NORTH CAROLINA
RANDOLPH COUNTY

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION

MID-STATE FARMS COOPERATIVE COMPANY,
Plaintiff

vs.

INTERNATIONAL PROTEINS CORPORATION; EAST COAST TERMINALS, INC.; SOUTH PACIFIC PROTEINS, INC.; and MONSANTO COMPANY,
Defendants

72 CVS 76

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NORTH CAROLINA
WILKES COUNTY

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION

HOLLY FARMS POULTRY INDUSTRIES, INC.,
Plaintiff

vs.

WILBUR-ELLIS COMPANY; INTERNATIONAL PROTEINS CORPORATION; EAST COAST TERMINALS, INC.; SOUTH PACIFIC PROTEINS ASSOCIATION, INC.; and MONSANTO COMPANY,
Defendants

71 CVS 1173

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DEPOSITION OF WILLIAM B. PAPAGEORGE

GRAHAM ERLACHER & ASSOCIATES
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The deposition of William B. Papageorge was taken at the Albert Pick Motor Inn, Greensboro, North Carolina, commencing at 2:00 o'clock p.m. on Thursday, the 3rd day of August, 1972.

APPEARANCES

For the Plaintiff Mid-State Farms:
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For the Plaintiff Holly Farms Poultry Industries, Inc.:
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For the Defendant International Proteins Corporation:
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For the Defendant East Coast Terminals, Inc.:
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and
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For the Defendant South Pacific Proteins, Inc.:
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and
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and
LARRY S. MOORE, Esq., of the law firm of Moore & Rousseau

For the Defendant Wilbur-Ellis Company:
KYLE HAYES, Esq., of the law firm of Hayes & Hayes



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For the Defendant Joy Manufacturing Company:
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and
PERRY C. HENSON, Esq., of the law firm of Perry C. Henson

Betty P. Julian, Official Court Reporter



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# I N D E X


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WILLIAM B. PAPAGEORGE

having been previously sworn, testified further as follows:

EXAMINATION BY MR. JORDAN

Q Mr. Papageorge, yesterday afternoon just before we adjourned, I asked you what investigation was made by Monsanto concerning the milk contamination in Ohio in early 1970.

MR. SMITH: I object to the form of the question. If you will phrase it again - and I might say that insofar as this witness is concerned, I said yesterday that there was some litigation; I would not object to your asking him questions as to what information or observations he had up until the time that some suit was started, and then I will object after that.

MR. JORDAN: Well, Mr. Smith, let's get it clear on the record that all of us in this room except you are obviously of the opinion that we are entitled to discover information concerning other litigation involving polychlorinated biphenyl contamination or injury or damage, and we're going to insist on that. Are you going to resist it? Do we have to go to court to get an order on it?

MR. SMITH: I don't know what you'll have to do. I'll state for the record that the litigation does not involve heat transfer fluid in any way. And secondly,



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that any information after a suit was brought has to do with preparation for trial and involves the attorney-client relationship, and I believe it is not subject to discovery, and I will so instruct the witness. But I was careful to say this morning that I am not objecting to your question relating to what this witness may know in regard to the way the matter first came to his attention before the litigation. And if you want to get it in the record, it has nothing to do with heat transfer fluids; you can do that. That was the point you made yesterday and I state it for the record. If you want to ask the witness about it, it's all right with me.

MR. JORDAN: Whether or not it has to do with heat transfer fluid - we're not concerned with heat transfer fluid; we're concerned with polychlorinated biphenyl material in any application or use which might cause harm. That's what we are concerned with, and I think that's what we're entitled to discover.

Q (By Mr. Jordan) Well, Mr. Papageorge, what about the Ohio milk incident? Tell us what you know about how it came to your attention to begin with.

A As best as I recall, in early 1970 - and I believe it was about March of 1970 - I received a telephone call from a Dr. Hill who identified himself as being a member or



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a part of the Food, Dairy and Drug Division of the Ohio State Department of Agriculture, and he asked me if I knew of any tolerance level that had been established for the presence of polychlorinated biphenyl in milk. I told him that to my knowledge there was no such tolerance level established; I had not heard of any. He then asked me to describe what polychlorinated biphenyls were, and I gave him the general description of the type that I described Thursday afternoon and Friday morning. I believe that was it - last week. He then asked me what I knew about polychlorinated biphenyl and its effect on human beings, and as I recall, at this point I told him I wasn't really that qualified to speak about toxicological matters but I would recommend that our medical director would be a better source of this type of information, and offered to have our medical director get in touch with Dr. Hill and discuss this matter further. This I did, and as I understand, Dr. Kelly - our medical director - did talk to Dr. Hill. While on the telephone with Dr. Hill, I discussed with him if he had an analytical methodology he was using, and he assured me that he had one. I don't know which method he was using. I offered to share Monsanto's method. And as I recall, at that time he didn't think that this would really be of too much help to him. At the same time, he was somewhat concerned that his laboratory results may not be as accurate as



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he would like them to be and asked if he could send a sample for Monsanto's laboratory to look at. I agreed that we could do this. And I don't know whether I gave him Dr. Scott Tucker's telephone - Dr. Scott Tucker being our group leader in the analytical research area - or whether I called Dr. Tucker and gave him Dr. Hill's telephone number, but in any regard there was a communication established between Monsanto's laboratory and Dr. Hill's laboratory. An arrangement was made for a sample to be sent to Monsanto's laboratory. There was some confusion at that time - the sample was misplaced. By the time we were able to locate it, the sample had deteriorated, putrefied. It was decided that this might give us an erroneous reading. And the Ohio laboratory was asked for a fresh sample, and eventually our laboratory analyzed it and confirmed that the polychlorinated biphenyls were indeed present in this milk at about the same levels that the Ohio laboratory had found.

Q What level was that?

A The number escapes me at the moment. I don't recall, sir. I just don't recall.

Q Did you have any consultations with anyone connected with the Food and Drug Administration about this Ohio matter?

A No, sir.



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Q Do you know whether anybody connected with Monsanto had any contacts with the Food and Drug Administration about it?

A No, sir, I don't.

Q Did Monsanto make any investigation to determine how the PCB got into the milk?

A No, sir. Dr. Hill indicated to me over the telephone that it was his opinion that the PCB's came from a coating that had been applied to the masonry surface of the silo, and he indicated to me that he had an analysis made of samples of scrapings off that wall - the silo wall, and had also made analyses of some silage, and it was his opinion that the polychlorinated biphenyls were present in the coating, somehow were transferred to the silage, and the silage then was the source of the polychlorinated biphenyls in the milk.

Q In other words, it went from the sealant on the silo wall to the silage, which was eaten by the cattle, which in turn went into the milk produced by the milk cattle?

MR. SMITH: I object to the form. He said that was Dr. Hill's--

Q (By Mr. Jordan) Is that what you were told?

A That's what I was told, yes, sir.

Q Did you or Monsanto initiate any measures to



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prevent the recurrence of that type of occurrence?

A In terminating the sale of polychlorinated biphenyls for use in these applications we referred to earlier as open systems or plasticizers and the discontinuation of the use of distributors for this marketing of these materials. This would make it impossible for anyone to obtain any polychlorinated biphenyls for a coating application.

Q Did you learn of PCB's being found in milk in Florida and Georgia in 1970?

A I learned about that fairly recently as part of our contacts with the federal PCB task force.

Q When was the federal PCB task force set up?

A Sometime in September 1971.

Q And who is head of that?

A Dr. Edward Burger, Jr.

Q What part of the government is he connected with?

A He's with the Office of Science and Technology, the Executive Office of the President.

Q Did the President set up the PCB task force by executive order?

A I'm not aware of any presidential executive order setting up the task force, no, sir.

Q How was it set up, to your knowledge?

A It is my understanding that Commissioner Edwards



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of the Food and Drug Administration had proposed that such a task force be established because many agencies in our federal government were involved, and it was his opinion that the polychlorinated biphenyl situation could be best handled through a multi-department task force.

Q When did Commissioner Edwards make that announcement?

A I recall the press conference Commissioner Edwards held in late September 1970, in which he indicated that he had previous to that date suggested the formation of the interdepartmental agency, the task force. I do not know whether he made the specific request that this task force be formed.

MR. MARSHALL: What year?

THE WITNESS: 1971.

Q (By Mr. Jordan) I thought you said 1970 was the press conference.

A My error - 1971, sir.

Q Were you present at the press conference?

A No, sir.

Q Did you get a copy of the press release?

A Yes, sir.

Q Is it in your files?

A Yes, sir.

Q Who else was on the task force for PCB's?



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A You mean the agencies, sir, or the individuals?

Q The individuals.

A The individuals. I'll try to recall as many as I can. Dr. Albert Kolbye, representing the Food and Drug Administration; Mr. John Wessel, also from the Food and Drug Administration; Dr. John Buckley, representing the Environmental Protection Agency; Dr. Gerald Coombs - I believe he spells it C-o-o-m-b-s - with the U. S. Department of Agriculture; Dr. Lucille Stickel, representing - I believe it's the Department of Interior, the Wild Life Services; Dr. Cairns, representing the Department of Commerce; Dr. Terry D. Davies, I believe he's either co-chairman or vice chairman of the task force, and he represents the Council on Environmental Quality; Dr. Larry Fischbein, National Institute of Environmental Health Sciences.

MR. MARSHALL: Off the record.

(Discussion off the record.)

A (By the witness) There's a Mr. Broadhurst, Bureau of Standards. I don't recall any more names. I don't believe that list is complete, and there were many alternate members.

Q (By Mr. Jordan) Is any employee of Monsanto a member or alternate member of the task force?

A No, sir.



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Q Now, you say you didn't learn about the Georgia/ Florida finding of PCB in milk until sometime last year?

A Yes, sir.

MR. SMITH: Recently. Object to form.

A (By the witness) Recently. Late '71, as I recall, sir, and as part of that press release packet that Commissioner Edwards issued, as I recall, there is a chronological listing of polychlorinated biphenyl instances and I believe - if my memory serves me right - that this is where I first became aware of the Georgia milk incident.

Q (By Mr. Jordan) When did you learn about the findings of PCB in the fat tissue of turkeys in California?

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

Q (By Mr. Jordan) Did you know that PCB's were found in fat tissue of turkeys in California?

A Yes, sir.

Q When did you learn that?

A That was shortly after the New York poultry incident we discussed yesterday, which was late '70. So this incident would have to be either late '70 or early 1971.

Q What investigation did you make of the turkey contamination in California?

A I received a telephone call - I don't remember the name of the individual, but he was a scientist. Again, the



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qyestions were typical - wanted to know what are polychlorinated biphenyls, where are they used - and he informed me that polychlorinated biphenyls had been found in some turkeys. He did not tell me the level. He would not tell me the type of polychlorinated biphenyls found. He indicated that he suspected it was in the turkey feed, which was a pelletized feed. He indicated they used a masonite flour which had been chemically treated by a process known as hydrolysis to form a synthetic molasses - and those are his words - which is, I'm led to believe, important in the pelletizing operation. He asked me if it were possible that this could be the source of polychlorinated biphenyls. I told him it's possible; on the other hand I had no real facts to go by. It's my understanding that masonite contains a lot of scrap material. I understand that adhesives are present. It's conceivable that polychlorinated biphenyls could have been present. I heard no more from that source other than that.

Q Did he indicate what his position was, or why he was making the inquiry?

A As I recall, he was involved with research work. He had the title of doctor. I am under the impression that he was a technical man in a research department, and the reason for his call was his findings in these turkeys.

Q What research department did he identify? The



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research department of a university or private enterprise?

A Private enterprise, sir.

Q Do you remember the name of it?

A Yes. I don't know if it's appropriate to mention.

MR. SMITH: Well, I'll object at this point and instruct him not to answer. I'll try to find out and give you the information if I can, maybe on some protective order.

MR. MARSHALL: Can we get off the record a minute?

Q (By Mr. Jordan) Is there litigation involved in the California turkey situation?

A No, sir.

MR. MARSHALL: Could we get off the record a minute?

MR. JORDAN: Just a second.

Q (By Mr. Jordan) Is this organization that this man identified himself as being connected with a customer of Monsanto?

A Yes, sir.

MR. SMITH: Then I renew my objection and instruct him--

MR. JORDAN: All right. What was it, Alan?

(Discussion off the record.)

A (By the witness) It's my understanding that this material this scientist referred to as masonite flour is a



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powder made from the grinding and crushing of scrap masonite board.

Q (By Mr. Jordan) Now, Mr. Papageorge, we have questioned you about numerous incidents involving PCB's found in various things. Do you know of any others, any other incidents where polychlorinated biphenyl has been discovered in an animal - animals, birds, fowls, fish, feeds, humans, milk, feed of any kind - that you have not told us about?

MR. SMITH: Object to the form of the question.

Q (By Mr. Jordan) During 1970 and '71.

MR. SMITH: Object to the form.

A (By the witness) Sir, there are many, many, many reports covering the various areas you've just described which we have not discussed here.

Q (By Mr. Jordan) Well, let's take the ones in 1970 that you know about. Will you enumerate those as best you recall?

A You're asking for something almost superhuman.

Q Just the ones you remember, Mr. Papageorge.

A There were reports in 1970 describing the presence of polychlorinated biphenyls in seals and seabirds in the North Sea and the Irish Sea. I believe that report came out fairly late in 1970. There were reports of - a report of a poultry study made at the University of Utrecht in The



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Netherlands in which French material, German material, and U. S. made material containing polychlorinated biphenyls were tested, and this is the study that indicated the presence in the European material of the highly toxic polychlorinated dibenzofuran. There were reports out of the Gulf Breeze Laboratory or the commercial fishers laboratory there--

Q Gulf where?

A Gulf Breeze, Florida, just outside Pensacola, Dr. Tom Duke and his team - in which they described the effect of polychlorinated biphenyls on marine creatures - more specifically juvenile shrimp. Dr. Robert Risebrough, associated with the University of California, and along with other co-authors, as I recall, released at least two articles in which he reported the presence of polychlorinated biphenyls in at least a couple species of wild birds and claimed that it was the polychlorinated biphenyls that were affecting the eggshell thickness of these birds and thereby affecting the reproduction process.

Q Let me interrupt you there, if I may, and ask you some questions about the reports you mentioned.

A Yes, sir.

Q Was the poultry study at the University of Utrecht published?

A Yes, sir, it was eventually published.



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Q When?

A To the best of my recollection, late 1970, early 1971.

Q Did you see a copy of the report prior to publication?

A No, sir.

Q Do you have a copy of the University of Utrecht report in your files?

A I believe I do, sir, yes, sir.

Q Did that report make any findings concerning the effects of the United States PCB material?

A Yes. It referred to the fact that one of the United States produced materials was one of the test materials, and it went on to describe what effect it had on poultry. And here the essence, as I recall, is that the U. S. material was considerably and showed considerably less effect than the European material.

Q Did it show some effect on the poultry?

A Yes, it ~~was~~ has some effect.

Q Adverse effects?

A All effects in these studies are adverse, sir.

Q Was that United States material manufactured by Monsanto?

A Yes, sir.

Q What was it?



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A It's a material we refer to as Aroclor 1260.

Q Now, was the Gulf Breeze Laboratory report published?

A Yes, sir.

Q When?

A Sometime in 1970.

Q Did you learn of the University of Utrecht report prior to its publication?

A I learned of the work prior to its publication, and I was told that they were planning to publish the data.

Q Did you learn of any of the findings prior to publication?

A I learned from the investigators during a visit to the University of Utrecht.

Q When was that?

A In May of 1970.

Q Now, when did you first learn of the Gulf Breeze Laboratory findings?

A Early 1970.

Q Do you have a copy of the Gulf Breeze Laboratory report in your files?

A Yes, sir.

Q Do you have copies of Dr. Risebrough's report?

A Yes, sir.

Q When did you first learn of Dr. Risebrough's



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findings?

A Early 1970.

Q All right, sir. Now, tell us other things that you learned in 1970 that you can remember about PCB's being found in animals or food or feed, fish, fowl, snakes, alligators, anything.

MR. SMITH: Object to the form of the question.

A (By the witness) I was aware of work being conducted by the Bureau of Interior Laboratories located in Columbia, Missouri.

Q (By Mr. Jordan) What laboratory?

A It's called the Fish-Pesticide Laboratory of the Bureau of Fisheries and Wild Life of the Department of Interior.

Q When were those studies made?

A It's a continuing program they are involved with, and as I understand it, their studies started in 1969 and continue today.

Q Have they periodically issued reports of their findings?

A Yes, sir. Some of the reports have been made to professional organizations.

Q Have those reports come to your attention?

A Yes, sir.

Q Do you have copies in your files?



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A Yes, sir.

Q With reference to Dr. Risebrough's work, I draw your attention to a copy of an article which was published on December 14th, 1968, in the publication entitled, "Nature", and the article is captioned, "Polychlorinated Biphenyls in the Global Eco-system."

A Yes, sir.

Q Have you read that article?

A Yes, sir.

Q Do you have a copy of this in your files?

A Yes, sir.

Q And this came out in December of '68, did it not?

A That's correct, sir.

MR. SMITH: Could we have a copy?

MR. JORDAN: I didn't have it marked as an exhibit.

Q (By Mr. Jordan) Mr. Papageorge, prior to your assignment to the international office of the company in St. Louis in January of 1970, had you been aware of these studies being made of PCB's commencing in 1966, I believe, in Sweden and continuing on up until the time you came to St. Louis, including Risebrough's work?

A I was aware of some of this about October, November, 1969.

Q Is that when you first became aware of the PCB



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problems?

A Yes, sir.

Q And how did you become aware in October or November of 1969? What directed your interest toward--

A My supervisor - and I don't recall whether it was by telephone or one of his frequent visits to the plant at which I was located - mentioned that he had heard that there seemed to be some problems relating to polychlorinated biphenyls.

Q Who was that gentleman?

A Raymond J. Stratmire. eyer

Q And is he still connected with Monsanto?

