

ORIGINAL

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
BEAUMONT DIVISION

CHARLES B. WRIGHT, ET UX.,)
)
 PLAINTIFFS,)
 vs.) NO. B-85-322-CA
)
MONSANTO COMPANY, ET AL.,)
)
 DEFENDANTS.)

Deposition of W.B. PAPAGEORGE
Taken on behalf of the PLAINTIFF.

G O R E R E P O R T I N G C O M P A N Y
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1 W.B. PAPAGEORGE,
2 of lawful age, having been first duly sworn to
3 testify the truth, the whole truth, and nothing
4 but the truth in the case aforesaid, deposes and
5 says in reply to oral interrogatories propounded
6 as follows, to-wit:

7 DIRECT EXAMINATION

8 QUESTIONS BY MR. HOBSON:

9 Q. Would you introduce yourself, sir?

10 A. William B. Papageorge.

11 Q. Mr. Papageorge, my name is Herschel
12 Hobson and I think we have met here just a few
13 moments ago for the first time. I am going to
14 take your deposition in this case, and I represent
15 the plaintiff and as I understand, you are
16 employed by Monsanto?

17 A. Yes.

18 Q. Monsanto is a company that we have sued,
19 so you recognize I am on the other side of this
20 lawsuit from you and your employer?

21 A. I do.

22 Q. How long have you been employed by
23 Monsanto, Mr. Papageorge?

24 A. Since 1951.

25 Q. Were you employed by anybody else before

1 that?

2 A. Yes.

3 Q. Just brief thumbnail history of your
4 employment?

5 A. The previous four years I was with the
6 Philips Petroleum Company in Bartlesville,
7 Oklahoma.

8 Q. What kind of work do you do, Mr.
9 Papageorge? What is your training? Are you an
10 engineer or --

11 A. My training, I have degrees in chemical
12 engineer.

13 Q. We were interrupted just briefly, Mr.
14 Papageorge. You told me you were a chemical
15 engineer?

16 A. Yes.

17 Q. What degrees do you hold?

18 A. Bachelor of science degree, and a
19 masters of science degree.

20 Q. Where did you get your degrees?

21 A. Both from Washington University in St.
22 Louis.

23 Q. Did you go to Philips after you got your
24 degrees?

25 A. Yes.

1 Q. And when you came to Monsanto in 1951,
2 what was your job capacity at that time?
3 A. Design engineer.
4 Q. Where were you located?
5 A. The Monsanto plant in St. Louis called
6 the John F. Queenie plant.
7 Q. This case has to do with PCBs, and I
8 understand that there is a plant in Illinois that
9 made the PCBs, that your understanding?
10 A. Yes.
11 Q. Was that the only plant at Monsanto that
12 made PCBs?
13 A. No.
14 Q. What is the name of the town in Illinois
15 where the PCBs were made?
16 A. Sauget, S-A-U-G-E-T.
17 Q. That is why I asked you to say it. I
18 wasn't sure how to do it.
19 Where else did Monsanto make PCBs?
20 A. Anniston, Alabama.
21 Q. Anyplace else?
22 A. Newport, Wales in the United Kingdom.
23 Q. Anyplace else?
24 A. And there was a joint venture with
25 Mitsubishi in Japan.

1 Q. Any others?

2 A. That is all I am aware of.

3 Q. In some of the other depositions or in

4 the literature I have read about PCBs there is a

5 mention of a certain kind of Japanese dielectric

6 material. Did you all have a trade name for your

7 Japanese dielectric material?

8 A. It was the same trade name we used in

9 the United States and Europe.

10 Q. Aroclor?

11 A. Aroclor.

12 Q. So I read about another Japanese

13 dielectric material, a trade name which I can't

14 remember right now, but Monsanto, including this

15 Mitsubishi joint venture you always used Aroclor

16 as your trade name?

17 A. Yes.

18 Q. Have you ever worked at any one of those

19 other plants, has that ever been your assignment?

20 A. I worked at two of the four.

21 Q. Which two was that?

22 A. The Anniston, Alabama plant and the

23 Sauget, Illinois plant.

24 Q. I had in 1951 here in St. Louis, where

25 you started. That is not either one of these two

1 plants?

2 A. That is correct.

3 Q. Where did you go next in your career
4 with Monsanto after you were design engineer here
5 in St. Louis?

6 A. You mean geographically or work
7 assignment?

8 Q. Promotion wise and then if you changed
9 geographically, let me know?

10 A. At the same site in 1953, approximately,
11 I was appointed a supervisor of a chemical
12 production unit at the same plant, the Queenie
13 plant.

14 Following that, I was assigned to still
15 another chemical producing unit. That would be
16 about 1954.

17 Q. And that plant was still in St. Louis,
18 here?

19 A. Yes. Still the same location.

20 And about 1955, I was appointed a
21 maintenance supervisor at the same plant. And
22 about 1956, '57, I was the maintenance
23 superindendent at the same plant. About 1958 or
24 '59, I was appointed general superindendent of
25 warehousing distribution, shipping and utilities.

1 And in 1964, I was transferred to the Sauget,
2 Illinois plant as a general superintendent of
3 manufacturing. In 1965, I was transferred to the
4 Anniston, Alabama plant as plant manager. In
5 1977, I returned to the St. Louis area, assigned
6 as manager of environmental control, coordinating
7 the PCB issue.

8 Q. What year was that, sir?

9 A. 1970.

10 In about 1971, '72, my job remained the
11 same, but the title was changed to manager,
12 environmental protection. 1973, my job was
13 expanded to include several other Monsanto
14 products, title changed to manager, product
15 acceptability. And I kept that title with
16 different product assignments until 1977, at which
17 time I was appointed director of environmental
18 operations for one of Monsanto's operating units
19 which at that time was the chemical intermediate
20 unit.

21 In 1982, I was appointed -- same title,
22 director of environmental operations for the
23 Monsanto industrial chemicals unit, and beginning
24 this year, 1986, I was appointed manager of
25 occupational health for Monsanto Chemical Company,

1 an operating unit of Monsanto Company.

2 I think that brings us up to date.

3 Q. Okay, sir.

4 Now, as manager of environmental health,

5 what kinds of activities fall under your

6 supervision?

7 A. Occupational health?

8 I have the industrial health --

9 industrial hygiene, occupational medicine, and

10 epidemiology related to sites that are assigned to

11 the chemical company world wide.

12 Q. Who is your chief epidemiologist now?

13 A. Dr. William Gaffey.

14 Q. Who is head of your industrial hygiene

15 program?

16 A. The directed head is John Henshaw.

17 Q. And who heads up your occupational

18 medicine program?

19 A. Dr. George Roush, R-O-U-S-H.

20 Q. Earlier today I learned that there will

21 be a Dr. Emmett Kelly for a deposition today. Is

22 he in your organization?

23 A. Dr. Kelly is a retired employee. He is

24 Dr. Roush's predecessor.

25 MR. CARRINGTON: What is Henshaw's area?

1 THE WITNESS: Industrial hygiene.

2 Q. Has Monsanto ever purchased PCBs from
3 any other manufacturer for resale?

4 A. Not to my knowledge.

5 Q. Is that something that has ever been
6 looked at, to your knowledge?

7 A. No. Not to my knowledge.

8 Q. Has Monsanto licensed the right to make
9 PCBs to anyone else other than this joint venture
10 you mentioned?

11 A. Not that I am aware of.

12 Q. Were the processes at these four plants
13 the same that made PCBs?

14 A. Yes.

15 Q. Would you describe to me how you
16 manufactured PCBs?

17 A. We start with Benzene, which is a
18 petroleum product, and expose the Benzene to high
19 temperature pressure, thereby forming biphenyl
20 which is combination of two Benzenes. Biphenyl,
21 itself, at room temperature is -- to me looks like
22 candle wax. So it has to be heated to make it a
23 liquid, which we do, and we then funnel chlorine
24 through the liquid. Chlorine then randomly
25 affixes itself to the biphenyl, anywhere from one

1 chlorine -- well, zero chlorines to ten
2 chlorines. And the mixture Monsanto sold as
3 Aroclors, PCB mixture is just that, a mixture of
4 the various PCBs of which there are 210 possible.

5 Q. As I understand, even though there are
6 210 possible, some of those are quite unlikely?

7 A. True.

8 Q. Do you recall about how many likely PCBs
9 there are?

10 A. Well, there is -- commercial mixtures we
11 sold would generally go up to about eight
12 chlorines, and nine and ten are, to my knowledge,
13 not detected in those mixtures.

14 Q. What about side reactions in
15 manufacturing other than PCBs, make dibenzofurans
16 or other materials with the PCBs?

17 A. Those are possible.

18 Q. Were they made in your processes?

19 A. Not in our process.

20 Q. How did you control them?

21 A. Well, I don't know that we deliberately
22 controlled. Our process, which I didn't complete
23 describing, involves the addition of a
24 neutralizing material, because as you make the
25 PCBs, you also make acid. Our process involved

1 the addition of lime to neutralize the remaining
2 acid in the mixture. That mixture then was
3 distilled, and the recovered vapors which are
4 condensed is the finished product. That is the
5 Aroclor material.

6 I am under the understanding -- in fact,
7 I was told by researchers in Europe that the
8 European equivalent were found to contain
9 chlorinated furans. I am also aware their process
10 used caustic soda as the neutralizing agent which
11 is more reactive than lime. That is the only
12 difference in the two processes I have been able
13 to determine.

