A. It was quantitative analyses, for
9 the most part, using gas chromatography.

10 Q. Where did you learn the use of
11 quantitative analyses using gas chromatography?

12 MR. MALIN: Excuse me. I object to
13 the form of the question. He said
14 qualitative analyses.

15 MR. COHEN: He said quantity.

16 THE WITNESS: I said quantitative.

17 MR. MALIN: I'm sorry.

18 MR. COHEN: I said qualitative; he
19 said quantitative.

20 THE WITNESS: My training began
21 during my undergraduate education and summer
22 employment during that time continued
23 through graduate training.

24 BY MR. COHEN:

25 Q. Where were you employed then during

1
2 the summer years when you were doing gas
3 chromatography?

4 A. I was employed for two summers at
5 Miles Laboratories.

6 Q. M-y-l-e-s?

7 A. M-i-l-e-s.

8 Q. M-i?

9 A. In Elkhart, Indiana, and one summer
10 with Dow Chemical Company in Midland, Michigan.

11 Q. Did either of these jobs involve
12 analyses whether gaualitative or quantitative
13 looking for the existence of the quantities of
14 PCBs?

15 A. No, they did not.

16 Q. Tell me about your training in gas
17 chromatography together with Miles Laboratories
18 and Dow Chemical?

19 A. Well, it was not so much training as
20 it was just on-the-job training, in that I was
21 introduced to the instruments, which I had some
22 knowledge with anyway, and basically shown how
23 they expected the instruments to be used on the
24 particular analyses I was doing.

25 Q. Were you given a procedures manual

1 at that time for the use of the gas
2 chromatography?

3 A. I believe I was at Miles. I don't
4 recall at Dow.

5 Q. Were you given any information
6 regarding published or accepted protocols for the
7 use of the gas chromatography?

8 A. Not that I recall.

9 Q. Do you recall the use of any
10 particular standard procedures for the use of gas
11 chromatography back in those days, which would
12 have been, I guess, in the mid-'60s?

13 A. Not other than what the company
14 itself was using.

15 Q. What was, do you recall, the name of
16 the instruments you were using, the brand name?

17 A. No, I don't.

18 Q. Was it a mass spectrometry-type
19 instrument?

20 A. Not during that time period, no,
21 sir.

22 Q. Did they exist during that time
23 period, to your recollection?

24 A. No, in association -- well, they
25

1
2 were not commonly available associated with gas
3 chromatographs, no.

4 Q. When did they first become
5 available, that is mass spectrometry become
6 associated, available and associated with gas
7 chromatography?

8 A. It was during the 1960s that it was
9 developed in certain research labs, both in the
10 United States and in Europe. It was probably
11 commercially available towards the end of the
12 1960s and became more readily available during the
13 early 1970s.

14 Q. When you started with Monsanto in
15 1973 doing quantitative analyses using gas
5 16 chromatography, were you also using mass
17 spectrometry?

18 A. I was not, no.

19 Q. Was it available in your laboratory?

20 A. It was available and in an
21 associated laboratory, yes.

22 Q. But not in the laboratories in which
23 you were working?

24 A. That's correct.

25 Q. Do you know if Monsanto at that time

1 was doing quantitative analyses for PCBs in the
2 same sample material that you were working on
3 using mass spectrometry?
4

5 MR. MALIN: I object to the form of
6 the question, because I don't understand it.
7 If you think you understand the question,
8 try and answer it.

9 BY MR. COHEN:

10 Q. We haven't yet identified the sample
11 material and products that you were analyzing,
12 have we?

13 A. That's true.

14 Q. So, I don't know what they are. So
15 I'm just asking you about the same type of sample
16 material that you were analyzing.

17 Do you know if Monsanto --

18 A. I don't specifically recall.

19 Q. Did the gas chromatography that you
20 were doing back in the '60s, when you were still
21 an undergraduate, involve the use of a packed
22 column?

23 A. Yes, it did.

24 Q. And did that process continue to
25 involve the use of a packed column using gas

1 chromatography throughout that time period that we
2 have been discussing up through the mid-'70s when
3 you were with Monsanto?
4

5 A. For the most part, yes.

6 Q. What do you mean by "for the most
7 part"? Tell me when it was in use?

8 A. To the end of that period at
9 Monsanto, we were beginning to investigate the use
10 of capillary columns.

11 Q. When did you first start using
12 capillary columns instead of packed columns
13 analyses with your gas chromatography at Monsanto,
14 do you recall?

15 A. Well, during the time periods I
16 mentioned, towards the end of your time period, we
17 began investigating the use on an occasional
18 basis; but I don't know that it ever replaced it.

19 Q. Today, is Monsanto still using
20 packed column gas chromatography in their analyses
21 and analytical laboratories?

22 A. For some purposes, yes.

23 Q. And capillary columns for other
24 purposes?

25 A. That's correct.

1
2 Q. Can you tell us the purposes for
3 each, to your knowledge?

4 A. They are wide and varying for both.
5 It depends on the particular analysis that's being
6 done.

7 Q. How about for quantitative analyses,
8 looking for quantities of PCBs in the sample?
9 What type of analyses are they doing today, to
10 your knowledge?

11 A. Capillary columns.

12 Q. Does that include the mass
13 spectrometry?

14 A. Yes, it does.

15 Q. How long has mass spectrometry, to
16 your knowledge, been used on a regular basis by
17 Monsanto in quantitative analyses for PCBs?

18 A. Approximately since the mid-1970s,
19 but I would add not exclusively during that time
20 period. There were some GC analyses being done
21 without mass spectrometry, also.

22 Q. Have you ever had an opportunity to
23 compare the results between gas chromatography
24 using mass spectrometry and gas chromatography
25 without mass spectrometry on quantitative analyses

1
2 for PCBs?

3 A. Yes.

4 Q. What have you found, generally?

5 A. I think generally, depending on the
6 analysis, each may or may not have specific
7 advantages for a particular analysis and done
8 correctly both can give acceptable answers.

9 Q. What were the samples that you were
10 doing quantitative analyses of back in 1973?

11 A. There were a variety of samples,
12 including environmental samples, submitted to our
13 laboratory and also including research samples
14 generated within our laboratory.

15 Q. Did you ever sample product that was
16 manufactured?

17 MR. MALIN: Object to the form of
18 the question. I don't understand it. When
19 you say product that was manufactured, you
20 mean that was product that was manufactured
21 currently?

22 MR. COHEN: Strike that.

23 BY MR. COHEN:

24 Q. Did you ever have the occasion to
25 analyze, quantitative analysis using gas

chromatography back in 1973, newly manufactured product manufactured by the Monsanto Company?

A. I would say in 1973, the answer is no.

Q. At some time in your employment, did that practice change?

A. Well, I guess I would ask you what you mean by analyze newly manufactured product?

Q. Well, I am referring to the use of quantitative analysis to analyze samples of product for the purpose of determining quality control.

MR. MALIN: I will object to the form of the question. I don't understand it from a technical point of view; just not understandable.

You mean analysis for something you sort of know what you are looking for.

MR. COHEN: Well, we're looking for PCBs, quantities of PCBs.

BY MR. COHEN:

Q. Isn't that right, sir?

A. It can be.

Q. Well, isn't that what you were

1 looking for when you were doing quantitative
2 analyses in 1973?

3 A. That's correct.

4 Q. Tell me what else you were looking
5 for?

6 A. Well, I was looking for PCBs.

7 Q. The quantities of PCBs?

8 A. Right, but in PCBs.

9 Q. You identified two different types
10 of samples: Environmental samples and research
11 samples you said, among other things?

12 A. That's correct.

13 Q. Won't you tell me the other things
14 that might make that inquiry somewhat simpler?
15 What were the other types of samples you --

16 A. If I said that, it was just
17 colloquialism. Those were the two types of
18 samples we looked at in general terms.

19 Q. Now, describe for me what you mean
20 by environmental samples?

21 A. Those were samples of, for instance,
22 water or soil or, in some cases, animal tissue
23 taken from the environment outside the Monsanto
24 Company Research Laboratory that I was involved
25

with.

Q. What were the research samples?

A. Part of the responsibilities of our group were to investigate certain properties of polychlorinated biphenyls, and in those investigations, samples were generated which were analyzed for PCB content.

MR. COHEN: May have that last answer read back to me?

(The record was read.)

BY MR. COHEN:

Q. What was your participation in that process of investigating certain properties of PCBs?

A. My primary purpose was doing the actual analysis by gas chromatography.

Q. For quantities of PCBs; is that right?

A. In general, that's true, yes.

Q. All right.

You say in general. What else were you looking for, whether it was from time to time or on any basis, other than quantity?

A. Well, especially in environmental

1
2 samples, part of the process was to attempt to
3 determine, if possible, which particular product
4 might have been responsible for the residue
5 detected.

6 Q. So you were looking at environmental
7 samples to identify, if you could, the product as
8 originally manufactured that ended up in that
9 environmental specimen?

10 A. That is part of the process, yes.

11 Q. Were you able to do that?

12 A. In some instances, yes; and some,
13 no.

14 Q. How did you do it?

15 A. At that time, primarily by looking
16 at the patterns of the peaks on the gas
17 chromatogram and matching it to a pattern
18 generated by a standard product.

19 Q. What do you mean by a standard
20 product?

21 A. One of the products as manufactured
22 by Monsanto Company.

23 Q. Well, did you actually get a product
24 that came out of the factory and analysis it to
25 see the peaks that it produced, or did you have a

published standard from which you were working?

A. We used our own products as standards, as did everyone else in the country.

Q. Indeed, would it be fair to say at that time there were published standards reflecting the peaks that the product produced?

MR. MALIN: I will object to the form of the question, which I don't quite understand it. If you think you understand the question, you may answer.

Could I ask what time frame you're talking about when you say at that time?

BY MR. COHEN:

Q. I'm talking about the time frame that you are talking about.

Starting in 1973, when you were an analytical chemist on quantitative analysis using gas chromatography?

A. Certainly by 1974, ASTM, the American Society for Testing and Materials had published a standard method for PCBs and environmental samples, which was based on the Monsanto technology. So at that point, by then, certainly there was a published method.

1
2 Q. Now, that was the methodology that
3 was published; is that right; how the test is
4 done?

5 A. That's correct.

6 Q. Now, were part of the ASTM published
7 methodology a printout of an expected gas
8 chromatograph of Monsanto's product?

9 A. I would not use the term "expected,"
10 but certainly in that method there were published
11 chromatograms of analyses of Monsanto's product,
12 yes.

13 Q. What I am trying to understand, sir,
14 in your work during that time period when you were
15 trying to identify the product that ended up in
16 the environmental sample, were you comparing the
17 environmental sample to a chromatogram that you
18 were producing on the spot, so to speak, of your
19 own product, or were you comparing it to one of
20 these published chromatograms?

21 A. We probably were comparing it to
22 standards in our laboratory that we were producing
23 at the time we were doing the analysis.

24 Q. Did you, in 1974, at least, have the
25 opportunity to see and be familiar with the

published chromatograms that were available for Monsanto products?

A. I certainly saw some of them. I wouldn't know whether I saw all of them or not. That's unlikely.

Q. Were you satisfied that the chromatograms that you saw that were published and that were generally available in 1974 were reflective of a chromatogram that Monsanto's product would produce, if analyzed in accordance with ASTM's methodology?

MR. MALIN: I object to the form of the question.

Answer the question, if you understand it.

THE WITNESS: I don't think that there can be a general characterization as to either the suitability or unsuitability of the published work without reference to a specific paper.

BY MR. COHEN:

Q. So, if you saw a particular chromatogram, and I'm going to put it in front of you and I said that from 1974 you could then say,

7
1 well, you felt that this was an accurate
2 chromatogram of what the product would produce or
3 you might say that it was not?
4

5 A. I mean, if you were to put a paper
6 in front of me and ask me that, yes. I don't know
7 that I could answer one way or the other without
8 reading the paper and possibly trying to
9 understand from it what the authors did and what
10 it purported to represent.

11 Q. I think you said that, at least as
12 of 1974, there were published chromatograms
13 available reflecting or that were reflective of
14 your product.

15 Would you say that situation has
16 continued through today that published
17 chromatograms are available for various Aroclor
18 products?

19 A. Certainly.

20 Q. Was it an accepted practice, as you
21 understood it back in 1973 or '74, to try to
22 determine from environmental samples the product
23 that had ended up in that sample?

24 A. People were certainly trying to do
25 that. I don't know that it was an accepted

practice.

Q. Well, indeed, you were one of the people who was trying to do it?

A. That's correct.

Q. Would you agree that subsequent to that time that practice has become more widespread, if not accepted?

MR. MALIN: Objection to the form of the question.

If you think you understand that question, go ahead and answer it.

THE WITNESS: I would like to make a clarifying statement which may shorten this line of questioning. That is that when PCBs have been in the environment for some period of time, there are chromatic pattern changes.

So that attempts to identify which product may have been responsible for that particular PCB in a sample may be more or less successful, depending on the degree to which the PCBs have changed.

So to go back to answer your question, I think people continue to look at

environmental samples and in some instances do try to make assignment of that particular residue to a particular product.

That procedure may or may not be accurate or reflective of the true situation, depending on the characteristics of that particular sample.

BY MR. COHEN:

Q. When you use the phrase "environmental samples," do you mean to include in that animal tissue?

A. Yes.

Q. And that was with respect to your last answer, I was asking you?

A. Yes.

They would certainly be included.

Q. And would you agree that the process that people use, with apparently varying degrees of success, is the same process that you had used back in the '70s which is producing a chromatogram from a gas chromatographic analysis and comparing that to one produced from an examination of the product itself?

MR. MALIN: I will object to the

form of the question. If you think you can answer that broad a question, give it a shot.

THE WITNESS: In their most general characteristics, they are essentially the same process.

BY MR. COHEN:

Q. Can you tell me the properties of PCBs that were being investigated by the group with which you were involved in 1973?

MR. MALIN: Objection to the form of the question. I don't think he talked about properties, per se.