A No, sir.

Q Is he living?

A Yes, sir.

Q Is he retired?

A No, sir.

Q Who is he with now?

A He is now associated with the ~~Millencroft~~ Mallinckrodt Chemical Company.

Q Whereabouts?

A In St. Louis, Missouri.

Q What was his title when he was your supervisor?

A He was Director of Manufacturing, Organic Chemicals Division.



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Q When did he leave Monsanto?

A I'm going to guess a little bit. April, May or June of 1970.

Q Mr. Papageorge, by December of 1970, were you aware that there were hundreds of reports of PCB's being found in mammals, fish, birds, feed, food, throughout the world and human beings?

MR. SMITH: Object to the form.

A (By the witness) Sir, I was aware of many reports. I don't know that at that point in time they reached a hundred as yet.

Q (By Mr. Jordan) There were many, many reports?

A There were many reports.

Q More than you can presently remember, isn't that true?

A That is correct.

Q I believe you said you'd have to be superhuman to remember them all?

A That is right, sir. That's my opinion.

Q And the only way that you can really remember all of the numerous incidents and reports involving PCB's which you were aware of by December 1970 would be for you to go to your files and the notebook - this ringbinder that you said, and this packet about four inches thick which has a rubber band around it, and go through those voluminous



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documents and pick out the ones that you were aware of in December of 1970. Isn't that true?

MR. L. MOORE: Object to the form of the question.

A (By the witness) That's an approach, sir, that can be taken, yes, sir.

Q (By Mr. Jordan) Well, isn't that the only way that you could really enumerate every one that you knew about by December of 1970?

MR. SMITH: Object to the form.

A (By the witness) Well, I can go to other indices and refresh my recollection, too, sir.

Q (By Mr. Jordan) But you would have to have something to refresh your recollection?

A That is correct.

Q You just couldn't sit there and breathe them all off right now to save your life, could you?

A I couldn't do it. Others might be able to.

Q Let me draw a few to your attention here and see if they refresh your memory. I show you a paper, a copy of a short article in "New Scientist," December 15, 1966. The article is captioned, "Report of a New Chemical Hazard." And it refers to Mr. Jensen's Swedish study on PCB's. Do you have a copy of that in your files?

A I don't recall this one, no, sir.

Q All right. Now, here is one, "Water Research,"



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printed in 1970, "A Review of Chlorinated Biphenyls Contamination in Natural Waters," by Mr. Vith and Mr. Lee, University of Wisconsin, was received by "Water Research" in November 1969. Are you familiar with that one?

A Yes, sir.

Q And here is one from "Environmental Science and Technology," October 1970, by Carl G. Gustafoson, Federal Water Quality Administration, Athens, Georgia. "PCB - Prevalent and Persistent. Intensified research is needed to minimize their dangers." And it refers to Monsanto Company's recent letter to Congressman Ryan. Are you familiar with this article?

A Yes, sir.

Q Were you in December of 1970?

A Yes, sir.

Q And I show you an article from "The New Yorker" magazine, June 20, 1970, which reports on the ubiquity of the polychlorinated phenolic compounds in the environment and their apparent ability to accumulate in systems of living creatures are suggested by the contamination caused by a group of polychlorinated phenolic compounds known as polychlorinated biphenyls, or more commonly PCB. These materials which are known to be highly toxic and are potential sources of -- in themselves and used for a wide variety of purposes.



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MR. SMITH: You are reading from "The New Yorker" magazine?

MR. JORDAN: Yes, sir.

Q (By Mr. Jordan) And then it refers to Monsanto manufacturing PCB under the trade name of Aroclors. Were you familiar with this article?

A Yes, sir.

Q And were you familiar with it in 1970?

A Yes, sir.

Q In December?

A Yes, sir.

Q All right, sir. Now, here's another from "Environment", January 1970, which starts off, "An alphabet of environmental contamination, PCB, may become as well known as DDT, and for some of the same reasons." Were you familiar with this article?

A Yes, sir.

Q This is, I believe, by Dr. Risebrough with Virginia Brodine, correct?

A Yes, sir.

Q And he has all sorts of tables - at least two tables here I notice - about PCB content, falcons and sea birds and eggs. Is that right?

A That's what he claims, sir.

Q You were familiar with that?



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A Yes, sir.

Q And then the Monsanto Company prepared and published or furnished a statement on PCB at the invitation of this "Environment" publication. Isn't that true?

A That is right, sir.

Q Who prepared Monsanto's rebuttal to Dr. Risebrough's article?

A I do not know.

Q Did you participate in it?

A No, sir, that was prepared before my involvement.

Q That was before your time?

A Yes, sir.

Q With the PCB. Now, here's an article that was published way back in November 1965 in "Poultry Science". "Studies in Chickadema Disease; Similarity of Symptoms Produced by Feeding Chlorinated Biphenyls." Are you familiar with this article?

A No, sir.

Q You didn't know about this one?

A No, sir.

MR. SMITH: When was the date of that and the name of the magazine?

MR. JORDAN: "Poultry Science," November 1965.

MR. SMITH: Who publishes that?

MR. HARRELL: "Poultry Science" magazine?



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MR. JORDAN: "Poultry Science" magazine.

MR. SMITH: What's the address?

MR. JORDAN: I don't know. The article was received for publication February 26th, 1965, and it was written by D. F. Flick, Roger G. O'Dell, and Virginia A. Childs, Nutrition Research Branch, Division of Nutrition, Food and Drug Administration, Washington, D. C. 20204.

MR. SMITH: Can I have a copy of that and any of these others you're asking him about?

MR. JORDAN: Well, we don't have any other copies. I'm not marking them as exhibits. I'm just asking---

MR. SMITH: Will you permit me to make copies?

MR. JORDAN: You can make copies if you want to.

MR. SMITH: All right.

Q (By Mr. Jordan) Now, here's an article from "Poultry Science," which was received for publication December 10, 1970, and was published apparently in '71; I don't know what date. But it's called, "Toxicity Studies on Polychlorinated Biphenyls in the Chicken." This was done by the Department of Food Science, Poultry Science, of the University of Wisconsin. Are you familiar with that article?

A No, sir.

Q And here's an article which was received for



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publication on May 3rd, '61. "Hydropericardium and Acidities in Chicks Fed With Chlorinated Hydrocarbon." Are you familiar with this article?

A No, sir.

MR. SMITH: What was it they were fed with?

MR. JORDAN: Chlorinated hydrocarbon.

MR. SMITH: Does it spell out in any more detail what it was?

MR. JORDAN: Well, let's see. It refers to chlorinated biphenyls in one of the tables, and it refers to Aroclors 1242.

MR. SMITH: What's the date of it?

MR. JORDAN: It's not dated but it was received for publication May 3rd, 1961.

MR. SMITH: What was the publication it was in?

MR. JORDAN: I do not know.

MR. HAGAN: Off the record.

(Discussion off the record.)

Q (By Mr. Jordan) Here's one from "Poultry Science" which was received for publication December 10th, 1970. I believe I've already shown you this one. Yes, that's the same as the previous one. Here's a publication of the 1971 "Cornell Nutrition Conference".

MR. SMITH: What date?

MR. JORDAN: I've given you all the information I



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have.

Q (By Mr. Jordan) The caption, "Result of Experiments on Effects of PCB's on Laying Hen Performance." It's by the Agway Research Laboratory in New York. Are you familiar with this publication?

A No, sir. I'm familiar with the work.

Q You are familiar with the work?

A Yes, sir.

Q Now, here's an article published in "Buyer? Science," September 1, 1970, called, "Polychlorinated Biphenyls, Another Long-life Widespread Chemical in the Environment." Are you familiar with this article?

A Yes, sir.

Q Were you in December of 1970?

A Yes, sir.

Q Mr. Papageorge, you have referred to polychlorinated biphenyls as being non-reactive. Will you describe what you mean by that?

A Sir, if I recall correctly, I intended at least to use the expression "relatively non-reactive".

Q Well, you first said they were non-reactive and then you modified that subsequently by saying "relatively non-reactive". Now, what I would like to know is what do you mean by "relatively non-reactive"?

A By that expression, I mean that these materials



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do not chemically, or are not chemically affected by such things as - affected easily by such things as oxygen or acid or alkalis, the kinds of things that many of us associate with corrosion and deterioration.

Q Do you have anything to add to that explanation?

A No, sir.

Q Now, you stated earlier this week in response to a question I put to you that one of the reasons that Monsanto, or one of the reasons that you made the recommendation that Monsanto cease selling PCB materials for so-called open applications or for closed food applications was because of the furor which had arisen over the whole subject matter. Do you recall your statement?

MR. SMITH: Now, I object to the form.

Q (By Mr. Jordan) Do you recall that?

A Yes, sir.

Q Now, my question is this. If there had not been a furor, would you have still recommended that Monsanto terminate sales of PCB's for so-called open systems?

MR. SMITH: I object to the form. If you can answer it, go ahead.

A (By the witness) I can give you my personal guess as to what might have happened, sir.

Q (By Mr. Jordan) I want to know what you would have recommended.



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A I would have recommended that we still would discontinue the marketing of these materials for the reason that presence in the environment has been established and therefore we should not continue to add to this burden on the environment by these open applications.

Q And would you have also ultimately recommended as you did whether there had been any furor or not that these materials not be supplied in heat exchange fluids for processors of materials going into feed?

MR. SMITH: Object to the form. I'm going to instruct him not to answer the way you have put it, Mr. Jordan.

Q (By Mr. Jordan) Well, Mr. Papageorge, I understood you to testify that Monsanto has terminated the sale of PCB material for use in the heat exchange fluid in the treatment of feed ingredients.

MR. SMITH: Well, I'm going to instruct him not to answer, Mr. Jordan.

MR. JORDAN: The testimony is on the record, Mr. Smith.

MR. SMITH: I don't believe it is - not that way. You're talking about company decisions made after July 1971, after this Wilmington - and it's repetitious.

Q (By Mr. Jordan) I asked you about an article which reported a talk that you made in Kansas City in



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December of 1971, and I asked if you stated that, "As a result of the fish meal incident" - that is the one in North Carolina - "Monsanto reviewed its policy and decided it was too much to expect all heat transfer systems to be entirely leak proof at all times." So you decided not to service any heat transfer systems related directly or indirectly to food or animal feed. And I understood you to testify that you did make that statement in this Kansas City talk.

MR. SMITH: I object. It's repetitious.

Q (By Mr. Jordan) Did you?

A Yes, sir.

Q All right. Now, my question is if there had been no furor about PCB, would Monsanto have reviewed its policy and made the same decision - not to service heat transfer systems related directly or indirectly to food or animal feed?

MR. SMITH: I object and instruct him not to answer. That's an impossible question. He's already made a statement, the basis for the policy change. It's purely hypothetical and an impossibility.

Q (By Mr. Jordan) Well, is this statement where you are quoted in this article a correct statement, Mr. Papageorge?

MR. SMITH: Read it to him again, please.



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Q (By Mr. Jordan) "As a result of the fish meal incident, Monsanto reviewed its policy and decided it was too much to expect all heat transfer systems to be entirely leak proof at all times. So it was decided not to service any heat transfer systems related directly or indirectly to food or animal feed."

A That is correct, sir.

Q What consulting laboratory has done studies for Monsanto other than the Industrial Bio-Test Laboratory in Norfolk, Illinois?

MR. SMITH: On what subject, Mr. Jordan?

MR. JORDAN: On PCB's.

A There's the University of Bangor. Is this the laboratory, sir, you had in mind?

Q (By Mr. Jordan) I'm not talking about the work in Wales; I'm talking about in the United States.

A In the United States.

MR. SMITH: Now, you are confining your question to the possible effect or impact on the environment in the way you agreed at the hearing before?

MR. JORDAN: No, sir. I'm interested in any laboratory work done out of Monsanto that this man knows about that relates to testing of polychlorinated biphenyls.

MR. SMITH: Well, I think it ought to be narrowed



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within the scope of Judge Kivett's order. I don't know what the answer might be, but it ought to be confined in some way to the effect of PCB on the environment.

Q (By Mr. Jordan) Well, let's confine it to PCB on the environment. That covers the whole range from "A" to "Z".

A Sir, I know there were studies made on polychlorinated biphenyls in laboratories for Monsanto. I recall the Kettering Laboratory as being mentioned.

Q Where is the Kettering Laboratory located?

MR. SMITH: Mr. Jordan, in connection with this question, we gave you a list of laboratories in response to your interrogatory which is phrased in the same way as your question.

MR. JORDAN: Mr. Smith, I have this witness under oath and I'm questioning him now, not you. You've never been under oath in this case.

MR. SMITH: Well, the interrogatory is under oath and I furnished the material. If you just want to sit here and ask him if he can remember what's on a piece of paper that you've already got.

Q (By Mr. Jordan) Where is the Kettering Laboratory located?

A I believe it's Cincinnati, Ohio.



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Q Do you know when that work was done?

A I believe it was in the 1950's.

Q Do you have those reports in your files?

A No, sir.

Q All right. What about the Younger Laboratories? Have they done any work for Monsanto?

A They have done work for Monsanto.

Q On PCB's?

MR. HENSON: Which one?

MR. JORDAN: Younger.

THE WITNESS: Y-o-u-n-g-e-r.

A (By the witness) I don't specifically recall any data which to me was identified as originating with the Younger Laboratories related to polychlorinated biphenyls. They are used by Monsanto, however.

Q (By Mr. Jordan) What?

A These laboratories are used by Monsanto.

Q All right. What other laboratory reports by outside labs were made for Monsanto on the effects of PCB on the environment - the effect or non-effect?

A I recall a discussion with representatives of our medical department in which the reference was made to a - I'm not sure of the formal title of this laboratory; I think it's called the Bernard Skin Clinic in St. Louis, in which some polychlorinated biphenyls studies were made, and



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that's the extent of my knowledge.

Q When?

A I don't know, sir.

Q Were those reports in the medical department?

A I would guess so, yes.

Q You don't have them?

A I don't have them, sir.

Q Do you recall any other toxicological studies which are in the possession of Monsanto which relate to PCB which were made by outside laboratories?

A No, sir.

Q Now, in your testimony on Friday, you said - and I quote from the bottom of page 13 - "Also I think it's appropriate to mention that the early reports of poly-chlorinated biphenyls in the environment invariably reported the presence of the higher chlorinated types. I discussed that in addition to our work in developing more refined analytical methodology, Monsanto's program for learning more about the toxicity of these materials through animal laboratory studies. And if you recall, these were studies that were normally and to this day conducted for those materials that are intended for feed use, and this kind of study is unique as applied to industrial chemicals. This does not mean that we have not conducted other toxicological studies in the past, from the 1930's on, which were the



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normal type of studies that are used for industrial chemicals to establish information that is normally required for shipping purposes and handling purposes, again on an industrial basis."

MR. SMITH: Mr. Jordan, I think there's a mistake in the transcript. I think the word is "food use" and not "feed use".

MR. JORDAN: Well, I'm just reading what the reporter has given to me. I'm not attempting to correct it.

MR. SMITH: Well, I'm pointing out that I think that's a mistake.

Q (By Mr. Jordan) At any rate, I focus your attention on the other toxicological studies.

A Yes, sir.

Q Will you describe what they are to your knowledge, whether they were made outside of Monsanto or in Monsanto's lab?

A They were made outside of Monsanto for Monsanto by these laboratories we just discussed. As best as I recall, the Kettering Laboratories were mentioned. I'm not sure of the Younger Laboratories, but if not the Younger Laboratories, some similar laboratory. And then this Bernard Skin Clinic or Skin Hospital work. It's this kind of work that was done in the earlier years.



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Q Do you know of any toxicological studies that were made during the 1950's or the first five years of the 1960's?

A I'm going to guess, sir. I believe - it's my understanding that these studies at the Kettering Labs were performed in the '50's. I don't recall any mention of work in the early 1960's.

Q To your knowledge, has Monsanto conducted in its own laboratory any toxicological studies of PCB's during the period from 1960 through 1967?

A Not to my knowledge, no, sir.

Q Now, at page 15 of your testimony Friday, you said - and I quote - "We decided rather early that some applications of polychlorinated biphenyls were of the type that because of their nature lead to immediate introduction into the environment." When was "rather early"?

A Discussions in this area, to the best of my knowledge, were in progress when I first arrived on the scene, so to speak, so that I became involved personally in early 1970 in discussions in which Monsanto representatives on occasion, off and on, were considering the termination of sales to some applications.

Q Well, Mr. Papageorge, the statement is, "We decided rather early that some applications of polychlorinated biphenyls were of the type that because of their nature lead to immediate introduction into the environment."



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A Right, sir.

Q Now, what I want to know is what was the "rather early" date of the decision?

MR. SMITH: I believe he's already answered the question, Mr. Jordan. He's been asked now - this is the fifth day - on when the decision was made, and he's given you the decision.

A (By the witness) Sir, as early -- I am personally aware that in early March of 1970 we had that decision.

Q (By Mr. Jordan) All right. On page 17 of your testimony, you said, "Part of our program was the sharing of our experiences and new information regarding polychlorinated biphenyls with our customers. So by letters and by marketing representative calls, discussions with groups - I was even involved with many visits to major customers - we passed on to them our experiences." Now, how many major customers did you visit after you became involved with PCB's?

A I have never counted them, sir. About fifteen to twenty.

Q On page 21 of your testimony last Friday, you said, "I believe at this point - and this is a personal opinion - that the European producers are now beginning to understand what we have been telling them, and this has been accelerated admittedly by Sweden's reaction by passing legislation for control of the use of polychlorinated



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biphenyls." Do you know what that legislation is, what it provides?

A I do not know all the details, but I am led to believe that in Sweden in order to import, handle, use, and export polychlorinated biphenyls, the parties interested must apply for permits or licenses and must keep records relating to the amount of polychlorinated biphenyl being handled, shipped, used. And I'm also led to believe that they must periodically report to some agency in Sweden relating to the use and handling of polychlorinated biphenyls.