14 Q. Do you think that is where the option
15 name is from, sodium hydroxide?

16 A. Yes.

17 Q. You did not find benzofurans in your
18 PCBs?

19 A. Yes.

20 Q. Do you know what the lower limit of
21 production was that has been looked at?

22 A. At that time, I just don't remember.

23 Q. Would it be in the parts per billion
24 range or parts per million?

25 A. Parts per billion.

1 Q. Do you know if the Aroclors that were
2 looked at for benzofurans were looked at from all
3 four of the manufacturing operations?
4 A. I don't know about the Japanese
5 operation, but I know they were looked at for the
6 other three.
7 Q. When did the Anniston, Alabama plant
8 begin operation, about?
9 A. I understand it was about 1929.
10 Q. And what about the Sauget, Illinois?
11 A. About nineteen thirty -- late thirties.
12 Q. And the UK operation?
13 A. As best I remember, that was in the
14 fifties.
15 Q. And Japan?
16 A. 1970.
17 Q. I take it you didn't make them in Japan
18 too long?
19 A. That's correct.
20 Q. How long did that plant operate?
21 A. About a year.
22 Q. And the UK plant, do you know when it
23 ceased production?
24 A. About the same time as the U.S., about
25 '77, sir.

1 Q. And you say that is about the same time
2 the other two plants stopped?

3 A. The Anniston plant ceased operations in
4 1972 or three. And the Sauget, Illinois operation
5 was terminated in 1977.

6 Q. Do you know why you kept the Sauget,
7 Illinois plant going longer than the Anniston
8 plant?

9 A. It was the more modern of the two units.

10 Q. What was the difference from a
11 modernization standpoint?

12 A. We had modern instruments, the equipment
13 is newer. It is expected to be less plagued with
14 maintenance problems, easier to control leaks and
15 the like because of that. That is all I can
16 remember at this moment.

17 Q. The Anniston plant, was it originally
18 built to make PCBs or was it a unit that made
19 something else you converted to make PCBs, do you
20 recall?

21 A. The Anniston plant, as I understand it,
22 was originally in the metal additives business.
23 Swann Chemical Company is the owner operator. And
24 the PCB unit was added later. I don't know
25 whether they converted equipment or added new

1 equipment specifically designed to make PCBs.

2 Q. What about in Sauget?

3 A. Sauget unit was deliberately designed to
4 make PCBs, patterned after the Anniston unit.

5 Q. And I take it Newport, Wales, same
6 thing, it was deliberately built?

7 A. Yes.

8 Q. What were the differences in design
9 between Newport, Wales, and Sauget?

10 A. I don't think there was anything
11 dramatically different. I believe the size of the
12 equipment was varied; bigger tanks I believe were
13 necessary at Krummrich than the others because of
14 the anticipated capacity needs.

15 Q. But the process, itself, was the same?

16 A. The process was identical.

17 Q. How many people were involved in
18 manufacturing PCBs at the Anniston plant, give or
19 take?

20 A. The definition of involvement, it is a
21 matter of degree.

22 If we take it from the point where raw
23 material is received, the product is made, unit
24 maintained, the janitors that clean up to the
25 people that ship it out, I would say eighty to a

1 hundred.

2 Q. How many total employees are in the
3 plant at Anniston, about?

4 A. At that time, about 350.

5 Q. How many of the employees were involved
6 in operating the unit, actually manufactured the
7 PCBs and then packaged the PCBs for shipping?

8 A. Fifty.

9 Q. And then you would have maintenance
10 people?

11 A. Yes.

12 Q. Were the maintenance people assigned to
13 that unit individually or were they floating from
14 unit to unit where they were needed?

15 A. They would service the whole plant, so
16 they would float from job to job.

17 Q. What about at Sauget, how many people
18 were involved in those operations?

19 A. About the same numbers.

20 Q. Again, would maintenance people be
21 involved in other processes as well as PCBs?

22 A. Yes.

23 Q. Aroclor is Monsanto's trade name. Is
24 there any other trade name that Monsanto sold PCB
25 under that you are aware of?

1 A. Yes.

2 Q. What were the other trade names?

3 A. Therminol was one of them.

4 Q. Would you spell that for us, please?

5 A. T-H-E-R-M-I-N-O-L.

6 And in Europe, the same material was
7 sold under the trade name Santotherm,
8 S-A-N-T-O-T-H-E-R-M. These were PCBs used in heat
9 transfer applications.

10 Santovac, S-A-N-T-O-V-A-C, were PCBs
11 used in vacuum pump service.

12 Q. What kinds of vacuum pumps are we
13 talking about?

14 A. Gee, I don't know how to describe.
15 These are pupms that are used to evacuate vessels,
16 to pull the area to create vacuums, sucks vapors
17 out of systems.

18 Q. All sizes of pumps or talking about
19 pumps that are carried around to big ones that fit
20 on the back of trucks?

21 A. All sizes, depending on the vendors as
22 to which size he would recommend to his
23 customers.

24 Other trade names that appear on our
25 products contain PCBs. Now, these are blends of

1 PCBs with other materials. We had a series of
2 hydraulic fluids under the trade name
3 P-Y-D-R-A-U-L, Pydraul.

4 Q. Who were your customers for these
5 hydraulic fluids?

6 A. All types of industries that used
7 hydraulic systems in their operations;
8 particularly where fire hazards could exist such
9 as die casting industry.

10 Q. Mining operations?

11 A. Mining equipment, some of it used it,
12 yes. Some forklifts, some customers, air
13 compressors, even some elevators.

14 Q. What about automobiles?

15 A. No.

16 Q. Trucks, eighteen wheelers?

17 A. Not in the normal power system of the
18 truck. There are a few that had auxiliary
19 equipment attached to them like hoists and lifts,
20 some of them used hydraulics, but not too many.

21 Q. Any other trade name products that were
22 sold?

23 A. Yes. We packaged mixtures with PCBs for
24 the dielectric industry, used trade names that
25 belonged to other companies on the labels and

1 shipped them from the plants.

2 Q. Who were those?

3 A. It was General Electric's Pyranol,
4 P-Y-R-A-N-O-L, and there were several of those.
5 And then Westinghouse's Inerteen I-N-E-R-T-E-E-N.
6 I can't think of any other trade names
7 at the moment.

8 Q. The private label stuff that you did for
9 GE and Westinghouse, is that the right
10 characterization, private label?

11 A. I have heard that expression used. I
12 don't know technically if it is the correct one or
13 not.

14 Q. You made it and put somebody else's name
15 on it. Your name, Monsanto, didn't appear on the
16 products that GE and Westinghouse sold?

17 A. It appeared as packaged by Monsanto.

18 Q. It said packaged by?

19 A. Yes, with Monsanto's logo.

20 Q. So if I picked up a can of Pyranol, it
21 would have GE on it?

22 A. No.

23 Q. I mean Monsanto on it?

24 A. Yes.

25 Q. Would it say GE on it or General

1 Electric?

2 A. No, it would say Pyranol number so and
3 so.

4 Q. What about Westinghouse, would their
5 Inerteen have Monsanto on it or Westinghouse on
6 it?

7 A. Monsanto on it. This is a material that
8 left Monsanto plants.

9 Q. How did it leave? How was it packaged
10 for Westinghouse and GE?

11 A. Several forms. It could be five gallon
12 pails, thirty-two gallon steel drums or fifty-five
13 gallon steel drums or by tank trucks or rail car,
14 tank rail car.

15 Q. Do you know if GE or Westinghouse
16 repackaged these materials and put their names on
17 them?

18 A. I am led to believe that some of that
19 did take place, yes.

20 Q. Were all of the PCB materials that
21 Monsanto sold in liquid form?

22 A. I understand there was a brief period
23 where we sold a PCB that was a solid.

24 Q. Do you know what its purpose was or how
25 it was made into a solid?

1 A. It was the fully chlorinated, the ten
2 chlorine version, which is a solid at that --
3 under those conditions, and it was a very short
4 production run, and I understand it was sold as a
5 fire retardant additive for plastics.

6 Q. Do you know about what time period that
7 was?

8 A. It was in the middle fifties.

9 Q. Where was it made?

10 A. Anniston, Alabama.

11 Q. Was it made in the same reactor as the
12 other PCBs or did you have to make a special
13 reactor and unit for that?

14 A. It was the same reactor.

15 Q. You weren't there when they made that
16 run, I guess, but do you happen to know what
17 changes in operating parameters were necessary in
18 order to make the ten chlorine unit -- ten
19 chlorine PCBs?

20 A. Well, the period of chlorination was
21 extended, introducing chlorine longer to make
22 certain it was fully chlorinated. The
23 temperatures had to be raised to keep it molten.
24 And I understand, I am led from the records that I
25 read and all, that when they cooled it to make it

1 into its solid form so it could be shipped, they
2 had to use equipment that was used by another
3 product made at that plant, and they had to
4 control the dusting problem that was created by
5 this new material. Those are the changes that I
6 understand took place at that time.

