

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	No. 78 C 1004
	)	
OUTBOARD MARINE CORPORATION	)	
AND MONSANTO COMPANY,	)	
	)	
Defendants.	)	

The continued deposition of DR. WILLIAM R. RICHARD, JR., called by the Plaintiff for examination, pursuant to adjournment, and pursuant to the Rules of Civil Procedure for the United States District Courts pertaining to the taking of depositions, taken before Thea L. Urban, a Notary Public in and for the County of Cook, State of Illinois, and a Certified Shorthand Reporter of said State, at the offices of Kirkland & Ellis, 200 East Randolph Drive, 59th Floor, Chicago, Illinois 60601, on the 16th day of January, A.D. 1981, commencing at 9:30 o'clock a.m.

PRESENT:

MS. ELIZABETH STEIN,
(Pollution Control Section
Land & Natural Resources Division
Department of Justice
Washington, D.C. 20530),
and

COPY

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PRESENT: (Continued)

MS. M. KAYE JACOBS and
MR. GEORGE PHELUS,
(Water Enforcement Division
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604),

appeared on behalf of the United
States of America;

MS. ROSEANN OLIVER,
(Phelan, Pope & John, Ltd.
30 North LaSalle Street
Chicago, Illinois 60603),

and

MS. JOANNE NEW,
(Martin, Craig, Chester & Sonnenschein
115 South LaSalle Street
Chicago, Illinois 60603),

appeared on behalf of Outboard Marine
Corporation;

MR. JAMES H. SCHINK and
MR. ROBERT SHAPIRO,
(Kirkland & Ellis
200 East Randolph Drive
Chicago, Illinois 60601),

appeared on behalf of Monsanto Company.

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I N D E X

WITNESS :

Direct

Cross

Redirect

Recross

WILLIAM R. RICHARD, JR.

By Ms. Stein

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By Ms. Oliver

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By Mr. Schink

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E X H I B I T S

Richard-Plaintiff Deposition
Exhibit

Marked for ID

No. 9

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Richard-OMC Deposition Exhibit

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CERTIFIED QUESTIONS

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W I L L I A M R. R I C H A R D, J R.,
called as a witness herein, having been previously
duly sworn, was examined and testified further as
follows:

DIRECT EXAMINATION (Resumed)

BY MS. STEIN:

Q Could you please tell us who was your pre-
decessor as the Manager of Research and Development
in the Functional Fluids Group?

A Tracy Patrick.

Q Was that Mr. Patrick?

A Dr. Patrick.

Q Doctor, do you know if he is still employed
by Monsanto?

A He is not. He retired.

Q Do you know where he has gone?

A San Diego.

Q Do you know how long he was in the position
of Manager of Research and Development of Functional
Fluids Group?

A No.

Q Do you have any approximate idea of the
length of his tenure?

A He was part of Petroleum Additives Group

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and I'm not sure how long Tracy had that job.

Q More than a couple of years, do you think?

A I am just not certain.

(Richard-Plaintiff Deposition
Exhibit No. 9 marked for
identification, 1/16/81, TLU.)

BY MS. STEIN:

Q Dr. Richard, I show you what has been marked
as Richard-Plaintiff Deposition Exhibit No. 9 for
identification and ask you if you recognize that
document?

A Right.

Q On the first page of this document is a
little note. Is that your handwriting?

A Yes.

Q Who is Elmer?

A That is undoubtedly Elmer Wheeler.

Q Had he asked you to prepare the document of
the type that is accompanying this notation, from the
desk of William Richard?

A Presumably.

Q Do you remember at all what prompted you to
prepare this particular document?

A No, not specifically.

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Q Generally, could you tell me what it was that prompted you to prepare this document?

A I guess we wanted to gather our thoughts and see what we should do.

Q Did you consult with anyone in the preparation of this document?

You did prepare the Defense of Aroclor Functional Fluids document which is six pages and appended to this little note from the desk of William Richard, did you not?

A Right.

Q Did you have any special help to prepare this document?

A No.

Q Did you consult with other people at all in the preparation of this document?

A We had previous contacts, which you have explored.

Q What I am asking is the names of the people that you consulted to gather the information that is in this document, and we can go through it paragraph by paragraph.

Did you develop this general policy which is referred to on the first page?

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A The consultations, if there were such that it was no formal consultations, that would be from conversations which we had, for example, at the Industrial Bio-Test Laboratories with consultants that we have named, the Medical Department, possibly some of the marketing people have been named and the analytical people.

Q Was it normally your responsibility to prepare a document of this nature, a defense of a particular product?

A It is normal in research to try to plan ahead on a what if basis, in order to try to see where the research should go, what has to be done, what kinds of things have to be tested.

I think you do the same sort of planning. They are all what if questions, what if this happens, what if that happens.

Q I am not sure that is responsive. I am asking if it is normal to prepare a document in defense of a particular product or series of products in your function as Manager of Research and Development of the Functional Fluids Group.

A It may be to plan a new product in which case you could call it an offense into a new area for

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product development.

Q I will ask the question again:

Was it a normal part of your duties as Manager of Research and Development at the Functional Fluids Group to prepare the document or documents in support of a specific product or product line?

A I think the answer is yes, if it were called for, if it were needed.

Q With whom would you consult in preparing, by title, this defense? Did you make the legal findings, did you make the medical findings, did you make policy decisions on profits?

A No.

Q Yourself?

A No. The answer is no. The answer is this document does not represent the position of Monsanto or even the business group at this particular time. This is a planning document on the part of the Research Department.

Q Did you review this document before you came in here today?

A I looked at it yesterday.

Q Did you look at it yesterday evening after the deposition?

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A No.

Q Did you look at it at lunchtime?

A I did not.

Q What time of day did you look at it?

A I looked at it the previous day.

Q What was the purpose in sending this document to Mr. Wheeler?

A Apparently Elmer had asked for a summary of what the Research Department would probably need to do.

Q Had you promised to get it to him by a certain time or date?

A The note on the first page would indicate that.

Q Had he indicated that he was in some hurry for a document of this sort?

A I can't be specific, no.

Q Is that your handwriting on the top of the page which has the numbers marked down in the bottom, 0001077?

A I don't believe it is.

Q Do you recognize that handwriting?

A I do not.

Q Could you explain what you meant by making

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"the Government, State and universities prove their case," in the first line of the first paragraph?

A Yes. We didn't have the resources to do environmental sampling and the point of issue is how widely spread was the chlorinated biphenyl in the world and so the purpose was to let them go ahead and to do it.

We didn't have the resources to make that sort of case. I don't think that the word case refers to a legal case here.

Q What was the basis for the statement, the first statement on the bottom of the page under the heading "Probable Outcome: We can prove some things are okay at low concentration"?

I would like to know what things you thought would be okay and at what concentration levels.

A I think things would refer to either products or situations or functions.

Q What products?

A They would be Aroclor-containing products.

Q All Aroclors or Aroclor in a specific way, sealers?

A I don't know at this stage.

Q What about Aroclor 5460?

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A Remember this is a speculative document. I don't have all the facts in front of me.

Q What research did you do in order to develop this document?

A The research which we had accomplished up to that time. It was mostly analytical work.

Q Under whose direction?

A Dr. Keller. It was in part talking with consultants. It was in part gathering information from the universities and people who had worked on the problem outside our direction.

Q Did you talk with the marketing people in developing this document?

A I think probably the only person I consulted directly was Mr. Davis.

Q At the time he was product specialist for Pydrauls?

A He had approximately that title. Whether it was exactly that, I'm not sure.

Q Did you talk with anyone in the manufacturing group about it?

A That is possible. I can't recall for sure.

Q Let me back up a minute to the first page which is marked 0001076.

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You have written: "I promised a draft committee review before I left on vacation."

What was the committee to which you are referring there?

A I can't recall. There was a formal committee. It might have been an informal committee.

Q What would be the titles and names, if you remember, of the people who were on the committee?

A I don't remember.

(Mr. Featherstone entered the deposition room.)

BY MS. STEIN:

Q For what purpose was the committee established?

A I'm sure it was to collect information on Aroclor.

Q What kind of information?

A To find out what was happening outside Monsanto, find out what the analytical results were, find out what was happening in Ruabon, find out what was happening in terms of biodegradation work.

Q Would this have been the same committee as the Corporate Management Committee?

A No.

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Q What was the Corporate Management Committee?

A I'm not certain, but it certainly wasn't the committee here that I referred to.

Q Are you stating that you don't remember what this committee was exactly or who was on it?

A It was not a formal committee setup. I don't think I had any definite name and I don't remember any formal membership of such a committee.

Q Who were the informal members of the committee then?

A It would be Mr. Wheeler, probably Dr. Keller, probably Howard Bergen. It appears that I might have been, Paul Hodges and Martin Farrar.

Q Who is Paul Hodges?

A A man who has an environmental-type job with a manufacturing organization. I don't know his exact title.

Q This was in manufacturing components of the functional fluids group?

A No, it would be in the Organic Division, I would think.

Q Did he have responsibility for certain kinds of products in the manufacturing group?

A No, I don't think so. I think it was more

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of a staff job.

Q Do you remember the kind of responsibilities he had? Was it public relations or quality control or specific --

A I can't define his job exactly.

Q How did you perceive his job to be? Why would you have contacted him or put him on this list?

A Because he might know something about environmental regulations, I would think.

Q Did he have a legal background?

A No.

Q Do you know what kind of a background he had?

A Probably a chemist or chem engineer. I don't know his background.

Q Would he have been involved in preparing documents for submission to Government agencies?

A It is possible.

Q What I am trying to get at is what prompted your statement that he might be familiar with environmental regulations.

A Yes, he might have prepared regulatory statements. I don't really know.

MR. SCHINK: You don't have to speculate.

BY MS. STEIN:

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Q Who is Martin Farrar?

A He was the Manager of Research for the Plasticizer Group.

Q How long was he in that job, do you remember?

A A number of years.

Q Do you have any --

A Still is.

Q He still is?

A Yes.

Q What does the Res. 1 next to his name mean?

A It is the address, Residence 1, probably.

Q What is his educational background?

A Ph.D. Chemist.

Q Was he involved in developing policy with respect to Aroclors or were you?

A Only with regard to research policy, if there was such a thing. He had the same job I did, to try to lay out research for the plasticizer group.

Q On the bottom of the page numbered 0001077, you have written:

"Therefore, we will have to restrict uses and clean up as much as we can, starting immediately."

What was the basis for that statement

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and with whom did you consult before you wrote that statement?

A I don't think I consulted with anyone directly before I wrote that statement. It was a feeling that I had that we might have to do such a thing.

Q What kind of uses were you talking about restricting?

A I don't think I had any specific cases in mind.

Q Are you talking about open systems as opposed to closed systems?

A I don't think I was even that specific with this.

Q Do you know what kinds of uses were made of the various Aroclor products?

A Yes. I had a general notion of ideas, you know, where they were, what functions they were being used in. Yes.

Q Could you tell me what your general idea of those uses was?

A Aroclor was used in the plasticizer area, first for NCR paper, the carbonless paper.

It was used as a plasticizer in various

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plastic compositions, especially where resins and fire-retardant properties were required.

It was used in sealants and I think it was used in melt adhesives.

In the functional fluids area, it was used in certain Therminol products. It was used in Pydraul industrial hydraulic products. It was used in Pydraul air compressor products.

It was used as a dielectric fluid, capacitors and transformers.

Q Are there any other uses you can think of, if you remember them?

MR. SCHINK: We have been over all this yesterday. It is all repetitive, Ms. Stein. Perhaps we can get on to something new.

BY MS. STEIN:

Q What did you mean by clean up as much as we can?

A Just that.

Q Could you be more specific?

A No.

Q Clean up what uses?

A No.

Q Was any action taken to clean up as much

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as we can, starting immediately?

A I think Monsanto took steps to make sure that their manufacturing operations, drumming operations, handling operations were as tight and satisfactory as possible, and I think that this was spelled out in directions to the manufacturing plant by Mr. Papageorge.

Q Did you ever see copies of those directions to manufacturing plants?

A I would think they went directly to manufacturing. I might have been copied in, I'm not sure.

Q But you know that in fact they were prepared and circulated?

A I know that the plants had objectives to make, sure, that Aroclor was not leaving the plant.

Q Do you know when those would have been prepared, the year?

A I can't tell you.

Q Do you know which plants received this directive and where they are located?

MR. SCHINK: He said he wasn't sure that they did receive those directives. I don't think this is relevant to the litigation anyway, in any event.

