SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF SULLIVAN

----------x

INTER-COUNTY FARMERS COOPERATIVE ASSN.,

Plaintiff,

- against -

ROZANSKY FEED COMPANY, INC.,

Defendant.

----------x

ROZANSKY FEED COMPANY, INC.,

Third-Party Plaintiff,

- against -

MONSANTO COMPANY and GENERAL HOST CORPORATION,

Third-Party Defendants.

----------x

MONSANTO COMPANY,

Fourth-Party Plaintiff,

- against -

DENK BAKING CORP.,

Fourth-Party Defendant.

----------x

SUPREME COURT : SULLIVAN COUNTY

----------x

MAX M. BRENDER and BEATRICE BRENDER d/b/a BRENDER'S LEGHORNS,

Plaintiffs,

- against -

INTER-COUNTY FARMERS COOPERATIVE ASSOCIATION, INC.,

Defendant.

----------x

WATER_PCB-SD0000049704

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.

Defendant and Third-Party Plaintiff,

- against -

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant.

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant & Fourth-Party Plaintiff,

- against -

MONSANTO COMPANY and GENERAL HOST CORPORATION,

Fourth-Party Defendants.

SUPREME COURT : SULLIVAN COUNTY

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.,

Plaintiff,

- against -

VICTOR BECHAR,

Defendant.

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.,

Plaintiff & Third-Party Plaintiff,

- against -

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant.

WATER_PCB-SD0000049705

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant &
Fourth-Party Plaintiff,

- against -

MONSANTO COMPANY and GENERAL HOST CORPORATION,

Fourth-Party Defendants.

SUPREME COURT : SULLIVAN COUNTY

SUNNYSIDE UP, INC.,

Plaintiff,

- against -

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.,

Defendant.

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.,

Defendant and Third-
Party Plaintiff,

- against -

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant.

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant
and Fourth-Party Plaintiff,

- against -

MONSANTO COMPANY and GENERAL HOST CORPORATION,

Fourth-Party Defendants.

WATER_PCB-SD0000049706

SUPREME COURT : SULLIVAN COUNTY

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.,

Plaintiff,

- against -

LOUIS QUESADA,

Defendant.

INTER-COUNTY FARMERS COOPERATIVE ASSN., INC.,

Defendant & Third-Party Plaintiff,

- against -

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant.

ROZANSKY FEED COMPANY, INC.,

Third-Party Defendant & Fourth-Party Plaintiff,

- against -

MONSANTO COMPANY and GENERAL HOST CORPORATION,

Fourth-Party Defendants.

SUPREME COURT : SULLIVAN COUNTY

AGWAY, INC.,

Plaintiff,

- against -

ROZANSKY FEED COMPANY, INC., and GENERAL HOST CORPORATION,

Defendants.

WATER_PCB-SD0000049707

ROZANSKY FEED COMPANY, INC.,

Third-Party Plaintiff,

- against -

MONSANTO COMPANY and GENERAL HOST CORPORATION,

Third-Party Defendants.

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF SULLIVAN

L & L STARTED PULLETS, INC.,

Plaintiff,

- against -

INTER-COUNTY FARMERS COOPERATIVE ASSOCIATION, INC.,

Defendant.

September 26, 1977

APPEARANCES:

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WATER_PCB-SD0000049708

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Not Present:

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WATER_PCB-SD0000049709

APPEARANCES (Continued):

Not Present:

KALTER & GOTTLIEB, ESQS.
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Woodbourne, New York 12788
(MICHAEL R. GOTTLIEB, ESQ.)

- - -

EXAMINATION BEFORE TRIAL OF WILLIAM G. PAPAGEORGE, a witness in behalf of the Third-Party Defendant and Fourth Party Defendant, Monsanto Company, taken pursuant to Notice, held at the Offices of Wiess & Costa, Esqs., before Robert Hantman, a Certified Shorthand Reporter and Notary Public of the State of New York, on September 26, 1977, at 2:10 o'clock P.M.

- - -

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IT IS HEREBY STIPULATED AND AGREED by and between the attorneys for the respective parties hereto, that all rights provided by the C.P.L.R., including the right to object to any question, except as to the form, or to move to strike any testimony at this examination, is reserved, and in addition, the failure to object to any question, or to move to strike testimony at this examination, shall not be a bar or waiver to make such motion at, and is reserved for, the trial of this action.

IT IS FURTHER STIPULATED AND AGREED that this examination may be sworn to by the witness being examined, before a Notary Public other than the Notary Public before whom this examination was begun, but the failure to do so, or to return the original of this examination to counsel, shall not be deemed waiver of the rights provided by Rule 3116 C.P.L.R., and shall be controlled thereby.

IT IS FURTHER STIPULATED AND AGREED that the filing and certification of the original of this examination is waived.

IT IS FURTHER STIPULATED AND AGREED that counsel for the opposing parties will furnish a copy of this examination without charge as heretofore agreed.

- - -

WATER_PCB-SD0000049711

I N D E X

EXHIBITS

Inter-County

Number	Description	Identification
A1 - A6	Product Labels	70
B	Documents (Letter, Article)	144
C	Letter (6/8/70)	145
D1 - D19	Test Results	170
E1 - E5	Documents (Test Results, Letter)	205
F	Folder	285

Denk

Number	Description	Identification
B	Statement - Freundlich	256

Rozansky

Number	Description	Identification
A	Report - Biodegradation Study	259
B	Report - Wheeler	260
C1 - C3	Report - Manufacture and use of PCBs	280
D1 - D6	Report	282
E1 - E3	News Release	290
F1 - F4	News Release	290

WATER_PCB-SD0000049712

INDEX (Continued) --

EXHIBITS

Rozansky

Number	Description	Identification
G	Sales Records	305
H	Letter (1/15/71)	366

WATER_PCB-SD0000049713

W I L L I A M B. P A P A G E O R G E, a witness in behalf of the Third-Party Defendant and Fourth-Party Defendant, Monsanto Company, having been first duly sworn by Robert Hantman, a Notary Public of the State of New York, was examined and testified as follows:

MR. EISENBERG: Cook & Tucker has advised our firm that they wouldn't be here today, and we're authorized to go ahead without them. I'm also advised the firm of Kalter & Gottlieb will not be here today, but that they want a copy of the record. I would think although my client is not here today, any witness who is available is deemed to be made available at one time.

If there's any examination that we're not present at, we won't take the position that we have a right to examine again, and I think all counsel can agree on that. I know Cook & Tucker doesn't want to come in a second time, I know that.

Mr. Papageorge, to allay any fears, we're going to be here at this session however long it takes.

WATER_PCB-SD0000049714

MR. CLINE: In order to make our position very clear, Mr. Papageorge is here on behalf of Monsanto. He will give such testimony as you gentlemen require within the rules. He will not be back. This order that's been submitted is clear as can be as far as we are concerned, and we don't intend that he be produced a second time, no matter who doesn't show.

(Discussion off the record.)

EXAMINATION

BY MR. EISENBERG:

Q Your full name is William Papageorge.

A Yes.

Q Where do you live?

A St. Louis, Missouri suburbs.

Q How old are you?

A 55.

Q Now, the very fact that you're here today implies that you have some connection with Monsanto; is that true?

A That is true.

Q Are you the designated witness, so to speak, in cases involving PCB's for the company?

A Yes, sir.

WATER_PCB-SD0000049715

Q Have you testified in other cases where Monsanto was involved and PCB's are involved?

A Yes.

MR. CLINE: I'm going to object to the last question on the ground that it's totally irrelevant to any issue that's here.

Q What is your job title with Monsanto at the present time?

A Director of Environmental Operations.

Q And can you give us a thumbnail sketch of what is entailed in that?