7 Q. Do you know how much temperature
8 increase was necessary?

9 A. I don't remember. Something in the
10 order of a hundred degrees Fahrenheit difference.

11 Q. Was this a heat generated or supplied to
12 the reactor by steam or was it direct fired or do
13 you recall?

14 A. This had to be direct fire.

15 Q. We are not talking about low
16 temperatures here?

17 A. That's right.

18 Q. Approximately what was the operating
19 temperature of the reactor when you were making
20 normal Aroclors?

21 A. About 500 degrees Fahrenheit.

22 Q. You could maintain 500 degrees
23 Fahrenheit and then just by varying the period of
24 chlorination, the length of time of chlorination,
25 you could make the various Aroclors?

1 A. Yes. For the lower chlorinated -- when
2 I say 500, give or take a bit. Some of it was 400
3 something approaching the 500. And we would pull,
4 when we distilled, we would pull a higher vacuum
5 for the higher boiling materials.

6 Q. Did you make your own chlorine at these
7 plants?

8 A. At one time, yes.

9 Q. Up until about when, would you recall?

10 A. At Anniston, I think we dismantled our
11 chlorine producing unit in 1968 or nine. We then
12 purchased chlorine.

13 At the -- I am not familiar with the
14 source of chlorine at Japan. At the other two
15 sites, it was a combination of chlorine produced
16 at the plant, supplemented by purchased chlorine.

17 Q. Did you use one process for making
18 chlorine?

19 A. I'm sorry?

20 Q. Did you use one process for making
21 chlorine?

22 A. Yes.

23 Q. Which one did you use?

24 A. This is the use of the Denora cell. I
25 don't know if you are familiar with it. It is

1 micro electrodes.

2 Q. I am most familiar with the Hooker
3 process, but I know of the Denora.

4 Have you had an opportunity in your work
5 to become familiar with how PCBs are utilized in
6 industry?

7 A. Yes.

8 Q. In the electronics business, how are
9 PCBs utilized, to your knowledge?

10 A. Electronics or electrical?

11 Q. Start with electronics?

12 A. I am not familiar with the specifics,
13 but PCBs were used in some of the electronic
14 components as a plasticizing agent.

15 Q. Like in the coatings of capacitors or
16 boards or --

17 A. Yes. The board concept.

18 Q. Would you consider a capacitor an
19 electronic component or electrical component? It
20 doesn't matter, let's talk about capacitors.

21 PCBs were used in capacitors?

22 A. Yes.

23 Q. How were they used in the capacitors,
24 what function did they play in the capacitor, do
25 you know?

1 A. They helped insulate the layers of foil,
2 which are separated by paper, and the additions of
3 the PCB enhanced insulating properties of that
4 paper.

5 Q. Do you know how the PCBs were introduced
6 in the components, in capacitor manufacturing?

7 A. Yes.

8 Q. How was that done?

9 A. The capacitors are fully assembled in
10 terms of the materials used to make them, the can,
11 the lid, the contents. There is a hole
12 deliberately left open in the top of the unit.
13 These are placed in baskets conveyed into chambers
14 about half the size of this room, and stacked in
15 that room. The chamber is closed, sealed, and
16 evacuated, all the air is removed from it, which,
17 in turn, sucks the air out of each of the
18 capacitor units.

19 The PCB, then, which is to impregnate
20 the capacitors, is introduced into that chamber.
21 The chamber is flooded, so that the PCB finds
22 itself, now, into the evacuated can. And after
23 that step, the surplus PCB is pumped out of the
24 chamber, the chamber is opened and these units are
25 brought out into the open down the assembly line

1 at which workers on the assembly line solder the
2 opening in the unit shut.

3 The units are then degreased, the
4 surplus PCB that is clinging to the outside
5 surfaces is removed and the small ones are ready
6 for equipment shipment, testing and shipping. The
7 larger ones in the cases I saw were painted
8 through a spray chamber, were then ready for
9 sale.

10 Q. What other kinds of electronic
11 components, I guess, would PCBs be used for?

12 A. I don't know that -- all I know is that
13 the defense industry, Department of the Defense
14 with their contractors were involved with PCBs and
15 some of their equipment. I do not know the
16 details. I was not made privy to it.

17 Q. What about small transformers?

18 A. Small transformers?

19 Q. Right, like used in radios or?

20 A. I am not aware of PCBs used in that type
21 of transformer.

22 Q. What about in electrical equipment, how
23 were PCBs used?

24 A. It is used in addition to capacitors, it
25 is used in transformers, and it is also used or

1 was used in some of the electrical switching gear,
2 which turn high power off and on, and it was used
3 in some electromagnetic devices, such as those
4 large magnets that are used to move scrap steel
5 from one pile to another, they contained PCB type
6 fluids.

7 Q. Start with the transformers. Do you
8 know how PCB are used in transformers?

9 A. I think I do, yes.

10 Q. All right, sir. Can you explain for
11 us?

12 A. It is used in some transformers to help
13 conduct the heat that is generated within the unit
14 to the outer surfaces where it can be dissipated.
15 So it is really a heat transfer system,
16 internally.

17 I don't know what else to add to that.

18 Q. Do you know if PCBs are used in any of
19 the components of the transformers?

20 A. Not to my knowledge.

21 Q. What about in the electrical switch
22 gear, how would the PCBs be used in the electrical
23 switch gear?

24 A. Again, as a heat dissipating device.

25 Q. Would it be used in these push buttons,

1 also?

2 A. I have personally not seen any push
3 button with PCB containing units.

4 Q. You mentioned one of the products you
5 used as a heat transfer medium, PCBs are used in
6 the heat transfer medium. What are some of the
7 uses of the heat transfer medium?

8 A. For example, they are used to cook
9 varnishes, and to avoid the use of an open flame
10 under the varnish pots, the heating of the PCB
11 would occur in one room, the hot PCB would be
12 transferred to the varnish pot, transfer -- the
13 heat would transfer to the varnish, and the cool
14 PCB would return back to the fired unit to be
15 reheated, and that is the heat -- a typical heat
16 transfer system.

17 Q. Have you ever seen that product used for
18 ethylene oxide units?

19 A. No. It is widely used throughout many
20 industries in those cases where flammable
21 materials are present and must be heated. And
22 avoiding direct contact of the heat source to the
23 flammable material.

24 Q. Is that use of PCBs still ongoing?

25 A. Yes.

1 I'm sorry, not with PCBs.

2 Q. Are there any uses of PCBs ongoing right
3 now that your aware of?

4 A. The only one I am aware of are the
5 permitted use in transformers and capacitors that
6 are in place, not new ones.

7 Q. Do you know if anyone has used PCBs for
8 encapsulization for other applications,
9 encapsulated PCBs in a material to be used in
10 other types of operations?

11 A. Yes.

12 Q. What kinds of encapsulation processes
13 are you familiar with?

14 A. The only one I am familiar with were the
15 carbonless copy paper application, which I think
16 is encapsulated, and the encapsulation included
17 PCBs as a co-solvent.

18 Q. Has the electrical industry or
19 electronics industry used encapsulation in any of
20 their components that you are aware of?

21 A. I don't know.

22 Q. Do you know if any other companies
23 marketed PCBs in the United States?

24 A. I received reports at one point in time
25 that there were some companies involved in the

1 sale of PCBs. That is as far as I got with my
2 information.

3 Q. Do you recall what those reports said,
4 who it was and where it was and what it was for?

5 A. Well, it was relating to our withdrawal
6 from the heat transfer application, and I got
7 reports from the -- I believe it was the U.S.
8 Geodetic -- one of the government industries, I
9 think it was U.S. Geodetic Survey, that had
10 something to do with the offshore drilling rigs,
11 that indicated that the drilling rig operators
12 were obtaining replacement PCBs from other
13 companies after we had withdrawn.

14 The reports I got at the time were
15 Coastal Chemical and Geneva Chemical.

16 Q. Are those foreign operations?

17 A. I don't know.

18 Q. Was Monsanto the only domestic
19 manufacturer of PCBs, U.S. manufacturer?

20 A. To my knowledge, yes.

21 Q. Do you know if GE or Westinghouse
22 obtained any of their PCBs from any foreign
23 manufacturers?

24 A. I do not know.

25 Q. What about the other chemical

1 manufacturers -- excuse me, not chemical
2 manufacturers, but electrical equipment
3 manufacturers, do you know if they bought any
4 foreign PCB?

5 A. I do not know.

6 Q. Have you ever seen any figures on
7 imports of PCB materials into this country?

8 A. I recall some figures that were obtained
9 from the Department of Commerce in about 1972 or
10 thereabouts. Prior to that, there were no figures
11 available to any government agency, that I could
12 determine.

13 Q. What did you find in '72 or '73?

14 A. I forget the exact numbers. As I
15 recall, they were primarily associated with PCBs
16 present in equipment and apparatus, rather than
17 PCBs shipped in containers. I have forgotten the
18 numbers.

19 Q. The florescent lighting fixtures, I
20 understand they have something called a ballast in
21 them and this had PCBs in it, is that your
22 understanding?

23 A. Some of them do.

24 Q. Do you know how you can determine which
25 ones do and which ones don't?

1 A. My layman's approach is the single tube
2 florescent fixture does not have a ballast which
3 contains PCBs. Multiple tubes are very likely to
4 contain some PCB.