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BY MS. STEIN:

Q Will you please answer the question?

A I think the one plant is William G. Krummrich.

Q Were there any others?

A There was a plant in Anniston, Alabama and I'm not sure whether it had been shut down by this time or not.

Q On the following page which is marked 0001078, you have written:

"Clean up Aroclors and substitute products where necessary and when required before threats of publicity and competitive activity overwhelm us."

Could you define for me the criteria that went into your statement, "where necessary"?

A Well, I didn't know what would develop and so it is just a general statement.

Q What do you mean by "when required"? What were the criteria, required by what?

A Again, I don't know when it would happen because I don't know what would develop.

Q What was the competitive activity that you were referring to there?

A It would be other products.

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Q Could you name some of those products and who manufactured them?

A There were --

Q Did you have specific ones in mind?

A Yes. There were no replacement products available for the dielectric area. I'm not sure about any replacements in the plasticizer activity.

There were no products available for NCR paper. There were phosphate ester fluids in the industrial hydraulic area, all-phosphate ester now.

Q Could you name those phosphate ester fluids and who produced them?

A No.

Q Were these Monsanto products or were they manufactured by other companies?

A They would be manufactured by other companies.

I think we should also add that they did not have the same characteristics as the Pydraul fluids which we were selling in terms of fire-resistance, in terms of hydrolytic stability, in terms of heat, in terms of safety.

Q What kind of safety do you mean, fire ignition?

A Fire ignition and ability to run machines at

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certain temperatures.

Q What was the basis for your statement, "Water pollution seems to be first issue"? Did you have any particular facts or circumstances in mind which led to that statement?

A Just the appearance of Aroclor in fish which were where the analyses showed the polychlorinated biphenyl to be.

Q Excuse me. I would like to back up for one minute.

When we were talking a moment ago about the substitute products and you said no products were available, did you mean there were no products available through Monsanto?

A No, I meant no products, period.

Q You have written, "Water pollution seems to be the first issue."

Was there any action which you took or recommended to try to further define the problem or to control it?

A We tried to find the presence of Aroclor and we tried to define what components of Aroclor were causing problems.

Q By trying to find Aroclors, are you referring

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to the studies that you discussed yesterday, the WARF studies or Risebrough studies?

A I am also referring to the Monsanto work.

Q Could you specify what work that was?

A Yes. We did limited sampling of water.

Q In what areas?

A Analytical work. I can't be specific.

Q Do you remember any specific areas?

A I would think that we sampled some in the Great Lakes. I would think we sampled some in the rivers.

Q Could you name the rivers?

A Probably the Mississippi. I don't know what other rivers we looked at.

Q If you did do that sampling, would that data still be at Monsanto?

A I would think so.

Q Would it be in the Research Department of the Functional Fluids Group?

A It is possible.

Q If it would not be there, where would it be, in the library?

A Wherever the records are kept, the Record Center.

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Q Monsanto has a Record Center?

A Yes.

Q Where is it located?

A I couldn't tell you, the Technical Reports Library is in the Technical Research Center.

Q But Monsanto also has a Record Center?

A Maybe the same, I'm not sure.

MS. JACOBS: Could I interject?

Who would have been in charge of that sampling, if you recall?

THE WITNESS: The analysis would have been done by Keller. The sampling itself, I don't recall.

BY MS. STEIN:

Q On Page 0001080, you have written "be able to replace Aroclor 1254 and Aroclor 1260 in Pydraul AC and 625 in two months' time before November 15, 1969."

Why did you choose those two products? And why did you choose that particular date?

A The product is we wanted to get rid of the higher chlorinated biphenyls and we wanted to tackle the air compressor problem because of a direct injection into the compressor and a loss from the Pensacola plant.

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Q Monsanto cycling plant?

A Monsanto.

Q Did that plant manufacture chlorinated biphenyls?

A No.

Q Do you know what that plant manufactured?

A It made nylon, principally.

Q But it used Pydraul in its manufacturing operations?

A As part of a manufacturing operation.

Q Had there been discharges of Pydraul from that plant?

A Yes, there are discharges.

Q From that plant?

A Yes.

Q And into which water body?

A It would be Pensacola Bay.

Q Had Monsanto taken samples of those discharges?

A We didn't -- well, I don't know --

MR. SCHINK: You don't have to guess.

BY THE WITNESS:

A I don't know.

BY MS. STEIN:

Q Do you know who the manager at that time was?

A No.

Q Who is Mr. Fallon who is mentioned on this same page of documents?

A He was a marketing manager.

Q In the Functional Fluids Group?

A Right.

Q For what product or products?

A I think he had heat transfer and he had hydraulic fluids, and he may have had something else, but those two.

Q Had you discussed with him this action to suggest possible buy of all-phosphate ester from Food Machinery?

A I think not.

Q What was the basis then for putting that down as a course of action?

A Again, it is a question of trying to put alternates in a contingency plan which you may or may not have to implement.

Q Let me back up for one moment.

On the Gulf Coast segment of this document on the same page, "Be able to replace Aroclor 1254 and Aroclor 1260...before November 15, 1969,"

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who was it who established that date?

A I was guessing. I didn't know whether we could do it or not.

Sometimes you set targets and sometimes you are able to meet them and sometimes you are not.

Q What was the criteria that you used for setting that as a target date?

A Just pick a date.

Q Did you consult with anyone before you picked that date?

A I doubt it.

Q Farther down in that same segment of this memorandum, I assume the name in the left-hand column under the heading Action, that was the person that was responsible, is that correct?

A That might be responsible. Remember, this is a might, what if document.

Q Under that same heading, "Suggest possible substitution of Aroclor 5442 for Aroclor 1254 in hydraulic and compressor blends."

What was Aroclor 5442?

A It was a terphenyl with a 42 percent chlorine.

Q Further down in that same paragraph, you mention you have to test the product in pump test for deposits.

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Was that testing that you suggested be done?

A Again, it is a contingency plan. We would have to test the product if we went ahead with it.

Q Did you go ahead and substitute Aroclor 5442 for Aroclor 1254 in hydraulic and compressor blends?

A It didn't work out. Again, it shows 5442 and it didn't work out.

Q How didn't it work?

A Too high of viscosity.

Q Farther down on the same page --

A I think it is important that this illustrates that this is a contingency plan.

Q I haven't asked a question.

MR. SCHINK: I think the witness was trying to complete his answer to the last question, Ms. Stein.

MS. STEIN: I don't think he was. I think it was an additional comment that was not responsive to a particular question.

BY MS. STEIN:

Q Further down on that same page under the heading Inland-Waterways, you have written, "Be close enough to Great Lakes studies to judge situation."

Could you please tell me which Great

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Lakes studies you were referring to there?

A Undoubtedly to the WARF studies.

(Mr. Featherstone left the
deposition room.)

BY MS. STEIN:

Q Are there any others of which you are aware?

A I think those are the only ones.

Q The next paragraph is, "Be prepared to
replace Aroclor 1254 and Aroclor 1260 in four months
in hydraulic fluids and in air compressor fluids."

Were you able to develop replacement
for Aroclor 1254 and 1260 for those uses you mention
there?

A I don't think we were able to do it in that
time frame.

Q Do you remember why you suggested four
months as the time frame?

A Again, I was too optimistic in setting dates
on the contingency plan.

Q On that same page, the final paragraph,
"Be prepared to replace all Aroclor 1242 or 1248 in
six months in hydraulic fluids. This means replace-
ment of Pydraul 312 series, and control of sale of
Aroclor 1248 to other hydraulic accounts such as..."

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Were there any names that followed after the word "as" there?

A It looks as though they had been deleted. I can't help you.

Q Do you remember any of the names?

A No.

Q What were the criteria that you used for deciding, for choosing the customers to whom there would be continued sales of Aroclor?

A I have no notion on this score. I wouldn't and didn't and shouldn't have chosen any specific customers.

Q Were you aware of any customers who did use Aroclor 1248 at the time that you used this --

A I know it was a 200, Pydraul A-200.

Q Do you know any customers who used Pydraul A-200 at the time you wrote this memorandum?

A Yes.

Q Was Johnson Motors one of those customers?

A Yes.

Q Was it you who deleted the rest of that paragraph on this page?

A No.

Q Do you know who did delete it?

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A No.

MR. SCHINK: But you know who deleted it, Ms. Stein, because we provided you with that information.

MS. STEIN: Yes, and there are also two pages which have been deleted out of this memorandum, 5 and 6.

MR. SCHINK: That is correct. You have been provided the index and the reasons for the deletion.

MS. STEIN: And the entire top of Page 7 has been deleted.

BY MS. STEIN:

Q Other than customer names, do you remember what else would have been on those pages, Pages 5, 6 and 7 --

A No.

Q -- Dr. Richard?

A I don't.

Q Could you give me a list of documents you went over before you came into this deposition?

MR. SCHINK: You don't have to answer that question. You are directed not to answer that.

MS. STEIN: All right.

Do you have any further questions?

MS. JACOBS: Why don't we take a break.

MR. SCHINK: Are you finished?

MS. STEIN: Yes.

MS. OLIVER: Before we go off the record, did you direct him not to answer what documents he looked at?

MS. STEIN: This is not on the record.

(Discussion off the record.)

(Brief recess had.)

(Richard-Outboard Marine
Corporation Deposition Exhibits
Nos. 10 through 22 marked for
identification, 1/16/81, TLU.)

BY MS. STEIN:

Q Dr. Richard, was there ever a final draft or any further draft of this document that you prepared?

A Not in Monsanto's, I didn't prepare.

Q I do not have access to the Monsanto files.

MR. SCHINK: If you recall.

BY THE WITNESS:

A No.

BY MS. STEIN:

Q Do you know if there was any follow-up on the suggestions that are presented in this document?

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A As far as research --

Q Yes.

A -- function?

Q Yes.

A Yes.

Q What were those steps?

A We continued to work on the biodegradability, continued to contact Ruabon, continued to follow the literature and reports from the outside, continued to seek replacements for the products as indicated.

Q Did you ever visit any of the Government biological laboratories?

A I think I was at the FDA.

Q Did you personally visit the FDA Lab?

A Yes.

Q Where is it located?

A Washington, D.C.

Q Do you remember when you went there?

A Not precisely.

Q Would it have been after this memorandum was written?

A I don't remember before or after.

Q Do you remember with whom you spoke when you went there?

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A Some of the analytical people.

Q Do you remember any of their names?

A No.

Q Do you know what project they were working on at the time?

A Yes, chlorinated biphenyls.

Q Did you remember whether there was any work published by those same people that you referred to?

A By the FDA?

Q Yes.

A No.

Q Just one further question from the text of the document itself.

On Page 2 under the heading Great Lakes, you wrote Aroclor 1254 will be found, with an exclamation mark.

What was the basis for that statement?

A It is my prediction based on the evidence from probably Widmark.

Q Following that you have Aroclor 1242 will be found, followed with a question mark.

What was the basis for that?

A I was trying to guess whether or not it would be found.

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MS. STEIN: Thank you very much. I have no further questions.

CROSS EXAMINATION

BY MS. OLIVER:

Q Dr. Richard, yesterday you outlined for us the organizational setup at Monsanto.

A Of what?

Q The organizational setup, how the divisions were set up.

A Not really.

Q What I would like to know is when you became the Research Director, Functional Fluids in the Organic Division --

A I was Research Manager.

Q Manager.

-- you said there was also an Inorganic Division.

What other divisions were there?

A In Monsanto?

Q In Monsanto.

A At that time?

Q At that time before the reorganization into MICC.

A I could give you a rough -- there was a

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Textile Division and there was a Plastics Division.

I don't know -- there was an Agriculture Division.

Those are the principal components, but there was probably a whole bunch of subsidiaries.

Q Was the Research Department for all the divisions?

A Was.

Q Was there a central research section that did research for all of the divisions in Monsanto?

A There was also a Central Research Department, but it didn't do work for all the companies.

Q The Research Center that you were located at --

A In what year now?

Q -- from '63 to the time of the reorganization.

A All right.

Q What divisions did the Research Center do work for?

A I worked in two locations: The Organic Division's laboratories, some of the Organic Division laboratories were out on South Second Street in St. Louis. And some were in Akron and some in Florida and there was a little increment at their Research Center at Creve Coeur.

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Q Where was the Research Department for functional fluids located?

A In '64 it was located on South Second Street.

Q In St. Louis?