Q Do you know whether that legislation contained criminal penalties?

A No, sir, I don't.

MR. SMITH: I suggest - it's 11:00 o'clock - if we're going to have a morning break--

MR. JORDAN: All right.

(A brief recess was taken.)

Q (By Mr. Jordan) Mr. Papageorge, you testified that the Japanese have taken even more restrictive steps than Sweden. What do you know about the Japanese restrictions on PCB?

A I don't know any details of the Japanese situation other than apparently they are more restrictive because the manufacturers in Japan chose to discontinue manufacturing.

Q Well, do you know what those additional restrictions



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are?

A I do not know any of the details, sir.

Q When did Monsanto in Japan decide to discontinue manufacturing PCB's?

MR. SMITH: Monsanto, Japan? Object to the form.

Q (By Mr. Jordan) Monsanto Mitsubishi, or whatever the name of it is - the one that Monsanto has in Japan.

MR. SMITH: Has an interest in.

Q (By Mr. Jordan) When was that decision made?

A Sir, I don't know when the directors of Mitsubishi Monsanto met to arrive at that decision. I am led to believe that sometime in January, early February, the decision was made to discontinue manufacture as of March 31st, 1971 - I'm sorry; '72 - 1972.

Q Now, do you know anything about the restrictive regulations in the United Kingdom?

A There are no restrictions imposed by the government of the United Kingdom on polychlorinated biphenyls.

Q Has Monsanto inaugurated the restrictive sales programs which you have testified about in connection with its foreign sales?

A Yes, sir.

Q And does that include sales from the plant in Wales?

A Yes, sir.



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Q Do you know whether Monsanto Mitsubishi has obtained any reports from any Japanese laboratory with reference to PCB's?

A No, sir, I do not.

Q Who would know that? Who could answer that?

A Well, I would suspect, sir, that the managers of Monsanto Mitsubishi would.

Q Could you give us the name of the manager?

A No, sir. My personal contacts have been primarily through Dr. Durland, who is Monsanto's representative.

Q Well, is he one of the managing directors of the Japanese operation?

A Yes, sir, he is one of the directors.

MR. SMITH: Mr. Jordan, I will object to the form of the question, because you said managing directors and he said, "Yes, one of the directors," and I don't want it to be confusing. Will you distinguish between the director and--

Q (By Mr. Jordan) Is he the top Monsanto director in the Japanese operation to your knowledge?

A Yes, sir.

MR. SMITH: That doesn't necessarily mean that he's the manager of Monsanto Mitsubishi.

MR. JORDAN: If he's the head man, that's enough for me.



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MR. SMITH: Well, I object to the statement.

A (By the witness) Well, I don't know about "head man", sir. He represents Monsanto's interests in Tokyo relating to this company.

Q (By Mr. Jordan) Where is Monsanto Mitsubishi located?

A In Japan.

Q Where in Japan?

A I don't recall the addresses, sir, but the offices are located in Tokyo. I do not know where the chemical plants are located.

Q Does Monsanto Mitsubishi have more than one plant?

A I'm led to believe so, yes, sir.

Q How many?

A I've heard of at least two.

Q Now, will you tell us what Therminol 55 is?

A It is a chemical material that we describe as being an ~~out-keel~~ alkyl benzene type.

Q Does it have any polychlorinated biphenyl in it?

A No, sir.

Q Does it have any chlorine in it?

A No, sir.

Q What is it made up of besides benzene?

A These are chemical groups which are known to the chemist as ~~out-keel~~ alkyl groups, which are combinations of



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carbon and hydrogen.

Q Does Therminol 55 vary in viscosity?

A Within limits, sir.

Q Is it as viscous as Therminal FR-1 or 2?

A I don't recall the number, sir. I don't know.

Q Does Therminol 55 have thermal properties?

A I don't understand the question.

MR. SMITH: Thermal?

MR. JORDAN: Thermal properties.

A (By the witness) I'm confused, sir. All materials have thermal properties.

Q (By Mr. Jordan) Well, it is resistant to heat?

A It resists deterioration due to high temperatures, but it, too, has its limits, like everything else.

Q Is it less resistant than FR-1, heat resistant?

A I believe, if I recall correctly, its upper temperature limitations are not as high as the Therminaol FR-1.

Q What are its upper temperature limitations?

A I don't recall the number, sir.

Q Can you give us a range?

A Somewhere in the 500 to 600 degrees Fahrenheit.

Q It will not vaporize till it reaches temperatures above that range?

A That is my understanding, yes, sir.



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Q Now, what is Therminol 66?

A That is a mixture of chemicals which are referred to as hydrogenated terphenyls.

Q Does it have any polychlorinated biphenyl in it?

A No, sir.

Q Does 66 have better thermal properties than 55?

A Somewhat better, yes, sir.

Q What would be the upper temperature range on Therminol 66?

A I think its range runs in the higher 500's to the low 600 degrees, but there again, I don't recall the exact numbers.

Q When was Therminol 55 and Therminol 66 developed?

A I don't know, sir.

Q Do you know whether those two chemicals have been thoroughly tested for toxicity?

A I don't know what is meant by "thoroughly tested".

Q Well, have there been any toxicity studies made by Monsanto on these two chemicals?

A Yes, sir.

Q And were they made by an outside lab or Monsanto's own lab?

A Outside laboratories.

Q What laboratory made them?

A I do not know which laboratory made the early



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tests that are normally conducted for industrial chemicals, but the more recent tests have been conducted by Industrial Bio-Test Laboratories near Chicago.

Q Have you seen any of those tests?

A I have seen summaries and reports of these tests.

Q Do you have those summaries and reports in your files?

A I believe I do, sir.

Q Mr. Papageorge, when was Therminol 55 first marketed by Monsanto, to your knowledge?

A Two, three, four years ago. I don't know, sir.

Q Was it on the market in 1970?

A Oh, yes.

Q And when was Therminol 66 first marketed?

A At least that period of time if not more.

Q It was available on the market in '69 and '70?

A Yes, sir.

Q Now, have the toxicity studies been made on both these heat exchange fluids - 55 and 66?

A It has been made, yes, sir.

Q Were those studies completed prior to the time that the Therminol 55 and Therminol 66 were placed on the market?

A Not all of them, sir.

Q Some were?



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A Yes, sir.

Q Do you know whether either Therminol 55 or Therminol 66 have been approved by the United States Department of Agriculture?

A I have been shown a letter received by one of our marketing representatives signed by a representative of the U. S. Department of Agriculture in which the individual from the Department of Agriculture agrees that one of these, if not both of these Therminols, is appropriate for use in heat transfer systems.

Q Do you recall the date of that letter?

A It's sometime in this year, 1972.

Q Did any such letter exist prior to July 15th, 1971?

A No, sir.

Q Are you sure about that, Mr. Papageorge?

A As best as I recall, sir.

Q All right. Now, is there any chlorine in Therminol 66?

A No, sir.

Q Who is C. B. Holloran?

A He's one of Monsanto's attorneys.

Q He's with the legal department?

A Yes, sir.

Q Prior to the time that you took your job in



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January of 1970, was there a predecessor in that job or was this a newly created job?

A It was a newly created job.

Q Does Monsanto have any guidelines with reference to not communicating between employees in the company in writing?

A No, I'm not aware of any, sir.

Q Do you know whether Monsanto has any written records retention and disposal program?

A I was aware of such a program during my assignment as plant manager at Anniston, Alabama, and I was in my role in that assignment participating in such a program with plant records. Since 1969, I do not know the status of such a program.

Q You don't know whether such a program exists in the St. Louis office?

A I'm not aware of anything in that area, sir.

Q Do you have in your files any clippings from the "Miami Herald" about the fish kills in Escambia Bay?

A I don't recall any such articles, sir.

Q You testified on Monday morning that you were aware of PCB's getting into Escambia Bay in the latter part of 1969 as a result of an industrial accident.

MR. SMITH: Object.

Q (By Mr. Jordan) Would you describe what that



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industrial accident was?

MR. SMITH: Object to the form.

A (By the witness) The polychlorinated biphenyls which were detected in the Escambia Bay were attributed to a loss of hydraulic fluid from an air compressor at Monsanto's plant in Pensacola, Florida.

Q (By Mr. Jordan) And when did that happen?

A The latter part of 1969.

Q Is the PCB material still used in those air compressors at Pensacola?

A No, sir.

Q When was it removed?

A Immediately after the leakage was discovered.

Q And what was substituted in place of it?

A I don't know, sir.

Q Has there been more than one such incident at Monsanto's plant in Pensacola?

A Not to my knowledge.

Q Now, have there been spills or leakage of PCB's from any other Monsanto plant, to your knowledge?

A I didn't hear the latter part of the question.

Q Have there been spills or leakage of polychlorinated biphenyls from any other Monsanto plant to your knowledge?

A Yes, there have been.



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Q Where?

A At the plants that manufacture polychlorinated biphenyls.

Q At Sauget?

A Yes, sir.

Q How many times?

A I don't know that these are incidents so much as a source of polychlorinated biphenyls in the plant effluent which results from the activity, production activities in the plant.

Q During the years that you were plant manager at Anniston, did you have spills or leakage of PCB's from time to time?

A On occasion, yes, sir.

Q Have there been spills and leakage at the plant in Wales?

A I can only guess at that, sir.

Q What is your knowledge on that?

MR. SMITH: I instruct him not to guess.

Q (By Mr. Jordan) Do you have any knowledge or information on that?

A I have no knowledge. I can only assume.

Q Sir?

A I can only assume and guess.

MR. SMITH: I instruct him not to assume and guess.



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He said he had no knowledge.

Q (By Mr. Jordan) Do you have any information as to any spillage or leakage of PCB's at the Japanese plants in which Monsanto is interested?

A I have no information about the Japanese operation.

Q Does Monsanto make PCB's in any other plant, or did they in 1970-71, besides the one in Japan, the one in Wales, and the two in the United States?

A Nowhere else, sir.

Q Just four places where it was produced?

A By Monsanto interests?

Q Yes.

A Yes, sir.

Q Now, was the hydraulic system in the plant at Escambia Bay, or Pensacola, deemed to be a closed system?

A Yes, sir.

Q Was any of the leakage or spillage which occurred at Anniston when you were the plant manager from a closed system?

A Sir, the closed system definition or description has been applied to the uses of polychlorinated biphenyls. I know that I have not personally related it to the equipment manufacturing polychlorinated biphenyls or the equipment which is used to fill tank cars or trucks or containers. So in my own concept of this system, I would not



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call that a closed system. There are too many open parts to it.

Q To your knowledge, was the system at the Kopel Pasteurizing Company in Stockton, California, a closed system?

MR. SMITH: To the witness's knowledge?

MR. JORDAN: Yes.

MR. SMITH: I don't know that there's any indication that he's ever seen it.

MR. JORDAN: Well, I'm just asking him what he knows about it.

A (By the witness) From what I have been told, that system is a closed system, sir.

Q (By Mr. Jordan) All right. Now, do you know of other instances of a spillage or leakage of PCB's from closed systems that have come to your attention during the past two and a half years?

MR. SMITH: You mean other than the one at Wilmington?

Q (By Mr. Jordan) The one at Wilmington and the one at the hydraulic plant - in the hydraulic system at Pensacola and the one at the Kopel place in Stockton.

MR. SMITH: Well, object to that question, to the form of it.

A (By the witness) I know of only one other



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incident, sir.

Q (By Mr. Jordan) Where was that?

A One of our customers who is in the food processing industry experienced an accident in his equipment.

Q When did this happen?

A I believe it was June or so of 1971.

Q Do you know of any other incidents of leakage or spilling from a closed system?

A No, sir.

Q Have there been any studies of PCB to determine what effect it might have on carcinoma, or whether it could cause carcinoma?

A I understand that there are some laboratories that have indicated conducting such studies. I have not seen any reports on these findings. I do not know if they have actually conducted the studies. However, I also understand that when animals are exposed to chemicals or materials, many laboratories routinely look for signs of carcinogenesisity.

Q Well, do you know whether any such signs have turned up in laboratory studies of PCB's?

A There were some reports that some workers in the FDA had seen something that made them suspicious. We have checked with them, but they still at that time were unsure of their findings, and to this day I'm led to believe they



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are still not certain of what they saw.

Q Have you seen any of those reports?

A I saw no reports. I was present in a discussion with individuals in the Food and Drug Administration, and I saw a reference to it in some summary reports that had been issued.

Q Do you have a copy of that summary report in your files?

A This is the-- I have reference to the report issued by the Interdepartmental PCB Task Force of the federal government.

Q Do you have a copy of that report?

A Yes, sir.

Q When was that meeting that you mentioned where this was discussed?

A This was an informal session in which we discussed this matter during the Quail's Roost, North Carolina, meeting in December 1971.

Q Was that the first time that that topic was ever discussed in your presence?

A That is correct, sir.

Q Now, I understood you to testify that you were first aware of a problem at East Coast Terminals on July 12th, 1971, late in the day?

A Yes, sir.



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Q How did you become aware of that?

A I received a telephone call - I believe I stated this the other day - from Dr. Lynn Romoser, Monsanto's Agricultural Products Division.

Q What did he tell you?

A Well, in the course of conversation, he raised the question of "had we sold polychlorinated biphenyls to a company known as East Coast Terminals located in Wilmington, North Carolina," that he had some information that indicated that they were processing fish meal at this location. And it was at this time that he educated me somewhat in the fish meal business, and mentioned such names as Dr. Charles Burgess and South Pacific Proteins, and Mr. Dean Morton - this kind of broad information. I told him I had never heard of this type of operation or this company, but I would look into the records and call him back.

Q What was this gentleman's name? Dr. what?

A Romoser. R-o-m-o-s-e-r, I believe is the way he speells it.

Q Where is his office?

A In St. Louis.

Q In the same building your office is in?

A No, sir.

Q Is he an employee of Monsanto?



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A Yes, sir.

Q What is his position?

A I don't know his formal title, but he is involved in the marketing and technical supporting of the marketing effort in animal feed components.

Q And was he in 1970 and '71 involved in that area?

A To the best of my knowledge, yes, sir.

Q Now, where did Dr. Romoser tell you that he had gotten his information?

A I believe he mentioned that he had been in - I don't know if it was at this first conversation or when I called back, but between the two conversations he mentioned such companies as Holly Farms, and I believe that's where he got most of his information.

Q Did he tell you who he had talked with at Holly Farms?

A As best as I recall, this is when he mentioned a Mr. James Andrews.

Q Did you contact Romoser back?

A Yes, sir.

Q What did you tell him?

A I told him that we had looked at our records and found that we had shipped a heat transfer fluid which we call Therminol FR-1 and which contained polychlorinated biphenyls to East Coast Terminals in August and December of



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1970, and in May and June of 1971.

Q Where did you look to get that information about those shipments?

A As I described the other day, this was a print-out from the computer which is in the possession of our marketing manager.

Q In your group?

A In the business group involved with this product, yes, sir.

Q Is this a master print-out that shows shipments to all customers, or is it a print-out for each separate customer?

A I don't know what you mean by master print-out, but it is a section of a very voluminous report, and in this section - at least that section that I consulted--

Q Does that section show sales to each individual customer?

A Yes, sir.

Q In other words, you could look at this one piece of paper and get all of the information about how many sales and when they had been made to East Coast Terminals?

A Well, it only tells me how many sales of a product was made to East Coast Terminals. It's by product makeup.

Q But it shows each of these sales that you said you



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told Dr. Romoser about?

A Yes, sir.

Q That's all on one piece of paper?

A Yes, sir.

Q Now, what else did you tell Dr. Romoser when you called him back, if anything?

A I believe I had told him that we in the St. Louis office knew nothing about this operation, and that I had planned to call the representative in our New York area who I understood has experience in heat transfer applications to see if he could help us get more information.

Q And who did you call?

A Mr. Jay Pullman.

Q Did you call him on the 12th or did you call him the next day?

A As best as I recall, I tried to reach him that afternoon, and because of the time zone difference it could well be that I reached him the following morning, the 13th.

Q All right. Now, when you talked to Mr. Pullman, what did you say to him and what did he say to you?

A I told him that I understood that in Wilmington, North Carolina, there is a company known as East Coast Terminals processing fish meal. Did he know anything about it? He said he had never heard of it before. I said, "Well, they have requested and received some Therminol FR



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fluid recently. I'm concerned that it's leaking into their product. Do you think you can help us get more information?" And sometime during this conversation, I mentioned that I understood somehow that South Pacific Proteins Company is involved, and there's a Mr. Charles Burgess. And I also at that time gave him Mr. Dean Morton's name and telephone number.

Q Did he say that he would help you?

A He said he thought he could help, that he had heard of South Pacific Proteins, that he'd try to look into it for me and call me back.

Q Did he call you back?

A No, sir, I called him.

Q The same day?

A No, sir.

Q When did you call him back the second time?

A This was the 14th of July 1971 when I called him back.

Q All right. When you called him back, what did you tell him and what did he tell you?

A I asked him if he had any success in getting more information. He said, "Well, somewhat." He tried to reach Mr. Charles Burgess, and it was his understanding that Mr. Burgess was unavailable and on his way to Peru, but he did call Mr. Dean Morton in Wilmington and talked with Mr.



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Morton, tried to convince him that he should stop the leak. He established that Mr. Morton had plans for an overhaul of the entire system later on. He established that - at least what he told me at that time was that there were still six to eight drums of Therminol FR-1 in Mr. Morton's inventory, that Mr. Morton planned to run until he had consumed the inventory. He talked to Mr. Morton about the wisdom of changing to a different fluid.

Q What fluid?

A I believe Therminol 55 was mentioned as a possible alternative. He also discussed the Commodity Pasteurizing unit in Stockton, California. And Mr. Pullman told me that Mr. Morton was aware of that situation.

Q What situation?

A The fact that a unit did exist in Stockton and that it did contain Therminol FR fluid and there was serious consideration being given to convert to a different fluid.

