

IN THE MATTER OF:

*Carolyn B. Fisher, Executrix of the Estate
or Ralph L. Fisher, Deceased,
vs.
Monsanto Company, a Delaware Corporation*

Cause No. 93037D

*Deposition of Robert E. Kelly, M.D.
February 22, 1994*

*Gore & Perry Reporting Company
100 North Broadway, Suite 1175
Saint Louis, Missouri 63102
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WESTERN DISTRICT OF VIRGINIA

DANVILLE DIVISION

CAROLYN B. FISHER, EXECUTRIX

OF THE ESTATE OF RALPH L.

FISHER, DECEASED,

Plaintiff,

- vs -

CAUSE NO. 93037D

MONSANTO COMPANY, A

DELAWARE CORPORATION,

Defendant.

Deposition of ROBERT E. KELLY, M.D., taken
on behalf of the Plaintiff, at the offices of
Husch & Eppenberger, 100 North Broadway, 13th
Floor, in the City of St. Louis, State of
Missouri, on the 22nd day of February, 1994,
before Cynthia R. Rollberg, Shorthand Reporter
and Notary Public.

Gore & Perry Reporting Co. St. Louis, Missouri
(314) 241-6750 621-4790

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25 ALSO PRESENT: J. DONALD COWAN, JR.

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WITNESS SIGNATURE PAGE

COMES NOW THE WITNESS, ROBERT E. KELLY, M.D.,
 and having read the foregoing transcript of the
 deposition taken on the 22nd day of February,
 1994, acknowledges by signature hereto that it
 is a true and accurate transcript of the
 testimony given on the date hereinabove
 mentioned.

Robert E Kelly M.D.

ROBERT E. KELLY, M.D.

Subscribed and sworn to me before this

30th day of March, 1994,

My Commission expires: _____

Josephine S. Niblock

NOTARY PUBLIC

JOSEPHINE S. NIBLOCK
 NOTARY PUBLIC STATE OF MISSOURI
 ST. LOUIS COUNTY
 MY COMMISSION EXP. JAN. 15, 1995

Deposition Correction Sheet

In Re:

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

Page 9 ⁹ Line 18 Should read: and I have talked to epidemiologists

Reason for assigned change: word should be plural

Page 10 Line 3 should read *incidence*

Page 43 Line 15 Should read: somebody's file

Page 20 Line 10 " " *of instead of or*

Reason for assigned change: word should be possessive

Page 22 Line 13 *some chromium salts.*

Page 68 Line 17 Should read: from Swann Chemical Company

Page 48 Line 16 " " *or instead of of.*

Reason for assigned change: misspelling

Page 58 Line 25 *atropine for antipark - misspelling.*

Page 83 Line 1 Should read: Swann Chemical

Page 62 Line 13 " " *making instead of baking.*

Reason for assigned change: misspelling

Page 83 Line 4 Should read: Swann had

Reason for assigned change: misspelling

Page 92 Line 22 Should read: dibenzo dioxins

Reason for assigned change: misspelling

Page 93 Line 18 Should read: a Dr. Vos in

Reason for assigned change: misspelling

Page 94 Line 2 Should read: the Vos study

Reason for assigned change: misspelling

Page 95 Line 19 Should read: down Vos went

Reason for assigned change: misspelling

R. B. Kelly

Deposition Correction Sheet

In Re:

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

Page 100 Line 22 Should read: a Dr. Von Oettingen

Reason for assigned change: misspelling

Page 101 Line 1 Should read: the Von Oettingen report

Reason for assigned change: misspelling

Page 108 Line 6 Should read: the Von Oettingen study

Reason for assigned change: misspelling

Page 113 ^{Line} should read one milligram per cubic meter
omit the word million

Page 115 Line 2 Should read: Like Zack and Musch

Reason for assigned change: misspellings

Page 115 Line 23 Should read: Musch study

Reason for assigned change: misspellings

Page 118 Line 1 Should read: Dr. Renate Kimbrough

Reason for assigned change: misspelling

Page 118 Line 22 Should read: of Treon's work

Reason for assigned change: should be possessive

Page 118 Line 25 Should read: the Swann episode

Reason for assigned change: misspelling

Page 119 Line 2 Should read: the Swann PCBs

Reason for assigned change: misspelling

Deposition Correction Sheet

In Re:

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

Page 135 Line 1 Should read: the Swann Chemical Company
Page 136 line 6 should cubic meter
Reason for assigned change: misspelling

