ORIGINAL

IN THE MATTER OF:

Transwestern Pipeline Company
vs.
Monsanto Company, et al.

Cause No. BC 026959

Deposition of W.B. Papageorge
November 3, 1992

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SUPERIOR COURT

FOR THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

TRANSWESTERN PIPELINE COMPANY,

Plaintiff,

vs. NO. BC 026959

MONSANTO COMPANY AND
DOES 1 THROUGH 200 INCLUSIVE,

Defendants.

Deposition of W.B. PAPAGEORGE, taken on behalf of the Plaintiff, at the offices of Bryan Cave, One Metropolitan Square, in the City of St. Louis, State of Missouri, on the 3rd day of November, 1992 before Ronald A. Gore, Registered Professional Reporter and Notary Public.

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EXHIBITS

W.B. PAPAGEORGE,

of lawful age, having been first duly sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, deposes and says in reply to oral interrogatories propounded as follows, to-wit:

EXAMINATION

QUESTIONS BY **MR. TALLON:**

Q: Good morning, Mr. Papageorge.

A: Good morning.

Q: We're going to spend some time running through some issues related to the case which is pending in California between our client, Transwestern Pipeline Company, and Monsanto. And I'd like to start off just briefly by asking you, you were employed by Monsanto between 1951 and 1986?

A: That is correct.

Q: You retired from Monsanto's service in 1986?

A: I did.

Q: Since 1986 you have appeared on behalf of Monsanto at depositions in civil cases?

A: I have.

Q: You have appeared on behalf of Monsanto at trials in civil cases, correct?

A: I have.

Q: And you're appearing on behalf of Monsanto today?

A: Yes.

Q: Now, you have a bachelor of science degree in chemical engineering from Washington University?

A: I do.

Q: And you received that in 1943?

A: That is correct.

Q: You also hold a master's in chemical engineering, correct?

A: That is correct.

Q: Also, conferred by Wash U, or Washington University?

A: Yes.

Q: And you received that in 1947?

A: Yes.

Q: Now, you did some additional graduate work in chemical engineering between 1948 and 1950, is that right?

A: More accurately '51, also.

Q: Was that part of a process working toward a Ph.D?

A: Yes.

Q: Did you complete your Ph.D work?

A: I did not.

Q: Did you get so far as to start a dissertation?

A: No. That was the obstacle. I relocated.

Q: And just briefly if you would, Mr. Papageorge, describe the field of chemical engineering as you studied it between 1943 and 1951?

A: Oh, I don't know that -- I'll try. I never tried to do this before. Chemical engineering is the field in which mathematics and scientific principles, majoring in chemical understanding, chemical reactions and physical properties of chemicals, are used to design processes for the conversion of chemicals to more useful types of chemicals, or to purify existing materials to a quality that is desired by the end user.

Q: Now, you are a registered

professional engineer?

A: I am.

Q: When did you first become registered as a professional engineer?

A: As best I recall, 1963.

Q: And you have kept your registration current through today?

A: Yes.

Q: As I understand it, you joined Monsanto chemical company as a process designer at the Queeny plant in 1951, is that correct?

A: That is correct.

Q: Were you employed before you joined Monsanto as a process designer?

A: I think I understand you, was I employed as --

Q: Before --

A: As a process designer or --

Q: I'm sorry. Were you employed in any capacity before you joined Monsanto in 1951?

A: Yes.

Q: As what?

A: Two types of assignments. I was a

research chemical engineer with the Phillips Petroleum Company in Bartlesville, Oklahoma for about two years. Then I was a process engineer for the Phillips Petroleum Company for another two years or so.

Q: Which two years were you a research chemical engineer for Phillips?

A: '47, '48, maybe, as best I recall, into 1949.

Q: And were you a process engineer for Phillips between '48 or '49 and 1951?

A: Yes.

Q: And then you relocated to begin work for Monsanto?

A: Yes.

Q: As I understand it, in 1954 you became a production supervisor, also at the Queeny plant?

A: '54? I believe, more correctly, I would call that an assistant supervisor.

Q: Yet you were an assistant supervisor at the Queeny plant, is that right?

A: For a while, yes.

Q: Subsequently, you became a

maintenance supervisor?

A: No. I became the supervisor, then. It was a step-wise process, you got a promotion.

Q: You went from the position as assistant supervisor to the position as supervisor?

A: Yes.

Q: Of what?

A: Of a chemical manufacturing unit at the John F Queeny plant of Monsanto Company located in St. Louis.

Q: What unit was that that you supervised?

A: This was a unit in which we refined chemicals which eventually were used to manufacture what Monsanto referred to as rubber chemicals. These are chemicals added to rubber formulations to give them the desired properties.

Q: All right. And did you at a point in your job history at Monsanto become a maintenance supervisor at Queeny?

A: I did.

Q: And was that in 1957 or 1958?

A: Oh, as best I remember, about that time, yes.

Q: In general terms, what were your responsibilities as maintenance supervisor at the Queeny plant?

A: As maintenance supervisor I supervised a team of craftsmen, supervised by -- depending on the work load, by two or three foremen, and this team was given the assignment of working throughout the plant installing new facilities on a very small scale. Like replacing a tank here, a pump there, pipeline somewhere else, electrical equipment, and the like.

Q: Were you, as maintenance supervisor, responsible for the entire Queeny plant or just portions of it or of portions of the maintenance responsibilities?

A: As maintenance supervisor I was responsible for only a small part of the total maintenance effort. And, as I indicated, only for that part that dealt with installing new facilities on a small scale.

Q: Subsequently, as I understand it, you became maintenance superintendent at the Queeny plant?

A: That is correct.

Q: And that was approximately 1960?

A: Yes.

Q: And in that position you were responsible for regular maintenance of the overall plant?

A: I need some help with the word regular.

Q: Why don't you tell me what your responsibilities were.

A: I was responsible for all of the activities assigned to the maintenance department, which included not only the repair facilities, but also included this small group that I had initially, the installation of the small projects, and I was also responsible for the larger projects that were contracted out to other companies.

Q: And, subsequently, you changed positions again and became superintendent in plant technical services at the Queeny

plant, correct?

A: That is correct.

Q: And that was approximately 1963?

A: Close to that. I don't recall the exact year.

Q: That's fine.

A: That's close.

Q: Now, is it the case that in that position, in part you were responsible for design of new systems and facilities to help improve plant performance?

A: Yes. Performance of -- in many categories: Quantity, quality, cost. And only for a portion of the plant, not the entire plant.

Q: Which portion?

A: It was a series of products that -- I can't remember all of them. I remember maleic anhydride. M-a-l-e-i-c, anhydride, a-n-h-y-d-r-i-d-e. Phthalic anhydride, p-h-t-h-a-l-i-c. Plasticizers. I recall these rubber chemicals, I'm going to call them intermediates. These are chemicals that are used to eventually become rubber chemicals. I'm sure there

were some others, I don't recall them all.

Q: The plasticizers to which you referred were those plasticizers that were composed in whole or in part of polychlorinated biphenyls?

A: No.

Q: By the way, if I use the term PCBs, would you understand that to mean polychlorinated biphenyls, right?

A: Biphenols is an O-L, biphenyls is the Y-L spelling.

Q: I'm referring to the Y-L spelling.

A: Okay. I'll understand it that way.

Q: Good. Thank you. During the period that you were the superintendant in plant technical services at Queeny, did you have an opportunity to use chemicals or components of chemicals that were based on PCBs in air compressors?

A: There certainly were air compressors involved with some of the production units that my team was involved with. However, I don't at the moment recall any project that we undertook during my period of involvement that involved the

specifications for a new compressor which may have contained a PCB fluid. So, I don't recall any involvement that wasn't already in place.

Q: At the time you were superintendant of plant technical services at Queeny, were there already air compressors in place at Queeny that used Pydrauls?

A: Certainly.

Q: And were there heat exchange systems in use at Queeny when you were superintendent in plant technical services that used PCBs as a medium for heat transfer?

A: Yes.

Q: And were there electrical transformers at Queeny by that time that also used PCBs in the electrical transformer itself?

A: Yes.

Q: And just touching on an answer you gave a moment ago, I take it that all of those systems had been in place before you became superintendent in plant technical services?

A: Some were certainly in place. Others were being put in place by other teams of engineers similar to my team. Of course, some were installed by outside contractors as well.

Q: In 1963, when you were superintendant of plant technical services at Queeny, were Aroclors manufactured at the Queeny plant?

A: No.

Q: Were PCBs used in manufacturing processes at the Queeny plant?

A: There were some blending activities where PCBs were an ingredient along with other materials.

Q: Which processes are you referring to, Mr. Papageorge?

A: The process is blending itself. The products are the Pydraul series.

Q: The Pydraul series of Monsanto products were blended at the Queeny plant in 1963?

A: Some of them, yes.

Q: Some of them. Are you able to say with any specificity which Pydraul products

were blended at Queeny in 1963?

A: Not with specificity, because Pydrauls at that time were blended at either Anniston, Krummrich or Queeny, depending on the availability of the mixing tanks and the drumming facilities. So, it's conceivable that at some time or other all of the Pydrauls were blended at all of these sites.

Q: In general, are you able to state the uses to which Pydraul products were put, or the uses for which they were sold by Monsanto?

A: I can recall a few of them.

Q: Could you tell me, please?

A: I don't know whether it will be all inclusive.

Q: That's fine.

A: The major use was in high pressure, high temperature hydraulic industrial systems, such as in the metal diecasting industry. At least one of the Pydrauls was used in air compressors as a lubricant. There were other hydraulic system applications in addition to the diecasting

of varying nature. I'm having a hard time thinking of specifics. For example, the hydraulic systems in use around high temperature applications, such as cooking various kinds of foods, they would use the fire resistant hydraulic fluid to move conveyor belts, equipment. At the moment, I can't think of other better examples. So, there were many miscellaneous uses.

Q: The air compressor lubricant that you referred to a moment ago, is that Pydraul AC?

A: That's the principal one, yes, sir.

Q: While you served as superintendent in plant technical services at Queeny, did you attend safety programs sponsored by Monsanto, at least annually?

A: Certainly.

Q: And as part of those safety programs you were furnished with information that included education about chemicals that workers were exposed to at the Queeny plant?

A: I was furnished information of chemicals, yes. Chemicals that I and my

team would likely be exposed to, not all the chemicals at the plant.

Q: And included in the information that you received concerning chemicals that your workers would be exposed to was information regarding PCBs, correct?

A: Yes. If it was applicable, yes. Not all workers would be exposed to PCBs.

Q: At the safety programs that you attended in that time period, is it the case that Jack Garrett from the medical department was usually in attendance?

A: Not usually.

Q: Do you recollect that Jack Garrett from the medical department was represented at one or more of the safety programs you attended in that era?

A: Yes. Mr. Garrett made at least one trip a year to the plant.

Q: Do you have a recollection today, Mr. Papageorge, of Mr. Garrett having specifically furnished information at one of these safety programs that you attended relating to PCBs?

A: That was 30 years ago. I just --

it doesn't stand out any more than the other chemicals that Mr. Garrett would talk to us about.

Q: Do you recollect that either from Mr. Garrett or another source at these annual safety programs you learned that PCBs were a skin and eye irritant?

A: Yes.

Q: And do you recall being informed during the course of one or more of these safety programs that if you got PCB materials on your skin you should wash it off fairly quickly?

A: Your question implies that I first heard of PCBs and skin irritation at these annual meetings, and that Mr. Garrett is the only individual that would have relayed that information to me. I don't recall it being exactly like that. The plant itself had individuals who were responsible for the safety of the employees at the plant. Mr. Garrett was the corporate man who was supportive and would be sort of the -- coaching that team. I don't personally recall who was the one to inform me of this

skin irritation. But I do know that I was aware of it. It might have been the plant doctor, for all I know. I can't remember specifically.

Q: Was there also a plant safety officer at that time?

A: Yes, there was a plant safety manager. I forget the exact wording of the title.

Q: Just to be clear, your answer suggested that before 1963 you were aware that if you got PCB material on your skin you should wash it off fairly quickly, is that the case?

A: Well, I was aware of PCB and skin irritation for several reasons. One is the use in the plant by operating personnel. And later when I was with the maintenance team, the individuals who repaired the compressors or the transformers or the heat transfer systems, they, too, were coached as to what PCBs could do to their skin. I do not remember the reference to quickly washing off. The instructions were when things are under control, for example, you

stop the spray of the spill or you've temporarily corrected the situation that created this exposure, then you can go over and wash your hands, and it's highly recommended. Of course, even better, wear the proper gloves so your hand doesn't get exposed.

Q: And to what do you refer when you refer to wearing proper gloves?

A: I'm referring to a glove that's available that goes beyond the wrist, halfway to the elbow. It's got a good cuff on it and is covered with a material that is fairly resistant to PCBs. We never did find one that was totally resistant, but at least it was resistant enough so it could be used for a respectable period of time before it was discarded. As I remember, neoprene was an example of the material that was acceptable.

Q: And, to your best recollection, when were you first aware that workers coming in contact with PCBs should wear such gloves?

A: About 1954 or so.

Q: Did you find that natural rubber gloves were not resistant to PCBs?

A: Yes.

Q: And can you state with any degree of accuracy when you first became aware of that fact?

A: I don't remember any specific time, because we used the resistant materials and the problem was never brought to my attention until -- I don't remember the dates -- until someone wore shoes or overshoes made from a rubber other than neoprene. And when I saw those, I could see that they were swollen and distorted and had been affected by the PCB.

Q: Do you recall seeing those shoes when you were working at the Queeny plant or later at Anniston, or do you recall when?

A: I saw them at the Queeny plant and at Anniston later, yes.

Q: Do you recall being told at any annual safety program or at another period -- or any other period, excuse me, in your work at the Queeny plant that your

workers should avoid breathing hot PCBs used in the manufacturing process because of irritation to the respiratory system?

A: Yes.

Q: And did you issue, or was it a program to issue masks of any sort to your workers to help prevent inhalation of hot PCB materials, vapors?

A: The workers were issued and had available respirators that were issued to them, but not specific to PCBs. They dealt with so many other chemicals, so they were generally issued an all-purpose kind of respirator and were taught how to use them and under what conditions to use them, and it was up to their judgment as to when they used them.

Q: Was it your understanding that use of the respirators was encouraged or required when employees were in contact with hot PCB vapors?

A: It was encouraged, and strongly encouraged for those situations that would lead to what we call prolonged exposure, not the instantaneous walking through a

cloud of fumes, for example, but where the exposure was long enough -- and this varied from person to person -- where it became an irritant and the individual can feel it's taking an effect and can withdraw and put on a respirator and go back to do what he was doing. So, there was no specific concentration, let's say, of PCBs, or period of time, because individuals do vary. It was left up to the judgment of the individual as to when he became uncomfortable, to go get relief.

Q: Was this period of exposure that you defined as meeting the criteria for prolonged exposure greater than five minutes, greater than ten minutes?

A: I never had such a time period in mind. Because, as I said, it varies.

Q: And just to be clear, we've been talking -- I've been asking about the time from and after 1963 when you became superintendent in technical plant services at the Queeny plant. To your knowledge, were these respirators in use by these workers coming in contact with hot PCB

vapors before 1963?

A: Oh, yes.

Q: And, to your knowledge, were workers at the Queeny plant advised to wear proper gloves when coming into contact with PCB liquids before 1963?

A: Yes.

Q: Do you know how much, or how long before 1963 workers were advised to use those gloves, proper gloves, as you used the term?

A: At the Queeny plant? I'm trying to recall what date PCBs first were present in the Queeny plant, and I don't know that I ever knew that. But I do know that the instructions relating to covering of hands and respiratory protection were associated with PCBs from the 1930's when Monsanto became involved with PCBs, manufacturing and using. I have no reason to believe that that information didn't precede the introduction of the product in a piece of equipment or at a plant.

Q: A moment ago in one of your answers you referred to the occasion where your

workers would have to wear the proper gloves, and you referred to stopping a spray or a spill. Were there sprays or spills of PCB materials during the period that you had maintenance responsibility or superintendent responsibility at the Queeny plant?

A: On occasion, yes.

Q: And what kinds of sprays or spills do you recall today, Mr. Papageorge?

A: Oh, I recall material spraying out of a pump. I recall material that was under pressure in a pipeline, and it was leaking out of a flanged connection. I recall a stream of PCBs coming out of a faulty valve that could not be closed tightly. Those are examples of the kinds of things that happened.

Q: When you referred to a pump spraying, are you referring to a hose failure, or something else?

A: You may be familiar, pumps have a shaft that drives an impeller, and around that shaft is a device called a packing gland or a seal, this keeps the liquid in

the pump when the shaft spins inside of that device. On occasion these seals or packing glands do wear out, and give opportunity for the liquid to back up, follow the shaft and come out of that faulty seal and spray into the work area.

Q: When you referred a moment ago to PCB materials under pressure in a pipeline and leaking through a flanged connection, what kind of pipeline are you referring to?

A: Well, an example may well be a part of the heat transfer system which uses PCBs as the heat medium, it's heated one place and the heat is used in another and it's transferred through a pipeline. On occasion these pipelines are flanged, which means they have metal plates with a material in between called a gasket. On occasion that gasket fails, and liquid will spew out of it.

Q: Spew out of it meaning it blows out of the pipeline at whatever pressure is being applied to it inside the pipeline?

A: Certainly.

Q: Mr. Papageorge, you've referred to

the concept of heat transfer systems, and so have I. But since we probably will discuss that concept more than once during the course of this deposition, I wonder if there is some general common definition that you can give to a heat transfer system so that I am sure that we're talking about the same thing?

A: I'll try.

Q: Thank you.

A: A heat transfer system that I have in mind when I speak about the PCB type is a system where PCB liquids are heated in one location to very high temperatures, using either an oil or a gas source of heat. That hot or very hot fluid is then pumped to another location where the process requires high temperatures, such as cooking varnish or heating some chemicals, distilling them. These systems give the opportunity to provide high temperature without the risks that high pressure steam would give, because steam under high pressure, under failure, can give problems. I don't know how else to

describe these systems.

Q: As I understand your description, the heat from the PCBs radiates through the pipeline or pipe in which the PCBs is contained and carries heat that way to whatever application they're being used in, is that right?

A: That's close. You said pipeline. Sometimes the hot fluid is introduced into coils inside a vessel or a tank. Sometimes that hot fluid is introduced into an outer jacket where the tank has -- it's a tank within a tank, and the hot material is in the outer, annular space.

Q: All right. Thank you. During the period that you were a superintendent in the plant technical services department at Queeny, did you have occasion to speak with Dr. Emmet Kelly from the Monsanto medical department?

A: Not at that time, no.

Q: During the period that you served as superintendant, did Dr. Kelly ever participate in the safety programs that you attended?

A: No.

Q: Did you ever have a discussion with Dr. Emmet Kelly in which he indicated to you that exposure to PCBs could cause a skin condition known as chloracne?

A: At what point in time?

Q: That's going to be the next question. First of all, I was wondering if you recall having had such a discussion with Dr. Kelly, and then I was going to ask you when, to the best of your recollection, if you had a recollection, such a conversation occurred?

A: I do recall such a discussion with Dr. Kelly, and it occurred while I was at Anniston, Alabama in the early '60's or -- I'm sorry, the late '60's.

Q: Under what circumstances did that conversation with Dr. Kelly occur, as best you recall today?