Q Had the Stockton operation already been converted to a different fluid at this time?

A To the best of my knowledge, no, sir.

Q Now, what did Mr. Pullman tell you that Mr. Morton said besides telling him about the situation in Stockton?

A Mr. Pullman indicated to me that Mr. Morton had indicated that he could not stop his operation, that he had



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to continue processing the fish meal, that he had shipment commitments to meet. I believe that's all I recall of the conversation.

Q Did he tell you that he had offered to sell to Mr. Morton a quantity of the FR 55 or 66?

MR. SMITH: Object to form.

A (By the witness) I don't know that we got into any discussion of the selling of an alternative fluid, no, sir. A discussion of conversion did come up, but no details of the conversion were mentioned.

Q He didn't say anything about whether he had offered to furnish the 55 or 66 in exchange for the FR-1 without cost to East Coast?

A I don't recall that discussion taking place, no, sir.

Q And was the upshot of what he said that he had been unable to persuade Mr. Burgess to-- I mean unable to persuade Mr. Morton to stop running and unable to convince him to convert?

A That was the impression that I gathered from our telephone conversation, and then Mr. Pullman then said, "I intend to confirm our discussion with Mr. Morton in a letter to him."

Q Now, did you report that to anyone at Monsanto?

A Yes, sir.



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Q Who did you report that conversation to?

A Mr. T. L. Gossage.

Q Who is he?

A Director of Marketing of the business group concerned. Donald Rousch, heat transfer engineering specialist. Charles J. Smith, at that time Assistant General Manager of the Organic Chemicals Division. Mr. John Mason, Assistant General Manager of the Organic Chemicals division. Mr. Howard Minckler, General Manager and Vice President, Organic Chemicals Division. I believe that's--

Q Did you have a meeting with these people that you have named?

A Mr. Gossage and Mr. Rousch were in my office when I made the telephone call.

Q You mean the call to Mr. Pullman?

A To Mr. Pullman, yes, sir.

Q Well, then after you made the telephone call, did these other people join you and--

A No, sir, I went to each of their offices and described my conversation with Mr. Pullman with them individually.

Q And what was the reaction of these people when you described your conversation with Mr. Pullman?

A I guess I can best describe it as being disturbed that we had not succeeded in convincing Mr. Morton that this



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was a serious matter - at least from what we knew of the situation.

Q Did you report back to Dr. Romoser after you talked to Pullman the second time?

A I don't recall deliberately dialing the phone to reach Dr. Romoser on this matter, but during that period of time I was in contact with Dr. Romoser and it's very probable that I did discuss this telephone conversation with Mr. Pullman. I don't remember it specifically.

Q Where in St. Louis is Dr. Romoser's office?

A At the general offices in St. Louis.

Q I thought you said it was in a different building from the one your office--

A Yes, sir.

Q But they're all in the same location though?

A Yes, sir.

Q I see. Now, who made the decision for you to call Mr. Morton on July the 16th?

A I did.

Q Did these people that you talked with suggest that you communicate directly with him?

A No one made that suggestion, no, sir.

Q Now, these visits to these people and discussions with them were on July the 14th?

A I don't believe I reached everyone on the 14th;



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I reached some of them on the morning of the 15th.

Q Did you tell them that you planned to call Mr. Morton?

A Not at that time, no, sir.

Q When did you advise these other people, including Mr. Minckler, that you intended to call Morton and tell him that he had to shut down or you were going to report it to the Department of Agriculture?

A I don't recall advising anybody I was going to do this. I was aware of our decision to call some government agency.

Q When was that decision made?

A The afternoon of July 16th, Friday the 16th.

Q Now, did you at any time call anyone at Holly Farms about this matter during that week?

A Not to my knowledge, sir; that week, no, sir.

Q Do you know whether anybody at Monsanto communicated with Holly Farms during the week of July 11th, 1971?

A I believe Dr. Romoser was in contact with Holly Farms.

Q Do you know when he talked to Holly Farms?

A No.

Q Did he talk to them more than once?

A I am led to believe it was more than once during that period of time, yes, sir.



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Q Did he report to you on his conversation with Holly Farms on the second time he talked to them?

A I'm not aware of any report that identified whether it was a first contact or the second contact. The general impression I have, in his discussions with Holly Farms the problem of polychlorinated biphenyls in poultry and in feed was the topic of discussion.

Q During the week of July 11th, did you talk on the telephone with Mr. McNulty of Carolina By-Products Company?

MR. SMITH: He's already testified he did, Mr. Jordan.

A (By the witness) Yes, sir, I did.

Q (By Mr. Jordan) What day was that?

A I don't recall the exact date. It's probably the 13th or 14th of July.

Q Did he call you?

A I don't recall, sir. I don't know if I placed the call or if he did.

Q Now, in that conversation, did he ask you whether East Coast Terminals was using PCB or polychlorinated biphenyl as a heat exchange fluid?

A I don't believe Mr. McNulty mentioned East Coast Terminals by name, sir.

Q What did he mention?



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A He asked me the typical questions relating to polychlorinated biphenyls - where are they used, how could they get into poultry feed. He was concerned about whether or not his products were contaminated. He indicated that from his experience he first personally suspected that what they were witnessing was the same symptoms associated with chickadema. He also indicated that a sample of poultry feed had been analyzed by the Wisconsin Alumni Research Foundation Laboratories in Madison, Wisconsin, that the polychlorinated biphenyl content was - as best I recall - about 140 parts per billion. And I believe he indicated, "I think I know where it's coming from, and I think it's coming from some fish meal." But I am almost certain he didn't mention the company by name.

Q Did he ask you if Monsanto sold PCB or polychlorinated biphenyl heat exchange fluid to any customer in North Carolina?

A No, he didn't ask that question, sir.

Q Well, did he ask you if you sold it to any fish meal processors in this area of the country?

A No, sir.

Q Did you decline to tell Mr. McNulty what customers in this area of the country Monsanto sold polychlorinated biphenyls to?

A Sir, I don't recall the question being raised, but



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I just don't recall that question coming up.

Q All right. Now, you have testified about your telephone call to Mr. Morton in which he said, "Fellow, you've got to do your thing and I've got to do mine." Now, did Mr. Morton tell you in that telephone conversation that he had received a letter from Mr. Pullman?

A I don't believe a letter was discussed in that conversation, sir, no, sir.

Q Did Mr. Morton call you back?

A Mr. Morton tried to reach me, yes, sir.

Q Well, did he?

A He left his name and phone number, and as best I recall, I returned the call.

Q Now, what happened in the second telephone call with Mr. Morton? What was said by you and what was said by him?

A As best as I can remember the events, I had previous to that call tried to return the call to a Mr. Pratt.

Q Who?

A Mr. Pratt.

Q All right.

A With South Pacific Proteins in ~~Dearing~~ Darien. The time of day was such that it was the end of the business day and no one answered the telephone. I tried through directory



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service to get Mr. Pratt's home phone number. There was a telephone strike of some sort at that time, and the temporary help at the switchboard could not assist me. In the interim I had received a note that Mr. Morton was trying to reach me. So when I dialed Mr. Morton's number, I had two objectives in mind - one was to get Mr. Pratt's home phone number; the other was to respond to Mr. Morton's call. In our discussion at that second conversation, as I recall - and this is quite vivid in my recollection - Mr. Morton says, "Incidentally, I think you should know we shut down the unit at 5:00 p.m. Eastern Daylight Saving Time." And I remember it because of the specific way in which the time was mentioned. And I said, "That's good; I'm glad to hear it." And I told him, "Well, we did go ahead and call the Food and Drug Administration people." I don't recall anything else from that conversation.

Q Did he tell you that he had been in touch with Mr. Pratt?

A I don't recall that item being discussed, no, sir.

Q Now, in the first conversation with Mr. Morton, he was obviously upset and angry, was he not?

A Well, not knowing Mr. Morton, I can only guess at that, sir; from the tone of his voice, yes, sir.

Q The tone of his voice indicated that he was angry and upset, didn't it?



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A That's my subjective recollection, yes, sir.

Q Now, in his second conversation, did he appear to be calmer and cooled off?

A I would describe the second conversation as being very business-like, sir.

Q But no emotional overlay?

A I did not sense any emotion.

Q Okay. Now, you finally did get hold of Pratt sometime that day, did you not, on the 16th?

A If I recall correctly, sir, while I was talking to Mr. Morton and had received from Mr. Morton a telephone number, Mr. Pratt had tried to reach me on another telephone, and I was able to pick up the phone and talk to Mr. Pratt.

Q Did you tell Mr. Pratt the same thing you had told Mr. Morton?

A Well, the discussion went something like this. Mr. Pratt indicated to me he didn't feel that we had told him enough about polychlorinated biphenyls and what effect they might have in animal feed, and he appeared to be disturbed that he hadn't quite gotten the message. He asked me what about this replacement material that your people are recommending; why is it any safer? And I told him that no chlorine was present in these alternative materials, and our information told us that these materials were not the kinds that would cause problems such as we had experienced



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with polychlorinated biphenyls. However, I told him these are not fire resistant, so you must be careful from a fire standpoint. And in the discussion, I recommended to him that it would be wise if we shipped replacement material to him so that he at least had it on his premises that weekend for the working day starting Monday. And from that discussion, it appeared to me that he was agreeing to this. It sounded like a proper approach. And during the discussion, Mr. Pratt also indicated to me that "we never sell this" - and I don't recall the exact words, but something like "this dirty fish meal to the feed industry." And I said, "Oh? What do you do with it?" He said, "Well, we sell that sort of thing to the fertilizer people." And I said, "Oh, wait a minute. This could be introducing other problems. We don't want it broadcast out there like DDT." Then he immediately backed off and said, "Oh, no, we don't do that. We just store this. We keep it." And I said, "Where do you keep it?" He said, "Well, we try to keep it away from the good material." And those aren't the exact words, but that's the discussion.

Q Anything else said by you or him that you recall?

A I don't recall any other matters discussed with Mr. Pratt, no, sir.

Q During the week of July 11th, did you have any conference with anyone in the legal department of Monsanto?



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A Yes, sir.

Q Who did you confer with?

A Mr. Rodney Harris.

Q When?

A Off and on through several days of that week, sir, intermittently.

Q Were the conferences concerning this East Coast Terminals matter?

A Yes, sir.

Q Did anybody else participate in those conferences that you had with the legal department?

A Mr. Elmer Wheeler was present at least one of these. Mr. Romoser was present.

Q You mean Dr. Romoser?

A Dr. Romoser. I'm pretty sure he was present at least at one of these. A Mr. Southerland.

Q Who is he?

A He's Dr. Romoser's immediate supervisor - at that time.

Q Did Mr. James Roder participate in any of those discussions?

A No, sir. Mr. Nick Redding, I believe was present.

Q Who is he?

A He is Mr. Southerland's supervisor.

Q Was anybody from the marketing or sales part of



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the group present at any of these conferences with counsel?

A No, sir.

MR. SMITH: You're talking about the conferences where Mr. Papageorge was present?

MR. JORDAN: Yes.

Q (By Mr. Jordan) What did you do with the notes or memoranda that you prepared in pencil of your conversation with Morton and Pratt?

MR. SMITH: There has been no testimony about that, Mr. Jordan, and I object to the form of the question.

MR. JORDAN He said he made some pencil notes at the request of his attorney.

Q (By Mr. Jordan) What did you do with them?

A I gave those to Mr. Richard Store, an attorney with Monsanto Company.

Q And was that during the week of July 11th?

A No, sir, that was following that week.

Q The following week?

A I don't recall whether it was exactly that week. They were prepared, and I don't recall if I gave them to him immediately or if there was some lapse of time before I got them to him personally.

Q But they were prepared by you?

A Yes, sir.

Q Did you go to Wilmington?



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A At what time, sir?

Q Anytime.

A I went to Wilmington, North Carolina, in February 1972.

Q You had not been there before?

A No, sir.

Q Do you know whether anybody from Monsanto went to Wilmington in July of 1971?

A To my knowledge, sir, nobody from Monsanto went to Wilmington. To be more specific, East Coast Terminals location in Wilmington.

Q Yes. Was Mr. Wheeler in your office when he called the FDA in Washington on July the 16th?

A No, sir.

Q Were you in his office?

A No, sir.

Q Did he tell you that he was calling them before he made the call?

A Yes, sir.

Q And did he report afterwards that he had made the call?

A I was in an office with Mr. Wheeler when he made the call, sir.

Q Oh; you were in another office - neither yours nor his?



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A That is correct.

Q I see. Whose office were you in?

A Dr. Emmett Kelly's office.

Q I believe Dr. Kelly is medical director of the group?

A Yes, sir.

Q Did Mr. Wheeler do all the talking to the FDA people?

A Yes, sir.

Q Now, since the week of July 11th, have you had any further conversations with Mr. Pullman?

A No, sir.

Q Mr. Papageorge, have you ever discussed the use of polychlorinated biphenyls heat exchange fluid with any representative of the Western Precipitation Division of Joy Manufacturing Company?

A No, sir.

Q Have you ever discussed it with Baker Engineering?

A No, sir.

Q Have you ever discussed it with any representative of William J. Moran Company?

A No, sir.

Q Now, do you know who in Monsanto - do you know whether anyone connected with Monsanto has had discussion with either Western Precipitation Division of Joy or



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William J. Moran Company or Baker Engineering on this subject matter?

A I do not know, sir.

Q Were you ever told that at one time there were on-going discussions between representatives of Monsanto and William J. Moran Company and Western Precipitation Division of Joy Manufacturing Company with reference to the construction of fish meal pasteurizers throughout the country?

A No, sir, I was never told this.

Q Mr. Papageorge, do you know how long Monsanto has been in the business of manufacturing chemicals of all sorts and types?

A Sir, if my memory serves me right, I believe Monsanto was in the business of manufacturing chemicals in the early 1900's; certainly prior to World War I. That's as close as I can recall the dates.

Q And in all of those many, many decades of business activity, Monsanto has continued to be engaged in the manufacture of various types of industrial chemicals, isn't that true?

A That is correct, sir.

Q And how many employees does Monsanto have in all?

A I would guess, sir, between fifty to sixty-five thousand.



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Q Does that include the employees in the foreign affiliates and subs?

A I believe so, sir.

Q Now, do you know about where Monsanto ranks with reference to dollar volume of chemical sales with other American chemical companies?

A It's ranked by sales as the third largest.

Q The third largest?

A Yes, sir.

Q What are the two larger ones?

A The DuPont Company and the Union Carbide Company.

Q All during the years that you have been employed by Monsanto, have they maintained research laboratory facilities in St. Louis?

A Yes, sir.

Q And does Monsanto have any central research or pure research laboratory engaged in research for new products?

MR. SMITH: I believe I'll object to the form - particularly the reference to purity.

MR. HENSON: Pure research has its place in science.

Q (By Mr. Jordan) My question is this, Mr. Papageorge, is the company engaged in research for the purpose of developing new product lines?



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A Yes, sir.

Q Has that gone on all the time you've been employed by the company?

A Yes, sir.

Q Now, in addition to that, does the company maintain laboratory facilities at each of its manufacturing plants for purposes of testing?

A As far as I know, sir. To the best of my knowledge, yes.

Q Is there a testing facility at Sauget or laboratory where testing can be made on products produced at that factory?

A Yes, sir.

Q And is there the same type facility at Anniston?

A Yes, sir.

Q And is there the same type of facility in Wales and Japan?

A Yes, for Wales; I can only guess regarding Japan.

Q Well, if you don't know about Japan, don't attempt to answer it. Now, is all of the new product research carried on in the St. Louis laboratory, or do you have other laboratories engaged in new product research?

A There are other laboratories engaged in new product research.

Q How many others?



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A I'm certain I don't know all of them, sir. I have heard of a few.

Q Mr. Papageorge, in the fifty or sixty thousand employees of Monsanto, are not several thousand of those employees highly trained engineers and scientists?

A There are many, sir. I have no idea of the number.

Q Among Monsanto's employees are many, many chemists, chemical engineers, and medical doctors, is that true?

A Yes, sir.

Q And also physicists?

A I never met a physicist at Monsanto, but this doesn't mean he doesn't exist there.

Q But many of these chemical engineers and chemists at Monsanto hold the Doctor of Philosophy Degree, do they not?

A Yes, sir.

Q And you yourself have a Master of Science?

A Yes, sir.

Q And there are also many, many chemists and chemical engineers who hold a Master's Degree in addition to the Bachelor of Arts Degree?

A Yes, sir.

MR. JORDAN: I have no further questions of the



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witness at this time. I may want to examine him again after we've had an opportunity to study the documents which he has in his office in the filing cabinets - that I find in his office and elsewhere.

MR. HENSON: Is it time for lunch now?

(Whereupon, at 12:30 p.m., a lunch recess was taken until 1:30 p.m.)

AFTERNOON SESSION

EXAMINATION BY MR. HARRELL

Q Mr. Papageorge, I am Mr. Harrell and I am here representing Mid-State Farms, one of the plaintiffs in this case, and I believe Mr. Jordan has covered most of the areas I want to go into, but I do have a few questions of you. First off, I would like to start off with the chronology of events relating to Monsanto and PCB and ask you some questions about those. In February of 1970, was a letter written to animal feed processors sent out by the heat transfer marketing group of Monsanto to animal feed processors?

A If there were any animal feed processors on our records as having purchased heat transfer fluid which contained polychlorinated biphenyls, they would have received



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a copy of this February 1970 letter which was sent out by the Marketing Director of the business group, not just the heat transfer portion.

Q All right, sir. In April of 1970, was there a meeting of the Corporate Management Committee referred to as a "close the loop" meeting relating to the termination of sales of PCB in certain applications?

MR. SMITH: Object to the form of the question.

A (By the witness) I don't know about the description "close the loop" meeting.

Q (By Mr. Harrell) Other than that then, was there a meeting of the Corporate Management Committee relating to the phasing out or termination of sales of PCB for certain applications?

