IN THE MATTER OF:

Ralph Fisher
vs.
Monsanto Company, a Delaware Corporation

Cause No. 93-0037-D

Deposition of William B. Papageorge
1-28-94

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FOR THE WESTERN DISTRICT OF VIRGINIA

DANVILLE DIVISION

RALPH FISHER,

Plaintiff,

-vs- C.A. No. 93-0037-D

MONSANTO COMPANY,
a Delaware Corporation,

Defendant.

DEPOSITION OF WILLIAM PAPAGEORGE, taken on behalf of the Plaintiff, at the offices of Husch & Eppenberger, 100 North Broadway, in the City of St. Louis, State of Missouri, on the 28th day of January, 1994, before Roberta Feinstein, Certified Shorthand Reporter and Notary Public.

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WILLIAM 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. WARSHAUER:

(It was stipulated that all objections are reserved except as to form).

Q: Give us your name, please, sir.

A: William B. Papageorge.

Q: Am I correct in understanding that today you are testifying merely as a witness on your personal knowledge as an employee of Monsanto in the past, as opposed to a corporate representative as you were the last time we met?

Am I correct that you are indeed not the corporate representative of Monsanto today, but are instead just testifying from your own knowledge and on behalf of yourself?

A: That is my understanding, yes, sir.

Q: I'm going to try to keep this brief today, Mr. Papageorge, so I want to go over

just some things that I'm particularly curious about.

Do you agree, from your years of experience with PCB's, that a respirator or mask should be worn when one is around dangerous levels of PCB's in the air?

A: I agree, as long as we both have the same understanding of what dangerous levels are.

Q: Define dangerous for me.

A: That's rather difficult, because it not only includes a concentration of the material in the air being breathed, but also has to consider the amount of time that the employee would be in that environment. It's a combination of time plus concentration.

I would suggest that the recommended levels that are recommended by the American Congress of Governmental Hygienists - - I believe that's correct - - if experience shows that those levels are exceeded, then the employees ought to be instructed to put on this protective equipment.

Q: Is that because you're of the belief that the inhalation of PCB vapors, mist and

steams could create systemic poisoning?

A: I think you said the last word was steam?

Q: Steams.

A: S-T-E-A-M?

Q: Yes, heated vapors.

A: Because steam, my understanding, is water vapors.

Q: Okay.

A: Again, if the individual is exposed to levels that are higher than at least the recommended for enough times and long enough periods of time, it's very possible that his body would accumulate enough of that material to where some symptoms will be evident, which I would suggest might indicate a systemic effect, as distinguished from a local irritation.

Q: Do you believe that individuals who work with PCB's should avoid dermal contact or skin contact with the products in order to avoid absorption of PCB's?

A: Yes, that's one of the recommendations on our labels and booklets and all, yes.

Q: Do you think protective clothing is appropriate to prevent absorption?

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A: Not for a normal kind of working activity. By protective clothing, I'm assuming you mean something that covers from head to toe and supplies the ultimate in total protection.

Q: That would be one level, yes, and you say that that would not be appropriate?

A: That's a little too far, unless a most unusual condition exists where an awful lot of the material is in an environment where the worker is expected to go in and conduct some emergency kind of operation.

Q: Let's go back a step back from the space suit type of protection.

Would you agree that it's appropriate that workers wear gloves, for example, if their hands are going to be in PCB's?

A: If their hands are going to be, yes, the proper kind of gloves.

Q: A glove that would prevent contact of the materials with the skin on the hands?

A: Correct.

Q: Would you agree that it would be appropriate for employees who do come in contact with PCB liquids to wash their skin as rapidly as possible?

A: The sooner the better, yes, but it is not the kind of chemical that requires - - to use an example, exposure to a cyanide would require immediate action. It's not that type of action.

When the job permits the person, he should go wash up.

Q: Do you agree that workers who are exposed to PCB's should avoid ingesting PCB's, for example, by getting it on their food through their contact with their hands or by smoking cigarettes that they hold in their hands that have got PCB's on them?

A: That is recommended, yes, I agree.

Q: In your career at Monsanto, when was the first time you visited a facility run by Westinghouse at which your Aroclor PCB products were being used in the manufacture of equipment, electrical equipment specifically?

A: The summer of 1970.

Q: What plant was that, sir?

A: There were several. There was a plant in Pennsylvania, Sharon, I think it's Sharon, Pennsylvania, South Boston, Virginia, and Bloomington, Indiana.

Q: Let's talk about these plants individually. At Sharon, Pennsylvania, do you recall what they manufactured there?

A: Transformers.

Q: Who was the person that you met with at that location, if you recall?

A: Of course there were several. I don't recall all of them. Harry Shepherd, I believe, was the top manager there.

There was a Doctor T.K. Sloat, those were the two key individuals that I remember.

Q: Tell me about your tour of the facility. Did you walk through the manufacturing part of the building?

A: Yes.

Q: What do you recall about the general housekeeping in the plant in the areas in which PCB's were being used?

A: Good, I was not disturbed by what I saw. I didn't see anything that I felt I had to point a finger at and say, "Correct this," no, it was well run.

Q: Did you see anyone at Sharon wearing a respirator or other protective mask to protect them from inhalation from PCB vapors?

A: No.

Q: Did you see anyone at Sharon wearing appropriate gloves to protect them from absorption of PCB liquids?

A: I saw - - I recall seeing employees with gloves. I have a difficult time relating that to any specific plant.

Q: Can you relate it to a specific type of glove? Were these leather gloves, the white mules that workers wear, or were they a neoprene safety glove?

A: No, this appeared to be a black rubber looking type, and I have to assume it was the resistant type of rubber for PCB.

Q: Did you see any shower facilities at Sharon?

A: I don't remember seeing any shower facility.

Q: Did you see any posted warnings advising the employees of any risks associated with contact with PCB products?

A: No.

Q: So you saw no warnings about inhalation, absorption or ingestion dangers?

MR. MOORE: I object to the

characterization. Let's get it clear as to whether he says he doesn't recall, or whether he didn't see.

Q: MR. WARSHAUER: Do you recall one way or the other?

A: Are you talking now about posted warnings?

Q: Yes, sir.

A: I did not see any.

Q: Let's talk about the Bloomington, Indiana plant. Do you think you visited Sharon in 1970?

A: Yes.

Q: When did you first visit Bloomington?

A: The same period of time, the summer of 1970, June or July.

Q: Who did you meet with in Bloomington?

A: Again, a dozen different people. I do recall a Mr. McClain, Don McClain, I think it is.

I have forgotten some of the names. I think there's a Mr. Pickett, the engineering guy or maintenance guy at the plant.

I'm trying to remember the name of the plant manager. My memory fails me. I can't

remember their names.

Q: What did you think of the general housekeeping in the PCB areas at the South Boston Westinghouse facility?

A: It would help my answer if I understood what we're both defining as housekeeping.

Q: Was there PCB fluid on the floors, was it unsawdust-worthy, the absorption ovens leaking, that kind of thing?

MR. MOORE: Clarification, are you asking about South Boston?

MR. WARSHAUER: I'm asking about Bloomington.

MR. MOORE: Because I believe you misspoke and said South Boston when you asked the question.

Q: MR. WARSHAUER: I meant Bloomington, I'm sorry.

A: At Bloomington they manufactured electrical capacitors. Part of the system includes conveyors that transport the filled capacitors to the next step in their process.

The capacitors, when they come out of the filling units, are coated with liquid, and they drip.

They are in baskets that are placed on the conveyor, and as they travel down the conveyor this liquid drips.

They had designed a system of drip pans under the conveyor to collect that liquid. There were times when the drip pan was not directly under the conveyor, which caused some of the liquid containing PCB's to drop to the floor.

Their attempt at control, which I kind of put under good housekeeping, although it looks like it isn't, their attempt was to have a layer of sawdust to absorb the PCB's, which in turn could be scooped up and taken elsewhere.

When we talk about good housekeeping, I did not see anything that would indicate that the contamination or the spillage or what have you was something that occurred weeks and days and months ago and had not been attended to.

Q: Let me ask the question in another fashion, if we're going to use that as a definition of good housekeeping.

Let me ask it first about Sharon, because you may have had that same definition in mind.

Did you see demonstrated at the Sharon

Westinghouse facility an ability by Westinghouse to account for all of the PCB that was delivered to them, and the product, as opposed to spilling it, having it overflow in the conveyors onto the floors and other places that they may have cleaned up, but it got outside the production process?

A: I have no measure of that.

Q: Let's talk about Bloomington, same question, were they losing some PCB there that was going outside the production process?

A: Yes, the drip package I talked about was to me obvious. Other than that, I have no understanding or feel for it.

Q: Do you know what PCB smells like?

A: Yes.

Q: Could you describe that for us?

A: I can describe what it smells like to me. To me it reminds me of a disinfectant type odor. I don't know how else to describe it.

It reminds me of the old time disinfectants that you might smell that they used to clean out rest rooms or operating rooms and the like.

Q: Do you know at what level you can smell it in parts per million?

A: I do not.

Q: You've smelled natural gas, haven't you, or propane or natural gas from a stove?

A: I have smelled the ingredient they add to it to give it an odor.

Q: It's called methyl mercaptan, is that right?

A: Yes, sir.

Q: Is it as strong an odor as that?

A: Oh, no, not to me, no. It's not as distinctive either.

Q: Do you think that it would have to be at a higher concentration in the air to be smellable or noticeable?

MR. MOORE: I object to the form.

A: I don't know how to relate higher concentration. Higher than what? I find that it varies from individual to individual.

There are some that have a very sensitive ability to detect odors, that can walk in a room and they notice it.

I don't have that particular problem. There may be a level there that I don't detect, but it eventually reaches a point where yes, I can detect it and define it as relating to the

PCB's.

Q: MR. WARSHAUER: If you can smell it, do you believe that that would indicate to someone who smells it that perhaps they have a level that could present some hazards to them?

MR. MOORE: I object to the form.

A: Not necessarily, no.

Q: MR. WARSHAUER: Did you smell it at Sharon?

A: I don't recall smelling it, no.

Q: Did you smell it at Bloomington?

A: Yes.

Q: Was it a strong smell to you there?

A: No. It was there. I was aware I was in a room where it was present, yes.

Q: At Bloomington did you see any employees wearing respirators or other respiratory protection devices?

A: No.

Q: Did you see anyone there wearing gloves or other protective clothing?

A: Again, I'm having difficulty recalling just which plant I saw the gloves. I just don't remember.

Q: Did you see any showers at Bloomington

facility?

A: I don't recall seeing showers at Bloomington.

Q: Did you see any posted warnings advising the workers of risks associated with inhalation, ingestion or absorption of PCB products at Bloomington?

A: Posted? No.

Q: Did you ever discuss or see the plant manager at Bloomington give a demonstration of his thoughts about the dangers associated with PCB's in which he stuck his hands in it and washed his face in it before the assembled Bloomington Westinghouse manufacturing force?