A: At that time I was plant manager of the Anniston plant. As plant manager, I had responsibility for the industrial hygiene practices at that plant. I, of course, had a safety supervisor to assist

me, who also acted as plant industrial hygienist. And I also had a physician, a plant physician. Dr. Kelly made it a point to, at least once a year, visit the plant and spend a day with us, at which he really made an inspection of the medical records and saw that the programs that Monsanto required were in place and were being conducted appropriately. And he would then take time to sit down with either me alone or with the safety supervisor and the doctor, depending on the availability of all three of us, and conduct what I would call tutorials on the kinds of things that one can expect by being exposed not only to PCBs, but all the other chemicals in the plant. And I do recall the reference to chloracne and PCBs at that plant during those years.

Q: Do you recollect whether the reference to chloracne came up in response to some specific complaint or whether it was simply general information that Dr. Kelly was passing along?

A: I would suggest that there was no

specific situation. It was general as it applied to that particular group of products.

Q: Do you recollect from the same period any other information provided to you and to your group by Dr. Kelly regarding issues that may arise as a result of exposure to PCBs?

A: It's very hard to recall exactly when and from whom I gained information regarding PCB and effects on exposure. The discussions would usually -- I'm thinking now of Dr. Kelly's kind of tutorial, he would try to teach us to look for what I'm going to call early warning symptoms, and during that discussion he would say if you don't pay attention to these symptoms, you could eventually end up with such things as chloracne. When I mention early warning, I do recall very vividly two that worked for me, at least I relied on them a lot. A symptom that is associated with, I'm going to call it prolonged exposure to vapors, was a situation where the employee would complain about symptoms like a severe chest

cold, discomfort, difficult breathing, rawness in the upper chest. That was a good sign. That's what the plant doctor would look for. The other symptom that would serve as an early warning, and it had to do with skin exposure, this was reddening of the skin, and in the more severe cases it would look like a severe case of chapped hands, even to the point where the skin would crack and blood might ooze through. If those two symptoms were recognized and corrective action taken, then Dr. Kelly would say you won't see what he called the systemic effects, which included chloracne. That's how the subject of chloracne would come up.

Q: How did you understand the term systemic effects as used by Dr. Kelly in these discussions?

A: Well, I understood it as, in laymen's terms, the medical effects noted on a -- effects noted on a person that are not necessarily related to the exact area of exposure. An example would be chloracne behind the ears when the exposure might

well have been on the hands. That's what I understand about systemic symptoms.

Q: Systemic indicating that contamination is internal, or contaminated a system of the body, such as the endocrine system?

A: It certainly has to do something with the body system and its ability to cope with that particular chemical.

Q: Did you understand Dr. Kelly to say that any particular system or systems were implicated in prolonged exposure to PCBs?

A: Yes.

Q: Which?

A: He mentioned that the liver was the part of the body that was, in essence, designed to cope with such things as chemicals of this type.

(Recess).

MR. TALLON: Mr. Papageorge, we were talking a moment ago about discussions that you recollect having had with Dr. Emmet Kelly, which you believe took place when you were the plant manager at Anniston, is that right?

A: That is correct.

Q: You became plant manager at Anniston in 1965?

A: Yes.

Q: And you held that position until when?

A: The end of 1969.

Q: And that's when you moved to St. Louis?

A: Yes.

Q: I want to refer back, now, to the time when you were still superintendent in plant technical services in the plant technical services department at the John F. Queeny plant. While you held that position, did you examine written materials available in the plant medical library to understand some of the chemicals that your staff was working with?

A: On occasion, yes.

Q: At the end of 1963, Mr. Papageorge, did you become the general superintendent of warehousing, distribution and utilities at the Queeny plant?

A: Yes.

Q: And, in general, what did your responsibilities in that position include?

A: In general, I supplied the services to the units that made chemicals that included such things as electricity and steam and water. That was the utilities part. The delivery of their raw materials, receipt and delivery, and also the picking up of their produced material and shipping it, warehousing and shipping it. And, also, the trash collection service, picking up all the refuse that was created.

Q: Did the trash collection service include picking up spilled chemical materials?

A: Yes.

Q: Did your warehousing responsibilities include storage of PCB products?

A: Yes.

Q: During the period that you held the position as general superintendant, did you store any unblended Aroclors at Queeny?

A: Yes.

Q: Which, if you recall?

A: Well, Aroclor 1242. Aroclor 1248. I believe that reflects the PCB storage types.

Q: The Aroclor 1242 and 1248 that you had responsibility for warehousing, that was not manufactured at the Queeny plant, correct?

A: That is correct.

Q: Those two materials, Aroclor 1242 and 1248, were used in manufacturing processes at the Queeny plant, correct?

A: No. They were used in making blended products.

Q: And those products included the Pydraul series of products to which you referred earlier?

A: Yes.

Q: Did you have responsibility for warehousing or storing finished Pydraul products while you held the position of general superintendent?

A: Yes.

Q: The Aroclors 1242 and 1248, they were received at Queeny from either the Krummrich or the Anniston plant, is that

right?

A: That is correct.

Q: Could it have been either, or was it one of those two or both?

A: Both.

Q: Was Aroclor 1242 and 1248 made at both Krummrich and Anniston in 1963?

A: Yes.

Q: Did you receive blended PCBs for use, for example, in air compressors at the Queeny plant from Krummrich or Anniston in 1963?

A: Would you help me with blended PCBs? I'm not familiar with that expression.

Q: Well, okay. I meant to say blended Aroclors. But, more particularly, did you receive products that were composed of different mixtures of Aroclors for use at the Queeny plant from either Krummrich or Anniston?

A: The trademark Aroclor with a number designates a particular product that was produced, and that's the material that was shipped from either Anniston or Krummrich

to the Queeny plant. I don't know how else to respond to your question.

Q: While you were general superintendent at the Queeny plant, did you use -- or did the plant use PCB materials in heat transfer systems?

A: Yes.

Q: And what PCB materials were used in heat transfer systems during that period?

A: As best I recall, they used a product referred to as Therminol FR1 and Therminol FR2.

Q: And were those Therminol products manufactured at the Queeny plant or were they shipped into Queeny from another plant?

A: They were shipped into the Queeny plant from the other plants.

Q: From which other plant or plants?

A: Either Anniston or Krummrich plant.

Q: And at the Queeny plant, when you were general superintendent of warehousing, distribution and utilities, the plant used Pydrauls in certain air compressors, correct?

A: Yes.

Q: Were those Pydrauls blended at Queeny or received at Queeny from other Monsanto plants?

A: At what period of time?

Q: While you were general superintendant.

A: They were blended at the Queeny plant.

Q: The Aroclors 1242 and 1248 that you had responsibility for warehousing and receiving from other Monsanto plants, those were packaged in steel containers when they arrived at Queeny?

A: No.

Q: What were they packaged in?

A: They arrived in a tank car, railroad tank car.

Q: And how were the materials transferred from the tank car to more usable containers, if you recall?

A: It's a system of pipes and pumps and tanks.

Q: Do you recollect any spillage or leakage ever occurring in the course of

transferring those materials from the railroad car?

A: Yes, there were occasions when there would be an upset.

Q: While you were general superintendent of warehousing, distribution and utilities at the Queeny plant, did you have any responsibility for directing the cleanup of spilled Aroclors or spilled blended Aroclors?

A: Yes.

Q: Did you have a special team detailed for that purpose, or no?

A: No.

Q: When the spills occurred, was the spillage collected and placed in a steel container?

A: The spills that occurred occurred out on a crushed rock lot where the railroad spur was, so the contaminated crushed rock would be shoveled into steel drums and set off on the side until the trash service, pickup service would arrive, and it would then be eventually sent to a landfill.

Q: With respect to spillage that occurred inside the plant, were materials such as -- absorbing mediums, such as sawdust or commercial products used to collect the spillage, the PCB spillage?

A: If that occurred, that's what would be done. They would use such things as sawdust or clay, some absorbent material.

Q: Do you recall that, in fact, spills of PCB products did occur and that they were absorbed in sawdust or clay or some other commercial product?

MR. PREUSS: Inside the plant?

MR. TALLON: Yes.

A: What I would call spills, and those that I recall were generally small ones that required, really, just a rag, wipe it up with a rag and put that rag in the proper kind of drum for disposal. I don't recall any spill inside the blending facility large enough to warrant bringing in any special absorbent materials.

Q: With respect to the contaminated gravel that you referred to earlier, or in the case of the rag that you referred to

just a moment ago, is it your understanding that those waste materials would be transported to a landfill for burial?

A: Yes.

Q: And was there such a landfill at the Krummrich plant?

A: Yes.

Q: Is that where the waste materials from the Queeny plant went?

A: Yes.

Q: Do you know whether PCB materials from the Queeny plant were disposed of in this period of time in limestone pits?

A: I don't recall any reference to limestone pits for disposal.

Q: I just want to show you a document which is not dated at the time that you were general superintendent, but I simply want to ask whether it refreshes your recollection. For purposes of this deposition, we're going to mark this document as Exhibit 1080. And it's a memorandum dated February 2, 1971, and it has a number at the bottom which is 0007201 and, indeed, has been marked as Papageorge

Exhibit 63 at some other deposition.

(Deposition Exhibit Number 1080 mark'd for identification).

A: I have reviewed the document.

Q: The specific issue that I was interested in, Mr. Papageorge, was the reference in the third full paragraph to the parts per billion level in certain limestone pits, and my question to you is whether review of that paragraph or any portion of this document refreshes your recollection that PCB materials were ever disposed of in limestone pits, whether those pits were at Queeny, Anniston or elsewhere?

MR. PREUSS: Your original question was directed to Queeny during the time table he was superintendent, right?

MR. TALLON: Understood.

A: If I understand your question, this refers to the disposal of PCB wastes in limestone pits.

Q: Yes. That's correct.

A: This memorandum does not address that subject.

Q: What do you understand this memorandum to address?

A: This memorandum addresses waste water from the Anniston plant, and the amount of PCBs that are detected in that water. And the third paragraph gives those levels of 100 to 300 parts per billion level.

Q: Did waste waters -- during the period that you had any responsibility either at Anniston or in your subsequent position in St. Louis, did you have any knowledge of waste waters from the Anniston plant flowing through it or being contained in limestone pits?

A: Yes.

Q: And what information do you have with respect to the runoff or flow of waste waters into or through limestone pits?

A: The Anniston plant had deliberately designed pits in which crushed limestone was dumped. The water coming out of the PCB operation is acidic, it's too acid to release to the municipal sewerage system. It is directed through this crushed

limestone to neutralize, to take the acidity out of it, and from there it flowed into the Anniston municipal sewerage system. This limestone pit was not intended to be a PCB disposal site, it's part of the pre-treatment of the water that left the plant.

Q: Are you referring in your answer to one pit or more than one pit?

A: As I recall, there were two pits, one in use and the other being cleaned out, as required.

Q: And, to your knowledge, when did those pits come into use at the Anniston plant?

A: In the 1930's.

Q: Again, I'm now going back to the period where you served as general superintendant of warehousing, distribution and utilities at the Queeny plant. As I understand it, chemical wastes were treated differently at that time than trash, is that right?

A: Well, if we both have the same definition of trash. Trash included such

things as office waste paper baskets and so on. Yes, chemicals that were created as a result of the activities in the plant were segregated from lumber and paper and earth, and so on, that did not contain these chemicals.

Q: And the lumber and earth and other materials not containing chemicals were segregated from the chemicals which you perceived as having potential for creating some health problems?

A: Well, certainly, that was one of the considerations for segregating them.

Q: And PCBs went into the chemical waste as opposed to the trash waste, correct?

A: Any material that contained PCBs went into the chemical waste, yes.

Q: That is to say that the PCBs went into the category that you would describe as having a potential for human health problems, correct?

A: Well, the potential for human health problems is present for all the industrial chemicals that were sent to this

same landfill. It's a matter of how much and under what conditions and the like. The material that was sent to the chemical landfill was what I would describe as industrial chemicals of all kinds, just thousands of them.

Q: And those PCBs and such other industrial chemicals were in the category that you referred to a moment ago as having the potential for human health problems, right?

A: Yes. The same as many, many materials. Gasoline being one of them.

Q: Now, in 1964 you became general superintendant of manufacturing at the Krummrich plant?

A: Yes.

Q: And, in general terms, Mr. Papageorge, would you describe your responsibilities, please?

A: I was one of half a dozen or so general superintendants of manufacturing assigned a given set of products, which the operating units assigned to me would produce.

Q: And during that period you did not have responsibility for any PCB products, is that right?

A: Not the production thereof, no.

Q: Did you have any responsibility for the use of the products?

A: Yes.

Q: What responsibility was that?

A: My operating team operated compressors that had PCB fluids in them, and they operated the transfer systems that contained PCB materials.

Q: Did you have responsibility for chlorophenols in your job as general superintendant in manufacturing at the Krummrich plant?

A: I did.

Q: And for phenols?

A: Phenol, yes.

Q: Are chlorophenols and phenols chlorinated hydrocarbons?

A: The phenols themselves are not chlorinated hydrocarbons. The chorophenol is a chlorinated hydrocarbon.

Q: Is it your understanding that

polychlorinated biphenyls are chlorinated hydrocarbons?

A: Yes.

Q: Are there other compounds that are within the group of compounds or chemicals called chlorinated hydrocarbons?

A: Oh, yes. Must be hundreds of them.

Q: So, chlorinated hydrocarbons is not specific to PCBs?

A: That's correct.

Q: You also had responsibility for products such as rubber adhesives and sodium sulfate?

A: I would more correctly call that rubber additives. These are chemicals added to rubber products to give them desired properties. I also had sodium sulfate, yes.

Q: In 1965, I believe, you became the plant manager at the Anniston plant?

A: I did.

Q: And that was in Anniston, Alabama?

A: Yes.

Q: You had in that position complete responsibility for the operations of the

plant?

A: Yes.

Q: And some of the operations of the Anniston plant included production of PCBs?

A: Yes.

Q: The PCBs produced at Anniston at the time you were plant manager included all of the Aroclors?

A: I hesitate, because the word Aroclor covered PCBs as well as other products. So, the PCBs referred to as Aroclors were manufactured at Anniston, all of them were.

Q: And that would include Aroclor 1242?

A: Yes.

Q: 1248?

A: Yes.

Q: 1254?

A: Yes.

Q: 1260?

A: Yes.

Q: Were those unblended Aroclors sold to customers?

A: I have a little problem with the

word unblended. These are, to start with, mixtures.

Q: What do you mean by that?

A: Chemical mixtures. The PCB that was sold commercially was never a pure chemical as the chemist in the laboratory might describe it. In the family of PCBs there are, as I remember, 209 different types, varying from one chlorine to 10 chlorines per molecule. And the position of the chlorines varied, so by the time you calculate all the possibilities, there are 209 of them. The commercial mixtures that were made contained various amounts of these 209 different chemicals. So, you see, Aroclor in itself, in a way, was a blend to start with.

Q: I see.

A: Naturally occurring blend, as it was used, in the pot.

Q: So, in the case of Aroclor 1242, the 42 in that product referred to the fact that that product was 42 percent chlorine by weight?

A: Yes.

Q: And the Aroclor 1242 was composed of a number of different isomers, is that right?

A: Yes.

Q: And there were isomers that were higher weight than 4 chlorines on the biphenyl rings?

A: Yes.

Q: That was a part, but not a part that was a result of the manufacturing process, correct?

A: Correct.

Q: And in the Aroclor 1242 there could be more highly chlorinated biphenyls, such as having 5 chlorines attached to the biphenyl rings?

A: There were some fives, yes.

Q: And the chlorine atoms could attach to various parts of the biphenyl ring so that there were a number of different configurations for a five, or pentachlorobiphenyl?

A: That was possible, yes.

Q: The fact that the different Aroclors contained different isomers was,

in fact, desirable, was it not?

A: Yes, in a way.

Q: It was also unavoidable?

A: True.

Q: While you were plant manager at Anniston, I understand that you came to some understanding of the applications in which the Aroclor products were used, correct?

A: That is correct.

Q: And as I understand it, at that time you learned that Aroclors 1221 and 1242 were used in electrical capacitors, right?

A: Yes.

Q: And that Aroclors 1242, 1248, 1254 and 1260 were used in transformers, correct?

A: Correct.

Q: And that Aroclors 1242 and 1248 were used as hydraulic fluids, correct?

A: As an ingredient in hydraulic fluids, yes.

Q: Was a preferred use of Aroclor 1242 as an ingredient in hydraulic fluids?

A: I don't know that it was so much a preferred use. It was found to give the desired properties of the end mixture.

Q: What do you mean by the desired properties of the end mixture, Mr. Papageorge?

A: Well, this refers to fire resistance, primarily with reference to the PCB. The stability, it won't break down under use. The lubricating properties, lubricity. And it gives the proper viscosity, the weight of it, the specific gravity. These are the things that the chemist looks for when he takes a sample and looks at it to see if it meets the specifications required.

Q: While you were the plant manager at Anniston, did you come to learn that Aroclors 1242, 1248 and 1254 were used as heat transfer fluids or in heat transfer fluids?

A: Yes.

Q: And did you come to learn that all of the Aroclors that were PCBs were used in plasticizers?

A: Yes.

Q: And did you learn that NCR used an Aroclor 1242 in ink?

A: I knew NCR used 1242 in a formulation to make the coating that was applied to paper for reproduction purposes.

Q: You're referring to carbonless carbon paper?

A: Yes.

Q: Were Aroclors also used in printer's ink?

A: I understand in some instances, yes.

Q: By the way, when you -- at any time when you were working at Queeny as opposed to Anniston or Krummrich, which we have also discussed, were you aware of any manufacture at the Queeny plant of a product called OS-81?

A: Yes.

Q: And did you have any responsibility for the development -- excuse me, for the production or manufacture of OS-81?

A: No.

Q: During the time that you had any

position at the Queeny plant, did you -- were you aware of the manufacture at the Queeny plant of a product called MCS-153?

A: I was.

Q: And during the time that you were at the Queeny plant, did you have any awareness of the manufacture of a product called Turbinol 153?

A: Yes. Let me think. No. No. The term Turbinol was not in use while I was at the Queeny plant.

Q: And you're aware that the term Turbinol did come into use later?

A: Yes.

Q: While you were at the Krummrich or Anniston plants, did you have any responsibilities for the -- any responsibilities with respect to the manufacture or sale of either OS-81 or MCS-153?

A: No.

Q: Were those products that were manufactured at the Queeny plant exclusively, so far as you know?

A: Yes.

Q: And so far as you know, was Turbinol 153 also manufactured exclusively at the Queeny plant?

A: As far as I know, yes, sir.

Q: While you were at the Queeny plant, and by this question I mean to exclude knowledge that you acquired later, did you learn to whom MCS-153 was sold?

A: In what period of time?

Q: While you were at the Queeny plant.

A: Oh, no.

Q: And did you have any knowledge, while you were working at the Queeny plant, now, of the use to which MCS-153 was put by the ultimate consumer?

A: At that time, no.

Q: And if I asked you the same question with respect to OS-81, would your answer be the same?

A: It would.

Q: During the time you were plant manager at Anniston, Mr. Papageorge, you had access to the plant medical library?

A: Certainly. What there was of it.

It was not as extensive as the St. Louis library.

Q: During the period that you served as plant manager for Anniston, were you aware of guidelines issued by the American Conference of Governmental Industrial Hygienists?

A: Certainly.

Q: And were you aware of any specific discussion in those guidelines of Aroclor products?

A: Yes.

Q: And have you ever reviewed documentation related to threshold limit values -- excuse me, not ever, but while you were at Anniston, did you review documentation of threshold limit values?

A: Can you help me with documentation? I'm aware of the acceptance by the ACGIH of exposure levels that were determined from some studies made. And this is documented, as I remember, in a brochure or little pamphlet, about four pages or thereabouts, as best I remember. If you call that documentation, I would say

yes.