5 Q. Does it make any difference if it has
6 one of these little tin can starter units?

7 A. Yes, that is the single unit. That does
8 not have PCBs.

9 Q. So if it has the little screw-in tin
10 can, then you know your unit doesn't have PCBs in
11 it?

12 A. That is my understanding, yes.

13 Q. If it has one of these black boxes in it
14 that is two or three inches tall and two or three
15 inches wide and six to ten inches wide, that is
16 where the PCBs would be?

17 A. Yes.

18 Q. I call it a ballast. Do you know what
19 it really is?

20 A. Again, I am not an electrical engineer,
21 but I understand that is a combination of a little
22 transformer and a capacitor. Together they
23 operate to give the right charge of electricity to
24 start the glowing of the tube.

25 Q. Do you know how the PCBs were used in

1 these ballasts of florescent lights?

2 A. I understand it was in the capacitor
3 portion.

4 Q. My experience has been that sometimes
5 these things have a kind of a gooey material that
6 comes out of them. Is that where the PCBs are?

7 A. Some of that is PCBs, but the amount of
8 PCBs is very low, an ounce or so. It is my
9 understanding it is not very great.

10 Q. An ounce or so of the entire ballast
11 weight would be PCBs?

12 A. Yes.

13 Q. When one buys Aroclor, I understand it
14 comes with different numbers after, it is Aroclor
15 something or another, and as I recall from reading
16 the last two digits tell you the percent of
17 chlorination?

18 A. Yes.

19 Q. Is that a range? In other words, if I
20 buy Aroclor 1260, does that mean it is about sixty
21 percent chlorinated?

22 A. I would word it a little differently.

23 Q. Tell me what it means?

24 A. I would say of that total weight of
25 Aroclor 1260, 60 percent by weight is chlorine.

1 Q. Is there a cut-off? I mean, the
2 difference between Arochlor 1240 and Arochlor 1260,
3 would there be a range in there, 1240 is thirty to
4 fifty and 1260 is fifty to seventy?

5 A. That is a range, but it is not that
6 wide. The specification calls for fairly narrow
7 range. So when you see 1260, it is sixty-nine
8 point something to sixty point something. So it
9 is not too great a range in terms of total
10 chlorine.

11 Q. Chemically, is there much variation
12 between 1260 that is made today and 1260 that is
13 made a year later?

14 A. No. It is pretty consistent.

15 Q. If you dipped into some 1260 and got
16 some of it, what chemicals would you expect to
17 find there? I mean, are all of the PCBs sixty
18 percent chlorinated or is it a mixture?

19 A. It is a mixture.

20 Q. Tell me how that mixture varies?

21 A. I would expect to find in a 1260 the
22 single chlorinated type, the two chlorine, three
23 chlorine, four, five, six, seven, eight, but the
24 amount of the five, six, seven and eight would be
25 greater, higher than I would find in, say, the

1 Aroclor 1242 version.

2 Q. So it is a distribution of these
3 different chemicals and it is sort of the average
4 or the most of the chemicals located that
5 determines what the Aroclor is?

6 I may not have said that very
7 eloquently.

8 A. Yes, that points out the differences in
9 these mixtures.

10 Q. Would -- if you took one of the lower
11 chlorinated weights of Aroclors and compared it to
12 one of the higher chlorinated Aroclors, some
13 disappear?

14 A. Yes. They lower chlorinated would be
15 highly unlikely to contain the seven and eight
16 chlorine; whereas the higher chlorinated would be
17 less likely to contain very much of these single
18 and double two chlorine. So there is a shift that
19 takes place. But there is an overlap of the two
20 mixtures.

21 Q. What would be the lowest chlorinated
22 Aroclor that you would sell?

23 A. We had an Aroclor 1221.

24 Q. In 1221, would you expect there would be
25 some eight chlorine biphenyls or just none at all?

1 A. None at all of that low chlorine.

2 Q. What about on the other end of the
3 spectrum, you said you made some of the ten
4 chlorine versions, did that have an Aroclor
5 number?

6 A. Yes. It was Aroclor 1272, sir. That
7 was seventy-two percent is the maximum.

8 Q. And at 1272 or -- what would be the next
9 one down that you more commonly made than that?

10 A. Commonly made would be 1260.

11 Q. The 1260 material, would you expect to
12 find some one and two chlorine biphenyls in that?

13 A. A little bit would be detected.

14 Q. What was the, I guess, the best seller
15 over the years?

16 A. Best seller? I believe Aroclor 1242.

17 Q. And what was 1242's primary use?

18 A. I don't know that I recall its primary
19 use. It was widely used in capacitors and in some
20 transformers, in some coatings. It was used in
21 the carbonless copy paper application, which was a
22 large user when it was fully developed. It was
23 used in heat transfer fluids and in the vacuum
24 pumps. So it covered just about all the uses.

25 Q. What was the largest seller that was

1 sold as Pyranols?

2 A. That I don't know. I don't remember the
3 different Pyranol numbers.

4 Q. Same thing for Inerteen?

5 A. Correct.

6 Q. You mentioned coatings. I don't think
7 we have talked about coatings, yet. How were PCBs
8 used in coatings?

9 A. Paints and varnishes is what I had in
10 mind when I talked about coatings. Specialty
11 paints contained some PCBs to give them long
12 wearing properties, like the traffic lanes that
13 are painted on highways, or paints that were
14 exposed to high temperatures, it could resist heat
15 a little better, or ship hulls, boat hulls.

16 Q. Were the PCBs ever used for any -- well,
17 there is a term and it has gone from my mind, used
18 -- these marine paints that have had in the past
19 mercurials and other kinds of materials on them to
20 keep the barnacles from growing on the ships, did
21 it have any use -- and there is a name for that
22 that I can't remember --

23 A. I understand PCBs did give the coating a
24 property that would reduce the formation of
25 barnacles.

1 Q. Do you know who had the patent or the
2 license for the carbonless paper in PCBs?

3 A. NCR.

4 Q. Did they develop that process, NCR?

5 A. Yes.

6 Q. Did Monsanto have any involvement in
7 developing that process?

8 A. No.

9 Q. Do you know how they came about using
10 PCBs in the carbonless paper process?

11 A. I'm sorry?

12 Q. Do you know how NCR came about using PCB
13 in their carbonless paper process?

14 A. No, I don't.

15 Q. What time period has the epidemiological
16 program at Monsanto been under your supervision?

17 A. I wouldn't say that it has ever been
18 under my supervision.

19 Q. I'm sorry, I thought a while ago when
20 you were telling me you were the manager or
21 director, that epidemiology came under your
22 auspices?

23 A. I relate to it, I use Dr. Gaffey as my
24 in-house consultant, and I interface with the
25 plants that provide the data that Dr. Gaffey uses

1 in his studies.

2 Q. About how long have you been doing in
3 that?

4 A. Ever since I was appointed a director of
5 environmental operations, which was about 1977.

6 Q. Was Dr. Gaffey here when you got that
7 appointment or did he come shortly after?

8 A. He came shortly after that. I don't
9 recall what year.

10 Q. And Judith Zack was doing that work
11 before Dr. Gaffey?

12 A. Yes.

13 Q. How long had Judy Zack been doing that
14 work? Was she there when you came or got into
15 this position?

16 A. Yes. She was active at the time. A
17 couple of years, as best I recall.

18 Q. Do you know if anybody preceded Judy
19 Zack as an epidemiologist or was she Monsanto's
20 first?

21 A. I would say she was Monsanto's first.

22 Q. Did she and Dr. Gaffey work together
23 any?

24 A. I believe there was a brief period when
25 their careers overlapped, yes, but I don't

1 remember the specifics.

2 Q. Did Judy Zack have a Ph.D?

3 A. I don't know.

4 Q. When Dr. Gaffey and Judy Zack

5 overlapped, who was on top of the overlapping, who

6 reported to who?

7 A. It is my understanding Dr. Gaffey was

8 the head of the department, so --

9 Q. So he was hired in over Judy Zack?

10 A. Yes.

11 Q. You mentioned a while ago that one of

12 your duties was to coordinate with the plants to

13 get data for epidemiology. Have you been involved

14 in estimating or obtaining exposure data in

15 epidemiological studies involving PCBs?

16 A. Not directly, no.

17 Q. Has it been done? Not to my knowledge.

18 Q. I take it you have some familiarity with

19 epidemiological studies?

20 A. A little bit, yes.

21 Q. It is done in a way that exposure

22 indices are determined, either through actual

23 monitoring or through estimations made by

24 industrial hygienists or others as to exposure,

25 are you familiar with that?

1 A. Yes.

2 Q. Has that ever been done for any of the
3 employees who manufactured or worked in these PCB
4 plants?

5 A. I don't know the depth to which it was
6 done, but something in the way of such a study has
7 been done. But I don't know if the distinction
8 has been any more refined than they worked in that
9 unit or not.

10 Q. I take it from your earlier discussions
11 here today that you have visited these plants
12 where PCBs were made?

13 A. Oh, yes.

14 Q. Which plant would you say would have the
15 higher exposure?

16 MR. HALL: Would you read that question?

17 (The requested portion of the record
18 read by the reporter).

19 MR. HALL: Do you understand that
20 question?

21 A. I don't know that I understand it
22 totally.

23 At what point in time I guess is my
24 dilemma.

25 Q. Well, obviously --

1 A. When I visited them?

2 Q. Yes. I want to ask you about your
3 knowledge, first of all, when you saw these
4 plants. You told me workers there would have
5 greater exposure than the ones at Sauget?