A: I did not witness that, no.

Q: Did you ever hear of it?

A: I've heard of similar demonstrations, but I don't associate that with the plant manager at Bloomington.

Q: If you had heard of such a demonstration, do you believe that would be an appropriate message to send to the work force who works with PCB's?

A: I have a hard time with the word "appropriate." It does dramatically show it's

not an acute kind of material in terms of something drastic happening that instant.

Q: He's not going to end up like the joker in the Batman movie, I guess.

MR. MOORE: I object to the form of that.

Q: MR. WARSHAUER: Would that give the workers an appropriate message as to how they should handle PCB products and how they should exercise appropriate cautions for their own protections?

A: I'd have to hear the discussion, the words that went with this whole demonstration in terms of getting a message across and the whole exercise to see that when the employee leaves that meeting he has the proper respect for the chemical.

Just the visual part isn't enough. It has to be well covered with some more words.

Q: Mr. Papageorge, can you imagine any scenario where it would be appropriate to demonstrate to your workers with bare hands into a pool of PCB's, and then to put this on your face?

MR. MOORE: I object to the form.

A: I could see where a person giving that

instruction would use those techniques, as I said earlier, to demonstrate the lack of acute effects, instant effects.

Q: MR. WARSHAUER: Didn't you write a trip report about your trip to Bloomington in which you thought that they were a bit of a mess the way they were handling their PCB waste?

MR. MOORE: I object to the form.

A: I recall a report I wrote or a memorandum or letter. I don't personally call it a trip report.

I believe I commented on my observations.

Q: MR. WARSHAUER: At one point didn't you comment on how their plant - - and I'm not using your words - - was significantly more likely to expose workers to PCB's than was even the plant where they were manufactured that was maintained by Monsanto, in the Krummrich plant, for example?

MR. MOORE: I object to the form.

A: I don't recall the exact words, but it's possible that I said that, yes. I'd have to see it.

Q: MR. WARSHAUER: And that at one point somebody from the government wanted to tour a

plant to get an idea of how workers are exposed, and they went up to one of the Monsanto plants and decided that it was just too clean, it wasn't going to be a good example for them, and you were pleased with that, and were sort of sending them down the road to Westinghouse and saying, "Maybe you'll find something there."

Do you recall that scenario?

MR. MOORE: I object to the form.

A: I recall the representatives of the National Institute of Occupational Safety and Health visiting our Krummrich plant, and I do recall that they didn't see enough evidence that would indicate exposures that would be meaningful to them in terms of measurements.

I don't recall that I deliberately mentioned any particular capacitor plant or transformer plant they should visit, but I just don't remember that.

It could be, but then on the other hand it could not be. I don't remember.

Q: MR. WARSHAUER: With respect to potential exposure for workers, how did the Sharon plant compare to Monsanto's plant in

Sauget, Illinois, the Krummrich plant?

MR. MOORE: Based on his observations?

MR. WARSHAUER: Yes, based on his observations.

A: From what I saw I would say they're comparable.

Q: MR. WARSHAUER: How did the Krummrich plant compare to the Bloomington, Indiana Westinghouse plant?

A: Well, it was, in my opinion, less apt to expose the worker than at Bloomington because of this misalignment of the conveyor system.

Q: How about because of the vapors of PCB's that were in the Bloomington plant, did that also contribute to the potential for exposure there?

MR. MOORE: I object to the form.

A: Of course the presence of vapors could lead to exposures. I personally didn't see the situation where when they opened the impregnating chambers, any fumes that would affect the workers down the line a bit.

It was just the person who did the opening, and he did open it and he walked way. The

ventilation system took care of the vapors.

I didn't see anything that I felt was disturbing as it regarded exposing that worker to those vapors.

Yeah, there were vapors there all right.

Q: MR. WARSHAUER: Let's talk about the South Boston plant. Did you also visit that in the summer of 1970?

A: I did.

Q: Who did you meet with there?

A: I met with, let's see, the maintenance engineer or the key engineering guy, a Gary Wilburn, I'm trying to remember the name of the plant manager, it started with an A, Aldstrom? That's not the correct spelling. It started with an A, the plant manager.

Again, there was a room full of people around a conference table. I don't remember them all.

Q: Did you take a tour of the facility?

A: I did, yes.

Q: What did you think, first about their housekeeping, using your definition?

A: Their housekeeping was excellent.

Q: What about their control of waste

PCB's?

A: Waste?

Q: PCB's that might be overflowing from a process, dripping from a conveyor, otherwise escaping, did you see any of that?

MR. MOORE: Objection to the form.

A: I did not see any leakage or spillage of the type you described, but the fact that the place had what I'm going to call a bone dry look about it indicates to me that if they had these situations, and none occurred while I was there, they obviously took care of them to the point where no stain was left on the concrete floor, no oily pipes, nothing appeared to be covered with oily liquid.

Q: MR. WARSHAUER: From your experience have you found that PCB's will eat the soles off of boots in a fairly rapid fashion, makes your boots wear out much faster than you would normally expect?

A: I have seen the typical work shoe that's made with leather tops and some kind of rubber sole and heel, that type of shoe, when exposed to PCB's, eventually, depending on how often and how long, that rubber sole will curl

and distort, and the tops of the shoes become - - of course they do look oily, like oily leather - - but the shoe then becomes really uncomfortable, unwearable, in addition to the fact that it's got an undesirable chemical in it that workers shouldn't be exposed to.

Q: If workers' shoes were wearing out at the South Boston plant, what would that tell you, and they were getting these effects from PCB's, what would that tell you about South Boston's control of their PCB products?

MR. MOORE: I object to the form.

A: I don't know that it would tell me an awful lot about the South Boston plant's housekeeping.

It would indicate to me that the worker is doing something that causes him to expose his shoes to the liquid.

He could be asked to go into a tank car and wipe it clean, and he walks in a little pool of PCB, and he comes out and his shoes, of course, start showing effects of that kind of exposure, so I don't know what the worker is doing to cause that exposure.

Q: MR. WARSHAUER: Did you see any workers

there with respirators or other protective devices to protect their respiratory system?

A: I did not.

Q: Did you see any workers there with gloves?

A: There again, it could be. I don't know which plant had the gloves, or maybe all three did, I don't know.

Q: Did you see any showers there?

A: I don't recall a shower room, no.

Q: Did you see any posted signs advising employees of the dangers associated with inhalation, absorption or ingestion of PCB's?

A: I don't recall any posted signs, no.

Q: Did you see any posted signs advising employees of the appropriate handling procedures or cautions to be followed when dealing with PCB's?

A: I don't remember any signs at all.

Q: Anywhere within the confines of the plant did you see any of the warnings at Westinghouse that Westinghouse had posted that were consistent with the warnings that you described to me in our other meeting that you put on your fifty-five gallon drums and on your

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tank cars?

A: I just don't recall any posted warnings.

Q: Did you see any of your fifty-five gallon drums of PCB's inside the confines of the plant at South Boston?

A: No.

Q: Did you see your tank cars, Monsanto's tank cars, at the South Boston facility?

A: Yes.

Q: Where were they located?

A: There's a rail spur. I recall seeing cars that were supported on the spur, yes.

Q: From the location where you were standing when you saw these cars, could you read the warnings that were affixed to these tank cars?

A: No.

Q: Could you even tell that the warnings had been affixed?

A: No. The warnings Monsanto placed on the cars were placed on the seal, the dome of the tank car.

As I remember, all of these domes had been opened so the seal had already been broken, and

the warnings associated with it went with that broken seal, wherever they take them, so there were no tags on the tops of the cars that I saw.

Q: Would you agree that a person standing next to a tank car, even if the warning was in place, would have no ability to read it unless he climbed up onto the tank car and was able to stand there near the top?

A: That's true, that's the intent. It's the person who opens the car sees the message.

Q: What ventilation equipment did you see in the South Boston facility in the areas where PCB's were handled?

A: From a distance I recall, up near the dome of the building near the ceiling, I recall the large ventilating fans.

That's as best as my memory will allow me.

Q: Who went with you on your trip to South Boston in 1970?

A: Mr. Wilburn was with me, about three or four other Westinghouse employees were in that group.

Q: Who from Monsanto went with you?

A: Randy Graham.

Q: Do you know if Mr. Graham still works for Monsanto?

A: He does not.

Q: Do you know where he resides?

A: Not really, up in the Northeast somewhere.

Q: Where did he live at the time that he went with you? Was he living in St. Louis?

A: No, he was in the Northeast somewhere, up in the New York area, New Jersey area.

Q: What was his responsibility for Monsanto?

A: He was the Monsanto sales representative in the field that concerned himself with the marketing of dielectric fluids to the electric equipment manufacturers.

Q: Do you know how old he is?

A: I'd be guessing.

Q: Older or younger than you?

A: Younger than me. Everybody is.

Q: Do you know any other field representatives or salespeople who went to the Westinghouse facility at South Boston other than yourself at any time?

A: Oh, gee, I know that Monsanto people

went there. I don't know who they are.

Q: How would I go about discovering that?

MR. MOORE: I don't know that the witness is here to give advice on discovery procedures.

MR. WARSHAUER: If he knows he can tell me.

A: I would try to find Mr. Graham and see if his bosses ever joined him and so on.

Q: MR. WARSHAUER: Who was his boss?

A: Well, there were several through the period of time out of the New York office, whoever the district manager was through the decades or so up there.

Then he had - - I just don't remember who they all were. They rotated the jobs up there every two to three years.

Q: When you were at the Anniston plant, did these people ever come and visit you down there?

MR. MOORE: Who do you mean, "these people"?

Q: MR. WARSHAUER: These salespeople, Randy Graham or his bosses or co-workers.

A: Certainly.

Q: Did you ever discuss with them any of the health risks that you perceived were associated with PCB's?

A: Did I personally discuss with them?

Q: Yes, sir.

A: I'm trying to recall. That type of subject is normally handled by the representatives of Monsanto's Medical Department, and the marketing people, during their frequent meetings that are held, as a group would invite the appropriate speakers to their meeting, and the Medical Department would cover such subjects as the PCB health issue.

I'm trying to recall, you asked me specifically if I've talked about it. The only time that I recall marketing people involved with health effects of PCB's and a customer was a visit by Westinghouse representatives at the plant when I was there.

Q: When was that?

A: 67, 68.

Q: Do you recall who it was who came to the plant?

A: This person I referred to as Mr. Pickett, I'm not sure that's the right name, it starts with a P, he and two associates.

Q: What did you tell them?

A: We reviewed the whole subject of skin

exposure, breathing exposure, ingestion, respirators that we used.

We had a display table, I remember, with the gloves, respirator, the kind of booties that held up in the material - - by "booties" I mean the over shoe type of footwear.

Q: Could it be absorbed through the foot also, PCB's?