A There was a meeting in April, yes, sir.

Q All right, sir. Now, in April of 1970, did you appear before the Corporate Management Committee with respect to preliminary plans of an incinerator to destroy PCB?

A I was present - I mentioned I was present and I mentioned to the members of the corporate management committee present that we were planning the design and erection of an incinerator, yes, sir.

Q All right. Also in April of 1970, did Monsanto recommend to the FDA or some other governmental agency that



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PCB be removed from pesticides?

A Yes, sir.

Q Now, in May of 1970, was a decision made by Monsanto to stop the sale of PCB's for all applications which might allow escape into the environment?

MR. SMITH: Read that one one more time, please.

Q (By Mr. Harrell) Was the decision made by Monsanto to stop the sale of PCB for all uses which might easily escape into the environment?

A Yes, sir.

MR. HENSON: May '70?

MR. HARRELL: Right, May '70.

Q (By Mr. Harrell) Now, also in May or June of 1970, did Monsanto enter into a restrictive sales program whereby it stopped the sale of its PCB products through distributors?

A Yes, sir.

Q All right, sir. Also in June of 1970, was a letter sent by Monsanto to its PCB customers who were determined to be using PCB for the processing of human food?

MR. SMITH: Object to the form. I don't believe there's any testimony that they've ever used PCB for the processing of human food.

Q (By Mr. Harrell) All right, sir. I'll rephrase the question. In June of 1970, did Monsanto or any of its



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employees send or cause to be sent a letter to certain of its customers who in the processing of human food, or food for human consumption, used PCB in a system used for such food processing?

A I'll have to give a qualified yes to that, sir.

Q All right, sir. Go ahead.

A To make a clarification, if the polychlorinated biphenyl product was used in a heat transfer system, the customer received a letter informing him of the termination of sales for that application.

Q I believe that's more accurate the way you put it, and I'm sorry I didn't word it that way. Now, in June of 1970, was PCB removed, or were customers of Monsanto using PCB in hydraulic fluid applications notified that the PCB would be removed from such fluids?

MR. SMITH: Object to the form. If PCB is removed from such fluids in the possession of customers who had hydraulic systems?

MR. HARRELL: Let me rephrase the question.

Q (By Mr. Harrell) In June of 1970, did Monsanto send out a letter to its customers who were determined to be using PCB products in hydraulic fluids notifying them of the removal of such from the market?

A I believe that's accurate, sir. I don't know whether it was June or July, but in that period of time, yes.



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Q All right. And later on, was this program carried out in 1970 and was the hydraulic fluid containing PCB phased out of the market?

A It was phased out to the extent that by the end of 1970, approximately eighty percent of the fluid had been reformulated. The remaining fluids were reformulated and phased out before the end of the first quarter of 1971.

Q All right. Now, in August of 1970, did Monsanto remove from the market the sales of carbonless copy paper which contained PCB's?

A No, sir.

Q When was that done?

A The last shipment of polychlorinated biphenyl to the carbonless copy paper application was made at the end of the first quarter of 1971.

Q All right. Let me go back to this application then and ask you what, if anything, happened with respect to this in August of 1970 - that's with respect to carbonless copy paper?

A In August of 1970, we were very likely in the midst of the beginning of the phase out program. I don't recall specifically what period of time the alternative fluids were being shipped to the customer for ~~try~~ trial runs in his system, but from that point until the end of the first quarter there was a phasing out with one fluid being



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introduced and the other being withdrawn.

Q Did this carbonless copy paper, did that involve a fluid?

A Yes, sir.

Q It does? All right. Now, moving on, from the period of June of 1970 to August of 1970, were there certain label changes carried out where PCB products were shipped to customers?

A Yes, sir.

Q Do you know whether or not that label change was made applicable to stocks of PCB that were on hand in Monsanto warehouses at that time?

A Yes, sir.

Q All right, sir. Now, after August of 1970, Monsanto was marketing and selling only to two classes of PCB users - that is, the dielectric users and the closed systems users. Is that accurate?

A I would qualify that by describing the closed system a little closer - closed system heat transfer.

Q Closed system heat transfer systems?

A Closed system heat transfer systems, yes, sir.

MR. SMITH: Before you leave that question, Mr. Harrell, that's subject of course to the phasing out that was occurring that he's already testified about. You put a date of August and said that actually some of



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the other applications were being phased out at that point.

THE WITNESS: That is correct.

Q (By Mr. Harrell) Well, which ones were still going and were being in the phase out period other than these two applications in August of 1970?

A This is the hydraulic fluid application we discussed which was eighty percent completed by the end of the year, the remainder in the first quarter of '71; and the carbonless copy paper application which was being phased out during that period of time.

Q All right. Now, how about the plasticizers?

A Plasticizer sales were terminated abruptly on August 30th, 1970.

Q When you say abruptly, there were no other sales for plasticizer uses after August of 1970?

A Of the chlorinated biphenyls, yes, sir.

Q And after August of 1970, would it be accurate to say that as to the dielectric uses that PCB products - that Monsanto restricted those sales to well known customers - that is, those who were known to be manufacturing transformers or capacitors?

A No, it would not be accurate, because we did not include in there the utility companies who are users of transformers and purchase fluid for their maintenance



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programs.

Q Would it be accurate to say then that the sales were restricted to well known customers whom Monsanto was aware of the use to which the PCB product was being put?

A To the best of my knowledge, yes, sir.

MR. SMITH: Now, you are limiting that now to dielectric fluids?

MR. HARRELL: Dielectric fluids.

Q (By Mr. Harrell) All right. When Monsanto decided it was going to a restrictive sales program and it would no longer sell its PCB products through distributors, did it obtain a list of the customers of those distributors?

A No, sir, not to my knowledge.

Q Well, did it inaugurate as a part of the restrictive sales program a listing of customers using PCB products?

A No, sir, it did not inaugurate a listing. The lists were in existence. The marketing information reports contained these customer names.

Q You mean even though you had distributors who were selling this, there was also a list of customers that was maintained by Monsanto?

A The list that Monsanto had was in addition to any customers whose needs were supplied by distributors. Those customers are not known to Monsanto. We have no records of those.



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Q You mean the distributors' customers are not known to Monsanto?

A That is correct.

Q Do you know whether or not East Coast Terminals was being supplied by a distributor in the purchase of Therminol FR-1?

A No, sir, they were not.

Q Their orders were made direct to Monsanto?

A As I understand it, they were shipped by Monsanto, yes.

Q When was the computer system which you have described as keeping data on PCB purchases, when was it put into operation, if you know?

A I do not know, sir.

Q Do you know what other information is coded into that computer with respect to customer orders of PCB?

MR. SMITH: I'm going to object to the form of the question. I don't know that there's been any testimony that the computer records anything about PCB. It may give the name of a customer of a product.

Q (By Mr. Harrell) Mr. Papageorge, does the computer to which you have referred in your testimony, does it contain or keep any list or did it keep any list of Monsanto customers who were using products which contained PCB?

A Yes, sir.



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Q All right, sir. Do you know what other information other than the customer's name was coded into that computer?

A I know some of it, sir. I do not propose that I know all of it.

Q Well, I don't want you to give all of it. I want to be specific about it. Do you know whether or not information as to the use to which the customer was putting the PCB related product was coded into the computer?

A No, sir, it's not on it. It is not on this printout that I referred to.

Q Did I understand your testimony previously to be that the computer about once a month would print out the data pertaining to the customers who use PCB products?

A Yes, sir.

Q It was only once a month?

A The report is re-issued on a monthly basis, yes, sir.

Q All right. Who would get that report when it was printed up?

A I don't know all recipients. I do know that the marketing managers involved with the product would get their section of the full report.

Q So in other words - when was it printed? On the basis of the day of the month, when would that report be



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printed?

A I believe the report arrived in the hands of these managers about the third week of the succeeding month.

Q The third week of the succeeding month?

A Yes, sir.

Q So that June orders would come in, say, around the third week of July - maybe around the 20th?

A 20th, 21st, 22nd of July, yes, sir. No. Let me think a bit now. I'm wrong on that. The report I consulted on the 16th was accurate to the end of June, as I recall. So it was earlier in the month that they would receive it.

MR. SMITH: Mr. Harrell, before you leave that, it seems to me the witness may have made an obvious mistake. I believe his testimony has been that he saw a report on the 12th. I think it ought to be corrected.

THE WITNESS: The report I saw on the 12th.

Q (By Mr. Harrell) The 12th of July 1971?

A July 1971 was current through the end of the previous June 30th, 1971. So obviously it was available to the marketing managers early in the month of July.

Q So that would mean, wouldn't it, Mr. Papageorge, that a customer ordering--- that if a customer made an order of a small amount of Therminol FR-1 on June the 2nd of 1971, that that would not become known to Monsanto's personnel reading that report until sometime well into July, say per-



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haps the second week in July?

A That would be true if this is the only source of information. I don't know if the marketing managers have other ways to get this kind of information faster.

Q Well, was this computer system a part of your restrictive sales program?

A It played a part, yes, sir.

Q Do you know whether or not the machine or the computer was ever stopped periodically and periodical checks were made on customer orders?

A No, I do not know that.

Q Who would know?

A The marketing managers.

Q How about Mr. - what's his name - Rousch? Who is in charge of the computer?

A I don't know who is in charge of the computer.

Q Who primarily has responsibility for this computer that we're talking about that kept a check on customer orders?

A I don't know the name of the individual.

Q I thought you gave us a name yesterday. Do you not recall that?

A No, I don't. It must have been some other name I gave.

Q I believe you have said in your testimony that



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there was in existence a PCB task force which is a governmental arm?

A Yes, sir.

Q Do you know of any other similar organization in government which is concerned with any other specific family of chemical compounds?

A No, sir.

Q Has Monsanto in its own laboratories ever made an analysis of the fish meal shipped from East Coast Terminals or processed at East Coast Terminals during the months from May until July of 1971?

A Yes, sir.

Q Do you have the results of those tests?

A I don't have them personally, no, sir.

Q Are they in your office?

A No, sir. No, they're not in my office.

Q Are they not among the files that you have described to Mr. Jordan - fifteen filing--

A I don't believe they're in those files, no, sir.

Q Do you personally know what the results of those tests were with respect to the percentage or amount of PCB in parts per million in this particular batch of fish meal?

A No, I don't. I saw a pencil note listing these amounts, but I do not remember the magnitude of the numbers.

Q Do you have a pretty strong impression about what



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that would be or not?

A No, it's not strong enough.

Q Do you know, Mr. Papageorge, who would be the official that we would be able to get copies of this report from?

MR. SMITH: Mr. Harrell, would you identify the report again for me that you're talking about? What are you asking about?

MR. HARRELL: I asked him about a report that Monsanto had; some tests that Monsanto had run on this fish meal that was processed by East Coast Terminals during the months from May to July 1971, and he answered that they had made such tests, and now I'm asking him if he knows where we can get the report of such tests.

MR. SMITH: Okay. For the record, there was no previous testimony, and it's my understanding that some tests were made of fish meal that was furnished by Holly Farms. I don't know whether it was made in May or June or July or when it was.

Q (By Mr. Harrell) Do you know where we could get these reports of the results of these tests?

A Well, they must exist in the laboratory files of the laboratory that conducted the tests.

Q Do you know where the samples of the fish meal that came to the Monsanto laboratory supposedly from the East



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Coast Terminals, do you know where those samples came from?

A You mean who sent them to us?

Q Yes, sir.

A They were sent to us by Holly Farms, the Holly Farms Company.

Q With respect to tests on poultry which Monsanto has conducted in its laboratories, or has had conducted, do you know whether those tests were conducted on birds at levels of over ten parts per million in feed?

A Yes. Yes, there was a series of tests at a hundred parts per million.

Q Did I understand your testimony to be that an adverse effect was detected at levels of ten parts per million when fed to birds, leghorns?

A Of the one commercial polychlorinated biphenyl mixture?

Q Yes, sir.

A I'll try to clarify it. The tests were made using three commercial polychlorinated biphenyl mixtures fed to the animals at three different levels - one part per million of its diet, ten parts per million of its diet, and a hundred parts per million. One of these commercial mixtures which contained the lower chlorinated types of polychlorinated biphenyl showed an effect on the birds at ten parts per million and at a hundred parts per million.



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Q Would the adverse effect on the birds be greater at a hundred parts per million than it was at ten parts per million?

A I don't recall the exact number, sir, but that is normally the type of information you would expect.

Q Would it be in proportion to the gradation or the amount of PCB parts per million?

A I'm not qualified to answer that.

Q After August of 1970, what steps, if any, did Monsanto take to assure that its sales to customers other than dielectric customers were in fact to closed systems?

A I cannot speak for the actions of the marketing managers, and I personally do not know the details of how they went about executing their program. So I don't know.

Q I believe your testimony is, though, that to your knowledge nobody at Monsanto ever inquired before July of 1971 to what use the people at East Coast Terminals were putting this Therminol FR-1. Is that accurate?

A That is accurate.

Q After August of 1970 when Monsanto had inaugurated its restrictive sales program, did it ever accept any orders for products containing PCB by telephone call?

A Yes, sir.

Q What procedure, if any - if you know - was used as far as customer identification and uses of the product



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with respect to the telephone calls?

A This is part of the details I had reference to when I indicated I'm not aware of all the details of who does what under what conditions.

Q Do you know whether or not in the case of a telephone call, the orders of PCB, a written memorandum would be made of the telephone order?

A I have seen on occasion written penciled memoranda of orders, but I do not know if this is done on each and every order.

Q All right. Do you know whether or not then any effort was made to reduce this to data that would go into the computer that kept the data on customer orders?

A There must have been some documentary, some input. I don't know how this was done.

Q You think it might have been done by use of some uniform form which Monsanto had in use?

A It could be, sir. Now, to avoid confusion, I should point out that the order processing procedure was changed, as I recall, in early 1971, or during 1971. And I don't know all the details except that orders at one time were placed in regional and district offices and teletyped to shipping points and accounting centers and invoicing centers. The change in procedure involved the use of telephone to a central location, called into a computer,



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eliminating the field offices' involvement in this activity.

Q Wasn't the purpose of eliminating the distributors in the sale of PCB products and the purpose of the restrictive sales program, though, to get a better check or information on PCB products sales?

A Yes, sir.

Q Are you familiar with the internal checks that the company inaugurated as a part of that program to insure that it was getting the information on sales?

A No, I'm not, sir.

Q Who would be familiar with that, with the internal checks and procedures adopted to implement that program?

A As I understand it, the marketing manager to whom a particular product has been assigned had the responsibility for all of the activities relating to the marketing of his product, and it's up to him.

Q All right. What individual would that have been in late 1970 and early and mid 1971?

A For which product, sir?

Q For the heat transfer fluid.

A Mr. J. R. Fallon.

Q When PCB is ingested either by fowl or by mammal and that ingestion is continued over a period of time, is there an accumulation of PCB in the animal's system?

A Yes.



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Q Are human beings like animals, are they in a food chain?

A That's my understanding, sir, yes, sir.

Q Would human beings be in the food chain of fish meal being processed in a feed pasteurizer?

A If by feed pasteurizer you imply it's getting into animal feed, domestic animals, which in turn are consumed by humans, yes, that's part of the food chain.

Q Would the food chain be in such case that the poultry or animal would eat the feed with which the fish meal had been mixed and then be in turn consumed by human beings? Would that be the food chain?

A That is my understanding of the definition of the food chain, yes, sir.

Q And if the poultry or animal which was being consumed by humans contained a deleterious substance, then that would be ingested by the human beings in the food chain, wouldn't it?

A Unless some control was set up to break the food chain at this point and prevent it from going further.

Q How long, if you know, has Monsanto had on its staff men who specialize in the animal feed business?

A I know nothing about the animal feed business.

Q Is it your impression that Dr. Romoser has been working as an animal feed specialist for at least from



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January of 1970?

A Yes, sir.

Q Do you know whether or not Monsanto's marketing people or engineering staff from time to time in the past have attended symposiums or meetings on animal feed processing?

A I do not know.

Q Do you know whether or not Monsanto has ever authorized fabricators, builders or manufacturers of food pasteurizing systems to use the trade name Therminol in plans, specifications or operating manuals?

A I do not know of any such authorization.

Q Is the process for the manufacture, or was the process for the manufacture of PCB's a protected and patented process?

A Again, at what point in time? It was at one point in time, yes, sir.

Q During the period 1969 through mid 1971.

A No, there was no protection.

Q Has it ever been a protected and patented process?

A It's my understanding that it was patented and the patent expired sometime in the 1950's.

Q Do you know whether or not any of the governmental agencies concerned with either water standards or air standards have established any tolerances either in water



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or air for polychlorinated biphenyls?

A I do not know of any levels established for polychlorinated biphenyls in air. I understand the Federal Environmental Protection Agency has sent to its regional offices a memorandum which attempts to guide their enforcement people relating to polychlorinated biphenyls in river and lake systems, and the level there has been established at .01 parts per billion.

Q Do you know whether any state agencies concerned with maintaining adequate water standards have adopted any regulations with respect to PCB?

A I am not aware of any regulations that are documented. I am aware of activity in the State of Michigan, which leads me to believe that their tolerance is zero detectable of polychlorinated biphenyls in water systems.

Q In other words, if they detect any in it, it's too much. Is that what you're saying?

A That is my understanding, sir.

Q Do you know whether or not PCB can enter into the tissue of an animal or mammal other than by ingestion - that is, by mouth?

A I have no expertise here at all; no knowledge, sir. I'd like to clarify that a bit. You said "by mouth". There is on our label precautions against breathing.

Q Do you know whether or not it is absorbed through



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the skin of animals or humans?

A I do not know about absorption through the skin, no, sir.

Q Did Monsanto develop and adopt its own analysis methodology with respect to PCB?

A Yes, sir.

Q Has it furnished that methodology to any laboratory that requested information?