A In St. Louis.

Q Did that location do all the research for functional fluids, research and development?

A They were moved and that function and Organic Research Department moved to the Research Center and I don't recall exactly the year, but those laboratories were then dismantled on South Second -- well, not occupied anyway, and was eventually torn down.

Q But there was one place that did all the research and development for functional fluids. It wasn't started in Dayton and there weren't plants someplace else?

A The principal research was done in St. Louis. It was done out on Second Street.

There was a period of time it was done in part at the Research Center, part on South Second Street.

We had fire test facilities on a farm in St. Charles which is close to St. Louis. It was

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all within, almost within a central geographic area, but not necessarily on one plant site.

Q Am I correct that before 1963 before you became Research Manager, you had no involvement or contact with hydraulic fluids or Pydraul fluids?

A That is correct.

Q Had you done any study or worked with chlorinated biphenyls before you went to the functional fluids group?

A I had not.

Q During the years from 1963 until 1967 or '68 when you became aware of Mr. Jensen's work in Sweden, were you involved in continuing research on the Pydraul fluids?

A Yes.

Q What type of research were you doing?

A We were formulating new fluids. We were trying to solve the lubricity problems, corrosion problems, solve erosion problems.

Q Would these problems be brought up by customers and they would eventually reach the Research and Development Section?

A Sometimes they would be initiated by the Research Department, sometimes by customers.

Q Until the time you became aware of Mr. Jensen's work, did you consider removing Aroclors from the Pydraul fluids?

A No.

Q Was there a pump company or a machine company that you worked with in testing your Pydraul fluids in the 1960s?

A We had our own pump test but on occasion we would have to work with an outside company if we didn't have a particular pump available.

Q Do you recall the names of any of those companies?

A Mr. Stark would be closer to that, but we did some outside testing on occasion. We didn't have the equipment.

Q In the early 1970s a specialty products group appeared. Do you know why a specialty products group was formed?

A I think it was the combination of, I believe that is when Paper Chemicals was added and they needed to name somebody besides Functional Fluids.

Q Did Functional Fluids then become Specialty Products?

A Not really. It retained its identity as

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part of it.

Q Who was in charge of the Specialty Products Group?

A I would say the Business Director was probably Howard Bergen.

Q You went over a little bit yesterday about what the business manager did.

A Business Director was the title, yes. I can't keep them straight either.

Q What were his duties or responsibilities?

A To organize the function as a business, to make it operate and if possible show a profit.

Q Did he coordinate the research and development and the marketing aspects of the fluid business?

A That was his function, one of his functions, sure.

Q Mr. Papageorge worked for Mr. Bergen in the late 1960s, early 1970s, is that right?

A Correct.

Q His position was sort of an environmental coordinator, is that correct?

A Yes.

Q Do you know when that position was created?

A I don't have the exact date, but '69, '70,

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along in there.

Q Do you know if it was created in response to the problems that arose with Aroclors?

A Yes.

Q Do you know what Mr. Papageorge's responsibilities were or what he was supposed to do as an environmental coordinator?

A Coordinate the activities of Research, Marketing, Manufacturing, with emphasis on the environmental aspects of those functions.

Q Was his responsibility limited to the Aroclor problems?

A I think anything in functional fluids, Mr. Bergen felt was his responsibility.

Q Did anybody work for Papageorge that you are aware of?

A I think during that period of time, I think the answer is no.

Q Has that position or department been expanded over the years?

A It has within Monsanto. It became a full function with a vice president; Monty Throdahl is the Vice President in charge of Environmental Affairs, whatever the title is.

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Q Do you know when that position was created approximately?

A No.

Q Was there one person who was given the job of supervising all the aspects involved of the Aroclor problem that came about?

A One person?

Q Yes.

A No.

Q But there was an informal type committee that worked on the problem?

A Yes, they tried to coordinate the thing but I'd say there was no one single person.

Q Who would make the final decision in taking the product off the market?

A Bergen would have to make a recommendation to his boss and what his boss had to do with it, I don't know; probably go up beyond that.

MR. SCHINK: You don't have to guess if you don't know who made the decision.

BY THE WITNESS:

A I don't know who made the decision.

BY MS. OLIVER:

Q You also mentioned yesterday the Commercial

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Development Department.

Could you tell me what that was?

A The function is to introduce new products to the marketplace where or when appropriate and Marketing was not in a position to do so and also their function sometimes was to perceive the need for new products in the market, if that were appropriate.

Q Was that department within the Organic Division?

A Commercial Development Department had a varied history. Sometimes it was big and strong and sometimes it was just part of a business group, maybe with one person or maybe one or two people. It varied.

Q But it was separate from the Marketing?

A It would normally have been, if it were given a title at all, it would normally have a Manager of Commercial Development or some title like that.

Q Did the person or persons who would work in Commercial Development go out and get customers or talk to customers?

A Get customers? They would sometimes talk to customers if there was a question and work with

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customers for trials. They are most effective when there wasn't a marketing group or marketing man when you want to test something in a new area, but you didn't have a regular marketing person.

Q I see.

As Research Manager of Functional Fluids, do you know whether once a product was marketed, such as Pydraul A-200, whether toxicity tests or other tests relating to the health aspect were done on the product?

A Would you state the first part of the question?

Q Once a product was marketed, would it be customary to have toxicity tests done after the initial testing in the marketing of the product?

A If that were appropriate, if there was a perceived need to do so.

Q But otherwise, it would not be continued to be tested?

A If no perceived need, the perceived need to be specific or it could be generated from the Medical Department.

Q Before Bio-Test came into the picture in about 1968 to do some testing on Aroclors, were

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Younger Labs the only testing laboratory that you were aware of that did toxicity testing?

A They did the normal routine acute but the Medical Department used other people, other labs and other locations and sometimes universities.

Q Mr. Wheeler would be able to tell us what they were?

A He would be in a better position to know that, to remember.

Q Dr. Richard, I would like to let you look at what we have marked as Deposition Exhibit No. 10 and ask you if you can identify that for us.

A Yes.

Q This was a memorandum written by you?

A Right.

Q Those are your initials on the page?

A Yes.

Q It is directed to Mr. Davis, is that correct?

A Yes.

Q In this memo, you advised Mr. Davis that the FDA has inquired of samples for Aroclor, is that correct?

A Yes.

Q And you asked him the question:

"Are we preparing ourselves and customers

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to minimize or prevent process, stream and air pollution?" is that correct?

A Correct.

Q You generally testified yesterday to your recollection of your question to Mr. Davis in his response which was marked as Exhibit No. 2.

Does that refresh your recollection as to what you were asking him or why you were asking him?

A Yes. I think Davis' letter or memo was in response to my earlier memo.

Q To this memo?

A Yes, the document yesterday was probably in response to this memo, Document 10.

Q Did you have a telephone call or written response by the FDA asking for samples?

A I had telephone calls from Glasgow asking for samples and I saw in the file that he had sent the letter, follow-up letter, Glasgow had sent one to Monsanto.

Q Why did you ask Mr. Davis whether Monsanto was preparing itself and its customers to minimize or prevent pollution?

A Again, a contingency plan, if certain events would occur or certain indications would be confirmed,

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we should be preparing ourselves to minimize the losses of Aroclor.

Q What event or occurrences did you possibly see occurring?

A It would have to be that the confirmation of polychlorinated biphenyls were actually out there, there would have to be confirmation of what the compositions out there actually were, would have to be confirmation that they didn't degrade fast enough for the environment to take care of it, would have to be confirmation of whether the losses were Aroclor and how they were being distributed in the world.

There would have to be confirmation of toxicity information, was Aroclor a hazard or wasn't it?

Q Did you believe that preparation had been made by Monsanto for itself and its customers to minimize or prevent pollution?

A If those things should occur, yes.

Q Do you know what preparations were being made by Monsanto?

A We were taking samples to test the assumptions and see whether they were valid or not.

Q Did you and Mr. Davis have any other discussions

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about what steps were being taken or could be taken to minimize or prevent pollution?

A None beyond what Mr. Davis responded to me.

Q Do you know if Mr. Davis or anyone else contacted any customers of Monsanto?

A To tell them, I can't answer.

Q You don't know?

A I don't know.

Q I would like to show you what we have marked as Exhibit No. 11, 12, 13 and 14 and ask you if you would, to just look at those.

Dr. Richard, Exhibit No. 11 is a letter to you from the United States Department of Agriculture, is that correct?

A By the note, yes.

Q And the Department of Agriculture is asking for samples of various Aroclors, is that right?

A Apparently, yes.

Q Do you recall any communications with the Department of Agriculture?

A No.

Q Were you getting any other communications during this time, June 3, 1978 asking for samples, that you can recall?

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MS. STEIN: Excuse me, '68 or '78?

MS. OLIVER: '68.

BY THE WITNESS:

A The only calls I really recall were Glasgow because he made two or three of them and there may have been other ones that came in, I'm not sure.

BY MS. OLIVER:

Q Exhibit No. 12, can you identify that briefly, Dr. Richard?

A I sent samples, apparently in response to the Blickenstaff letter, samples of Aroclor.

Q This letter is dated June 18, 1968, is that right?

A Yes.

Q Exhibit No. 13 is a memo directed to you, is that correct?

A Apparently, yes.

Q Who is the person whose name appears at the bottom of that memo, Dr. Richard?

A His name is Cumming Paton and he would normally be in Marketing.

Q Do you recall this memorandum at all?

A No, not specifically.

Q And the date of this memorandum is June 18,

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1968, is that correct?

A (Nodding.)

Yes.

Q Again, it is a request for samples from the U.S. Bureau of Commercial Fisheries this time, is that right?

A Apparently, right.

Q Mr. Paton states in the memo that they are studying pollutants in Lake Michigan and believe they have found PCBs.

Do you recall any communications with anyone, either in Monsanto or outside of Monsanto, concerning the U.S. Bureau of Commercial Fisheries about studies in Lake Michigan?

A I don't personally recall the conversation with the Bureau of Commercial Fisheries.

Q Did you have any conversations with anyone concerning your study?

A I don't recall that I did.

Q Exhibit No. 14 is a two-page letter and another letter attached to it. This was a letter from Mr. Glasgow of the FDA to you asking for samples, is that correct?

A Yes.

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Q The last page of the exhibit is your response to Mr. Glasgow, is that right?

A Apparently, yes.

Q That letter is dated July 15, 1968.

Did you have any further communications with any United States Departments, either written or oral, after sending them samples in 1968?

MR. SCHINK: Regarding chlorinated biphenyls or anything?

MS. OLIVER: Regarding Aroclors.

BY THE WITNESS:

A I visited the FDA laboratories once and we talked about some analytical methods, but that's about it. That is all I recall.

BY MS. OLIVER:

Q You do not recall discussing with anyone from the United States Government, any department, what their results of your samples were?

A What their results of the samples were?

I think this is a job that fell to Elmer Wheeler to keep track of, universities and laboratories and go visit them.

Q So you don't recall it?

A I might have gotten some indirect reports,

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you know.

MR. SCHINK: Do you recall any reports is the question.

BY THE WITNESS:

A No, I don't.

BY MS. OLIVER:

Q You do not recall any?

A No.

Q Did you have any inquiry from the United States Government or any department concerning whether you were doing sampling, whether Monsanto was doing sampling in finding Aroclors in the environment?

A No.

Q Did you have any inquiry from any Government agency concerning who you were selling your Aroclor products to?

A That inquiry wouldn't come to me.

Q You don't recall?

A I don't recall it.

Q Who would an inquiry like that go to?

A I think it would go to Marketing or the Product Director, the Business Director, I should say -- well, it might come to the Marketing Product Director or Business Director, I don't know.

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MR. SCHINK: You don't have to guess.

BY MS. OLIVER:

Q In 1968 or 1969, did you have any reason to think that the United States was going to put any requirements on the use of Aroclors?

A No.

Q Is that a subject that was discussed in any informal meetings among the people involved with the Aroclor problem?

A I think requirements were not discussed. What Monsanto was trying to do was to do the right thing as they perceived it and to avoid the necessity for regulation.

Q A concern of Monsanto also was not to lose the business they had acquired in the Pydraul area?

A Correct.

Q Yesterday we talked a little bit about A-200 and I think you told us that there were two different Aroclors: Aroclor 1242 and 1248.

Were there two different types of A-200, one with Aroclor 1242 and one sold with 1248?

A No.

Q Was it one A-200 that had both Aroclors in it?

A Yes.