A: Sure. The skin there is not much different than the hands.

Q: And this would be 1967?

A: Thereabouts, yes, sir.

Q: And you visited them in 1970?

A: Yes, sir.

Q: Did you visit at anytime between 67 and 70?

A: I did not.

Q: Did you visit at anytime after 1970?

A: No.

Q: In 1970 did you see anyone using booties at the Bloomington, Sharon or South Boston Westinghouse facilities?

A: No.

Q: Did you see anyone using any of the equipment that you had on your display table

that you showed these Westinghouse people in 1967?

MR. MOORE: I object to the form.

A: I saw the gloves.

Q: MR. WARSHAUER: At a facility that you can't remember, you just know you saw them?

A: I did, yes.

MR. MOORE: I believe the witness said it could have been one or all of the facilities.

Q: MR. WARSHAUER: Did you say one or all?

A: That's right. I just don't remember specifically associating my observation with a specific plant, but it was not surprising to see it.

Q: In 1967 at this meeting with Westinghouse people, did you tell them of any particular dangers that you perceived were caused by the partial or incomplete combustion of PCB products?

A: In 1967, no.

Q: Did you tell them in 1967 of any particular risk associated with polychlorinated dibenzyl furans?

A: No, sir. I wasn't even aware of those myself.

Q: Did Westinghouse indicate to you in 1967 that it was aware of the contamination of PCB products by furans?

MR. MOORE: I object to the form.

A: No, it did not.

Q: MR. WARSHAUER: In 1970 when you visited these three plants, did you discuss with anyone there the contamination of PCB's by furans?

MR. MOORE: I object to the form.

A: We covered the subject related to information that I personally got from the researchers in Holland and the presence of furans in some PCB's that were available in Europe.

Q: MR. WARSHAUER: If I'm correct, you represented to Westinghouse that you didn't think Monsanto's PCB products were contaminated by furans at that time, is that correct?

A: We had made analyses, and had yet to detect it.

Q: By 1970?

A: By 1970, correct.

Q: In fact, that turned out to be false?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: It was true that you had not detected it, but it turned out there that were indeed furans in PCB's on a common basis even by Monsanto's manufacturing processes?

MR. MOORE: I object to the form.

A: Yes, five years later it was detected, yes.

Q: MR. WARSHAUER: Do furans have any value in a PCB product?

A: Not that I know of.

Q: Would you consider the existence of furans in a PCB product to be a defect in the product?

MR. MOORE: I object to the form.

A: No, a defect to me is a material that affects the performance or characteristics of that product.

To my understanding, all industrial chemicals have unknown ingredients in them that in many cases have never been analyzed and could not be analyzed because of lack of technology.

Furans is an example of something that was eventually detected. That doesn't tell me

anything about the other materials that might have been in PCB's also.

It's not a pure, hundred percent pure chemical.

Q: MR. WARSHAUER: Did Westinghouse, to your knowledge, ever request that furans be included in the PCB's that they purchased from Monsanto?

A: No.

Q: When you mentioned that your definition of a defect would be something that would affect the performance or characteristic of the product, would one of the characteristics of a product be its propensity to cause injury to humans, or its dangers or health risks?

A: Yeah, that would be a characteristic.

Q: Would you agree that furans materially alter the health risks associated with PCB's?

MR. MOORE: I object to the form.

A: I have nothing, no evidence that would tell me that the furans materially affected the PCB's used in commerce from over forty years and tested as a material that contained that unknown amount of furans.

Any testing that was ever done does not

establish the contention that the presence of furans materially affected the toxicity of PCB's.

Q: MR. WARSHAUER: Mr. Papageorge, are you familiar with the studies of the Yusho rice oil poisonings in Japan?

A: I am familiar with the studies, yes, the evaluation of that incident.

Q: Is it your understanding that many of the evaluators of that incident believe that a lot of the human health effects could be traced to the furan element of that particular PCB mixture that was being used for heat transfer medium?

A: Yes, at those levels, very high levels.

Q: Are you aware of a safe level of furans?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: Let me ask you this way, because we could go in a hundred different ways when we're talking.

Would you voluntarily consume even water if you knew that it had one part per million of furans in it?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: Based on your knowledge of the health risks associated with furans?

MR. MOORE: I object to the form.

A: I probably would. I wouldn't be too disturbed by that, that amount.

Q: MR. WARSHAUER: Would you be disturbed - - my example is just a glassful. Would you be disturbed if that was your daily intake for a year?

MR. MOORE: I object to the form.

A: I have no basis to determine that. I don't know enough about furans and how the body metabolizes them and stores them and on and on.

I don't have information to help me there.

Q: MR. WARSHAUER: What information are you aware of that Monsanto shared with Westinghouse concerning the dangers of furans, other than what you knew in 1970?

A: There wasn't any further information, at least to my knowledge, that we could have shared and didn't.

Anything we knew about furans they knew. In fact, they knew it before we did in many cases.

Q: Would you agree that it's possible to

manufacture PCB's without furans within them?

MR. MOORE: I object to the form.

A: It's possible, because we demonstrated that with a PCB product that we made.

Q: MR. WARSHAUER: What product was that?

A: We called it Aroclor 1016.

Q: Was that the Aroclor that was supposed to have similar properties to 1254, but not hang out in the environment as long, am I correct?

A: No.

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: Which one was it supposed to be similar to?

A: It replaced Aroclor 1242.

Q: It was supposed to do everything that 1242 did, with less long-term environmental effects?

MR. MOORE: I object to the form.

A: I don't know about the word "everything." It worked in capacitors very much like the 1242 did and had the advantage of not being the type that if accidentally released to the environment, would be found years later.

Q: MR. WARSHAUER: And you were able to manufacture that without furans in it, is that correct?

A: That is correct.

Q: Do you know whether that product was sold to the South Boston facility of Westinghouse?

A: I don't believe it was.

Q: Would it be your expectation, based on what you now know about PCB manufacturing, that virtually all of the PCB that was delivered to South Boston was contaminated with furans?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: At some level?

MR. MOORE: I object to the form.

A: I don't have any hard data to support that, but one can say that since the process did not change, and the technology in analytical procedures had reached a point where it could detect the furans, it's likely that the material in the past was similar.

Q: MR. WARSHAUER: Did you ever have a discussion with Westinghouse about burning PCB's?

A: Are we talking here about the disposal

method by incineration?

Q: Let's start with that.

A: Yes, I had that.

Q: What did you tell them about that?

A: Well, we talked about the desirability for disposal of liquid PCB's by incineration if done under the proper conditions with enough oxygen and high enough temperature and long enough time in the burner area, the whole idea being to destroy the PCB down to the very basic water and hydrochloric acid without anything in-between.

I don't know what else to say there, other than yeah, we did talk about incineration.

Q: What about did you ever talk to Westinghouse people about what happens if you use a welding torch or a brazing torch on a pipe that has contamination of PCB in it, what happens to that PCB?

A: No, we never talked about welding or brazing torches. I did talk about the conditions required for total destruction and the fact that if these conditions weren't met, that in the presence of oxygen you could get some materials that contained carbon, hydrogen,

chlorine and this oxygen, which would be hot and desirable, and I used that as a means of demonstrating that it had to be done at these conditions that we talked about earlier.

Q: Did you ever tell them about the risk of soldering?

A: No, I never addressed that. I don't know enough about soldering to make sense in that area.

Q: Did you see any welding, brazing or soldering at Sharon, South Boston or Bloomington during your 1970 field trips?

A: I did not see any welding or brazing. I saw some soldering of capacitors where they seal the fill hole in the unit.

Q: Where did you see that?

A: At Bloomington.

Q: Did you see anyone who was performing that task wearing a respirator?

A: No.

Q: In the area where you saw that was there PCB spillage that you saw?

A: The unit was still wet. It was on this work platform that tied into the conveyor, and the top of the unit has a lip on it with a

film of oil on it through which the soldering gun extends.

Q: What did you think was going to happen to that PCB as it heated up with the soldering gun?

A: It would vaporize. It doesn't mean it would burn.

Q: Do you think any of it would convert to furans?

MR. MOORE: I object to the form.

A: Not in my opinion. There isn't enough time, there isn't enough temperature. It's a fleeting moment, and it moves on.

Q: MR. WARSHAUER: How long does it take?

A: Oh, just a shot of it.

Q: How long does it take to create furans?

A: Oh, gosh, I don't know.

Q: How much temperature does it take?

A: It's over three hundred degrees centigrade. That's almost six hundred Fahrenheit. That's pretty hot. That's hotter than it takes to melt solder.

Q: Did you ever come to an idea of how hot the heat transfer medium was at Yusho, how hot that PCB got to?

MR. MOORE: I object to the form.

A: I have no idea. I don't know that it was ever mentioned. I don't know.

Q: MR. WARSHAUER: Other than telling Westinghouse that they wanted to avoid the partial combustion of PCB's, did you tell them the dangers, or the level of toxicity of the furans that might be formed by partial combustion?

A: I did not tell them because it was unknown. There was no level I could give to them.

(PLAINTIFF'S DEPOSITION EXHIBIT NO. 1 MARKED FOR IDENTIFICATION).

Q: MR. WARSHAUER: Let me show you what we've marked as Plaintiff's Exhibit Number 1 to this deposition.

That has been retyped from the original, like a lot of these originals that date back thirty years or more.

By the hundredth effort at photocopying they get difficult to read, and that's why we retyped it, but we believe, and I think I can state quite fairly, that it is an accurate version.

MR. MOORE: Do you have the original?

MR. WARSHAUER: I did not bring the original with me, but I can get it to you later.

A: I have quickly reviewed the document.

Q: MR. WARSHAUER: Have you ever seen it?

A: This is my first exposure to it.

Q: Do you know what it relates to?

MR. MOORE: I object to that. He hasn't seen it before.

Q: MR. WARSHAUER: From your quick review of it, do you have an understanding what it is that Doctor Kelly is talking about?

MR. MOORE: I object to that.

A: This is to Doctor Kelly. The subject it states is Chloracne Cases due to Trichlorphenol. I don't know how else to describe it.

They do relate this to a Monsanto facility in West Virginia. They describe different animal testing and so on and the different chemicals that were involved.

Q: MR. WARSHAUER: Aren't they talking also about a contaminant of that Trichlorphenol product that appears to be what we would call

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polychlorinated furans today?

A: There is a reference to at least one of the individuals, Doctor Oettel, believes that there's a potent chloracnogen, and they show here on the second page the chemical diagram for that material, which appears to be what we today call chlorinated dibenzyl furans, although it's not exactly depicted as such.

Q: Does the rest of that report - - and I know you haven't seen it before, as you told me - - depict fairly significant levels of toxicity, and that the rabbits didn't even live a day once exposed to that?

MR. MOORE: I object to the form. There is no foundation for that question.