A I am concerned with environmental affairs relating to our products and the processes used to manufacture these products. Now, this group of products represents only a part of all the products Monsanto is involved with.

Q Is there another section or division comparable to yours that has that area of responsibility with these other products?

A Yes.

Q And how many other such departments are there within the company?

A There are six operating companies within Monsanto Company.

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Q I don't know if we have to go into all six of them, but is there some aspect of your work that delineates the products you're concerned with as opposed to what the other five divisions are concerned with?

A Yes. Currently the products I'm concerned with are those products that we in the chemical industry refer to as bulk chemicals. These are those chemicals produced in very large quantities which are referred to as the building blocks of the chemical industry, like acids and lye and benzene and the like.

Q That's in contradistinction to the other divisions which deal with products that are more finished? Would that be a fair statement?

A That is a fair statement, yes.

Q Now, going backwards, how long have you been in your present job as head of the environmental aspect for this one of the six divisions?

A Since September 15th, this year.

Q Rather than go backward, let's start frontward. Let me take you up from where you started. Where did you get your schooling?

A I attended Washington University in St. Louis, Missouri, and received a Bachelor of Science degree in

WATER_PCB-SD0000049717

chemical engineering; and then I had further schooling and received a Master of Science degree in chemical engineering.

Q Also at Washington?

A Also at Washington University.

Q What year did you get the two degrees?

A The Bachelor of Science degree was awarded in 1943; the Master of Science degree was awarded in 1947.

Q Are you mainly confined to one area in the chemical field? Are you mainly in organic chemistry; is that the area of your greatest expertise?

A Yes.

Q And following the bestowal upon you of a Master's degree did you have subsequent professional education?

A Yes. I've attended courses at what is now known as Oklahoma State University, and I've also attended courses at Washington University.

Q And were these essentially focused on organic chemistry?

A No. These were primarily courses in engineering.

Q How about have you done any teaching or writing in the scientific field?

A No, sir.

Q As far as your employment history, when did you

WATER_PCB-SD0000049718

get your first job in the chemical industry?

A My first job was in 1947.

Q Can you just sketch it briefly for us?

A It was with Phillips Petroleum Company in Bartlesville, Oklahoma. I started out in research work related to crude oil production, and then went into engineering work related to the refining of crude oil.

Q Did you have anything to do during that stage of your professional life with any research in lubricants or products which removed heat, things of that type?

A No, sir.

Q During those years did you come across or have any contact either as a student or as a researcher with PCB's as such?

A No.

Q Had you ever even heard of them at that stage of your professional career?

A No.

Q How long did you stay -- Phillips you told me was '47?

A That is right.

Q And again, how long did you stay at Phillips?

A Until 1951.

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Q Did you change your association?

A I changed association and joined Monsanto Company.

Q Have you been with them continuously since '51?

A Yes.

Q I don't expect at this point great detail but can you give me a summary again of what you started with in the company and give me the duration of when you changed slots, so to speak?

A I started Monsanto as a design engineer and, as best I recall, that assignment lasted a couple of years; then I was given an assignment to superyise the manufacturing unit which manufactured a series of chemicals we referred to as plasticizers. From that assignment, as I recall, was also about a two-year duration. I then was assigned to the Maintenance Department, Maintenance and Construction Department supervising a geographic area or the efforts involved within a geographic area, and that assignment, again, was about a year and a halt, as best I recall; and then I was made the Superintendent of Maintenance function, which encompassed the entire site, the entire location; and as maintenance superintendent, I had the assignment for two or three years. I've forgotten exactly how long. Then I

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was made a group leader back in the Engineering Department, supervising the efforts of several engineers and technicians and draftsmen and alike. That lasted, again, a couple years as best I recall. I was then made a general superintendent of the warehousing material handling services kind of activities in a plant for two years; then I was transferred to another plant as a general superintendent of a manufacturing unit; and when I say general superintendent of manufacturing I'm talking about a third of the plant, one-third of the total.

Following that, I was appointed Plant Manager of the Anniston, Alabama plant. That assignment was made in 1965, and I terminated that in 1969. Following that, I was appointed Manager of Environmental Protection, concerned only with environmental problems associated with PCB's. That became effective January 1970, and as best I recall -- I don't remember the exact date but somewhere in there my title was changed, although the assignment did not change too dramatically, to manager of environmental control or protection -- it's the other way around. Initially it was control and we decided we can't control the environment. We can protect it so we decided to change the title.

Shortly after that, in addition to PCB's, I was

WATER_PCB-SD0000049721

also given additional chemicals to be concerned with, to look into, to avoid similar problems we had, say, with PCB's. Late 1971 the title was again changed and it became Manager of Product Acceptability, and I maintained that title until September 15th of this year, at which time I was given my current assignment.

Q Tell me again what the whole job title now is.

A It's Director, Environmental Operations.

Q Now, when you started out as design engineer, Monsanto didn't manufacture machinery as such, did it?

A Not to my knowledge.

Q So when you were designing were you designing essentially machinery that customers would use?

A No. I was designing machinery -- really I was designing and specifying equipment and machinery which was manufactured and supplied to us by others.

Q I see. For use by Monsanto in manufacturing various products itself made; is that right?

A Yes.

Q Let me just ask you some questions about Monsanto. Is Monsanto a single unified corporation or is it rather a series of separate corporations?

A Well, as I understand it, it is a company

WATER_PCB-SD0000049722

incorporated in Delaware, and it does have some subsidiaries. I don't know if I m responding to your question or not.

Q You are. Has your association with Monsanto been entirely with the parent company, so to speak, or have you worked at different times for the subsidiaries?

MR. CLINE: This implies knowledge on his part as to whether he's dealing with divisions or separate corporations, and even I don't know the answer to that; so I think you're putting him on a limb.

MR. EISENBERG: Certainly the intention to do that isn't there.

MR. CLINE: I understand that.

MR. EISENBERG: If he knows, I suppose he can answer it, and if he doesn't, the simple way to handle it is to say he doesn't know.

MR. CLINE: What he wants you to state is the separate entities you worked for are the divisions of the corporation or separate corporations?

A They were divisions of the parent corporations.

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Q Could you give us now the major divisions of the parent corporation, what they would be?

A Are you asking about the current organization?

Q No. I'm concerned mainly with the time span of, say, '65 to '73. Could you give me the answer for that period?

A I'll try.

MR. CLINE: It's a little long in your time. I'd go along '65 through '71.

MR. EISENBERG: That's all right.

BY MR. EISENBERG:

Q Your counsel and I agreed to six years. Has there been a substantial change in six years or has it been pretty much the same as it's always been?

MR. CLINE: This lawsuit involves this period of time and what's occurred since that time is of no moment here.

MR. EISENBERG: We're concerned with the corporate setup. If there's been no changes that will help speed it along.

MR. CLINE: I suppose it isn't all that important. Tell him what he wants to know as best you know. Give him what you got now and go

WATER_PCB-SD0000049724

back as best you can to that period of time if you wish.

A Currently Monsanto is divided into six operating companies which we refer to, one of them being Monsanto Textiles Company. Another would be Monsanto Industrial Chemicals Company. Then there is the Monsanto Chemical Intermediates Company which is the company I belong to. There is Monsanto Consumer Products Company. And then there's Monsanto Plastics and Resins Company. And the sixth one is Monsanto Agricultural Products Company.

Q Now, leaving aside just name changes which we're not concerned with, has the company essentially operated in those six divisions over the years since you've been there?

A You qualified it only by referring to name changing. In essence the company operated in this fashion although there's been some combination and recombination with different titles for the different sections or divisions.

Q Now, in your tenure with the company have you always been essentially in Chemical Intermediates or have you crossed division lines at different times?

A I have crossed division lines.

Q Now, back in the days when you just started and

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you did some design engineering work as you described a few answers back, did you get involved in the problem of heat transference in the various machines you actually worked on?