Page 146 Line 13 Should read: is no sense doing a test
Reason for assigned change: misspelling

Page 173 Line 12 Should read: naphthalene of various chlorine
Reason for assigned change: misspelling

Page 176 Line 9 Should read: Dr. Suskind of Kettering
176 " 7 " " Elmer instead of Albert
Reason for assigned change: misspelling

Page 176 Line 10 Should read: Dr. Oettel, O-E-T-T-E-L
176 " 16 " " ~~Franklin~~ quicksilver
Reason for assigned change: misspelling

Page 177 Line 1 Should read: tetrachloro diphenylene oxide
Reason for assigned change: incorrect chemical name

Page 177 Line 2 Should read: tetrachloro dophenylene oxide
Reason for assigned change: incorrect chemical name

Page 177 Line 21-22 Should read: chlorinated diphenyl oxide
Reason for assigned change: make 2 words.

Page 177 Line 22-23 Should read: chlorinated diphenylene oxide
Reason for assigned change: incorrect chemical name

Blum & Kelly

Deposition Correction Sheet

In Re:

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

Page 179 Line 18 Should read: Dr. Steele's and Dr. Marder's

Reason for assigned change: misspellings

Page 179 Line 19 Should read: Dr. Steele's

Reason for assigned change: misspelling

Page Line Should read:

Reason for assigned change:

Page Line Should read:

Reason for assigned change:

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Page Line Should read:

Reason for assigned change:

P. Bennett Kelly

Gore & Perry Reporting Co. St. Louis, Missouri
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WATER_PCB-SD0000067855

1 ROBERT E. KELLY, M.D.,
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 cause aforesaid, deposes
5 and says in reply to oral interrogatories
6 propounded as follows:

7 DIRECT EXAMINATION

8 MR. WARSHAUER: This is the
9 deposition of Dr. R.E. Kelly taken pursuant
10 to notice and agreement taken for discovery
11 and cross examination, taken pursuant to
12 federal rules of evidence and federal rules
13 of civil procedure.

14 (Witness sworn.)

15 Q: (By Mr. Warshauer) Give us your
16 name, please, sir.

17 MR. DAVIDSON: Excuse me, are there
18 any stipulations with regard to objections?

19 MR. WARSHAUER: You all can object
20 anytime you want to.

21 MR. DAVIDSON: Okay.

22 MR. WARSHAUER: And I tried to do
23 that where we stop the video tape and start
24 the tape, it is easier just to do it at a
25 time later if we ever wanted to do that.

1 Since my primary purpose is cross examination
2 I'm not that particular what the tape looks
3 like.

4 A: Robert Emmet, E-M-M-E-T, Kelly,
5 K-E-L-L-Y, M.D.

6 Q: Dr. Kelly, at the end of this
7 deposition you will have the right to read
8 and sign it, make any changes, deletions or
9 corrections allowed by law or you may waive
10 that right? What is your --

11 A: I do not waive it.

12 Q: Give us your date of birth, please,
13 sir.

14 A: November the 14th, 1909.

15 Q: And would you please share with us
16 the benefit of your education?

17 A: Yes, I received a bachelors degree
18 from St. Louis University in 1930, and M.D.
19 degree in 1932.

20 Q: Also from St. Louis?

21 A: Same institution.

22 Q: When you were in medical school did
23 you choose a particular course in which to
24 specialize?

25 A: No.

1 Q: After medical school in your
2 residency or internship programs did you
3 choose a particular course in which to
4 specialize?

5 A: Yes, I was a resident in internal
6 medicine at St. Louis City Hospital. I was
7 there for three years. The first two years
8 were rotating internships, and then the last
9 was a residency in medicine.

10 Q: All right. When you were in
11 undergraduate school what was your major?

12 A: They didn't have them. Oh,
13 undergraduate school?

14 Q: Yes, sir.

15 A: It was premedical. There was no
16 particular major at that time. It was a
17 premedical course, two years premedical
18 course.

19 Q: How much chemistry did you take?

20 A: Organic, inorganic, I would say two
21 semesters of chemistry.

22 Q: Now, when you decided to become an
23 internal medicine doctor what did you
24 understand that that practice would entail?

25 A: It would entail the non-surgical

1 treatment of adults, of systemic illnesses
2 similar to diabetes, asthma, pneumonia, the
3 non-surgical treatment of illnesses.

4 Q: And during your rotation through the
5 various specialties did any of those -- did
6 any of that training include toxicology?