A: I'm not really qualified to determine the significance of the effect noted, because I don't know exactly how much material the animal was exposed to and so on.

Q: MR. WARSHAUER: But it would be absolutely true to say that you did not share that information with anyone at Westinghouse, is that correct?

A: That is correct, I didn't even know it existed.

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Q: Do you know if anyone else at Monsanto did?

A: I don't know.

Q: You did, however, share with Westinghouse that inhalation should be avoided?

A: Oh, yes.

MR. MOORE: I think we've shifted from one subject to another, and let's clear that up.

Q: MR. WARSHAUER: Going back to PCB's in general, you did share with Westinghouse that inhalation, ingestion and absorption should be avoided?

A: For PCB's, yes.

Q: And that was your belief in 1970, that that was not a healthy practice, to inhale, absorb or ingest PCB's?

A: Above some level really.

Q: Can you describe that level?

A: The best way that I have found and practiced in describing excessive breathing, excessive skin exposure and the like is to use what I'm going to call early warning symptoms.

If an individual's hands are red to the point they look like severe chapped hands, in some cases even cracks that were bleeding, I

looked upon that as an early warning symptom that the individual is getting overexposed.

This is before any other symptoms, like chloracne, appear. That's why I call it early warning, red hands, "Hey, fellow, you're not wearing your gloves at the right times."

The early warning symptom that I used and preached really regarding inhalation was a situation where a person who overbreathed, if you will, these fumes would end up with a feeling in his chest like a severe chest cold. That again was an early warning, "You're not wearing your respirator at the right times."

We didn't want to see anymore congested chests, so rather than try to depict or explain to a worker some number that he can't measure anyway, I have found that the early warning symptoms were very effective.

Q: When you were in South Boston, did you see any posted signs advising employees about early warning symptoms?

A: No.

Q: Was it around 1972 or so that Monsanto began insisting on indemnification letters?

MR. MOORE: I object to the form.

A: Late 71, early 72, yes.

Q: MR. WARSHAUER: And at this time do you believe that you could have prevented the sale, or you could have cut somebody off if they were not treating the product with due respect?

A: I believe so, yes.

Q: And it's your understanding Westinghouse signed an indemnification letter?

A: Yes, they did.

Q: After they signed the indemnification letter, what inspections did you do at Sharon, South Boston or Bloomington to insure that they were indeed handling the material with proper respect?

MR. MOORE: I object to the form.

A: I personally conducted no inspection. I'm not in the enforcement business.

Q: MR. WARSHAUER: Do you know if anyone else did?

A: There were visits made and observations made, but I don't know that I would classify them as formal inspections.

Q: Who made the visits and observations?

A: Monsanto field representatives.

Q: People like Randy Graham?

A: Yes, Randy Graham was one of them. There were others that followed. I don't remember their names.

Q: Is it true that Monsanto had absolutely no way of knowing whether or not its PCB warnings against ingestion, inhalation and absorption were actually communicated to the workers?

A: Actually, no. We relied on the understanding that customers like Westinghouse had the sophistication and resources, in some cases better than Monsanto's, to accomplish this. It was their responsibility.

Q: What steps are you aware of that Monsanto took to see that they were, in fact, following this responsibility or complying with this responsibility?

A: I would suggest that you could define as a step the efforts made to communicate with Monsanto, what Monsanto knew about the proper handling of material, and also, the very close contact between the two medical departments of these two world class organizations, and quite a bit of that took place through the decades.

From that contact it's just perceived that

something is being communicated to the customer, in this case Westinghouse, and there's a reason for their interest in this subject, and we couldn't go any further than that in sitting in on their safety meetings with their employees and so on.

Q: What led you to believe that this Medical Department to Medical Department or Randy Graham to purchasing agent type of communication and conduct would actually result in effective warnings and instructions being delivered to the work force?

MR. MOORE: I object to the form.

A: It's just the - - you got to have some faith and trust in the people you're dealing with, and the fact that our Medical Department did not receive any reports over the forty years of a health problem was reassuring that something right must be going on.

Q: MR. WARSHAUER: You didn't think the Zack and Mush study that was done in 1975 indicated some health problems?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: Are you familiar with that study?

A: I think we're talking about the same study. This was a study of Monsanto's employees?

Q: Yes, sir.

A: Yes. I don't know what you're driving at. There is nothing that I remember in that report that associated a problem directly with PCB misuse or misapplication.

Q: There was a doctor who analyzed that report for Monsanto named Doctor Maboubhi, who worked for the Epley Center for Cancer Research.

He said that there was a three to tenfold increase in lung cancer which he thought was significant.

Did you not think that was significant?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: Or that that was a health concern?

MR. MOORE: I object to the form.

A: Keep in mind I'm not an epidemiologist or toxicologist or a Medical Doctor, but it was my understanding that the incidents of lung cancer compared to the county in which this facility is located and at which many of the

workers live, that comparison would indicate that it is not related to the PCB exposure, and that's my understanding and conclusion of that as it relates to PCB's.

Q: MR. WARSHAUER: Did you share that study with Westinghouse?

A: I did.

Q: To let them make their own mind up about it?

A: We shared the study with Westinghouse when I was involved with the PCB issue. The consultant you referred to, and I can't pronounce his name, that came later.

I was not really involved with that activity, so I don't know what happened from that point on.

Q: Who is Frederick Johanssen?

A: He was a member of Monsanto's Medical Department, he is a Ph.D. in toxicology.

Q: Do you know where he lives?

A: I don't know today, no.

Q: Do you know if he's still with Monsanto?

A: The last I heard, yes.

Q: Do you know what his opinion was about

the incidences of cancers among workers at the Krummrich plant?

A: For this study?

Q: Yes, sir.

A: Yes, he said that it's not related to PCB's, which is the chemical I was concerned with.

Q: As part of your provision of information to Westinghouse, did you tell them about your studies, Monsanto's studies, that had been done by Industrial Biotest?

A: Yes.

Q: And you and I have already talked about that at another meeting we had.

Do you still believe that that is a legitimate study done by a first rate lab?

A: Yes, I do.

Q: Despite the fact that some of their people have testified that Monsanto caused the results to be altered?

MR. MOORE: I object to the form.

A: Monsanto didn't cause the result to be altered. Monsanto's representatives suggested that the data from the three studies was similar.

The conclusion of one of those three was slightly different than the other two. Why not make them all alike? That was the recommendation made.

Q: MR. WARSHAUER: And you still hold your opinion about Industrial Biotest, even after their officers have been prosecuted and found guilty of mail fraud in relationship to test results?

MR. MOORE: I object to the form.

A: The laboratory I saw at the time the tests for PCB's were conducted was, and still is, in my opinion, a first rate lab.

What happened after that and what their officers did I personally don't associate with the period when PCB's were being studied.

Q: MR. WARSHAUER: Did you tell Westinghouse that Monsanto had asked the Industrial Biotest people to change this report that you mentioned to me?

MR. MOORE: I object to the form.

A: No, I don't believe I did. I don't know if anyone else did or hot.

Can we take a break?

(Recess)

Q: MR. WARSHAUER: Mr. Papageorge, can you recall the names of any person at Westinghouse who told you that Westinghouse was informing its employees of the dangers or potential dangers associated with the inhalation, ingestion or absorption of PCB's?

A: Several Westinghouse people, Don McClain comes to mind, reassuring me that communications were - -

Q: Can you tell me the gist of what he told you?

A: The gist really boils down to, "We're sharing with our employees the information regarding the breathing, ingestion, the skin, the washing of clothing," the typical kinds of things that we've talked about here.

Q: When did he tell you this?

A: I don't recall the specific day. It seemed to me I first - - there were so many opportunities for this, I just can't pinpoint it.

It was a subject from the very beginning of my contacts with Mr. McClain. As best I can recall, it happened at a meeting of Westinghouse people in St. Louis at Monsanto's

offices in early 1970.

Q: Before or after the field trips?

A: Before, and it was reinforced, or re-discussed, and then it came up with Mr. McClain at the meetings a group of us held regarding the proper handling of PCB's over a period of time, 71, 72 period.

Q: Monsanto had been making PCB's since around 1935, is that correct?

A: That is correct.

Q: Why is it that about 1970 you had field trips that you have a person in charge of PCB's?

A: The issue at that period of time, the seventies, was environmental, not employee safety.

The subject of employee safety was really a review; nothing new was being added.

Q: About 1970 do you know whether Monsanto was aware that PCB's were bio-accumulative?

MR. MOORE: I object to the form.

A: By 1970? Monsanto was aware of the potential for accumulation in the environment, which was brought about by the results of analysis of environmental samples.

I don't know that in 1970 there were any studies that resulted in good, hard data that definitely established that, but it was a consideration at that time.

Q: MR. WARSHAUER: Do you know whether or not at that time Monsanto was aware that the bio-accumulation was occurring in humans?

MR. MOORE: I object to the form.

A: No, it was not known.

Q: MR. WARSHAUER: Let's take a look at a couple things.

(PLAINTIFF'S DEPOSITION EXHIBIT NO. 2 MARKED FOR IDENTIFICATION).

Q: MR. WARSHAUER: I show you what's been marked Number 2.

A: I reviewed it.

Q: What is it?

A: It's a Monsanto memorandum, or a copy of one, some of the letterhead is missing, authored by Doctor Kelly addressed to me dated March 30, 1970.

Q: What's the subject?

A: The subject is the presence of a PCB found in milk and traced to silage.

Q: Is that memorandum consistent with the

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concept of bio-accumulation, that is, a movement through the food chain of PCB's from the paint in the silage to the silage to the cow to the cow's milk?

MR. MOORE: I object to the form.

A: I guess yes, that could be described as an example of how it builds up.

Q: MR. WARSHAUER: Did you share that kind of information with Westinghouse when you met with them in the summer of 1970?

A: Oh, yes.

Q: Did you tell them in 1970 that this accumulation was going all the way through the food chain, and would stop at humans if they were the top of the food chain?

A: Well, I don't know if we used exactly those words, but that was the concept, that here's an example of what can happen in human food.

(PLAINTIFF'S DEPOSITION EXHIBIT NO. 3 MARKED FOR IDENTIFICATION).

Q: MR. WARSHAUER: I show you what we've marked as Number 3 to your deposition.

A: Okay.

Q: Do you recognize what that is?

A: Yes, I do.
Q: Tell us what that is.
A: This is a Monsanto memorandum authored by R.E. Keller addressed to me dated April 17, 1970, on the subject Environmental Materials Analyzed by Monsanto for PCB's.
Q: One of the things that was analyzed in that was a sample of human fat, is that correct?
A: That is correct.
Q: Did you share with Westinghouse the idea that human fat was showing PCB's in it?
A: Yes.
Q: Do you have any reason to believe that Westinghouse was sharing with its workers the idea that their fat would be containing PCB levels?
MR. MOORE: I object to the form.
A: That I don't know.
(PLAINTIFF'S DEPOSITION EXHIBIT NO. 4 MARKED FOR IDENTIFICATION).
Q: MR. WARSHAUER: I show you what's been marked as Number 4.
A: Okay.
Q: What is that Number 4?