6 MS. OLIVER: I object, foundation, as far
7 as it calls for some kind of scientific conclusion
8 that Mr. Papageorge may not be able to give us.

9 MR. HOBSON: If he can't give me, he
10 can't give me.

11 A. The potential for exposure was, to some
12 degree, greater at the older unit; however, the
13 use of protective equipment helped overcome or
14 prevent exposure. So when I look at the worker,
15 per se, I would say that exposure was equivalent,
16 practically nil.

17 Q. Whatever exposure, if any, you think,
18 then, based on your understanding of what is going
19 on out there, that the employees at each of these
20 plants would have been equally exposed, if exposed
21 at all?

22 A. Yes.

23 Q. What about over time, can you tell me if
24 based on your experience and knowledge, if you
25 have any experience and knowledge, would exposures

1 have been greater in, say, the 1930s when these
2 plants were operating or would they have been
3 greater in the '40s or '50s or would it go the
4 other way?

5 MS. OLIVER: Same objection as to lack of
6 foundation.

7 A. My understanding is that the thirties,
8 there were some incidences that led to an
9 acquiring of some information that helped us
10 understand what PCBs would do to skin and to
11 respiratory systems, which supported what the
12 animal studies had previously told us. So from
13 those experiences in the thirties, led to the use
14 of respirators when vapors were available or
15 present, the use of gloves, instead of bare hands,
16 and the washing of work clothes, removal of
17 contaminated work clothes. So the early thirties
18 were a learning experience, and later on, I am not
19 aware of any unusual situation, other than the
20 dusting that occurred when we made that special
21 material which was something new that they had to
22 learn how to cope with.

23 Q. What kinds of respirators were being
24 used at the plant, do you know?

25 A. I don't remember the makes and models.

1 It is the half face organic vapor type.

2 Q. Half face dual cartridge air purifying
3 respirator?

4 A. Yes.

5 Q. And used organic cartridges?

6 A. Yes.

7 Q. Do you know if the organic vapor
8 cartridges were verified for effectiveness against
9 PCBs?

10 A. No, I don't.

11 Q. What kind of gloves were they using?

12 A. Well, again I don't remember the
13 specifics, but they were a black rubber like
14 material.

15 Q. You don't know which particular material
16 they were made from?

17 A. I don't remember. At one time I did,
18 but I don't remember.

19 Q. When did --

20 MR. HALL: Were you through?

21 Q. I'm sorry, I didn't mean to interrupt
22 you.

23 A. I do remember there was no material that
24 was effective for long, so we had to buy many new
25 gloves, just keep throwing them away and getting

1 new ones.

2 Q. I was going to ask you about the -- how
3 readily penetrated the gloves were by the PCBs?

4 A. Well, they would swell before they would
5 penetrate to the point where they weren't
6 useable. So that was the indicator, throw them
7 away and get new once.

8 Q. Do you know if any studies have been
9 conducted about the ability of PCBs to penetrate
10 different glove materials?

11 A. I am not aware of any.

12 Q. When did you say the respirators and
13 gloves were regularly begun to be used in the
14 manufacturing facilities? Is that the thirties?

15 A. No. They were, of course, in place in
16 the sixties when I was involved, and the best I
17 can recall, in the fifties they were introduced.

18 Q. So at least by the fifties you all were
19 aware in your manufacturing facilities that
20 respirators or gloves and protective equipment
21 were necessary?

22 A. Yes, plus clothing.

23 Q. The clothing that the workers wore, was
24 it provided by Monsanto?

25 A. Yes.

1 Q. Was it thrown away or was it laundered?

2 A. Laundered.

3 Q. Do you know if it mattered whether it
4 was laundered with soap and water or whether it
5 had to be drycleaned?

6 A. I don't remember.

7 Q. In telling me what you did earlier, I
8 didn't recall that you said anything about
9 toxicology. Do you have any input or interface
10 with toxicology?

11 A. The interface is one where I am aware of
12 the results of their studies, and apply them
13 through the industrial hygienist to the
14 workplace.

15 Q. I think one of the jobs you told me
16 about was product acceptability?

17 A. Yes.

18 Q. Did that involve evaluation of products
19 for the toxilological properties?

20 A. Yes. At that time, I had a direct
21 interface with the toxicologist.

22 Q. Does Monsanto practice what I would term
23 tier testing? Have you ever heard that
24 terminology?

25 A. Yes.

1 Q. Do you do that?

2 A. Yes.

3 Q. Can you describe to me your tier testing
4 program?

5 A. It varies from product to product; but
6 the sequence is one of starting off with what is
7 commonly referred to as acute toxicity testing,
8 which involves inhalation, skin, exposures to
9 determine, in a relative fashion, the toxicity of
10 that new material or that product. This is
11 normally followed to the next tier in a thirty day
12 study. It might be a feeding study or an
13 inhalation study or skin absorption, depending on
14 what is perceived to be the most apt problem of
15 exposure to humans.

16 The next step would be a subchronic
17 series of, say, ninety-day study. And finally,
18 there would be a lifetime study with laboratory
19 animals which is about two years. And depending
20 on the product, there would be some, what I would
21 refer to as special studies, mutagenicity,
22 reproduction, teratogenicity, depending on the
23 toxicologist's opinion as to how it might resemble
24 a known material that any suspicions that he may
25 have as to what might happen.

1 The intent is to conduct the studies in
2 a sequential fashion so the results of a study
3 helped plan the next study, what direction the
4 total program should be headed. That is my
5 exposure to tier study at Monsanto.

6 Q. Can you tell me, in general, what
7 triggers each tier? In other words, when you
8 would begin the first tier, and what would trigger
9 the second tier and the third tier, and so on?

10 A. Well, within Monsanto, we have a
11 procedure that follows a development of a product
12 through the laboratory, through research. Before
13 our researchers can send samples of a new product
14 to potential customers for evaluation, the first
15 tier of studies must be completed, and we pass the
16 findings of those studies on to the person
17 receiving the sample.

18 And we also need that information for
19 shipping those samples, putting the proper labels
20 on them. If there is any promise to that product,
21 as indicated by the customer or potential
22 customer's reaction, we then embark on the second
23 set, the ninety-day studies. Depending on the
24 results of those ninety-day studies, and the
25 professional opinion of the toxicologist, we may

1 approve the production in limited quantities of
2 that product shipped to known customers. On the
3 other hand, if there is some adverse findings we
4 proceed, then, with the two year studies.

5 Final approval for marketing a product
6 must wait until all studies are completed and the
7 results evaluated. So it is tied in with the
8 progress that a product makes from the laboratory
9 bench to the production unit.

10 Q. Can you tell me approximately when
11 Monsanto began their tier testing approach?

12 A. I don't personally know of a specific
13 date. Some products had tier testing from back in
14 the '40s and '50s. It became a -- I guess a
15 standard approach in the middle '70s, as best I
16 recall.

17 Q. Are you familiar with the term called
18 product shepherdizing?

19 A. No.

20 MR. HALL: Could we take a brief break
21 here?

22 MR. HOBSON: Yes.

23 (Recess.)

24 BY MR. HOBSON:

25 Q. Mr. Papageorge, I think when we took our

1 break, I was asking you about shepherdizing
2 programs, and I think you said you didn't
3 recognize that term. What I have in mind is are
4 you familiar with any procedures whereby
5 manufacturer of a product will retain control over
6 how that product is used or handled after its
7 sale?

8 Classic example that you might or might
9 not know about is Ethyl Corporation where they
10 sold Tricepdid (sic.) for years and years, and you
11 mentioned you worked with Philips, Ethyl specified
12 the design of the lead handling facilities and
13 retained to right to come in and inspect them and
14 train employees, does that strike a --

15 A. I am aware of the Ethyl program. I am
16 not aware of similar programs.

17 Q. I was going to ask you whether Monsanto
18 had any similar programs for any of their
19 products?

20 A. No. Not that I know of.

21 Q. Do you know whether anybody besides
22 Ethyl had those kinds of programs?

23 A. No, I do not.

24 Q. Do you have any input to the reports of
25 studies that are conducted by Monsanto, for

1 instance, epidemiological studies, would those
2 studies come to your desk for your comment and
3 review before they are released or published?

4 A. Not normally.

5 Q. Do you know if Monsanto has ever had any
6 business dealings with a company called
7 Research-Cottrell?

8 A. I am aware of Research-Cottrell, and I
9 am also aware that our engineering people have had
10 contacts with Research-Cottrell people, but I do
11 not know the specifics.

12 Q. But I want to limit my questions right
13 now to PCBs. Do you know if any work with
14 Research-Cottrell with PCBs has ever been done,
15 sold them for any product for use in their product
16 or anything like that?

17 A. I don't remember.

18 Q. Who would be a more likely person to ask
19 that question to than you, if you know of anybody
20 at Monsanto that could tell us about the business
21 dealings of Monsanto and Research-Cottrell?

22 A. Someone at the marketing sales
23 organization at the point in time for which you
24 want to question. It would be a marketing
25 person.

1 Q. I take it that your job has given you
2 the opportunity to become somewhat familiar with
3 the medical and scientific literature that
4 surrounds PCBs and their use; is that correct?

5 A. Yes.

6 Q. When, in the medical and scientific
7 literature, published literature, could you go and
8 find mention of potential for some kind of health
9 hazard associated with PCBs?