7 A: No, sir.

8 Q: Did any of that training include
9 pathology?

10 A: Yes. Oh, pathology was included in
11 medical school.

12 Q: Did you ever have any other training
13 beyond medical school in pathology, formal
14 training?

15 A: No formal training. There were
16 autopsies, obviously, of cases that expired
17 on our wards.

18 Q: And did you conduct the autopsies?

19 A: No, I observed them.

20 Q: Did you ever have any continuing
21 medical education after your formal training
22 as a doctor in the fields of pathology?

23 A: No, sir.

24 Q: Did you ever have any formal
25 continuing education of any sort in the field

1 of toxicology after your medical training?

2 A: If by formal you mean one-week
3 courses, two-week courses, longer than that?

4 Q: A one-day seminar?

5 A: Well, I served a number of seminars
6 on toxicology given by various institutions
7 that I attended.

8 Q: And where were these?

9 A: University of Michigan, Harvard
10 University, and then others were given just
11 in conjunction with meetings of the
12 Industrial Medical Association.

13 Q: Did you ever have any training
14 either in medical school or after medical
15 school in the field of epidemiology?

16 A: Except do-it-yourself training, I
17 read a great deal of epidemiological studies
18 and I have talked to epidemiologist, but I
19 did not have any formal training.

20 Q: Not even one-day seminars?

21 A: No, sir, not that I can recall.

22 Q: With respect to epidemiology what do
23 you understand that term to mean?

24 A: It means the relationship of a
25 particular condition and it's incidence, it's

1 occurrence in a group of people related to
2 the incidents in a similar group not exposed
3 to any particular condition, whether that's
4 viral or chemical or bacterial.

5 Q: There is a term that I have seen
6 used in various studies abbreviated SMR.

7 A: Yes.

8 Q: Do you know what that is?

9 A: Yes, that's a standard mortality
10 rate, whether it's mortality or morbidity,
11 it's used in both times, both areas.

12 Q: Do you have an idea in your mind as
13 to what number would be necessary for a
14 standard mortality or morbidity rate to be a
15 significant number?

16 A: Yes, I think it certainly should be
17 over that it would not occur in ninety-five
18 percent by chance, and could not occur by
19 ninety-five percent by chance.

20 Q: If we saw an SMR that said two
21 hundred what would that mean to me?

22 A: It would be two hundred times one is
23 usually considered the standard mortality
24 rate. And if you had two hundred it would be
25 two hundred times that much.

1 Q: All right. And if I had two?

2 A: It would be twice as much.

3 Q: And would an SMR of two have some
4 particular -- particular meaning if I was to
5 look at a particular study?

6 A: No, because there are other things
7 to be considered.

8 Q: And what are those?

9 A: Well, I would say that Sir Richard
10 Dall who was a premiere epidemiologist and
11 professor at Oxford, and he is well known as
12 an authority on epidemiology. He states that
13 for an epidemiological study to be valid you
14 had to have four things. One, it had to be
15 statistically significant. By that I mean if
16 you flipped a penny up in the air ten times
17 and it came up heads eight times you would
18 not say that the odds are eight to two that
19 it would turn up heads, but if you had a
20 thousand times when you flipped it up it
21 would be very close to five hundred times
22 heads. So that particular factor would be
23 scientifically -- significantly a significant
24 number.

25 The second condition he said was it

1 had to be reproducible. If you had an
2 epidemiological study that showed cancer of
3 the lungs, one study, another one cancer of
4 the testes, another one cancer of the gall
5 bladder, but not reproducible on all the
6 studies, that would give you cause to
7 question the validity of the study. The
8 third one was no confounders. By that means
9 that -- by that I mean if you're studying
10 diabetes in an individual group if you don't
11 take into account heredity, obesity, some
12 other factors you still could question that
13 epidemiological study.

14 The fourth is this, it could be dose
15 related. If you had people working with a
16 compound for one year and they had five times
17 the condition that people who worked ten
18 years would have, five times the number, that
19 would not be dose related obviously.

20 So those are the four conditions
21 that could influence the mortality rate, the
22 SMR of a particular epidemiological study.

23 Q: You mentioned the second factor?

24 A: Beg your pardon?

25 Q: The second factor you mentioned was

1 reproducibility. And the example you gave
2 was that one study may find lung cancer,
3 another study may find gall bladder, I think
4 was your term, and the third study may find
5 testicle cancer?

6 A: Yes, sir.

7 Q: Is it ever possible to you or would
8 it be something that you could see as
9 possible that a given compound could cause --
10 be multi-factorial in it's carcinogenic
11 effect depending on the environment in which
12 the particular group lives?