A: Number 4 is a memorandum, a Monsanto memorandum, authored by Elmer P. Wheeler addressed to me dated October 19, 1970,

MR. MOORE: I'll note that it's on the face of the document labeled DRAFT.

Q: MR. WARSHAUER: What does it discuss, Mr. Papageorge?

MR. MOORE: And while we're defining the document, for the record I'll observe that you have two typewritten pages and then several, three pages of what appear to be handwritten notes that bear a different date than the typewritten portion.

A: Yes.

Q: MR. WARSHAUER: What does it talk about?

A: Further Toxicity Research, Aroclors and Substitutes is the subject.

Q: What was the goal of that potential research is my first question, and were you involved in it is Question 2?

A: I was involved in a discussion that was held subsequent to this as to what further studies would be made, and how they would be financed, and all those kind of details.

You asked also the purpose for this?

Q: Yes, sir.

A: There were new types of PCB's being considered, and also non-PCB substitute materials being considered.

The intent was to get sufficient toxicity data to give us some guidelines as to proper ways of handling, proper ways of labeling and that sort of thing.

Q: Do you know if Westinghouse was involved in this process?

A: No.

Q: No, they were not, or no, you don't know?

A: I'm sorry, they were not involved in this particular process.

Q: In 1970 did you have an idea how long PCB's would remain in an animal once they were in that animal's fat tissues or blood?

MR. MOORE: I object to the form.

A: 1970? No.

Q: MR. WARSHAUER: Did you have any discussions with Westinghouse about that?

A: No, there was nothing to discuss at that time.

Q: How many times have you been deposed since we last spoke?

A: None.

Q: You had one afterwards for the Nevada case possibly, didn't you? We spoke in July.

A: Okay, so I had one in September. I was confusing my dates.

Q: Do you recall what case that was for?

A: I think it was Nevada Power, yes.

Q: Was that lawyer from Texas who took it?

A: I don't associate Texas. That doesn't mean they weren't there.

Q: Did Monsanto ever communicate to Westinghouse that its PCB products could cause central nervous system injuries?

A: No.

Q: Did Monsanto ever communicate to Westinghouse that its PCB products could cause brain cancer?

A: No.

Q: Were you genuinely convinced after your field trips in 1970 and the discussions that you had had with people from Westinghouse around that time period that Westinghouse was aware of the safe and proper handling of PCB's

for its workers?

A: Definitely, yes.

(PLAINTIFF'S DEPOSITION EXHIBIT NO. 5 MARKED FOR IDENTIFICATION).

Q: MR. WARSHAUER: Let me show you what's been marked as Number 5 to this deposition. Do you recognize that?

A: Yes, I do.

Q: What date is it, and what is it about?

A: This is 1975.

Q: What does it relate to?

A: It relates to a response to a series of questions that I received from Westinghouse South Boston plant.

Q: Mr. Papageorge, forgive me for not attaching the questions to that letter. Either they're on my desk or somewhere else, but do you recall what those questions were about?

MR. MOORE: I object to that, Michael. That's really not fair. We're talking about almost eighteen, twenty years ago.

MR. WARSHAUER: I'm just asking him if he recalls.

A: The subject had to do with effects on workers of overexposure, as I remember. I

don't remember the exact questions.

Q: MR. WARSHAUER: And they gave a question, and you would give an answer, and there were several of these, is that right?

A: That's my recollection, yes.

Q: And these are sort of basic how to kinds of questions, how, "Our workers are asking questions, what do we tell them?" kind of thing, is that right?

MR. MOORE: Objection to the form.

A: Well, they were certainly questions that could have arisen from workers, but when you say "how to," I don't know that it was so much a how to, in other words, wear a respirator.

As I remember, it was health effects discussion or questions.

Q: MR. WARSHAUER: Why is it in 1975 Mr. Dan Albert, the Staff Supervisor of Personnel Relations at Westinghouse in South Boston, would be asking these kinds of questions about health effects?

MR. MOORE: I object.

Q: MR. WARSHAUER: Do you know?

MR. MOORE: I object.

A: I don't know Mr. Albert's background. I was left with the impression he was fairly new to this job, and why he chose to take this approach I don't know.

As I remember, he asked Mr. Wilburn who he should contact, and Mr. Wilburn gave him my name.

That's all I really know, because he had the answers to his questions right in-house, in my opinion.

Q: MR. WARSHAUER: It is curious, though, if he had the questions in-house, why he would have come to you.

MR. MOORE: Objection.

A: You would have to ask Mr. Albert, sir. I don't know.

Q: MR. WARSHAUER: Did you tell him in response to his questions that inhalation, absorption and ingestion should be avoided?

A: Yes.

Q: Did you follow up to see what, if any, steps he took to implement your suggestions?

MR. MOORE: Objection.

A: I don't know if you would call it a follow-up. In my subsequent contacts with, I

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remember, Doctor T.K. Sloat, he assured me that they were doing these things for decades, and nothing new had happened.

Q: MR. WARSHAUER: Who was Doctor Sloat?

A: He was an old time Westinghouse employee, very familiar with PCB's and electrical equipment, located at Sharon, but had intimate knowledge of PCB's throughout Westinghouse.

Q: When did he tell you this?

A: Oh, golly, I don't remember the exact dates, 74, 75 period, about the time after this report, after this exhibit.

Q: After Mr. Albert had called with these questions?

A: Yes.

Q: And also, before Mr. Albert had called with these questions, Westinghouse had already signed the indemnity agreement, is that right?

A: Oh, yes.

Q: Did those questions not lead you to believe that maybe Westinghouse had really no concept of how to protect themselves from this chemical, and maybe you ought to follow up to see whether your indemnity agreement concerns

were being complied with?

MR. MOORE: I object.

A: Sir, Mr. Albert represents just one newly arrived member of Westinghouse on the PCB scene, and when you compare that to the tens and dozens of other Westinghouse people who were very familiar with this material and its use, this was good review as far as we saw it, a good update, but nothing new to Westinghouse.

Q: MR. WARSHAUER: Did you have any thought at the time Mr. Albert wrote you about if he's asking these questions at his level, what kinds of questions must have remained unanswered for those people who worked with their hands in PCB fluids?

MR. MOORE: I object to the form.

A: No, I didn't, because I can't make the jump from what goes on in Mr. Albert's mind, and what his workers, who in many cases handled this material for decades, know and practice.

Q: MR. WARSHAUER: What did you do to prepare for today, anything in particular?

A: I met with Mr. Moore here, and looked at documents I was told had been produced in this matter. That's it really.

Q: Did you look at your affidavit?

A: I looked, yeah, that was one of the documents, the affidavit.

Q: Did you get any idea from Mr. Albert's letter in 1975 that PCB's must have been more or less all over the plant for him to have questions of this nature?

MR. MOORE: I object to the form.

A: No, I couldn't arrive at that conclusion.

Q: MR. WARSHAUER: To really insure itself that these communications, warnings, advisories concerning the handling of PCB's were communicated to workers, why didn't Monsanto just ask the workers?

A: Well, that would be a most unusual practice in the industry, unless the customer requested somebody from Monsanto to be a speaker at a meeting.

You just can not walk through a plant gate with the guard stopping you and go in to talk to workers, on any subject.

Q: But if Monsanto had attempted to communicate directly to workers, they didn't even have the risk of losing the customer,

because you had the only product that customer could buy, isn't that true?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: It's not like they could go to somewhere else if they got mad at you.

A: Well, sure they could.

Q: Where else could they buy PCB's in 1975, 1972?

A: There were several companies that were ready, willing and able to make PCB's.

Q: Name them.

A: Dow Chemical.

Q: Dow had never made PCB's since 1935.

A: Yes, but they had the facilities. All it takes is a few tanks. They had biphenyl and they had chlorine, and there is no sophisticated symmetry involved.

Coastal Chemical.

Q: They had never made them since 1935 either, had they?

A: I don't have positive proof, but there's some evidence that they were involved with PCB sales in the seventies.

Q: Where is that proof?

A: I don't have proof, I said. There were some indications that some PCB customers of Monsanto who had been told they could no longer get PCB's from Monsanto had gotten some from some outfits, and one of the outfits suspected was Coastal Chemical Company.

There's Geneva Industries was also sort of rumored. I have no proof of that either. There's another firm, I can't remember their names.

Q: So Monsanto had cut off some companies that they felt were not able to handle their chemical in a safe fashion, is that right?

MR. MOORE: I object to that.

Q: MR. WARSHAUER: Had refused to sell some companies?

A: Termination of sales is based on the use of PCB's.

Q: Right. The use that was unacceptable was a use that exposed the environment or animals or humans to unnecessary dangerous levels of exposure, is that right?

A: No, the use that permitted easy entry of PCB's into the environment, regardless of the effect of that amount, whatever it is.

Q: And those companies had just been cut off?

A: Yes.

Q: Westinghouse was never cut off until 1977, is that right?

A: That is correct.

Q: How is it that on March 18th of 1975 you were able in good conscience to say that Inerteens should pose no environmental or human health problems with proper handling?

Two years later you were required to stop manufacturing them. Wasn't there significant evidence at this time that there was no safe handling?

MR. MOORE: I object to the form.

A: No, the termination took place because our customers informed us they had alternative materials that were reasonably acceptable, and they were willing to make that change in spite of some of the shortcomings of these alternative materials, and the move was made primarily to get away from this potential for PCB's getting in the environment.

It had nothing to do with known problems with the continued use at that time.

Q: MR. WARSHAUER: Was it just coincidence that Congress banned them a year later in 78?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: There had to be some proof. You just don't pick out a chemical and ban it, do you?

MR. MOORE: I object to form.

A: Well, you'll have to ask Congress about that.

Q: MR. WARSHAUER: Is it your belief that this was an inappropriate ban?

MR. MOORE: I object to the form.

A: I have a personal belief that the PCB's used in the toxic substances act as an example primarily because EPA already knew that the manufacturer of the material and users had already agreed to get out, and it was really a - - I'm going to call it a politically acceptable chemical to use as an example.

That's my personal belief.

Q: MR. WARSHAUER: Do you believe that PCB's should still be manufactured?

MR. MOORE: I object to the form.

Q: MR. WARSHAUER: Your personal belief.

MR. MOORE: I object to the form.

A: I have a personal belief that PCB's could still be used in electrical equipment where the safety of fires and explosions far outweighs any potential for harm, and I'm thinking of the World Trade Center, which still has PCB units in it, and I don't know what's going to happen when they're all replaced with the materials today being used.

I really believe that the risks are great. We just haven't - - society has not realized the dangers just yet.

Q: MR. WARSHAUER: Are you familiar with the New York State Office Building in Binghamton?