At least, if you think you understand the question, try and answer it.

THE WITNESS: With regard to my previous answer, we were looking at the biodegradation of PCBs. We were looking at soil transport.

We were looking at solubility in water.

There may have been others. Those are the ones that come to mind right now.

BY MR. COHEN:

1
2 Q. Now, was there an ongoing
3 investigation when you joined Monsanto in 1973?

4 A. Yes, it was.

5 Q. Do you know how long that
6 investigation had been continuing in existence at
7 the time you joined them in 1973?

8 A. Since probably the '68 or 1969 time
9 period; maybe even a little before then.

10 Q. Do you know what the impetus was
11 that caused that investigation to begin whenever
12 it was in the late '60s?

13 A. In general terms, I do, yes.

14 Q. What was it?

15 A. From the primary impetus was reports
16 from Europe in about 1966 that PCB residues had
17 been identified in environmental samples by
18 researchers in Sweden.

19 Q. Anything else that was reported?

20 A. Well, I mean, that was the first
21 report.

22 Q. The first report that you're
23 referring to simply identified the existence of
24 the residues in environmental samples?

25 A. That's correct.

1 Q. Was there any suspected concern
2 regarding the presence of these residues in the
3 environmental samples?
4

5 MR. MALIN: I will object to the
6 form of the question. He's already
7 indicated that he wasn't there in 1968. If
8 you want to talk about the time period --

9 BY MR. COHEN:

10 Q. Let me ask you this, Doctor.
11 Did you see that report apparently
12 from Europe done by researchers in Sweden
13 regarding the presence of PCB residues in
14 environmental samples?

15 A. When?

16 Q. In 1973.

17 A. Probably shortly after joining the
18 company in either late '73 or early '74, I
19 probably read the paper, yes.

20 Q. And are you familiar with the
21 paper's contents?

22 A. Yes, I am.

23 Q. And can you tell me, then, going
24 back to an earlier question, was the sole concern
25 that the residues of the material was being found

in environmental samples?

MR. MALIN: I object to the form of the question.

THE WITNESS: I'm not sure I understand --

MR. MALIN: That sole concern?

THE WITNESS: -- the question.

MR. MALIN: If you think you can answer the question, try and answer it.

BY MR. COHEN:

Q. Was there any concern raised by the researchers in Sweden regarding the presence of the product's residues in the environmental samples?

A. Yes.

Q. What was the concern?

A. Well, the primary concern at the time was that this was a material with which people at the time were not particularly familiar. They were doing pesticide analyses, at the time there was concern about pesticides to the environment, and I would say that some of that concern was transferred to the finding of PCBs, but the true significance wasn't understood at the

time.

Q. What do you mean by "true significance"?

A. Well, I don't think anybody knew enough about PCBs at the time, other than -- I mean, other than just knowing what they were, to determine whether there was any other concern or not.

Q. To your knowledge, sir, how long has Monsanto been manufacturing PCB products and selling those products?

A. Well, since 1935.

Q. And do I understand that the first time that an investigation to determine certain properties of PCBs, specifically biodegradable, soil transport, solubility in water was conducted by Monsanto was sometime slightly preceding the 1968 to '69 time period?

A. I don't think that's a fair characterization, no.

I'm sure there were other types of investigations going on throughout the time of manufacture.

Q. Can you identify them for me?

1
2 A. Well, certainly they would have been
3 looking at characterizations as to their
4 suitability as products. There were
5 characterizations as to quality control of the
6 particular batches that were being manufactured.

7 There had been certain amounts of
8 toxilological testings done prior to that time
9 period.

10 Q. Are you familiar with that
11 toxilological testing?

12 A. In the most general of terms, yes.

13 Q. In other words, you know the testing
14 was done?

15 A. That's about the extent of it, yes.

16 Q. Have you ever had a chance to review
17 any of those tests?

18 A. Not those early tests, no, I have
19 not.

20 Q. Do you know when the first tests
21 were started?

22 A. Not for sure.

23 Q. Do you know whether Monsanto did the
24 toxilological testing inhouse or whether they had
25 subcontracted it out?

A. My recollection is that it was done outside of Monsanto.

Q. Do you know the names of the laboratories that did the testing?

A. No, I don't.

Q. You're aware of testing done during the '70s, at least by Industrial Biotest?

A. I am aware of those tests.

Q. Are you aware of any testing done by laboratories other than Industrial Biotest during the same time period?

A. Yes, I am.

Q. And that would be toxilogical testing?

A. Yes.

Q. Can you identify the laboratories that you are familiar with?

A. Younger Laboratories.

Q. They are located in St. Louis?

A. That's correct. Suburban St. Louis.

Q. Any others?

A. That's all I know.

Q. Do you know when the first toxilogical testing was done, either internally or

externally on PCBs?

A. My recollection is during the early 1950s.

Q. Do you know what the subjects of the tests were?

A. Not for sure, no.

Q. Well, did they use animals for testing?

A. I believe so, yes.

Q. Do you know?

A. If that's what you meant by subjects?

Q. Yes.

A. Yes, I believe they did use animals.

Q. Do you know the laboratory that did the testing?

A. No, I don't.

Q. Do you know the species?

A. Not specifically, no.

Q. Tell me about the quality control work that was being done prior to the late '60s. Was that being done inhouse?

A. Yes.

Q. What would have been the analysis

1 that was being done as far as quality control is
2 concerned. What were they looking for?

3 A. Primarily, they were looking to
4 assay the product was my understanding.

5 Q. When you say "assay the product,"
6 what is that qualitative and quantitative analysis
7 of the product in order to determine the substance
8 that was actually being manufactured and the
9 quantity of each of its components?
10

11 A. With the exclusion of your last
12 phrase, the quantity of each of its components, I
13 would agree, yes.

14 At that time, they were not doing
15 analysis for the quantities of each component.

16 Q. What control do you know of that
17 existed prior to the mid to late '60s to assure
18 that the product that was going out the door had
19 the quantity of each component that Monsanto
20 desired?

21 A. I really don't.

22 MR. MALIN: Objection to the form of
23 the question.

24 THE WITNESS: I don't know the
25 answer to that.

BY MR. COHEN:

Q. Do you know who would?

A. No, I don't.

Q. In the assay of the product, as you referred to it, the qualitative analysis, do you know what specific components they would be looking for?

A. PCBs.

Q. Anything else?

A. Not that I know of, no.

Q. How about compounds like PCBS?

MR. MALIN: Excuse me. Are we talking about the time period of the '50s now?

MR. COHEN: I am talking about the '60s.

BY MR. COHEN:

Q. Prior to the 1968, '69 time period, do you know, were they looking for the presence of PCDF?

A. I am certain they were not.

Q. Certain they were not. Do you know when Monsanto first began doing QC checks for the presence of PCDFs?

WISE HATCHER DINTER BRUSILOV

1 A. Yes, I do.

2 Q. When was that?

3 A. 1971.

4 Q. Now, what makes you so certain that
5 it was 1971?

6 A. Because at that time frame, a
7 report, again from Europe, reported the presence
8 of PCDFs in European PCB products. Monsanto
9 scientists actually went to Europe and talked to
10 the particular researchers to obtain their
11 technology brought that technology back and
12 Monsanto Company basically confirmed their
13 findings that PCDFs were present in foreign
14 materials, but could not be detected in
15 Monsanto-manufactured products.

16 Q. Do you know at what level the PCDFs
17 were identified in foreign materials?

18 A. My recollection is 10 to 20 parts
19 per million.

20 Q. Parts per million?

21 A. That's correct.

22 Q. And do you know the foreign products
23 that contained that level of PCDFs that were being
24 referred to in 1971?

1 A. I believe they were the Kanechlor
2 product and Prodelec product.
3

4 Q. Kanechlor, as I understand it, is a
5 product of Mitsubishi Electric?

6 A. I don't believe -- that may be
7 correct.

8 I don't know for sure.

9 Q. What was the other product you
10 named?

11 A. Prodelec. The Prodelec product.

12 Q. That product --

13 A. There were the clorphens. They may
14 have been involved also. I don't really recall.
15 Prodelec is a French product. I think that's
16 actually the company's name and not the product
17 name.

18 Q. What was the detection levels that
19 was available in Monsanto's testing at that time
20 in 1971 for PCDFs, do you know?

21 A. I believe they were reporting one to
22 two parts per million as a detection limit.

23 Q. So if there were PCDFs in Monsanto's
24 product as of 1971, that is the new product that
25 was going out the door, it was not detectable

1 because it was below the one to two parts per
2 million detection limit; is that fair to say?

3 A. That's correct.

4 Q. And it was new product that was
5 going out the door that was being analyzed at that
6 time; is that right?

7 A. That's correct.

8 Q. Do you know how frequently it was
9 being analyzed?

10 A. Not very. I think it was a
11 one-time -- as at that particular instance, it was
12 a one-time investigation to basically try to
13 confirm the European work and at that time, once
14 that confirmation was done, I believe that project
15 was, I won't say stopped, but certainly it was not
16 an ongoing project.

17 Q. Did Monsanto ever adopt, to your
18 knowledge, and I am speaking about , obviously,
19 subsequent to 1971, a quality control analysis of
20 the product going out the door for PCDFs?

21 A. Not to my knowledge.

22 Q. Have they done an occasional
23 analysis of new products for PCDF content?

24 MR. MALIN: Objection to the form of
25

the question. What time frame?

THE WITNESS: I was going --

BY MR. COHEN:

Q. Subsequent to 1971.

A. Yes, that's correct.

Q. Apparently, they never did it before 1971, didn't have the technique and when they did try it on their own product, they came up below a detection limit?

A. That's correct.

Q. Can you tell me how frequently they have done quality control analyses for PCDF contents subsequent to 1971?

A. I would say they have never done quality control analysis, as I understand the term quality control analysis.

Q. Tell me what your understanding is of the term quality control analysis?

A. I would say quality control analysis is a routine check of a particular property or whatever on a product as it is manufactured and marketed.

Q. In order to determine that it meets certain specifications; would that be fair to say?

A. That's correct. In general, that's true.

Q. So they have never done quality control analysis of PCB products to determine the presence of PCDFs?

A. No. I would say that's correct as we're talking about the term of quality control, yes.

Q. But they apparently have done some occasional analysis of the product in order to determine the presence or lack thereof of PCDFs?

A. That's correct.

Q. Do you know how frequently that analysis has been done?

A. I would say five or six times over the period 1971 to 1977, when we quit making the product.

Q. Five or six times total?

A. Roughly, I would think.

Q. In approximately a six-year time period?

A. That's correct.

Q. How many plants during that six-year time period were manufacturing products containing

PCBs, do you know?

A. In the United States?

Q. Yes.

A. One.

Q. And where was that plant?

A. In Sauget, Illinois.

Q. So, of necessity, obviously, it would have been product manufactured at that plant that they were analyzing?

A. In general, that's true.

They actually did analyze some retained samples from that Anniston plant. At least on one occasion I recall.

Q. Do you know if there was any variation between the findings between the product from Sauget and Anniston?

A. I would have to say that in general the answer is no, but there was very few Anniston products analyzed. So it is difficult to make a general characterization like that.

Q. Do you know what level of PCDFs were detected in new products by Monsanto's own tests during these five or six different tests, if any levels were found?

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A. In general, I do, yes.

Q. What was the level?

A. Well, depends on the product.

In general, 1016 had no detectable
PCBs.

Aroclor 1242 was generally less than
two PPBs.

The Aroclor 1254 product.

Q. PPBs we're talking?

A. PPM. If I said PPM, I misspoke.

Q. You said PPB. Are we talking PPM?

A. Yes, I misspoke. I'm talking about
parts per million.

Aroclor 1254, in general, were below
five parts per million, although there were a few
higher analyses. Aroclor 1260 was generally in
the one to two parts per million range, also.

Q. Does Monsanto consider PCPD to be an
impurity in the product?

A. I would --

MR. MALIN: I object to the form of
the question. If you think you are in a
position to answer that, try and answer it.

THE WITNESS: That term is probably

as appropriate as any to describe their presence there.

BY MR. COHEN:

Q. Are there any other compounds like PCDFs that Monsanto considered impurities that they began analyzing for, whether on a quality control basis or on an occasional non-quality control basis, subsequent to 1971?

A. I guess I don't know what you mean by like PCDFs.

Q. Well, that is an impurity of substance that they did not intend to be in the product such as dioxin, for example?

A. There were a few analyzed for polychlorinated naphthalenes. The early work, apparently the 1971 work, apparently did look for dioxins; none were detected.

Q. Have any further tests been done looking for dioxins in new products, to your knowledge?

A. By Monsanto, not to my knowledge, no.

Q. Do you know what the pesticides were that those Swedish researchers were looking for

back in 1971 that caused the initial inquiry? Was it '71 or was it '68?

A. '66.

Q. '66?

A. DDT and it's metabolites.

Q. Do you know how it is that they came about to discover the presence of PCBs while looking for DDT and its metabolite?

A. In general, yes.

Q. Would you tell me?

A. DDT was being analyzed for using a new detector on gas chromatograph was very sensitive to chlorinated compounds. DDT -- and it has two principal metabolites known as DTE and DDD -- which would account for three peaks in a gas chromatogram.

When they were doing these analyses, the researchers apparently noted that in some or most samples there was a larger series or envelope of peaks that were occurring, and eventually, they found an eagle sample, which had relatively large amounts of these peaks in them, large enough, in fact, that they could analyze that particular sample by mass spectrometry and basically, to make

1 a long story short, they eventually determined
2 that to say peaks were possibly chlorinated
3 biphenyls.
4

5 Q. What is the chemical composition of
6 DDT?

7 A. In what sense? I mean, it is made
8 up of carbon, hydrogen and chlorine.

9 Q. Does it have any phenol?

10 A. Excuse me?

11 Q. Are there any phenol molecules?

12 A. Phenol.

13 Q. Phenol?

14 A. O-1?

15 Q. Yes.

16 A. No.

17 Q. How how about DDEs?

18 A. No.

19 Q. DDD?

20 A. No.

21 Q. Who were the Swedish researchers who
22 were doing that research?

23 A. They were James W. Jensen and
24 Widmark.

25 Q. And you said an eagle sample.

You're referring to a bird?