Q: Okay. Let me show you another document which we'll mark as Exhibit 1081, and ask you if you saw this particular document during the period that you served as plant manager at Anniston?.

(Deposition Exhibit Number 1081 mark'd for identification).

MR. TALLON: For the record, while the witness is reviewing the document, I'll note that this document was previously marked as Deposition Exhibit 640, and it is not -- it is an excerpt from another document. And I'm referring, Mr. Papageorge, to the passage which appears on the bottom of the first page and carries over to the top of the second.

A: I have reviewed the document.

Q: Do you recollect having seen that document during the period that you served as plant manager at Anniston?

A: I do not recall this format, this particular document.

Q: Do you recollect whether you saw documents that had information that is

either the same as or similar to the information described under the -- rather, in the paragraph that begins on the bottom of the first page of that exhibit and carries over to the top of the second?

A: When you say similar information, I have seen -- I had seen some of the reference documents which contained some of this information.

Q: By the reference documents, are you referring to the five studies which are listed as references on the top of page 2 of this exhibit?

MR. PREUSS: Five references. Be more accurate. Whether they're studies or not is an open question.

MR. TALLON: Five references. Right.

A: I am referring to three of the five. I only recognize references 1, 2 and 5. I don't recall references 3 and 4.

Q: Do you recollect when you saw any of references 1, 2 and 5 for the first time?

A: Sometime about 1965, shortly after

I arrived at the plant.

Q: Do you recall a particular reason or the circumstances under which you first came to see the references to which you have just referred?

A: Part of my approach to learning more about the materials at the plant. It's part of an overall self-teaching course, in a way.

Q: All right. Thank you. When you were plant manager at Anniston, did you come to understand the manufacturing process through which PCBs were manufactured?

A: Yes.

Q: And is it the case that that process starts with biphenyl? Let me put it this way --

A: You could say it starts with chlorine, too, so I don't know quite how to answer.

Q: One of the necessary ingredients in order to make PCB products is biphenyl?

A: Correct.

Q: In the manufacturing process as it

starts, what does the biphenyl look like?

A: Let me attempt it this way. Biphenyl at room temperature looks to me like white candle wax. At the manufacturing site, since the biphenyl is manufactured under hot conditions, it is not permitted, really, to solidify because it would have to be reheated again for use. So when you say what form is it in, it looks like a clear mineral oil. It's a clear liquid. And it's hot.

Q: What is the process or what was the process used while you were plant manager at Anniston to take that biphenyl and make it into a PCB?

A: It's placed in a heated tank in the presence of some iron, we throw in some iron filings or iron oxide, and then bubble chlorine gas through this mass as agitated. And, from experience, it is known that after so many hours of this chlorination step the desired type of PCB mixture is achieved. And the chlorine source is shut off. The contents of the tank then is, I want to use the word

neutralized, which means the acidity is reduced, then the contents are transferred over to a distillation unit where heat is applied and the desirable part of the batch of that material is boiled over as vapors. These vapors are cooled. They, of course, condense into a liquid and that's the liquid that is referred to as Aroclor with some number.

Q: You indicated that after so many hours the chlorine source would be shut off as the desired mixture was achieved. So, for example, in order to make Aroclor 1242 the heated biphenyl would be exposed to the chlorine gas source for longer than it would take to manufacture Aroclor 1242?

A: Generally, yes.

Q: While you were plant manager at Anniston did you become familiar with the standard manufacturing process?

A: Certainly.

Q: And why was that?

A: Well, it was expected of me to know how the chemicals that I was responsible for are manufactured. And the document

that covers this is called the standard manufacturing process.

Q: And that standard manufacturing process document includes a description of the actual mechanics of manufacture, is that correct?

A: Yes. Part of its contents, yes.

Q: As best you recall today, what other information is included within the standard manufacturing process?

A: I've forgotten all the sections in the document. I do recall a safety and handling section. I think that I recall sections on the -- that relate to the storage, transfer to drums and tank cars or trucks. That's the handling after manufacture, and labeling thereof. I'm sure there are other sections, I just can't recall them all now.

Q: Let me show you a document which we'll mark as the next exhibit in order, titled "Monsanto Company Organic Chemicals Division Standard Manufacturing Process for Aroclors, Department 246". And for purposes of identification, this is a thick

document that has a series of production numbers, starting with Tran 009192 and runs on through Tran 009324. We'll have that marked, then take a moment to have you look at it, Mr. Papageorge.

(Deposition Exhibit Number 1082 mark'd for identification).

A: I have scanned the document.

MR. TALLON: Having scanned it, can you identify it for the record?

A: This is a copy of the standard manufacturing process for the manufacture of Aroclors at the Krummrich plant of Monsanto Company, and it's dated December 17, 1962, and with it are amendments. The amendments -- there appear to be two sets, one at the front of the packet, and others at the back. On my quick reading, as best I can determine, the amendments up front are amendments to a version of this process manual dated July '64. I note that in the back of the packet there are amendments referring to versions of this process manual in the '50's and '60's. My quick review indicates that's what this material

consists of.

Q: Did you have the same or a similar standard manufacturing process manual available to you when you were plant manager at Anniston?

A: Yes.

Q: Was it the same or a similar one?

A: Similar. It was different because the equipment was different.

Q: Were the differences in terms of the chemistry of biphenyl chlorination materially different?

A: The chemistry was identical.

Q: In the manufacturing process at Anniston, at Krummrich and elsewhere, the process of manufacturing PCBs resulted in many isomers being formed, is that right?

A: Certainly.

Q: Is it your understanding, Mr. Papageorge, that having different isomers present in each Aroclor made the Aroclor product more stable?

A: I do not have such an understanding, no.

Q: Do you disagree that having many

isomers present in a PCB product makes it a stable product?

A: No.

Q: Do you see any relationship between the number of isomers in a PCB and its stability?

A: No.

Q: Did the standard manufacturing process manual that you had at Anniston have a safety and toxicity data section such as Appendix J to the exhibit you have before you?

A: Similar to, yes.

Q: I wonder if you could turn for a moment -- to the number on the bottom of the page in the lower right-hand corner may be the easiest one to use, it's page 9291.

A: I have it.

Q: The discussion of safety and toxicity data, just for sake of completeness, actually appears to begin two pages prior, 9289, but I'm particularly interested in knowing whether you recall if the material following the caption "Other hazards" at the top of page 9291 was in the

standard manufacturing process manual that you had available to you at Anniston when you were plant manager there?

A: I cannot speak for the exact words, but the thought was in that document. I don't recall exactly the form it took, and what part of the document it appeared in. If I could see --

Q: The exact one?

A: It would really help my recollection.

Q: Do you recall whether the standard manufacturing process manual that you had available to you while you were plant manager at Anniston noted that Aroclors can cause dermatitis?

A: The best I can recall, some documents did. Now, I don't recall -- I just can't remember how it appears in the standard manufacturing process document.

Q: Regardless of the passage or section of the standard manufacturing process in which safety and toxicity data was reflected in that standard manufacturing process manual available to

you at Anniston, was the information that Aroclors can cause dermatitis reflected in the standard manufacturing process available to you at Anniston?

A: Yes.

Q: Was the information that systemic poisoning from the fumes available in the standard manufacturing process manual that was available to you at Anniston?

A: I remember the reference to chloracne.

Q: Is that --

A: I don't remember the use of the word systemic in the document we're talking about, but that doesn't mean it didn't exist. Again, if I could just see the document it would certainly help.

Q: If I had it, I'd sure give it to you. Do you recall that the standard manufacturing process manual that you had available to you at Anniston noted that a hazard of Aroclors included yellow atrophy of the liver?

A: I recall a reference to liver damage. I, at the moment, don't recall the

reference yellow atrophy.

Q: To the best of your knowledge, would there be different safety and toxicity data available to the plant manager at Krummrich who was your contemporary while you were plant manager at Anniston?

A: To the best of my understanding, the health and safety data came out of Monsanto's corporate medical department.

Q: Suggesting to you that it would be the same in each case?

A: It would suggest that the basic information on which these documents were based came from the same source. It may vary depending on the author, which individual in the medical department sat down and put it on paper. So, different words might be used, but the intent was to convey the same kind of thinking.

Q: When you were plant manager at Anniston, what was meant by the reference department 246?

A: That's the designation of the PCB-producing unit at the Krummrich plant.

Q: And did you have a similar designation for the PCB manufacturing unit at Anniston?

A: We did, but at the plant we never used the number, we just referred to it as the Aroclor department. Being a smaller plant, we didn't have to resort to this kind of numbering system.

Q: This kind of numbering system meaning a department reference?

A: Similar to the department 246 for the Krummrich unit.

Q: Is it your understanding that the standard manufacturing process manual was different for each location or the same for each location where it was used?

MR. PREUSS: Are you talking about identical or the same type of information?

MR. TALLON: Same type of information.

A: It's intended to contain the same type of information, tailored to fit the physical facilities and situation at the plant.

Q: You indicated there were some

differences in the physical facilities between Anniston and Krummrich, correct?

A: There were.

Q: The safety and toxicity data would not be different, as I understand your answer, is that right?

A: Let me think a bit on that. They should be the same, since both plants made the same end products, and used the same starting materials. Yes, they should be the same.

MR. PREUSS: Just for clarification, your "same" is communicating the same information as opposed to identical words?

MR. TALLON: That's the term I used.

MR. PREUSS: Okay.

A: Information, yes.

Q: Setting aside for a moment your specific reference to the standard manufacturing process, while you were plant manager at Anniston did you come to understand that exposure to Aroclors included the hazard of systemic poisoning

from the fumes?

A: Certainly. I don't know which came first, but it was supportive of discussions of the type I had with Dr. Kelly and with Dr. Francis at the plant.

Q: Dr. Francis was your plant medical director?

A: Yes, sir.

Q: And while you were plant manager at Anniston, did you also come to understand that exposure to Aroclors could result in yellow atrophy of the liver?

A: I understood that the liver could be affected. I personally don't recall the expression yellow atrophy at that point in time.

Q: Do I take it from your answer that at a later point in time you became familiar, or at least had heard the term yellow atrophy?

A: Yes, sir.

Q: And was that after -- did you acquire that familiarity after you moved back to St. Louis in late '69 or early '70?

A: Yes.

Q: By the way, was the standard manufacturing process available to customers of Monsanto?

A: No.

Q: In fact, it was confidential and proprietary to Monsanto, correct?

A: Certainly.

Q: I had asked you a little while ago a question that I'm not sure that I ever focused on again, because we started talking about something else. And the question was whether there were customers for Aroclors as opposed to blended products such as Pydrauls, and you began to explain to me that you had trouble with the term blended Aroclors. But forgive me if you answered this and I've forgotten, but while you were plant manager at Anniston, were there customers who bought Aroclors such as Aroclor 1242 or Aroclor 1248?

A: Certainly, yes.

Q: And was that also true of Krummrich?

A: Yes.

Q: And was that true of Queeny?

A: Yes.

Q: Or were all the products produced by Queeny mixtures of different Aroclors?

A: The Queeny plant did not produce any part that was sold and labeled as Aroclor.

Q: But Krummrich and Anniston did?

A: Yes.

Q: And what's the difference between a distilled Aroclor and a crude Aroclor, as you remember it?

A: The crude Aroclor is that mass of material that results from the chlorination of biphenyl, and right at the -- when we turn off the chlorine, that's the crude material as it sits in that tank. The refined material, I think that's the word he --

Q: Distilled.

A: Distilled. Is material that is produced when this crude material is exposed to high temperature and pulled with a vacuum to capture the vapors that result from the high temperature. And as these vapors are cooled, they, of course,

condense and they collect into a receiving tank, and that's the distilled PCB mixture.

Q: In the Monsanto product nomenclature, a distilled Aroclor was identified with the prefix 12, such as Aroclor 1242, correct?

A: That is correct.

Q: And a crude Aroclor was identified with the prefix 11, such as 1142?

A: That is correct.

Q: Were there customers for crude Aroclors?

A: Yes.

Q: Do you recall which Aroclors were sold as crude Aroclors?

A: I think throughout the years they were -- there were some requests for all of them by some customers. It's a limited market.

Q: And to the best of your knowledge, to what use were those crude Aroclors put by the customers for them?

A: The best of my knowledge, they were applied to what we call plasticizer applications in which color was not a

problem, such as black asphalt tile for floors, where we didn't care if the color of the PCB was brown or tan or so on.

Q: The distilled Aroclors had greater clarity than the crude?

A: Yes.

Q: And during the period that you were plant manager of the Anniston plant, were there customers who bought all of the Aroclors that were distilled, such as Aroclor 1242 and 1248, 1254?

MR. PREUSS: Customers that bought the whole line?

MR. TALLON: No. I mean customers who bought any of those? And I'm distinguishing the Aroclors from the blended products such as a Pydraul or a Therminol.

A: Certainly, there are customers who ordered and did receive the Aroclors that were made at the Anniston plant.

Q: As opposed to products including different Aroclors?

A: That's right. When I speak of Aroclors, I'm talking about the commercial

mixture of PCBs as produced. The other products had their own trade names. The term Aroclor did not apply to those products.

Q: So, if you use the term Aroclor 1242, you would be referring to the commercial mixture that could be sold as such and was sold as such?

A: Yes.

Q: If you're talking about Therminol, you'd be talking about a specific trade name product?

A: Yes.

Q: When you were plant manager at Anniston, Mr. Papageorge, had you any understanding of the stability of PCBs, the characteristics which made the product stable?

A: I did.

Q: And what was your understanding?

A: My understanding is that these materials were very highly stable. In fact, that they were the most stable chemicals of that type known.

Q: Was that an understanding that you

acquired after you became plant manager at Anniston?

A: Yes.

Q: Specifically referring to the period when you were plant manager at Anniston as opposed to later, did you have an understanding as to whether or not PCBs would degrade in the environment?

A: Well, my understanding was that they -- being so stable, they would not degrade.

Q: When you were plant manager at Anniston, Mr. Papageorge, do you recollect having entertained customers from Westinghouse who undertook a plant visit?

A: I recall at least one such visit, yes, sir.

Q: Was Westinghouse a customer for Aroclors or PCB products that were manufactured at Anniston?

A: Yes.

Q: And what did Westinghouse buy at that time?

A: They bought a fluid for use in their electrical equipment which was

designated by their trade name Inerteen, and I've forgotten the numbers and letters that go with that. And the ingredient that the -- the PCB ingredient in that material was Aroclor 1242.

Q: Did Westinghouse purchase any other product from Monsanto at the time you served as plant manager at Anniston?

A: Yes. They purchased several mixtures which contained PCBs. And all of them were prepared to Westinghouse specifications and used the Westinghouse trade name, Inerteen. Again, I've forgotten the letter and number designations that accompany that, and I've personally forgotten the exact recipes that apply to each of these.

Q: To the best of your recollection, without specific reference to the exact recipes, what other Aroclors were mixed in the products produced for Westinghouse?

A: As best I remember, there were some with Aroclor 1248 and some with Aroclor 1254.

Q: By the way, I just said in that

question, or suggested in that question that Monsanto manufactured the product for Westinghouse. Is that accurate? Did Monsanto blend Inerteen for Westinghouse?

A: Yes.

Q: And then that product was sold by Westinghouse with its trade name and label, presumably?

A: I don't know that I would designate Westinghouse's activity as selling the product. They sold a device which contained that product, and, in turn, they were involved in a service type of business where that product would be shipped to their customer's plant to service the unit that had been purchased from them. I don't know that that was the common understanding of selling a product to the marketplace.

Q: I think that's fair. Were the Inerteen line of products patented, so far as you know?

A: I do not -- I don't know.

Q: Do you have a recollection of having discussed with any representatives of Westinghouse issues of toxicology that

Westinghouse had encountered with their workers?

MR. PREUSS: At any point in time?

MR. TALLON: While he was plant manager at Anniston.

A: Can you help me with issues of toxicology?

Q: For example, do you recall ever having discussed with representatives of Westinghouse during the period that you were plant manager at Anniston dermatitis issues that arose with respect to their workers?

A: Yes.

Q: And do you recall that such discussions occurred in or about 1967?

A: That's about the time it happened, yes.

Q: And under what circumstances do you recall that such discussions took place?

A: I recall that representatives of Westinghouse visited the Anniston plant, and we had meetings with these Westinghouse individuals, and several Monsanto employees, and the principal topic of

discussion was the safe handling of PCBs in the workplace.

Q: By the way, did you participate in those discussions?

A: Yes, sir.

Q: Westinghouse was a customer of your plant, correct?

A: Yes.

Q: Who besides yourself do you recollect having been present on behalf of Monsanto?

A: Oh --

Q: Dr. Kelly?

A: No.

Q: Anyone from the medical department in St. Louis?

A: Not in St. Louis, no. This was a plant activity. The plant physician was able to spend sometime with us and, of course, the plant individual who was concerned with industrial hygiene was there, and the supervisor of the operating unit who had hands-on knowledge of how they coached their operators and what equipment was available, and shared all that with the

Westinghouse people.

Q: Did the Westinghouse people who were present describe specific problems that they were encountering with their workers, as you best recall?

A: As best I recall, they said on occasion some of their workers had red skin spots. And I recall that they attributed that to the fact that the workers weren't wearing the proper -- wearing their gloves.

Q: And did the Monsanto representatives furnish information to the Westinghouse representatives on how best to deal with this situation?

A: Certainly. We were able -- I recall a table on which we had displayed different kinds of gloves, and I do also recall a jar of skin ointment that was shown to them. We told them that this is what we do, it may or may not fit your needs.

Q: Was Westinghouse one of the principal customers for the Anniston plant during the period you were plant manager?

A: Yes, sir.

Q: Let me show you a document, Mr. Papageorge, which we'll ask the court reporter to mark as the next exhibit in order. It's a one page document with production number Tran 005541.

(Deposition Exhibit Number 1083 mark'd for identification).

MR. TALLON: Would you take a moment and review that, please.

A: I've read it.

Q: Does that memorandum refer to the Westinghouse visit or meeting to which you have referred in your testimony?

A: It does.

Q: The memorandum which is from Mr. Benignus to Gerald Miller at Anniston is dated September 21, 1967. Do you, by the way, have a recollection of having received this memorandum?

A: I do.

Q: The memorandum specifically refers to the best methods -- this is now in the third paragraph -- the best methods for handling Aroclor 1242 to avoid problems of

dermatitis and toxicology. Do you see that?

A: I do.

Q: The red skin spots to which you have referred in your testimony, is that the dermatitis which is referred to in this memo?

A: That's what I believe it to refer to, yes.

Q: To your knowledge, were there other issues related to toxicology raised by the Westinghouse representatives or discussed with them?

A: No. Nothing else was mentioned.

Q: Was there any discussion of systemic complications arising from exposure to Aroclors?

A: Well, the discussion included the possibility if the material was abused, that Monsanto was in a position to be able to tell them we had never seen it, and the Westinghouse people also chimed in and said they hadn't seen anything like that, either.

Q: What are you referring to as the

results of abusing the materials?

A: Well, it's the word I use to describe improper handling, the ignoring of what I have referred to earlier as the early warning symptoms. Just improper procedures that -- really, I guess, in a way, the lack of common sense, almost, where a person abuses his own body by exposure after exposure. That's the kind of thing that I was led to believe would result in liver damage. But having never seen it indicated to us we were doing what we concluded to be the right thing.

Q: When you used the term improper handling, what handling, or improper handling methods were you thinking of?