10 MR. HALL: Would you read that back for
11 me?

12 A. I am confused by the word when.

13 Q. About what year?

14 A. You mean the report was published?

15 Q. Yes, sir.

16 A. This is the literature available to the
17 general public?

18 Q. Right. Well, general public, scientific
19 people. If you had a medical doctor or industrial
20 hygienist that wanted to go find out something
21 about a product?

22 A. The earliest I recall was, and I have
23 forgotten the formal title, it is a hygienic
24 review that reported acute studies that were
25 conducted, the results of these studies, and

1 recommended an exposure level in the workplace. I
2 think it is the American Hygienic -- the name
3 escapes me, but I recall a pamphlet or bulletin
4 that was available in the 1950s.

5 Q. American Conference of Industrial
6 Hygienists?

7 A. That is another group that picked up
8 these values, but it seems to me there was another
9 study that preceded that.

10 Q. But mid '50s?

11 A. They are related.

12 In the '50s.

13 Q. So at least from the '50s, some
14 precautions, at least potentially, ought to be
15 associated with PCBs?

16 MR. SULLIVAN: I am going to object to
17 the form of the question because I don't think the
18 question specifies precautions as to whom. I
19 don't think there has been any clarification as to
20 who this type of knowledge can be imputed to. So
21 I think the question is clearly overly broad.

22 Q. If you can, answer, Mr. Papageorge?

23 A. I remember you said in the '50s some
24 precautions. There were precautions existing
25 prior to that on labels.

1 Q. All right. Let's talk about that,
2 then. What precautions on what labels were you
3 referring to?

4 A. Monsanto's products which contained
5 PCBs, on their labels had precautionary statements
6 referring to breathing of vapors and exposure to
7 skin.

8 Q. When were those incorporated on the
9 labels, approximately?

10 A. Starting almost from the beginning. The
11 '30s, '40s.

12 Q. What would those labels have been put on
13 to?

14 A. They were put on the smaller packages as
15 distinguished from the trucks and tank cars. And
16 they were also included in the trade literature
17 and brochures that were published off and on by
18 Monsanto.

19 Q. What were the uses of these brochures
20 and items that you have just discussed? I don't
21 understand what you mean by that.

22 A. They were publications that describe the
23 products, describe known applications of those
24 products, and also in some instances, suggested
25 other applications that hadn't been fully

1 developed, but appeared to be promising, so they
2 were both describing known situations and
3 suggesting further uses. It is sort of
4 advertising literature for the product lines. And
5 in there, each of these, there is a section on
6 safety and health, and describes precautions to be
7 taken.

8 Q. I think in response to one of my earlier
9 questions you told me about, or at least in my
10 mind I think you told me about some observations
11 that Monsanto made in its manufacturing facilities
12 early on about some problems that led to the use
13 of gloves and respirators and clothing.

14 Are these the dermatological problems
15 that you are talking about?

16 A. Yes, determine a logical was some of the
17 -- the reddening of the hands and so on was noted.

18 Q. And chloracne problems?

19 A. Chloracne didn't appear until we made
20 that one special run of that 1272 type. But
21 chloracne was suspected because of that kind of
22 chemical. Chlorinated hydrocarbons have that
23 reputation.

24 Q. The labeling that you had on your
25 product in the '30s and '40s, would it address

1 those kinds of hazards?

2 A. It addressed skin and respiratory
3 problems, yes.

4 Q. Tell me about the respiratory problems.
5 What did it address from the way of respiratory
6 problems?

7 A. I forget the exact words, but it
8 cautioned do not inhale vapors or avoid inhaling
9 vapors. I forget the exact words.

10 Q. Do you know why that precaution dealing
11 with respiratory hazards were on the products? In
12 other words, what outcome were you guarding
13 against with that kind of information?

14 A. We were guarding against irritation. It
15 is even more than that. The severe harm to a
16 respiratory system that I have been told
17 represents a severe cold, a sore throat, irritated
18 nostrils, pain in the chest that comes from
19 exposure to these kinds of materials.

20 Q. Exposure via the respiratory route?

21 A. Yes.

22 Q. So skin exposure, wearing gloves and
23 that sort of thing was directed more at the red
24 hands and respiratory hazards, the cold like
25 symptoms you were trying to prevent; is that

1 right?

2 A. Yes.

3 Q. Were the respiratory symptoms and the
4 dermatological problems something that you could
5 find in the medical and scientific literature in
6 the '50s?

7 A. Yes.

8 Q. Was that literature published in the
9 United States, to your knowledge?

10 A. The only one I can address is the
11 article I tried to describe earlier where they did
12 end up with a recommended exposure level. As I
13 recall, there was a summary of these kinds of
14 effects in that brochure, or that pamphlet.

15 Q. And that would have been in the '50s?

16 A. Yes.

17 Q. When did your career at Monsanto get
18 involved with health effects of PCBs as a part of
19 your regular job, and if I didn't ask that very
20 well, I will maybe come at it this way: I think
21 you said in 1970 that your job changed to an
22 environmental -- I think you said you got more
23 involved or got involved with the PCB issue, if I
24 remember your response.

25 A. Yes.

1 Q. Is that when it was, 1970 that this took
2 more of your time?

3 A. Yes.

4 Q. What precipitated you finding that job
5 or that job finding you or do you know?

6 A. In the late '60s, laboratories
7 throughout the world, in looking for DDTs, found
8 evidence that PCBs were present in samples. And
9 Monsanto became aware of that, started some early
10 investigations. So by late 1969, Monsanto was
11 concerned that these PCBs, which are man made,
12 which was one of our products, were being found in
13 samples that -- that, to Monsanto, were
14 surprising. And it did effect many of our
15 products, and it involved, within Monsanto at that
16 time, two business groups, and that is when they
17 felt that they needed someone to help coordinate
18 the flow of information from the outside and
19 within Monsanto regarding PCBs. That is when the
20 job was created. Then I was asked to help.

21 Q. Which two business groups were these
22 that were involved?

23 A. At that time, they were called the
24 plasticizers group and the other I remember was
25 the functional fluids group.

1 Q. I don't recall that we talked much about
2 the plasticizer application of PCBs. Can you tell
3 me something about that?

4 A. I think a more descriptive words, at
5 least it helps me, is called miscellaneous uses.
6 These are the applications that we talked earlier
7 about, paints and varnishes, plasticizing of
8 plastics, making them more flexible, wire coatings
9 or other plastic articles, the carbonless copy
10 paper, all of those uses which the PCBs were
11 incorporated with other chemicals in a finished
12 product as distinguished from the fluid existing
13 and maintaining that identity as a PCB and heat
14 transfer fluid or hydraulic fluid or dielectric
15 fluid, which were the functional fluids group.

16 Q. These miscellaneous applications,
17 coatings and carbonless paper, when PCBs are used
18 in those, if you need to break it down for me,
19 please do so, are the PCBs reacted with the other
20 materials that make up the system or do they
21 continue to exist identifiably and chemically?

22 A. In most cases, they maintain their
23 identity. They do not react chemically.

24 Q. And I guess in a way, that is one of the
25 problems with PCBs, they don't react chemically

1 and that is why they are persistent in the
2 environment?

3 A. Yes.

4 Q. Do PCBs exist naturally in the
5 environment?

6 A. Not that I am aware of.

7 Q. So when we say PCB, they are man made?

8 A. That is my understanding.

9 Q. When do you recall, if you recall, the
10 potential discussion of the potential of PCBs to
11 cause cancer, either in animals or man or through
12 some test system fall into this story about PCBs?

13 A. The first report that I was aware of
14 which related cancer to PCB was a report of a
15 study conducted by Dr. Kembro, Renata Kembro, in
16 which she reported that the animals she tested
17 showed cancerous livers. That is, as best I
18 recall, the first association of cancer and PCBs.

19 Q. Do you recall about when that was?

20 A. Yes. About 1974.

21 Q. That would be after you took this
22 coordinating job that you told me about between
23 the two divisions?

24 A. Yes.

25 Q. Who is Dr. Kembro?

1 A. She, at the time, was a member of the
2 Center for Disease Control in Atlanta, Georgia.
3 No, let me correct that.

4 I believe when she started the study,
5 she was a member of the Food and Drug
6 Administration located in Atlanta. Later she
7 joined or was a member of the Center for Disease
8 Control.

9 Q. Do you know what products she tested?

10 A. Yes.

11 Q. Which one was that?

12 A. Aroclor 1260.

13 Q. Did it prove out to be she, indeed, had
14 liver cancer in her animals?

15 A. I don't know that any proof was
16 definitely established. There was a disagreement
17 between toxicologists. I don't know it was ever
18 resolved.

19 Q. Some folks said it was cancerous and
20 some said it was a non-cancerous tumor?

21 A. That's right.

22 Q. What is the state of the knowledge
23 today, as you know, about the cancer potential for
24 PCBs, and if you need to break that out for man,
25 animals or test systems, feel free?

1 MR. SULLIVAN: I am going to object to
2 the form of the question in there are obviously
3 fifteen forms of cancer, and I think the question
4 is ambiguous, at best, with respect to what you
5 are asking of the witness.

6 MS. OLIVER: I am also going to object on
7 the grounds that that asks for a medical opinion
8 to have any real usefulness in a case like this,
9 and Mr. Papageorge can't give us that opinion.