A. Yes.

Q. And it was in tissue?

A. Yes.

Q. Now, you had been telling me about your work from 1973.

When did your actual duties change from the quantitative analysis that you were doing using gas chromatography?

A. Well, in about I guess 19 -- I guess about 1983 or '84, maybe later -- no, excuse me.

I'm sorry. In about 1975, I transferred to another group within the section I was working in, and at that time began doing mass spectrometry analyses.

Q. Of?

A. A variety of products of the chemical company, of Monsanto Industrial Chemical Companies.

Q. Did that include PCBs?

A. Occasionally; yes.

Q. What, at that time, were you looking for?

A. At that time, we began looking for

polychlorinated dibenzofurans in PCBs, and we also occasionally looked for PCBs in other Monsanto products.

Q. So you or your group were involved in these five or six different tests for PCDFs?

A. That's correct.

Q. Were you looking for PCDFs in any other sample other than Monsanto products?

A. In that time period, I do not believe so, no.

Q. So when you said that you were looking for PCBs and you said PCDFs, you were the one or your group was the group involved in doing those five or six analyses for PCDFs?

A. In that time frame; correct.

Q. Did you write up your findings?

A. Not in any formal report, no.

Q. How did you record your findings?

A. I believe they were recorded on what we had were little analytical request sheets where the person requesting the analysis would make a request on one side of the sheet and we would report the results back on the other side.

Q. What happened to those analytical

requests sheets with the results reported on the other side, do you know?

A. I mean, what do you mean what happened to them? They were given to the guy who was requesting.

Q. That's what I want to know. It went back to the guy who made the request?

A. Yes.

Q. Who made the request for the PCDF analysis, do you know?

A. Well, primarily the researchers that were doing the product development work on that product line.

Q. Do you know the names?

A. I know who was doing -- I don't know specifically who did the request. I mean, I know who was in doing the research work.

Q. Tell me who the research --

A. Dr. Richard -- Dr. William Richard, Dr. Ralph Munch were the primary people involved in that work.

Q. M-u-n-c-h?

A. That's correct.

Q. Are those people still with

Monsanto?

A. Dr. Richard is deceased and Dr. Munch has retired.

Q. You said product line. What product line were you referring to?

A. Well, the electrical fluids, dielectric fluids.

Q. Aroclors?

A. Yes.

Q. Did you do any work on products containing PCBs other than the dielectric fluids?

A. Not that I recall.

Q. Did Monsanto manufacture at that time PCB material in a product form other than dielectric fluids?

A. Not at that time, no.

MR. MALIN: Mr. Cohen, you realize that is beyond the scope of the discovery rule. Products other than dielectric fluids are not within the scope. So I don't mind --

MR. COHEN: I didn't see that limitation. It says Monsanto Company by the individuals with the knowledge of the

product purity of Monsanto products that contained PCBs. I don't see a word about dielectric fluids in there.

MR. MALIN: Transformer fluids in use at the Paoli Rail Yard, is the intent of the meaning of it, is obvious.

MR. COHEN: I think you are reading Section D. I'm referring to Section E, "transformer fluid sold for use at Paoli Rail Yard" applies to Section D. I'm talking about Section E.

MR. MALIN: Well --

MR. COHEN: Are you instructing the witness not to answer?

MR. MALIN: I'm going to permit a preliminary question. If you're going into that detail, I'm going to direct him not to answer.

BY MR. COHEN:

Q. When was the last time that Monsanto manufactured a product containing PCBs, other than dielectric fluid, to your knowledge?

A. To my knowledge, 1972.

Q. And what was that product?

A. It was either our, I think it was a hydraulic fluid line, Pydraul fluid.

THE WITNESS: Could we take a break?

MR. COHEN: Absolutely.

- - -

(A short recess was taken)

- - -

BY MR. COHEN:

Q. Is Pentachlorophenol a PCB?

A. Pentachlorophenol, o-1, is not a PCB.

Q. You had said that you were working in a group in 1973 and then in 1975 you transferred to another group.

A. That's correct.

Q. What was the name of your 1973 group?

A. Analytical Chemistry Group.

Q. And your 1975 group?

A. Spectroscopy group.

Q. Did you have like a group leader, some person who was designated who was sort of in charge of that group?

A. Which?

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Q. Either group.

A. Yes.

Q. Tell me about your 1973 group, the Analytical Chemistry Group; who was the leader?

A. Scott Tucker.

Q. And your 1975 group, the Spectroscopy Group?

A. Martin Dietrich.

Q. Do you know the names of the other members of your 1973 group?

A. Probably some of them.

Q. All right. Do your best.

A. Ozzie Kinast, Chester Brackbill, Oreville Hicks, Vic Sager.

Those are the ones I can recall.

Q. How about your 1975 group?

A. Dave Guerri, Bernie Katlafsky, I think. Scott Tucker was in that group for a while.

Those are the ones I recall.

Q. How long did you stay in the Spectroscopy group?

A. Until 1978.

Q. Then what did you do?

1
2 A. I became a group leader in the
3 Environmental Analysis Section. I guess it was
4 Environmental Scientist, actually, was the section
5 there.

6 Q. How long did you stay there?

7 A. Until 1981.

8 Q. Is that when you became a Senior
9 Research Specialist, mass spectrometry?

10 A. That's correct.

11 Q. And on and on through that
12 employment record that you have here?

13 A. Yes.

14 Q. September 1986, you became manager
15 of the Environmental Technical Support at Monsanto
16 Company?

17 A. That's correct.

18 Q. You hold that position today?

19 A. That's correct.

20 Q. What have your duties been?

21 A. Primarily my duties are to serve as
22 a resource within Monsanto Company for a variety
23 of technical information relating to our products.

24 Q. For whom are you a resource?

25 A. A variety of groups: regulatory

people, manufacturing people,

Q. Internal manufacturing, outside manufacturing?

A. Internal, yes.

I do handle some outside inquiries on certain product lines.

I basically do through the whole company, really.

Q. Regulatory groups.

Are you speaking of outside regulatory groups?

A. I mean, as I spoke there I was talking about internal people who worked with regulatory groups.

I also have done, you know, have interacted with outside regulatory groups.

Q. How about for counsel?

A. Yes, I work for the Law Department.

Q. You work for the Law Department?

A. I have worked for the Law Department and I work with the Law Department on occasion, yes.

Q. Not a regular thing?

A. Depends on how many cases are going

on. Sometimes it is more regular than others.

Q. Well, do you advise outside counsel in lawsuits brought against Monsanto regarding PCBs?

A. Yes, I could.

Q. And do you participate in those litigations in any way?

A. I don't know what you mean by participate.

MR. MALIN: I object to the form of the question. He's giving a deposition here.

BY MR. COHEN:

Q. Well, you are participating, too. You are giving a deposition?

A. That's correct.

Q. Do you participate otherwise? Do you attend depositions?

A. I have done that.

Q. Indeed, you have attended depositions in this matter, have you not?

A. That's correct.

Q. That was Mr. Delaney?

A. I believe that was his name, yes.

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Q. Any others?

A. Excuse me, in this?

Q. Yes.

A. I don't believe so.

Q. And to be accurate, you did not attend all of Mr. Delaney's deposition, did you?

A. I believe that's correct. I don't know for sure. I believe that is correct that I did not.

Q. You attended one session or two sessions?

A. I think I attended two sessions.

Q. Have you had the occasion to testify in other litigations involving PCBs?

A. Yes, I have.

Q. Have you acted as a witness in other litigations?

A. Yes, I have.

Q. Can you tell me the litigations in which you have acted as a witness?

MR. MALIN: You want a list of all the court cases he has ever been in?

MR. COHEN: Sure, if he has them.

MR. MALIN: No, I don't have them.

Give him all the cases that you have been in.

THE WITNESS: I testified on the stand in the City of Bloomington case, and portions of my deposition testimony were read into the record in the Scott litigation in Texas.

Those are the only litigations that I have actually testified in at trial.

BY MR. COHEN:

Q. Were you appearing in either instance the Bloomington matter or Scott matter as an expert?

A. I was certainly in Bloomington. I don't know about Scott. In Bloomington, I was.

Q. When you started with Monsanto -- were there others in which you gave depositions?

A. Gave depositions?

Q. Yes.

A. Yes, I think so.

Q. Okay. Tell me about them.

MR. MALIN: Didn't you give a deposition in Haley?

THE WITNESS: Yes, you are right. I

did. Deposition in Haley litigation in Michigan.

BY MR. COHEN:

Q. Is that Haley versus Monsanto?

A. Yes.

Q. H-a-l-e-y?

A. I believe that's right.

Q. Michigan State Court?

A. I don't know. I believe so.

MR. MALIN: I don't recall the court cases myself, you may.

THE WITNESS: I don't believe there were any other PCB cases.

BY MR. COHEN:

Q. So, three matters that you can think of --

A. Yes.

Q. -- you have testified in?

A. Yes.

Q. You told me that as of 1973 you were aware of testing that had been done by Monsanto prior to that time regarding certain subjects that was suitability of the product, quality control packages and toxilological studies, some of which

WISE HATCHER DINTER BRUSILOV

1
2 you identified as being done as early as the '50s;
3 is that right?

4 A. That's my recollection, yes.

5 Q. What was your understanding of the
6 toxicological properties of PCBs in 1973 when you
7 started with Monsanto?

8 MR. MALIN: I object to the form of
9 the question. If you think you understand
10 that, you're capable of answering it, you
11 may answer it.

12 He's not here as a toxicologist and
13 he hasn't said he's a toxicologist, but go
14 ahead.

15 MR. COHEN: I'm asking his
16 understanding?

17 THE WITNESS: My understanding was
18 that they were not particularly toxic, as
19 far as industrial chemicals go. Certainly
20 they had some toxicity associated with them,
21 as does any chemical.

22 BY MR. COHEN:

23 Q. What did you understand to be the
24 concern associated with the work done by the
25 European researchers, Jensen and Widmark,

regarding the toxicological properties of PCBs?

A. I don't know that I had an understanding of their concern with regard to toxicological properties.

Q. Did you know about the existence of PCDFs when you started with Monsanto in 1973?

A. No, I did not.

Q. When did you first learn about PCDFs?

A. Shortly thereafter.

Q. And what did you know or believe about the toxicological properties of PCDFs at that time?

A. I think my understanding was that they were probably more toxic than PCBs.

Q. Do you know why they were believed to be more toxic than PCBs?

MR. MALIN: Objection to the form.

If you think you understand that, answer the question.

Are you talking about chemical structure or whatever? What are you talking about?

MR. COHEN: Whatever. I don't know.

I'm asking. He said he understood it was more toxics than PCBs?

THE WITNESS: My understanding would have been based on work reported in the literature primarily by analogy to other chemicals.

BY MR. COHEN:

Q. What other chemicals?

A. Primarily, the PCDD, the dioxin compounds.

Q. Okay.

Now, what was it about the PCDDs that either the literature reported or you believe made them more toxic than PCBs?

A. I guess I don't understand exactly what your question means. I mean, obviously, the reports and the literature that dioxin compounds were significantly toxic to certain species of animals, and comparing that to what we knew about PCBs, they were more toxic than PCBs.

Q. Well, did they indicate, that literature that you are referring to, indicate why the PCBs, PCDDs were more toxic than PCBs?

A. In that time period, I'm not sure

there was an understanding of that, no.

Q. In other words, there was simply a reporting of finding higher toxicity without an understanding; why?

A. That's my recollection.

Q. And the PCDFs were apparently more likened to the PCDDs than the PCBs?

A. That's correct. That's my recollection.

Q. Do you know if they ever did discover why PCDDs were more toxic than PCDFs?

A. Continuing investigation to present.

Q. What is your belief today?

A. My understanding is that it has something to do with, speaking as basically a layman in toxicology, it has something to do with the mechanism of its toxicity.

Q. What is the mechanism of its toxicity?

A. Some people believe that there is a receptor in animal species which dioxin compounds latch onto.

Q. What is the belief regarding, as you understand it, regarding the toxicity of PCDFs

1
2 today?

3 A. The relative toxicity or the
4 mechanism of toxicity?

5 Q. Let's first talk about the relative
6 toxicity?

7 A. Say the understanding is that they
8 are less toxic than the PCDD, but more toxic than
9 PCBs.

10 Q. Any order of magnitude you can give
11 me?

12 A. That depends on the particular
13 compound which you're speaking of.

14 Q. Higher chlorinated compounds seem to
15 be more toxic than the lower chlorinated
16 compounds?

17 A. Not necessarily.

18 Q. Then what is the difference? What
19 is the differentiating factor to determine the
20 toxicity to PCDFs as you understand it?

21 MR. MALIN: I object to the form of
22 the question.

23 Is your question one which addresses
24 itself to which PCDFs are more toxic than
25 others, and what is the reason if they are

more toxic than they are believed to be more toxic?

Is that your question?

MR. COHEN: Yes.

MR. MALIN: Can you answer that question?

THE WITNESS: I can answer.

My understanding of that process is basically as a non-toxicologist, yes.

BY MR. COHEN:

Q. Give me your understanding as a non-toxicologist?

A. My understanding is toxicity of these types of compounds has to do with the positioning of the chlorine atoms around the ring structures of the compounds and that materials with chlorines in the four lateral positions, basically at the end of the two rings, whether we're talking about PCDFs or PCDDs, tend to have higher toxicity associated with them and that that toxicity maximizes at the tetrachlorated or for a chlorine-containing compound.

Q. What about the toxicity of PCBs, any relationship between the position of the chlorine

atoms?

A. There appears to be, yes.

Q. Same relationship?

A. It is not as clear-cut, but the same rough association is there, yes.

MR. MALIN: This question addresses itself to PCDD or PCBs?