A Yes.

Q And in those years the lubricants used, did any of them in volume have the kind of lubricants involving PCB's involved in this lawsuit?

A Yes.

Q Can you tell me what those were back in that would be the post 1951 period?

A As best I recall, we did use some of Monsanto's heat transfer fluids in our own heat transfer systems. We also used some of the industrial hydraulic fluids in some of our machinery such as air compressors. Now, this is not to say that every heat transfer system had these fluids in them or that every piece of moving machinery had these fluids in them.

Q I know that, but my question was: Were PCB or PCB derivatives or components used during that stage by Monsanto?

A Yes.

Q Did they have trade names or brand names or

WATER_PCB-SD0000049726

designated names as such during that period of time?

A Yes.

Q Can you tell us what those names were?

MR. SOMMERS: Can we make more specific the period you're talking? I think it's a little vague.

Q We're during your tenure of your design engineering which started in 1951.

MR. EISENBERG: His first job was as design engineer and we're talking about that period.

MR. SOMMERS: Okay.

BY MR. EISENBERG:

Q I think I was getting into the names of the heat transfer fluids.

A Having some difficulty in establishing exactly the year and when some of these trade names were adopted for the market place and some were used internally for a long time --

Q We understand that and we don't expect precision. If you can just give us general times, that would be enough.

A Okay. Of course, the most common reference to these fluids at that time was the use of the trade-mark

WATER_PCB-SD0000049727

Aroclor.

Q You described that as a trade-mark in and of itself?

A It's a trade-mark, yes, sir.

Q Registered by Monsanto?

A That is right.

Q Was it registered at that time or prior to '51?

A It was registered prior to but I don't know the exact timing.

Q Now, did you yourself have anything to do with the -- I guess laymen would call it the invention or the making up the compound? Did you have anything to do with that?

A No, sir.

Q It was a finished product at the time you first began to utilize it in your design engineering work?

A Yes.

Q Does Aroclor contain PCB's?

MR. CLINE: You got the present tense.

MR. EISENBERG: I'll withdraw it.

Q Did Aroclor back in the days you first began to be familiar with it, which I take it is the post '51 period, contain PCB's?

WATER_PCB-SD0000049728

A Some of the Aroclors contained PCB's.

Q I take it from that answer that there were different Aroclors.

A That is right.

Q How many altogether were there?

A There were two basic types.

Q Did they have suffixes or prefixes which designated the kind of types there were?

A There were suffixes, numerical suffixes which would indicate which type of commercial chemical they were.

Q Do you remember what the suffixes were?

A Yes. There was a 1200 series which designated the use of PCB's, polychlorinated by phenyls. The 5,000 series designated the presence of polychlorinated ter-phenyls.

Q Was there an abbreviation to describe those?

A Later recently the abbreviation has been adopted PCT's.

Q And what series were the PCT's?

A The 5,000. There was another series, the 4,000 series which denoted a mixture of PCB's and PCT's.

Q We're still back in the early 1950's when you were working as you have described. Did you utilize all three

WATER_PCB-SD0000049729

types of Aroclor in some of the machinery that you worked on or helped design?

A I don't know quite how to respond to the question because some of the PCB's, let's refer to the Aroclor 1200 Series, were used in the liquid form in the machines. It is possible that some of the Aroclor 5,000 Series may have been present in the gasketing of those machines or in some other form which we could not identify with the naked eye, so it's possible that both were present, yes.

Q All right. Now, back when you started you were obviously a junior man. What was the department you worked in and who was your boss back then? Can you recall that?

A The department was called the Plant Process Development Department.

Q Was that out in St. Louis?

A In St. Louis.

Q St. Louis, I take it, is the site of the company's main manufacturing operation?

MR. CLINE: Now?

A No, sir.

Q How about back in the 50's?

A No. It's the site of the general offices of the

WATER_PCB-SD0000049730

corporation, not of the main manufacturing unit.

Q We can't do everything in one question. We'll just start with the executive offices. They have always been in St. Louis?

A Yes.

Q How about the research and development; has that always been out in St. Louis or has that been in different places?

A It has been in different places.

Q Would it be a fact that in the kind of work you did in design engineering, documentation was made of the various work not only of you but of the other people in your department, and filed in appropriate areas with the division you were in?

A I don't know personally.

Q Well, did you, yourself, make reports and document what you were doing as the months and years went by in that task?

A Yes.

Q Do you recall whether at that time there were reports, internal reports of the company dealing with heat transfer problems in the use of Aroclor in the machines that were being designed or worked on at that time?

WATER_PCB-SD0000049731

A I don't recall any reports about heat transfer problems.

Q Well, if I change problems to just consideration, do you recall if they were --

MR. CLINE: I don't really understand what you're getting at. I object to the form of the question.

MR. EISENBERG: I think we can eliminate the problem on form.

BY MR. EISENBERG:

Q What I want to know is: Whether or not back in that time span in the department there were records of the use of Aroclor, be it the 1200 Series or other series, in connection with the machines that were under design or under consideration by the division at that time.

A Yes.

Q Were there any references that you can now recall? Again, we don't expect total recall. We know it's not possible. With respect to any leakage considerations or methods by which the PCB might escape the heat transfer systems, was that factor ever discussed or did it show up in the reports at that time?

A I don't know specific to PCB's.

WATER_PCB-SD0000049732

Q Was that subject covered generally, though, not specifically to PCB's?

A That is true, yes.

Q Now, staying with the time span we're in now, were there other heat transfer fluids manufactured by Monsanto other than Aroclor?

A At what point in time?

Q In the early fifties.

MR. CLINE: 1951 and 1953. He's got you as a design engineer in that period of time.

MR. EISENBERG: That's right.

A I don't recall any other chemical that was offered as a heat transfer fluid at that time by Monsanto.

Q Where was Aroclor produced at that time?

A At one of two Monsanto plant locations, the plant at Anniston, Alabama.

Q Is that the one you later became the manager in?

A Yes, sir; and the other unit was located in Sauget, Illinois.

Q Were the plants virtually the same in what they produced or were there some variations between the two plants at that time?

A They were the same.

WATER_PCB-SD0000049733

Q Skipping from '51 right down to '71, did the company during that time span begin to produce other heat transfer fluids which contained PCB's other than Aroclor?

A No.

Q Can you tell us, I'm talking now about the 200 Series of Aroclor, is it 100 per cent PCB's?

A Yes.

Q Does Monsanto market a product called Therminol?

MR. CLINE: You're again using the present tense. I cautioned you about that.

Q At any time did Monsanto commence the production of a product called Therminol?

MR. CLINE: We're talking about a period of time through 1971.

MR. EISENBERG: Yes.

A Yes.

Q Again, I don't expect the exact day but what general time span did they begin with that?

A As best I recall, the latter part of the 1950's.

Q When I asked before did they ever market or make another heat transfer fluid, was there something inappropriate or inartful in my question where we didn't find by that question if Therminol was produced in the

WATER_PCB-SD0000049734

late fifties?

MR. CLINE: What he means is: Is Therminol and Aroclor the same thing or Aroclor 1200?

THE WITNESS: We initially marketed PCB's for heat transfer applications under the Aroclor trade-mark, and there was a transitional period in which we introduced the trade-mark Therminol, but for many years many of our established customers still referred to it as Aroclor, so we really had two trade names on the market place for the very same material.

BY MR. EISENBERG:

Q It's the same thing? Just a change of name?

A That is right.

Q Is Aroclor-Therminol the only PCB product manufactured during this time span, early fifties to end of '71?

A If you're speaking only of 100 per cent PCB products, those are the two trade-marks used in the United States by Monsanto.

Q Were there other products with lesser percentages of PCB's marketed during that time span?

A Yes.

WATER_PCB-SD0000049735

Q Could you tell us of them?