A: Yes, I am.

Q: It remains unoccupied for over ten years?

A: Yes.

Q: What is your thought about that? They say it's a human health hazard because of the PCB's and contaminants.

MR. MOORE: I object to the form.

A: We're comparing exposure to the chemical with the potential for explosions and fires.

I personally don't know the details of that particular fire that resulted in the contamination, but I would suggest that in a properly installed electrical system that can operate for decades without explosions and fires, those benefits have got to be considered.

The occasional explosion, and this Binghamton case may have been one, could result in some other problems, but in balance I personally believe fires and explosions are still a big factor.

Q: MR. WARSHAUER: Can you give me the date just by year of the last scientific study that you personally read concerning PCB hazards in human health, the year the study was published?

A: The last report?

Q: Yes. Let me ask the question another way: Do you remain current with contemporary PCB scientific research?

A: No.

Q: So would it be fair to say that you have not read any published studies that were published in 1993?

A: That's true.

Q: Or 92?

A: True.

Q: 91?

A: True.

Q: Did you read the study done of Bloomington Westinghouse workers that was authored by Greg Steele and others?

A: I have not.

Q: Thank you.

MR. MOORE: Before we go off the record, Michael, I know that you've deposed Mr. Papageorge before, and you correctly pointed out that he's appearing here in his personal capacity today, but you are aware that he's highly knowledgeable about various aspects of PCB's and Monsanto's dealings with and handling of PCB's over the years, and it's my understanding that he's perhaps the most knowledgeable person available to Monsanto today, even though he's retired from employment, regarding a broad spectrum of issues.

I want it clear for the record that he's here today to answer your questions on any of

those subjects.

MR. WARSHAUER: He's not here to talk to the corporation. When I want the corporation's position I'm going to need a 30(b)6 deponent.

MR. MOORE: We set forth our position on that in correspondence.

MR. WARSHAUER: And I don't agree with you. I think you have to produce a human being who can be cross-examined, not just answers to written questions, so at that time I may choose to have another deposition.

Who that human being will be, I don't know, but I have satisfied my curiosity as to Mr. Papageorge's personal knowledge that is relevant to me today.

MR. MOORE: Nothing from the Defendants.

WITNESS SIGNATURE PAGE

COMES NOW THE WITNESS, William Papageorge, and having read the foregoing transcript of the deposition taken on the 28th day of January, 1994, acknowledges by signature hereto that it is a true and accurate transcript of the testimony given on the date hereinabove mentioned.

_____

WILLIAM PAPAGEORGE

Subscribed and sworn to before me this _____ day of _____, 1994.

My Commission expires: May 21, 1994.

_____

Notary Public

STATE OF MISSOURI

SS

CITY OF ST. LOUIS

I, Roberta Feinstein, a Notary Public in and for the State of Missouri, duly commissioned, qualified and authorized to administer oaths and to certify to depositions, do hereby certify that pursuant to Agreement in the civil cause now pending and undetermined in the United States District Court for the Western District of Virginia, Danville Division, to be used in the trial of said cause in said court, I was attended at the offices of Husch & Eppenberger, 100 North Broadway, in the City of St. Louis, State of Missouri, by the aforesaid witness; and by the aforesaid attorneys; on the 28th day of January, 1994.

The said witness, being of sound mind and being by me first carefully examined and duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, thereupon testified as is shown in the foregoing transcript, said testimony being by me reported in shorthand

and caused to be transcribed into typewriting, and that the foregoing pages correctly set forth the testimony of the aforementioned witness, together with the questions propounded by counsel and remarks and objections of counsel thereto, and is in all respects a full, true, correct and complete transcript of the questions propounded to and the answers given by said witness; that signature of the deponent was not waived by agreement of counsel.

I further certify that I am not of counsel or attorney for either of the parties to said suit, not related to nor interested in any of the parties or their attorneys.

Witness my hand and notarial seal at St. Louis, Missouri, this 1st day of February, 1994.

My Commission expires May 24, 1994.

_____

Notary Public in and for the

State of Missouri

Costs for Burge & Wettermark

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attendance 50.00

jurat 1.00

$291.00

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1 cc $ 88.00

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GORE REPORTING COMPANY, INC.
100 NORTH BROADWAY
SUITE 1175
SAINT LOUIS, MISSOURI 63102

(314) 241-6750
(800) 878-6711
FAX (314) 241-5070

Ms. Moore;

Enclosed please find the original signature page and errata sheets for the deposition of William Papa George taken 1-28-94, in the case of Ralph Fisher vs. Monsanto Company.

Please have the witness execute your copy of the transcript, making any corrections necessary on the errata sheets. The errata sheets should be signed at the space on the bottom, and the signature page should be signed before a Notary Public.

For these pages to be inserted in the original and filed with the court, please return them to: Ms. Michael J. Warshauer
Burge & Wettermark
2700 The Grand
75 Fourteenth St.
Atlanta, Georgia 30309

Your prompt cooperation will be appreciated.

Sincerely,

GORE REPORTING COMPANY

cc:

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This document has been retyped for clarity.

Mr. H.K. Nason-M.O.
Mr. R.E. Soden-Nitro
Mr. L.C. Weger-Nitro

From MONSANTO CHEMICAL COMPANY
Att St. Louis, Mo.

Date June 12, 1956

To Dr. R. Emmet Kelly *Reference*

At Medical Dept. *Subject* CHLORACNE CASES AT BADISCHEN ANILIN DUE TO TRICHLORPHENOL

Person Present: Dr. H. Oettel
Dr. H. T. Hofmann
A. Palm (Ph.D.)
W. Soenksen (Plant Supt., part-time)

On the 17th of November, 1953, Badische was producing a batch of trichlorphenol from tetrachlorbenzene when the process exceeded control pressure and temperatures similar to our incident at Nitro. No one was injured at the time. Within one week, as clean-up was being carried out, the first cases of chloracne developed. Fifteen or sixteen cases (6 serious) developed within the next 1-2 months and additional cases showed up during the next 10-12 months until there was a total of 50-60 cases.

I did not see our most severe Nitro cases nor have I seen photographs of these cases. The photographs of the worst Badische cases show horrible skin eruptions with nearly blister-like welts and some ulceration where infection ensued. Areas involved included the face, neck, arms, and upper half of the body. It is my impression that their severe cases were much worse than ours. In addition to the skin manifestations, their men reported all the additional symptoms as experiences in our workers, i.e., fatigue, vertigo, loss of libido, painful joints, etc.

About ten days following the incident, and after initial clean-up, Dr. Oettel was asked to expose animals to the workroom atmosphere. Rabbits (in open wire cages) were placed in the operating area for 24-48 hours. There were no obvious symptoms which developed in the animals until one week after exposure - when they died. Autopsy showed liver necrosis. Oettel thought there might be virus infection or some other cause for death until he exposed additional animals in the department, others in cages suspended inside the "decontaminated" autoclave, and some in the adjacent department. All died within 1-2 weeks following exposure. Subsequently, animals placed in the cages which had previously been in the department died of liver necrosis.

A thorough systematic investigation has isolated impurities in the trichlorphenol process (or residues) which will cause the same effects in rabbits. Liver necrosis will develop in rabbits at the following doses of the indicated materials:

15-20 mg. of pentachlor naphthalene
1 mg. of chlorinated diphenyl oxide
0.2 mg. of residue from trichlorphenol distillation
0.01 mg. of residue fraction from trichlorphenol (above 230°C)

PENGAD-Bayonne, N.J.
PLAINTIFF'S DEPOSITION EXHIBIT

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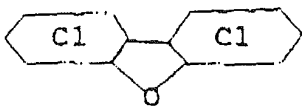
Dr. Oettel believes that the most potent chloracnogen is a compound somewhat similar to chlorinated diphenyl oxide, 

but, probably with additional oxygen atoms in the molecules. He has corresponded with Don Irish at Dow who either reached the same conclusion independently or, in mentioning the potential of chlorinateddiphenyl oxide, influenced Oettel's reasoning. Oettel believes, further, that this impurity <u>can</u> show up in the production of any chlorinated phenol allegedly to chlornapthalenes, pentachlorphenol, chlorinated biphenyl, etc.

Dr. Oettel has no faith in any animal <u>skin</u> tests for isolating chloracnogens. He was very interested in Kettering's work and was not aware of the publication referred to in Dr. Suskind's first report and which describes the cyclic skin development in new-born rats. (Reference: Parnell, J.P.: Postnatal Development and Functional Histology of the Sebaceous Glands in the Rat, Am.J. Anat., 85:41, 1949). He is convinced that the Bromsulphalein test reported in the attached reprint is significant. In this regard, Badische routinely uses this test on each batch of trichlorphenol which they now purchase from Bayer, and refuses to accept material which fails to pass the animal tests, (I also learned at Bayer that they have experienced chloracne during the production of trichlorphenol but "have now licked the problem" according to Dr. Hansen (chemist - Research Director At Elberfeld).

Badische has been able to reproduce in the laboratory the conditions which lead to the incident such as theirs and ours at Nitro and was quite surprised that we had not been able to do so. I was not given the Nitro process information, i.e., temperatures and pressures, but if I had had this information I am sure that I could have obtained Badische's. One of their chemists, a Dr. Palm, sat in on our discussions and was prepared to go into details. He did mention that "with 3 mols of trichlorphenol, methyl alcohol, and alkali, and a temperature of 180°C" the process gets out of control. His remarks are in quotes because he does not speak English and I'm not certain of his remarks.

Dr. Oettel would be very happy to receive samples of any of our materials for investigation. He would like particularly:

(1) Samples of <u>any</u> of the materials involved in our 1949 incident including tetrachlorbenzene, trichlorphenol, or Na salt and any residues from the autoclave or material cleaned from the equipment and structural members.

(2) Trichlorphenol (or Na salt) from regular production.

(3) Any samples from raw materials, intermediates, and final product which may have been involved in our cases which developed during our normal 2, 4, 5-T production in the years following the initial incident.

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He would be happy to exchange freely any and all information with us and Kettering. It was my suggestion that this be direct with Dr. Suskind to eliminate "third parties." He would routinely send carbons of any correspondence to us and we could request Dr. Suskind to do likewise. It is my opinion that this might save unnecessary duplication of effort and expense. In addition, Kettering might obtain valuable information to further their investigation involving human volunteers.

I left with Dr. Oettel copies of the following:

(1) The five (5) reports from the Industrial Hygiene Foundation which discuss their rabbit ear tests.

(2) Kettering's report - "Clinical and Environmental Survey at Nitro, 1953."

(3) Kettering's report - "Environmental Survey Carried Out In Building 30, Monsanto Chemical Company at Nitro, February 2, 1956."