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Q Was there a reason why it was formulated with two Aroclors?

A To get the proper viscosity and fire-resistance.

Q That made it different from the other Aroclor products, is that correct?

MR. SCHINK: Fluids are you referring to?

MS. OLIVER: The other, Therminol, Skydrol, Pydraul fluids.

BY THE WITNESS:

A Yes, it was different.

BY MS. OLIVER:

Q Were one of the reasons it was different because it had two Aroclors in it, is that right, Dr. Richard?

A Well, it was different because it was intended for a Pydraul hydraulic fluid and certain specific viscosity range that would work in hydraulic systems and have certain specific fire-resistance.

Q But the chemical formulation was different because it had two Aroclors. Do you understand what I am asking?

A It had two Aroclors in it.

Q Did Pydraul AC have two Aroclors in it?

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A I think AC had a combination of phosphate and probably, I cannot remember, but maybe one Aroclor. I don't know.

Q Did F-9 have two Aroclors in it?

A It had one.

Q Did 312 have two Aroclors in it?

A It had one.

Q Are you familiar with the formulation called A-200A?

A Yes.

Q Can you tell me what the composition of A-200A was?

A The composition was Santicizer 711, Santicizer 140 and Aroclor 5432.

Q When was that developed?

A In '70, introduced in '71, the '70-'71 period.

Q Why was that developed?

A To reformulate away from Aroclor 1242 and 1248 in hydraulic fluid.

Q Was that developed for A-200B?

A I am not sure about the composition in A and B, in A-200A and first is A-200B.

Q First there was A-200B?

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A Shouldn't have been. The composition of fluid that was marketed was the composition that I've given. Now, if it was marketed, if the one marketed was A-200B, then that is the composition I have given.

I would have to go back and look at the composition if it's A-200A --

Q But am I correct there were two different fluids?

A I would have to look, go back and look at the formulations.

Q You are not sure right now whether there was A-200A and A-200B?

A Apparently not. I thought there was only one fluid marketed.

MS. STEIN: May I ask for clarification?

On the fluid contained in Santicizer 711 Santicizer 140 and Aroclor 5432, was that A-200B?

THE WITNESS: I am not certain whether it was A or B now.

MS. STEIN: All right.

THE WITNESS: We have to look at the formulation.

BY MS. OLIVER:

Q Do you have a recollection that there was more than one replacement for A-200 marketed by Monsanto

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before?

A I am not certain of that.

Q Before it went to phosphate esters?

A I would have to look at the formulation and I think we would have to check back through the records.

Q Speaking of records, did you keep records of all correspondence you got while you were Research Manager?

A I kept records. Whether I kept every piece of paper, that is questionable.

Q Were records kept in the Research and Development Department according to fluid?

A Yes, often according to product, also sometimes according to function or sometimes according to base stock.

Q So there might be a file for Aroclor and there might be a file for hydraulic fluid and there might be a file for Pydraul?

A Possible.

Q How long were records normally kept in the Research Department?

A There is a record retention schedule and unless something unusual came up, that record retention is followed.

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Q Do you know what the schedule would be?

A It was a whole book on it.

Q How long have you had a record retention schedule at Monsanto?

A I cannot answer that.

Q Ten years or more than ten?

A I would guess, I don't have to guess. I don't know.

Q One of the documents that have already been marked, for example, Exhibit No. 13, the right-hand corner has a stamp on it that says, it looks like a circulation stamp.

You testified yesterday that this was not a stamp that you used.

A That is correct.

Q Do you know what department or what person would use a stamp like that?

A I don't know whose stamp it was.

Q Was that a stamp that would be used in the ordinary and customary --

MR. SCHINK: He doesn't know whose stamp it was.

MS. OLIVER: I am asking about the stamp itself, not whose stamp it was.

BY THE WITNESS:

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A I don't think it is any standard.

BY MS. OLIVER:

Q Have you ever seen a stamp like this before on documents other than relating to Aroclors?

A Never paid any attention.

Q Did you ever recall seeing a box that one of the items said Destroy?

A I don't know anything about that box or the stamp.

Q Were you ever given any documents that you were asked not to keep in your ordinary files?

A I kept no special files.

Q Were you ever given any documents that you were asked to throw out after you read?

A The only thing we've ever followed is the record retention file.

Q Do you recall today whether that book on record retention has as one of the subjects any substance about destroying documents?

A It is a question of retaining what you should retain and how long it should be retained.

Q Yesterday you talked a little bit about the biodegradation tests that Monsanto started in 1969.

A Right.

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Q Whose idea was it to start those tests?

A I think it was a combination of discussions of Industrial Bio-Test, possible discussions with Dick Baxter and myself; possible discussion from Widmark because of his findings.

Q Were you in charge of the program?

A I was paying for the program and yes, asking for the results.

Q Dr. Keller was doing the analysis, is that right?

A It was in his section.

Q That is right. When were these tests completed?

A They were continued, many tests.

You would have to ask Dr. Keller when he did the last one, but probably over an extended period of time.

Q You said that tests had not been run on non-soluble materials.

A I didn't say non. I probably said low solubility.

Q I am sorry, low solubility.

Why weren't those done?

A There was no perceived need to do that kind

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of testing.

Q Why not?

A People didn't believe these compounds were soluble enough to be present in the environment.

Q Did Monsanto continue these tests past 1971 or '72?

A You would have to ask Dr. Keller, but my guess is yes.

Q Did you and Dr. Keller ever reach agreement on what these tests showed?

A What they showed?

Q Yes, what were the results generally?

A We showed in the case of chlorinated biphenyls and biodegradation of lower chlorinated isomers. We also showed metabolism, same types of isomers.

Q What was the ultimate purpose for these tests? Was there a reason why they were being run other than to see if you could biodegrade Aroclors?

A We wanted to know what was acceptable in the environment and what was not, what was likely to be out there.

Q Did they tell you that?

A They gave an indication.

Q As a result of these tests, did Monsanto take

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any action with respect to what it thought was out in the environment?

A We took action to limit the sale and production of higher chlorinated Aroclors and to limit the production of those compounds and limit those applications that would show up in the environment.

Q Do you know how Monsanto took action to limit the sale of higher Aroclors?

A The exact mechanism would be by the Marketing Department's Business Directors and so forth.

Q Do you have a general knowledge of what action was taken to limit the sale?

A I have given my general knowledge of the replacement products. We replaced Therminol and starting in 1970 and continuing through '71, we replaced the NCR Aroclors in the paper applications and we replaced the Aroclors in the Pydraul AC fluids and we began replacement in the hydraulic area, did replace it in 1971, '72.

Q Do you know whether the facts that these tests were being done or the results of these tests were ever discussed with customers of Monsanto?

A You would have to ask Marketing.

Q You don't know?

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A I didn't have any direct contact or responsibility for contact with customers.

Q But in any indirect or general knowledge you might have regarding customers, you do not have any knowledge of that, is that right?

A I think you will have to get that information from the people that did it.

Q I want to make sure you have no knowledge, is my question.

A I don't have any specific knowledge of transmissions from, on particular customers.

Q Do you have any general knowledge of transmission of information to customers?

A Yes, I know that Monsanto notified all customers in a letter from Marketing.

Q How do you know?

A On the products.

Well, I knew a letter was going out to all customers that were using Aroclor or had products with Aroclor in them.

Q Do you know what the substance of that letter was?

A I don't know exactly what was in that letter, no.

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Q Were you asked to help prepare that letter?

A No.

Q Do you know who did prepare that letter?

A I know it went out under Marketing, probably Donald, Don Olson.

Q Do you have any other general knowledge of information to customers?

A General knowledge of customers, you have to be more specific.

Q Do you have any knowledge of a letter that went out, as you say?

A Yes.

Q By Mr. Olson, do you know of any other knowledge, know of anything that was done by Monsanto with respect to its customers and advising the customers of what was happening?

MR. SCHINK: You are now talking about results of biodegradation tests and these things?

MS. OLIVER: Yes.

BY THE WITNESS:

A No.

BY MS. OLIVER:

Q You mentioned yesterday that your biodegradation tests were run on sewer sludge in special strains.

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Special strains means what?

A I said that Professor Evans had provided information of Roabon, of special strains of microbes. I can't go beyond that.

Q Were you involved in the decision to take A-200 off the market?

A No.

Q Do you know who was involved?

A No.

Q Were you involved in any discussions with the Business Manager or the Marketing people on how to keep the Pydraul business?

A Not my function.

Q No, you were not?

A No.

Q Were you involved in any discussions between 1968 and 1972 on what to tell Monsanto customers of Pydraul?

A No.

Q Would that be Marketing, as far as you know?

A It should be Marketing and the Business Director.

Q Was all Pydraul proved by Factory Mutual for fire-resistancy?

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A Some of the earlier ones might have been approved by UL instead of Factory Mutual.

Q But to your knowledge, all the Pydraul fluids had approval?

A All later fluids were approved by Factory Mutual.

Q Do you know what Factory Mutual looked for in giving its approval or withholding approval?

A Principally fire-resistance.

Q Anything else?

A There may have been. I am not familiar with it.

Q Are you familiar with written call reports by sales people to customers?

A Yes.

Q Would you receive copies of those call reports?

A Often.

Q Often?

A Often.

Q Not as a regular matter?

A Yes, as a regular matter.

Q For every customer in Functional Fluids?

A Maybe not every customer. I read an awful

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lot or received an awful lot of call reports.

Q Do you know whether call reports were required to be written by the salesmen?

A You will have to ask Marketing.

Q You don't know?

A No.

Q Do you have any knowledge of any action that Monsanto took to remove Aroclors or PCBs from its own effluent?

A Yes.

Q When did that program begin?

A I don't know the specific date, but we've always tried, manufacturing always was concerned and as analytical methods developed, we kept pushing the concentration and so forth in the wastestreams down and down.

Q Would your department or your group do the analysis of the effluent with Monsanto's discharges?

A I think Applied Sciences did it usually. As methods were developed, I think probably control lab analysis took part of the load.

Q Control lab?

A Control labs, plant control labs.

Q Were you involved in developing a process to

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remove PCBs from the effluent?

MR. SCHINK: You are talking from any effluent?

MS. OLIVER: Monsanto.

BY THE WITNESS:

A From a water effluent?

BY MS. OLIVER:

Q Right.

A We looked at the adsorption of Aroclor on carbon and asked people at Dayton, the Dayton laboratory, to look at it on the adsorption of clay.

Q Who had you asked to try to do this adsorption method?

A I don't know. It's a pretty common sort of way to get impurities out of the water.

MS. STEIN: Excuse me. Is this adsorption or absorption?

THE WITNESS: I think it's a-d.

MS. STEIN: Thank you.

THE WITNESS: Adsorption.

BY MS. OLIVER:

Q Approximately when did Monsanto first look into this process for PCBs in its effluent?

A I don't have an exact date. It was certainly in '69, the '70 period.

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Q Was that process successful?

A Whether Aroclor adsorbed on carbon, yes.

Q Was the process used at the Monsanto plants?

A Adsorption was used on limestone at Anniston when that plant was running. Krummrich, I don't know.

Q Were Krummrich and Anniston the only two Monsanto plants to your knowledge that discharged PCB?

MR. SCHINK: I am going to object. I think the questions about general techniques for removal, I think wherever asked are relevant. Certainly Monsanto's plants and discharges, if any, are not relevant and I would ask you to move on to something else.

If you want to pursue that line, I will direct the witness.

MS. OLIVER: I think the area is relevant to the lawsuit.

MR. SCHINK: Well, we think there is a difference on that. Probably the way to proceed would be to go on to something else. Any detailed questions you would ask him about what happened at the Monsanto plants, we would object and direct the witness not to answer.

MS. OLIVER: Are you directing him not to answer that question?

MR. SCHINK: Would you read the question back?

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(Question read.)

MR. SCHINK: You can answer that question, if you know. It is a yes or no.

THE WITNESS: Repeat the question for me.

(Question read.)

BY THE WITNESS:

A The answer is no.

BY MS. OLIVER:

Q What other plants were there?

MR. SCHINK: At this point I am directing the witness. I think we are really far afield.

There has been a lot of questioning in this deposition that I realize it is the first deposition, but it has been rather far afield and I think we are beyond the point now.

MS. OLIVER: Certify the question, please.

BY MS. OLIVER:

Q Dr. Richard, to your knowledge were those adsorption methods or processes ever discussed with any customers of Monsanto?

A The customer contact is normally between Marketing and the customer. I did not discuss any.