10 Q. You can still answer, if you can, Mr.
11 Papageorge.

12 A. I am aware of a study conducted by the
13 National Cancer Institute with Aroclor 1254 in
14 which they found no evidence of cancer.

15 Q. Is that animal study?

16 A. Animal study.

17 MR. SULLIVAN: You said what? I'm sorry?

18 A. Aroclor 1254 was studied by the National
19 Cancer Institute and found no evidence of cancer,
20 lifetime study of rats.

21 I have not seen, personally, any
22 scientific report that associates cancer with
23 humans and PCBs.

24 Q. Do you know if it has been tested --
25 PCBs have been tested by the screening system

1 sister chromatid exchange?

2 A. I am aware only those studies were
3 conducted, but I don't know the results.

4 Q. Do you know what Monsanto's position is
5 about the carcinogenicity of PCBs today?

6 A. Yes.

7 Q. Can you tell us what that is?

8 A. It is not a human carcinogen, and it is
9 not even a suspect animal carcinogen.

10 Q. Did you have anything to do with the
11 testing of -- in the PCBs by stream bounds test,
12 bio test?

13 A. Well, I was involved. I don't know what
14 you mean by anything to do. I visited the
15 laboratories, I was made aware of progress,
16 periodically I would get a report on the
17 findings.

18 Q. Do you know if anybody ever determined
19 that adequate quality control was maintained on
20 those tests by IBT?

21 A. I believe that our Monsanto quality
22 control group studied those reports from those
23 studies to determine that it was acceptable.

24 Q. Are you familiar with the problems that
25 IBT got into about their quality control program?

1 A. Yes, I am.

2 Q. And do you know if Monsanto determined
3 that your studies were not involved in IBT's
4 problems?

5 A. It is my understanding that the PCB
6 studies were completed long before the IBT people
7 had their problem.

8 Q. Have you given testimony to any
9 governmental bodies regarding PCBs and the alleged
10 or potential for health hazards?

11 A. I have not personally done so, no.

12 Q. What studies are you aware of, if any,
13 that Monsanto has done on their own workers that
14 have been exposed to PCBs?

15 A. I am aware of an epidemiology study that
16 was started by Judith Zack. I am also aware that
17 there is further study of that same cohort. I do
18 not know the results. I do know the results from
19 Mrs. Zack's studies.

20 MR. HALL: Zack?

21 A. Zack, I'm sorry, Zack, Z-A.

22 Q. Do you know if the follow-up study has
23 been completed?

24 A. I do not know.

25 Q. You told me about the different uses in

1 the trade name of the PCBs that Monsanto makes.
2 Would the handling of those materials all be in
3 these four plants you told me about or does
4 Monsanto take some of the PCBs it manufactures at
5 its four manufacturing plants and transport those
6 to another locations for further processing or
7 packaging or utilization in some way?

8 A. Yes, it has happened.

9 Q. Can you tell me about how it has been
10 transported away from those four facilities, and
11 what handling or application has been made?

12 A. Well, most of the material transferred
13 from the producing units to another Monsanto unit
14 was done with rail cars. Occasionally, it would
15 be transferred in steel drums. The John F.
16 Queenie plant in St. Louis was the site to which
17 PCBs would be shipped, and these PCBs would be
18 blended with other ingredients to produce the
19 hydraulic fluids which were sold under the Pyranol
20 trademark.

21 Other Monsanto sites receive PCBs,
22 either in drums or tank cars, for use at their
23 site in their equipment, not to produce a shippable
24 product.

25 Q. Like heat exchange?

1 A. Heat exchange or compressor fluid.

2 Q. Any other transfer applications that you
3 can think of?

4 A. Between Monsanto plants, no.

5 Q. Do you know if Monsanto has ever
6 contracted with anyone to handle PCB materials on
7 behalf of Monsanto? In other words, facility that
8 packaged them for you or did something else for
9 you with those materials, an extension of your
10 operations?

11 A. The only arrangement I am aware of is
12 the use of distributors who would receive the
13 packaged material for their inventory. They, in
14 turn, would resell it.

15 Q. Does Monsanto put any restrictions for
16 reuse on the containers that PCBs were shipped
17 in?

18 A. I don't recall the specific instructions
19 regarding the containers, no.

20 Q. Do you know if PCBs are absorbed through
21 the skin?

22 I should say the intact human skin, to
23 be clear.

24 A. I have that understanding, yes.

25 Q. Do you know if there has ever been a

1 study done to determine whether or not the
2 temperature of the medium, of the PCB has any
3 affect on skin absorption?

4 A. I am not aware of such a study.

5 Q. Have you ever been tested to determine
6 the PCB content of your body?

7 A. No.

8 Q. Is that something that Monsanto has done
9 for any 11 of its employees that you are aware
10 of?

11 A. Not that I know of.

12 Q. Do you know if any biological monitoring
13 was done of employees, for instance, blood samples
14 or urine or something like that to determine if
15 they were exposed to PCBs?

16 A. Not that I know of.

17 Q. Are there any trade associations that
18 you know of that have had an involvement with any
19 of the potential hazards or with the regulatory
20 activities that surround PCBs?

21 A. Yes.

22 Q. Which ones have been active?

23 A. There is the NEMA, National Electrical
24 Manufacturers Association, and they eventually
25 work through ANSI, the American National Standards

1 Institute. Then there was the -- I believe it is
2 EEI. I think it is the Edison Electric Institute,
3 but I am not certain. It is EEI. I can't recall
4 any others.

5 Q. Is Monsanto a member of CIIT?

6 A. Yes.

7 Q. Do you know if CIIT has ever done any
8 work on PCBs?

9 A. Not that I know of.

10 Q. What have NEMA and ANSI done with regard
11 to PCBs?

12 A. They issued a guideline document on the
13 appropriate handling and disposal of dielectric
14 fluids.

15 Q. Do you know about when that was issued?

16 A. Yes. There were versions available in
17 1972 under the NEMA logo. The ANSI version I
18 recall came out about 1974.

19 Q. Is that something you have in your
20 files, the NEMA and ANSI versions?

21 A. Not any more.

22 Q. In general, can you tell me what kinds
23 of handling precautions the NEMA paper in 1972
24 would have included?

25 A. In general, it talked about avoiding

1 skin contact and breathing of vapors and referred
2 to protective gloves, it referred to hand creams,
3 barrier creams, it referred to just cleanliness,
4 in general, and it went on to discuss disposal
5 methods, recommended incineration sites, waste
6 material.

7 Q. What --

8 A. That is all that comes to mind at the
9 moment.

10 Q. EEI, do you recall what the work they
11 did involved?

12 A. They prepared a document, a position
13 paper which summarized PCBs for their members and
14 they also were active in contacting governmental
15 agencies and some of the members of Congress and
16 the intent, as I recall, of that group was to
17 demonstrate that PCBs would be difficult to
18 replace, that continued use in some applications
19 was justifiable.

20 Q. If I had a fifty-five gallon drum of PCB
21 material today that I wanted to get rid of, how
22 would I go about doing that?

23 A. Well, I would suggest to you that you
24 contact the Rollins incinerating operation in Dear
25 Park, Texas, and arrange for a proper shipment so

1 they don't spill it en route, and Rollins people
2 will incinerate it for you.

3 Q. Are they the only one that do that kind
4 of business?

5 A. I believe they are at the moment, yes.

6 Q. Has Monsanto ever taken upon themselves
7 to bring this material back for disposal?

8 A. There was a period of time when we did
9 have that service, yes.

10 Q. What did that involve and where was it
11 and what did you do?

12 A. We had an incinerator installed at the
13 Sauget, Illinois plant which was capable of
14 destroying liquid PCB wastes, and we would tell
15 our -- encourage our customers to collect the
16 material in sturdy drums that could withstand the
17 trip back, and we would supply labels with the
18 proper precautionary words on it, and give them an
19 address, ship to address, and we would attempt to
20 charge a fee that would sort of pay for the
21 operation without any profit motive. And it was
22 used quite extensively.

23 Q. What time period did that occur,
24 approximately?

25 A. I'm sorry?

1 Q. What time period, approximately, that
2 can you remember?

3 A. We started collecting the material in
4 late 1970. The unit was placed on stream in early
5 '71, and was finally dismantled when we ceased
6 operations in '77.

7 Q. Is there a reason why you ceased that
8 operation?

9 A. Well, I wasn't involved directly at the
10 time, so I really don't know.

11 MR. HALL: By that operation, you were
12 talking about the disposal?

13 MR. HOBSON: Yes.

14 Q. Have you ever had any contact with a
15 company called Transformer Consultants?

16 A. Yes.

17 Q. When did those contacts begin?

18 A. '74 or '75.

19 Q. Can you tell me the nature of those
20 contacts at that time?

21 A. As best I recall, they were in the
22 business of servicing transformers. They were
23 aware of the PCB issue and through our marketing
24 people, made some inquiries regarding brochures
25 and the like that Monsanto might offer. The

1 marketing individual asked me to join him and we
2 visited Transformer Consultants. I believe that
3 was about '74, '75, at their offices.

4 Q. Would there be a way you could verify
5 that date? Do you have a field memo or expense
6 report or something that would give you a date?