13 MR. DAVIDSON: Object to the form of
14 the question.

15 A: I don't follow that last statement,
16 the last phrase of yours.

17 Q: (By Mr. Warshauer) Let me give it to
18 you this way. Let's assume that a compound
19 showed elevated skin cancers for people who
20 live in south Florida, even above their
21 neighborhood skin cancers, but people who
22 lived in an area where there was high lead
23 would show increased lead injuries above the
24 neighborhood's lead injuries. Would it be
25 possible that a compound could have a

1 synergistic effect that would show up in
2 multiple locations?

3 MR. DAVIDSON: Object to the form.

4 A: That would a supposition by
5 appointment, sir, and I don't think I could
6 answer that.

7 Q: (By Mr. Warshauer) What is your
8 understanding of the term synergistic effects
9 of --

10 A: Synergistic effects in my point of
11 view is that two compounds acted together
12 have an action greater than the sum of the
13 individual actions if there were -- when they
14 were acting alone.

15 Q: Have you ever done any laboratory
16 work yourself on experimental animals?

17 A: On what?

18 Q: Experimental animals?

19 A: Medical school.

20 Q: Outside of medical school have you
21 ever run a lab to see the toxic effects of
22 chemicals on animals?

23 A: No, sir, I have not. I have
24 supervised labs.

25 Q: And where did you supervise those

1 labs?

2 A: Well, I mean I have seen the
3 laboratories, I have had -- I've gone to
4 laboratories where we were going to have
5 toxicological work done. For the first ten
6 years I was with Monsanto we did not have a
7 toxicologist of our own, so I was the one
8 that engaged outside toxicological
9 laboratories and I saw these laboratories.

10 Q: When you look to the laboratory what
11 kinds of things did you look for?

12 A: Well, first you looked at the person
13 running it, the types of individuals, what
14 their backgrounds were, what their
15 reputations were, who their clients were, how
16 satisfied the clients were.

17 Then you looked at the general
18 housekeeping of the laboratories, and then
19 you evaluated the man from your -- from what
20 you thought his scientific credibility was.

21 Q: Speaking of evaluating the man from
22 his scientific credibility, do you think that
23 is the most important aspect of measuring a
24 lab, the credibility and believability of
25 it's scientists?

1 A: Well, that's certainly important. I
2 don't know how to equate that with the
3 facilities of the laboratory, but certainly I
4 would look for the scientific expertise and
5 the credibility of the laboratory director,
6 yes, I would.

7 Q: If a laboratory director was shown
8 to you to be someone you could not believe or
9 did not have scientific integrity would that
10 be a lab that you would use and depend on?

11 A: If it were shown that he was not
12 scientifically honest, is that you're saying?

13 Q: Yes, sir.

14 A: By a credible person?

15 Q: Yes, sir.

16 A: If I was sure of the accuracy of the
17 statement I would not use them, but I would
18 have to be sure of the accuracy of the
19 statement.

20 Q: Did you have any training outside or
21 in medical school in the field of
22 occupational medicine?

23 A: No, sir. In the 1930's there were
24 occasional lectures on specific diseases like
25 silicosis and asbestosis and anemia from

1 benzene, but individual lectures on those
2 subjects but not in the general realm of
3 occupational medicine.

4 Q: Did you ever attend any continuing
5 medical education of any sort after your
6 formal medical training in the field of
7 occupational medicine?

8 A: Yes, I've had one or two, several
9 one or two week courses in occupational
10 medicine.

11 Q: Tell me about those.

12 A: What do you want to know about them?

13 Q: What were they about, what
14 particular kinds of things did you study?

15 A: One, you studied the organization of
16 a medical department, you studied the factors
17 that could be used in a preventive medical
18 program for a medical department. You
19 studied -- they did have some slight, some
20 minor talks in epidemiology, no -- nothing in
21 great depth. There was a certain amount of
22 toxicology given, the types of toxicology
23 testing. And then there was also discussion
24 of the various occupational injuries or
25 illnesses that were current at that time that

1 they knew had an occupational connection.

2 Q: Did any of these courses that you
3 took discuss occupational injury associated
4 with PCB's?

5 A: No, sir, in 1936 PCB's were not a
6 very prominent factor. In fact, I don't know
7 of any courses in occupational medicine -- in
8 the continuing medical education that I've
9 seen devoted to PCB's.