We reviewed thoroughly Mr. Weger's excellent "History of Chloracne" which he sent to me with covering memo dated May 15, 1956, and which included descriptions of Kettering's reports on their human and animal research. I did not give Dr. Oettel a copy of this account because I did not have permission to do so. As a result of my visit, it may be desirable to edit this report somewhat and add further process information before forwarding this to Badische.

Any specific recommendations are implied in the above narrative account of my visit to Badische and must be based on an agreement that full and complete exchange of information with Badische is desirable and possible.

EPW

Elmer P. Wheeler

EPW:dh

Attachment

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This document has been retyped for clarity.

CONFERENCE AT KETTERING LABORATORY

PRESENT:
R. R. Suskind, M.D. - Kettering Laboratory Cincinnati, Ohio
H. Oettel M.D. - B.A.S.F. Ludwigshaven, Germany
E. P. Wheeler - Monsanto
L. C. Weger - Monsanto

This conference was arranged to share information between Badische, Monsanto and the Kettering Laboratory on chlor-acne. In the case of both Badische and Monsanto, the incident of chlor-acne followed the violent decomposition of a batch of trichloro-phenate in process. The Monsanto incident occurred March 8, 1949 and the German incident in December, 1953. Both cases were followed in a period of days or weeks by an outbreak of chlor-acne of epidemic proportions.

Following the Monsanto incident Dr. Suskind and the Kettering Laboratory have done extensive studies into the problem. Dr. Suskind reviewed, in some detail, work and studies which were carried out. In the beginning, Dr. Suskind related tests and studies made on four of the more severe acne cases and presented pictures of the individuals involved together with photo micrographs of skin biopses showing acne lesions. Dr. Oettel presented similar photographs and photo micrographs of German cases which compared very closely with those from Monsanto. It appeared that the German cases may have been more severe with regard to the skin disturbances. It was also apparent that the residual scarring was a good deal more pronounced.

Dr. Suskind described in some detail, animal tests continued by skin application and by inhalation using both sodium TCP and 245T on a

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variety of animals including rabbits, rats (adult and baby), cats, dogs and guinea pigs, etc. While in many of the experimental animals evidence of toxicity was manifest, there was no chlor-acne developed. Dr. Suskind and Dr. Oettel both agreed that the so called "rabbit ear test", as developed and described by Messrs. Adams, Irish, Spencer and Row, is unrealistic and non-reproducible. Since none of the very extensive animal experiments were successful in the production of acne, a decision was made to employ human volunteers in an attempt to find a means of evaluating the acnegenic potential of various process materials.

In the first of these experiments, Halowax 1014 (a known acnegen) was chosen as a control. This was applied as a 20% application in "plastibase" an ointment essentially consisting of 5% Polyethylene in mineral oil. Halowax in this experiment was compared to 245T and both materials were applied to the forearm of the human volunteers and kept in contact with the forearm on a continuous basis. Extensive liver function tests were conducted every other day and the volunteers were examined daily by a qualified physician who was particularly mindful of possible liver changes. In 2 to 3 days, redness developed in the Halowax exposures and in 10 days there were some follicular changes terminating in actual lesions. There was no evidence of skin changes in the 245T exposures. Acne was produced only locally in the sight of exposure in every case, that is, there was no systemic change. (At other hospitals with large scale tests, using Halowax, acne was produced in all cases except people above the age of 70. In no case was there any change in liver functions.)

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In a later series of experiments, Dr. Suskind described how three materials submitted by Monsanto were compared with Halowax using the technique described above. The materials from Monsanto were all sodium triphenolate prepared as follows:

1) Normal sodium TCP from a plant operation
2) Sodium TCP made from distilled triphenol
3) Sodium TCP made from trichlorophenol purified by the Diamond Alkali technique (dilution, filtration, precipitation and washing)

In this experiment acne was produced in the Halowax control cases and in the cases exposed to the normal plant produce sodium TCP; no acne developed in the cases exposed to the treated TCP samples in the concentrations used.

Dr. Suskind stated that the evolution of chlor-acne is very similar to Acne Vulgaris. Dr. Oettel and Dr. Suskind agreed that massive doses of Vitamin A (100,000 units per day) are effective in Acne Vulgaris. Vitamin therapy was unsuccessful in the Monsanto cases. Dr. Oettel was of the opinion that treatment was too late and stated that they have found that massive doses given in the very early signs of chlor-acne have often resulted in complete clearing of symptoms in 2 to 3 weeks.

Dr. Suskind stated that there is evidence that people develop acne from inhalation or ingesting of Halowax and Dr. Oettel agreed that acne need not come from percutaneous absorption but also may be systemic in origin. Dr. Suskind stated that in the Monsanto cases the skin problem was not disabling but the many other symptoms such as vertigo, aching muscles,

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dyspnea and headaches were. In close checking the varying secondary symptoms (once termed bizarre) it developed that all of the typical symptoms were common to both the German and Monsanto cases with the exception of dyspnea and intolerance to cold.

Dr. Oettel stated that materials such as Halowax and trichlorophenol are not in themselves acnogenic but that the offending contaminant is an "oxidate". Residues from the Badische decomposition have been extracted and elemental analyses made of the extracts (carbon, hydrogen, chlorine, oxygen). Following this, a series of oxygen bearing, chlorine bearing ring hydrocarbons were synthesized and checked for animal toxicity, using rabbits. Comparative acute toxicity of four of the compounds are as follows:

1) triphlorophenol - greater than 1 gram per kilogram
2) tetrachloro naphthalene - 50 mg per kilogram
3) tetrachloro diphenylene oxide - 0.1 mg per kilogram
4) tetrachloro diphenylene dioxide - 0.005 mg per kilogram

The latter compound (also called tetrachloro diphenyl dioxane) checks more closely by elemental analysis with the extract of the residues from the decomposition. Dr. Oettel is convinced that this is the active agent. They have developed a liver function test for rabbits which involves a micro determination of Bromsulphalein retention. This is used as a control test on purchased trichlorophenol (feeding 1 gram of the sample per kilogram of body weight to each of three rabbits). If there is no more than 5% of BSP retention in 5 days, the material is approved for processing. Dr. Oettel stated positively that there had been no cases of chlor-acne in the 245T synthesis operation.

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In a later conversation while returning to St. Louis, it developed that the 1953 decomposition at Badische Works did not occur early in the hydrolysis as in the case of both Monsanto and Diamond Alkali, but was in the stripping of excess amthanol following the hydrolysis when the batch was dehydrated and decomposed. The decomposition pressure was relieved through normal pressure relief devices and the autoclave was also left full of a mass of coke so hot that it was "gleaming". Badische has been able to reproduce the decomposition of NA-TCP by dehydration in the presence of iron. (This appears to still leave unexplained the type of decomposition experience by Monsanto and Diamond Alkali.)

Badische no longer produces TCP but purchases trichloro-phenol from Bayer and uses the BSP test for acceptance or rejection of each lot. Bayer professes to have had no chlor-acne but Dr. Oettel doubts their veracity. Dr. Oettel stated that Boehringer in Ingelheim, Germany had a slight decomposition in sodium TCP production and have had many cases of chlor-acne for many years. Their trichloro-phenol gave high results (positive) by the BSP tests.

Dr. Oettel volunteered to run BSP tests for Monsanto on samples which we might forward to him. Mr. Weger agreed to have responsibility for following up on this work.

This document has been retyped for clarity.

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St Louis

March 30, 1970

H. S. Bergen - HBER
H. L. Minckler - HM
P. S. Park - PPARK
J. E. Springgate - JS

R[illegible]TILITY

W. B. Papageorge
WPAPA

We have been in communication with Dr. Hill of the Ohio State Board of Health. He has found PCB, particularly Aroclor 1254, in samples of milk from at least three herds in Ohio. He has traced this contamination back to silage from three different silos. Dr. Hill reported concentrations of 0.2 ppm of PCB in the silage in the center of the silo and up to 20 ppm in the material next to the walls. He also stated that concentrations in the milk were between 0.1 ppm and 0.6 ppm and that some of the milk had been destroyed.

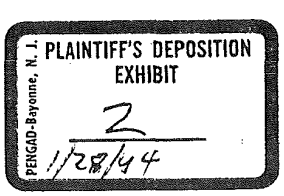
The silos are concrete silos whose interior surfaces were painted in 1967 using a formulation that contained 1254. I don't know if there was any other Aroclor in the formulation nor do we know the coating manufacturer; although, this could be found out if important. The presence of PCB in the silage came from flaking off of the material and possibly from leaching out during the silage storage. At present they will have to destroy about 150 tons of silage which is valued at about $30 per ton. As a rough guess, they consider there may be 50 other silos involved in Ohio that were painted with the same formulation. They are also looking into the fat contamination of the cows themselves.

All in all, this could be quite a serious problem, having legal and publicity overtones.

This brings us to a very serious point. When are we going to tell our customers not to use any Aroclor in any paint formulation that contacts food, feed, or water for animals or humans? I think it is very important that this be done. It may be that some of the customers will assure themselves on the basis of non-extractability that a particular formulation might be safe but I think we should make a blanket recommendation against these uses.

R. Emmet Kelly, M. D.

REK/ln



WATER_PCB-SD0000059381

Monsan...

R. E. Keller - St. Louis Organic Research - South Second Street

April 17, 1970

cc J. Mason
H. S. Bergen
J. E. Springgate
R. E. Kelly
E. P. Wheeler
W. R. Richard
M. W. Farrar
E. S. Tucker

ENVIRONMENTAL MATERIALS ANALYZED BY MONSANTO FOR PCB's

TO : W. B. Papageorge

PERSONAL AND CONFIDENTIAL

This note summarizes work we have done to date on the detection of PCB's in environmental materials. The attached table covers a total of 167 samples which have been analyzed.

PCB's typical of our Aroclor products have been found in -

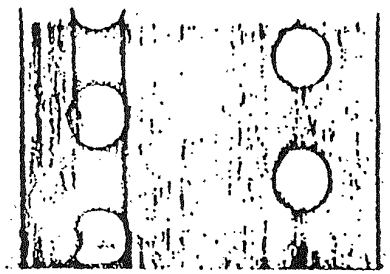
- water and sediment from nine US rivers, one UK river and Lake Michigan,
- air (atmospheric, 0.05 mg PCB/cubic meter) at the Anniston plant,
- fish from Lake Michigan and three midwest rivers,
- human fat from a midwest biopsy specimen and
- milk from Maryland and Ohio dairy farms.

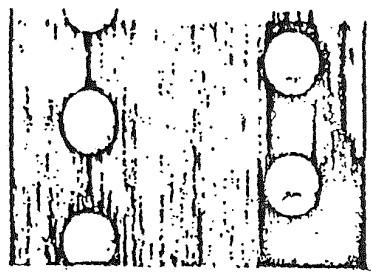
The water, sediment and air samples contain PCB's typical of Aroclor 1242, 1248, 1254 and/or 1260. The milk, human fat and fish samples contain PCB's most typical of Aroclor 1254.