Q You have no knowledge whether it was discussed or not by anyone else?

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A What time frame are you talking about?

Q The time you developed this process and once it was developed.

MR. SCHINK: Wait a minute. I am not sure there has been any testimony the process was developed. I think he said research looked into it.

BY THE WITNESS:

A Yes. There is no process. We looked into the adsorption of the material on carbon and got some numbers, but you have to take it further than that to call it a process.

BY MS. OLIVER:

Q Did you use the adsorption process at Monsanto on Monsanto's effluent?

A Anniston used a limestone pit.

Q Would that be used for water effluent, are we talking about the same thing?

A Yes, we are talking about the discharge at the Anniston plant.

Q To your knowledge, did a similar or that type of procedure that Monsanto found able to be used, was that procedure discussed with any of its customers who used Aroclors?

A I don't know.

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Q Can you tell me what the designation OS 95 means? Are you familiar with that?

A OS 59?

Q What does the OS designation mean?

A Silicate ester.

Q Would a designation like that be used for fluid that was proposed to be tested for marketing?

A The silicate esters were normally marketed as Coolenal, early designation, and maybe its early designation, and maybe developed from a number, a OS number.

Q That could be an early development number?

A It might be.

Q You are not aware that A-200 was referred to at some time in that time period as OS 95, are you?

A No.

Q Yesterday you discussed a little bit that you considered talking to two consultants, Dr. Mehler and Dr. Metcalf?

A Both cases, doctors, yes.

Q You had one meeting with Dr. Mehler and that was marked yesterday as an exhibit, your notes from that meeting.

MR. SCHINK: Wait. I don't think those were his

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notes. This was an exhibit.

MS. OLIVER: Notes from a meeting with Dr. Mehler.

MR. SCHINK: No, I don't believe that was the witness' testimony.

BY MS. OLIVER:

Q Do you recall meeting with Dr. Mehler in any event?

A Yes, at least once.

Q Do you recall meeting with Dr. Metcalf?

A Yes.

Q Do you recall when that was?

A Approximately '69.

Q What did you and Dr. Metcalf talk about?

A The problems of Aroclor in the environment.

Q Any specifics in that regard that you remember?

A We again laid out what we knew of the problem, production rates, past history, what had been reported in the literature; asked for his advice.

Q Did he give you any advice?

A Yes.

Q What advice did he give you?

A I'm not sure I can recall it all, but indicated he thought it was possible it was out there in

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the environment, probably that we should confirm analysis and analytical methods.

I'm sure he recommended toxicity testing on various species to find out whether it was toxic and if so, to quantify it within reason.

I am sure he recommended that we begin thinking about replacement products. I don't know whether he had any thoughts on incineration or not, but he might have.

Q Where was Dr. Metcalf located?

A He was at the University of Illinois and I think then he moved to California.

Q Are he and Dr. Mehler still around, do you know?

A As far as I know, both are alive.

Q Do you recall any other meetings with Dr. Metcalf or Dr. Mehler?

A No, there were only one or two laying out the problems; one maybe, possibly two.

Q Did they ever contact you again asking you what you were finding or how things were going, anything like that?

A Metcalf might have.

Q Do you recall anything specifically?

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A Metcalf was a consultant, had a consulting contract with Monsanto and I don't know to what period of time it extended, but he certainly could have been interested over the course of that contract.

Q What was his contract area?

A Environmental problems, I guess. I don't know. I would have to read the contract, you would have to read the contract. I didn't have the contract with him.

Q Who did he work with in Monsanto?

A I think the contract was high up as Throdahl.

Q Is Mr. Throdahl still the Vice President in charge of Environmental Matters?

A Right.

Q You mentioned the probability of incineration. Can you tell me what you looked into in that regard?

A Yes. We wanted to be able to destroy the waste, the industrial waste of the Aroclor and we did two things: We looked on the outside for those people in the liquid incineration waste business and there were a few, one or two people just getting started, and that was about '69.

And then we also contacted the John Zink and actually chose to, we ran tests at John Zink

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on the description of Aroclor and then signed a contract with them to build an incinerator for us to destroy chlorinated biphenyls at the Krummrich plant.

Q When did that go into operation, that incinerator?

A About 1971, maybe '72; the '71-'72 period.

Q Did it work to destroy biphenyls?

A Yes.

Q Is it still being used?

A No, it was shut down.

I don't know the year. I was not involved in the group at that time.

Q How would it work? Would you get a shipment of hydraulic fluid and throw it into the incinerator?

A You normally had to transfer from drums to holding tanks and then from holding tanks to a fixed pipe and control valves and so forth and then into a high-temperature special incinerator and then it was a special scrubbing for the outlet to absorb the 8 CL that was being generated. The Aroclors are degraded to things like CO2 and 8CL.

Q How high a temperature, do you know, to get destruction?

A It is a function of time and temperature.

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Incinerator temperatures are very difficult to measure exact temperatures. A CL product are 2,000 C. and above, something like that.

Q How long would they have to be in the incinerator?

A I don't know. The engineers have the times. There are some combinations of time and -- well, time and temperature and then you make measurements on the configuration of consistency so that you get the right kind, the right degree of destruction as high as possible.

There are over 99.99 percent, like that.

Q What was the cost of this incinerator, do you recall?

A No, I don't have the capital, no.

Q Who worked on this project besides you?

A Primary function was Central Engineering Department and the Manager of that function was Bob Kluntz.

Q He would be the person who would be able to tell us more about the process of incineration?

A Or the engineers that were concerned with the design. It would be a combination of Monsanto and Johnson.

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Q Do you know what Monsanto engineers were involved in the design?

A I know Art Peer was involved in the early negotiation, but whether he stayed with the project continually, I don't know.

Q Do you know if customers of Monsanto were told of this incineration process that was being developed and used by Monsanto?

MR. SCHINK: I don't think there has been testimony it was used by Monsanto or exclusively by them.

BY MS. OLIVER:

Q Let me ask you:

Did Monsanto use their incinerator at the Krummrich plant?

A Yes, it went into operation -- could you repeat that?

(Question read.)

BY THE WITNESS:

A I think you would get a good answer from Marketing on this subject.

BY MS. OLIVER:

Q Is your answer that you don't know?

A I don't know the specifics of it.

Q Do you know generally if any information was

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given?

A I don't know. The incinerator would burn Aroclor and Aroclor hydrocarbon combinations.

Q You also talked about some sampling that Monsanto did, limited sampling of water.

Do you know if that was done in connection with certain customers of Monsanto?

A I am not sure whether it was done with customers. I think we wanted to have some idea that what was being reported in the literature was maybe in agreement with our results.

Q Do you know how it was determined where to sample?

A I didn't make any of those determinations. I don't know.

Q Who did?

A I am not sure, I don't know.

Q Do you recall what the results of that sampling program were?

A We confirmed that chlorinated biphenyl was in certain of the waters sampled. I cannot give you specifics.

Q Was the work that was done by Dr. Keller in analyzing samples done under your supervision?

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A Not my direct supervision. You mean did I know it was being performed?

Q Do you know what he was doing and what he was finding and how he was supposed to do it?

A Yes, certainly in a general way I knew, yes.

Q Do you recall receiving results of those studies or analyses?

A I presume I should have received reports.

Q You don't have any specific recollection of what the results were or where they were, where the samples were?

A I said my recollection is Great Lakes, Mississippi River. Beyond that, I don't know specifically about where it was sampled.

Q When were those analyses completed, approximately?

A I don't know.

Q Did there come a point in time when you were convinced that PCBs were in the environment?

A Yes, gradually.

Q About when was that?

A I'd say '69 through '70, '71; all through there.

Q Were you also convinced that the findings

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were persistent in the environment?

A The findings were persistent?

Q Or that the Aroclor in the environment was persistent?

Do you understand?

A I think we came to believe what was indicated earlier, that the higher chlorinated isomers were persistent in the environment.

Q Just so we understand each other, what do you mean by persistent in the environment?

A We found that, Monsanto developed in '72, it went back and analyzed what products we had made since the start of production and Dr. Munch calculated what the composition should be out in the environment.

Q Who is Dr. Munch?

A He is a physical chemist who was in charge of the dielectric research work, work on dielectric fluids.

Q Was he in a similar position to you?

A No.

Q Did he work underneath you?

A He was a senior scientist and later a distinguished scientist, worked in fluids, actually out-ranked me in terms of certain grade levels and things

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like this.

Munch was in charge of dielectric fluids.

Q Dr. Munch went back and determined how much fluid Monsanto had sold?

A How much Aroclor and of the different kinds of Aroclor that had been produced by us. And he then calculated what you theoretically should find in the environment, the composition.

Q When did he do this study?

A I don't know exactly, but I know it was reported to the polychlorinated biphenyl, Government task force in, I think, '72.

Q Do you know who asked Dr. Munch to do this project?

A No, I think that he conceived the idea and -- let me just finish the sentence.

He calculated what theoretically it would be and if theoretically would be high, much higher in the lower chlorinated Aroclors than was actually being found so that this was probably the best confirmation, really, of what was happening in the environment.

It did not depend on laboratory testing.

It didn't depend on maleic anhydride testing. The

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calculations fit the situation and again confirmed the same thing, that the lower chlorinated isomers are biodegradable in the environment.

Q When you talked about lower and higher grade, what is the cutoff, what does it mean to you? What is a low and what is a high?

A I would say the cutoff is at 5 and above. 5 chlorines.

Q Can that be translated into the different Aroclors, 1242, 1248?

A Like he says, this is distribution -- I guess everybody here knows that, but 48 corresponds to a maximum of 4 chlorines.

Q So Aroclor 1248 would normally be low grade?

A Except for the tails on it which are higher, but the 1221 would be 2 and you can figure it out yourself. 42 would be 3.

Q Was Dr. Munch's study ever confirmed, to your knowledge, by any other study or analysis done?

A All the environmental samples that were from Germany and from Sweden and I'm not sure about Risebrough, but I think Risebrough and so forth, looked simply like 5460. The details of this, Keller and the people that were doing the actual samplings

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would know which chlorines were missing and so forth, but I think it is very strong evidence that what we suspected, what Widmark suspected, we began to confirm. It seems to be the right story, seems to be the right situation.

Q Did Monsanto continue this type of testing up until 1976?

A I couldn't tell you. I left the group in '74.

Q Was this type of testing still going on in 1974 when you left?

MR. SCHINK: What type of testing are you referring to, specifically?

MS. OLIVER: Analyses to find out what is in the environment.

BY THE WITNESS:

A Well, I would say that we didn't do a lot of environmental testing. We would try to keep track of what others were finding.

As I said earlier, we didn't go out. We didn't have the manpower to go out and sample all over the place, but I would guess we'd keep track of the reports and literature and so forth.

BY MS. OLIVER:

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Q Was there somebody who worked for you that was in charge of keeping track of the literature on Aroclors?

A The people that were working on the project were certainly in sometimes hourly and daily contact with really what was going on within their specialties.

Q In your group, Lou Stark, is that his name?

A Yes.

Q He was involved?

A In hydraulics.

Q Right.

Who else in your group was involved?

MR. SCHINK: Involved?

MS. OLIVER: In keeping track of what was going on in the area of Aroclors in the environment.

BY THE WITNESS:

A Munch for dielectrics, Dave Miller, Dr. Miller in heat transfer.

That's about it, I guess.

BY MS. OLIVER:

Q And in applied sciences?

A And of course, the applied sciences.

Q Dr. Keller and Dr. Tucker?

A Dr. Keller and Dr. Tucker, yes, but there

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may have been others later: Mieure, Keller and so forth.

Q Did the biodegradation studies continue up to the time you left in 1974?

A I would say you have to ask Mr. Keller when.

Q You don't recall?

A I don't know specifically. Biodegradation studies go on continually, but maybe not on the Aroclor.

Q So you do not recall on Aroclors?

A I don't know specifically when.

Q You said yesterday that in your opinion the presence of Aroclors in the environment was not demonstrated to be harmful to health in 1970, is that correct?

A My recollection, that is correct.

Q That is your opinion?

A That is my opinion.

Q Did you have any facts on which you base that opinion?

A I think it is lack of evidence.

Q Can you tell us what types of evidence you were looking for in determining whether it would be harmful to health?

A You would have to look for evidence where people had come in contact with environmental quantities

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of Aroclor and showed significant serious problems.

Q What type of problems?

A That is really medical, a medical problem.