10 Q: You mentioned that in 1936, did you
11 take any occupational medicine type courses
12 after 1936?

13 A: With the exception of those -- well,
14 I don't know why I picked the date 1936, I
15 graduated in -- I graduated in '36. We --
16 some of these one or two week courses that I
17 took, one and two week's courses that I took,
18 dealt with occupational illnesses, yes.

19 Q: Do you remember when and where those
20 courses were?

21 A: Well, the one I remember
22 particularly was the University of Michigan,
23 and that was probably in the late thirties or
24 shortly after I went with Monsanto.

25 Q: Do you remember any other ones, say,

1 in the sixties?

2 A: I don't. I'm not certain about it.

3 Q: Did you take any courses in
4 industrial hygiene?

5 A: No, sir.

6 Q: Do you have much knowledge in that
7 field?

8 A: I would consider myself to be
9 knowledgeable in the general field. I had
10 four industrial hygienists reporting to me.

11 Q: What is your definition of that
12 practice?

13 A: An industrial hygienist is an
14 individual who monitors the environment of
15 the workplace.

16 Q: And do you have skills to monitor
17 the environment of a workplace yourself?

18 A: No, sir, I do not.

19 Q: After you finished your medical
20 school did you seek certification by any
21 boards or specialties?

22 A: Yes, yes.

23 Q: And which certifications?

24 A: I'm certified in internal medicine,
25 I'm certified in preventive medicine under

1 the sub-specialty of occupational medicine,
2 so I'm certified in two boards.

3 Q: Do you have any training in
4 pulmonology outside of medical school?

5 A: Well, you always have training in
6 your internship and residency, yes.

7 Q: But outside of medical school do you
8 have, and residency, outside of your formal
9 medical education is what I meant.

10 A: I probably had a college or
11 physician's course in pulmonology at some
12 time. I have a vague recollection of it.

13 Q: In the last twenty-five years?

14 A: Something like that. Probably
15 longer ago than twenty-five years.

16 Q: Do you have any training outside of
17 medical school in the field of oncology?

18 A: No, sir, formal training, no, sir.

19 Q: Do you have an understanding of what
20 causes cancer?

21 A: I would get the Nobel Prize if I
22 did.

23 Q: What is your understanding as to the
24 mechanism by which a cancer becomes a health
25 problem for a human?

1 A: The mechanism that --

2 Q: Does it have stages, does one day I
3 have nothing, the next day I have cancer, or
4 is it a process that takes some time?

5 A: Well, it takes some time but there
6 has got to be a beginning. You do have a
7 time when you do not have cancer, and when
8 the cancer starts it presumably starts in a
9 single cell, but by the time -- cancer is not
10 a straight line illness. It doesn't go like
11 this. It's up and down like this. In other
12 words, cancer is not -- it is not a straight
13 line disease. You don't get cancer that
14 keeps on getting worse. Cancers have various
15 rates of progression. Sometimes they
16 progress for a while and stay static.
17 Sometimes they regress spontaneously, not all
18 the way to zero, but they regress somewhat.

19 Q: If I tell you the term initiation
20 with respect to cancer, what does that mean?

21 A: To me it means starting of a cancer,
22 something starts the cancer.

23 Q: And are you aware of any agents or
24 events that can serve as initiators of
25 cancers in humans?

1 A: Well, I believe radiation is a --
2 can start as a -- can be initiation.

3 Q: How about the term promotor, what
4 does that mean with respect to cancer in
5 humans?

6 A: It means to me that it's a compound
7 or a chemical that enhances the action of a
8 cancer that an individual already has.

9 Q: Well, if you have an initiated
10 cancer without promotion does the initiated
11 cancer cause any adverse health effects in
12 your opinion?

13 A: It all depends how far along it
14 grows.

15 Q: Are you aware of any chemicals that
16 you believe serve as either initiators or
17 promoters of cancers in humans?