A Any laboratory in the world that's requested our methodology has received a copy of it, yes, sir.

Q Is there anything unusual with respect to PCB that makes it difficult with respect to qualitative or quantitative analysis in a laboratory?

A Well, there are some characteristics about polychlorinated biphenyls that pose problems in analysis. In the instruments that are available today to the chemist which detect the presence of materials like this by a response in that instrument that is charted on a paper in peaks and valleys, which many of us refer to as finger Print current, these polychlorinated biphenyls appear on this chart in the same range that many of the common insecticides appear. So there is this interference problem.

Q Are there other analysis methodology, though, for the detection of PCB which are acceptable or have been found to be acceptable as far as Monsanto is concerned?



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A Well, none of these methods are too different. They all resemble each other. They are different--

Q Are they pretty standard, would you say?

A Fairly so, sir, yes, sir. There are methods in use that are good methods. Methods, for example, such as the one developed by the Food and Drug Administration laboratories.

Q And that was separate and apart from Monsanto's own analysis methodology?

A That is correct. Now, I am under the impression that all of these methods are based on the early work of the Swedish scientists, Drs. Jensen and Widmark.

Q Is that true of the Monsanto methodology also?

A Yes, sir.

Q Would an analytical chemist pretty well come to the same methods of analysis with respect to PCB working independently?

MR. SMITH: I object. I believe that's a pretty hypothetical question.

Q (By Mr. Harrell) Well, if you have an opinion. Do you have an opinion as to that?

MR. SMITH: As of today?

MR. HARRELL: Yes.

MR. SMITH: Do you mean today in view of what's been published by others?



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MR. HARRELL: Yes.

A (By the witness) I can relate to you my understanding of the total problem. There have been many attempts that I have been told about where laboratories have cooperated in what is referred to as a round-robin, where samples of material deliberately injected with polychlorinated biphenyls have been sent to these laboratories for analysis. And in every instance that I have heard of and read of, there are as many answers as there are laboratories. Each laboratory must in essence calibrate its capabilities regarding the ability to reproduce a number consistently. That number, however, may not agree with another laboratory's answer. So this is one of the dilemmas that exists in this area.

Q (By Mr. Harrell) But other laboratories other than Monsanto's have developed credible methods of analysis as to PCB?

A Oh, yes. Yes.

MR. HARRELL: I have no further questions.

MR. HAYES: Is Wilbur-Ellis next?

MR. SMITH: Yes.

EXAMINATION BY MR. HAYES

Q Mr. Papageorge, when was the first time that you contacted anyone from Holly Farms, if you did contact them, or you were contacted by them?



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A I contacted Dr. Kenneth May on the morning of Saturday, July 17th, 1971, at a consulting analytical laboratory known as Woodson-Tenent Laboratories in Memphis, Tennessee.

Q Now, will you go ahead and recount for us as best you can what conversation you had with him or he had with you?

A As best I recall, Dr. May was having difficulties, or Dr. May was telling me of the difficulties the laboratory was having in reproducing some analytical results, and he began to ask me some very technical questions relating to the analytical methodology. And at this point, I suggested that I was not qualified to discuss it in that much detail, but I would get the proper person in touch with him and they could pursue the problem deeper. Dr. May also requested from me a sample of Therminol FR-1 be sent to the Woodson-Tenent Laboratories for use as a laboratory standard, and I offered to expedite the shipping of such a sample as soon as I could that day and to inform him or the laboratory personnel of what airline flight that sample would be arriving on so they could pick it up at the airport. As best as I recall, that was the gist of our discussion that morning.

Q Now, did you have a later discussion with him?

A Yes. As best I recall, I met Dr. May at a



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meeting in Washington sometime about September, October, 1971, which was - as I understood it then - called by a Broilers Association to which Monsanto was invited, along with broiler producers and representatives of the federal Food and Drug Administration and the U. S. Department of Agriculture.

Q And that was in September or October, 1971?

A Sometime in that period, yes, sir.

Q Now, to whom in your organization did you refer Dr. May?

A As a result of that first telephone conversation with Dr. May, I then called Dr. Scott Tucker from Monsanto's research department and asked him to call the Woodson-Tenent Laboratory and talk with Dr. May or with representatives of the laboratory to discuss the analysis of their samples.

Q State, if you recall, whether or not Dr. May said anything to you with reference to his problems in the poultry industry.

MR. MURRELLE: Objection.

Q (By Mr. Hayes) In the first conversation.

MR. MURRELLE: Objection.

A (By the witness) I do not recall the specific description of the problems, but I do recall a sense of urgency and importance, because Dr. May - I believe - made



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it a point to impress me with the importance when he described how he was given a private airplane. I don't know whether it belonged to his company or who the owner was, but nevertheless Dr. May was given the services of a private airplane to expedite his activities with the Memphis laboratory. From this discussion, I had an impression that it was very important to him and to his company.

Q (By Mr. Hayes) Well, did he tell you over what period of time that this problem had developed, or he had had knowledge of it, Mr. Papageorge?

A No, sir.

Q He gave you the impression that it was an emergency, is that right?

A That is the impression I was definitely left with, yes, sir.

Q Now, do you know whether or not Monsanto has had business transactions involving chemicals with Holly Farms or any of its subsidiaries?

A I have been informed, sir, that Holly Farms is a customer of Monsanto's agricultural chemical products.

Q And over what period of time, if you know, have they been customers of Monsanto?

A I have no further information regarding that relationship.

Q Who would know about that, Mr. Papageorge?



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A This would have to be a guess on my part, sir.

Q Well, your best opinion.

A Dr. Romoser might be familiar with this customer.

Q Do you know if Mid-State Milling is a customer of Monsanto?

A I have no information relating to Mid-State.

MR. SMITH: Mid-State Milling?

MR. HAYES: Yes.

MR. HENSON: It's North State? He said North State?

MR. VANCE: Mid-State Farms.

MR. SMITH: Where is that located, Mr. Hayes?

MR. HAYES: Mid-State Farms is what I had in mind.

MR. SMITH: Okay.

Q (By Mr. Hayes) Now, did you have any other conversation with Mr. Andrews, or did you have any conversation with Mr. Andrews of Holly Farms? ..

A I don't recall any conversations with Mr. Andrews, sir.

MR. HAYES: I believe that's all for Wilbur-Ellis at this time.

MR. ELSTER: International has no questions at this time.

MR. HUTCHINS: East Coast Terminals has a few questions.



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EXAMINATION BY MR. HUTCHINS

Q Mr. Papageorge, when you sent out letters, you said you did send out a warning letter to Joy Manufacturing Company, you have ascertained?

MR. FEERICK: Objection to form.

A That is correct.

Q (By Mr. Hutchins) And what were the contents of the letter which was sent to Joy Manufacturing Company? Was it a standard letter?

MR. FEERICK: Object to form.

A I don't know what is meant by "a standard letter".

Q (By Mr. Hutchins) Was it the same letter that you sent to other customers and the mechanical people who had bought Therminol FR-1?

A Yes, sir. This was the letter dated in February 1970 in which we informed customers on record that polychlorinated biphenyls were being mentioned as environmental pollutants and --

MR. HAGAN: Being mentioned -- I'm sorry.

A (By the witness) Environmental pollutants, and at that point in time we had reports that perhaps some species of wild life were being affected. And if I recall, that letter went on to mention the trademarks of products that contained polychlorinated biphenyls.

Q (By Mr. Hutchins) That is specifically FR-1 and



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FR-2?

A As I recall, sir, it says Therminol FR's and the other trademarks. This was an attempt to let the customer know what he had. And as I recall, the letter also cautioned the customer on the proper use of the material so it would not get into the environment. Those are not the exact words, but that is the intent of the letter.

Q Can you remember anything else the letter said?

A No, sir.

Q And this same form letter, or same letter, went to all the customers which the company found had purchased this Therminol FR-1 or 2 product?

MR. FEERICK: Object to the form.

Q (By Mr. Hutchins) In the engineering field. In other words, the same letter went to Baker Engineering Company as went to Joy Manufacturing Company?

A Yes, sir.

Q It was a form letter?

A Yes, sir.

Q The same letter to each purchaser of the product that you had on record?

MR. FEERICK: Object to the form.

A I don't want to mislead you. The same letter--one letter went to the dielectric company customers and another went to all others - not all others. A second



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letter went to the Therminol customers and hydraulic fluid customers, these kinds of applications, and still another letter went to the plasticizers. I don't want to mislead anyone.

Q (By Mr. Hutchins) All right. Within the area then of heat transfer fluid, the customers - I think you said Baker Engineering Company was one and Joy Manufacturing Company was another?

A I ascertained that they were on the mailing list, yes, sir.

Q Now, both of these were buyers of the Therminol FR-1 or 2 products for heat transfer applications or uses and were sent the same letter?

MR. FEERICK: Object to the form.

A That is correct.

Q In other words, all users were sent the same letter--

MR. FEERICK: Object to form.

Q That were using the heat transfer fluid - you ascertained from your records had purchased?

A From our records, yes, sir.

Q Right. So there was no customizing of the letters; they were all the same form letter?

A Yes, sir.

Q Now, as far as the purchasers of the Therminol



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FR-1 and Therminol FR-2 in the engineering and mechanical field as far as heat transfer fluid was concerned, there was no subsequent letter to them other than the one in February 1970?

A I'm assuming we're still talking about the period 1970 and the first part of '71?

Q Right.

A There was a letter relating to food processing. I don't know personally, but it's conceivable that equipment manufacturers in food processing may have gotten a copy of this letter.

Q You don't know about that and have not checked that?

A I have not personally checked that, no, sir.

Q Do you have a way to check that now?

A Yes.

Q That could be ascertained?

A Yes, sir.

Q By you?

A Yes, sir.

Q The letter which went out to people who were in the food processing area using heat transfer fluid, what did that letter say? First of all, did it say the same thing to every one it went to? The same letter went to everybody?



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A Yes, sir, the same wording. I don't recall the exact words. I think it referred to the previous letter that was mailed in February of that year, and I believe it goes on to say that because of additional information related to polychlorinated biphenyls, we have decided to terminate the sale to applications in the food industry and this termination would take place on July 31st, 1970. I believe that's the intent of the letter.

Q You don't remember anything else about that letter either other than what you have told us? I mean so far as the general import of it.

A That is correct, sir.

Q Now, in either of these letters, Mr. Papageorge, did you ask or require that these equipment manufacturers make available to the Monsanto Company a list of the persons to whom they had sold the Therminol FR-1 or 2 or used it in facilities which they built?

MR. FEERICK: Object to the form of that.

A I don't recall that the letters made that request, sir, no, sir.

Q (By Mr. Hutchins) Was any request made at any time of these types of purchasers of Therminol FR-1 and FR-2 for heat transfer systems?

A I personally do not know.

Q Was any communication made to these engineering



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type customers that they in turn contact the people to whom they had put the material in the systems of other people, to forward your warning on?

A I do not know.

Q To your knowledge, Monsanto Company never asked these engineering type customers to forward the warning or the letter you were sending them to customers which they had put the heat transfer fluid in their systems?

A No, I do not have such knowledge, no, sir.

Q Do you know who connected with the Monsanto Company contacted the Commodity Pasteurizing Company or Kopel Company in California with regard to the change of its Therminol FR-1 or 2 product to another product?

A I have been told fairly recently, sir.

Q Who was that?

A I do not know the individual by name, but I am told he was our representative in the western part of the country - marketing representative.

Q Sales representative?

A Sales representative, yes, sir.

Q Who told you this, Mr. Papageorge?

A I believe it was Mr. Roder, James Roder.

Q Do you have only one sales representative in the western part of the country for heat transfer fluid?

A I do not know, sir.



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Q You don't know how many?

A No, sir.

Q I guess Fallon would know that information?

A Yes, sir.

Q Do you have information as to whether the representative of Monsanto Company approached the people at Commodity Pasteurizing or whether the people at Commodity Pasteurizing approached Monsanto people about this problem or this situation of the Commodity Pasteurizing facility in Stockton or Long Beach, California?

MR. SMITH: Well, now, I object to the form. Are you saying that there was a problem at that plant?

MR. HUTCHINS: Well, you can strike the "problem". About the situation.

A (By the witness) It's my understanding, sir, that in the perusal of our records in a continuing search for food processing applications - because this is not something that takes place overnight; it's a continual program - the words "Commodity Pasteurizing" sounded very much like a food processing operation, and because of that name a contact was made with Commodity Pasteurizing Company. I do not at this point know if it was made through this field representative initially or whether it was made by mail, but an initial contact was made. And this contact, I am told, included a copy of this June 1970 letter which



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was mailed to food processing plants.

Q Your records then, because of the name "Pasteurizing" indicated to somebody in Monsanto that that might be a food processing point?

A That's right.

Q For use of Therminol FR-1 or 2 in a closed system?

A That is correct.

Q Having to do with food processing?

A That is correct.

Q So your records then indicated that there had been a sale of Therminol FR-1 or 2 regarding a heat transfer fluid to the Kopel Terminal or Commodity Pasteurizing on the west coast in California?

A It's my understanding the records showed the name Commodity Pasteurizing, yes, sir.

Q I see. Now, from checking your records, can you ascertain whether that sale was made as a result of contacts made by your company to Commodity Pasteurizing, or whether the sale was originally made by a contact originating with Commodity Pasteurizing seeking out Monsanto?

A This document we've been referring to today would not indicate the source of the order, or whether it was the initial purchase, or any information other than a recipient of material in a given month. That's all it says. Now, I do not know if there are other sources of information that



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would help in this area.

Q You say you do not know that?

A I do not know, no, sir.

Q If that were available, would that be under the supervision of Mr. Fallon or someone in his marketing department of the company?

A I would say yes, to my knowledge, right.

MR. VANCE: It's 3:00 o'clock. You want to take a short break?

MR. HUTCHINS: All right.

(A brief recess was taken.)

Q (By Mr. Hutchins) Mr. Papageorge, has Monsanto in its laboratories or ever by commission work made any studies of the effects on its Therminol products as a result of its contact or mixture with other chemicals or compounds?

A I am not aware of any such studies.

Q From your knowledge of chemistry, is there any action or reaction that these polychlorinated biphenyls would take in response to the introduction of other chemicals to the polychlorinated biphenyls - that is, is there anything else which would cause a chain reaction to make it more deleterious or less deleterious in the environment?

A I can only share with you some thoughts that have been expressed to me by others that under some conditions



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which have yet to be defined thoroughly, it is conceivable that polychlorinated biphenyls can be converted to these furans I referred to previously, and it would require a source of oxygen from somewhere. At least this much has to occur. So from these kinds of discussions, I am led to believe that it's possible under some conditions for polychlorinated biphenyls to be chemically altered.

Q For the better or the worse as far as an environmental effect or an effect on foods or food process?

A Either way. It could go either way, sir.

Q Then I take it that you mean by that that by the introduction of certain other chemicals or compounds, these other chemicals or compounds or things that are introduced to the polychlorinated biphenyls may have the effect of starting a chain reaction which may make them better or worse to the environment?

A Yes, sir, if I understand your expression "chain reaction".

Q Well, that's a layman's term.

A I interpret that to mean that starting with a polychlorinated biphenyl, you end up with another chemical identity which in turn is modified to still another, on and on, which is the kind of thing that happens, I'm told, in the metabolic process of the food that you and I and any animal might eat. This is the kind of thing that happens,



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yes. There is some evidence in the residue studies of the tissues of our test animals that this might be going on, because there is a loss of PCB from the tissues, yes, sir.

Q Now, in adding certain kinds of vitamin compounds or other things to a supply of food for animals, part of which had polychlorinated biphenyls already in it, are those the sort of things that can start almost a metabolistic change?

A I don't know of any vitamins that had polychlorinated biphenyl in them.

Q No, no. I mean if you put vitamins, say, or any other compound that might be mixed with food or animal feed with other parts of the mixture in making the feed, could that cause a chemical reaction which would make the polychlorinated biphenyls react?

A Sir, we're in a field of metabolism that I have no knowledge in. I'm just not qualified to respond to your question.

Q All right. Is there anyone in Monsanto Company who would be qualified in this area of the action and reaction of other chemicals or vitamins or any kind of compound on the environmental impact of PCB, and if there is such a fellow, who is he?

A I have never talked to this individual.

MR. SMITH: Are you posing a purely hypothetical



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situation?

MR. MARSHALL: Well, the question speaks for itself. The witness is ready to answer.

MR. HENSON: If there is such an individual, he should be made president of Monsanto tomorrow.

MR. SMITH: Well, the reason why I asked, I hadn't objected to the form but I would unless there was some clarification, because as far as I can tell, it was never ever intended that PCB's - polychlorinated biphenyls - be in any food.

MR. MARSHALL: Well, we object to gratuitous remarks by counsel and respectfully request that the witness proceed with his answer.

A (By the witness) I find the question is difficult to respond to, because it seems to me quite broad. The reaction of chemicals such as - let's take polychlorinated biphenyls, with something, let's say, like caustic soda in a pot at high temperatures - and again, we're speculating here - with a source of ultraviolet light. I can visualize a chemical reaction taking place. On the other hand, there's a different kind of reaction that I understand takes place in the body of a test animal where hormones and enzymes and all kinds of things with which I have very little familiarity take place, and the resulting chemicals that are formed are to me quite exotic, and I just



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don't feel qualified to answer this, and I don't know personally of any individual that can cover that broad a question which is over here in animal metabolism and food assimilation, and to the other extreme of just plain old pure chemistry - industrial type chemistry.

Q (By Mr. Hutchins) Well, who in Monsanto would be knowledgeable in the area of pure old chemistry?

A I would start with our director of research, Dr. William Richard.

Q Now, in your testimony a few minutes ago to Mr. Harrell, you said that on your print-out from the computer, the use made of the polychlorinated biphenyls was not on your print-out - the customer's use was not on your print-out from the computer.

A There is no column as such. However, the description of the product is very informative relating to use.

Q What do you mean by that?