Q You also said, I think, that Aroclors in the right environment had not been demonstrated to be harmful to the environment.

Again, is that a correct statement of what your opinion was?

A As I said.

Q That is your opinion?

A Yes.

Q What would you look at to determine whether or not something was demonstrated to be harmful to the environment?

A You have to have a definition of harmful that is some kind of standard and that has been a very difficult issue.

Q What is your definition of harmful?

A It is a subjective thing and I don't have a good answer to this problem.

Q Do you have any definition that you consider?

A No.

Q Did you look at what the risk might be?

A That is one approach, a possible approach.

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Q What other approaches might there be?

A I think that is the best chance in what we know to quantify risk.

Q Did you consider what the risk of Aroclors in the environment would be, the risk of harm?

A No.

Q You have never considered that?

A I think the subject of risk is only now being addressed in a quantitative way in the chemical area.

Q Up to now you have not considered that?

A I have not been involved with Aroclors since 1974.

Q When you were involved with Aroclor up to 1974, did you make --

A I don't know how to quantify.

Q -- that determination?

A Quantify the risk at that time?

Q Did you know whether anyone at Monsanto tried to make a quantification of what the risk of harm would be?

A I don't think anybody knew how to quantify the risk.

Q To your knowledge, nobody did at Monsanto?

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A Nobody did.

Q Did you ever consider looking at natural sources of PCB in the atmosphere or the environment?

MS. JACOBS: I am going to object to the form of the question. What do you mean by natural?

BY MS. OLIVER:

Q Do you understand?

A Non-synthetic, I suppose.

It was considered.

Q How was it considered?

A Well, it is one of the possibilities, conceivable possibilities that it could be created by nature.

(Discussion off the record.)

BY MS. OLIVER:

Q Back on the record.

Did you understand the question?

A It is one of the possibilities. I am not familiar with whether anybody has considered it or not.

MR. SCHINK: Do you want to take a break for a minute?

MS. OLIVER: Why don't we do that.

(Brief recess had.)

(Mr. Phelus left the deposition room.)

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BY MS. OLIVER:

Q Back on the record.

Dr. Richard, would you look for a minute at Exhibit No. 8.

Exhibit No. 8 are notes by Dr. Mehler on chlorinated biphenyl.

You discussed yesterday one of Dr. Mehler's comments under No. 1(b):

"Are there 'natural' sources of PCB?"

What did you understand Dr. Mehler to be talking about?

A Well, were there other sources of polychlorinated biphenyls other than by, I suppose, our intended manufacture.

Q Did Monsanto look into whether there are other sources, natural sources?

A I draw a blank. I can't remember.

Q You don't recall.

You testified a little earlier today that the incineration or the incinerator that Monsanto used was shut down at some point in time.

Do you know what the reason for shutting down the incinerator was?

A I was not directly involved. I'm sure others --

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Q Do you have any knowledge?

A I think other facilities were apparently available.

Q Other than incineration?

A Other than Monsanto's incinerator.

Q Other than that fact, do you know any other reason why that incinerator was shut down?

A No.

Q You testified yesterday that Monsanto tried to undertake fish testing to determine the presence of Aroclor in fish. Do you recall that, there were some problems with it?

A Industrial Bio-Test.

Q But there were some problems you testified to in doing that testing?

A Yes.

Q And the problem was that the Aroclor would latch onto the side of the container.

A I said that was one problem. I said there were, I think there were other problems and Mr. Wheeler was probably closer to it than I was.

I don't recall the specific problem or problems.

Q Could you tell me what the properties of the

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Aroclor would be to cause it to latch onto the side of the container as opposed to this dispersing in water?

A Not dispersing in water, it's insolubility would be the main and the fact that it was organophilic.

Q What does organophilic mean?

A It has an affinity for organic non-polar or semi-polar as opposed to real polar stuff like water.

Q When your group was doing its work in developing the substitute fluids for A-200, for example, was your group concerned with how the substitute fluid would be used by the customer?

A Yes.

Q Was there consideration given to whether the old Pydraul fluid that was being replaced should be drained out of the hydraulic machinery?

A I didn't have any direct part of that. I think combination of Mr. Stark and Marketing, Mr. Stark would make some calculations as to, just on a mathematical basis on how long it would take at certain usage rates.

Q Did Mr. Stark do that, to your knowledge?

A To my knowledge, he did in some instances.

Q In instances concerning specific customers?

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A I think in the case of Johnson Motors, the answer is yes.

Q He did that?

A I think so.

Q Did he talk to you about his calculations?

A No.

Q Do you know whether it was discussed between Mr. Stark or anyone else at Monsanto whether A-200 should be drained out of the machines?

A I cannot answer that.

Q Did your fluids group prepare a monthly summary of what was happening in your department?

A Yes.

Q Who prepared that monthly summary during the period, say, 1965 through 1970?

Is there a person in charge doing it?

A Normally the group leader would prepare his section and he would put it together. He'd do it if necessary.

Q Would that be Mr. Stark for hydraulic fluids?

A If it were an industrial hydraulic fluid in terms of formulation or testing, probably yes.

Q Who would receive copies of the monthly summary from the functional fluids section?

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A Business Director. I would think appropriate Product Managers, Marketing for any commercial development person or persons.

Q Anybody else?

A I would think Manufacturing would have a copy. I think Engineering would have a copy, Medical might or might not have a copy, I'm not sure. It would depend on their interest.

Q I would like you to look at what we have marked as Exhibit 15 which is a memorandum from Mr. Wheeler directed to you, dated September 11, 1968, is that correct?

A Yes.

Q Attached to the memorandum is a letter from Bio-Test concerning protocols for studies of Aroclors, is that right?

A Yes.

Q Do you recall receiving the memorandum from Mr. Wheeler and the proposed protocols?

A Not specifically, but since I was responsible for the budget part of it, why, it would be normal that he would send something like that to me.

Q Did Mr. Wheeler ever ask you for your comment on proposed protocols? Do you recall from reviewing

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Exhibit 15 whether you and he discussed the protocols, of what you discussed, if anything?

A No, I either had none or very little input into that exact protocol.

Q Could you identify Exhibit 16 for us, please?

A It is a note from Wheeler to me about a manuscript of Dr. Risebrough's paper.

Q It also refers to a letter?

A To Mr. Conkin.

Q Who was Dr. Conkin?

A Dr. Conkin was apparently a group leader and I don't know what his exact title was in Agriculture Research.

Q Did you and Dr. Conkin have any discussions concerning Aroclors that you recall?

A No. I talked to Bob once, maybe once.

Q You don't have any specific recollection?

A I don't remember specifics.

Q Do you know who Wayne Thornburg is?

A No.

Q Would you please look at Exhibit No. 17 which appears to be a memorandum from Mr. Wheeler to you, dated December 9, 1968.

Do you recall seeing or receiving that

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memorandum?

A Not specifically, but it would be right along.

Q This summarizes a meeting with Dr. Calandra of Bio-Test, is that right?

A Yes.

Q Do you know whose handwriting appears in the margin of this memo?

A No, I don't know whose handwriting it is.

Q Some of the work that is listed here to be done, proposed anyway, under several paragraphs, one has written in "no action." Do you see that?

A Yes.

Q Do you know who wrote that in?

A I don't know.

Q Do you know why no action was taken?

MR. SCHINK: I object to the form of that question.
That assumes --

BY MS. OLIVER:

Q Do you know whether any action was taken with respect to, for example, No. 2, 30-Day Range Finding Toxicity Studies with Rats?

A Yes.

Q Do you know why no action had been taken?

A Probably had not been taken up to that point

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in time; probably started within the next month or so.

It doesn't mean, I am sure it does not mean that no action will be taken. It means, meant, okay, what is the status at that time.

Q Do you know whether all the proposals listed in this memorandum were done at some time by Monsanto?

A The thing to do is ask Elmer and so forth, Mr. Wheeler.

Q Was Mr. Wheeler --

A I would say, let me look through this thing.

I could say a good share of it was. We would normally do a 30-day range finding before you start chronic testing and chronic testing was started in '69, so I'm sure this 30-day stuff, the language, "to begin the two-year studies at that time." If they were, "The actual preparation of 'hot' material is to be held in abeyance but exploration as to the availability and cost of tagged material" --

By hot, they mean radioactive tracer work and in general we did not do radioactive tracer work.

Q What would radioactive tracing do, why would you do it?

A You would attempt to increase the sensitivity

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or be able to track the material and be able to get the same sensitivity and be able to track the material by high chromatographic resolution

I talked to Keller about whether we did any "hot" material at all; the advisability of determining the character and possibility of isolating the "major fraction" in each of the Aroclors to be studied -- we did that.

Proposal, "To obtain appropriate animal organs and tissues to become familiar with the extraction and analytical techniques using actual specimens," we did that.

"Analytical work should be initiated to determine the decomposition products when representative materials (paper) containing Aroclor are burned," we did that.

You have to ask Keller on the next one.

Q Which is No. --

A 8.

Q No. 8?

A Yes. Keller and Wheeler, maybe they remember.

"There should be further discussions initiated with Risebrough and others around the country whom we have not yet contacted," we did that.

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"Bits of information," we did publish and reported to FDA when work was completed. I went to Calandra's lab at least once or twice. I don't know whether it was January 15 or not.

Q Look at No. 18 for identification which is a letter from Mr. Wheeler to Dr. Calandra showing a carbon copy to you.

The date of that letter is December 20, 1968, and it lists the initiation of some proposed studies to Bio-Test, is that right?

A It authorizes Bio-Test to get going.

Q On the second page of that letter, your third to the last paragraph, Mr. Wheeler asks Dr. Calandra whether he has any available source of DDT.

Do you know why Mr. Wheeler would have asked --

A He might have wanted it as a control, I'm not sure.

Q Yesterday you talked a little bit, you mentioned anyway that you were finding a relationship between DDT and PCB.

Did you ever confirm whether a relationship existed?

A We did not find a relationship. Others were

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reporting Aroclor and DDT. That is how we began to find out that polychlorinated biphenyls were in the environment, but pesticide residue people were the ones that were looking to that.

Q You did not do any work then or have any finding or become aware of any findings of a relationship between DDT and PCB?

A What kind of relationship are you speaking of?

Q A relationship which would indicate why it was being found together.

A Together, no.

Q The second page of Exhibit 18 again refers to a meeting with Dr. Calandra and it refers to a copy of Bill Richard's version.

Was it your practice to take written notes at a meeting?

A Sometimes yes, sometimes no.

Q If you did take written notes, would you keep them?

A Probably not.

Q What would you do with them?

A My notes are usually so bad that they are ready for the waste can.

Q Would you throw them out in some instances?

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A Yes, most of the time.

Q Would you identify what we have marked as Exhibit 19?

A How do you want me to identify it, did I write it or --

Q Can you identify what it is, can you do that?

A It seems to be a summary of the program for Aroclor wildlife.

Q Do you know if that was part of what was a functional fluids monthly summary for December 1968?

A It might have been.

Q Is that the type of thing that might appear in the monthly summary?

A It might, or it might appear in memo form..

Q Do you know who prepared this?

A I'd say it could be Wheeler, might be Keller, might be me with a summary.

Q It appears to be Pages 13, 14, 33 and 34 of another document, is that correct?

A Okay.

Q Would you identify Exhibit No. 20?

A It is an experiment to begin the determinations of Aroclor water solubility, point out some of

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the difficulties experienced in trying to get solubility.

Q It is a memo dated February 26, 1969 from Dr. Tucker to L. R. Stark.

A Lou Stark.

Q And shows a carbon to you, is that right?

A Yes.

Q Is this procedure different than the biodegradation tests that you undertook?

A This is just measuring the solubility of Aroclor in water.

Q Did you try to break it down?

A No.

Q The last paragraph of Dr. Tucker's memo refers or states, "Pydraul fluids being multi-component systems are a completely different story and as such, will require more effort."

A Yes.

Q Did you have an understanding of what Dr. Tucker meant by that?

A No, but if he meant, he probably did, the Pydraul line, then he is correct. It is a much more difficult job to measure whether it is soluble in water, the exact solubilities.

Q Dr. Richard, would you look at what we have

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marked as Exhibit 21 for identification and identify that for us, if you can.

A It is a memo from Dr. Mainprize to me and dated March 20, 1970 and it concerns Aroclor biodegradation.

Q Does this memo summarize the results of biodegradation studies?

A Up to that date, or at least it is kind of probably a progress report.

Q But studies continued past that date?