MR. COHEN: Well, I had first asked about PCDFs, the nature of his understanding today of the toxicity of PCDFs regarding the toxicity of PCDDs, order of magnitude, and also we got into then the issue of the mechanism, and then comparing it to PCBs; is that right?

THE WITNESS: Roughly, that is correct, yes. I think, I believe I understood the questions, and I believe I answered them as best I could.

BY MR. COHEN:

Q. Can you tell me why Monsanto stopped manufacturing PCB products in 1977?

MR. MALIN: I object to the form of the question. No reason to believe that the witness is in a position to know that.

BY MR. COHEN:

Q. Do you know?

A. I have an understanding.

Q. Tell me what your understanding is?

A. My understanding is that because of the environmental problems and their apparently widespread presence in the environment, and, frankly, regulatory pressure, I believe Monsanto felt it was in the Company's and environmental best interest to stop making the products once all substitutes were available.

Q. What was the concern regarding the widespread presence in the environment?

A. The primary concern was that they were there and widespread.

Q. Was there any concern that they harmed the environment or any element in the environment?

A. There were concerns along those lines, yes.

Q. Were those concerns shared by Monsanto personnel?

A. I believe so, yes.

MR. DUGGIN: I object to the scope

1
2 of these questions. They are for outside
3 the scope of discovery.

4 MR. COHEN: As I understand it, this
5 witness doesn't even know what products were
6 available; is that right?

7 THE WITNESS: Not specifically, no.

8 BY MR. COHEN:

9 Q. What was the belief within the
10 organization of Monsanto regarding any potential
11 harm to any element in the environment?

12 MR. MALIN: I object to the form of
13 the question. I am going to let you answer
14 that. But these questions are way outside
15 the scope and whether or not this witness is
16 capable of answering these questions is
17 highly questionable to begin with, but, in
18 any event, if you have some understanding,
19 I'm going to permit you to answer the
20 question.

21 MS. DUGGIN: On behalf of General
22 Electric, let me just state for the record
23 that I am going to object to that whole
24 series of questions on decisions regarding
25 the manufacture of PCBs, and I will not

reiterate that objection, if we can understand it goes to the entire series of questions.

MR. COHEN: You want to answer the last question?

THE WITNESS: May I have it read back or restated?

MR. COHEN: Sure.

I am not even sure we got finished the question before the objection was interposed.

(The pending question was read.)

BY MR. COHEN:

Q. And I am speaking at the time period when the products was withdrawn from manufacture.

MR. MALIN: I'm objecting to the form of the question. If you think you can summarize the belief, I'll permit you to answer that question.

THE WITNESS: I don't think I can speak for corporate Monsanto.

If you want me to answer it as a scientist at Monsanto, individually, I can make some attempt to do that.

BY MR. COHEN:

Q. I would like you to tell me what you knew at that time regarding the views being addressed inside the company, whether in published documentation or in any other way regarding that particular issue?

A. Okay, my understanding would be that based on literature reports, on potential effects of PCBs, as well as other chlorinated compounds in the environment, that such materials should not be discharged into the environment and that Monsanto felt that they should limit the sale of PCB materials to uses which should not result in environmental discharge. They did that in the 1971, '72 time period.

And further felt that because of things being reported in the literature that when suitable replacements were available, they should cease manufacture, which they did in 1977, with regard to -- I'm sorry the '72 -- '72 to 1977 time frame, my answers are with relationship to uses as dielectric fluids.

Q. And that's because no other product was being manufactured subsequent to 1972

1 containing PCBs other than dielectric fluids?

2 A. That's correct.

3 Q. What other chlorinated compounds in
4 the environment were you referring to just in your
5 last answer?
6

7 A. Primarily, chlorinated pesticides
8 such as DDT.

9 Q. When you were doing PCDF analyses,
10 were you only doing that on new products?

11 A. Yes.

12 Q. So you never had the occasion to do
13 PCDF analyses on products that had already been
14 used for its intended purpose as a dielectric
15 fluid?

16 A. I did not, no.

17 Q. Are you aware of work that has been
18 done analyzed using dielectric fluid for the
19 presence of PCDFs?

20 A. Yes, I am.

21 Q. Was that work being done inside
22 Monsanto as well as outside Monsanto?

23 A. No, it was not.

24 Q. Where was it being done?

25 A. There were a variety of groups doing

1
2 it. There is one or two reports out of Great
3 Britain. There was some work done in Canada.

4 And the biggest project was done
5 under the auspices of EPRI, which is based in
6 California.

7 Q. Who is that EPRI?

8 A. EPRI is the Electric Power Research
9 Institute, I believe, which is a research
10 organization for the electrical utility industry.

11 Q. And when was that done, sir?

12 A. In the mid-1980s, is my
13 recollection.

14 Q. So what you are saying is that, to
15 your knowledge, at no time did Monsanto do
16 analysis of used dielectric fluids for PCDF
17 quantification or PCDF presence?

18 A. A qualification: Neither
19 qualitative nor quantitative analysis, that is
20 correct.

21 Q. What do you understand from the
22 literature is the qualitative and quantitative
23 analysis of used dielectric fluids with respect to
24 PCDF?

25 MR. MALIN: I object to the form of

the question. If you think you can answer that question as stated, try and answer it.

THE WITNESS: My understanding of the literature is that the levels of PCDFs are not increased during use as dielectric fluids in electrical equipment.

BY MR. COHEN:

Q. Is that in normal use?

MR. MALIN: I object to the form of the question.

I don't know -- how are you supposed to know. If you think you can answer that question from any of the literature, go ahead.

THE WITNESS: That is included, yes.

BY MR. COHEN:

Q. What about from heat cycle?

Anything in the literature regarding any change in either the quantitative or qualitative properties of the dielectric fluid as a result of heat cycle?

MR. MALIN: I am going object to the form of the question. I'm not sure you can define what heat cycling is. If you think you know what is heat cycling is based on

your review of the literature, you answer the question.

THE WITNESS: I would like to hear more clearly defined what you mean by heat cycle.

BY MR. COHEN:

Q. Exposing the substance to increases in temperature for a period of time then reducing the temperature again, increasing it again?

A. I don't know that that specifically has been addressed, no.

Could I clarify my previous answer?

Q. Sure.

A. It is my understanding that during normal use, electrical transformers, for instance, go through some home heat, they do tend to run hot when they are heavy loaded and cooler when they're not. I would consider that normal.

My answer would be under this kind of application, there are no changes in the dibenzofurans levels in the fluids.

Q. Do you know if EPRI has published their work?

A. Yes, they have.

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Q. And do you know where it is to be found?

A. It is available as a report from EPRI.

Q. Do you have a copy?

A. Yes, I do.

MR. COHEN: Mr. Malin, I am going to make a request that the witness supply you with a copy of the EPRI report and that you supply it to us.

MR. MALIN: Well, let's be a little more specific. Is there a date on that report?

MR. COHEN: Let's ask the witness.

He said in the mid-'80s.

BY MR. COHEN:

Q. Tell me to the best of your ability, pin down for me, if you can, the EPRI report that you are referring to?

A. I mean, I know what I am referring to. I don't know the specific number. I think it was 1985. I don't know the specific report number. I mean, I have in mind what I am talking about. That's about the best as I can do as I sit

here.

Q. If I said would you get a copy out for me, can you go someplace and find it and get a copy out, I assume?

A. Yes, I could.

Q. Then you could supply it to Mr. Malin; is that correct?

A. Yes, I could.

MR. MALIN: We'll take the request under advisement.

BY MR. COHEN:

Q. Are you familiar with the work that was published that the Environmental Prospectus, Volume 60, regarding the formation of polychlorinated dibenzofurans and dioxins during certain circumstances published by Hutzinger, Choudhry and others?

A. Could I see a copy of the paper, please? I mean, the answer is probably yes, but I would like to see what I am answering yes to.

MR. COHEN: Let the record reflect that I am showing the witness a copy of a document that has previously been marked in a related litigation as part of the

appendices as A0009437 through 9443.

MS. DUGGIN: You said related litigation. Is that the Federal litigation?

MR. COHEN: I think you know where it was produced.

MS. DUGGIN: No, I don't. That's why I am asking you the question. Would you be kind enough to tell me.

MR. COHEN: It was part of the appendix in the matter before the Third Circuit Court of Appeals.

MS. DUGGIN: Thank you.

THE WITNESS: I'm generally familiar with that paper, yes.

BY MR. COHEN:

Q. Do you know the conclusions of the paper?

A. Not as I sit here.

I know generally what those authors have said in other context.

Q. Why don't you tell us what they have said in other context?

A. I believe basically that the thrust of that paper is that PCDFs can be produced as

products of incomplete combustion of PCBs in fire situations.

Q. Are you familiar with the temperature that is most likely to yield PCDF production from PCBs, temperature range?

A. Yes, I am.

Q. And what is it?

A. It is a temperature range of one or 200 degrees centigrade or Celsius centered about 600 to 650 degrees Celsius.

That is the temperature range that has been reported in the literature.

MR. COHEN: Why don't we mark this then as Kaley-2.

- - -

(Document marked as Kaley Exhibit 2 for identification.)

- - -

BY MR. COHEN:

Q. Do you know what temperature in that range is most likely to produce PCDF production from PCB fluids?

MR. MALIN: I assume you're asking him what he knows from it based upon his

reading of the literature because that's all
he said.

MR. COHEN: Well --

BY MR. COHEN:

Q. You did not do any independent
testing to see what temperatures produced PCDFs
from PCBs, did you?

MR. MALIN: Far afield from that
permitted under discovery. I'm going to
permit you to answer the question.

MR. COHEN: I don't think it is.

We're going to pin it down a little further.

BY MR. COHEN:

Q. Did you do any independent testing
to see what would produce PCDFs from PCB fluids?

A. No.

Q. Do you know if Monsanto has ever
done any testing of that type?

A. Not to my knowledge.

I would like to make a clarification
of that, because there is a paper in the
literature by Monsanto scientists using pure PCB
congeners to generate standard pure PCDF congeners
from PCBs.

1 And heat is involved in that
2
3 process, too, so to the extent that Monsanto's
4 scientists used PCBs to generate PCDF standards,
5 yes, Monsanto did that work. But with regard to
6 the particular subject of that paper, Monsanto has
7 not done any work.

8 Q. Do you know who the authors of that
9 research were?

10 A. Certainly Fred Hileman is an author
11 of that paper. I don't recall the others.

12 Q. And do you know where that paper is
13 found?

14 A. I don't recall the journal.

15 Q. Do you have a copy of the paper?

16 A. Yes.

17 Q. If I were to ask you to get one,
18 could you get one; obviously not today?

19 A. Under those terms, yes, I could.

20 Q. And could you produce it to Mr.
21 Malin?

22 A. Yes, I could.

23 MR. COHEN: Then I will make a
24 request, Mr. Malin, for a copy of Mr.
25 Hileman and others' paper regarding the

production of pure PCDF congeners from pure
PCB congeners.

Getting it now for me?

MR. MALIN: I don't know.

BY MR. COHEN:

Q. Let me ask you this, Dr. Kaley.

Are you familiar with the actual
circumstances of uses of mobile units, rail cars
and the cycles that the transformers on those cars
will go through?

A. No, I'm not.

Q. Do you know if anybody in Monsanto
has ever done any work to study how mobile unit
rail cars are operated and their circumstances of
operation?

A. I do not know.

Q. Does Monsanto have a department
where they get information back from the field on
the performance of their products?

MR. MALIN: I object to the form of
the question. That question is entirely too
broad.

BY MR. COHEN:

Q. Let's break it down to the product

dielectric fluid.

MR. MALIN: What time frame are you talking about?

MR. COHEN: Well, obviously, during the time frame when you were making the products.

THE WITNESS: I don't know if there was a specific department for that purpose.

No, not to my knowledge.

BY MR. COHEN:

Q. Do you know if there is any repository or record that Monsanto had where reports from the customers came back indicating the performance of the dielectric fluid?

A. No, I do not.

Q. Do you know if Monsanto had any source of information prior to 1977 regarding the actual circumstances of use of mobile unit rail cars?

A. I don't understand what you mean by source of information.

Q. Well, did they have reports given to them or prepared by them?

Did they have any?

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A. I haven't --

Q. Scientific data of any type?

A. I do not know.

Q. Do you know what happened at the
Paoli Rail Yard?

MR. MALIN: I object to the form of
the question. It is entirely too broad.

MR. COHEN: Okay.

BY MR. COHEN:

Q. Do you know where the Paoli Rail
Yard is?

A. Generally.

Q. Have you been there?

A. No, I have not.

Q. So you have never seen the facility?

A. That's correct.

Q. Have you seen photographs of it?

A. I do not believe I have.

Q. Maps?

A. I don't have a specific
recollection, but it is possible I have seen a map
or a diagram or something.

Q. All right.

I was going to ask you next.

Drawings or diagrams?

A. It is possible; I don't specifically recall having seen any.

Q. Do you know what buildings there are there?

A. No, I don't.

Q. Do you know what the facility was used for?

A. I believe I have some understanding of that.

Q. From what source?

A. Either discussions with attorneys or possibly some documents I have read. I don't know.

Q. Do you know what went on at the Paoli Rail Yard during any period of time with respect to PCB fluids?

A. Not specifically, no.

Q. Do you know if rail cars were even in the Paoli Rail Yard?

A. I mean I suppose; I do not know that specifically, no.

Q. It would be an assumption?

A. It would, but I would consider it to

1 be a safe assumption, but I can't say that I
2 specifically know that, no.