A As I think here I misled you. There is a third trade-mark with 100 per cent PCB's which we also used, Santovac,

Q Is it the exact same thing? It's 100 per cent PCB's, fluids used in vacuum pumps.

Q Was it the same stuff, exactly the same stuff as Therminol?

A Same as some of the Aroclors.

Q I want to go back now and talk about PCB's, and I want you to recognize this as layman essentially. Can you give us a layman's explanation of the chemical characteristics that make up PCB's?

A I will try, of course,

Q Okay.

A I think I can best explain it by trying to get into a little basic chemistry if I can do so.

Q You go right ahead.

A The starting material for PCB's is really benzene. I suspect that many of us in this room have heard of benzene, and benzene is depicted by the chemist for communicating purposes in his shorthand by a hexagon diagram on a piece of paper, six-pointed figure, six points.

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That in a way tells us the shape of the benzene material as visualized by the chemist. When benzene is exposed to high pressures and temperatures, two of these hexagons join up point to point. It then had a double hexing configuration which is referred to by the chemist as the biphenyl group.

Now, in each of the remaining five points of the two hexagons, so that makes ten points, there is a hydrogen present. There's a hydrogen on each one of these points. That's for biphenyl. Now, when biphenyl is exposed to chlorine as it is when PCB's are manufactured, the chlorine will displace the hydrogen in a rather random way, and yet a reproducible fashion, so when we see these ten points at which hydrogens are located we should also see those as ten potential points for chlorine to be located.

As a result, we can have anywhere from one chlorine added onto a maximum of ten chlorines and the chemist then refers to each of these materials, the single chloral, the two chloral, the three chloral by the expression homologues, and the word "homologue" in essence refers to a family with the same number of chlorines present, although those chlorines could be located at different points around this double ring. The members of the family of this homologue family are referred to as isomers -- and I hope

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I don't confuse too much -- let's take the case where only one chlorine is added. It is possible to have three positions where this chlorine attaches itself, and no more. Any other attempt just brings you back to one of the three, so there are, then, in this case a homologue referred to as monochloral, one chloral biphenyl, and there are three isomers in that family, dependent upon the position of the chlorine.

Now, take the other extreme where ten chlorines are added. In other words, all of the points are occupied by a chlorine, there is only one possibility for that, ten chloral biphenyl; so in that instance the homologue consists of only one member in that family, one isomer, and there are variations in between. The commercial mixtures that were produced have never contained any one of these isomers. They have always contained many of these isomers. There are 209 possible isomers of chloral biphenyl. All the combinations and permutations. The commercial mixtures usually range from 50 to 80 of these isomers. I hope that that's adequate.

Q That was very good. I was going to ask you this: Do I get it right that it's like permutations and combinations, that there are 209 possible combinations of:

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PCB's?

A Combinations of chlorine and the biphenyl group.

Q That's what I meant to say. Are they all PCB's?

A They're all members of the PCB family.

Q And your answer that the commercially marketed ones contain between 50 and 80, is that 50 and 80 isomers?

A Yes.

Q Now, is it possible when you go about making PCB's for the fabricator of it or the manufacture of it to ascertain in advance how many isomers he wants to come out of that particular batch?

A It is possible, yes.

Q Well, let's take during your span as plant manager in Anniston. Was it done that way?

A It's done in an indirect way from experience.

Q Now, does the end product between 50 and 80, was the Monsanto decision to market PCB's within those parameters guided by certain industrial considerations that were garnered by the company by experience and research and things of that type?

A Yes.

Q And can you tell us what the considerations were that went into a decision to market a PCB product within

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that 50 to 80 range?

A All right. One of the key considerations was the fact that this mixture was fire resistant.

Q I try to let you finish but I must ask you at this point: Are there other PCB's in lesser than 50 and greater than 80 that would not be fire resistant?

MR. CLINE: Your answer to the question that you asked is going to be totally fragmented unless you let him answer the question. You asked him what are the characteristics of this product that induced Monsanto to market it. Now, why don't you let him do that and then take it apart step by step thereafter if you want to.

MR. EISENBERG: I'll whatever you say. Do it that way.

BY MR. EISENBERG:

Q First one desirable characteristic, fire resistant.

A Correct. Another very desirable characteristic and I'm mentioning initially the characteristics common to all of the commercial mixtures. Later I hope I can get a chance to talk about those characteristics unique to some of the more common ones, all right? Now, another principal

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characteristic of PCB's is their chemical resistance to acids and bases and sunlight; in other words, resistance to deterioration.

Q There's a high indestructability quotient, is that a fair --

A That is correct. Let me try to get into some of the specifics for the types of uses the different PCB's were sold to. For heat transfer applications the characteristic that was highly desirable is the resistance to breakdown or deterioration at extremely high temperatures. Another valuable characteristic is the fact that they could be heated to very high temperatures and still remain as liquids rather than become vapors, gases. A characteristic that was very valuable in electrical applications was its high electrical insulating properties. It will not conduct electricity. I think this covers the key characteristics.

Q When these characteristics were ascertained, was it done through the research and development facility at Monsanto?

A Most of them were, yes.

Q Have you over the years had any role, whether direct or indirect, supervisory or subordinate to research and development?

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A I'm confused about the time span.

Q I meant over the years at any time.

A I also would like to ask: Is this with reference to application research or all research?

Q I'm really concerned with PCB's, anything to do with PCB's during that time.

A I was very involved with the research effort relating to PCB's in establishing analytical methodology and determining biodegradation and determining the temperatures at which incineration could take place.

Q That would be to destroy them?

A That is right.

Q When you did this were you assigned there specifically or did you do it while you had one of the other tasks you told us about before?

A That was part of my task as Manager, Environmental Protection for PCB's.

Q Now, getting back to the characteristics of PCB's, when different chlorines are added to them, are where different weights to the PCB's? Do they have different characteristics?

A Yes.

Q And when a customer ordered PCB's for use as a

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heat transfer fluid or lubricant --

MR. CLINE: Again you've used the present tense.

MR. LAGARENNE: He said "ordered."

MR. CLINE: He's got it in the present tense.

MR. EISENBERG: We'll get it right.

BY MR. EISENBERG:

Q I'm talking about the pre-'71 period. Were there people in the company, be they in sales or technical departments, that somehow told the customers what the characteristics of the PCB's, what different weights would be?

A Yes.

Q Did Monsanto have people who would actually work with a customer who was interested in either setting up a machine or even designing a machine where they supply technical know-how and technical advice on the kind of heat transferral fluids that might be appropriate or best suited to that given machine?

A Yes.

Q And what department or departments did they work out of when they did that?

A That was normally in what we at Monsanto refer to

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as the Marketing Department.

Q The marketing people, again, in lay language, they're basically salesmen. Were there also technical people assigned to marketing who knew these chemical characteristics of the different kind of PCB's that were available?

A Yes.

Q Do you know whether or not the technical advice provided by the kind of personnel we're now talking about would in any way assist in the design of the heat transferral characteristics of the machine that was being worked on at the time?

A Yes.

Q As far as the different kinds of PCB's, they were marketed first you told us Aroclor and then Therminol. Was there another suffix which designated the weights of the particular product? I think you told us they were mostly between 50 and 80. Would there be an Aroclor 1200 Series suffix 51, then a 52, and so forth?

A If I understand your question, let me answer it this way: The 1200 was followed by another two digits to complete the designation. The last two digits represented the per cent chlorine in the mixture. The higher the number

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the higher the presence of chlorine. Therefore, the more viscous or heavier the material until it reached, as I recall, about 68 per cent when the material was no longer a liquid. It was a solid.

Q When it got beyond 68 per cent chlorine it was still PCB's, was it not?

A Correct.

Q And do I understand you correctly that at that point it ceased being a liquid and became a solid?