A: The kinds of things we caution our people about. Don't keep breathing fumes if you notice that they're irritating you. When you are working around this hot tank of material and you open the lid, don't poke your face right into it. And when the valve handle is oily, put your gloves on, or if you do get some on your hands, eventually, when things are under control,

go over and wash your hands. The kind of thing one does, I guess, even at home when you clean the paint brush with paint remover, you get the brush cleaned up, put it away, then you go wash your hands. We used to use the expression common sense a lot, which the operators understood. And keep in mind, the operators there are not supervised around the clock, they're on their own at night, on weekends, so we had to rely on their common sense.

Q: When you referred to improper procedures, were you referring to the kinds of improper handling that you just mentioned or were you referring to anything else in addition to the kinds of improper handling you just mentioned?

A: Oh, by improper handling I meant ignoring the presence on your skin time and time again, ignoring the fact that your skin is red. That means you're doing something wrong, correct your behavior. I mentioned this breathing problem before, if it's irritating you, that's telling you something, either get away, button up the

system or if you have to, put on a respirator and go in there and correct the problem. That's the kinds of things I have in mind when we talk about proper handling, respect for the material.

Q: While you were plant manager at Anniston, were there occasions where PCBs spilled, either in the plant or immediately outside the plant?

A: On occasion, yes.

Q: And on the occasions where such spills occurred, were spills washed with water?

A: Not when I was there. We practiced the absorption treatment with sand, which we found to be quite effective. Sand or even soil, dirt. It was easily found and readily available. And we picked up the free flowing material in that fashion. For very small spills, if I can call it that, rags were useful. That's about it, really. We didn't have any major catastrophe where a full tank would dump out there on the grounds.

Q: Did you also use sawdust or

absorbent clays?

A: Yes. When we had sawdust on hand, we'd do that. And clays, yes. Clay is on hand because it was part of the treatment. Clay was used in the process to clean up the PCBs. It was handy it was used. We left it up to the fellows to use whatever was handy and absorb the material.

Q: Did you or anyone working for you advise against using water to clean up PCB spills?

A: It wasn't so much advice against as it was one of water and PCBs just don't mix, and you're just not going to accomplish much, you're going to spread that spill over the whole pavement rather than get rid of it.

Q: PCBs have limited solubility in water?

A: Very much so, yes.

Q: And as I understand it, Aroclor 1242, for example, has a solubility limit of 200 parts per billion in water?

A: In water at room temperature, yes, sir.

Q: Do higher weighted Aroclors have less or more solubility than 1242?

A: The higher the weight, the less the solubility.

Q: And if PCBs and water are mixed past the point of solubility, do the PCBs sink to the bottom of the water?

A: They do.

Q: While you were plant manager at Anniston, Anniston used a landfill for disposal of chemical wastes, including PCBs?

A: They did.

Q: And chemical wastes, including PCBs, were placed in barrels or other containers in a trench and then the trench was backfilled?

A: Yes.

Q: Did you know of any methodology for an analysis for the presence of dissolved PCBs in water while you were plant manager at Anniston?

A: There was none.

Q: By the time you went to St. Louis in 1970, was there a method?

A: Yes.

Q: And by 1970 you could analyze for the presence of dissolved PCBs in water in the tens of parts per million?

A: Yes.

Q: Were any Aroclors sewered, s-e-w-e-r-e-d, at production plant outfalls while you were plant manager at Anniston?

A: On occasion, the limestone pits which overflowed into the sewer system would carry some of the limestone sediment which contained PCBs, and that did get into the sewer system.

Q: Before you moved from Alabama to St. Louis -- by the way, when did you move from Alabama to St. Louis? Was that in '69 or in '70?

A: Well, I reported in St. Louis just after the first of the year 1970, and I wore two hats for a while. Finally settled into St. Louis about the middle of -- or end of January.

Q: While you were plant manager at Anniston, that is to say, before you left Alabama for St. Louis, did you undertake to

prevent sewerage of any PCBs that were getting into the sewer system from overflow of the limestone pits?

A: Well, yes. Before 1970 we recognized that the pits were an upset at times creating this situation. Although the city sewerage handling system collected all of this in their sediments, and that was landfilled, so we felt that that was acceptable, but we still didn't want the accidental release into the system, so we had those limestone pits enlarged for more capacity, and we increased the frequency at which they were, in essence, cleaned out. We'd go in there with bulldozers and scrape up the contaminated limestone and sediment and bury it in the landfill and put in fresh rock.

Q: Do you happen to recall, by any chance, the size of the limestone pits either before enlargement or after?

A: No, I don't. I remember only that they were about doubled in size. I don't recall the dimensions any more.

Q: Were the limestone pits earthen

pits filled with limestone or were they lined with some material?

A: They were lined with a -- what was defined as an impervious clay, so you'd get very little, if any, penetration downward.

Q: Do you recall being asked to take waste samples of plant outfalls to check for PCB presence in 1969?

A: There was some -- 1969? Yes, there was some requests coming out of the St. Louis laboratory for water samples, which was part of the analytical chemistry development to see if the methodology that was developed could apply to the real world situation. And they asked for samples of water, yes.

Q: Let me show you a document which is a two page memorandum, dated January 23, 1969, bearing production numbers Tran 086143 and 144.

(Deposition Exhibit Number 1084 mark'd for identification).

A: I have reviewed the document.

MR. TALLON: Can you identify the document for the record, Mr. Papageorge?

A: Yes. This is a Monsanto memorandum authored by Paul Hodges, who was the environmental manager in the general offices of Monsanto, addressed to the environmental representatives at Anniston and Krummrich plant, suggesting that water samples be taken of waste waters from each plant and preserved for future analysis by new methods being developed in Monsanto's research department.

Q: Do you know if samples, water samples were collected at Anniston?

A: Yes, they were.

Q: And were they sent on to St. Louis?

A: Eventually, yes.

Q: Did you personally take any action as a consequence of this memorandum, or did you direct that any action be taken?

A: Oh, I don't know that I -- I confirmed that the recipients were aware of this need and I checked with the individual whose responsibility I felt it came under, and he assured me that everything was in order.

Q: There is a reference in the

paragraph numbered 3, which is on the second page of this memorandum, and it states "Anniston is drumming and hauling their similar spent Aroclor to a dump". Do you see that?

A: Yes.

Q: Is that an accurate statement?

A: Yes. This is to that landfill that I referred to earlier.

Q: And where was the landfill?

A: On the Anniston property, within the gate.

Q: Did you know, by the way, Mr. Papageorge, what Mr. Hodges referred to in the first sentence of this memorandum when he referred to the attention now being focused on the presence of Aroclors in natural waters?

A: Yes. This was referring to reports that Monsanto was receiving from several laboratories that claimed they saw something that resembled PCBs in their samples.

Q: Did you have any understanding at the time as to what detection methodology

those laboratories were using?

A: At that time did I have it?

Q: Yes.

A: No.

Q: Before you moved to St. Louis in early 1970, did you have any understanding of what methodology was used to detect the presence of PCBs in water or any kind of scientific sample?

A: When you added that last part it changed the question. The presence in water involved new technology of which I was not aware at the time. The presence of PCBs in other kinds of samples, as you say, there was technology for determining, say, PCBs, the amount of PCBs in paint or the amount of PCBs in an adhesive. This means amounts that are, say, in the percent level, big quantities. So, there is two different kinds of analyses that apply here.

Q: What was the technology that was not new that was used to detect PCBs in paint, for example?

A: The most basic one was one of

converting all the chlorine that's in the sample to a soluble chlorine. It's old time chemistry, really. And determining by the chlorine presence and some arithmetic how much of that could relate to a PCB.

Q: Did this process have a name that you can think of today?

A: I don't know that it had any special name. Just analyzing for chlorine content.

Q: And what is the new technology to which you referred?

A: The new technology involved the use of gas liquid chromatography verified by mass spectrometry. These are sophisticated instruments that were developed at about the late '60's, I would suggest, or made available generally in the late '60's, and are able to detect material such as the PCBs down to the parts per billion, parts per trillion range. And they were also able to identify the type of PCB.

Q: Gas chromatography was available to the scientific community before the late '60's, correct?

A: There were instruments that were available, but I have an understanding that depending on what point in time you're looking at the capability of that instrument to detect smaller and smaller quantities of some of these chemicals improved with time, so the instrument that was called a GLC unit in the '50's was much different than the one available in the '60's.

Q: The gas liquid chromatography unit was refined over time, as you understand it?

A: Yes.

Q: But a gas liquid chromatography machine was available starting in the '50's, so far as you know?

A: There were devices like that available. I have a personal understanding they are were not universally used tools. They were specialized tools, and not many of them were available.

Q: Monsanto had gas chromatography equipment available to it before the late '60's, correct?

A: Yes.

Q: And more than available to it, Monsanto had, or owned gas chromatography equipment before the late '60's, right?

A: I understand that they had in their research function, not at the plant level. It did not become a daily tool for normal production.

Q: Right. And do you know when, approximately, or precisely, Monsanto acquired the gas chromatography equipment for the first time?

A: No, I don't.

Q: Would you say that it was in the '60's?

A: Certainly the '60's, yes. I don't know early or middle. '60's, yes, they had something. But the unit used specifically for PCB studies was not acquired, as I understand it, until about 1967, or thereabouts.

Q: You're referring to a machine or machines that linked the gas liquid chromatography with mass spectrometry?

A: Certainly that link was made. But

I am certain the individual pieces were also of the latest model, and they were paired off to support each other.

Q: And that was Scott Tucker's specialty?

A: Yes. Amongst others, yes.

Q: When you used the term -- actually, what I think you said was the new technology was gas liquid chromatography verified by mass spectrometry. What did you mean by the term verified?

A: The mass spec unit has the capability of looking at a sample and by the response and -- I'm not an instrument designer, so I can't really explain how it works. But the response of this instrument to the sample gives an idea of how large the molecule is as represented by the peaks and valleys of the GLC chart. By the size of the molecule one can then determine the type of chemical that the instrument is seeing or detecting. With that information, one can determine the difference between the different types of PCBs, for example, or the difference

between a PCB and a DDT.

Q: Was this linked system sometimes referred to as GC mass?

A: Yes. That's the -- yes, the short term for it.

Q: By 1970 were you aware of any laboratories world-wide using GC mass technology to test for the presence of PCBs?

MR. PREUSS: Up to 1970?

MR. TALLON: I certainly meant to say in 1970. I may have said up to. By 1970.

A: By 1970 I was aware of a few laboratories that had this capability.

Q: Did those laboratories include laboratories in which Doctors Jensen and Widmark worked in Sweden?

A: Yes.

Q: And did those laboratories include the laboratory that Dr. Risebrough worked in in California?

A: Dr. Risebrough had a GLC unit, but at that time I don't think he had mass spec. I could be wrong on that, but I'm

left with that impression.

Q: In 1970 was Dr. Risebrough, in your view, capable of identifying PCBs through GLC testing?

MR. PREUSS: Objection, no foundation.

A: I think, in my opinion, Dr. Risebrough was capable of detecting PCBs in his samples at low levels. However, there might have been a percentage of error involved at that time that's higher than what exists today.

Q: The percentage of error in 1970 was higher than the percentage of error in 1992?

A: Yes, I believe that. This is not to say that he was off on the wrong path, but there were times when he was, himself, skeptical of what his instrument was telling him.

Q: Were you at all involved, Mr. Papageorge, in the development of the testing methodology employed by Monsanto for PCB detection?

A: No.

Q: Do you know whether the testing methodology developed by Monsanto was based on the work done by Doctors Jensen and Widmark?

A: That's my understanding.

(Recess).

MR. TALLON: Mr. Papageorge, do you believe that by late 1968 a competent scientist should have been able to distinguish between PCBs and DDT?

A: You're asking for my belief at this moment?

Q: Yes.

A: No, I don't believe that that was a realistic expectation.

Q: Now, in the fall of 1969 you were advised that -- or asked to assume the position of manager, environmental control, as of January 1, 1970?

A: More correctly, I was asked to take on this assignment in December.

Q: In December 1969?

A: '69, correct.

Q: Was it a request or a direction?

A: In the business world, it's hard to

distinguish.

Q: Good point. And you were asked to assume this position by Mr. Stratmeyer, correct?

A: That is correct.

Q: He was your immediate supervisor?

A: At the time, yes.

Q: Where was he located at the time?

A: St. Louis.

Q: What was his title, as best you recall today?

A: Director of manufacturing for the operating unit that made PCBs, among other chemicals.

Q: Did the other plant supervisors report to Mr. Stratmeyer as well, Krummrich and Queeny?

A: Yes.

Q: Did Mr. Stratmeyer tell you when he first raised the issue with you in December 1969 why you particularly were being invited to take on this position?

A: Well, it was suggested that since I managed the plant where the product was made, I certainly had some information that

related to these materials that others didn't have, such as how they're made and what they are and how do we ship them, and who some of the customers were, and he just -- in his thinking, he believed that, I guess, in a way I could bring something to the party, if I can use that expression. It's my understanding there were others that were interviewed for this assignment, I was not the only person considered.

Q: Do you have a present understanding of who or what body selected you personally to assume this position?

A: As I understood it, it was a joint decision by Mr. Bergen and Mr. Springgate.

Q: Mr. Springgate was in charge of plasticizer products at that time?

A: That is correct.

Q: And Mr. Bergen was in charge of other functional fluids?

A: Yes.

Q: And they were both in St. Louis?

A: Yes.

Q: Did you ever acquire any understanding as to why Mr. Bergen -- why

Messrs. Bergen and Springgate had selected you for this position?

A: No.

Q: Before you talked to Mr. Stratmeyer with respect to his invitation to you to take on this position, had you ever talked with him about the issue of whether there was an issue related to PCB products and environmental or health hazards?

A: Yes.

Q: Do you recall talking to him in early 1969 regarding some questions involving the line of PCB products?

A: Yes.

Q: And what do you recall today he and you having discussed on that subject in early 1969?

A: It was really more near mid 1969, as best I recall. And Mr. Stratmeyer, during his monthly visit to the plant, mentioned to me that he was informed that there seemed to be an environmental problem with the presence of PCBs, and he himself didn't know much more than that, that he would keep me informed as he gained more

information.

Q: Did Mr. Stratmeyer elaborate any more than you have already described as to the nature of the environmental problem?

A: I don't recall any specifics. It's just a matter of PCBs being found in the environment in environmental samples. That was the extent of his knowledge, or his understanding.

Q: When you spoke with Mr. Stratmeyer in December 1969 about taking on the position of manager, environmental control, were you in your office in Anniston, Alabama or did you go to St. Louis for purposes of meeting with Mr. Stratmeyer?

A: I was in St. Louis in December on a personal -- holiday visit, really, Christmas week, and so on, and I took advantage of the opportunity to arrange for the interview with Mr. -- Messrs. Bergen and Springgate in December. And before I returned to Anniston near the end of the month, Mr. Stratmeyer reached me and informed me that the decision had been made to offer me the assignment, would I accept

it, if so, when can I start. I told him okay, if somebody thinks I can help you, I'll take it, and I can start whenever somebody relieves me of the plant responsibilities.

Q: Before you traveled to St. Louis for your Christmas holidays you were aware that this position had been created and that there was a search on to find someone to fill it?

A: Yes. Mr. Stratmeyer informed me in late November, is the best I recall, November of '69.

Q: When Mr. Stratmeyer and you -- was the discussion that you had with Mr. Stratmeyer in November '69 the first time that you learned that such a position had been created?

A: Yes.

Q: At the time that Mr. Stratmeyer and you spoke in late November 1969, what did Mr. Stratmeyer tell you about the position or about anything related to it?

A: Of course, I don't remember the exact words.

Q: Naturally.

A: But, in essence, what he informed me of is that these materials were being found in the environment, they appear to be found in fish and some wild birds, that there are many laboratories are gaining the expertise, we're getting a lot of inquiries, we have two business groups involved, and we'd like to have somebody coordinate all this activity so we're headed in the right direction and definitely that the left hand knows what the right is doing kind of situation. Would you be interested? In essence, that was the information he gave me.

Q: And you expressed interest?

A: My remark, as I said earlier, was if somebody thinks I can help, I'll give it a try.

Q: Between the time of that conversation with Mr. Stratmeyer and the time when you met with Messrs. Bergen and Springgate in St. Louis in December, did you have any contact with anyone else in respect of the new position of manager,

environmental control?

A: No.

Q: So, the next time that you discussed this with anyone was with Messrs. Bergen and Springgate in St. Louis?

A: In December, yes.

Q: Did you meet with them separately?

A: Yes.

Q: And when you met with Mr. Bergen, did he discuss the responsibilities that he envisioned your taking on if you assumed the position as manager, environmental control?

A: Yes. He attempted to describe it as best he could, considering the fast moving situation that it was. I got the impression, really, that this was all so new that they weren't sure themselves exactly what I would be involved with. But the main responsibility was really one of improving communications, dissemination of information, both within Monsanto and outside of Monsanto.

Q: Did Mr. Bergen advise you at that time of the existence of something called

the ad hoc committee?

A: He didn't refer to it by that name. He said we've got a few of our people working on this trying to help us out, but they need some kind of guidance, and they're all so busy with other things they're doing they really feel pressed for time to give it the right kind of attention. He did mention the existence of a group. I was aware of it, yes.

Q: The group to which Mr. Bergen referred you later came to understanding was the ad hoc committee or an ad ad hoc committee?

A: Well the group was a little bit bigger than that. The ad hoc committee represented a few key individuals from the bigger group. The bigger group, really, was Monsanto individuals in the two business groups that were directly related to the PCB products, a manufacturing guy, a marketing guy a research guy.

Q: Did you later come to know who was on the ad hoc committee?

A: Certainly.

Q: Who?

A: Elmer Wheeler.

Q: From the medical department?

A: Medical department. Bill Richard and Martin Farrar, who represented the two research functions of the two business groups. And Paul Hodges, who was the manager of environment for the operating unit.

Q: Dr. Richard was from the research group associated with the functional fluids business?

A: Yes.

Q: I take it from your description of this new job that it was deemed important to put someone in charge of, among other things, communication on a full-time basis rather than having people try to do that work in addition to their other work?

A: That was the principal intent, yes.

Q: Did Mr. Bergen describe what he personally hoped that you might be able to do if you filled the position, in addition to improving communication?

A: Yes. His hope was that -- it was

really multi-faceted. One was, is there any harm with the presence of PCBs in the environment. If so, what do we do about it? What other laboratories throughout the world are working on this and what information can we get from them? Let's try to establish which of the PCBs are being found. There was much confusion at the time. Let's communicate what we know with our customers. Let's push the toxicity studies. By pushing, I meant to speed up as much as you can. Although with studies already in place, you have to wait for the time to elapse to give you the right information. Keep improving the analytical method, that was another point that he wanted done. Because even in 1970 there was still some skepticism relating to analytical results and reproduceability, the same sample would give different answers depending on who looked at it and what instrument he used and what procedures were used. I believe that covers the main features here at that point in time.

Q: Did either Mr. Bergen or Mr.

Springgate indicate to you that there was a precipitating event or series of events which had led to the creation of this new position?

A: Precipitating event? I don't recall any single event as precipitating all this interest. It was a series of reports. Dr. Risebrough's results and Dr. Pecal up at Cornell University, I recall that. There was some activity in Georgia regarding the presence in milk. The Great Lakes were being studied. That would suggest that it was not any one incident, but the sum total of all this scattered information coming in with many question marks that had to be answered.

Q: Was the creation of this new position a directive of the corporate management committee, so far as you know?

A: I would describe it as a recommendation from the business groups to corporate management, and corporate management approved that recommendation.

Q: And by the use of the term corporate management, are you referring

specifically to the corporate management committee or another group or groups?

A: To the group of president and his vice-presidents at that time called the corporate management committee.