18 A: Yes, asbestos.

19 Q: Okay. And is that an initiator or
20 promoter or both or something else?

21 A: I don't know.

22 Q: Anything other than asbestos?

23 A: Yes, betanaphthalamine.

24 Q: And what cancer does that cause?

25 A: Bladder.

1 Q: And is it an initiator or promoter
2 or both?

3 A: I don't know.

4 Q: Any other chemicals that you are
5 aware of that cause cancer in humans?

6 A: Amino biphenyl.

7 Q: And is that an initiator or
8 promoter?

9 A: I don't know.

10 Q: What cancer is it associated with?

11 A: Bladder.

12 Q: Anything else?

13 A: Chromium, subchromium salts do.

14 Q: What cancers?

15 A: Nasal cancers, nasal passages.

16 Q: Any others?

17 A: Yes, there are chemicals in smoke,
18 in cigarette smoke that cause lung cancer.

19 Q: Polycyclate organics, whatever they
20 are called?

21 MR. DAVIDSON: Object to the form.

22 A: I'm not certain if they have defined
23 what the --

24 Q: (By Mr. Warshauer) What would you
25 call them as a group?

1 A: Polyaromatic hydrocarbons.

2 Q: And how about dioxins?

3 A: That is --

4 MR. DAVIDSON: Object to the form.

5 A: Are we talking about human
6 cancers --

7 Q: (By Mr. Warshauer) Human cancers.

8 A: I think dioxin is a compound in
9 which there is quite a bit of confusion, not
10 confusion, but in the scientific thought in
11 my mind is somewhat indefinite as to the
12 action -- there are people on both sides of
13 the dioxin problem, visa vie, cancer, and I'm
14 not in a position to make a judgment on that.

15 Q: You're not on either side then?

16 A: I'm waiting to see what happens.
17 Yes, that's true.

18 Q: How about --

19 MR. DAVIDSON: I would remind you
20 that Dr. Kelly is not being named as an
21 expert witness. He retired in 1974 and it
22 has not been, other than his natural
23 curiosity, to keep up with this sort of thing
24 or what the current thinking with respect to
25 cancer causation is on various subjects.

1 MR. WARSHAUER: Okay.

2 Q: (By Mr. Warshauer) How about the
3 idea of polychlorinated dibenzofurans as
4 being associated with human cancers?

5 A: I don't think that's been proven.

6 Q: Has it been disproven to your
7 knowledge?

8 A: Well, it is pretty hard to disprove
9 a negative.

10 Q: Do you have an opinion whether or
11 not it could be associated or should be
12 associated with cancers in humans, either as
13 an initiator or promotor?

14 A: I have no opinion.

15 Q: Have you had any training in
16 studying the effects of toxins on the
17 environment?

18 A: Have I had training in studying the
19 action of what on the environment?

20 Q: Of a toxin on the environment.

21 A: No formal training, no, sir.

22 Q: Tell me about the training or the
23 experience that you have if any that you
24 think would allow you to have opinions on the
25 effect of toxic chemicals on the environment?

1 A: I've read a great deal about the
2 action of various compounds on the
3 environment. I've talked to a number of
4 people who have studied the environment, that
5 studied the action of various chemicals on
6 the environment.

7 Q: When did the action of chemicals on
8 the environment if ever become a concern of
9 yours?

10 MR. DAVIDSON: I'm going to object
11 to the form as being --

12 A: That's awful hard to say.

13 MR. DAVIDSON: Dr. Kelly, hang on a
14 second, I'm going to object to the form as
15 being vague as to exactly what you were
16 asking about with reference to a specific
17 time period.

18 Q: (By Mr. Warshauer) Okay. Let me ask
19 you this. Was there ever a period in your
20 career that you became concerned about the
21 effects of chemicals on the environment?

22 A: There came a time in my career that
23 I became concerned about the possible effect
24 of chemicals on the environment, yes, sir.

25 Q: And when was that?

1 A: That was in the late sixties.

2 Q: And what chemical was that?

3 A: That was polychlorinated
4 dibenzene -- polychlorinated diphenyl --
5 biphenyl.

6 Q: Okay. And I have referred to that
7 as PCB's?

8 A: Beg your pardon?

9 Q: I'm going to refer to that as PCB's,
10 is that all right with you?

11 A: It's fine with me.

12 Q: Prior to the late sixties was there
13 a reason that you had not been concerned
14 about the effects of chemicals on the
15 environment?

16 A: Well, I did say that I did have some
17 concern about chemicals on the environment.
18 There was stories of acid rain, there was
19 stories of -- there were other instances of,
20 oh, we had smog in St. Louis where we were
21 burning soft coal in St. Louis in the 1930's
22 or 1920's. I certainly had concern when you
23 couldn't look out the window at noon and see
24 a block away, so I had concern then
25 certainly.

1 Q: Why did it concern you?

2 A: Well, I lived there. I lived in
3 St. Louis.

4 Q: Did you think it was going to be a
5 human health risk or were you concerned
6 because you wanted to see blue sky instead of
7 gray sky?