A Yes.

Q And was either Aroclor-Therminol ever marketed as a solid?

A It was marketed as Aroclor 1268.

Q And what commercial use was made in the pre-'71 period of Aroclor 1268?

A It was used as an ingredient in adhesives which have to be heated to make them liquid form for use, which in turn hardened when they're cooled. It's used as an ingredient -- I'm sorry, was, was used as an ingredient in waxes, primarily the wax used in casting machine parts. It was also used as an ingredient in some lacquers and paints. It was never used as a heat transfer fluid. Therefore, it was never sold as a Therminol.

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Q Well, from that last answer -- if I pick up the thread, tell me and, of course, if I'm wrong, tell me that, too -- is it right that PCB's had a generically now different broad area as a commercial use, heat transfer fluid, wax, paper, lacquers, paints, adhesives? Is it possible for you to give me a general rundown to the weights that would be, let's start at did you say 1242 was the starting one, did you say?

A 1221 is the lowest chlorine content.

Q 1221? Is it possible to say go from 1221 to a weight, say, in the 1230's, and say now this was used essentially as heat transfer, the next five or six weights were adhesives; is it possible for you to do that?

A I can try it.

Q Why don't you try it?

A Aroclor 1221 used as a dielectric fluid in some capacitors, as an ingredient in industrial hydraulic fluid, and in one of the Therminols.

(Discussion off the record.)

A (Cont'd.) That would be Therminol FR-0; Aroclor 1232, lacquers and paints, a plasticizer in some plastics; Aroclor 1242, this is the most popular fluid used in electrical capacitors, used in Therminol FR-1,

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carbonless copy paper coating, paints and lacquers, adhesives; Aroclor 1248 used in some electrical capacitors and transformers; Therminol FR-2, adhesives, paints and coatings; Aroclor 1254, electrical transformers, paints and coatings, plasticizer, Therminol FR-3; Aroclor 1260, electrical transformers adhesives, paints and lacquers -- paints and other coatings, adhesives, plasticizers, wax formulations; Aroclor 1268 --

MR. CLINE: Was there an Aroclor equivalent of 1260?

THE WITNESS: No, sir.

A (Cont'd.) Aroclor 1268, wax formulations, adhesives, plastics, coatings. That's to the best of my memory.

Q That's pretty good. I was going to ask you: If I got it right there were four kinds of Therminols, FR-0, FR-1, FR-2 and FR-3. Were those simply trade names for the equivalent Aroclor and simply a device for marketing those various kinds of Aroclors?

A Yes.

Q So that when you say -- I'll pick one out -- a 1221 was FR-0, and it was used in certain things, is it right that Therminol FR-0 would be used for those very

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things?

A Let me see if I understand your question.

Q It's a simple thing. I'll ask it again. Maybe I didn't stress myself. You said 1221 is used for dielectric fluids, industrial hydraulic fluids, and in one of the Therminols FR-0, what I want to know is, when the customer bought it would he buy it as Therminol FR-0?

A If the customer purchased that fluid for a heat transfer application he would order it as Therminol FR-0.

Q I think I can bring this to a close. What prompted my question was I think maybe your phraseology. I think you said a 1221 went into a Therminol FR-0. Do you mean by that that it actually is Therminol FR-0 or does it really go into it?

A Let me try to explain the system. When we manufactured Aroclor 1221 we would schedule the production and it would be put into a tank and it's made. Its quality would be determined, and if it was a very high quality it would be reserved, if you will, for the electrical application, and it would carry on the label, it would carry the label Aroclor 1221 which meant that this material could be shipped for any application, because the electrical application was the most demanding insofar as quality is

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concerned. If, however, it had some property that prevented it from being classified for purely electrical. For example, it conducted electricity a little bit, it's still good enough; in fact, it's still excellent for heat transfer applications.

At that point the decision would be made, let's put the Therminol FR-0 label on that container, and that material would only be sold as a heat transfer fluid. It would not be sold to the electrical capacitor manufacturer.

Q If I get you right from that answer, all Therminol FR-0 is Aroclor 1221.

A That is right.

Q But not all Aroclor 1221 is Therminol FR-0.

A That is correct.

Q Now, your use of the term high quality is new to us and you started to explain it somewhat by giving an example of particular batch, one being suited perhaps for electrical uses and a second batch of the same chlorine number not being suited. Were there other characteristics that went into deciding whether a given batch or load or whatever you'd call it? Batch, I guess; it's a liquid.

A Yes.

Q What other characteristics went into the

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determination of whether it was or was not of high quality?

A The characteristics for the electrical application included some special tests that determined its electrical properties. They are referred to by expression such as dielectric constant which is really a measure of its ability to conduct electricity. That is a very key characteristic for electrical service. Another important charactistic is the presence of free chlorine -- any chlorine that's still in there and hasn't reacted, that is important. We have found from experience that it must be a very low value.

A third characteristic is the presence of moisture. A slight amount of moisture is unacceptable for dielectrical purposes. Now, these three characteristics do not show up in the specification for heat transfer fluid, so we really have two sets of specifications. However, the material that passes the dielectric specification could and has been sold as Therminol when we didn't have enough of the other on hand.

Q For heat transfer fluids.

A As heat transfer fluids so we'd peel off the Aroclor label and put on a Therminol label.

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Q Does FR mean fire resistant?

A Yes.

Q All Therminols have FR designations. They're all fire resistant.

A No, sir.

MR. CLINE: The last question is objected to as to form. Mr. Papageorge tells me that in response to one of the questions he answered it in part, but for some reason something else came up so that he didn't complete his answer and he wanted to do so. It was a question relating to the marketing branches of Monsanto having technical people to advise prospective customers on the construction or design of heat transfer equipment and indicated that he left something out of that answer.

Would you like to put that in now, Mr. Papageorge, concerning the extent to which these people advised and what areas they advised on?

THE WITNESS: The technical — the marketing technical services' advice was oriented to Monsanto's product, what temperatures it can withstand before it breaks down, what its gravity

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or heaviness is so that the other designers can calculate the size of the pipeline and what kind of pump it takes to move the material.

I guess to make it short, the advice was product oriented as distinguished from the whole system. We were not in the oven manufacturing business or design business; we were not in the varnish pot design business. I didn't mean to mislead the group. It had to do with our product and its properties so that they can in turn use it for their more detailed design.

BY MR. EISENBERG:

Q I think just before we broke we had a couple of questions about the use of prefix FR standing for fire resistant, and I mentioned to you that all four Therminols you identified had an FR prefix. Now, were all those four Therminols fire resistant?

A Yes.

Q Were any Therminols marketed commercially that were not fire resistant?

A Your time frame again.

Q Let's go '65 to '71.

A At that time, no, so all Therminols had the FR

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designation.

Q As far as the numbers, were they essentially to designate viscosity?

A Yes.

Q The higher the number I think the more viscous -- were they actually heavier; was the PCB product actually heavier?

A Yes.

Q If you put it on a scale, the designated high number would weigh more than the lower number?

A Yes.

Q And that was because of what you told us before about the chlorines being added and that all was a factor, a variable in weight, I take it.

A Yes.

Q Again, going back right to the start of this, and I'll confine this not to '65-'71, but I'll confine it to the knowledge you have. Does Monsanto have a patent on PCB's?

A No.

Q I think you told us before that Therminol was a registered trade-mark. Was Aroclor also a registered trade-mark?

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A Yes.

Q And that third one, Santovac, was that also a trade-mark?

A Yes.

Q Do you know when it was, and this need not be based on personal knowledge, but if you know from your work at the company when PCB's were first utilized by Monsanto?

A Late 1929.

Q And again, do you know whether the general uses were comparable to the uses that continued down through the fifties and sixties?

A The uses -- the use at that time was as a dielectric in electrical equipment.