A Looking at this print-out, and if we look at that section that refers to sales of - let's take a trademark of ours, Pydrol (Pydraul). That tells us that this fluid or this application is hydraulic fluid applications. So that's telling us something. Looking at that section that says Therminol, that tells us it's a heat transfer application. That is the way we determined some of this. There is no box or column that says "heat transfer," "hydraulic,"



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"plasticizer", and so on.

Q Do you know whether the computer is programmed so as to give additional information that was not on the print-out you got?

A This I don't know.

Q You may have given this, but I'd like to know, is there a person at Monsanto Company in St. Louis who is in charge of computer programming and the computer operation of Monsanto Chemical Company or Monsanto Company?

A Yes, I am sure there is, sir, but I do not know the man's name.

Q All right. Do you know of any open system applications for heat transfer fluid?

A I know of some small ones. I have heard of some larger ones. These are open vats of hot liquid.

Q Is heat transfer fluid used in that?

A This is the hot liquid, and the item being processed is submerged into this hot liquid - or the item being tested, or whatever is being done to this item.

Q In February 1970, when the company made its decision about the warning regarding PCB's, it decided to discontinue all sales of PCB's in the general plasticizer application as of August 30th. Wasn't that the decision as far as plasticizer applications?

A That was a decision, sir, but you mentioned



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earlier in February. I don't believe that in February we would get ready to implement such a program.

Q When was it finally decided to discontinue sales of all PCB's for all general plasticizer applications? When was the decision made?

A The final decision to proceed with implementation was made in May of 1970.

Q And that cut-off date for the sale was August 30th, 1970, wasn't it?

A For the open system applications, yes, sir, with the exception of the two we discussed earlier - the hydraulic fluid phase-out program and the carbonless copy paper phase-out program.

Q All right. Now, you were going to continue the sale of PCB's in the dielectric fluid areas, were you not?

A Yes, sir.

Q Was one of the decisions that was reached there in the dielectric fluids area, was part of the program there, that Monsanto Company would cooperate with customers in collecting this spent fluid or arced fluid?

A We would cooperate, sir, in terms of accepting at our plant for disposal this spent or arced fluid, yes, sir. We were not offering a service whereby we would go into the customer's plant and collect from his tanks.

Q Well, part of the policy of the company was to



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cooperate with customers?

A Yes, sir.

Q In collecting the spent or arced fluid for regeneration or incineration, right?

A That is right, yes, sir.

Q Now, was part of the policy set by the company there as far as heat transfer fluid, was part of the policy of the company then to insure modification of the system design to make provisions for collection of spill and leakage?

MR. SMITH: Would you repeat that, please?

Q (By Mr. Hutchins) Was part of the policy that was adopted by the Monsanto Company as far as the heat transfer fluid the insuring of modification to systems design to make provision for collection of spills and leakage?

MR. SMITH: Object to the form.

A I don't know that we insured anything in that regard. I don't believe I understand the question.

Q (By Mr. Hutchins) Well, Mr. Jordan gave you a paper writing that he identified the other day as Papageorge No. 3, I believe--

MR. MARSHALL: Plaintiff's Exhibit 3 of the Papageorge Deposition.

Q (By Mr. Hutchins) Referred to on Monsanto letterhead, "Polychlorinated Biphenyls, Control of Escape to



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Environment"?

A Yes, sir.

Q And you did identify that as one of the things that came out of the Monsanto Company and its policy regarding PCB's, didn't you?

A That is right, sir.

Q Now, I'll ask you if on the third page of that Monsanto document entitled "Polychlorinated Biphenyls, Control of Escape to the Environment," at subparagraph 4 it doesn't say, "Continue sales of PCB's as fire resistant heat transfer fluid, insuring modifications to systems design to make provision for collection of spills and leakage; collect spent fluid for regeneration and/or incineration"?

A Well, I do not know what is meant by "insuring".

Q Well, I didn't ask you what was meant; I asked you if that wasn't contained in the Monsanto bulletin.

MR. SMITH: Object. I don't believe that's been identified as a bulletin.

Q (By Mr. Hutchins) Well, Monsanto document; the exhibit that was given to you the other day.

A This is in that exhibit, yes, sir.

Q And I believe the other day you testified when Mr. Jordan was questioning you about that document that you had this document before you and made certain comments and



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suggestions about it before it was put in final form, didn't you?

A Yes, sir. I was asked to drop by the office, look at a pencil draft, make my comments, and left the room. The next time I saw the document was its finished form, and I do not recall exactly what changes were made from the pencil version I saw to the final draft.

Q But you don't deny that the Exhibit No. 3 which Mr. Jordan showed you the other day was the final draft?

A That is correct, sir.

MR. HUTCHINS: I have no further questions.

MR. HENSON: We have just two or three.

EXAMINATION BY MR. HENSON

Q Since you have assumed your present duties, Mr. Papageorge, have you had an opportunity or have you found it necessary to read and ascertain and learn about chickadema?

A Sir, I have heard of the expression "chickadema" in my discussions with our medical department personnel. I have a peripheral type, bits and pieces, of information, that leaves me with the impression that there is something to which chickens on occasion appear to be exposed, resulting in certain symptoms and physiological effects. Other than that, I continue to rely on my medical department personnel to advise me as to the importance of this kind of informa-



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tion.

Q Did you at any time learn from any source, or were you advised by anyone, that it was a toxic element or factor that was causing chickadema?

A Yes, sir.

Q Was that toxic element in anyway related to hydrocarbons as far as you knew?

A No, sir, I do not recall any discussions in which the material or substance causing this effect was ever identified to me chemically.

Q Chemically?

A That is right.

Q Can you tell me whether the fingerprints of this toxic condition which is thought to cause chickadema is very similar to the fingerprints of PCB's?

A I have never seen these so-called fingerprints. Only one individual to my recollection even referred to this similarity. That's the only information I have relating to that.

Q Could you give us a general definition of hydrocarbon chemically?

A Well, my understanding of the expression hydrocarbons is that it applies to those substances which contain hydrogen and carbon.

Q Can you tell us whether or not that is a broad



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category of chemicals?

A Yes, sir, very broad.

Q Can you tell us whether or not you have any information as to whether that broad category of hydrocarbons is toxic to animals or chickens or birds in certain levels?

A No, sir, I do not have any information to say that.

Q All right, sir. Now, what is the name of the FDA test which they are using to determine the presence of PCB's?

A I don't know of the formal title to this test. I'm aware of a procedure that was developed by two employees of the Food and Drug Administration - ~~Judas~~ Judith Armor and Jerry Burke, and it's referred to by those involved with polychlorinated biphenyl analyses as the Armor-Burke method, and this was published in the "Journal of the AOAC" - the Association of Official Analytical Chemists, I believe is the meaning of the AOAC.

Q Do you know when this particular test with this particular name was published?

A The name was published or the procedure?

Q The procedure was published.

A I believe about June, July 1970.

Q Now, this particular procedure to test for the



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presence of PCB's, relatively speaking was it an expensive procedure?

A Relatively so, yes.

Q And was it a procedure as compared with an instrument, or did it require the use of sophisticated instruments?

A It requires the use of an instrument that I'm told costs between fifteen and twenty thousand dollars.

Q All right. Have you ever heard of a Lieberman test?

A No, sir.

Q And you don't know whether that test is used in the poultry industry to detect the presence of toxic factors in feed?

A I have never heard of that test.

Q Since you assumed your duties, have you made any type of investigation or study to ascertain what tests are available to the poultry industry - such as the manufacturers of poultry feed or the producers of poultry?

A No, sir.

Q When you speak of PCB's as being one part per million or one part per billion, are you referring to a microscopic part, or is that relative?

A It's a relative expression, sir, and it's normally on a weight basis. So one part per million can



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mean one pound in a million pounds, one ounce in a million ounces - the same unit applies to both.

Q Well, when you speak of it as a guideline being .01 parts per billion in water and lakes, at that point you are speaking about in microscopic--

A Smaller than that, I suspect, sir. I don't think a microscope could see that.

Q And when you speak of so many parts - 140 parts per million in feed, you are again speaking of a microscopic element, aren't you?

A A very small amount, yes, sir.

Q Now, when you set up your restricted sales program for all areas of the sale of PCB's, or polychlorinated biphenyls, as part of that program was a system set up for new customers - for the control of new customers of Monsanto?

MR. SMITH: For the control of new customers?

Q (By Mr. Henson) When the system of restricted sales of PCB was enacted by the company, what controls, if any, were set up for new customers of PCB?

A This is a part of the program, sir, which I referred to and indicated I had no personal knowledge of the details of each of the manager's programs for carrying out his individual responsibilities in this area. They had the assignment to restrict sales to certain uses. I don't know



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how they went about achieving this.

Q But this program that you have told us about applied to the then users and future users?

A Yes, sir.

Q Is it true that the records of Monsanto show that East Coast was a user of FR-1 after the restricted program went into effect?

A There was no restricted program for heat transfer fluids at that time.

Q Well, there was a part of the program that did apply to heat transfer users, did it not, such as sending letters warning them--

MR. SMITH: Object to the form.

A (By the witness) Well, the communications program was distinct and different from the restricted sales program, and the marketing of Therminol fluids, which is our key that this is a heat transfer application, was continuing except to the food processors. Does that help?

Q (By Mr. Henson) Well, it is true that East Coast Terminals became a customer of Monsanto after the company had made a number of decisions concerning the sale of PCB's, is that not true?

A That is correct.

Q Because the print-out of the computer established that since the first sale was in August of 1970?



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A Yes. All right.

Q Do you know now or has any investigation conducted by you disclosed what was done by the company when they got this new customer for FR-1 in August of 1970?

A The order was honored and the material was shipped. Is that what you mean?

Q All right. Was there any other - as far as you know now, at that time when that order was honored, was there any other investigation to determine its use by East Coast Terminals?

A No, sir, there was no indication it was in the food processing application; therefore nothing would have to be done.

Q Do you know whether or not any type of letter was sent to the company in connection with your effort to cooperate with them in connection with leaks and return of material? Was that type of letter sent to East Coast when they ordered their first barrels or barrel of FR-1?

A I don't believe so, sir.

MR. SMITH: Your question was letter, wasn't it?

MR. HENSON: Yes.

Q (By Mr. Henson) Do you know whether or not a representative of the company called upon East Coast after Monsanto received its first order for FR-1?

A A representative of which company?



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Q Of Monsanto.

A Of Monsanto? To the best of my knowledge, no one visited East Coast Terminals.

Q After July 1971 when you received these calls in regard to East Coast Terminals, did the company then conduct any type of investigation of the order taking procedures in the company?

A Not to my knowledge, sir, no. There was no study made.

Q Now, you have referred to Mr. Rousch as being a heat transfer engineering specialist?

A Yes, sir.

Q And do you know - or in '69 through '71, did you know Mr. Rousch very well?

A Professionally I knew him, yes, sir.

Q Professionally? You're talking about your work for Monsanto?

A Yes, sir.

Q Were his duties, among others, to advise and counsel companies who were engaged in the design and erection of closed heat transfer systems?

A That's one of his duties, yes, sir.

Q One of his duties?

A Yes, sir.

Q And do you know whether or not he ever counseled



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with anyone connected with Joy Manufacturing Company in connection with the design or erection of either the East Coast plant or the Stockton plant?

A No, I do not, sir.

Q When you received - if you know, Mr. Papageorge, when the first order from East Coast Terminals for FR-1 was received, you indicated therewas no indication that it was in the food processing business. Was there any indication of the nature of this business at all, as far as you know?

A As far as I know, no.

MR. HENSON: We have no further questions.

EXAMINATION BY MR. FEDRICK

Q Mr. Papageorge, in 1970, do you know how many customers Monsanto had for its various PCB containing products?

A I don't have an exact count. I believe it's between fifteen hundred and two thousand.

Q Of these customers, how many people were involved in these closed system heat transfer applications?

A About six or seven hundred.

Q Now, Mr. Henson just talked to you about these computer print-outs. Could you describe for me exactly how this computer information is programmed topically - that is, by product, by application, by type of consumer, or what?



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A It's programmed by product, as a title - if you will - of that subsection, and listed under this product title starting on the lefthand margin is the customer's name and delivery location. As I recall, there is a column there that identifies the marketing district which is responsible for that customer. I believe it lists the total pounds of material the customer purchased the previous calendar year. It lists on there the anticipated needs for the current year. And then it reads across January through December, month by month, and in each box for each customer the pounds purchased in that month are printed. If the month has just elapsed, the number in that box represents that month's purchases. If the month is yet to come, it's in the future, that number in that box represents last year's purchase during that month. So on any one exhibit, we can see this year's purchases and the purchases made last year for the remainder of the year.

Q Now, when you request a print-out like the one you described, does the computer print out every bit of information it has about that customer, that it has in its memory bank?

A No, sir. It just lists the customer name, shipping address.

Q What else, for example, would be included in the memory bank of the computer for example for East Coast



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Terminals?

A I do not know.

Q In 1970, how many pounds of PCB containing products were manufactured by Monsanto Company?

A I don't recall the number, sir. The last full year of production, 1969, we approached eighty million pounds in this country. 1970 being a year of phase-out was certainly less than that. I at this moment cannot recall the number.

Q In 1969, for example, how was this eighty million pounds divided among the various areas of this dielectric fluids and heat transfer fluids and plasticizers, and so forth?

A About sixty percent of it was in the applications we have described as being closed systems - this is dielectric and heat transfer, and about forty percent was in the applications we've been referring to as open systems.

Q Now, you mentioned that heat transfer mediums were used in various food processing applications. Could you describe some of these applications for us?

A I've never personally seen them, but I can pass on to you what I've been told. They are used in the processing of potato chips and french fried potatoes. Now, keep in mind - I hope I don't give you the impression that the potato is fried in this polychlorinated biphenyl. There



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is the normal cooking oil and shortening that are actually-- into which the potato product is submerged. This shortening and cooking oil is indirectly heated through pipes or chambers in which the polychlorinated biphenyl fluid flows. They are used in the manufacture - or they were used in the manufacture of jams and jellies in cooking down the juices, fruit juices and all.

Q What do you mean by "they were used"?

A Yes, sir.

Q I'm talking about heat transfer mediums in general; not necessarily containing PCB's.

A Oh; I misunderstood. I thought you meant polychlorinated biphenyls in food uses.

Q Well, go ahead. You have some other applications?

A Let me think. This processing of potato chips and french fries is repeated, really, in the processing of fried chicken, doughnuts. Nothing comes to mind right now. It's that kind of application.

Q In any of these applications, is heat transfer medium not containing PCB's no longer used at all?

A In these kinds of applications today, they are using different fluids, and in some of these applications they were using different fluids in the past.

Q Now, when was the name "Therminol" first coined?

A I don't know.



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Q Do you have an idea when it was?

A No, sir.

Q Are there any promotional brochures by Monsanto encouraging the use of Therminol FR series in any applications?

A Yes, sir.

Q Can you describe those brochures and give us their numbers?

A I don't recall their numbers, sir. It's a typical promotional kind of document in which the characteristics of the fluids are described, their availability, the proper methods for handling, suggested applications. It's a pretty typical kind of sales bulletin.

Q Do you know if any of these brochures contain any warnings relative to the use of Therminol FR series fluids?

A Yes, sir. There is usually-- I don't recall specifically in this instance. There is usually a page or two in which we include the precautionary remarks if they are appropriate.

Q Do you have copies of these brochures somewhere in your office or in your filing cabinets?

A Not in my cabinets, no, sir.

Q Where are these brochures located?

A I have not personally seen them, but I would go



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to the marketing manager and ask for copies.

Q Do you know how many different types of brochures there are relative to Therminol FR series?

A To my knowledge, there was only one bulletin--let me think a minute. One bulletin that existed at any one time, and this, I am told, had been revised on occasion.

Q When is the last time a brochure was produced for the FR series?

A I don't know.

Q Now, this morning Mr. Jordan in the course of his examination went over a series of reports with you. Do you recall that? He asked you if you recalled ever seeing them.

A Yes.

Q And some of these studies involved the ingestion of varying amounts of Aroclors, is that right, in laboratory animals I'm talking about.

A Yes, sir, some of the reports.

Q Do you ever recall or have any knowledge about any independent laboratories or universities coming to Monsanto and asking for samples or lab standards for these studies?

A Yes, sir.

Q Who came to you and when?

A Over the past two to two and a half years, I would



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estimate four hundred or more requests of that nature throughout the world that were made to me personally.

Q Did you honor these requests?

A Yes, sir.

Q How about prior to that time? Do you have any records relative to this type of thing?

A No, sir, I don't have.

Q You say you came to Monsanto in 1970 as their manager of environmental control. Was there a predecessor at that post?

A No, sir.

Q Was the post created at that time?

A Yes, sir.

Q Prior to that time, who was involved in the collection of all this data? That is, who composed this notebook, this three-ring notebook that you referred to?

A That was put together by our medical department personnel.

Q Who in the medical department was primarily responsible for that?

A Elmer Wheeler.

Q Now, you say that Mr. Fallon is no longer with the company as of - to your knowledge - last Thursday. Do you know where he is now?

A I am told, sir, he is still located in the St.



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Louis area, and that's all I know.

Q Do you have any idea of his current employment prospects or anything?

A No, sir.

MR. SMITH: I thought he testified that he had another job. So "his employment prospects" I object to.

Q (By Mr. Feerick) Does he have another job?

A Sir, I'm told he has. He is now employed by another firm located in the St. Louis area.

Q Do you know the name of that firm?

A No, I don't, sir.

Q Is it a chemical company?

A I don't know.

Q Also during the course of your examination this morning, you were shown a list of publications which you compiled in May or June 1970. Do you recall that?

A Yes, sir.

Q Has there been another compiling of these various publications since that time?

A Yes, sir.

Q Do you have a copy of that in your records?

A Yes, sir.

Q And where is that located?

A In St. Louis.



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Q In a filing cabinet or where?