8 A: I didn't believe you wanted to be
9 breathing smoke all the time.

10 Q: Were you aware of any injury that
11 that could cause you?

12 A: Well, it was awful hard to evaluate
13 whether or not sinus trouble in St. Louis or
14 chest problems in St. Louis were not due to
15 the smoky environment, but it was my
16 impression that it was and I was concerned
17 about that.

18 Q: Did you ever read a book called
19 Silent Spring by a woman named Rachel Carson?

20 A: Yes, I did.

21 Q: When did you read that?

22 A: About two months after it was
23 published.

24 Q: What year was that; do you recall?

25 A: I don't recall.

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1 Q: Did that effect you in your role as
2 an employee of the Monsanto Company?

3 A: Not as a role, as my role at
4 Monsanto because as I recall she did not
5 mention any Monsanto Chemicals in this
6 particular book. Certainly she did not
7 mention PCB's in it, and I was not enough of
8 an authority to say whether her premises were
9 valid or whether they were biased. I just
10 was not in a position to review the accuracy
11 of her book.

12 Q: Well, did you even think in your
13 mind that her thoughts might have some
14 relevance to some of the non-biodegradable
15 chemicals being made by Monsanto?

16 A: No, because the thinking at that
17 time was that if you had a non-biodegradable
18 compound similar to what we thought PCB's
19 were at that particular time, if the material
20 were put -- if it got into a body of water it
21 would lie down at the bottom of the water
22 like a lump of coal or a piece of gravel and
23 it would be non-biodegradable, it was not
24 soluble in water. It would not harm the
25 environment or the people in -- or the

1 organisms in the environment. Now, that
2 thinking changed in the late sixties or
3 seventies.

4 Q: You mentioned that and I think I'm
5 quoting you, the thinking at that time, and
6 then you described what the thinking was.
7 What time were you talking about when you
8 were thinking that it would float -- that it
9 would go to the bottom of the water?

10 A: Up until 1967.

11 Q: What led you to think that way?

12 A: Well, we have a stable compound, we
13 have a compound that is not soluble in water,
14 and we didn't think that the material would
15 be degradable, and if it is not biodegradable
16 we didn't think it would be accumulated by
17 the marine organisms.

18 Q: See, I don't think the Falcons are
19 going to win the Super Bowl next year.

20 A: I'm sorry, I didn't hear you.

21 Q: I don't think the Falcons are going
22 to win the Super Bowl next year, but I have
23 some basis for that. What basis did you
24 have to believe that just because it sank to
25 the bottom or that it would sink to the

1 bottom, did you do experiments, did you do
2 animal studies, what did you do other than
3 just think it?

4 MR. DAVIDSON: Object to the form.

5 A: I didn't say that was the reason. I
6 didn't say that I had reasons why it sank to
7 the bottom. I said when it got into a body
8 of water it was not soluble. It was a -- so
9 it would not be dissolved by the water. It
10 would not be picked up by the water, and also
11 we knew that chemically it was a very stable
12 compound, which was according to the
13 information we had at that time, was not
14 amenable to degradation by other factors.

15 Q: And when you say at that time that's
16 up until the sixties when you began thinking
17 that it might have problems?

18 A: Yes.

19 Q: And that was the late sixties?

20 A: Yes, sir.

21 Q: Did you do any experiments to check
22 this hypotheses at any time since the time
23 you began at Monsanto until the time that you
24 first realized that the hypotheses may be
25 wrong?

1 A: No, sir, we did not. There was no
2 evidence of any injury from PCB to any of the
3 environment at that time.

4 Q: Well, is it Monsanto's practice not
5 to test if it didn't see evidence of
6 problems?

7 A: I don't know if I can speak for
8 Monsanto. The medical department did not run
9 any tests on biodegradation of products
10 before 1970, before the late sixties.

11 Q: And nor did the medical department
12 run any tests on the effects of
13 bioaccumulation of these products before that
14 same time period; is that correct?

15 MR. DAVIDSON: Object to the form.

16 A: Yes, and at that time nobody did.
17 The amount of bioaccumulation studies before
18 that time was quite meager. It was not
19 nearly as popular as it was in the seventies.

20 Q: Have you ever been involved in a
21 long term, you personally, not that you've
22 hired outside people to do outside Monsanto,
23 but you yourself, been involved in the long
24 term studies of latent diseases, the onset of
25 latent diseases?

1 A: I don't really understand your
2 question.

3 Q: Okay. That's fair enough. By that
4 I mean, for example, there was a drug called
5 DES which was given to mothers while they
6 were pregnant?