Q Did Monsanto use PCB's or utilize them in the products we've talked about so far this afternoon under any licenses or contracts with any other firms?

MR. CLINE: I don't understand the question.

(Discussion off the record.)

A To my knowledge there never was a patent on the material as a chemical. I understand and I have seen copies of an old patent that General Electric had in its application as a fluid in electrical equipment. That patent expired in

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the forties or early fifties. No other relationship exists with our customers.

MR. CLINE: Can I clarify that by asking an additional question? Do you mind?

MR. EISENBERG: Go ahead.

BY MR. CLINE:

Q Is it correct, Mr. Papageorge, that polychlorinated biphenyls are chemicals or chemical substances that have been put together by mankind for many, many years?

A Yes.

BY MR. EISENBERG:

Q Can you tell me if during the fifties and sixties PCB's were marketed commercially by any other domestic firm?

MR. CLINE: You mean anyone, any place in --

MR. EISENBERG: I mean a firm in the United States.

A I have been told that on occasion other companies have manufactured PCB's and have sold them. However, when I tried to pursue and get more specific information in terms of types, quantities and dates, I could not get the specifics.

Q How about foreign firms, do you know of PCB's

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under a commercially-marketed trade name was available from foreign sources in the fifties and sixties?

A Yes, they were available.

Q Could you tell us the names of the foreign companies and their countries of origin and if you know the trade names they used, that would be helpful, too.

A All right, I'll try. In Germany, and I must confess I don't know the full title of some of these companies, but a company we refer to as Bayer, and I'm certain there's a longer name than that in German.

Q Is that the same as the aspirin company?

A I believe they are related, yes, located in Leverkusen, Germany, manufactures PCB's, and they market them under the name -- it escapes me now.

MR. CLINE: If you want to, we'll leave a blank in there and we'll put it in.

THE WITNESS: There are two companies in France that marketed material which they called Kanechlor, and the companies are we refer to, and again I don't know the full name, Progil and Kuhlmann.

BY MR. EISENBERG:

Q Any others?

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A An Italian company, Cafarro, and a Spanish company, Flick, I believe, as best I can recall. There are strong indications that there are units, manufacturing units east of the so-called iron curtain, but we really don't know too much about them.

Q How about the Far East?

A In Japan, Monsanto had a joint venture with Mitsubishi who made PCB's and used the Monsanto trade-marks.

Q Were they made in Japan?

A Made in Japan, yes.

Q Were any of those shipped to this country?

A No. There's another producer, Kanafuji, also a Japanese producer. I do not know of any other PCB producers.

Q You don't know if these were sold commercially in the United States during the fifties and sixties?

A I do not know.

Q Do you know if there were any tariffs on these foreign PCB products in the fifties and sixties?

A Yes.

Q Were there tariffs?

A Yes.

Q Do you have any present recollection of what they

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amounted to in those years or don't you?

A It's my understanding that the situation is such that the American selling price establishes the tariff that is imposed on incoming material. This is the intent there is to protect the American industrial producer, so I'm led to believe that the tariff that's added on the import material there's some difference between what he says is his selling price and the American selling price.

Q Now that we're on that, take the '65-'71 period. How is it sold, by the drum, by the pound, by the what? I'm talking about PCB's now. Say you wanted to buy a drum of Therminol. Do you know what it cost, a 50-pound drum?

MR. CLINE: Are you talking about the cost or how it was sold? You asked a couple of questions.

MR. EISENBERG: I'm talking about the cost essentially.

BY MR. EISENBERG:

Q Was it sold by the pound or gallon?

A The material is sold by the pound.

MR. CLINE: Was sold by the pound?

THE WITNESS: Was sold.

Q How was it marketed, by the drum or some other

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container?

A Dependent on the amount purchased, it could be purchased in anywhere from five-gallon pails to 10,000-gallon tank cars.

Q Do you know what the price ran, not to the penny but what did it run from '65 to '71?

A The earliest price that I recall that in about 1970 it was selling for about 15 cents a pound, as best I recall.

Q As far as shipping it in containers, did the containers have to have any special characteristics or would any metal or plastic container do in transporting?

MR. CLINE: I'm going to object to what would do. If you want to ask him what containers were used by Monsanto as opposed to these other people that you talked about, I'm not going to object to that, but I'm not going to let you ask him what it should be shipped in.

MR. EISENBERG: I didn't mean that. My choice was just a colloquial choice of words. I don't want to get into what Mitsubishi or the guy in Germany used. He's told me anything from a five-gallon pail to a boxcar.

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MR. CLINE: Not a boxcar.

MR. EISENBERG: Well, a tank car. I don't want to go into every detail.

BY MR. EISENBERG:

Q What I want to know is: Did you have to coat it inside, protect it in any way? Was there any characteristic of PCB's that required what the layman called any special handling or packaging? That's the thrust of my questioning.

A I understand. Since PCB's are so inactive and inert, there was no need to look for anything special in the way of a metal container. The key consideration with respect to the dielectric fluid was to make certain it was absolutely clean.

Q Now, early in today's questioning you told us that there was a stage in your career where you were plant manager down at the PCB plant in -- was it Anniston, Alabama?

A Yes.

MR. CLINE: Are you intimating that that's the only thing that was made there? You called it a PCB plant. It's a chemical plant.

MR. EISENBERG: I'm intimating nothing. I'm going to find out by one of the next questions.

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MR. CLINE: I don't like the designation of the PCB plant at Anniston.

BY MR. EISENBERG:

Q Did they make other things in Anniston?

A Yes.

Q Did Monsanto have a whole complex down there of a plant that made various kinds of chemicals?

A Yes.

Q Was there a separate plant for PCB's?

A Yes.

Q Segregated off to one side under the Monsanto complex?

A It was identifiable geographically but not necessarily segregated.

Q Tell me again what the year was you went down there.

A 1965 through 1969.

Q Before you went down there had you had some either training or education or experience with respect to the manufacturing process before you were made head man down in Anniston?

A To which process?

Q To the manufacture of PCB's.

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A No.

Q What I want to talk about now is a little about the manufacture and how it's marketed, and so forth. I want to hear about the plant itself. What was the annual output, say, of the Anniston plant during that time span? I'm talking about PCB's. I don't care about the other stuff.

A Roughly 40 million pounds per year.

Q How many people did you have in the PCB plant during that time?

A As best I remember, about 30, 35.

Q And these were all production people?

A Yes.

Q Did you have any marketing people down under your supervision at the plant?

A No.

Q Did you have quality control people?

A Yes.

Q Did you have any research and development people?

A No.

Q Any legal people?

A No.

Q How about safety engineers?

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A Yes.

Q How many of them did you have?

A One.

Q Now, you've told us quite a lot, and I think most of us understand PCB's from the chemical point of view. Now I want you to give us a thumbnail on the technological point of view. How is it made? As I understand, you started with benzene? Was the starting point for the manufacturing the delivery of a tank load or tank loads of benzene to Anniston?

A Yes.

Q Why don't you just run through what happened after the tank load of benzene got there?

A All right. The converging of this tank car of benzene to biphenyl is not part of the PCB unit per se, but it's a very important first step. The benzene does arrive in tank cars from a petroleum source. It is, of course, emptied into large storage tanks. It's pumped from these storage tanks into a unit that's familiar to the petroleum people, you may have heard the expression cracking unit. What it is, it's a series of pipe coils inside a furnace which is fired by gas or oil up to, as I recall, 750 degrees centigrade, very high temperatures. It's at these

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red hot metal temperatures that the benzene is converted from benzene to biphenyl. Along with this biphenyl there is still some unchanged benzene that goes through the system. There is this hydrogen that was released when the two benzene forms, two hydrogens released, so there's hydrogen in there and also as a result of this high temperature we form some material that -- let's call it tars. It's unknown mixture of all kinds of materials, undesirable residues and that stream is sent to a refining system in which the hydrogen is removed, the benzene is sent back to the starting point, the biphenyl is sent forward and stored and these tars are drained off and put in drums and buried. Now, let's look at the biphenyl. This biphenyl material at room temperature is a solid. It looks very much like candle wax, white, off-white candle wax. It is kept at a high-enough temperature to make it a liquid, and then that liquid is pumped into a tank and kept hot enough to keep it a liquid form. Then into this tank chlorine is introduced as a gas. That chlorine is bubbled through this molten biphenyl for a period of time necessary to give the desired end product.