Q: And is it your understanding that the recommendation was made by the business groups through the ad hoc committee or through some other method?

A: The ad hoc committee pulled together a lot of information and presented that to Mr. Springgate, Mr. Bergen and their bosses. And after some discussion the program was developed that was later presented to this corporate management committee in early November, as best I recall.

Q: Let me show you a document which we'll ask the court reporter to mark as the next exhibit in order. It's a two page document which doesn't have a production number, but has been marked as an exhibit in earlier depositions. In fact, it appears to be Papageorge Exhibit 6. And we'll ask you to take a look at that as

soon as the court reporter marks it.

(Deposition Exhibit Number 1085 mark'd for identification).

A: I've reviewed the document.

MR. TALLON: Can you identify that document for the record, please, Mr. Papageorge?

A: This is a copy of a Monsanto, I'm going to call it a job description proposed for the job which I eventually was assigned.

Q: Do you know the source from which this document emanated, that is to say, who drafted it or what group drafted it?

A: I do not know.

Q: Does this document describe your duties or the duties which you took on starting in January of 1970?

A: It describes some of them.

Q: In other words, in addition to the seven broad categories which are reflected on this document, you, in the course of your job performance, took on other duties as well?

A: No. What I meant by my answer is

that, for example, duty number one, I was not given overall responsibility of the total management of the situation. That was retained by Springgate and Bergen. They're the ones that hire and fire and assign, and that, to me, is total management. Number two, I was able to participate in. Parts of number three. For example, I did not have budget supervisory authority, but I had -- I did participate in objective setting and priorities and promoting programs. Numbers four, five, six and seven, I was able to participate in.

Q: Just to touch back on something you said a moment ago, you said that you did not assume overall responsibility for the total management of the Aroclor pollution problem. Did you assume overall responsibility for the management of the Aroclor pollution problem, reporting to Messrs. Bergen and Springgate?

A: They retained the responsibility. I was just a resource person to help them fulfill that responsibility.

Q: You reported to Bergen and Springgate?

A: Just Mr. Bergen.

Q: Who was in charge of the -- was he functional fluids business director?

A: Yes.

Q: Did you have dotted line responsibility to the plasticizer business director, Mr. Springgate?

A: I believe I did. Although we bowed out of that business so quickly that it didn't amount to much.

Q: The position title on this document is Aroclor toxicity project manager. Is that the title you were given?

A: No.

Q: Have you ever seen a different version of this same document with a different title on it?

A: No, I have not. And I note that this document, many of the blanks are not filled, which indicates it was not formalized.

Q: Have you ever seen a version of this position description with those blanks

filled in?

A: No.

Q: Have you ever seen any other written job description which is, I take it, what this basically is? Have you ever seen any other written job description for you?

A: For me?

Q: In this position.

A: No.

Q: When you mentioned a moment ago that you did not supervise budgeting, did you have input on budgeting?

A: Certainly.

Q: And to be more precise, when I use the term input, I mean, did you participate in drafting budgets for the functional fluids group as it pertained to your area of responsibility?

A: Yes.

Q: Now, you held the position that you assumed -- did you assume your new position on January 1st?

A: That's the --

Q: That was the effective date?

A: That's the effective date, yes.

Q: You held that position through --

A: Through February of -- well, I was involved with the PCB issue through February of 1976.

Q: And did you change positions in February 1976?

A: Through the period '71 through '76 I was changing positions, but the responsibility for the PCB environmental issue I retained. In 1976, which was another of a series of Monsanto organization changes, I was given an entirely different set of products to monitor and work with. In 1976 PCBs was not part of that operating unit, and PCBs at that time were transferred to another person.

Q: Who was that?

A: Carl Weber.

Q: From the time that you -- from the time of February 1976 through the time that you retired, did you have any other responsibilities in respect of PCBs?

A: Yes. I had two types.

Q: Which two?

A: Starting in 1977, as best I recall, I was appointed as a director of environmental operations for one of Monsanto's operating units. That job involved a lot of activity as it relates to environmental pollution. PCBs, being one of the chemicals of concern, would certainly come under that. So, the plants assigned to me had to make certain that they were following the PCB practices that were in place at the time. So, that was the type of involvement I had. Part of that assignment also involved the industrial hygiene function, so, again, PCBs, as it relates to employees, came under that umbrella, specific to certain plants within Monsanto. In about 1982 the individual who was then assigned to the PCB environmental issue was assigned to report to me, so I was one step removed then from the PCB issue, but I was involved in that fashion.

Q: Just one other question while you have that document before you, Mr.

Papageorge. Other than as you have specifically indicated on the record, does this position description describe your job starting in January 1, 1970?

MR. PREUSS: Until '76?

MR. TALLON: Yes.

A: When you added 1976, as it relates to PCBs, the items that I described earlier as applying did apply. Through the years, starting in about 1973, I was assigned other Monsanto products, but retained the PCB responsibility. Some of the activities described in this document apply to other chemicals as well. But I did not have a document that specifically related to the total assignment, which was changing.

Q: So far as PCBs were concerned, this document reflected your responsibilities from January 1, 1970 through February 1976?

A: Correct.

Q: When you met with Mr. Bergen at the end of 1969 did you and Mr. Bergen discuss the reports emanating from Doctors Jensen and Widmark in Sweden?

A: Oh, yes.

Q: Had you any awareness of those reports before you spoke with Mr. Bergen about them?

A: No.

Q: And to the best of your recollection, what do you recall Mr. Bergen having said with respect to those reports?

A: He mentioned that the initial reports came out of Sweden, and he mentioned Dr. Jensen's work and Dr. Widmark, and he described some of the samples that he recalled being analyzed. And he mentioned the fact that the higher chlorinated types of PCBs were reported. He also mentioned that there was still some questions regarding the true identity of the material. And he also mentioned that Monsanto people had been in contact with Doctors Widmark and Jensen, that Monsanto had received copies of the procedures used by that laboratory, and that Monsanto's laboratory in St. Louis had taken those procedures and worked with them and modified them and had confirmed that, in truth, these were PCBs, and they appeared

to be the higher chlorinated types. And there was still some question in his mind of why just these higher chlorinated ones, since we sold quite a bit of the lower chlorinated, what accounted for that situation in which the lower chlorinated materials were not being detected. He indicated to me that the medical department was active to answer the question of okay, now that they're out there, what harm, if any, are they doing. That's, in essence, what he talked about.

Q: In that same conversation with Mr. Bergen, did Mr. Bergen make any reference to Dr. Risebrough's work in California?

A: I don't know if it was Mr. Bergen or Mr. Wheeler. One of the two brought it to my attention. I do know Mr. Wheeler did, but I don't recall Mr. Bergen mentioning that specifically. He mentioned they're being found in lots of places.

Q: Did you have a conversation with Mr. Wheeler in late 1969?

A: No.

Q: Your conversations with Mr. Wheeler

commenced after you took up your position on January 1, 1970?

A: Yes.

Q: Did you and Mr. Bergen have any discussion of incidents in the North Sea involving potential PCB contamination of birds or fish?

A: Not with --

MR. PREUSS: The time frame, again?

MR. TALLON: End of '69.

MR. PREUSS: The same conversation?

MR. TALLON: Yes.

A: I can't recall vividly that he mentioned the North Sea. But that -- again, I don't know if it was Mr. Bergen or Mr. Wheeler mentioning the North Sea incident, but I was made aware of it early on.

Q: Did Mr. Bergen tell you that he had collected files with respect to the issues that had been raised with respect to PCBs?

A: No, I don't recall any discussion about his files.

Q: Do you recall Mr. Bergen having told you about an Aroclor toxicity file?

A: Not at that meeting. Later on I found out that was his file designation for the subject.

Q: Later on, when?

A: Oh, the second or third week of January or so. We were sharing secretaries, so I was --

Q: By the way, do you recollect the name of Mr. Bergen's secretary in early 1970?

A: Yes.

Q: What was her name or his name?

A: Her name. Myra Stanley.

Q: Did you and Mr. Bergen in that initial December 1969 meeting discuss work being done at the University of Utrecht in the Neatherlands?

A: I don't associate Mr. Bergen with that topic, no.

Q: Is that something you believe you have may have discussed with Mr. Wheeler?

A: I'm certain that I did, yes.

Q: In your meeting with Mr. Bergen in

December 1969, did he mention to you something called the Yusho incident?

A: Again, I don't associate Mr. Bergen with that discussion.

Q: Is that a discussion you associate with Mr. Wheeler?

A: Yes.

Q: And Mr. Springgate, by any chance?

A: No.

Q: And is it your recollection that the Yusho incident was reported in the summer of 1969?

A: Yes, summer of '69. The incident occurred in '68. Yes.

Q: And is it your understanding that when first reported it was believed that rice oil had been contaminated with PCBs?

A: Yes.

Q: And that that contamination caused illness among the populace of Yusho, Japan?

A: That was the allegation, yes.

Q: Do you recollect whether in your discussion with Mr. Bergen at the end of 1969 you and he discussed a spill incident at Monsanto's Pensacola, Florida plant?

A: I recall a discussion of the incident, but, again, it's not clear in my mind if Mr. Bergen discussed in detail that type of subject. I just don't recall that.

Q: You indicated that when you were in St. Louis for the Christmas holidays over -- at the end of 1969 you also met with Mr. Springgate, is that right?

A: That's right.

Q: Was your meeting with Mr. Bergen longer than your meeting with Mr. Springgate?

A: Oh, yes.

Q: Mr. Springgate did not touch on all of the same topics as Mr. Bergen had?

A: No. No.

MR. TALLON: Why don't we take our luncheon break.

(Recess).

MR. TALLON: Mr. Papageorge, I want to touch back on a very few points that we had been discussing immediately before lunch in connection with your discussion with Mr. Bergen that occurred in December of 1969. I had asked you whether you

recalled if in that initial discussion Mr. Bergen had said to you anything about the work of Dr. Risebrough in California, and I think you had indicated on the record that you didn't have a clear recollection of his having done so. I just wanted to show you a passage from a deposition you gave in the Outboard Marine case in 1981, over 11 years ago, which focused on the same topic, and ask you if reviewing that transcript refreshed your recollection in any respect. And the particular portion which I'll ask you to read is the question that appears on the bottom of page 180 and the answer that you give on the top of page 181. But go ahead and read so much of this as you like in order to give yourself some context for the answer.

A: I've reviewed it.

Q: Does reviewing the answer you gave at the top of page 181 at that deposition refresh your recollection as to whether or not you and Mr. Bergen discussed Dr. Risebrough's work in the conversation you had with him at the end of 1969?

A: It does. It does refresh my recollection, yes.

Q: Having read that passage, do you now, in fact, recall having discussed with Mr. Bergen in late 1969 the work of Dr. Risebrough?

A: Yes.

Q: Similarly, Mr. Papageorge, I had asked you whether you recollected having discussed with Mr. Bergen what has sometimes come to be known as the Yusho incident, and you indicated you didn't have a specific recollection of that. I wonder if you might for a moment review the testimony you gave on page 184 of that deposition and, again, I will ask you whether your review of that refreshes any recollection you have of, indeed, having discussed the Yusho incident with Mr. Bergen at the end of 1969.

A: I've reviewed page 184.

Q: Does having read that page refresh your recollection as to whether or not you discussed the Yusho incident with Mr. Bergen at the end of 1969?

A: Yes, it does.

Q: And you do now recall having had such a discussion with Mr. Bergen at the end of 1969?

A: I do.

Q: Regardless of whether or not your understanding arose out of that initial meeting with Mr. Bergen, what do you recall having occurred with respect to the Yusho incident?

MR. PREUSS: At what point in time?

MR. TALLON: Well, right now. What was the Yusho incident about?

A: As I understand it, there was a unit in Japan that refined rise bran oil for use as a cooking oil. The system used a heat transfer system in which a Japanese made PCB mixture was involved. During one of their operations in 1968 it appears that some of this PCB material in the heating coils and spaces of the processing unit leaked into the oil itself. The oil containing the PCBs was distributed fairly widely in that prefecture in Japan. There

were many illnesses reported. As I remember, the exposure, the number of people exposed was in the thousands. I don't remember the exact number. I do recall some symptoms that were described as occurring in terms of nausea, loss of appetite, headaches, watery eyes, matter forming in the eyes, children, newborn children with dark colored skin. Those are some of the symptoms or ailments that were reported. The initial assumption was that it must be the PCBs in the oil that created these health problems. In December of '71 I was invited and attended a meeting in North Carolina at a retreat center called Quail's Roost. This meeting was called by the director of the National Institutes of Environmental Health, Dr. David Rawl. Also invited to that meeting, among many other people interested in PCBs, were representatives from Japan who were to discuss the Yusho incident. Their report at the time struck me as, frankly, confusing in terms of what their conclusions were regarding what contaminant

in the oil created the health problems. I was informed by a member of the Food and Drug Administration that the administration was also puzzled and intended to send a representative to Japan to look into the matter personally. In the meantime, I contacted Monsanto's representative in Japan to attempt to get as much information as he could. Unfortunately, after so many months of delay I did receive a package of paperback booklets, all in Japanese, which I, frankly, was frustrated, I couldn't get them translated. Nevertheless, finally, after many years of discussion here, in 1975 at a meeting sponsored by the Environmental Protection Agency in Chicago, this was November '75, there was what I believe to be a sort of a final report on the Yusho incident. And the conclusion I was left with was that the oil was contaminated with a high concentration of chlorinated dibenzofurans. I recall a summary made, and calculations made which indicated this concentration was measured in the thousands of parts per million,

highly concentrated. I recall a wrap-up discussion, headed by Dr. Voss from the University of Utrecht, and the discussion concluded that the health symptoms were related to the chlorinated dibenzofurans, not to the PCBs. That had been documented. And I last read this in a publication that covered the proceedings of that meeting. I hope that answers your question.

Q: Did you learn at any point between 1970 and '75, or thereafter, what had caused the leakage of the heating material into the cooking oil?

A: I did not.

Q: Was it your understanding that there was some sort of break or rupture in the heat transfer system?

A: Yes. Some failure in the system permitting the two liquids to mix.

Q: Until the report in 1975 to which you have just referred, was it your concern that the toxicity characteristics of the Yusho incident were attributable to PCBs?

A: Concern implies that I was in a position to have all the facts with some

hard data and final conclusions. I had more questions. Really, I would call them questions rather than concerns.

Q: Was one of your questions whether the toxicity characteristics of the Yusho incident were attributable to PCBs?

A: More correctly, after talking with our medical department representatives, my questions really became one of could some of these symptoms be due to PCBs and other symptoms be due to something else. That's the kind of gray area I found myself in.

Q: So, did you have a question as to whether some of the symptoms evidenced as a result of the Yusho incident were attributable to PCBs?

A: That question was in my mind, having no other facts, right.

Q: When you assumed your position as of January 1, 1970, was Monsanto the sole producer of polychlorinated biphenyls in the United States?

A: To my knowledge, yes.

Q: To your knowledge, was the production and the sale of PCBs a

profitable business for Monsanto when you took on your position as of January 1, 1970?

A: It was profitable, yes.

Q: After you took on your position as of January 1, 1970, I take it that you had a number of meetings with Elmer Wheeler?

A: Oh, yes.

Q: And that was for the purpose of your learning or increasing your knowledge with respect to the issues that had been raised with respect to PCBs as well as knowledge about PCBs in general, correct?

A: Correct.

Q: Did you have the opportunity to review whatever files Elmer Wheeler had had available at that time?

A: Yes.

Q: Did you review files from Mr. Bergen?

A: Some.

Q: Did you review his Aroclor toxicity file?

A: Yes.

Q: Did you review files from other

sources?

A: Dr. Keller's operation. Some of Dr. Richard's. And some from manufacturing, Mr. Kuhn.

Q: Did you read any of the materials that had been prepared by the ad hoc committee?

A: Certainly. Mr. Wheeler gave me those.

Q: Did you eventually become chairman of the ad hoc committee?

A: Sort of. Although we never used the title. I'm a person that called the meetings and tried to direct them.

Q: Did the ad hoc committee ever come to be known by any other name than ad hoc?

A: No, not that I know of. The term ad hoc only lasted for a few months, until they prepared a report recommending certain actions.

Q: I'm sorry, were you finished?

A: After that, the people met, but they did not refer to themselves as ad hoc anything.

Q: Was one of the recommendations of

the report to which you have just referred the creation of the job which you ultimately took on on January 1, 1970?

A: I'm trying to recall the contents of that report. And I honestly don't remember if that was the ad hoc committee's opinion or whether Mr. Springgate and Mr. Bergen and their lieutenants, working off this ad hoc document, included the appointment of a manager as part of their recommendations. I don't know where it started.

Q: Did Mr. Wheeler tell you in early 1970 that research conducted before that beginning of 1970 had determined that the liver was a target organ for PCBs?

A: Before 1970 and PCBs? I believe he did.

Q: Did Mr. Wheeler tell you that studies had determined that chickens developed reproduction problems from exposure to Aroclor 1242?

MR. PREUSS: What point in time?

MR. TALLON: This is the same time period.

MR. PREUSS: Late '69?

MR. TALLON: Early '70.

A: Early '70? The timing doesn't strike me as being quite right. In early '70 the chicken exposure studies were on their way. I don't recall when the hatchability problem was detected. I just don't remember the dates.

Q: Did you and Mr. Wheeler discuss an incident involving PCB contamination of seals in the North Sea?

A: Yes.

Q: And do you recall that as part of that discussion Mr. Wheeler told you that the seals were determined to have PCBs in their fatty tissues?

A: Yes.

Q: Do you recall what he told you in that regard?

MR. PREUSS: Other than that?

MR. TALLON: Right.

A: That's about the gist of it. They did find the presence of PCBs. He also mentioned that the animals appeared to be emaciated. That's all I recall of that

incident then.

Q: When you took on your position as of January 1, 1970, did Monsanto have studies under way at Industrial Biotest?

A: Yes.

Q: Are those the chicken studies to which you just referred?

A: That's one of the studies.

Q: Were there also studies being conducted on dogs and rats?

A: Yes.

Q: Did you ultimately come to learn the results of those studies?

A: Yes.

Q: And was one of the results of the IBT studies the finding that chickens developed reproductive problems from exposure to Aroclor 1242?

A: Yes.

Q: What reproductive problems were determined to result?

A: As I remember, there was a reference to the hatchability of the eggs and some egg shell thing.

Q: Do you recall that the studies

concluded that the reproductive problems developed from exposure to Aroclor 1242 in quantities as low as three parts per million?

A: I do.

Q: Do you know if similar conclusions were reached by Dr. Risebrough?

MR. PREUSS: On what? Hatchability of chickens at three parts per million?

MR. TALLON: Do you know if -- well, I'm using the term similar.

MR. PREUSS: Okay. Then I think we need -- I'd like an explanation.

MR. TALLON: Okay. Are you familiar with the work done by Dr. Risebrough?

A: Some of it.

Q: Mr. Wheeler gave you a copy of Dr. Risebrough's report in Nature magazine, is that right?

A: That's right.

Q: And did you review that after you took on your position as of January 1, 1970?

A: I did.

Q: And what do you recall of that work by Dr. Risebrough?

A: Dr. Risebrough reported the detection of DDT and PCBs in pelican eggs, as I remember, the brown pelican off southern California, and the observation that in many of the nests, the eggs had no shells or in others the shell was so thin that it broke when the mother bird would try to nest. I also recall that it was Dr. Risebrough's suspicion that PCBs might be the cause of this abnormality.

Q: Did you see any relationship between the results of the studies performed by IBT and Dr. Risebrough's work?