A Yes.

Q In what file?

A It's in one of the drawers. It's this bundle we referred to with the rubber band.

Q With the rubber band. Okay. To your knowledge, have you ever heard of an open system application for food processing?

A No, sir.

MR. FEERICK: I have nothing further.

EXAMINATION BY MR. VANCE

Q Mr. Papageorge, I believe you testified that Monsanto discontinued sales involving food applications - that is, of Therminol FR series - as of July 31st, 1970?

A That is correct, sir.

Q And that the discontinuation of sales of Therminol FR series involving feed was done sometime later - I believe you said July 1971?

A It was in the period shortly after July 1971, yes, sir.

Q So Monsanto did make a distinction between food and feed as far as this restriction of sales is concerned?

A Yes, sir.

Q All right, sir. Now, it was important for what people at Monsanto Chemical to know of these sales



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restrictions? I mean what categories of people?

A Well, it certainly would have to be the individuals in the business group who were responsible for this product in its marketing, its manufacture, research activities, and of course it would be the interest of the managers of the division or company in which the business group belonged.

Q All right. Now, in marketing, do you distinguish - does Monsanto distinguish between salesmen and order takers? Do you have outside salesmen and then people in the office that take orders?

A Yes, sir.

Q What do you call those order takers? I'm sure that's not the name for them.

A I don't recall. There have been various titles used rather loosely - sales correspondents is one title I have heard. Sometimes just the expression secretary applies to the girl taking the order. I don't know what they call the individuals who now operate the central order system.

Q Is there a department name within which sales correspondents or secretaries take orders for heat exchange fluids?

A At what point in time?

Q Well, say, in 1970.



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A 1970? Well, all of these individuals were located in district and regional sales offices, many of these individuals taking orders for any products that Monsanto sells.

Q How many sales correspondents or secretaries were involved in taking orders for the Therminal FR series?

A Oh, I don't know.

Q I mean inside salesmen.

A I have no idea.

Q What I'm getting at, would the same salesman take orders for this product as well as many others, or are they restricted within a certain group?

A The best I know - and this is a complex situation - it varied from location to location. In some areas - and this varied of course with work load, and if the work load was such that handling a very limited number of products could justify one individual, this is all that individual will handle. In some areas the work load was such that one individual would not only handle all the products of a given division, but probably could handle the products for the entire Monsanto Company, which would overlap these many product lines. So there is no one pattern that I'm aware of that I could describe for you.

Q Well, after the orders were taken originally by an outside salesman or an inside salesman, that order would



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be directed to a certain business group, would it not?

A Yes, sir.

Q Where would it go from the salesman?

A As I understood the system in 1970, sir, this order - based on which product was being ordered - would be placed on a teletype system and transmitted to a particular code. This would then send the message to a receiving unit in St. Louis which was located in the proximity of the appropriate business group. And that simultaneously would be transmitted to the appropriate shipping location, and that would be the document that the shipping people would use to fill the order and process it. The other document back at the other receiving unit would be the document that served as a source of information to the invoicing people, the accountants, and so on; that served administrative purposes there.

Q All right. Now, what persons within that chain were to be knowledgeable about the restrictions placed on the sale of that product, such as Therminol FR series?

A This I don't know. I'd have to ask the marketing manager as to the details of this particular program - what instructions he issued, where he placed the responsibility.

Q Well, it would not be the telex operator, would it?

A I don't know. I'd be guessing.

Q Well, could it be the outside salesmen? Would



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they be advised as to the restrictions?

A Conceivably, yes. In my opinion, they'd be the key individual, yes.

Q And who else would be key individuals that would be advised of these restrictions?

A Of course the staff that the marketing manager has to assist him, and that varies with products. They would of course be knowledgeable. I can't think of any others.

Q Now, on the revision of the label for Therminol FR series, does the same label appear - or did the same label appear in 1970 and 1971 on all PCB products, or did the labels vary from product to product?

A There was some variation, but the pertinent statements relating to precaution - "wash hands, avoid breathing, extreme care must be taken in handling, use, disposal" - these basic kinds of statements were the same on all of the labels of products containing polychlorinated biphenyls starting in - as best I recall - about August of 1970 and on.

Q Are these products shipped in the same form to the various users? For instance, is the PCB used in Therminol FR-1 shipped in the same manner that the product containing PCB for batteries is shipped in? What I'm asking is does it appear to be the same product for all uses, or are some



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in liquid form, some in solid form, and so on?

A There was one product of PCB's in the solid form which was shipped in bags. All the other polychlorinated biphenyl products were shipped either in tank cars or tank trucks, 55-barrel black painted drums, or the 5-gallon pail. Does this help? I said black drums. The hydraulic fluids were shipped in a white and green drum with a lithographic, more attractive exterior. So there was a difference for the hydraulic fluids, yes, sir.

Q Now, I believe the revised label stated substantially that the product contains polychlorinated biphenyls which some tests have shown may be hazardous to the environment. Isn't it true that some tests actually showed that PCB's are hazardous to the environment rather than may be?

A Well, sir, I'm trying to recall right now.

Q This was in early '70, I believe.

A A hazard to the environment. What I'm thinking, sir, is the fact that at that point in time, persistence was established. The persistence does not necessarily mean harm. In the reports available, all do not agree that polychlorinated biphenyls are definitely a hazard to the environment. There is some difference of opinion here. And I think those of us that have read the interdepartmental agency task force report will glean from it that there are



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still many unanswered questions and more work to be done. So it's still a subject in a state of flux regarding the amount of information available, the amount of information required.

Q Well, actually, sir, isn't it true that some tests which Monsanto actually ran itself showed that polychlorinated biphenyls are hazardous to the environment?

A The tests that we ran, sir, tell us that if the levels in the environment reach a given magnitude then they result in some effect that is undesirable. That's all these tests show.

Q Well then, they are hazardous then, are they not, at certain levels?

A That's true of many, many, many substances, sir.

Q Were Monsanto's attorneys involved in rewriting or revising the label?

A Yes, sir.

Q Did they suggest that Monsanto specifically mention food on the label?

A I don't recall the attorneys' mentioning food, no, sir.

MR. SMITH: Now you're talking about prior to this July 1971?

MR. VANCE: Yes.

THE WITNESS: Yes, sir.



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Q (By Mr. Vance) Back for a minute to mailing of these letters to customers. Was Berlin Chapman in Wisconsin included in this mailing list?

A I never heard of them. I don't know, sir.

Q You never have heard of Berlin Chapman?

A No, sir.

Q Have you ever heard of Baker Engineering Company in California?

A Yes, sir.

Q Were they included in the mailing?

A A checkup I made, I found out that they were on the mailing list, yes, sir.

Q Now, I believe you said that the computer gave a print-out showing information which included the customer's name and the delivery location and the marketing district of the product, is that correct?

A Yes, sir.

Q Therefore, the computer had stored information relating to delivery location of the product anywhere in the world that it was delivered, is that right?

A Yes, sir.

Q Now, isn't it true that the first order for East Coast Terminals was made by Baker Engineering with the specification that it was to be shipped to Baker Engineering Company in care of William J. Moran, East Coast Terminals,



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Wilmington, North Carolina?

A I'm not aware of a reference to the Moran Company. I am aware of the East Coast Terminals, Wilmington, North Carolina.

Q On the order?

A On the order, yes, sir.

Q And that order was dated October 10th, 1969, was it?

A I don't remember it that specifically, sir. It's about that time of the year, yes, sir.

Q And then the second order, November 25th, 1969, showed an order from Baker Engineering Company to be shipped to Baker Engineering Company in care of East Coast Terminals, Wilmington, North Carolina. Isn't that correct?

A I recall that, yes, sir.

Q Do you know what business Baker Engineering Company is in?

A I've been told that they are in the engineering construction business.

Q Have you been told that they construct pasteurizers or pasteurizing machinery?

A I don't think the expression was quite that broad.

Q What have you been told about Baker?

A I've been told that this is the company that installed the unit for pasteurizing fish meal at East Coast



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Terminals in Wilmington, North Carolina.

Q Did you receive this information from other Monsanto officials?

A Yes, sir.

MR. SMITH: Are you talking about at any time subsequent to July 16th, 1971?

THE WITNESS: That's right.

MR. VANCE: I haven't talked about any particular time.

MR. SMITH: I'll ask you to pin it down, if you will.

MR. HAGAN: Off the record.

(Discussion off the record.)

Q (By Mr. Vance) Mr. Papageorge, Monsanto Chemical drastically reduced its sales of PCB products in 1971, isn't that correct?

A Yes, sir.

Q Do you know how many tons of PCB's were produced by Monsanto in 1970?

A I tried earlier to recall the number, sir, to respond to a similar question, and I could not recall the number.

Q It's over forty-two thousand tons, isn't it?

A In 1970?

Q Yes, sir.



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A I don't believe so, sir. I thought that the 42,000 tons described the production in 1969, which is close to eighty million pounds that I mentioned.

Q Do you know how many tons of PCB have been produced by Monsanto since 1960?

A I have not added it up, no, sir.

Q Then in 1971, the production of PCB's was reduced to about twenty thousand tons, was it not? That is, Monsanto's production?

A I'd have to refer to my records, sir. I don't remember these numbers.

Q All right, sir. Did the tests which Monsanto performed in 1969 and '70 reveal any information not previously known to Monsanto?

A Well, sir, it's twofold. Having no information on what effect a two-year feeding study would have on any creatures, even though no effect is noted, that is information that we lacked before. So we did get some of that. We also got information, as I described earlier, that some of these polychlorinated biphenyls at the higher levels did show an effect on the test animals, and we got the information that we discussed relating to the effect on the hatchability of chicken eggs. So we did get information we didn't have at the start of the tests.

Q Now, did these tests involve the very expensive



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machinery that you referred to earlier?

A The analysis of the tissues from these animals involved this analytical machine I mentioned, yes, sir.

Q Is that a mass spectrophotometer?

A No. This is what is called the electron capture gas liquids chromotograph - GLC.

Q Was that developed by Monsanto?

A No, sir.

Q Well, you've mentioned - I think others have asked you about the methodology developed for the detection of PCB's. I don't believe anybody has actually asked you what it was. Would you tell us what the methodology is? Don't be concerned about the technical terms. We want to know what it is.

A Well, I'm not qualified to go-- it's about a half-inch thick report that describes the procedure, and I'm not qualified to take you step by step, but I'll try to give you the essence of what is attempted here.

MR. D. MOORE: We'll furnish you a copy, if you'd like.

MR. VANCE: I want to know what the witness knows. He has testified he has made technical talks to other groups, and we want to know what he knows about the technology.

MR. D. MOORE: Well, he can proceed, but we'll



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furnish you a copy if you want it.

A (By the witness) My technical talks, when it comes to analytical methodology, is to mention that we had an interest in this area, that we applied our resources to the problem, and came up with a procedure that we feel is the best available in the world, and we have shared this knowledge with anyone who is interested. The methodology is primarily one of taking a sample - whether it be water, sediment, animal tissue, chemicals - and exposing it to a process of extraction, as it's called. Where we're under very severe conditions of heat and alkali in the presence of a very pure solvent, the polychlorinated biphenyls are concentrated. The exposure to heat and alkali is intended to destroy other materials that would interfere with the fingerprint we referred to earlier. It does not, to my understanding, destroy all of the insecticides that might interfere, but at least it creates that condition where a peak that does show on the fingerprint is easily identifiable and can be accounted for as belonging to an insecticide. After the polychlorinated biphenyls have been extracted, they are concentrated to a very small volume. This concentrate is referred to as the extract, which some of you may hear on occasion, and this extract is introduced into this electron capture GLC instrument. And I am not qualified to tell you what's inside this box. This extract is



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introduced into this instrument with a hypodermic syringe. I'm told that this material, this extract now, if it contains any polychlorinated biphenyls is polychlorinated biphenyls in a clean solvent, is exposed to high temperatures over a given period of time, and as each of these chemical materials we call [illegible]rpolychlorinated biphenyls is given off from this extract, it creates a response in the instrument that by the mechanisms in this box is translated on a strip chart as a peak or a valley which comes out at a given period of time. The experienced chemist knows that so many seconds after the sample is introduced that a certain peak is expected if it's a polychlorinated biphenyl, and an experienced chemist knows that a pattern of these peaks and valleys represents a given commercial mixture. Now, that fingerprint is compared to a known contaminated - if you will - or injected sample of the commercial mixture, and the two are compared in order to establish its identity. Now, the amount of material - how do we know how much material is present? This is determined in various ways, and this leads to some of the confusion I indicated previously. Some laboratories use the height of three of the peaks that come out at certain time periods--

Q (By Mr. Vance) Height of three?

A They arbitrarily take three of the peaks and, say,



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look at peak number X and Y and Z, and compare that with the height of the peak that we get when we introduce a known amount of polychlorinated biphenyl. If it's twice as high, there must be twice as much in the unknown sample. If it's only half as high, there must be half as much. Some laboratories take only one peak. Some laboratories take as many as twelve peaks. The preferred method at this point in time is to take what is called the area under the curve, the total area, so you don't have to worry about numbers of peaks, and this is compared to the area under the curve against a standard. As Mr. Moore indicated, copies of this procedure are available to anyone interested. Does that help, Mr. Vance?

Q Yes. Is this the same method that the British and Swedes had used?

A As I understand, this is a modification of the basic method. The modifications, I am told, relate to the - what is known as the clean-up procedure during which the extract is compared. The modifications have to do with the working parts of the instrument. There are some changes made there which include the source of the electrons. This is the device that emits electrons. And the other change I'm aware of is the change in the material that is used to pack a glass tube, a glass column, through which these materials are forced to elude to give us these peaks and



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valleys.

Q Why do you consider this method superior, if you do?

A I do, and I could be accused of bias. We have been able to demonstrate in our laboratory our ability to detect levels of polychlorinated biphenyls lower than most laboratories can. So this leads me to think that our method is a good one.

Q Who developed the method for Monsanto?

A Dr. Scott Tucker.

Q He devised it?

A Yes, sir.

Q To your knowledge, was any effort made by Monsanto prior to the time this method was developed to develop such methodology?

A I don't know that I understand the question.

Q Well, let me rephrase it then. When was this method developed?

A The method was considered workable in late 1969 and had been in the process of being developed for over a year, and to this day it is-- we continue to look for improvements. So we don't feel that we're there yet. We have--

Q And you do not know of any efforts to develop such a method prior to '69 on the part of Monsanto?



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MR. SMITH: I believe he testified there had been a period of about a year.

MR. VANCE: Prior to '69.

MR. SMITH: Well, he said-- excuse me. I think his testimony is different from the question, and I also object to the form.

A (By the witness) Development work on analytical methodology, as I understand it, started in early 1968, which was about the time that most laboratories that were even considering polychlorinated biphenyls started to work on their methods. And by late '69, there was enough confidence established that we could generate some numbers and feel that they were significant.

Q (By Mr. Vance) Mr. Papageorge, when did Monsanto Chemical determine that polychlorinated biphenyls were detrimental to the environment, if you know?

MR. SMITH: Object to the form.

A In the broad sense as applied to your statement "detrimental to the environment", I would say that late '69, early '70 is when we began to agree that it was out there; no question about it; let's do something to minimize it.

Q (By Mr. Vance) Well, that's the time when you decided to make some effort to recall or destroy PCB's in the environment, is that right?

MR. SMITH: Object to the form.



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A (By the witness) The idea of recycling, reclaiming, disposing, evolved at about the same time that the plan for restricted sales began to evolve. All of these things happened together.

Q (By Mr. Vance) Now, is it my understanding that Monsanto had been producing PCB's since 1929?

A Monsanto and its predecessor, yes.

Q And it was not until 1969 that the company ascertained that PCB's were detrimental to the environment?

A That is correct.

Q Do polychlorinated biphenyls have any effect on inanimate objects - things in agriculture, grass, wheat, things of that nature?

A Not to my knowledge, sir.

Q Now, I believe you have been referred to as the coordinator of the PCB's at Monsanto - if we can use that popular expression. When did you first hear of Charles Burgess, or Chuck Burgess?

A I first heard of Mr. Burgess from Dr. Romoser on July the 12th, 1971, at the same time that Dr. Romoser asked me if I knew anything about East Coast Terminals and the use of polychlorinated biphenyls at that location.

Q When is the first time that you had any knowledge or had heard of South Pacific Proteins?

A That same conversation.



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Q At no time prior to that date?

A No, sir.

Q Does Monsanto Chemical have any system of follow-up on its former employees' forwarding addresses?

A I don't know, sir.

Q You don't know whether it maintains a file on former employees, how to get in touch with them?

A I can only guess that the personnel department does something along those lines. I have no experience in that line at all.

Q Do you know the policy of Monsanto Chemical as to the maintaining of records or the destruction of files and records within the company?

A I knew of a policy that existed prior to 1969. Since then I have not been involved in any matters relating to that area, so I do not know whether that policy that existed then is continuing today or whether it's been modified.

Q What was that policy in '69?

A I don't recall all of the details except that, as I recall, it had reference to certain kinds of records, the period for retaining these records and the places where these records should be retained, and some information relating to confidentiality and security.

Q Were you acquainted as to this policy by a company



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bulletin or pamphlet or memorandum?

A As I recall, there was some written material in which this information was listed or displayed. I don't remember vividly what it looked like, but this was the guidance.

Q It was in writing, wasn't it?

A Yes, sir, so we could refer to it. I recall that.

Q Who would know about that?

A I think, sir, Mr. - I'm not sure of his first name - Tom Parks.

Q Who is he?

A He's with Monsanto - at least the last time I was associated with that area, and he was involved with security matters for Monsanto and record keeping, record storage, and matters of that type.

MR. MARSHALL: Gentlemen, it's 5:00 o'clock. I suggest we adjourn.

(Discussion off the record.)

(Whereupon, at 5:00 o'clock p.m., the deposition was recessed until 9:30 a.m., on Thursday, August 10, 1972.)



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