If we wish to produce, let's say, Aroclor 1221, the chlorine is bubbled through for a shorter period of time

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than it takes to make Aroclor 1260 and we know from experience it takes so many hours and so many minutes to reach a point. When that time period has elapsed, the chlorine introduction is shut off and this mixture now of some unknown materials, along with the PCB mixture we're looking for is sent over to another unit, at which the temperature is raised high enough now for the PCB's to boil over in what we call in the chemical industry as a distillation. These vapors are condensed and the clean, let's call it refined PCB is accumulated. The material that remains in the distillation unit is a black residue that is either sold as a residue or is buried or burned, disposed of, and that's basically the process.

Q Is the plant in Sauget essentially the same type, the manufacturing process not only similar but identical?

A Yes.

Q How long would it take to start from the pure benzene and wind up with marketable PCB's?

A I don't know that I ever added up all the sequences but I'd say about eight hours for --

Q When it came out it was a liquid as opposed to a solid? It was no longer wax-like, it was a liquid.

A A liquid, yes, except for the Aroclor 1268 that is

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kept at high temperatures to keep it a liquid until it's sent over a device we call a flaker to make flakes very much like soap chips, and so on.

Q When 1268 is sold commercially it's sold as chips?

A It's sold as a powder granular material in bags.

Q You told us about 40 million pounds, I believe.

A Yes.

Q How large a batch would remain at one time?

A 4,000 pounds per batch, as I recall, was the standard batch.

Q Was there a line, so to speak, or a series of lines?

A It's a series of lines.

Q So you could make a number of 4,000 batches at one time?

A Oh, yes.

Q When the chlorine was bubbled through the wax-like biphenyl you told us about, was there a catalyst used?

A Yes. The catalyst is any source of iron. The wall of the kettle served as a catalyst, but to make sure we had enough in there we would introduce iron in the form of nuts and bolts and pipe fittings and alike in a metal basket which was submerged into the molten biphenyl.

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We also on occasion would add iron as a form of chemical called ferric chloride which looks like table salt, pour some into the batch.

Q So now we're down, we've run off a batch. Have you quality control people? I'm using the wrong conjunction or participle or whatever you call it, but back at that time, when did your quality control people first introduce themselves into the procedure?

A You recall when I mentioned the distillation step when the vapors are condensed and collected.

Q Yes.

A A sample is taken out of that material that's collected, sent to the laboratory and they run the tests specified on the specification sheet. When that particular batch meets these conditions it is released for pumping in either into these pails and drums I mentioned or into a large storage tank for eventual pumping into a tank car or tank truck.

If it does not meet those specifications, we must either take it back and redistill it or we hold it and introduce it back into the original step and chlorinate it to the next step higher on the scale. Instead of a 1242 we try to make a 1248 out of it, so we do recover

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it out of specification material.

Q Is what you've just described synonymous with what you told us about before, when you told us about things that had to be done to test to see about the quality of the product?

A That's that same step, yes. If we are going to make dielectric, quality control lab looks at more characteristics. If we're going to make heat transfer fluid it looks at fewer characteristics.

Q In the finished product is there any dissolved hydrogen chloride gas?

A No.

Q We've talked not today but of hydrocarbons. Is PCB a hydrocarbon?

A Yes, PCB's -- yes, the chemist would classify PCB's as a hydrocarbon.

Q Now, you told us about putting it in the pails. I take it there would be intermediate-size containers going all the way up to the tank cars; is that right?

A Yes, I can be more specific. There's the five gallon pail, a 30-gallon drum, a 55-gallon drum and for this one material, Aroclor 1268 we had the 50-pound kraft paper bag, and we also had a 250-pound fiber drum, the

WATER_PCB-SD0000049768

cardboard-type drum. In addition to those small packages we shipped in trucks and tank cars.

Q Now, I think you told me before you had no marketing people at the plant at Anniston; is that right?

A That is right.

Q Where would you get your orders from within the company as to where to ship a given quantity of product to?

A Within Monsanto we have a central order --- receiving service either by mail or toll-free call or whatever. The personnel at this customer service center would transmit the order via a communication system, and I forget the name of it. It's a service that Monsanto has where the order is typewritten at the plant as transmitted from the St. Louis office, and on this device that looks like a typewriter the order would be readable and that would be the document that would say ship so many pounds to so-and-so by a certain date.

Q Is it correct that when it came to selling Therminol and Aroclor, Monsanto didn't just list wholesale distribution but sold directly to the customer?

MR. CLINE: For clarification of it, the question makes no exceptions and indicates that

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this is a situation that existed in all instances.

MR. EISENBERG: That's well taken.

Q I'm talking about ordinary custom practice and usage back at the time when you were in Anniston. Was it the regular custom and practice for Monsanto to sell to the regular customer and not utilize any middlemen or wholesalers of any kind?

A I can best answer that by describing --

Q Why don't you go ahead.

A Aroclor was intended for the miscellaneous uses such as wax formulations, coatings, varnishes, lacquers and the like, were sold at one time, at the time we're talking about, up to 1970 through distributors. PCB's sold to the dielectric application, the heat transfer application, the vacuum pump application, and the hydraulic fluid application were not sold to distributors.

Q I take it that the product of your plant covered both categories so that in some cases you shipped directly to the customer and in other cases you shipped to, as you said, wholesalers and distributors.

A Yes.

Q Was it '69 you left the Anniston plant?

A Yes.

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Q Up to the time you left the Anniston plant did you have anything to do with the formulation or the composition of the labels or writings or markings on the various packaging utilized to ship the product?

A No.

Q Do you have with you or do you have available to you copies of the labels and writings on the containers utilized during that time span?

A Yes.

Q Might we take a peek at those?

A I have with me a label which refers to Therminol FR-2 which is typical of the labels used in that period of time for Therminols, Aroclors and alike, typical in the kinds of information that appears on the label other than the product designation.

Q Were there any differences at all in the labels between the four Therminols that were used at that time?

A No. They were all alike.

Q How about Aroclor, was the label on Aroclor different, other than the name obviously, any significant differences in the label?

A No.

Q We're going to look at the labels, pass them

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around to all the lawyers to look at but was it the same label for the five-gallon drum to the 250-pound fiber box?

A Yes.

MR. EISENBERG: Maybe we can mark that and then pass it around.

(Discussion off the record.)

MR. CLINE: We have several labels, the ones that were used in 1966 for a sample size and also '65 label for the 55-gallon drum. The others are later than his attendance at Anniston, however. The other labels that we have are labels that were in use in 1970 and '71.

MR. SOMMERS: Are they all being marked as a package?

MR. CLINE: Not as yet.

BY MR. EISENBERG:

Q Do you have the labels of '70 and '71, too?

A Yes.

MR. CLINE: We have examples. That's the best we have been able to come up with.

MR. EISENBERG: Might we mark all of them?

MR. CLINE: I think maybe they ought to be separated because of the years.

WATER_PCB-SD0000049772

MR. EISENBERG: Why don't you take the staple out and as you read it out just give us the year.

MR. CLINE: We've got a packet of labels that are marked in each instance as to the print date of the year, in some cases the month that's on them, and I don't really have any objection to having them all marked on that basis as a group, showing the dates written on there that we were able to research out at some point to determine that these are labels that were used as of that time. Is that all right?