A Yes.

Q Up to this point in time, did the results show that the lower Aroclors were able to biodegrade?

A They had unusual difficulty. I think cultures have to be adapted and these were some of the early positive results they got in biodegradation.

Q Were the later results different than what they had come up to to this point?

A The final results were published and I don't have the date of publication. That is the best summary that we have of that information.

Q Where was it published?

A I don't have the journal -- England, I have forgotten.

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Q Is it a trade journal or a technical journal?

A Technical journal.

Q Were you contacted by anyone at Monsanto concerning a change in the labeling of Aroclors?

A I was not concerned with labeling.

Q Did anyone ask you if a change should be made?

MR. SCHINK: Are you talking now about Pydraul products, because there were products called Aroclors as well?

BY MS. OLIVER:

Q Pydraul.

A I was not concerned. I shouldn't say that. I was not involved in any way with labeling, the labeling practice.

Q Was that Marketing?

A Probably.

MR. SCHINK: We have gone over this before.

BY THE WITNESS:

A (Continuing.) Marketing, Manufacturing, Legal, Distribution, and I don't know how many others.

BY MS. OLIVER:

Q The fact that you may have been copied into correspondence related to labeling --

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A I might have been copied in.

Q To your knowledge, you were not asked to comment or make any suggestions?

A I might have been asked whether I had any comments. Whether I made any is very doubtful.

Q Dr. Richard, would you look at what we have marked as Exhibit No. 22 and tell me if you can identify that.

A It is a letter from Keller to Papageorge on Aroclor's analytical program. The date is April 28, 1970.

Q It shows you were on the copy list.

A Copy list.

Q Did you have any input in preparing the analytical program which is attached to the cover page of the letter?

A You mean did I set the numbers, no.

Q Did you set objectives or participate in objectives or the action listed?

A Yes, in a general way. This is answering specific tables and that was up to Keller and his group to watch the production training on analytical results.

Q On the second page of this exhibit, the first

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page is entitled Aroclor Analytical Program. There appears to be Objective No. 1, which has been deleted. It starts with Objective No. 2.

Do you know what Objective No. 1 was?

A No.

Q In the margin of the program, there is references to Team 1, 2.

Do you know what that meant?

A Specifically no. It is not my writing.

Q You were not part of a team?

A It refers to probably Roman numeral letters in the first page.

Q Were you aware of any teams that were created?

A These are the teams: Tucker, Litschgi, Westenberger, Detrich and Mieure. He listed all the names on the teams.

Q Were you in charge of a team?

A No.

Q You just helped prepare the program?

A I didn't say that specific program. You asked whether I had any input into it, the analytical effort in a general way; yes, but specifics of that team program, no.

Q Did you have any input into the reclamation,

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any reclamation programs developed by Monsanto for Pydraul or Aroclor?

A Any input? Certainly in favor of it.

Q When was the idea of reclaiming Pydraul or Aroclor initiated?

A I would say before '64.

Q Who at Monsanto initiated --

A A question for Davis.

Q You cannot answer it?

A I don't know.

Q Was it developed in the Marketing section?

A It was developed outside Monsanto initially.

Q Do you know by whom?

A One of the ones that was in existence was Findett on the outskirts of St. Louis.

Q Was Findett connected in any way to Monsanto that you are aware of?

A Financially, no.

Q Was there a working relationship?

A Yes. We helped test the fluids and offered technical advice when needed.

Q When were you first aware of the Findett services?

A I guess when I came to Fluids.

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Q Did Monsanto later try to set up its own reclamation service?

A They had considered this possibility.

Q When was that?

A Surveyed the market in '72, around '72.

Q Do you know who developed the idea of Monsanto's own reclamation project?

A I don't think it was any one person's thought.

Q Do you know how the project was supposed to work or what the process was?

A Depended on the fluids that were to be reclaimed.

Q On the instance of Pydraul?

A Yes. You have to be concerned which Pydraul.

Q All right, A-200.

A Probably two ways of reclaiming it, either by adsorption or taking the acid compounds out and then putting the correct additives back in, filtering and so forth, depends on how badly it degraded.

Aroclors could also be recovered by distillation.

Q Do you know what method Monsanto was intending to use in 1971, '72?

A Monsanto, I don't know whether we spelled

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that out or not. Monsanto had the option to go either way, but '72, A-200 was out and so thermal distillation was also out. Other products weren't stable enough.

Q Who at Monsanto was in charge of researching for that project?

A Lou Stark.

Q He reported to you, did he not?

A Yes, right.

Q Were you actively helping him or --

A No.

Q -- or were you just there as a supervisor?

A I was sitting at a desk.

Q Were you involved in fluid adsorbent evaluations?

A No, Mr. Stark was and his group, I should say, maybe Lou and maybe somebody in his group.

Q Dr. Richard, do you recall that Monsanto took samples of Johnson's effluent, Johnson Motors?

A I know we sampled Johnson's effluent.

Q Do you know why it was sampled?

A We want to be careful, I guess, about what we mean by effluent.

Q What do you mean by effluent?

A I don't specifically know what we mean.

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Q Samples were taken at Johnson Motors?

A Yes, that is a better way of putting it.

Q Do you know when?

A '72.

Q Do you know why samples were taken?

A Yes.

Q Why?

A Water, to see a reclaim at Johnson Motors, wanted to see Johnson Motors' reclaimed fluid.

Q Was this in conjunction with the project that Monsanto was ready to start up for reclaiming fluids?

A A possible reclamation, yes.

Q Who was in charge of doing the sampling and the analysis of Johnson?

A Doing the sampling, the survey was being made by Don Pogue and Lou Stark. I don't know whether he took samples or not, but he was involved in some of the samplings and the analytical work went to applied sciences.

Q Was Don Pogue in your group?

A No.

Q What group was he in?

A Commercial development or marketing.

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Q Do you have any knowledge what samples were taken at Johnson Motors for the purpose of determining whether there were PCBs in the discharge?

A Yes, I think samples were analyzed for PCBs.

Q Other than the 1972 sampling, are you aware of any other samplings done by Monsanto at Johnson Motors?

A Wilson Overall made a second proposal through Monsanto and Environ. Rechem. later.

Q For what purpose?

A Again, for reclaim of fluids.

Q What was Environ. Rechem.?

A It was a unit in Monsanto that was set up to contract research, sometimes contract development.

It was outside contract work.

Q Contract work in any --

A For a fee. They worked for EPA, they worked for I don't know who all their customers were.

Q How long was Environ. Rechem. in business?

A Years. I don't know specifically how many.

Q Is it still in business?

A No.

Q Overall was with Environ. Rechem.?

A No, he was with Monsanto but he was with people

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from Environ. Rechem.

Q He was doing the proposals for Environ. Rechem.?

A I think that probably was close to the arrangement.

Q Do you recall being advised by letter or a copy of a call report or anything of any problems that Johnson Motors was having with A-200B in its machines?

A The recollection is with phenolic, and I guess we should use the word discharge. But specifically where there was a specific product, that is what we were to determine.

Q You recall being advised of a problem with phenol in Johnson's discharge?

A Yes, it was a general problem and you were trying to find out or Johnson was trying to find out where it was coming from and what to do about it.

Q Who advised you of the problem?

A If I saw it anywhere, it would be through work Stark was doing.

Q Do you know what Monsanto did to determine where the phenol was coming from?

A We probably analyzed our product and maybe resampled our product, I'm not sure.

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Q Mr. Stark would know?

A Yes.

Q Do you have any knowledge that anyone at Monsanto advised Johnson Motors that there were PCBs in its discharge?

A No direct knowledge.

Q Any indirect knowledge?

A If the analytical reports that were turned out were sent back to Johnson Motors.

Q Do you know if they were?

A No.

Q Do you know if any of the analytical reports that were done by Monsanto to find out if PCBs were in the environment in the Great Lakes or Mississippi River were sent to any of the Monsanto customers?

A Would you say that again?

MS. OLIVER: Would you read that?

(Question read.)

BY THE WITNESS:

A I would have to answer that normally Marketing would be the source for that information.

BY MS. OLIVER:

Q Do you recall there being a proposal by Monsanto offered to its customers to return Aroclor

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fluid to Monsanto for incineration?

A In the case of Therminol, yes.

Q Other than Therminol, were you aware of anything being returned to Monsanto?

A As far as I know, there were no restrictions on who could return fluid to us during the period of incineration, if it were Aroclor.

Q Do you know how customers were advised?

A No.

Q Dr. Richard, would you look at what we have marked as Deposition Exhibit No. 4, which I think are your notes on the meeting on March 16, 1969 with Bio-Test.

The last page of those notes is a chart, I guess you called it, entitled Aroclor in Wildlife.

I don't recall whether you testified yesterday you prepared the chart or not?

A I said that I probably prepared the chart, that I wasn't sure of whether it was all my notes, especially about in vitro or in vivo, but if it reflected something that went on in the meeting, it could be.

Q Could you explain what the chart is intended to mean?

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A We were attempting to find the problem and what we might do to try to avoid the problem.

Remember, we were meeting with these people to try to figure out what was happening.

Q What was the chart itself to show, what is it intended to show?

A It shows Aroclor applications and then it has something to do with acute and chronic toxicity which I'm sure we discussed in the meeting. The question, is it an enzyme enhancer, and I still don't know what Aroclor is an enzyme enhancer.

Q What is an enzyme enhancer?

A I am not familiar. I said that it was beyond my technical knowledge and we thought it was beyond our capability to tackle that problem, an enzyme enhancer.

Q Underneath that column, there is a small A that says PCB and Phenobarbital.

Do you know what that means?

A No. If you are an enzyme man, presumably you can tell if you do certain tests with additional things like Phenobarbital, whether it is an enhancer or not, but I am not versed in that chemistry and I cannot get any further than that.

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Q Down at the bottom of the page, there is a line that says Environment and it has another line drawn to PCBs in Plants, underneath Plants, there is Fish and after that in parens, (Food Chain), and then there are two more lines with arrows.

What is that intended to mean?

A Well, could it be in the food chain and could it be affecting birdlife and could it affect man.

Q Do you recall at the meeting whether there was discussion whether PCBs were in the food chain and affecting birdlife and man?

A Yes, we wanted to kind of decide what was happening to it.

Q Did you ever decide what was happening to it?

A We didn't do so much work, but certainly the FDA did a lot of work, certainly as far as the fish. Everybody that had a laboratory was evaluating that.

Q Is this chart intended to be just types of information that you would be interested in finding out?

A It was an attempt to organize in a small way the meeting, what was taking place, trying to understand the problem.

Q During the time you were Research Manager for

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Functional Fluids, do you recall movies being made of Pydraul fluids at Monsanto labs?

A Yes, we made fire test movies.

Q Do you recall when those were made?

A They were made continually, to keep a record. Sometimes they were edited to get better presentation, sometimes customers were brought in to see the results.

Q Do you have any specific recollection of any customers that were brought in or any movies that were made?

A We did it for most major customers and obviously in terms of introducing new products.

Q Do you recall movies being made for Pydraul fluids?

A Yes, Pydraul fluids.

Q And the movies were made with customers for Pydraul fluids?

A With the customers?

Q With customers.

A Normally the customer is not allowed into the fire zone directly. We keep people out of there.

Q Did the movies that you recall concerning Pydraul involve anything other than fire testing?

A Oh, on occasion, yes, show where they might

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be used.

Q Show how they were made?

A Show how they were made?

It might show some vessels or something.

Q Is there one person in Research who was in charge of the movie-making part of it?

A If you are talking about professionally-made film, the answer is no. If you are talking about research-made film, normally Mr. Stark would be the one.

I guess that is in the general, a correct answer. We made earlier films. Other people made earlier films though. Mr. Stark was probably not the manager.

Q Do you have any knowledge of the Monsanto manufacturing plant obtaining NPDS permits?

A I don't know. I didn't have anything to do with those permits so I am not the right one to ask.

MS. OLIVER: I don't think I have anything else.

Thank you, Dr. Richard.

MS. STEIN: I just have a few questions.

REDIRECT EXAMINATION

BY MS. STEIN:

Q I believe earlier this morning, Dr. Richard,

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you said with reference to A-200A and A-200B you would have to look at the book at the formulation.

Do you have any remaining lots of A-200A, A-200B?

A I cannot answer that. It probably can be answered, but I didn't --

Q Since you are no longer in the group?

A Yes.

Q Who is currently the Director of Research for the Functional Fluids Group?