7 A. I used to have, but I no longer have.

8 Q. Tell me what you remember about the
9 meeting, if you would?

10 A. About the visit?

11 Q. Yes, sir.

12 A. As I recall, we met with several of the
13 Transformer Consultants representatives, there was
14 a circle of us in a large room, and I reviewed
15 with that group the status of things as I
16 understood it at that point in time, the latest
17 toxicity study reports, where the government stood
18 regarding PCBs and regulating of PCBs, and by that
19 time, the EPA had some thoughts on it, and EPA had
20 some guidelines on it. And we talked about the
21 existence of the NEMA, ANSI committee that had by
22 that time pretty well finalized its guidelines.

23 As I recall, at that time Monsanto also
24 had revised a brochure on Askaril or PCB
25 handling. And we offered to send them copies that

1 they would, in turn, pass on to their clients,
2 customers. That was about the gist of our
3 discussion. We both agreed to keep the dialogue
4 going in the future.

5 Q. Did this take place in their facilities
6 or yours?

7 A. Their facilities in the Akron area, as I
8 recall.

9 Q. Had Transformer Consultants been a
10 customer of Monsanto's as far as purchasing of
11 Askaril materials?

12 A. I understand they were, yes.

13 Q. At the time of your visit?

14 A. Yes.

15 Q. If they would have bought your Askaril
16 materials, they would have gotten the labeling,
17 precautionary labeling for Askaril materials?

18 A. Yes.

19 Q. Do you know how long they had been
20 purchasing Askaril materials?

21 A. No, I don't.

22 Q. Did they give you any impression? In
23 other words, were you able to form any impression
24 about how long they had been purchasing your
25 product?

1 A. Not really.

2 MR. SULLIVAN: Objection to the form of
3 the question because I think he just said he
4 doesn't know. Consequently, the question calls
5 for sheer speculation.

6 Q. Did Transformer Consultants describe to
7 you what they did in their business?

8 A. Not to me, no.

9 Q. Did you have any knowledge prior to your
10 visit with Transformer Consultants?

11 A. Only that I was aware of the name and
12 the type of service. No direct contact.

13 Q. Can you tell us how transformers get
14 contaminated in the field with PCBs when,
15 apparently, they were intended to have mineral oil
16 in them?

17 A. I really have no personal involvement or
18 knowledge.

19 Q. Do you know if anybody at Monsanto has
20 looked at or thought about that problem?

21 A. Well, I have been present with
22 discussions on that, yes.

23 Q. What is your recollection of the
24 discussions?

25 A. The potential for cross contamination

1 does exist. Other than that, I don't recall
2 anything specific.

3 Q. Just that people have said the potential
4 exists, and you have not heard them say how that
5 occurs or why that occurs, just that the potential
6 exists?

7 A. I suspect they did mention it, but I
8 have forgotten, really.

9 Q. Mr. Papageorge, have you given any
10 technical papers or presentations to groups of
11 industrial hygienists or epidemiologists or
12 medical people that are interested in health
13 effects of different materials?

14 A. No.

15 Q. Have you published any papers in the
16 medical or scientific literature about PCBs and
17 any association for or against health effects?

18 A. No.

19 Q. Have you ever attempted to publish any?

20 A. No.

21 Q. Have any ever been prepared by you or
22 your staff for publication and Monsanto refused
23 publication?

24 A. No.

25 MR. HOBSON: I think that is all I have.

1 MR. HALL: Mr. Carrington?

2 MR. CARRINGTON: No questions.

3 MR. SCHEURICH: No questions.

4 MS. OLIVER: No questions.

5 MR. SULLIVAN: I have a couple. I just
6 wanted to clarify your testimony, if I could,
7 sir.

8 CROSS EXAMINATION

9 BY MR. SULLIVAN:

10 Q. Is my understanding correct that the
11 first regulations controlling the use of or
12 exposure to PCB would have been in the mid to late
13 1970s, approximately?

14 A. The first regulations. As I recall, FDA
15 came out with something about 1973. That would
16 have been the first.

17 Q. And I believe you testified that the
18 first report of any alleged or potential link to
19 PCB exposure with any form of cancer was not until
20 1974 or '75; is that correct?

21 A. Yes.

22 Q. And essentially all the prior
23 information available regarding any potential
24 health hazards associated with PCB use was
25 irritation to skin, such as chloracne, or

1 irritation to the respiratory system, such as a
2 cold or sore throat?

3 A. That is my understanding, yes.

4 Q. I believe you stated it was 1974, 1975,
5 when you were first contacted by someone from
6 Transformer Consultants; is that correct?

7 A. No. It was someone from Transformer
8 Consultants contacted a Monsanto person who, in
9 turn, contacted me.

10 Q. But it was, as best you can recall,
11 1974, '75, when that occurred?

12 A. Yes.

13 Q. And it is your understanding that
14 Transformer Consultants was asking for general
15 information about any potential hazards associated
16 with PCBs?

17 A. Yes.

18 Q. And is it fair to say that is about the
19 same time that industry and government was first
20 contemplating regulations regarding the use and
21 handling of PCBs?

22 That is the approximate time frame,
23 isn't it?

24 A. It is pretty close, yes.

25 Q. Is it fair to say, sir, you are not

1 aware of any competent medical literature or
2 research suggesting any link between PCB exposure
3 and lymphoma?

4 A. That's correct.

5 MR. SULLIVAN: No further questions.

6 MR. HALL: Anybody else?

7 MR. HOBSON: Generated a couple, if I
8 may.

9 REDIRECT EXAMINATION

10 BY MR. HOBSON:

11 Q. Do you know, Mr. Papageorge, if any of
12 the Walsh Healey regulations were applicable to
13 PCBs?

14 A. No.

15 Q. Did Monsanto ever have a policy or a
16 recommendation regarding the mixing of Askaril
17 materials with non Askaril materials when used as
18 dielectrics?

19 A. I don't know that I would call it a
20 policy.

21 Q. Well, if somebody asked you should these
22 materials be mixed, would you tell them anything
23 one way or the other?

24 A. Yes. We would say that if you mix them,
25 you diminish the fire resistance of that mixture.

1 So you are losing some of the benefits that PCBs
2 offer.

3 Q. So it is not a good idea to mix the two
4 materials together?

5 A. From a fire resistance viewpoint, yes.

6 Q. Is that something that was known for
7 many years, '30s, '40s, '50s?

8 A. Yes.

9 MR. SULLIVAN: Objection to the form of
10 the question because it is not defined, determined
11 known to whom.

12 Q. Certainly known to Monsanto, and if
13 anybody would have asked, you would have told them
14 they diminish the fire resistive properties of the
15 materials if they mix it?

16 A. Yes.

17 Q. Did you ever dispose of any PCB
18 materials for either General Electric or
19 Westinghouse?

20 A. Yes.

21 Q. That would have been at your Sauget,
22 Illinois facility?

23 A. Yes.

24 Q. Were they part of your -- I guess
25 campaign or part of your -- I don't know what word

1 to use, program, to bring PCBs back to Monsanto
2 and get them incinerated? In other words, did you
3 go to GE and Westinghouse and say here is our
4 facility and here is our capability and tell your
5 customers and use them as the conduit back to
6 Monsanto?

7 A. Yes. We had that approach.

8 MR. HOBSON: I think that is all I have.

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COMES NOW THE WITNESS, W.B. PAPAGEORGE,
and having read the foregoing transcript of the
deposition taken on the 26th day of September,
1986, acknowledges by signature hereto that it is
a true and accurate transcript of the testimony
given on the date hereinabove mentioned.

W.B. PAPAGEORGE

Subscribed and sworn to me before this
____ day of _____, 1987.

My Commission expires: _____

Notary Public

1 State of Missouri)
2) SS.
3 City of St. Louis)

4 I, ELSIE M. DELEVICH, a Notary Public in
5 and for the State of Missouri, duly commissioned,
6 qualified and authorized to administer oaths and
7 to certify to depositions, do hereby certify that
8 pursuant to Notice in the civil cause now pending
9 and undetermined in the United States District
10 Court for the Eastern District of Texas, Beaumont
11 Division, to be used in the trial of said cause in
12 said court, I was attended at the Danielle Hotel,
13 in the County of St. Louis, State of Missouri, by
14 the aforesaid witness; and by the aforesaid
15 attorneys; on the 26th day of September, 1986.

16 The said witness, being of sound mind and
17 being by me first carefully examined and duly
18 cautioned and sworn to testify the truth, the
19 whole truth, and nothing but the truth in the case
20 aforesaid, thereupon testified as is shown in the
21 foregoing transcript, said testimony being by me
22 reported in shorthand and caused to be transcribed
23 into typewriting, and that the foregoing pages
24 correctly set forth the testimony of the
25 aforementioned witness, together with the

1 questions propounded by counsel and remarks and
2 objections of counsel thereto, and is in all
3 respects a full, true, correct and complete
4 transcript of the questions propounded to and the
5 answers given by said witness; that signature of
6 the deponent was not waived by agreement of
7 counsel.

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

12 Witness my hand and notarial seal at
13 St. Louis, Missouri, this 14th day of
14 January, 1987.

15 My Commission expires August 8, 1988.

16
17 Elsie M. Delverick

18 Notary Public in and for the
19 State of Missouri.
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DEPOSITION CORRECTION SHEET

In Re:

Upon reading the deposition and before subscribing thereto,
the deponent indicated the following changes should be made:

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