3 Q. Is General Electric Company a
4 customer of Monsanto?

5 MR. MALIN: Currently? Do you want
6 to know if they are currently a customer?

7 MR. COHEN: Let's back up. Mr.
8 Malin makes a good interjection.

9 BY MR. COHEN:

10 Q. Prior to 1977, was General Electric
11 Company a customer for dielectric fluids of the
12 Monsanto Company?

13 A. Yes, they were.

14 Q. Do you know what General Electric
15 Company used dielectric fluid for?

16 A. In general terms.

17 Q. Tell me in general terms?

18 A. For dielectric fluids in
19 transformers and capacitors.

20 Q. What types of transformers?

21 A. Bumping up against my knowledge. I
22 don't know.

23 Q. We have reached the sides of the
24 envelopes?
25

1 A. Transformers for which
2 non-flammable, flame retardant, dielectric fluids
3 were deemed to be important or necessary.
4

5 Q. Would they have been fixed-location
6 transformers, to your knowledge?

7 A. I don't know. I don't know for
8 sure, specifically.

9 Q. Prior to 1977, was Westinghouse a
10 customer of Monsanto Company for dielectric
11 fluids?

12 A. Yes.

13 Q. Do you know what they used
14 dielectric fluids for?

15 A. In the same general terms, yes.

16 Q. And for the same general purposes as
17 GE?

18 A. That's my understanding.

19 Q. Was the Budd Company a customer of
20 Monsanto Company?

21 A. I don't know.

22 Q. Do you know who the Budd Company is?

23 A. I believe I do, yes.

24 Q. Are you aware of the product that
25 they manufactured prior to 1977?

1
2 A. My understanding would be that I
3 thought they made rail cars. If that's correct,
4 then, yes, I am. If that's not correct, then, no,
5 I don't.

6 Q. Do you know if GE manufactured rail
7 cars prior to 1977?

8 A. I don't know.

9 Q. Do you know who the plaintiffs are
10 in this case?

11 MR. MALIN: I don't think you know
12 that.

13 THE WITNESS: Specifically, no.

14 I mean I think I know what some
15 classifications are of the people who are
16 plaintiffs in this litigation, yes.

17 BY MR. COHEN:

18 Q. Tell me the classifications you
19 know?

20 A. I believe there are some people who
21 work at that rail yard, and I believe there are
22 some people who are residents in the areas near
23 the rail yard.

24 Q. Do you know what these people who
25 work in the rail yard are alleged to have done in

the course of their employment?

A. I don't believe I do specifically,
no.

Q. Do you know with respect to these
people who worked in the rail yard what, if any,
contact they would have had with products
containing PCBs?

A. Not specifically, no.

Q. Do you know if Monsanto Company sold
dielectric fluids containing PCBs for use in the
Paoli Rail Yard?

A. Not specifically, no.

Q. Do you know what dielectric fluids
were used in the Paoli Rail Yard?

A. I believe I have an understanding of
that.

Q. From whom?

A. Counsel.

Q. Okay. What's your understanding of
what dielectric fluids were used in the Paoli
yard?

A. Some of the dielectric fluids were
PCB containing dielectric fluids.

I don't know that all of them

contained PCBs or had a percentage.

Q. Do you know whether they were Monsanto products?

A. I don't know specifically. That would be a safe assumption.

Q. Do you know if the General Electric dielectric fluid sold and used prior to 1977 contained Monsanto products?

A. I know that some of their dielectric fluids, PCB-containing fluids contained Monsanto's product. I don't know that I know that all of it did.

Q. Do you know the make-up of General Electric's dielectric fluid?

A. Which fluid? I have --

Q. What is Pyranol?

A. Pyranol is GE's trademark for a series of flame retardant dielectric fluids.

Q. Do you know any of the product specs for any of those GE trademark fluids?

A. Not as I sit here, no.

Q. Do you know if Westinghouse sold the dielectric fluid that contained products manufactured by Monsanto?

1
2 A. It is my understanding that they
3 did, yes.

4 Q. Do you know what name it was sold
5 under?

6 A. Yes.

7 Q. What?

8 A. Inerteen, I believe.

9 Q. Do you know the product specs of
10 Inerteen?

11 A. Well, again, Inerteen is a trade
12 name for a series of fluids; that is my
13 understanding.

14 Q. Do you know what other product was
15 used and mixed, as I'm sure counsel would say,
16 with Aroclor to produce Pyranol?

17 A. I say it depends on the Pyranol.

18 Q. When you said you didn't know the
19 product specs of these products as you state here,
20 does that mean that you may have these product
21 specs available to you back in your office?

22 A. No. I have seen spec sheets but I
23 don't have them in my office. I don't even know
24 where I would have seen them, probably.

25 Q. Would you have occasion, during the

1 course of your employment, to regularly deal with
2 the product specifications for either the GE or
3 the Westinghouse products?
4

5 A. No.

6 Q. Do you know whether Pyranol was used
7 at the Paoli Rail Yard?

8 A. Not specifically, no.

9 Q. Do you know if Inerteen was used at
10 the Paoli Rail Yard?

11 A. Not specifically, no.

12 Q. Let me show you a document, sir,
13 that has been produced in this litigation and has
14 been marked as GE P000 654655, 656, 7 and 8.

15 I ask you first to look at the
16 document.

17 (Pause.)

18 BY MR. COHEN:

19 Q. Have you had a chance to look at the
20 document, sir?

21 A. I have looked at the document. I
22 have not read it in detail.

23 MR. COHEN: For identification, why
24 don't we mark it as Exhibit 3.

25 - - -

(Document marked as Kaley Exhibit 3
for identification.)

- - -

BY MR. COHEN:

Q. Is there any indication on that document, sir, that Monsanto's product is involved in that GE product?

A. Yes, there is.

Q. What is the indication?

A. At the top of the first page of Exhibit 654, there is an indication that 1242, 1254 and 1260 were Aroclor PCB mixtures. Monsanto Chemical is the name after it, probably indicating the manufacturer.

Q. And you recognize those numbers 1254, 1242, 1260, whatever it is, that they have there?

A. Yes, I do.

Q. What are those numbers?

A. Those are specific products, the designations in the Aroclor product line.

Q. To your knowledge, is that combination of numbers 1248, 1254 and 1260 a series of numbers over which Monsanto Company has

any proprietary rights?

A. It is 1242 rather than 1248.

Q. Whatever they are.

A. Yes, I understand.

MR. MALIN: I object to the form of the question. How is he supposed to know whether they have proprietary rights?

Look, if you think you know...

THE WITNESS: I was going to say I think we've got proprietary rights to the trademark Aroclor, so that to the extent something says Aroclor 1242, I would think we would have proprietary rights to that. I don't think we have any rights to the numbers themselves.

BY MR. COHEN:

Q. Does that sheet indicate product specification for any General Electric product?

A. That would be my presumption.

MR. MALIN: I object to the question. It speaks for itself. You're asking him to characterize a document that he has never seen before and it is somebody else's document.

But...

MR. COHEN: You're right. That's
what I asked. He said what he said.

BY MR. COHEN:

Q. Have you ever seen similar documents
indicating product specifications of GE's product,
dielectric fluid?

MR. MALIN: I object to the form of
that question. If you think you can answer
that question...

THE WITNESS: Not that I recall.

BY MR. COHEN:

Q. How about Westinghouse's product?

MR. MALIN: Same objection.

THE WITNESS: Same answer. Not that
I recall.

BY MR. COHEN:

Q. Did anyone ever report, to your
knowledge, to Monsanto Company that dielectric
fluids used in mobile unit rail car transformers
were frequently exposed to power surges, for
example?

A. Not to my knowledge.

Q. Did anyone ever report that they

were exposed to heat cycles?

A. Not to my knowledge.

Q. Did anyone, to your knowledge, ever report to Monsanto Corporation and Company, whatever it is, the fact that the dielectric fluid when extractd from transformers on mobile unit rail cars was black?

A. Not to my knowledge.

Q. Do you know if anyone within Monsanto Company ever had reports of analyses of used dielectric fluid extracted from mobile unit rail cars?

A. Not to my knowledge.

Q. Do you know if Monsanto Company has ever, either done analyses of used dielectric fluid from mobile unit rail cars or received analyses for quantification of PCDFs from used dielectric fluids?

MR. MALIN: I will object to the form of the question for a number of reasons.

First, he's talked about what he read in the literature. Is that what you mean, or do you mean received analyses from

someone?

MR. COHEN: I'm not speaking of published literature.

MR. MALIN: So, you can limit your question to nonpublished literature or reports that would have been received from any source nonpublished, not publicly available.

Is that fair?

MR. COHEN: Sure.

THE WITNESS: Not to my knowledge.

BY MR. COHEN:

Q. Just so we're clear, since Mr. Malin made an interjection or addition to the question.

Monsanto Company, to your knowledge, has never done an analysis of their own of used dielectric fluid from mobile unit rail cars in order to determine the presence and quantity of PCDFs; is that right?

A. That's correct. That's my understanding.

Q. To your knowledge, has Monsanto Company done any analysis of environmental samples taken from the area of the Paoli Rail Yard?

A. Not to my knowledge.

Q. Have they received reports of analyses of environmental samples taken from the area of the Paoli Rail Yard?

MR. MALIN: Again, I am going to object. If you mean publicly available or nonpublicly available. Obviously, there are EPA reports.

MR. COHEN: Well, have they received the EPA reports?

MR. MALIN: Which you have.

THE WITNESS: Certainly some reports, yes.

BY MR. COHEN:

Q. Do you know if Monsanto Company or anybody within Monsanto Company has made any attempt to determine whether the PCBs identified in the environmental samples from the area of the Paoli Rail Yard were from Monsanto's product?

MR. MALIN: I am going object to the form. You mean solely, based upon an analysis rather than marketing assumptions?

MR. COHEN: I would like to have the answer based upon analysis. We can talk

about marketing assumptions later.

MR. MALIN: But you're really talking about those. Go ahead, you can answer that question.

THE WITNESS: Can I have the question read back or can you restate it?

MR. COHEN: I doubt I can, but we can try.

MR. COHEN: Why don't you read it back.

(The pending question was read back.)

THE WITNESS: To my knowledge, no.

BY MR. COHEN:

Q. Now, ~~from the standpoint of~~ marketing analysis, have any assumptions been made, to your knowledge?

MR. MALIN: I will object to him being asked that question.

And I will object to the form of the question to extent that you are asking him whether or not Monsanto Company has made those marketing assumptions. He's not here for that. That's far beyond the scope of

the order.

I am going to direct him not to answer that. And that really is not an answerable question by that witness, anyway.

BY MR. COHEN:

Q. Do you know what percentage of the dielectric fluid sold in the United States between, say, 1970 and 1977, contained product manufactured by Monsanto Company?

A. No.

Q. Do you know of any other company that marketed more than 1 percent of the total dielectric fluid sold in the United States during that time period?

MR. MALIN: Well, again, that is not why that witness is here. You're asking him to --

MR. COHEN: I asked him a question: If he knew. If he doesn't know, he doesn't know.

MR. MALIN: I am going to let him answer.

MR. COHEN: We're trying to get to the issue of the nature and knowledge of the

chemical makeup of PCB fluids.

MR. MALIN: Of course --

MR. COHEN: If he can identify whose
PCBs fluid --

MR. MALIN: -- I don't see how he
can answer anymore questions.

THE WITNESS: Are you speaking of
PCB-containing dielectric fluids?

BY MR. COHEN:

Q. Yes, sir. If I didn't say that, I
meant to say that. You will have to forgive me.

A. I do not specifically know of any
other company that met the criteria of your
question, as I understood it.

Q. That is that sold dielectric fluid
containing PCBs and sold product sufficient to
amount to more than 1 percent of the product sold
in that country?

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

MR. MALIN: My objection is I don't
know how this witness would know. There is
no foundation to indicate that he would have
any knowledge in that area whatsoever.

MR. KOHN: Excuse us for 30 seconds.

(Pause.)

BY MR. COHEN:

Q. We talked somewhat earlier, sir, about your having, or your group having done five or six PCDF tests during a six- or seven-year period; do you recall that?

A. Yes.

Q. Let me show you a document that has been previously marked in this litigation, but we will mark today for identification but it has been previously marked with the letter A0009346 through 9351; also marked PRR 004369 through 371 and 4277 -- 4278 and 79.

Do you recognize the document?

- - -

(Documents were marked for identification as Kaley Exhibit 4.)

- - -

THE WITNESS: I'm sorry. What was the question?

BY MR. COHEN:

Q. Do you recognize it?

A. Not specifically, no.

Q. Is there anything you can tell me about these documents?

A. No.

Q. Okay.

MR. COX: Will that have a Kaley exhibit?

MR. COHEN: Yes, that's K-4.

BY MR. COHEN:

Q. You told me in 1975 you went into a group called Spectroscopy, and you were doing different types of analyses in that time period, 1975 through 1978 -- mass spectrometry on a variety of products?

A. That's correct.

Q. Did any of those products contain PCBs or PCDFs other than the dielectric fluid?

A. Yes.

Q. What were they?

A. The pentachlorophenol product line certainly contained PCDFs.

Q. That's P-H-E-N-O-L?

A. That's correct.

Q. What else?

A. That's all that I recall

specifically.

Q. And you were in the Spectroscopy group, I believe, for approximately three years?

A. That would be about right, yes.

Q. And was that all spent doing mass spectrometry on a variety of products?

A. In general, the answer is yes.

You know, I may have done a few other things along the way, but in general, that is the correct answer.

Q. And the totality of PCDF tests regarding dielectric fluids containing PCB was five or six?

A. That's my recollection.

Q. During that time period?

A. Something like that, yes.

Q. 1978 you became a group leader in the Environmental Analysis Section?

A. That's correct.

Q. And what were your duties then?

A. Primarily to supervise a group of other analytical chemists that were doing a variety of analyses on environmental-type samples.

Q. What types of analyses?

1
2 A. All types. There was gas
3 chromatography and liquid chromatography, mass
4 spectrometry, wet chemistry, electrochemistry; a
5 whole variety of techniques.

6 Q. What were you looking for,
7 specifically?

8 A. I mean, the answer to that is too
9 broad to take our time with.

10 We were responsible for
11 environmental analysis of the entire product line
12 of Monsanto Industrial Chemical Company. So it
13 was a whole range of products.