A Mark Gibbs.

Q Would Mr. Gibbs know whether or not there are any remaining lots or samples of A-200, A-200A or A-200B?

A He ought to be able to find out.

Q Would the same be true for F-9 or F-9A?

A Same answer, I don't know.

Q But he would be the person to ask?

A There are pretty strict rules on Aroclor about storage of samples even.

Q Earlier we were talking about the low solubilities of PCBs in water.

Did Monsanto do any research about dispersion into the area with respect to Aroclors?

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A I think the only thing that we did was the burning of the paper with and without Aroclor.

Q Did you --

A What we were trying to find out was was that a potential source, was NCR paper a potential source of Aroclor getting into the environment, from places like dumps and things like that, but it was just a simple experiment. We didn't make any big calculations, didn't have to.

Q Would the data of those tests still be at Monsanto in St. Louis?

A I would think, experiments where the paper was burned, yes.

Q Would that be in the functional fluids group records?

A Or applied sciences records.

Q Did you do any samples of dispersion from the incineration project that you were working on?

A From the incinerator itself, we determined the degree of destruction, the DE, destruction efficiency.

Q Could you describe the process of how you determined what the destruction efficiency of the incinerator was? Did you do stack tests, for example?

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A Yes.

MR. SCHINK: Is that relevant?

MS. STEIN: We are talking about PCB's presence in the environment.

MR. SCHINK: Not in this case. We are in this case talking about discharges from Outboard Marine waste waters. This is an incinerator case. Incinerators are relevant as a means of disposal, but I don't see how these things are relevant, and if you want to pursue that line of questioning --

MS. JACOBS: There were air emissions from the Johnson Outboard facility.

MR. SCHINK: They are not at issue in the lawsuit. What is in issue is the NPDS permit violations.

MS. STEIN: No, it is much broader than that.

MR. SCHINK: That is not the lawsuit that is on file, at least.

We will let the Court decide if you think it is appropriate. If you want to get into dispersion in the area of products of incineration, I think it is irrelevant and I'm going to direct the witness.

MS. STEIN: In that case I will certify the question.

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And the lawsuit is not limited to discharge merely for alleged violation of NPDS. It is broader than that.

MS. OLIVER: But it is limited to discharges in equitable waters of the State of Illinois or the United States or whatever the terminology.

MS. JACOBS: I think what is at issue is the condition that exists in Waukegan today.

MR. SCHINK: We do not have to debate this on the record. That is ridiculous. We have a judge to decide that.

Let us get on to something else.

BY MS. STEIN:

Q Was there effluent from the incinerator or the incinerator projects?

MR. SCHINK: If you know.

BY THE WITNESS:

A There is only one incinerator and the scrubbing water, whether this was discharged or not, I'm not sure.

BY MS. STEIN:

Q Did you take any samples from that discharge?

A I'm sure we did.

Q Do you know where the results of those samples

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would be?

A No.

Q What was the level of detection that you were able to ascertain down to, the lower detectable limit of PCBs in the discharge from that incinerator in the samplings?

A I don't have it.

Q Do you know who would know, would Mr. Stark have been in charge of that sampling?

A No, he wasn't.

MR. SCHINK: Are you talking about air discharges or water discharges?

MS. STEIN: I used the term emissions with air and discharge or effluent with water.

BY THE WITNESS:

A Well, there was a permit on this incinerator so look on the permit.

BY MS. STEIN:

Q I do not know whether or not there was a permit, but I do want to know whether or not Monsanto did take samples of that effluent and whether or not they kept records of the samples and if you didn't take them, I am asking if you know who did take those samples.

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A It would have to be in manufacturing.

Q And the records would be kept where?

A I would think at the manufacturing location.

Q I was a little confused by the discussion about the carbon adsorption of PCBs. You talked about Monsanto working on a process of carbon adsorption.

A All we did was in the laboratory.

Q And then you say -- go ahead.

A Okay. We are trying to find out whether you could remove soluble Aroclor on carbon, and yes, we did some lab and crude pilot plant determinations.

Q Where was the pilot plant located?

A We ran a unit in Anniston for a period of time.

Q Did you also do experiments with limestone adsorption of PCBs?

A I would say the Dayton plant did some laboratory work on clay and I said that the practice at Anniston was to add limestone, a limestone pit in which they pass the plant effluent over before it was discharged.

Q My confusion stems from the fact you are talking about carbon adsorption and clay and yet the Anniston plant, they were using limestone.

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A There are three substances.

Q So there would have been limestone adsorption experiments, if you will?

A Limestone was there principally to neutralize any acid and it also resulted in Aroclor adsorption.

Q Do you know where the limestone was taken after the water was passed through it?

MR. SCHINK: What does that have to do with the lawsuit? The witness has described for you the mechanics of what he looked for to remove PCBs from the effluent stream. You don't have a lawsuit involving anything but Johnson Motors, its discharges.

MS. STEIN: Monsanto is also a defendant in this lawsuit.

MR. SCHINK: Not with respect to any of its operations, only with respect to its sale of certain PCB-bearing hydraulic fluids to Outboard Marine. That is the issue in this lawsuit.

MS. STEIN: Just for the record, I am not necessarily going to agree with your characterization of the lawsuit or whether it is relevant.

BY MS. STEIN:

Q Dr. Richard, I would like to refer you to what has been marked as Richard-Outboard Marine

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Deposition Exhibit 21, and on the third page of that which has the numbers at the bottom, 1450. Do you have that page, up at the top? There is a heading Aroclor 1142 and 1130.

Are you familiar with those compounds?
Are those Aroclors?

A It says below it what they are.

Q I am asking if you know what the composition of those Aroclors were. It is a different series, apparently, from some of the others we have discussed.

A 1100 series means they were starting with cruder material, but the exact composition, I don't know.

Q By cruder material, do you mean there were more impurities in them?

A The composition, if it is pertinent, could possibly be retrieved.

Q Do you know where we could get the information?

MR. SCHINK: Again, Ms. Stein, those Aroclors are not involved in the sale of these products.

BY MS. STEIN:

Q Do you know where I could get that information on these?

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MR. SCHINK: You don't have to answer that question, Dr. Richard.

Really I object to the entire line of questioning about products other than those that were involved in the sale of hydraulic fluids by Monsanto to Outboard Marine.

MS. STEIN: Certify the question.

BY MS. STEIN:

Q Dr. Richard, I refer you to what has been marked as Richard Deposition Exhibit No. 22.

On the first page of that document, there are various teams established and projects. The first team was looking at Environmental Residue Analyses and the personnel are listed. I believe you testified yesterday that Dr. Tucker was in your group, is that correct?

A No.

Q Where was he?

A He worked for Keller.

Q Did you receive the results of these environmental residue analyses?

A Normally.

Q Do you remember what these particular residue analyses showed that were conducted by Dr. Tucker?

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A You would have to -- no, that would have to be specific.

Q Did you review this document before you came to the deposition?

A No.

Q Do you know whether these studies were aimed at certain PCBs at particular levels in particular samples?

A Yes.

Q Would these have been samples that Monsanto collected?

A Might have been or might have been sent to us.

Q Who would have sent them to you?

A I don't know.

Q Do you know why Dioxin was mentioned as one of the studies to be worked on here?

MR. SCHINK: Again, that has nothing to do with the lawsuit.

MS. JACOBS: It most certainly, assuredly does on the metabolism of PCBs and the action in the environment.

MR. SCHINK: There is nothing about that in the lawsuit --

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MS. JACOBS: That's right.

MR. SCHINK: -- that has been brought to my attention to date, Ms. Jacobs.

MS. JACOBS: Discovery depositions are called to lead to discovery of evidence, and if you are balking on inquiry here, we will never be able to get any relevant evidence should it exist.

MR. SCHINK: I am going to instruct the witness not to answer the question about Dioxin.

MS. STEIN: We are going to certify the question regarding studies on Dioxin performed by Monsanto.

BY MS. STEIN:

Q Dr. Richard, I believe you testified that you knew that effluent samples from Johnson Motors were being taken and they were being taken to see reclaim.

Could you describe what you mean by be taken to see reclaim?

A To determine the volume of reclaimed fluid.

Q Reclaimed fluid, did you mean?

A Pydraul that could be reclaimed.

Q In other words, the samples were being taken to determine whether or not there was in fact Pydraul in the discharge?

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A You want to be careful about discharge because that depends on, you are talking where in the plant. All we wanted to do was determine how much was being caught and could be recycled.

Q Do you know where these samples were being taken?

A No.

Q Do you know whether it was customary to take samples of customers' effluent?

A It was not customary under normal circumstances.

Q But if a customer requested you to take samples, if Monsanto requested you to take samples of effluent, it would be done?

A No.

Q What would be the circumstances for the company to determine that?

A If there was a special project to see whether the value of reclaimed fluid would in fact support a business.

Q Could you explain that answer? I am not sure what you mean by support a business.

A You know, you have to have a certain volume of business and you would have to figure out whether

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you could put up a plant and have the right amount of volume to support the plant and vice versa, a reclaim plant.

Q Do you know whether there were samplings for PCBs of any discharges or effluent other than that done at Johnson Motors?

A Certainly.

MR. SCHINK: Did you do any, do you know whether it was done? Yes or no.

THE WITNESS: Yes.

BY MS. STEIN:

Q With respect to this other customer or customers for which samples were taken, did you receive results of that sampling?

A I might have or might not have.

Q Do you know whether the analytical reports of the sampling were sent to your customers involved?

A No.

Q Do you know who would know whether or not these reports were sent?

A I would think Marketing.

MS. STEIN: Thank you very much.

CROSS EXAMINATION

BY MR. SCHINK:

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Q Dr. Richard, yesterday you mentioned that in 1966 your research group was doing some work looking into phosphate esters.

Do you recall whether that work related in any way to the research that Jensen and Widmark were doing regarding possible presence of PCBs in the environment?

A The answer is no. I was trying to describe how the development of a base stock took time. That was the context of the question. We were thinking about phosphate base stock and how they might be constructed and so forth as far as, as far back as '66.

I don't know if we were actually experimenting, but we were thinking about phosphate ester base stock.

Q You were asked a question earlier this morning about whether you were aware of any work at Monsanto relating to the quantification of the risk of harm to the environment from Aroclors.

What did you mean by the term quantification of risk of harm in the context of those questions and answers?

A I meant a detailed numerical assessment of

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risk.

Q Could you elaborate by what you mean by that?

A Detailed risk assessment is becoming a possible technique for risk evaluation and it involves determining the frequency of accidents or incidents, determining the exposure, correlate quantitatively toxic effects and then relate those to a situation that you are thinking about to measure the risk. That is the kind of quantitative risk that I had in mind when I said we had not done those kinds of calculations.

MR. SCHINK: I have nothing further.

We will not waive signature. We will, however, stipulate the deposition may be signed before any notary.

(Witness excused.)

FURTHER DEPONENT SAYETH NOT. . .

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	No. 78 C 1004
	)	
OUTBOARD MARINE CORPORATION	)	
AND MONSANTO COMPANY,	)	
	)	
Defendants.	)	

I hereby certify that I have read the foregoing transcript of my deposition given at the time and place aforesaid, consisting of Pages 1 to 331, inclusive, and I do again subscribe and make oath that the same is a true, correct and complete transcript of my deposition so given as aforesaid, as it now appears.

William R. Richard, Jr.

Subscribed and sworn to
before me this ____ day
of _____, A.D. 1981.

Notary Public.

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UNITED STATES OF AMERICA)
NORTHERN DISTRICT OF ILLINOIS)
EASTERN DIVISION) SS:
STATE OF ILLINOIS)
COUNTY OF COOK).

I, Thea L. Urban, a notary public in
and for the County of Cook and State of Illinois, do
hereby certify that WILLIAM R. RICHARD, JR. was by me
first duly sworn to testify the whole truth and that
the above deposition was recorded stenographically by
me and was reduced to typewriting under my personal
direction, and that the said deposition constitutes
a true record of the testimony given by said witness.

I further certify that the reading and
signing of said deposition was not waived by the
witness and his counsel.

I further certify that I am not a
relative or employee or attorney or counsel of any
of the parties, or a relative or employee of such
attorney or counsel, or financially interested
directly or indirectly in this action.

IN WITNESS WHEREOF, I have hereunto
set my hand and affixed my seal of office at Chicago,
Illinois, this ____ day of January, A.D. 1981.

Notary Public, Cook County, Illinois.
My commission expires December 15, 1983.

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