MR. EISENBERG: It sounds good to me. Go ahead and do it.

BY MR. EISENBERG:

Q Mr. Papageorge, rather than have the reporter mark it, why don't you give us the dates. Do you have six sheets, to begin with?

A There are six sheets to this collection.

Q Why don't you give them, going down from top to bottom the dates of the various sheets and what they are, top sheet, second sheet, second sheet, and so forth.

A The first label is a label that was printed in

WATER_PCB-SD0000049773

September of 1965 for placing on five-gallon pails of Therminol FR-2.

MR. CLINE: At the bottom it says "55 pounds."

A (Cont'd.) The second label is a label, again, for Therminol FR-2 which was printed August 24, 1970 for use on the 55-gallon drums, and this label shows a net weight of 600 pounds; the third label is identical to the second, except that it shows a net weight of 55 pounds and is to be used on the five-gallon pail.

MR. SOMMERS: Same date?

THE WITNESS: Same date, same material. Everything is identical to Label Number 2 except for the net weight.

A (Cont'd.) The fourth page is a copy of an additional label to be placed on all containers of PCB's. There's a date written to the use regarding food, pharmaceuticals and animal feed.

Q The first word so that you can identify it, the first word on this last label is the word "Attention."

A The fifth page is a label for Therminol FR-2. The date shown here is February 25, 1966. This label is intended to be used on samples of Therminol FR-2.

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The last page, again, is for Therminol FR-2, dated shown here as printed on November 1, 1965, and is for placing on 55-gallon drums and it shows a net weight of 600 pounds. These labels, although they all refer to FR-2 Therminol are typical of the labels used in those periods of time for PCB containing products from Monsanto.

MR. LAGARENNE: Have that marked Defendant, Inter-County A-1 through 6.

(Discussion off the record.)

Q While we're waiting for the labels, Mr. Papageorge, who -- when I say who, I don't mean people -- let's start with the department, who made up these labels at Monsanto?

A In Monsanto in our corporate distribution department there is a group that spends full time in designing Monsanto's labels.

Q Where are they located and who do they report to?

A This group is located at the corporate headquarters in St. Louis. It is supervised by Mr. R. G. Sido.

BY MR. CLINE:

Q Are you indicating that that has been so and up to including the period of 1971?

A Yes, sir. And when you ask me who does Mr. Sido

WATER_PCB-SD0000049775

report to, I'm not certain, but it's in the Distribution Department's organization.

BY MR. EISENBERG:

Q Mr. Papageorge, when you were head down in Anniston who was your boss down there? Did you have one local or located in St. Louis?

A My superior was located in St. Louis.

Q Who would that have been at that time?

A I had two supervisors in that period of time -- Mr. R. E. Soden and Mr. R. G. Stratmeyer.

Q And what was their rank in the hierarchy in the chemical intermediates?

A They were both directors of manufacturing of the Organic Division which existed at that time.

Q How many other divisions were there in chemical intermediate?

A I'm afraid I have misled you. Previously we talked about the components of Monsanto Company and the different titles. Well, at that time Chemical Intermediates didn't exist as a title of a component, so there is no such thing as divisions within chemical intermediates company. At that time they were all called divisions. There were no operating companies.

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Q What was the division at that time?

A That was the Organic Chemicals Division of Monsanto Chemical Company.

Q And in turn who would Stratmeyer and Soden report to?

A They would report to the General Manager of the Organic Division, Organic Chemicals Division.

Q Were there times during that time span that you were invited back to St. Louis to confer with superiors or people on the same level, management level as you were on problems of manufacture, distribution, safety and everything else? Were there such meetings held?

A Oh, yes, yes.

Q And with what approximate frequency?

A Approximately every six weeks, two months.

Q Was there at Monsanto during the late sixties, the time that you were head of Anniston, either a division that cut across the entire company or departments within the divisions themselves having to do with possible untoward characteristics of any of the products affecting either human health, animal health or the environment?

A Yes, there was.

Q And can you tell us what the name of that

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particular section or division was?

A This is a corporate department referred to as the Corporate Medical Department.

Q Do you know, again, without the precise date approximately when that department came into being?

A In the 1930's.

Q In the management setup at Monsanto in the table of organization what liaison, if any, was there between your plant -- when I say your plant I mean the PCB plant you headed at Anniston and the Corporate Medical Department?

A The liaison was primarily through the plant physician to the Director of the Corporate Medical Department who was also the physician.

Q Was there during your tenure as chief down there a plant physician or a series of plant physicians?

A There was one plant physician.

Q He was under your control, was he?

A Yes, sir.

Q Was it the regular management practice to include your meeting with him from time to time to discuss all problems involving PCB's and the whole operation at the plant?

A Yes; the whole plant, yes.

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Q When you went to St. Louis periodically to talk to the other people there about company business, was the subject of potential damage to the environment or to people or to animals part of the agenda?

A As appropriate, yes.

Q Well, I take it that you kept no memoranda or writings to help you remember what was said at all these meetings. I wouldn't think you'd have that, would you?

A No, sir.

Q Do you have a recollection, though, of the subject of potential danger to either human or animals or the environment coming up from time to time at those meetings?

A Yes, but keep in mind that this was a multi-chemical-producing complex, so --

Q Did the meetings you attended in St. Louis deal with not just PCB's but with a large number of products made by Monsanto?

A Yes.

Q Both in the Organic Division and probably other divisions as well.

A Yes.

Q Was it your recollection from those meetings that

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this problem of potential hazard cut across department lines and was a concern with respect to all products made by Monsanto.

A That's correct, yes.

MR. EISENBERG: It's a quarter of, and I think this might be a good time to adjourn.

(Discussion off the record.)

MR. CLINE: On behalf of Monsanto Chemical Corporation we are concerned about the fact that L & L Started Pullets as a plaintiff in one of the actions is not really a party to this aspect of the deposition, nor is anyone else a party to this aspect of the deposition with relation to L & L Started Pullets, Inc., because of the absence of the third-party or fourth-party actions that would otherwise have been started following the L & L Started Pullets action.

We assume that when the third-party actions and fourth-party actions, and so forth, that the Judge was told would be started with relation to the L & L Started Pullets action have been served, the parties to those actions who are here present, even though they don't have any standing

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now will deem this examination conducted of Monsanto as the examination for those actions.

In other words, we don't want pleadings to come about at a later point and have to have further depositions of Monsanto because new pleadings have been served in that action which haven't otherwise been started. Understand?

MR. EISENBERG: Not really.

MR. CLINE: You didn't serve the third-party actions.

MR. EISENBERG: That's right and we're going to serve them.

MR. CLINE: We don't know how long we got to wait.

MR. EISENBERG: Soon.

MR. CLINE: The point is we don't want to have those actions be served and then have to do Mr. Papageorge's testimony and others over.

MR. EISENBERG: Couldn't we shortcut it by deeming Mr. Lagarenne a third-party pleader?

MR. LAGARENNE: I can't be deemed to be the third-party pleader. I am the plaintiff in that action.

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MR. EISENBERG: I'm deemed to be the third-party pleader.

MR. CLINE: Will you agree to be bound by this examination of Monsanto as if Monsanto was a party in your action as a third-party or fourth-party defendant?

MR. LAGARENNE: I would agree in principle with that, but until these other defendants, third parties defendant or what have you are joined, they're really not in the lawsuit. I think I would prefer to say that when as and if the third-party actions and fourth-party actions, as the case may be, are started that all of the proceedings taken in all of the depositions and all of the people who are agreed to be examined pursuant to that stipulation be applicable all the way around.

MR. CLINE: I'm satisfied with that.

(The deposition was thereupon adjourned until Tuesday, September 27, 1977.)

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