14 Q. Some of those products include
15 dielectric fluids containing PCBs?

16 A. That time frame I would say the
17 answer to that is no.

18 Q. So from 1978 to '81, you were not
19 doing analyses of environmental samples looking
20 for the presence of PCBs from dielectric fluid
21 product?

22 A. I was doing some samples involving
23 looking for the presence of PCBs. Whether it was
24 from dielectric fluids, I don't know, and it was
25 not specifically targeted at dielectric fluids.

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Q. But you were doing some analyses looking for the presence of PCBs?

A. Yes.

Q. Was that strictly quantitative or also qualitative?

A. Both.

To the extent you can do the qualitative analysis under the restrictions I have noted before.

Q. And that was the same type of qualitative analysis we discussed earlier; that is, to try to identify if it was?

A. Right.

Q. From Monsanto product?

A. Although at this time we moved, though.

Not specifically to identify whether it was from Monsanto product.

I don't think there is any way to do that.

But, rather to tell what degree of chlorination the materials contained in that general time frame, we began moving away from doing analyses identifying materials as Monsanto

Aroclor product and moved towards identifying products by their degree of chlorination, not products, but residues.

Q. Any particular reason for that change?

Can you tell us about it?

A. Well, Nnumber one, when you're doing the analysis by mass spectrometry, that is the more natural kind of information you get out of the mass spectrometry.

Secondly, many of the analyses that we were doing during that time period were for PCBs that weren't necessarily from our prior product line.

Q. What would they have been from then?

A. Some of them certainly. What it was known as was an inadvertent generation of PCBs in other chemical processes.

Q. That is the creation of PCBs unintentionally in the creation of another product?

A. That's correct.

Q. Would that have been just with respect to products produced by Monsanto or by

1 anyone?

2 A. We were just doing products by
3 Monsanto.
4

5 Q. And did you determine that there was
6 the presence of PCBs as a result of, as you called
7 it, inadvertent generation?

8 A. Occasionally, yes.

9 Q. Did the results of the studies that
10 you produced indicate that the PCBs that were
11 found as a result of inadvertent generation, that
12 the results would have been similar to the results
13 that you found in the environmental specimens of
14 product containing PCBs from dielectric fluids?

15 A. Similar in what respect?

16 Q. Well, that they were difficult to
17 identify from which category they came?

18 A. Well, they did not come from product
19 category because they weren't generating those
20 products. So to that -- I mean --

21 Q. I guess what I am trying to ask you
22 is how did you know they were from inadvertent
23 generations rather than from contamination of
24 dielectric fluids?

25 A. Because they typically did not have

1
2 Monsanto product-type distribution of the PCB
3 congeners.

4 Q. What type of distribution of
5 congeners did they have; can you describe?

6 A. It depended on the product.

7 Q. Did these samples from inadvertent
8 generations bear a resemblance to what you had
9 discussed earlier as being the type of
10 distribution you would find from the product that
11 had been allowed to be exposed to the environment?

12 A. In general, no.

13 Q. Do you recognize the term
14 "weathering"?

15 A. Yes.

16 Q. What does weathering mean?

17 A. Weathering is a term used to
18 describe the effect of being out in the
19 environment or being out in the weather has on a
20 particular chemical.

21 Q. And would it be fair to say that
22 samples of environmental samples that contained
23 PCBs frequently show the effects of weathering?

24 A. Yes.

25 Q. And as I understand it, this

analysis of samples containing products from inadvertent generations did not produce results that looked like weathered product sample and environmental samples?

A. In general, that is true, yes.

Q. And the results of that analysis of the inadvertent-generated product was also different than the product that you could identify as being Monsanto-manufactured product; is that correct?

A. As I understand your question, yes.

Q. Did you ever publish your results?

MR. MALIN: Objection to the form.

Publish the results of what?

MR. COHEN: The study of inadvertent generation.

THE WITNESS: Portions of it, yes.

BY MR. COHEN:

Q. Can you tell me where it is found if I look on your CV?

A. It is in the EPA report, probably the last, maybe even the last entry.

Q. "Exposure Studies Relating to Industrial Processes Containing Incidental PCB"?

A. Yes.

That was a publication of a joint CMA committee that I was involved in looking at the question we're discussing.

Q. If I wanted to get that article, where would I go?

A. To the EPA. It is available from the National Technical Information Services.

Q. Do you have a copy of that article?

A. Yes, I do.

Q. So, if I were to ask you to get it, you could get it and put your hands on it pretty readily and produce it to counsel?

A. Yes, I could.

MR. COHEN: Counsel, I will make a request for the publication we've just referred to, Exposure Studies, et cetera.

MR. MALIN: Take it under advisement.

BY MR. COHEN:

Q. That was published in 1982, sir?

A. If that's what it says on that paper.

I don't recall, specifically.

MR. MALIN: That's what it says.

BY MR. COHEN:

Q. Testing your memory, sir.

A. Okay.

I believe that the May 12-13, 1982 date is the date of the actual conference. Judging from the NTIS PB84 designation on the report number, I would think it was published in 1984.

Q. Did you present it at the conference or symposium that's referred to in 1982?

A. I did not present the paper, no.

Q. Were there other authors along with yourself?

A. Yes.

Q. One of the co-authors presented it?

A. That's correct.

Q. And who was that?

A. A subcontractor named Kent Hodges from Dow Chemical Company.

Q. Was he with Dow at the time?

A. Yes, he was.

Q. So this was a project that actually was more than just inside Monsanto?

A. Yes, I believe I said it was a result of a CMA, Chemical Manufacturers Association Joint Committee project.

Q. What other activities were you involved in during that three-year period from '78 to '82 while you were supervising a group doing analyses on environmental samples?

A. I guess I don't know what you are looking for.

I mean, you want other product lines we looked at?

Q. Yes, what else did you do?

You did not spend all your time on that inadvertent generation project, did you?

A. No.

Q. What else did you do?

A. With regard to PCBs or with regard to everything in general?

Q. Well, first tell me everything in general, broad scope. Then we will focus on PCBs.

A. The Monsanto Industrial Chemical Company has a broad product line including industrial chemicals and all sorts of fluid and water treating chemicals. We did lots and lots

1 and lots of analyses with regard to all those
2 other product lines.

3 Q. So you were doing analyses of and on
4 of a broad product line?

5 A. A broad cut of that product line,
6 yes any time there were products for which there
7 were environmental questions that needed to be
8 answered.

9 Q. What other products were you
10 involved in that dealt with PCBs?

11 A. None.

12 Q. And was that inadvertent generation
13 project the only other area where you were looking
14 for PCBs?

15 A. I don't recall specifically. I
16 would have to assume that during that time period
17 we were looking at some environmental samples for
18 PCB residues.

19 In fact, I'm sure we were.

20 Q. What about from 1981 on. You became
21 a senior research specialist?

22 '81 to '85, what were your duties?

23 A. Well, that was in a corporate
24 research group, and I was basically running mass
25

1 spectrometers for corporate research. I did not
2 do any laboratory work associated with PCBs during
3 that time frame.
4

5 Q. And '85 to '86, what were your
6 duties?

7 A. At that point, I transferred to the
8 Environmental Policy staff and primarily was
9 involved in product stewardship for PCB products.

10 Q. What do you mean by "product
11 stewardship"?

12 A. A variety of things involved from
13 answering phone calls that come into Monsanto with
14 regard to PCBs, working with CMA committees on PCB
15 questions, working with our plants to make sure
16 they were in compliance with PCB regulations,
17 serving as an internal resource in the company on
18 PCB questions.

19 Q. During that tenure of employment
20 with Monsanto from 1973 to the present, have you
21 had any ongoing professional relationship with Dr.
22 Papageorge?

23 A. I see him occasionally.

24 Q. Well, was he at any time your
25 supervisor directly?

A. No.

Q. Did you have any reporting function to Dr. Papageorge?

A. No.

Q. When is the last time, to your knowledge, Dr. Papageorge was employed by Monsanto?

A. He retired, I would guess, 1985; somewhere in that time frame, anyway.

Q. Have you been shown any documents that indicate what transformer fluid was sold for use at the Paoli Rail Yard?

A. No, I have not.

Q. Do you know what transformer fluid was sold for use at the Paoli Rail Yard?

A. Not specifically, no.

Q. Prior to the time that the Anniston was that the Anniston plant.

A. There is an Anniston plant.

Q. Is that the one that was manufacturing dielectric fluid at some time?

A. Around 1970, yes.

Q. And then after that, it was Sauget only?

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A. That's correct.

Q. Well, prior to the other plants being shut down, can you tell me what other plants of Monsanto did manufacture dielectric fluids containing PCBs?

A. In the United States?

Q. Yes.

A. None. Other than Anniston and Sauget.

Q. Those were the only two?

A. That's correct.

Q. What is the chemical makeup of PCB-based dielectric fluid?

A. That depends on the particular fluids.

Q. And you don't know what particular fluids were sold for use at the Paoli Rail Yard?

A. That's correct.

Q. You don't know whether any of your product was sold to General Electric or Westinghouse or, indeed, to any other company which was later used at the Paoli Rail Yard?

A. Not specifically, no.

Q. So if I were to ask you to tell me

1 what you know about the chemical makeup of
2 PCB-based dielectric fluid and transformer fluids
3 sold for use at the Paoli Rail Yard, what would
4 you tell me?

5
6 MR. MALIN: Mr. Cohen, we have been
7 over that. We put that in our preliminary
8 statement in front of the judge.

9 We told you that what we know is
10 that we sold certain Aroclors to General
11 Electric and/or Westinghouse, and they could
12 use them anywhere in the world they wanted.

13 If they wanted to, they could use
14 any kind of Aroclors for any particular use,
15 but we have had what we think are safe
16 assumptions and that is that it would have
17 been used in railroad transformers.

18 He's made those assumptions, and you
19 have shown him documents which apparently
20 indicate what those fluids were, based upon
21 General Electric's records, and he's here to
22 tell you what he knows about the impurities
23 or possible contaminants in those fluids,
24 and that's really all he can do for you.

25 MR. COHEN: This is an adverse

1 witness that you produced to testify with
2 knowledge of the chemical makeup of
3 PCB-based dielectric fluids and transformer
4 fluids sold for use at the Paoli Rail Yard.
5 You started off making the statement that
6 you were going to limit that deposition to
7 that inquiry.
8

9 This witness has just told me he
10 doesn't know what was used at the Paoli Rail
11 Yard, yet, this is the witness that you
12 produced in response to Discovery Order No.
13 1, Paragraph 2, subpart lower case d.

14 And I'm trying to find out what he
15 can tell me. If he has to tell me about all
16 the PCBs used that you manufactured in order
17 to answer that inquiry, then I think we
18 better get started.

19 MR. MALIN: I think he's answered
20 your question more than once.

21 BY MR. COHEN:

22 Q. Let me ask you this, sir.

23 I have shown you a document that was
24 Kaley Exhibit 3, which you denied having any
25 specific knowledge of, but you could identify

certain Monsanto products as being shown there.

Do you know if that was the fluid that was used at the Paoli Rail Yard?

A. Which fluid?

Q. Any of them there. There is a half a dozen or more on that document.

A. No, I do not.

Q. What was your professional relationship with Dr. Emmett Kelly?

A. He was Medical Director of Monsanto for a brief time after I joined the company.

I don't know that I had a professional relationship with him at all.

Q. He was not one of your supervisors?

A. He was not.

Q. Did you ever do any analyses of any specimens whatsoever at his request?

A. I believe so, yes.

Q. Tell me about them.

A. I believe I did some preliminary analyses of blood serums from the workers at the Sauget plant that was done at his request.

MR. COX: Are they the same plant?

Sauget is also known as the other plant.

Krummrich is the Krummrich plant. That is the Sauget plant, yes.

BY MR. COHEN:

Q. You said that was serum?

A. My recollection is it was whole blood. I don't really recall.

Q. And this was the plant that manufactured the dielectric fluid?

A. That's correct.

Q. Did it manufacture other PCB products?

A. Not at the time frame I was employed at Monsanto, no.

Q. Did you know the employees', specific employees' tenure of employment at Sauget when you were analyzing the whole blood?

A. I didn't even know the specific employees.

Q. Well, without knowing their names, did you know their tenure of employment?

A. I did not.

Q. Did you know whether the samples, blood samples came from employees who had been at Sauget during a time period when a product other

than dielectric fluid may have been manufactured?

A. I have no knowledge to that effect.

Q. So you can tell us nothing today with respect to whether these employees could have been exposed to PCBs in connection with the manufacture of any other product other than dielectric fluids?

A. That is correct, I cannot.

Q. What were the results of your analyses of these employees, can you tell me?

MS. DUGGIN: Objection. We're far beyond the scope of the Discovery Order No. 1.

MR. COHEN: I don't see how.

MR. MALIN: I would agree that we're far beyond the scope of Discovery Order No. 1.

MR. COHEN: How are we beyond the scope of Discovery Order No. 1? I'm trying to find out about the chemical makeup of PCB-based dielectric.

MR. MALIN: I am going to permit the witness to answer the question.

MR. COHEN: Good.

THE WITNESS: I don't recall.

BY MR. COHEN:

Q. Did you publish your results?

A. No.

Q. Did you prepare a document reflecting the results of your analysis?

A. I would assume I wrote the numbers down somewhere.

Q. Well, we're trying to distinguish between publishing, where you may have taken that to mean that you went to some outside publisher and actually had something presented for the scientific community to peruse as distinguished from simply making a record of the results.

A. I understand.

It was not published in the public domain literature, no.

Q. But you believe you made some sort of report of what your results were?

A. I would assume that's the case. I don't really recall, but I mean, I'm certainly not carrying the numbers around in my head nor did I at the time.

Q. Did you report them back to Dr.

Kelly?

A. I probably did not, personally. I would assume they got back to him.

Q. Is this the only time that you did any analysis of any specimen at the request of Dr. Kelly?

A. To my recollection, yes.

Q. Now, as Medical Director, Dr. Kelly probably had other people working at his department.

Could it be that you did analyses of specimens at the request of others working with or for Dr. Kelly?