A: At what point in time, again? Dr. Risebrough's work was --

Q: Prior.

A: Pretty early. Along comes the chicken work.

Q: Right. So, of necessity, after you found out about the IBT chicken test results, did you draw any conclusions as to the relationship between the IBT studies and Dr. Risebrough's work, if any?

A: I did draw conclusions. But they were also influenced by a report that came out of the Patuxent, Maryland Wildlife Sanctuary Laboratory. As I remember, they were working with Japanese quail, some kind of quail. I recall talking to the researchers there, Dr. Stickel, husband and wife team. Nevertheless, the final conclusion, and published by that laboratory, is that the wild birds did not seem to be affected by PCBs, but were affected by DDT in terms of their reproduction capabilities. So, I concluded then that our chicken turned out to be a poor example of wildlife, so our tests really didn't tell us much about affect on wildlife.

Q: When was the -- or when were the results of the Patuxent study available to you?

A: Sometime in 1970. I don't remember the exact dates.

Q: After you learned of the results of the Patuxent study, did the -- did you doubt the validity of the IBT work?

A: No. I had no reason to. The work to me appeared quite valid.

Q: Did Elmer Wheeler give you articles from his files relating to DDT?

A: Oh, yes, quite a few.

Q: And did he explain to you the reason why he was furnishing you the articles with respect to DDT in connection with your work on PCBs?

A: The reason he did that is because many of the reports available to him up to that point in time included DDT along with PCBs in their evaluations of results noted, and the like. This starts even with Dr. Jensen's work in Sweden. So the fact that DDT kept appearing, well, just Elmer Wheeler started collecting DDT literature and had quite a bit of it by the time I showed up.

Q: Did you learn, by the way, when Monsanto first heard of the theories or results of work being done in Sweden by Jensen and Widmark?

A: I believe it was either late '66 or early '67.

Q: Did you ever see internal Monsanto correspondence which related to the initial reports from Sweden?

A: I recall some documents, yes.

Q: Do you recall seeing memoranda being transmitted to St. Louis by Mr. Wood, who was then based in London?

A: Yes. He's one of the correspondents. Yes.

(Discussion off the record).

MR. TALLON: Mr. Papageorge, I'm going to hand you a couple of exhibits marked at an earlier deposition bearing Exhibit numbers 663, 664, 665, 666 and 667 and ask you to just take a moment and look at those. Because this is the only copy of these documents available at this moment in history, I'm going to give them to your counsel for a second for his review.

MR. PREUSS: You want him to look at them?

MR. TALLON: Yes.

(Discussion off the record).

MR. PREUSS: Would you like him to read all of them?

MR. TALLON: The question will be whether Mr. Papageorge reviewed any of these documents after he assumed his position as of January 1, 1970?.

MR. PREUSS: Looks like the last one --

MR. TALLON: Is short a page?

MR. PREUSS: Yes.

MR. TALLON: Well, with the proviso that the last of those exhibits may be missing a page, Mr. Papageorge, my question for you is whether you recall having reviewed any of those documents which were marked as exhibits in a previous deposition after you took on your position as of January 1, 1970?

A: I did.

Q: Can you state as you sit here today which of those documents you reviewed after assuming your position?

A: All of them.

Q: Did you get those documents from Elmer Wheeler?

A: I did.

Q: Was there a separate file which you

were handed or which was delivered to you relating to the work of Doctors Jensen and Widmark?

A: Not a separate file. All the documents that Mr. Wheeler had that related to the issue were put in a three ring notebook for me, which I took for reading purposes.

Q: Did there come a time when you accepted as valid the results of the work performed in Sweden by Jensen and Widmark?

A: Did I personally accept?

Q: Yes.

A: By the time I got on board, there was enough information available to lead me to believe that what these researchers had reported was believable.

Q: In fact, by the time that you took on your position as of January 1, 1970, there was general acceptance within Monsanto of the validity of the work performed by Jensen and Widmark, correct?

MR. PREUSS: I'm going to object to the form of the question as to what you mean by general acceptance.

MR. TALLON: I mean that it was generally accepted.

MR. PREUSS: Vague, ambiguous.

MR. TALLON: Okay.

A: It was believed within the Monsanto technical community, those that know about such matters, that the researchers in Sweden had, indeed, detected materials that analyzed as polychlorinated biphenyls. There was still some skepticism about the actual identities. They were calling them, as I remember, the 1254 types. There was some question about that. And there was also some question regarding the quantification. Yes, we believe it's there, but when they report the amount, we just don't know how accurate that number is. That was the only uneasiness, let me call it, that existed as of 1970, or up to 1970.

Q: When you referred to skepticism as to the type of PCBs, are you referring to the fact that Jensen and Widmark seemed to be identifying PCBs that looked like the more highly chlorinated PCBs?

A: Yes.

Q: And you knew when you took on your position that the majority of the PCBs sold by Monsanto either as Aroclors or in mixtures were the more lower chlorinated PCBs by weight?

A: Of the total amount, yes.

Q: You eventually traveled to Sweden to meet with Jensen and/or Widmark, correct?

A: I met with Professor Widmark.

Q: And you were accompanied by Dr. Keller and Elmer Wheeler?

A: That is correct.

Q: The purpose for that trip was what?

A: We were seeking an up-to-date report on any additional findings they may have made, any further thoughts regarding their early work and any plans they may have regarding further work.

Q: Did you learn any additional information with respect to any of those three topics?

A: No.

Q: On that same trip you visited with

other manufacturers of PCBs?

A: Yes.

Q: And the purpose for the visit with those manufacturers?

A: It was twofold, as I recall. One is to share with them Monsanto's understanding of the environmental PCB issue, and information that we had, information that we generated, and, also, to get from the other producers some idea of what they were doing and what they thought and what plans they may have had regarding further studies or curtailment of production and the like.

Q: Did that trip take place in May 1970?

A: Yes. April, May.

Q: And did you also visit with researchers at the University of Utrecht in the Netherlands?

A: Yes.

Q: At that time they were conducting studies with respect to the effect of PCBs on poultry?

A: Yes.

Q: After you took on your position as of January 1, 1970, did you contact any government agencies that were looking at the effect of PCBs in the environment or on fauna?

A: Well, certainly, we contacted after 1970 -- shall we include the full six years or --

Q: No. Not yet. Well, let me ask you some more specific questions. After you took on your position as of January 1, 1970, did you communicate with any government officials in Georgia?

A: Yes. That had to do with milk.

Q: And when, to the best of your recollection, did those communications take place?

A: Early 1970.

Q: Was it your understanding that in Georgia PCBs had been found in cow milk?

A: Yes.

Q: And was it ever determined what the source of the PCBs in the cow milk was?

A: Yes.

Q: Was it determined that the silage

eaten by the cows had been stored in silos painted in the interior with PCB-containing paints?

A: Certainly, there was a situation where silo coatings were involved, yes. There was another situation in which cattle grazing under power lines were contaminated.

Q: From what?

A: Well, it seems that there were some PCBs mixed with motor oil, used motor oil and the like, and that oil was used as a diluent for weed killer which was sprayed under the power lines to keep the lanes open. The cattle were permitted to graze in that area and ingested the PCBs, plus whatever was in the used motor oil. And it showed up in their milk in Georgia.

Q: Meaning that the PCBs had accumulated in the cow's milk production system?

A: Well, certainly, it was part of their milk producing system, yes.

Q: Did you have any communications after you took on your position with the

Department of the Interior? I'm referring, now, basically, to 1970 rather than later.

A: Department of Interior. Yes, we had -- I believe that Patuxent, Maryland laboratory is part of the Department of Interior. Then there is a laboratory in Columbia, Missouri that concerns themselves with aquatic systems. So, we were in contact with both of those laboratories.

Q: And did you, after taking on your position as of January 1, 1970, communicate with Dr. Risebrough?

A: Yes.

Q: How soon after you took on your position did you do so?

A: It was only a matter of months. As I recall, at the latest June of 1970.

Q: And what was the purpose for your communication with Dr. Risebrough?

A: Well, the intent was to meet with Dr. Risebrough and his mentor, I guess I could call him, Professor Alcott, to do, in essence, what we tried with Jensen and Widmark, what further work have you done, what further results have you obtained,

what further work do you plan to do. And at the same time share with him what we knew. It was a two way conversation, Really, that was the intent of that contact.

Q: As part of the learning process for your new position, did you speak with Dr. Kelly?

A: Oh, yes.

Q: Was Dr. Kelly associated with the group that we referred to or, I referred to as the ad hoc committee?

A: No. But Elmer Wheeler, his Lieutenant, represented that function.

Q: Represented the function of the medical department?

A: Yes.

Q: Do you recollect having had a communication with Dr. Kelly in which he reminded you of the discussions you had had while you were plant manager of Anniston regarding chloracne?

A: Yes.

Q: And do you recall that Dr. Kelly reminded you that prolonged exposure could

lead to liver damage?

A: Yes.

Q: And death, if the liver was damaged severely enough?

A: Where it couldn't recover, yes.

Q: I take it that that was not new information to you at the time, but a reaffirmation of what was known to you?

A: That is correct.

Q: I take it that as part of your learning process you also spoke with Dr. Richard?

A: Yes.

Q: Did Richard, Dr. Richard express a concern to you that PCBs would, like DDT, eventually be banned?

A: Dr. Richard did express that thought, yes.

Q: And do you know when he expressed that thought to you for the first time?

A: January or February 1970. Very early on.

Q: Was Dr. Richard assigned to monitor scientific literature that may be developed in the field relating to PCBs?

A: Certainly, as director of research, that was one of his responsibilities, sure.

Q: Did you and Dr. Richard establish regular communications as part of your new job function?

A: Certainly.

(Recess).

MR. TALLON: Did you share Dr. Richard's concern about the prospect that PCBs could be banned?

A: Well, the thought did occur to me. I don't know how to evaluate my depth of concern compared to his. I had a belief, really, that I didn't have enough information to arrive at a hard conclusion that a ban is imminent. So, in my mind at that time I was thinking a partial ban or control -- regulated continued use is the thought that ran through my mind, as distinguished from Dr. Richard's strong belief there will be a total absolute ban.

Q: In fact, it was one of the conclusions or recommendations of the ad hoc committee that PCB sales could continue in controlled applications, is that right?

A: Yes, sir.

Q: Did you at some time, Mr. Papageorge, undertake to make a determination as to what kinds of applications could be controlled?

A: Oh, yes. That was a continual study, really. It never finished.

Q: Did you have access to information from salesmen as to the kinds of applications in which PCB mixtures as well as Aroclors were being used by Monsanto customers?

A: The salesmen were the principal source of this kind of information, yes, sir.

Q: Did there come a time when you, in conjunction with others, began to describe applications for the use of PCB products as either open or closed?

A: Yes.

Q: In order to make a determination as to whether or not an application was a closed application or an open application, was it necessary for you to acquire information about the application?

A: Certainly.

Q: In the course of your analysis with -- or analysis of applications in which Aroclors or PCB mixtures were being used, did you discuss with Dr. Richard the subject of leakage from hydraulic systems?

A: Certainly, yes.

Q: And did you also discuss the subject of leakage from hydraulic systems with Elmer Wheeler?

A: Yes.

Q: And others?

A: Yes.

Q: It is the case that hydraulic systems do leak, correct?

A: Ones not maintained, yes.

Q: And there are occasions when hydraulic systems leak simply as a result of parts failure?

A: Yes, sir. And this is particularly true of the very high pressure systems. Yes.

Q: Were you aware of an incident or a series of incidents at Monsanto's Pensacola, Florida plant involving leakage

from lubricant from an air compressor?

A: Yes.

Q: And to the best of your recollection, when did you learn of that incident or series of incidents?

A: When I talked with Mr. Wheeler in January of 1970.

Q: And to the best of your recollection, what understanding did you acquire of what had occurred in Pensacola?

A: There was a remotely located air compressor, by remotely I mean it was away from the general high traffic area of the plant, which was supplied with a PCB-containing hydraulic fluid out of a storage tank through a piping system into the compressor and back. As I understood it, the piping system developed a leak, not a big one, but a leak. The material in that pipe leaked out of that failure and found its way into the estuary there. And as I recall, there was something like three or five gallons a day, some such number comes to mind, and because of its remoteness it was not observed immediately

until the level in the storage tank was observed as being extremely low, and that's when the leak was pinpointed and the discovery made that the material had gotten into the bay. As I recall, this was reported to the Florida authorities and the cleanup effort was made. And, of course, the leak was repaired.

Q: Did you acquire an understanding as to the amount of time that lapsed between the initial leak and the discovery?

A: It seems to me a matter of days, up to a week.

Q: Did you ever acquire an understanding with respect to whether the leak was under high pressure or, instead, sort of dripping out?

A: It was not -- it was a little bit more than a drip, but not high pressure. It was a pinpoint stream.

Q: When you refer to leaking into an estuary, do you mean that the lubricant entered some kind of sewerage system and went into --

A: No. What I meant was the natural

surface drainage system that exists into the estuary, which becomes, really, part of Escambia Bay. I think it's Escambia River at that point, but it widens out into the bay.

Q: Do you know what the fluid used in that particular air compressor was?

A: I think it was Pydraul AC.

Q: Do you know what, if anything, occurred in the estuary as a result of the leakage, whether there was any fish kill or effect on other fauna?

A: Not in the estuary. Nothing observed.

Q: What about elsewhere downstream?

A: Nothing observed as a result.

Q: And approximately when did this Pensacola incident occur, to the best of your recollection?

A: '69. '68, '69, somewhere in there. I believe it was 1969.

Q: I show you a document which we'll mark as the next exhibit in order, Mr. Papageorge, and I'm going to ask you, after I show it to you, if you can just take a

moment and page through it, or take such time as you want, but I'm going to ask you some specific questions about some of the content of it.

(Deposition Exhibit Number 1086 mark'd for identification).

A: I've reviewed the exhibit.

Q: Mr. Papageorge, have you seen that particular document, report of Aroclor ad hoc committee, dated October 2, 1969 before?

A: I have seen copies of it, yes.

Q: Have you seen this particular copy, that is to say, one with the same handwritten notations that appear some places in it?

A: I don't recall seeing this particular copy, no.

Q: After you assumed your position as of January 1, 1970, did you learn that one of the objectives of the ad hoc committee had been to protect the continued sales and profits of Aroclors?

A: That had been the ad hoc committee's recommendation, yes.

Q: And did you also become aware that one of the objectives of the ad hoc committee had been to project -- pardon me, protect the image of the organic division and the corporation as members of the business community?

A: Yes, sir.

Q: By the way, did you ever have the opportunity to discuss the analysis and objectives reflected in this particular report with anyone who had been a member of that committee?

A: No.

Q: Did you ever learn -- I'm referring, as I go through this, Mr. Papageorge, to various passages in the report, and if it's helpful to you, I'm now referring to the passages under the caption "Probability of success" which begins on page 2 of the report. And I'm wondering, among other things, if you ever learned that it was the belief of the ad hoc committee that there was no practical course of action to effectively police the use of PCB products to prevent completely

environmental contamination?

A: I was aware of that line of thought. And since I did not see this particular document until years later, I was not aware that the ad hoc committee had addressed it.

Q: Had addressed it in writing?

A: That's right.

Q: Had you ever heard from any member of the ad hoc committee their personal view, or their view, personal or not, that the persistence of Aroclors or PCB mixtures in the environment was high?

A: I would better describe it was higher than expected, I guess would be a better understanding. It was thought that somehow the environment would cope with it and result in no detectible amounts. At least no analytical methods then could detect it. So, in a way, with the information and technology available, I'm talking now in the '60's and earlier, that kind of talk did take place.

Q: What kind of talk?

A: The persistence in the environment

as high as --

Q: That's what I said, yes.

A: With the knowledge -- again, I'm talking early on, before the analytical methods were able to find the low levels that were detected. The understanding of the chemistry of the PCBs by sophisticated scientists was such that these materials are so refractory, by that I mean they are so stable that they're not going to, first of all, be detected out there. They're like pebbles on the beach, you'd have to hit that pebble to find it. And by its sheer presence and unreactiveness, nothing is going to happen. And this is the very property that gives it the fire resistance that everyone was thankful for. It's this resistance to any kind of change or deterioration which is the same property that makes it fire-resistant, even high temperatures don't seem to bother it. I lost my line of thought on that.

Q: I think I may have, also. Could you just read the question and the answer back?.

(The requested portion of the record read by the reporter).

MR. TALLON: In that last answer, Mr. Papageorge, you referred to early on, and what time period are you thinking of when you use the term early on?

A: '60's back.

Q: Did you ever learn, Mr. Papageorge, that it was the hope of the functional fluids business group to be able to continue to use the lower chlorinated biphenyls in applications amenable to control to attempt to control losses to the environment?

A: Yes, that was one of their objectives.

Q: Did you understand that to be one of their objectives at the time you took on your position in January of 1970?

A: Yes.

Q: By the time you took on your position in January of 1970, did you have an understanding as to whether the PCBs being identified in the environment from various sources were likely to have

occurred as a result of naturally occurring phenomena, that is to say, in nature?

A: There was considerable discussion regarding this. I personally didn't feel I had enough information to help me arrive at such a conclusion. And I base that on the line of reasoning that says for nature to form PCBs with the fingerprint of the man-made material is highly unlikely. So, whenever I heard of detection of PCBs that had the fingerprint, the peaks and valleys of the chromatograph similar to the industrial material, I personally felt it was man-made.

Q: Among people that you had business contact with in the functional fluids group, was it the general consensus that the likelihood of natural origin of the PCBs being found in the environment was low?

A: I don't recall any industrial representative addressing that subject with me. Because very few of the customers had the tools and resources to make these kinds of studies, and they just did not bring up

that type of subject with me.

Q: Internally, with respect to the people with whom you dealt at Monsanto in the functional fluids business group or the plasticizer group, was it the consensus of the Monsanto businessmen and chemists or others in the functional fluids and plasticizer group that the likelihood of natural origin of the PCBs being found in the environment was low or remote?

A: Yes.

Q: Was it also the consensus of that same group that the likelihood of degradation was low or remote?

A: The consensus was that the likelihood of degradation would vary considerably depending on the type of PCB, the circumstances in which this PCB would find itself, if you will, the absence or presence of micro-creatures that might feed on it, the presence or absence of ultraviolet light, as an example, the temperatures involved. All of these factors contribute to the degradation of the material, and it would vary from case

to case.

Q: Was it generally viewed when you took on your position that the more highly chlorinated Aroclors and compounds would degrade either slowly or not at all?

A: Yes.

Q: Do you know, Mr. Papageorge, if at the time you took on your position in January of 1970 the ad hoc committee had recognized that functional fluid uses could lead to losses of Aroclors into the environment?

A: Yes. You have to put the proviso in there, uses that were in systems that weren't properly operated, properly maintained. That thought did occur. So the emphasis then became one of better control of the operations.

Q: Whose emphasis became one of better control?

A: Monsanto's communication emphasis to its customers was one of don't let it get away from you.

Q: Did you ever deal directly with Texas Eastern Transmission Corporation?

A: No.

Q: Did you ever deal directly with Transwestern Pipeline Company?

A: No.

Q: Do you know if anyone working for Monsanto ever dealt with Texas Eastern Transmission Company with respect to the kinds of controls you testified to a moment ago?

A: Yes, sir.

Q: You do know the answer to that?

A: Yes, sir.

Q: What is the answer?

A: I relied on Mr. Norm Johnson as my source of information regarding this small piece of business. And by small, I'm talking about numbers of customers involved. And it was his team's responsibility to communicate in both directions, to the customer and back to me and to Mr. Bergen, whatever transpired in terms of information forwarded and actions taken.