REK
R. E. Keller

js

PLAINTIFF'S DEPOSITION EXHIBIT 3 1/28/94
PENGAD-Bayonne, N.J.





ENVIRONMENTAL MATERIALS ANALYZED BY MONSANTO FOR PCB's

Non-Industrial Organization Supplying Sample	Location of Sampling Site	Matrix and No. of Samples	1242	1248	1254	1260	Range of PCB Levels	Confirmatory Technique
Wisconsin Alumni Research Foundation Institute, Inc.	Manitowoc River Wisconsin	Fish Composite (1)			x		ppm	EC/GC, GC/Mass
	Kewaunee River Wisconsin	" (1)			x		ppm	EC/GC
	Burns Ditch Lake Michigan	" (1)			x		ppm	EC/GC, GC/Mass
	Manistee River Michigan	" (1)			x		ppm	EC/GC
	Source Unknown	Human fat biopsy sample (1)			x		ppm	
Maryland Cooperative Milk Producers, Inc.	Dairy Farms belonging to Coop.	Milk (5)			x		ppb	EC/GC
		Water (4) (Stream and tank drinking water)					N.D. (<1 ppb)	EC/GC
State of Ohio Department of Agriculture Food, Dairies and Drug Laboratories	Dairy Farms	Silo Scrapings (1)			x		%	EC/GC
		Milk extract (1)			x		ppm	EC/GC, GC/Mass
		Raw Milk (3)			x		ppm	EC/GC

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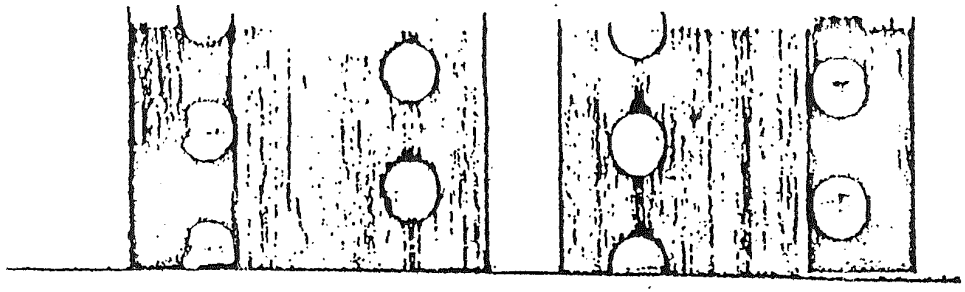
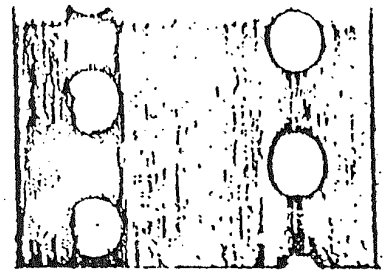
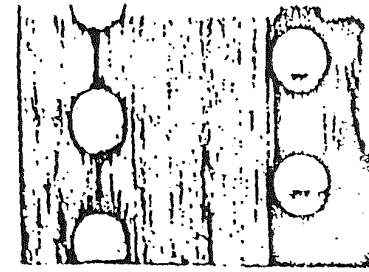


Manufacturer or User and Site Location	Associated Waterway(s)	Matrix and No. of Samples Analyzed		PCB's Found Most Typical of Aroclor 1242 1248 1254 1260	PCB Levels	Analysis Technique
Wisconsin Steel Chicago, Illinois	Chicago Metropolitan Sanitary District Sewer	Water	(3)	x	ppm-%	EC/GC
Wheeling Pittsburgh Steel Steubenville, Ohio	Ohio River	Water	(1)	x	ppm	EC/GC
		Sediment	(1)	x	ppb	EC/GC
Lester Coating Bedford, Ohio	Storm Sewer	Water	(1)	x	ppm	EC/GC
Central Diecasting Chicago, Illinois	Downtown Sanitary Sewer	Water	(2)	x	ppb-ppm	EC/GC

WATER_PCB-SD00005938





ENVIRONMENTAL MATERIALS ANALYZED BY MONSANTO FOR PCB's

Industrial

Manufacturer or User and Site Location	Associated Waterway(s)	Matrix and No. of Samples Analyzed		PCB's Found Most Typical of Aroclor 1242	1248	1254	1260	PCB Levels	Analysis Technique
Monsanto, US Anniston, Alabama	Snow Creek	Air	(3)	x				(0.05 mg PCB/cu meter	EC/GC
	Choccolocco Creek	Water	(23)	x	x	x	x	ppb-ppm	EC/GC
		Sediment	(12)	x	x	x	x	ppb-%	EC/GC
		Fish	(2)			x		ppm	EC/GC
Monsanto, US W. G. Krummrich Sauget, Illinois	Mississippi River	Water	(59)	x	x	x	x	ppb-ppm	EC/GC
		Sediment	(12)	x	x	x	x	ppb-%	EC/GC
Monsanto, US Pensacola, Fla.	Escambia River	Water	(7)			x		ppb	EC/GC
		Fish	(1)			x		ppm	EC/GC
Monsanto, UK Newport, England	River Severn (Uskmouth Area)	Sediment	(4)	x				ppb-ppm	EC/GC
National Cash Register Portage, Wisconsin	Fox River Wisconsin River	Water	(12)	x				ppm	EC/GC
General Motors Corp. Central Foundry Div. Bedford, Indiana	Fox River	Water	(1)	x	x			ppm	EC/GC
Johnson Motors Waukegan, Illinois	Lake Michigan	Water	(4)	x				ppm	EC/GC

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Medical Department

October 19, 1970 H. S. Bergen, HBERG

Further Toxicity Research--
Aroclors and Substitutes

W. B. Papageorge
WPAPA

D R A F T

Confirming our discussions, I have started to put together a table showing the information available and what we may need if the current plan for continued sales for some members of the Aroclor family and substitutes for others is to be implemented. The enclosed is a preliminary listing which will have to be reviewed and up-dated. For example we may have obtained acute toxicity data for one or more of the "dimer" materials, for MCS 1016 and Aroclor 1130 under some other sample designations.

The premises on which the more costly "needed" data include:

1. The determination that the chlorinated terphenyls can and will be found in environmental samples.

2. Biodegradation of the chlorinated terphenyls is virtually impossible.

3. Escape to the environment cannot be prevented in all proposed applications (including disposal of products containing them).

4. The lower chlorinated biphenyls may be biodegradable (metabolized in the mammalian species) with more toxic effects than the higher chlorinated PCB's--or at least at lower levels of insult.

5. Nothing more than acute data would be obtained for mixtures of the lower chlorinated biphenyls and the chlorinated terphenyls.

6. No chronic (two year studies) would be anticipated.

7. No sub-acute or chronic data would be obtained on non-halogenated substitute products such as phosphate esters, glycols, etc.

PENGAD-Bayonne, N.J. PLAINTIFF'S DEPOSITION EXHIBIT 4 1/28/97

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As you know we plan to discuss this with representatives of Industrial Bio-Test on October 20. One purpose will be to obtain current costs for the types of studies anticipated.

Elmer P. Wheeler

EPW:ju

Enclosure

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12/4/73

Going to continue or introduce:

Aroclor 5460
" 5432
" 5442

" 1242 - porosil treated
MCS 1016 - distilled 1242

" Aroclor 1130" - crude 30% - distilled (MCS:

" 1221 -
HB40 } When started?
MIPB } " finished?

Mono + Dichlorinated AMS Dimer

Bromo chloro, bicharge phosphates, etc.

Glycols -

Question -

Aroclor 5460 - Toxicity

1) Acute tox -
   a) Fish
   b) Chickens (?)
   c) Repeat - rats + rabbits acute c̄ current, m
2) Sub-acute -
   a) Done on rats + chicks
   b) Do on fish?
   c) Do on dogs?
   d) Rat reproduction?
3) Chronic
   a) Not unless required by FDA - at prese

Aroclor 5460 - Environmental - (Analytical)
a) Is 5460 now in env. samples?

c) Can escape be prevented?
Not in some proposed uses -
Can samples be taken from users stocks?
What happens in ~~[illegible]~~ disposal of products containing it? Burning, leaching

5432 - Have (?) acute screening data - only

5442 - Have " " data

Representative of current production

Questions — Toxicity 5432 - 5442
a) 90-day toxicity studies rats & dogs
b) Chicken reproduction, etc.
c) Fish acute and chronic
d) Rat reproduction
Other questions re environment same as 5460

Aroclor 1226
"Aroclor 1130" + MCS 1016 (Distilled products, capacitors

1) Acute data - Get if not already done.
2) 90 subacute - rats, dogs
3) Fish - acute and subacute (shrimp?)
4) Chickens -
5) Rat reproduction
Compare c old 1242 + 1230
6) Hi-level - 30 day studies per Tucker's memo

Chlorinated Dimers - Richard or Farran
Glycols ??

10/20/76

	30 days	45 days (15 recovery)	60 days	
100 ppm	10/10	10/10	10/10	240 rats
300 "	10/10	10/10	10/10	
1000 "	10/10	10/10	10/10	
Control	10/10	10/10	10/10	

$3000/cu

Aroclor 1221, MCS 1016, MCS 1043 (Aroclor 1130)

"Target organ" study
Start at 1/4 ⇒ MCD
Increase 2.2 log dose/week
for ~~[illegible]~~ four weeks

No safety factor possible

Determination
Accumulative effects
1) in shorter time
2) Doses for longer stu
3) Parameters - organs, body wt, acceptable Blood stud

Cost
~~[illegible]~~
to be [illegible]

Target Organ Study
rats - $2200
dogs - $2500

496

MAR 24 1975

Monsanto

SPECIALTY & PROCESS CHEMICALS DIVISION

MONSANTO INDUSTRIAL CHEMICALS CO.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 694-1000

March 18, 1975

Mr. Dan A. Albert
Staff Supervisor
Personnel Relations
Westinghouse Electric Corporation
Highway 58 West
South Boston, Virginia 24592

Dear Mr. Albert:

Attached are responses to the questions listed in your letter dated February 3, 1975.

In addition to the industrial hygiene practices described in our responses to your questions, I cannot overemphasize the need to properly control the use and handling of Inerteens to prevent their escape into the environment. Also, in discussing this information with your employees, I strongly recommend that the perspective gained from over 40 years of experience in which no human harm has resulted, be emphasized. In summary, the proper handling of Inerteens should pose no environmental or human health problems, permitting society's continued use of a very valuable material.

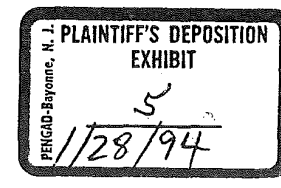
I hope the above information is useful to you. If I can be of further service please let me know.

Sincerely,

W. B. Papageorge

W. B. Papageorge
Manager, Product Acceptability
Specialty & Process Chemicals

WBP:pd



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