A. Not to my recollection, no.

Q. So this would have been the one time?

A. Yes.

Q. Can you give us a time frame when this analysis was done?

A. Well, it had to be during 1974, because that was the only time our careers overlapped.

Q. You said for a short time he was Medical Director at Monsanto?

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A. No, I said while I was there.

Q. Yes.

A. He was Medical Director for a very long time.

Q. Yes. I meant for a brief time during your tenure?

A. Yes.

MR. MALIN: 38 years, to be exact.

THE WITNESS: I believe he retired in 1974.

BY MR. COHEN:

Q. Other than PCDFs and PCDDs, or any other dioxin or dibenzofurans, did Monsanto do regular quality control checks of the dielectric fluid in order to determine the makeup of the product going out the door?

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

Q. Do you know if Monsanto did any analysis of the product to determine the purity of the product; that is, compliance with the specifications for the product?

MR. MALIN: I object to the form of the question, unless we know what specifications you are talking about.

Are you talking about the customer specifications?

BY MR. COHEN:

Q. Well, would you agree with me, sir, someone prepared a specification as to what the product was to be?

A. Yes.

Q. Either the customer or Monsanto themselves?

A. Yes.

Q. And Monsanto presumably attempted to manufacture the product in accordance with that specification, would you agree with that?

A. Yes.

Q. And I think, as we discussed impurities before, it would be something that deviated from the specified product; is that right?

A. Well, I don't know that specifications specifically dealt with impurities.

They were primarily performance based specifications.

Q. If the specification was outside or inside?

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A. I would presume both.

Q. Both?

A. But that is a presumption.

Q. Then when you say performance based, that is, the product was to do something, and that was how it was specified, rather than someone taking a piece of paper and writing down it is supposed to contain X amount of chlorine, X amount of that, X amount of this; is that correct?

A. I would say in general, that's true, yes.

Q. And do you know if quality control checks were done on the product in order to determine that it was meeting its performance-based specifications?

A. I don't know that, specifically.

Q. Do you know about the existence of any standard quality control procedure?

MR. MALIN: I am going to object to the form of the question. There is nothing that indicates that these tests relate to in his background which would indicate that he would be in a position to answer these specific types of questions about

performance-based quality control which, of course, is not an issue in this case.

MR. COHEN: Once again, Counsel, I will advise you that that is the witness you produced in accordance with the Discovery Order No. 1, Part 2, Subpart e, as the witness who would testify with knowledge of the product purity of Monsanto products that contained PCBs.

MR. MALIN: Then you had better tell us what you mean by purity. Is purity whether or not it has a certain dielectric content?

MR. COHEN: That is the witness that you produced to testify with respect to the subject. You understand what the words "product purity" to mean. You identified him as a witness to answer questions regarding that subject.

MR. MALIN: I am afraid you are somewhat confused about the nature of the kinds of questions to which you would seek answers, but I think the witness is --

BY MR. COHEN:

Q. Try to do your best with respect to my confusion, sir, and let's have the witness answer that question.

What can you tell me about product purity? What did you understand product purity to mean?

Answer this question, please.

MR. MALIN: I will object to that question. What does he understand as to that product? You better ask him specific questions. I direct you not to answer that question.

BY MR. COHEN:

Q. Dr. Kaley, tell me the circumstances of your being identified to come here and testify today?

A. I was asked.

MR. MALIN: I object to the form of that question. You may answer it.

BY MR. COHEN:

Q. Who asked you?

A. Mr. Malin.

Q. Directly?

A. Yes.

1
2 Q. Did he tell you what you were being
3 called for?

4 A. Yes, I believe so.

5 Q. Did he read you these two subparts
6 of that order?

7 A. I believe so, yes; at least
8 paraphrased them.

9 Q. Did he ask you to come here and
10 testify with respect to your knowledge of the
11 product of purity of Monsanto's products that
12 contained PCBs?

13 MR. MALIN: Don't answer any of
14 these questions about our discussions.

15 MR. COHEN: Well, what's your
16 objection? That is the man you identified.
17 You produced him here today. I didn't ask
18 for Dr. Kaley, I asked for a witness to
19 testify with respect to Discovery Order No.
20 1, Paragraph 2, (d) and (e).

21 MR. MALIN: And we have given you
22 the person with the most knowledge we have
23 on that particular subject.

24 You are going to ask for someone who
25 knows what specifically went to the Paoli

1 Rail Yard. We have told you time and time
2 again, we made the stuff and sold it. What
3 people did with it after that, that's
4 something else again.
5

6 MR. COHEN: Mr. Malin, you seem to
7 be the one that's confused, because there is
8 nothing in part (e) about the Paoli Rail
9 Yard. I am asking this man about product
10 purity, and now you won't even let the
11 witness answer.

12 MR. MALIN: Product purity.

13 There is a measure of relevance.
14 Overall product purity defined how? Maybe
15 you had better define "purity" for us.

16 MR. COHEN: I don't think I have to
17 define anything. This is a Court Order.
18 I'm asking the witness to tell me what he
19 understood product purity to be. You spoke
20 to him on the phone. You asked him to come
21 here and testify. He's testified that you
22 read to him or paraphrased these two
23 sections.

24 I want to understand what he
25 believed his knowledge of product purity

meant.

MR. MALIN: I am going to direct you not answer the question.

You have talked about what was in PCBs, which you have tested it for other than the actual PCB congeners. He's told you that. You're asking the questions. He has told you. He's told you with respect to --

MR. COHEN: No. Actually, let me interrupt you for a moment.

MR. MALIN: Let me finish.

MR. COHEN: Let me just interrupt.

He did not tell me what was in there and what they tested for, other than certain specified compounds. And I'm trying to find out what else they tested for.

MR. MALIN: Why don't you ask him that question?

MR. COHEN: Given that tapdance about purity --

MR. MALIN: Why don't you ask him that question.

MR. COHEN: I thought I had about 10

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minutes ago.

BY MR. COHEN:

Q. Let's go back.

What other analyses are you aware of that Monsanto made during the time period you were employed by Monsanto on the product going out the door; that is, dielectric fluid containing PCBs?

A. With regard to impurities?

Q. Anything.

A. I'm sure there were, as I said before, there were performance specifications which, to my understanding, is routinely done, to be sure the product was marketed as advertised.

Q. Who did that testing?

A. Probably, most of it was done at the plant.

Q. Any particular department or individual who did it?

A. I'm sure the quality control lab at the Krummich plant.

Q. So the Krummich plant, during the time period, had a quality control laboratory?

A. Yes.

Q. And do you know who was employed in

that quality control laboratory during that time period, '73, which was the start of your tenure, through '77, when they stopped manufacturing?

A. No.

Q. Were there scientists or technicians employed there?

A. Technicians.

Q. During that time period, were you in the Krummich quality control laboratory at this time?

A. No.

Q. So you have never seen it?

A. I have seen it.

Q. Oh, you have seen it?

A. I mean, I probably stuck my head in and looked at it.

Q. During that time period?

A. Probably not during that time period, no.

Q. Do you know what the laboratory was equipped with in the way of facilities for doing analyses during '73 to '77?

A. Not specifically.

Q. Did they have gas chromatography?

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A. I doubt it.

Q. I assume, likewise, they did not have mass spectrometry?

A. I'm sure they did not have mass spectrometry.

Q. Did they keep records of their analyses?

A. I don't know specifically.

Q. Do you know what criteria they would have been testing for?

A. Primarily, dielectric properties.

I mean, I assume we're still talking about dielectric fluids, dielectric properties primarily.

Q. How did they do that?

A. I don't know, specifically.

Q. Do you know what the tests would be for dielectric properties?

A. I would assume dielectric strength, primarily. Probably some measure of water content.

Q. Would water content, to your knowledge, be an impurity?

A. Yes.

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Q. Any other impurities you know about?

A. There could be any number, I suppose: Chlorine, hydrochloric acid.

Q. Were tests done for those impurities?

A. I don't know that they were done specifically for those impurities, no.

Q. What impurities do you know they did test for?

A. I don't know they tested for any specific impurities.

Q. Other than dielectric properties, do you know of any tests that they conducted?

A. Not specifically, no.

Q. Do you know the names of any individuals who were working in that QC lab during that time period?

A. No, I don't.

Q. Who was the supervisor of that QC lab?

A. I have no idea.

Q. What supervisory responsibilities did you have during that time period for that QC lab?

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A. None whatsoever.

Q. Who would have been a person whom you can identify who would have had supervisory responsibilities for that QC lab?

A. The person would have been, I suppose, the Plant Manager, but I don't know who was the Plant Manager at that time.

Q. Does Monsanto have a Quality Control Department as a centralized management level department?

A. It does not.

Well, let me modify that answer to say that there is a quality assurance group in Corporate Research which was formed probably in the late 1970s, primarily overlooking the quality of toxicological testing, not concerned with the quality assurance of products going out the plant gates.

Q. Now, by the time that Quality Assurance Department would have been created, you had stopped manufacturing PCBs?

A. Right.

And I want to emphasize that the kind of quality assurance that that group does has

nothing to do with what we have been discussing,
but the words could be confused in my answer and I
didn't want that to happen.

Q. But, the work that that Quality Assurance Department did, that is, studying toxicological properties, did that involve dielectric fluids containing PCBs?

A. Not to my knowledge, no.

I mean it is. They are an oversight group. They are an auditing-type group.

Q. So is it because the product was ceased, they stopped manufacturing it in '77, that quality assurance group never had anything to do with the toxicological properties of PCB fluids?

A. That would be my understanding, yes.

Q. How did Monsanto know, on an ongoing basis, the PCDF content, if any, of their dielectric fluid?

A. Well, we did not detect dibenzofurans in our own fluid until about 1975, at the earliest, and we only made them for two years after that.

So in general, we didn't have any idea that they were in there and could not have

measured them if they were after that period of time.

There were, as I mentioned, an occasional, you know, five or six, certainly less than 10 analyses done.

Q. And dioxin testing, I think you said was done once and not again?

A. To my recollection, that's correct, within Monsanto.

Q. Right. So, based upon that testing that you referred to, was the source of Monsanto's knowledge --

MR. MALIN: Objection.

Q. -- internally regarding the presence of PCDFs and dioxins?

MR. MALIN: Objection. He has testified with respect to literature that was published throughout the world with respect to the presence of PCDFs and PCBs manufactured elsewhere, and the literature with respect to tests done on PCBs.

MR. COHEN: That's very interesting.

BY MR. COHEN:

Q. I asked my question about internal

1 testing. That was the source of the knowledge for
2 internal testing; is that right?

3 A. For Monsanto-done performed
4 analyses, that's right.

5 Q. Thank you.

6 Are you familiar with the Kanechlor?

7 A. I mean, I know it's a PCB product,
8 yes.

9 Q. Did your laboratory in any of the
10 groups that you were working in at any time
11 analyze competitive dielectric fluids on the
12 markets?

13 A. In that earliest initial 1971
14 analysis for PCDFs in PCB containing products.
15 Some other ones, I don't know. I don't have a
16 specific. I can't say whether Kanechlor was among
17 those or not. I think it was.

18 Q. Other than that one experience that
19 you identified earlier, did the laboratories
20 otherwise analyze competing products --

21 A. Not that I recall.

22 Q. -- for any characteristic
23 whatsoever, performance?

24 A. Not that I know of, no.

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Q. Do you know the name Vos?

A. Yes, I do.

Q. That is a scientist who has done some analyses on PCBs?

A. Yes.

Q. Are you familiar with his work?

A. Yes, I am.

Q. Do you know if he has done testing of any of the Aroclor products to detect the presence of dibenzofurans?

A. Yes, at least the gentleman that did the first report that I mentioned in 1971, the first reported dibenzofurans in the foreign products, but he was not able to measure them in Monsanto's products.

Q. Was he a Monsanto employee?

A. No, he was not.

Q. At that time or anytime?

A. Certainly not at that time, not to my knowledge.

Was he at any time?

I suspect not.

Q. You're aware that some question has been raised regarding testing done by Industrial

Biotest on compounds other than PCBs --

A. Yes, I am.

Q. -- are you not?

A. I'm aware of that.

Q. To your knowledge, has any question ever been raised of any of IBT's testing of products containing PCBs?

A. By whom?

Q. Anyone. The United States Government; anyone.

A. Nobody like the United States Government I know of, no.

Q. Does Monsanto accept as accurate the results of the testing done by IBT on specimens that are said to contain PCBs?

MR. MALIN: I will object to the form of the question. That question is so vague and so compound, I don't see how it can be answered, especially by this witness. Especially since there has been no foundation laid to indicate this witness would have that knowledge or that this witness can speak for Monsanto in that respect.

MR. COHEN: Well, let me ask you that.

MR. MALIN: You think you can answer that question. Go ahead.

THE WITNESS: I can't speak for Monsanto.

BY MR. COHEN:

Q. Tell me what you know about the IBT testing.

MR. MALIN: That is so far afield. IBT testing. I don't see what that has to do with Discovery Order No. 1. However, I will permit you to go far enough to ascertain as to whether or not it has anything to do with this discovery.

BY MR. COHEN:

Q. Tell me what you know about the IBT testing using PCBs.

MR. MALIN: I object to the form of that question.

BY MR. COHEN:

Q. You can answer.

A. It is my understanding that in the late 1960s or early 1970s, Monsanto contracted

with Industrial Biotech Laboratories to do a series of toxicological tests, both short-term and long-term, on a variety of species to basically study the toxicological properties of the PCB product line.

Q. Was that the extent of what you know about the IBT testing?

A. I know the testing was done. I know there have been concerns raised about IBT in general, but, to my knowledge, there is no reason to believe that the results of the IBT tests don't represent an accurate picture of the toxicological properties of PCBs.

Q. And is that the general feeling, as you understand it, inside the company, Monsanto --

MR. MALIN: Same objection.