Q: You mentioned in your answer a small number of customers. Are you

referring specifically to a small number of customers for products sold under the trade names MCS-153 or Turbinol 153?

A: Yes.

Q: And which customers do you have in mind?

A: I, frankly, don't know, other than Texas Eastern as a listed customer. I remember a second one he -- I thought I remembered it started with a C. There couldn't have been more than half a dozen customers. That compares to thousands for other product lines, so --

Q: Does the name Columbia Gulf Transmission Company have any significance to you?

A: That's the C I was trying to recall.

Q: And what about the name Transwestern Pipeline Company?

A: I don't recall personally ever seeing Transwestern in any of the documents that crossed my desk. I just don't recall it.

Q: Do you have a sense today, or did

you have a sense during the period that you had this responsibility between 1970 and 1976 of the total volume of sales to this group of customers as compared to the other customers for Aroclors or PCB mixtures?

A: The only sense I have is that it was -- compared to the millions of pounds, this was a modest amount. Actually, relatively small, really.

Q: Compared to the millions of pounds sold, actually, it was fractional, wouldn't you say?

A: Oh, yes.

Q: When you took on your position at the beginning of 1970, Mr. Papageorge, did you have any discussions with Elmer Wheeler or others concerning the discovery of PCBs in commercially available electric dishwashing compounds?

A: Yes, that did come up.

Q: And what is it that you recall today about that subject?

A: I recall the customer informing us that PCBs were found in his product, and I also recall the lack of any information

that would lead us to find the source of the PCB in that product. And that's where it sort of stood in early 1970. It was still a big question mark.

Q: In early 1970 it was still a big question mark?

A: Yes, sir.

Q: Ultimately, was the source of PCBs in the electric dishwashing detergent determined?

A: Yes, sir.

Q: What was the source?

A: As I recall, it was the carton, the boxes, which were made from recycled paper.

Q: And did you ever acquire any understanding as to the process through which the PCBs found their way into the recycled paper?

A: We didn't have a specific source, we had what we considered to be three potential sources. One is the carbonless copy paper that was salvaged and recycled. The other was some printing inks contained PCBs, and that could have been a source. And a third was some adhesives contained

PCBs and some recycled packaging with adhesives still on them could have been involved.

Q: At what point in time did you identify these three potential sources for the presence of the PCBs and the recycled paper?

A: As best I recall, it had to be 1970. And it was related to cereal boxes.

Q: How do you mean, related to cereal boxes?

A: As I recall, there was PCBs found in Shredded Wheat. It was traced to the boxes. And in those days the Shredded Wheat, the biscuits were just dropped in the box before they put them in the envelopes, as they now do. And the boxes were determined to be made from recycled paper. And that's when it first hit us that the ordinary cardboard we see was -- could be a source of PCB. And then we went back to the dishwasher detergent incident and connected those two thoughts.

Q: And it was in 1970 that you or others working with you reached this

conclusion with respect to the cardboard boxes for Shredded Wheat?

A: Sometime in there, yes.

Q: The Aroclor used to develop carbonless copy paper, or the manufacture of it was Aroclor 1242?

A: Yes.

Q: Do you know what Aroclor or Aroclor mixtures were used for certain paper adhesives?

A: Well, it could be any of the -- any of them, 42, 48, 54 or 60.

Q: Were you ever able to determine which Aroclors were present in the cardboard boxes of either the Shredded Wheat or the dishwashing detergent?

A: We did on the Shredded Wheat, as I remember. That was 1242. I don't recall any analysis of the detergent box.

Q: Let me show you another document which bears production numbers Tran 016442 through and including Tran 016448. And after we ask the court reporter to mark it as the next exhibit, I'll ask you just to take a moment and page through it, please.

(Deposition Exhibit Number 1087 mark'd for identification).

A: I've reviewed the document.

MR. TALLON: Are you able to identify this document, Mr. Papageorge, as work produced by the ad hoc committee?

A: No, I cannot do that.

Q: Do you know if this document -- I'm sorry, I thought you were finished. Were you finished?

A: Yes.

Q: Do you know if this document formed part of the materials considered by the corporate management committee in their meeting which resulted in the creation of the position you assumed in January 1970?

A: I have no way to identify this document and tie it in to specific activities that did take place. I note, also, that it appears that it's not a complete document, because on the last page there is a -- the last sentence refers to a following section. So, I have a hard time identifying this particular document with any specific activity.

Q: Have you seen this before?

A: I have seen it before in matters like this.

Q: In other depositions?

A: In other depositions. But I still don't know where it originated and where it was used.

Q: And from that answer I would take it that you do not know who the author or authors of this particular document may be?

A: That is true.

Q: In 1970 did you, yourself, conclude that the presence of PCBs in undesirable locations was a fact?

A: I have a bit of a problem with undesirable locations. Undesirable in terms of presence of the material or the location is undesirable for other reasons?

Q: Undesirable as a result of the presence of the material.

A: There is evidence to support that, yes. I believe that.

Q: All right. After you assumed your position in January of 1970, were any studies with respect to the presence of

PCBs being undertaken at Monsanto's Ruabon facility?

A: I associate the Ruabon facility with some early studies regarding biodegradation of PCBs. Ruabon, also, was the site of a Monsanto research laboratory. And they undertook some studies in the United Kingdom that resembled the kinds of studies that the St. Louis laboratory was doing in the United States, that is, obtaining samples of the environment and analyzing it using Monsanto procedures.

Q: When you refer in your answer of a moment ago to early studies regarding biodegradation that were conducted at Ruabon, what studies were you referring to in terms of time?

A: Time?

Q: What time period? In other words, what do you mean by early?

A: I would suggest that this was the period '69, '70.

Q: Are you familiar with the term bioaccumulation?

A: I am.

Q: Is that a term that you were aware of before you took on your position in January of 1970?

A: I was not.

Q: Did you become aware of or familiar with that term after you took on that position?

A: I did.

Q: How long afterwards would you say?

A: Within six months.

Q: And at that time what did you understand the meaning of the term bioaccumulation to be?

A: It's the increase in presence of PCB in a living creature that continues to be exposed to PCB, either through ingestion or through the environment, the water it swims in and so on.

Q: And after you took on your position in 1970, were you given information as to how bioaccumulation occurs in the food chain?

A: I have a suspicion we're confusing bioaccumulation with biomagnification.

Q: I wasn't, but as long as you've raised the term, what do you mean by biomagnification?

A: To me that means that in the food chain, from the littlest single cell creature that is devoured by the biggest creature on up to the eagle, each step of the food chain accumulates PCBs in it, and as you go up the food chain you get a magnification of this quantity to the point where the creature at the top of the food chain has PCB in its tissue, or its system that is magnified many, many times over what it started out to be down at the single cell amoeba, for example.

Q: And eagles, for example, accumulate PCBs as a result of eating fish that are themselves contaminated with PCBs?

A: Yes. Because they ate some lower life creature that had PCBs. Each step downward had less in it.

(Recess).

MR. TALLON: Earlier, Mr. Papageorge, I had asked you about the Yushow incident, and I just wanted to

follow up that with one document and ask you if you've seen this particular document before. We'll ask the court reporter to mark it.

(Deposition Exhibit Number 1088 mark'd for identification).

A: I've read the document.

MR. TALLON: Have you seen that before?

A: Yes, I have.

Q: Did you communicate at all with Mr. Sido with respect to the information reflected in this memorandum?

A: I personally?

Q: Yes.

A: No.

Q: Thank you. Let me show you a document that bears production numbers Tran 071711 through 722.

(Deposition Exhibit Number 1089 mark'd for identification).

A: I've reviewed the exhibit.

Q: Mr. Papageorge, do you know whether this is one document, two documents or three, or, really, what comprises this

exhibit? The numbers are sequential, that is to say, the production numbers are sequential.

A: I don't know how you define document.

Q: Let's look, for instance, at the first three pages, Tran 071711 through 713, which is entitled "Historical summary of PCB environmental issue by W.B. Papageorge". Is that your work product?

A: That is.

Q: And can you state when this particular series of three pages was created by you?

A: This was created about -- as best I recall, this was created about the fall of 1970, the last quarter of 1970.

Q: What was the purpose for which this particular historical summary was prepared?

A: I was using this as a text from which I could either read or refresh my memory when I called on some customers of Monsanto.

Q: And from what source or sources did you acquire the information in order to

draft this historical summary?

MR. PREUSS: Just for the record, the historical summary is the first three pages.

MR. TALLON: Those are the pages I identified.

A: Well, this reflects, really, the condensation of the file that I accumulated through the summer of 1970 on the subject, and reflects my understanding of the situation that I had been sharing with customers earlier in 1970. And I decided to put them down on paper and make it easier on myself so I didn't forget any of the points covered. There was no one document that was the source of information.

Q: Was the text of this actually furnished to Monsanto customers? Again, I'm referring only to the first three pages.

A: Yes.

Q: And did you personally furnish it to Monsanto customers?

A: When I was present I would have

extra copies with me or they would make copies while I was visiting. I left several copies with the Monsanto salesmen that accompanied me. He, of course, could make additional copies and distribute them freely. There was no restriction on that distribution.

Q: Which customers did you either furnish a copy of this to or use it for purposes of your discussions?

A: I, of course, don't remember all of them.

Q: Naturally.

A: Manufacturers of electrical equipment. The automotive industry. Defense industry representatives. There were a few of those. I can't remember any other large categories. There might have been a few individual exceptions here and there. Heat transfer system or so on.

Q: Manufacturers of electrical equipment, did that include General Electric?

A: Yes.

Q: Westinghouse?

A: Yes.

Q: Any others that you can think of by name today?

A: Electronic Components. Sprague Electric. Sangamo Electric. Jard. Electronic Components. I'm sure there are others, they don't come to mind at the moment.

Q: And what automotive customers do you recall having furnished a copy of this to or with whom you used this as a basis for discussions?

A: General Motors and Ford. Those two.

Q: And what defense industry representatives do you recall having furnished a copy of this to or having used it as a basis of discussions with them?

A: Ratheon, Curtis Wright, and parts of General Electric. I can't think of any more at the moment.

Q: Was General Electric a big volume customer for purchase of Aroclors or mixed products?

A: Yes.

Q: And Westinghouse, is that true, also?

A: Yes.

Q: Do you recall actually having furnished a copy of this text to G.E. or Westinghouse?

A: Yes.

Q: Do you recall when?

A: It seems to me it was 1971. I'm having difficulty recalling the specific situation. It was a group of General Electric and a group of Westinghouse people. I don't know if it was in St. Louis or at their sites. It was a group of representatives that were gathered to hear the PCB update, and this was the document that was used.

Q: Was this document furnished by itself or was it part of a larger group of documents furnished to G.E., Westinghouse and others?

A: Well, the three pages we're talking about was -- stood by itself for G.E. and Westinghouse.

Q: For others, was this document part

of a larger assemblage of documents?

A: We're still talking about the first three pages?

Q: Yes, I am.

A: Yes.

Q: During the time you held your position between 1970 and 1976, was this document ever made part of a larger assemblage of documents to be furnished to customers or for other purposes?

A: Not this specific document, no.

Q: All of the following pages except for the last one appear to be a part of a document entitled "Monsanto PCB actions in Canada by D.G. Willie", do you see that?

A: I see that.

Q: To your knowledge, was the Monsanto Canada document ever combined with the historical summary in any kind of compilation of internal information?

A: I'm having problems understanding what you mean by a compilation. The package that we're looking at was left with Canadian customers by Mr. G. Willie, after we made the presentation. I made the first

three pages, he made the middle and I made the summary statement. For those audiences that we visited in late '70, they got the package immediately, then Mr. G. Willie had additional copies made that he would distribute to those customers that I could not personally visit.

Q: You believe that Mr. G. Willie made copies of this entire exhibit available to customers in Canada in 1970?

A: That was the intent and that was my understanding, yes.

Q: Did you ever furnish a copy of any portion of this exhibit to Texas Eastern Transmission Corporation?

A: I personally did not.

Q: Do you know whether you ever personally provided a copy of any portion of this exhibit to Transwestern Pipeline Company?

A: I did not.

Q: Do you have any information which suggests to you that copies of any portion of this exhibit were furnished to either of those two companies?

A: Copies of this summary statement, the first three pages were made available, again, to Mr. Johnson's team with the strong recommendation on my part to distribute it widely, don't hold back. And I was led to believe that was done, I have no reason to believe otherwise.

Q: When you say you were led to believe that was done, did Mr. Johnson lead you to believe that he had done so?

A: That his team had done it. Now, I don't know if he did it personally or whether another member of that group did.

Q: Did you ever see any list of customers to whom the first three pages of the exhibit had been furnished, customers that would have been within the group of customers for which Mr. Johnson was responsible?

A: No.

Q: I take it you have no personal knowledge whether or not Mr. Johnson or someone working for him actually furnished the first three pages to any customer?

A: You mean personal specific

knowledge that this packet was delivered to so and so on this date at this time?

Q: Right.

A: No, no different than any other literature.

Q: All right. Let me show you a document which bears production numbers STL 001523 through 1529 and has been marked in some other context Plaintiff's Exhibit 26, and we'll just mark it with our numbering sequence here.

(Deposition Exhibit Number 1090 mark'd for identification).

A: I have reviewed the document.

MR. TALLON: Can you identify this document?

A: I believe I can.

Q: All right. Would you tell me what you think it is?

A: This is the text that Mr. Elmer Wheeler used in making a presentation before Monsanto's corporate management committee in November of 1969 on the subject of PCBs in the environment.

Q: Is this a document that you

reviewed after you took up your position as of January 1, 1970?

A: This is one of the several documents I did review, yes.

Q: Did you ever use the terminology direct contamination or indirect contamination when referring to points of entry of PCBs into the environment?

A: Direct contamination and indirect? I probably used those terms, yes.

Q: In particular, I was referring to the usage of those terms on page 4 of this memorandum. And, then, specifically on page 4, Mr. Papageorge, it's the fifth paragraph from the top of the page or the second from the bottom.

A: I have read the references to direct and indirect, and they do fit my understanding of the types of entry into the environment.

Q: And direct contamination would be what, in your understanding?

A: Well, it's analogous to just dumping a bucket of PCB into the local river, that's direct.

Q: And indirect is what?

A: Indirect is one where, to give an example, NCR paper in the office waste basket is hauled to an incinerator to burn waste at a municipal incinerator operated at a fairly low temperature, just enough to burn the paper, smoke kind of operation, that's enough to vaporize the PCB without really changing it chemically, they just go up the stack as a vapor. Eventually, that's picked up by the winds and the rain and what have you and lands on earth somewhere, whether it be an ocean or land or river, and that PCB eventually builds up to the point where the analyst can see it. So, that's the indirect route.

Q: Is that explanation consistent with your use of the terms direct and indirect as of 1970?

A: Yes, I would use those terms to describe that kind of entry.

Q: Did Mr. Wheeler tell you that he had, indeed, made the presentation reflected in this exhibit to the corporate management committee?

A: Yes.

Q: And this particular copy, referring among other things, to the notation on the front page, did this come, so far as you know, from Mr. Bergen's Aroclor toxicity file?

A: I hesitate, because there were two individuals in the PCB marketing group that used the expression Aroclor toxicity for their filing purposes. One was Dr. Richard the other was Bergen. It could have come from Bergen, I don't know.

Q: Do you know whether the -- there are initials which appear on the front page under the checkmark, and whether those initials are HB?

A: I see the H, but I can't make out the next one. I don't know.

Q: And do you recognize or can you identify the handwriting that appears on the first page?

A: No, I cannot.

Q: Let me show you another document, please, Mr. Papageorge. And it is a document which has previously been marked

as Plaintiff's Exhibit 24 and has the production sequence of numbers commencing with STR 021938 through STR 021961. We'll ask the court reporter to mark that.

(Deposition Exhibit Number 1091 mark'd for identification).

A: I have scanned the document.

MR. TALLON: Can you identify that document?

A: I believe I can. This is a copy of a rough draft of a proposed plan for responding to the PCB environmental issue.

Q: Have you seen this document before?

A: I have seen copies of it, yes, sir.

Q: Do you know who the author or authors of this document were?

A: I do not.

Q: Do you know whether this -- whether the presentation reflected in this rough draft was part of a presentation to the corporate management committee in November of 1969?

A: That was the intended purpose of this information.

Q: And what is the source, or the

basis of your statement that such was the intended purpose of the information included with this document?

A: Well, there are several indicators that I see here that lead me to do that. For example, on page 12 there is mention of a project manager or the equivalent. That recommendation was picked up, and we saw it earlier in the minutes of the corporate management committee meeting. I don't know how else to confirm that. There is reference to the ad hoc committee and its input, which I believe we saw earlier. That was the beginning of the series of steps taken to prepare for that November meeting. And the previous exhibit where we saw the text by Elmer Wheeler is an example of how the presentation assignments were finally made to several individuals.

Q: Was this a document that you reviewed after you took over your responsibilities in January 1970?

A: It was after that, but not immediately after. It was several months before I got to it.

Q: Is it accurate to say that Monsanto confirmed the presence of PCBs in the environment in mid 1969?

A: Yes.

Q: Is it accurate to say that Monsanto confirmed the adequacy of the work by Widmark and Jensen in 1969?

A: As I said earlier, the adequacy in terms of identifying the materials as being chlorinated biphenyls. The question regarding the amounts reported was still debated.

Q: Is it accurate to say that in 1969, so far as you know, Monsanto employees within the functional fluids group viewed PCBs as a world-wide ecological problem?

MR. PREUSS: I'll object as over-broad. All Monsanto employees in the functional fluids section?

MR. TALLON: I didn't say all. I said that Monsanto employees, which conceivably could include a number less than all.

MR. PREUSS: I object as ambiguous. It could be all, it could be something less

than all.

A: Those employees that were involved with the PCB type products were aware of it, yes.

Q: Do you know whether Aroclor 1242 contains 7 percent of pentachlorobyphenyl or higher, that is to say, more highly chlorinated phenyls?

A: Yes.

Q: You do know. And is that the case?

A: That is the case. It can vary from batch to batch, that 7 percent is not absolute, but it's about that.

Q: It's an average?

A: Yes.

Q: Do you agree with the statement that in 1969 Monsanto product labels did not carry all information about known effects of PCBs?

A: What page is that, sir?

Q: 5. Under the caption "Legal liability".

A: Are you talking about the third sentence in that paragraph?

Q: Actually, the second. Well, yes,

I'm sorry, you're correct. That first sentence, only four words long, the sentence beginning "All customers".

A: Keep in mind, that's referring to environmental effects.

Q: I understand.

A: Yes.

Q: And do you agree with the statement that all customers using the products, referring to PCBs, have not been officially notified about known effects?

A: Again, regarding the environment, that's true.

Q: Did you, after you took up your position as of January 1, 1970, become aware of efforts to reformulate certain of the products sold by Monsanto that at least at that point contained polychlorinated biphenyls?

A: Yes.

Q: And when did you first learn that there would be some consideration given to the reformulation of PCB products?

A: Oh, very early on in 1970. By February I was tuned in to Dr. Richard's

efforts with his research team to replace the higher chlorinated types, say Aroclor 1254 and 1260. That was the initial effort, emphasis.

Q: And was Dr. Richard's emphasis to reformulate products that contained the more highly chlorinated PCBs only?

A: At that time, yes.

Q: At that time. By the way, excuse me, just one other question on the document which is before you, Exhibit 1091. At the end of the document, the last two pages, there is some draft graphs which have some kind of profit curve, do you see those?

A: I see those.

Q: Did you ever see final versions of charts or graphs that looked like that?

A: I have not.