THE WITNESS: That's my general understanding, yes.

Could I get another restroom break?

MR. COHEN: Want to stop for lunch?

THE WITNESS: That's up to you all.

MR. COHEN: I don't think we will be all that much longer. If you want to keep going.

Unless you all have a lot of questions yourself.

BY MR. COHEN:

Q. You are familiar with material safety data sheets, aren't you, sir?

A. Yes.

Q. Have you had any participation in the preparation of material safety data sheets since your employment or during your tenure of employment with Monsanto?

A. Yes.

Q. Anything to do with material safety data sheets regarding dielectric fluids containing PCB products or PCBs?

A. PCBs, yes, not dielectric fluids, specifically.

Q. Can you tell me which material safety data sheet for which years or during which publications were you involved?

A. I think it was the 1985 revision of the PCB MSDS.

I also reviewed the most recent, which I think was 1989, but I'm not sure.

Q. Would the 1985 MSDS have been the

1 first one that you would have been involved?

2 A. Yes.

3 Q. And what was it for? Exactly what
4 product was identified?

5 A. It was not for any product. It was
6 for generically for polychlorinated biphenyls.

7 Q. Did it identify a trade name?

8 A. In what sense? I mean, it
9 identified lots of trade names as alternative
10 names for PCBs.

11 Q. It identified a number of trade
12 names?

13 A. That's correct.

14 Q. Do you remember the trade names that
15 it identified?

16 A. Not all of them. Certainly Aroclor
17 was one, I believe. I believe Inerteen and
18 Pyranol were both mentioned. I don't know if any
19 of the other synonyms were listed or not. They
20 weren't listed as the product's title. They were
21 listed as snyonyms.

22 Q. Do you remember if any trade name
23 was identified as trades name?

24 A. No. MSDS is a requirement for
25

products that a company makes and Monsanto Company no longer makes PCBs. But we feel, and still feel, there is a need for a generic MSDS. So we may have a generic MSDS, but it's not the same as other MSDSs which have to be specific to a given product.

Q. In the course of working on the 1985 MSDS, did you review any of the prior MSDSs that Monsanto had prepared for PCB products?

A. Yes.

MR. COHEN: Let me show you an Material Safety Data Sheet that has been previously produced in this litigation.

Mark this, please.

- - -

(Material Safety Data Sheet marked as Kaley Exhibit 5 for identification.)

- - -

MR. COHEN: Actually, it looks like it has something attached to the back. We can probably tear off the last two pages.

Remove the last two pages from the document.

MR. COX: Off the record.

(Discussion held off the record)

MR. MALIN: Is this part original?

(Discussion held off the record)

THE WITNESS: The tests are
different documents.

BY MR. COHEN:

Q. They are different. Tell me about
what we have marked as K-5?

A. Are we back on the records?

Q. Yes.

MS. DUGGIN: One quick question.
Kaley-5, is all that except 9415?

MR. COHEN: He is now explaining.
He says they are different documents. He's
explaining it. And he is going to explain
it now.

BY MR. COHEN:

Q. Go ahead.

A. The first two pages appear to be a
document from May 1971, and the Material Safety
Data Sheet for Aroclor 1248.

Q. Well, the first page?

A. I mean, I guess the first page is
Aroclor 1248.

The second page says, Aroclor 1221.

I would assume it's yet another document. I don't know there is anything on here that specified themselves as a Monsanto document either with the first two pages as Monsanto documents.

The last three pages of the document 2817 -- 2824 and 2818 I would assume -- obviously, both the last two pages, one is Page 3 of 5 and one is Page 3 of 4. So they are obviously from different documents, also.

So I would say that that is a five-page compilation of at least four different Material Safety Data Sheets.

Q. Let's look at the page that is 2824.

A. Okay.

Q. Do you recognize that as being a Monsanto document?

A. It certainly appears to be one of the Material Safety Data Sheets that I'm familiar with from Monsanto, yes.

Q. But can you tell us, as you sit here today, what year it is from?

A. I cannot, no.

Q. Do you see the third full paragraph

on the fire and explosion, "PCBs in electrical equipment have been reported"?

A. Yes.

Q. Do you know what that is referring to?

A. Well, it's referring to the potential for the formation of reporting on reports of the potential for formation of dioxin and furans from PCB electrical fluids in fires. PCB fires.

Q. Do you know specifically what type of reports they are referring to?

A. There is a variety of reports. I would guess that is probably either the '85 or the document because I probably wrote that -- actually wrote that paragraph. There is Government reports as well as literature reports.

Q. Does Monsanto maintain any document repository which contain reports such as you apparently referred to on that page in that paragraph?

A. I don't know, specifically. I mean, these kinds of reports are in any library. I have some in my files.

Q. Let's put that aside.

Let me show you another document that has been previously supplied in this litigation. It is Pages 9 through 11 of a longer document. See if you can identify it for me?

MR. COHEN: Mark it as K-6.

- - -

(Three-page document marked as Kaley Exhibit 6 for identification)

- - -

THE WITNESS: I have no recollection of ever seeing that document.

BY MR. COHEN:

Q. So, you don't recognize it?

A. That's correct.

Q. Do you know what the AOAC is?

A. Yes, I do.

Q. What is it?

A. It is the Association of Official Analytical Chemists, I believe is the proper name of the organization.

Q. Since you don't know the specific transformers or dielectric fluids sold for transformer fluid for use at the Paoli Rail Yard,

1 what would you have to do to tell me about the
2 chemical makeup of PCB fluids that could have been
3 used at the Paoli Rail Yard?
4

5 MR. MALIN: I'll object to the form
6 of that question. It is vague and it is
7 also hypothetical. It's appears to be
8 hypothetical.

9 MR. COHEN: Nothing hypothetical. I
10 am trying to find out from the witness who
11 would have knowledge to be able to tell me
12 to answer that question.

13 THE WITNESS: My answer is I suppose
14 it depends on what you want to know.

15 BY MR. COHEN:

16 Q. Well, if I wanted to know what the
17 chemical makeup was, that is, what chemicals were
18 used and in what percentage to make the dielectric
19 fluid, what would you have to tell me?

20 A. I would have to know what the
21 particular products were, both their trade name
22 and numerical designation, and I would have to
23 have some information as to the chemical makeup of
24 those products like the specification sheets I
25 have shown earlier. Taking those to be

representative of things, then I suppose I could answer the question.

Q. If I were to ask you strictly with respect to Monsanto products that could have been used at the Paoli Rail Yard, could you do that as you sit here today?

A. I think so. I mean, I guess it depends. I'm not sure what question you want me to be able to answer.

Q. Can you tell me the percentage, either by weight or quantity of chlorine, for example, in Aroclor 1242?

A. Yes.

I mean --

Q. That heat remained constant?

A. Are you talking about free chlorine or bound chlorine?

Q. Bound?

A. Boundary, they're on average 42 percent.

Q. So, in other words --

A. Very close to that.

Q. -- you would just recite for me the percentages that have appeared in the publications

1
2 that have been produced similar to the one that we
3 looked at here earlier today regarding the GE
4 material?

5 A. Well, I mean, the products are
6 made -- the numerical designation represents the
7 percentage of chlorine in that product. It is
8 probably not 42.000 percent; it is probably 41 to
9 43 percent on any given batch.

10 Q. How does Monsanto know that?

11 A. I suppose they test for it. It is
12 partly the process used, and then there are tests
13 you can -- you test for specific gravity of the
14 product or there are specific tests to actually
15 measure the chlorine content. I do not know, as I
16 sit here. Monsanto may have done that on any
17 particular batch to verify that.

18 Q. You said I suppose and may have.

19 Do you know if Monsanto did such
20 testing?

21 A. I do not know specifically, no.

22 Q. So the consequence is you can't tell
23 me if they did test and on what frequency they did
24 test?

25 A. That's correct, I cannot.

Q. And apparently, there were at least two plants that manufactured dielectric fluids prior to 1971?

A. There are two plants that manufactured PCBs.

Q. Where was the dielectric fluid manufactured?

A. Well, I mean, some of the PCBs went to the dielectric fluid. Some of the PCBs went to other applications. I don't know that we specifically manufactured PCBs that were only for dielectric fluids.

Q. Do you know how many plants manufactured dielectric fluids?

MR. MALIN: He's just answered your question.

MR. COHEN: No, he hasn't. He just told me about PCBs. He said there are two plants that manufactured PCBs; is that correct?

THE WITNESS: That's correct.

BY MR. COHEN:

Q. In what form does the PCBs come out of the end of the production plant? Is it a

1 solid?

2 A. Depends. It can be from a fairly
3 free-flowing liquid to a very viscous liquid;
4 almost a solid.
5

6 Q. So, is it always manufactured in
7 liquid form?

8 A. I will say the answer to that is
9 yes.

10 Q. Now, prior to 1977, how many plants
11 did Monsanto operate that manufactured dielectric
12 fluid containing PCBs?

13 A. Well, since you did not like my
14 answer, I assume you're trying to make a point
15 which I don't understand.

16 Monsanto made PCBs in two plants,
17 both dielectric. PCBs from one of those plants
18 probably found their way -- some of those PCBs
19 into dielectric fluids.

20 MR. MALIN: I am going to object.

21 This witness is not qualified to determine
22 exactly where PCBs went or where they were,
23 if they were blended with other liquids to
24 make dielectric fluids, if they were.

25 BY MR. COHEN:

1 Q. You don't know. You don't know
2 where the dielectric fluid was manufactured?

3 A. I assume it was manufactured at both
4 plants. I mean --

5 Q. Is that an assumption on your part?

6 A. I mean, I know it was manufactured
7 -- I mean, I don't know what you mean by
8 dielectric fluids, I guess, as opposed to Aroclor
9 fluids in general.

10 Certainly there was blending done,
11 as Mr. Malin has pointed out, at Krummich. I
12 don't know if that was blending done at Anniston
13 or not. There was certainly blending done at
14 Krummich.

15 Q. Your Aroclor product with the number
16 such as 1242 or 1248 or 1260 was, as you
17 considered it, strictly a PCB product and not a
18 dielectric fluid?

19 A. It could have been used as a
20 dielectric fluid. Dielectric fluids were pure
21 PCBs.

22 Aroclor 1242. Certainly Aroclor
23 1242 or 1254 or any of the others were pure PCB.

24 Q. And it was that form that the
25

product was manufactured, Aroclor 1242, 1248, 1254, 1260?

A. That's correct.

Q. And it was then sold for use as a dielectric fluid?

A. That's correct. Some of it was.

Q. The PCB fluid was manufactured as a PCB fluid which then was used by the consumer as dielectric fluid --

A. That's correct.

Q. -- or in the case of products mixed by General Electric Company, it was sent to them in that form 1242, 1248, 1254, 1260. They mixed it with another product and sold their product?

A. In some cases that's true. In some cases Monsanto did blending to the customer's specifications, but it was always done in that sequence.

Q. So the product, PCBs, as Aroclor 1242, 1248, 1254, 1260, is synonymous with the dielectric fluid called Aroclor 1242, 1248, 1254, 1260; it is one and the same thing?

A. That would be my understanding as you were using the terms, yes. If there is

1 something more, it would not have been called
2 Aroclor 1242. It would have had to have been
3 designated in some other manner either by customer
4 trademark or some other thing.
5

6 Q. Did Monsanto manufacture a
7 dielectric fluid that was not pure PCBs?

8 A. We blended fluids to make dielectric
9 fluids that were not pure PCBs. I don't know if
10 that's what you mean by manufacture.

11 Q. Fine.

12 What was that product called?

13 A. We sold it under our customers'
14 trademarks is my understanding. There are
15 Pyranols and Inerteens, which were, in fact,
16 blended by Monsanto and shipped from our plants
17 and there may have been others. I'm picking on
18 those two because they are the most familiar to
19 me.

20 Q. So in that case, the customer, now
21 speaking of General Electric Company, would have
22 asked you to do the blending of the product and
23 you did?

24 A. That's my understanding, yes.

25 Q. To your knowledge, did General

Electric blend any of the products on their own?

A. Yes. My understanding is that they did.

Q. So they bought product such as Aroclor 1242, 1248, et cetera, took it to their plant where they blended the product and sold it, as you said, under their name?

A. That's my understanding, yes.

Q. Any other customers do that?

A. I think Westinghouse did. I assume any of them could have. I don't know.

MR. COHEN: I have no further questions for that witness. That is not to say that I am not going to refile a request to the court upon receipt of this transcript that Monsanto identify and produce other witnesses in compliance with Discovery Order No. 1 and specifically Paragraphs 2(d) and 2(e) based upon this witness' testimony.

MR. MALIN: Whatever. I guess that's it.

- - -

(Deposition concluded at 2:25 p.m.)

- - -

C E R T I F I C A T I O N

I hereby certify that the
proceedings and evidence noted are contained
fully and accurately in the notes taken by
me on the deposition of the above matter,
and that this is a correct transcript of the
same.


McKinley Wise, RPR
- - -

(The foregoing certification of this
transcript does not apply to any
reproduction of the same by any means,
unless under the direct control and/or
supervision of the certifying reporter.)
- - -

LAWYER'S NOTES

[illegible]

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LAWYER'S NOTES

Page	Line	CORRECTION	REASON
18	3	"polychlorides" should read "polychlorinated"	Editorial
34	17	"chromatic" should read "chromatographic"	Editorial
47	13	"clorphens" should read "Clophens"	Editorial
52	19	"PCPD" should read "PCDF"	Editorial
54	15	"DTE" should read "DDE"	Editorial
55	23	delete "James W."	Editorial
63	4	"Scientist" should read "Sciences"	Editorial
74	22	"tetrachorated" should read "tetrachlorinated"	Editorial
76	11	"all" should read "suitable"	Editorial
83	17	delete "home"	Editorial
85	14	"Prospectus" should read "Perspectives"	Editorial
120	20	"A subcontractor" should read "Someone"	Editorial
161	20	"Boundary" should read "Bound"	Editorial

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