Q: In early 1970 after you took up your position, did you learn of any efforts to reformulate products containing PCBs where the ability to control spills or escape of those products into the environment was difficult?

A: Yes.

Q: And what did you learn?

A: Well, I don't know quite how to describe it. There was a lot of research effort going on in the laboratories, tests being conducted to find replacements, say, in the paint applications, the carbonless copy paper application, the substitution or alternative material for the 1254 and 1260, even in the electrical use was looked at, because the emphasis was still on that high chlorinated material. Also, in the hydraulic fluids, those that had the higher chlorinated PCB ingredients. So, there was a multi-directed effort in all of these product lines looking for something that would do as well without the PCBs present.

Q: And were the efforts that you've just described under way by the time you took up your position?

A: Not all of them. They were phased in as research companies were made available.

Q: As best you recall, what reformulation projects were either in consideration or in progress by the time

you took up your position?

A: Oh, in January of '70, the carbonless copy paper was getting a lot of attention. The hydraulic fluids with the high chlorinated type PCBs were getting attention from that particular group. And the applications in paint and varnish and caulking and the like were getting attention. Those three areas were the starting points.

Q: After you took up your position on January 1, 1970, did there come a time where Monsanto was sued civilly by private plaintiffs in connection with its production of PCBs and sale of PCB-containing products?

A: Certainly, there were lawsuits after I assumed that position.

Q: And you have testified as a witness for Monsanto in cases where it has been sued, is that correct?

A: That is correct.

Q: Do you have any ability to state the number of different cases in which you have testified at depositions for Monsanto?

A: Both trial and deposition?

Q: Deposition.

A: I have not kept a score sheet, but I would suggest it's a couple dozen.

Q: Is the number of trials at which you have testified a lower number?

A: Yes.

Q: Do you have any ability to state the number of trials where you have been a trial witness for Monsanto?

A: Oh, about half a dozen.

Q: Have you ever testified before Congress with respect to PCBs?

A: Yes.

Q: On one occasion or on more than one occasion?

A: Just one before a Congressional subcommittee.

Q: Was that Congressman Ryan's committee?

A: No.

Q: What committee was that?

A: This was a subcommittee that concerned itself with many matters. I don't recall its exact title, but the word

Merchant Marine is in it. And one of the members was Congressman Stutz, is it, from Massachusetts. I think he's now chairman of that same committee currently. At that time he was a member. And he held hearings primarily concerned about the presence of PCBs in the bays and harbors.

Q: When do you believe that testimony was given?

A: I wish I had a copy of the text that I sent them. I'm going to say, as best I remember, 1971.

Q: Did you indicate in your answer of a moment ago that you had furnished that committee with some materials, textual materials?

A: Yes.

Q: What materials were those?

A: It was the text of my comments. It was the document that I read from.

Q: Were you at a point designated as the spokesman for Monsanto in PCB litigation?

A: On occasion I am. It's not a --

Q: It's not a title?

A: It's not a title, nor is it a consistent assignment. It varies.

Q: After you retired from Monsanto in 1986, have you worked as a consultant for Monsanto?

A: Yes.

Q: And you have been compensated for your time -- I'm sorry, go ahead.

A: Let me correct that. I said yes. I've served as a consultant for a law firm that is engaged by Monsanto.

Q: And that is work for which you are compensated?

A: Yes.

Q: And in 1987, you worked approximately 600 hours in that kind of engagement?

A: I don't remember. I guess I did.

Q: Are you serving as a consultant today?

A: I don't really know. I'm just helping out as requested. I'm available.

Q: Do you anticipate testifying at the trial of this case, Mr. Papageorge?

A: I would not be surprised if I'm

asked to testify, yes.

Q: Are you aware that as of early 1970 degradation studies showed that the principal components of Aroclor 1242 were degrading and what was left looked like Aroclor 1254?

A: Yes.

Q: And what studies showed you that?

A: In 1970 they were -- the studies that were carried out in Ruabon in Wales, that indicated that, and it was confirmed by some studies conducted in St. Louis with St. Louis river water as the media in which the PCBs were observed.

Q: Were you satisfied that the number of identifications of more highly chlorinated biphenyls in the environment were actually incidents of 1254 or 1260 or something that looked like 1254 or 1260?

MR. PREUSS: What point in time?

MR. TALLON: '70.

A: 1970? In 1970 the reports, as I received them, would say specifically that PCB detected and analyzed is Aroclor 1254 in concentrations of so many parts per

million. That kind of report. As time went on, and I would suggest this started happening in later 1970, the laboratories, those that were getting quite sophisticated in analyses of PCBs, would report their results in different language. They would say this PCB we've detected in this amount resembles Aroclor 1254, which told me that all the peaks and valleys that 1254 had were not quite present, so it's a distorted 1254 pattern. When I saw reports that used that "resembles" or "similar" to 1254, that gave me a hint that the starting material could have been 1254, but it could also have been a 1248 or a 1242.

Q: The number of incidents of reports of 1254 in the environment, to your mind, were out of proportion to the amount of material that was really sold as 1254, correct?

A: That is correct.

MR. PREUSS: What point in time?

MR. TALLON: I'm still dwelling on 1970.

MR. PREUSS: All right.

MR. TALLON: Let me show you a document which is dated November 17, 1969 and which bears production numbers Tran 023298 through 023301.

(Deposition Exhibit Number 1092 mark'd for identification).

A: I have reviewed the document.

Q: Can you identify the document?

A: Yes.

Q: What is it?

A: It's a copy of excerpts from minutes of the meeting of the Monsanto corporate development committee dated November 17, 1969, and addresses the PCB environmental issue.

Q: Is it your understanding that at this meeting the position which you ultimately filled was created?

A: Yes.

Q: And that was as a result of the presentation to the committee by Messrs. Bergen and Springgate?

A: Yes.

Q: You reviewed these minutes after you assumed your position as of January 1,

1970?

A: I eventually saw them within a three month period in early 1970.

Q: One of the items listed on the third page of this exhibit, item number 10, is to determine feasibility and cost of elimanating 5/6 chlorine in Aroclors 1242 and 1248. Do you see that?

A: I do.

Q: Do you have any knowledge as to whether such a feasibility study was ever undertaken?

A: Yes, it was.

Q: And was there a result produced?

A: Yes.

Q: What was the result?

A: There was a redistilled version of Aroclor 1242, which was marketed as Aroclor 1016.

Q: What do you mean when you use the term redistilled?

A: Well, if you'll recall when 1242 was initially produced there is a distillation step. In order to make the Aroclor 1016, this distilled 1242 is again

distilled in another more sophisticated distillation unit, and the resulting product is one in which the 5 and 6 chlorines are virtually eliminated, and some of the 4s. So, it concentrates the 3 chlorine type of PCB in the final product.

Q: Was the Aroclor 1016 ever made commercially available?

A: Yes.

Q: What does the prefix 10 indicate? We discussed earlier the meaning of 11 and 12.

A: There is no meaning attached to the number 1016. When this material was being tested, developed and sampled to the electrical customers, it was referred to as MCS 1016, Monsanto Company sample 1016. And the number 1016 comes out of a laboratory log book where the number is taken out and identifies the project and who the research chemist is and what date this assignment was made. After the product was introduced to the market, it was sold as Aroclor 1242 B, indicating biodegradable version.

Q: When was -- I'm sorry, I thought you were finished.

A: The communications became quite garbled after a while between the original 42 and the 42 B, to the point where it was decided that in order to keep everything communicating properly, all the parties involved, we'd better go back to the 1016 number. And that's how we sort of backed into Aroclor 1016.

Q: To your knowledge, when was MCS 1016 first made available commercially?

A: Late '71.

Q: And to what customer or which customers was it sold?

A: It was sold to manufacturers of electrical capacitors.

Q: Does that mean G.E. and Westinghouse?

A: Among others.

Q: Was it sold to any other customers at that time, to your knowledge?

A: Yes.

Q: Which?

A: Oh, I don't propose to recall all

of them. But there is the JARD Company I referred to earlier. Sprague Electric. Electronic Components. Universal. Sangamo. P.R. Mallory. I'm sure there are others, I just can't think of them now.

Q: Are those companies that you've just identified all manufacturers of electrical capacitors?

A: Yes, sir.

Q: To your knowledge, was MCS 1016 sold to customers other than customers who were manufacturers of electrical capacitors?

A: I don't know of any.

Q: Was Aroclor 1242 B made available commercially under that name?

A: For a brief period of time, yes.

Q: And then it was renamed Aroclor 1016?

A: Correct.

Q: Was Aroclor 1242 B made available to the same group of customers you've just described?

A: Yes.

Q: Was it made available to any larger

group of customers, so far as you know?

A: You mean for other applications?

Q: Yes.

A: No.

Q: Was MCS 1016, Aroclor 1242 B or Aroclor 1016 ever included in a mixed product, so far as you know?

A: I don't know of any mixed product, no.

Q: Just one question, Mr. Papageorge. The members of the corporate development committee identified on the first page of the exhibit we were just looking at, do you understand that to include among the members senior management of Monsanto Chemical Company or the Monsanto Company?

A: Yes.

Q: And Mr. Bock, who is the chairman of this committee, was he also the chairman of Monsanto?

A: He's the chairman of the board of Monsanto, yes, sir.

Q: I'm sorry, while we have this document before us, there is a reference in the last paragraph of the minutes on the

last page stating that the status of Aroclor 1242 should continue to be tested to determine whether it contributes to this problem. Do you see that reference?

A: I do.

Q: Do you know whether tests going to the status of Aroclor 1242 were made after the date of this meeting?

A: Yes.

Q: Were such tests made?

A: Yes.

Q: And what was the result of those tests, as best you recall it?

A: The approach was taken in two directions. One was the biodegradation studies that we talked of earlier, which indicated that the 5 and 6 chlorine type PCBs in 1242 could be identified in the environment. The other was in the -- it was really a program where samples were obtained in the environment and the chemist looked for 1242. That was to determine its presence in the environment. So, those two programs did take place.

Q: As a result of the second program

you described, was 1242 found in the environment?

A: Yes. They were found in the environment near the sites at which they were used and released.

Q: Let me show you a document, Mr. Papageorge, which is a two page document bearing production numbers Tran 036319 and 320. I'll ask the court reporter to mark it as the next exhibit in order.

(Deposition Exhibit Number 1093 mark'd for identification).

MR. TALLON: Would you take a moment and review that, please?

A: I have read it.

Q: Can you identify the document, please?

A: It is a letter dated August 18, 1970, signed by me and sent to a representative of Sprague Electric Company in Massachusetts.

Q: Did you prepare this letter?

A: Yes.

Q: The second page of the letter, actually, the paragraph beginning on the

first page and carrying over to the second, purports to break down the component homologues in Aroclor 1242 in approximate percentages, correct?

A: I see that, yes.

Q: And do you know the source from which you acquired that information?

A: It came from Monsanto's analytical research laboratory.

Q: The last, or, rather, the penultimate paragraph on page 2 states that test quantities of MCS 1016 have been prepared. Is that the substitute, redistilled product that you were just referring to a moment ago?

A: It is.

Q: And does this suggest to you that test quantities of MCS 1016 were available by the summer of -- late summer of 1970?

A: Yes.

Q: One other thing. On the first page, in the second paragraph there is a reference to the -- this is the last three lines of that paragraph, which I will actually read the whole sentence for

purposes of completeness. "We can only recommend that samples be representative of the conditions being studied with due consideration given to the low solubility of PCBs, their high density and their tendency to cling to solid surfaces." What did you mean, Mr. Papageorge, when you wrote that PCBs have a tendency to cling to solid surfaces?

A: PCBs do have the property of attaching themselves to soil particles, any solid matter, and that clinging is quite strong. And I also describe it, it's difficult to remove that PCB off of that particle, which is one of the challenges in the analytical laboratory, to try to extract that PCB to analyze for it.

Q: Did you ever -- I'm sorry, I thought you were finished.

A: And I mention that to highlight, really, the fact that when they grab a sample and they want to determine the PCB content, they consider that particular property.

Q: Is that a property of PCBs of which

you became aware after you took on your position in January of 1970, or is that a property of PCBs of which you were aware before that date?

A: I believe I was aware of that property before 1970.

Q: Had you ever heard that in Monsanto's labs Monsanto's scientists had difficulty working with PCBs in glass beakers and containers because the PCBs adhered to the sides of the glass vessels?

MR. PREUSS: At any time?

MR. TALLON: Yes.

A: Any time? Initially, that was one of the unrecognized problems, this magnetism, if you will. But once that was determined to be a problem, the chemist found ways to overcome it with the proper solvents and all.

Q: When you use the term initially, what time period were you referring to in that answer?

A: I'm talking about when they got the procedure out of Sweden and tried to use it in our laboratory and kept getting peculiar

answers, they determined that one of their problems, among several, was the fact that the PCBs were clinging to the glassware and not showing up through the instrument.

Q: When you indicated that the tendency of PCB is to cling to solid surfaces was a characteristic of which you were aware before 1970, do you have any ability to state when you became aware of that tendency or characteristic?

A: It was a gradual awareness. I certainly knew how difficult it was to clean off the concrete factory floor or to clean off of hand rails and door knobs and that kind of awareness. And I was also aware of how it clinged to the limestone pits we talked about earlier in the sludge.

Q: At Anniston?

A: At Anniston. It clung to those particles and didn't go off with the water, it stayed behind.

Q: Let me show you a document, Mr. Papageorge, which is dated March 6, 1970, and it bears production numbers Tran 008420 through 8423, which we'll have marked as

the next exhibit.

(Deposition Exhibit Number 1094 mark'd for identification).

A: I've read the exhibit.

Q: Is that a document that you prepared, Mr. Papageorge?

A: Yes, it is.

Q: And one that you prepared in March of 1970?

A: It is.

Q: Was this in response to questions which had been raised by Mr. Durland?

A: Yes.

Q: And I take it that Mr. Durland was in Tokyo at the time?

A: Yes.

Q: There is a reference on the first page to waste handling, and in particular you state that "lacking any positive guidelines we have tentatively selected a target of 10 PPB," is that right?

A: That is correct.

Q: That, of course, is a reference to parts per billion?

A: Correct.

Q: Can you explain to me how that target level is achieved -- excuse me, how that target level was selected?

A: It's primarily based on the ability of the analytical chemist to detect levels down to 10 parts per billion reliably, time after time. Pushing it any tighter than that at that time would give answers that just could not be relied upon. So, really, the analytical method and its reproduceability and reliability determined that for us.

Q: So, at that point in history, that is to say, March 1970, technology was available to detect the presence of PCBs down to 10 parts per billion?

A: Yes. Now, this is technology available to a manufacturing plant, not to a sophisticated research laboratory. There is a difference.

Q: And I take it from your response that a sophisticated laboratory might have access to equipment which could detect in smaller quantities at that time?

A: Not only the equipment, it's the

expertise of the chemist and the time he could devote. Research chemists can take a month on this sample, a plant chemist can't do that, the conditions are different.

Q: And I take it the target that you set here was, therefore, the minimum level of detectability for a plant chemist?

A: Yes.

Q: Was equipment installed at Anniston, at the Anniston and Krummrich plants to actually conduct detection tests?

A: It was installed at the Krummrich plant.

Q: When?

A: About 1972. Late '72.

Q: The corporate development committee, in November 1969, had called for a study of the discontinuance of the manufacture of Aroclors 1254 and 1260, correct?

A: Yes.

Q: And after meeting with General Electric, that plan was called into question by you?

A: That is correct.

Q: And that is because General Electric sought to continue to use the more highly chlorinated Aroclors in transformers?

A: That's true.

Q: Transformers were filled with Aroclors and then sealed, right?

A: Aroclors, as one ingredient of several in a liquid that was sealed tight, yes.

Q: In fact, the transformers were welded shut?

A: Certainly.

Q: Had you met with representatives of General Electric by March 1970?

A: Yes, we had.

Q: And the purpose of that meeting was to discuss the possibility that Monsanto could discontinue the manufacture of Aroclors 1254 and 1260?

A: That was one of the subjects discussed, yes.

Q: And had you also personally met with representatives of National Cash Register by March of 1970?

A: Yes.

Q: Did you meet with National Cash Register representatives in St. Louis or elsewhere?

A: As I recall, it was in Dayton.

Q: And did NCR or National Cash Register had manufacturing facilities where they used Aroclor 1242 in the United States?

A: Oh, yes.

Q: And in the U.K.?

A: Yes. Well -- yes.

Q: Does this memorandum indicate to you that by March of 1970 Monsanto was proposing a substitute for Aroclor 1242 to be sold to NCR?

A: Yes. In the United States.

Q: There is a reference, Mr. Papageorge, on page 3 of this memo, under the title "Biodegradability", that in particular states Aroclor 1242 undergoes slight degradation in sludge containing micro-organisms acclimated to biphenyl, do you see that?

A: I do.

Q: Did you acquire that piece of information as a result of studies being done at Ruabon and St. Louis?

A: And St. Louis. Both locations.

Q: And what is the sludge referred to in that sentence?

A: The media in which the tests were conducted was, to a layman like me, murky water. There was particulate matter in it that exists out in the natural environment. As I understand it, in that particulate matter exists bacteria that feed off of anything present in that particular environment, and it was found that during the studies that after a period of time these micro-organisms became acclimated or accustomed to the PCB and were willing to destroy it, to consume it. I don't know how else to explain that acclimation bit. What it turns out, as I understand it, is that these organisms will consume any food material that they're accustomed to first, and once that's exhausted, they're forced to go after such things as the biphenyls.

Q: What did you mean when you used the term "slight" to modify the term "degradation" in that same sentence?

A: That means that portions of the 1242 disappeared when the analyst went looking for them.

Q: Portions, what does that mean?

A: The lower chlorinated PCBs present in the original mixture disappeared.

Q: The lower chlorinated isomers?

A: Yes.

Q: Do you include within the lower chlorinated isomers the monochlorodiphenyls?

A: Yes.

Q: What about the dichloro?

A: That's true.

Q: Trichloro?

A: Some of them.

Q: Tetrachloro?

A: A few of them.

Q: A few meaning what to you?

A: Some of the tetrachloros are resistant because the chlorine is distributed in such a way, apparently, the

bacteria can't get at it, whereas some versions of the tetrachloro where the chlorine especially is over at one end, they can get at the easy end to start digesting it and consuming it.

Q: Did the micro-organisms have any affect on the pentachloro or more highly chlorinated biphenyls?

A: Not detectable.

MR. TALLON: We'll break now.

(Recess)

DEPOSITION CORRECTION SHEET

In Re: Transwestern Pipeline Company vs Monsanto Company, et al.

Upon reading the deposition and before subscribing thereto, the deponent indicated the following changes should be made:

Page	Line	Should read:
117	9	Peakall up at - - - .

Reason assigned for change: spelling

Page	Line	Should read:
123	20	Cole Weber .

Reason assigned for change: spelling

Page	Line	Should read:
135	18	- - -, Dr David Rall. - - -

Reason assigned for change: spelling

Page	Line	Should read:
143	24	- - - egg shell thinning.

Reason assigned for change: Incorrect word.

Page	Line	Should read:
156	22	- - - Professor Olcutt, - - -

Reason assigned for change: spelling

Page	Line	Should read:
195	7	- - -, a smokey kind of operation,

Reason assigned for change: clarification

Page	Line	Should read:
203	21	in as research capabilities were made

Reason assigned for change: Incorrect word.

Page	Line	Should read:
213	6	- - to keep everyone

Reason assigned for change: Incorrect word

Page	Line	Should read:
286	23	Bayer Company

Reason assigned for change: spelling

William B Papageorge

Deponent