7 A: Yes.

8 Q: There are people who say that their
9 children have higher cancer rates and that's
10 one of the latent effects of this disease --
11 of this drug. And there are people who have
12 followed these children for twenty-five
13 years, these are female children, and
14 thirty-five years, in fact. Did you ever
15 participate in that kind of study which is
16 what I meant?

17 MR. DAVIDSON: Object to the form.

18 A: No, sir, I didn't.

19 Q: (By Mr. Warshauer) Did you ever take
20 a Monsanto employee and follow him from the
21 day he was hired until the day he died?

22 A: We had a medical program that
23 followed Monsanto employees. We examined
24 them at regular intervals that would -- the
25 interval would vary between one and two

1 years. We followed them until the day he
2 retired from the company. We did not follow
3 him until he died, but if he worked there
4 forty years we followed him forty years. So
5 I would say if that is your interpretation of
6 study of a possible latency that's what we
7 did.

8 Q: Do you have any training in the
9 drafting of warnings?

10 A: I don't believe there is a formal
11 course on drafting of warnings, but I've
12 certainly had a great deal of experience in
13 warnings and caution statements on our
14 bulletins and on our labels, yes, sir.

15 Q: Who taught you how to do that?

16 A: I think it was an innate
17 intelligence of my own. I knew what the
18 chemical was, I knew what the chemical could
19 do, and I knew how to avoid the exposures.

20 Q: Did you have any training in human
21 factors, how people would react to your
22 writings, to your warnings and instructions?

23 A: No, but if we are speaking of PCB's,
24 now, I know how they reacted. If they
25 followed the warnings they didn't get the

1 illness.

2 Q: What studies did you take to see
3 whether or not people followed warnings that
4 you wrote on any chemical?

5 A: Well, I would say that over forty
6 years we had very few conditions that
7 occurred in people that followed our
8 warnings. When I say very few it might even
9 be zero. There have been cases where people
10 developed real or alleged injuries that they
11 would write to me, the doctors, the
12 customers, and I would answer them and find
13 in my experience the warnings were certainly
14 adequate based on the results. I don't know
15 if I've answered your question. I forgot
16 what your question was.

17 Q: Well, I don't think you did so let
18 me rephrase it a little bit. I understand
19 that people do advertising for people who run
20 Coke-a-Cola commercials, for example, before
21 they put that advertisement on television at
22 two hundred thousand dollars a minute or
23 whatever it is they pay, they test market it,
24 they take groups of people and they see how
25 they would react to the advertisements, see

1 whether it's effective or not. Did you ever
2 test market your warnings and instructions?

3 A: No, sir, I did not test market
4 warnings, my warnings and instructions.

5 Q: Did you ever have any training of
6 any kind to tell you what kinds of words
7 would work and be effective in a warning?

8 A: No, sir, but I must have hit on the
9 right ones because we didn't have any
10 problems with people not following our
11 warnings.

12 Q: Now I understand after you finished
13 your formal medical training, you had your
14 own practice as an internist for about six
15 months?

16 A: That is correct. Well, it was
17 longer than six months. It was solely a
18 practice, and then six months afterwards I
19 became associated with Monsanto on a part
20 time basis but I continued my private
21 practice until I went in the service in '42.

22 Q: When you came back from the service
23 did you ever treat a human being with the
24 purpose of making them well in your role as a
25 medical doctor?

1 A: Say that over, did --

2 Q: Did you ever treat somebody to make
3 them well, did you ever give people medical
4 services with the goal being to help them get
5 well after you returned from the military?

6 A: Yes, I certainly did.

7 Q: Tell me how you would do that, in
8 what role? Were you still writing
9 prescriptions for people?

10 A: Yes, and if they had appendicitis I
11 sent them to a surgeon. I diagnosed and sent
12 them to a surgeon.

13 Q: When did you stop doing that if
14 ever?

15 A: Well, I'm still a physician.
16 I still see people, I still see relatives. I
17 still see the occasional friend. I don't
18 think I'm withdrawn from the practice of
19 medicine.

20 Q: Was there a period of time in which
21 the practice of medicine became less
22 significant than your role as a manager?

23 A: I don't think you could divorce them
24 because my role as a manager involved --
25 involved thinking of the worker as a patient,

1 as an individual, and I saw people everyday
2 at the Monsanto dispensaries. I saw people
3 on my wards at City Hospital. Over the years
4 I taught at St. Louis University in The
5 Department of Internal Medicine. I'm an
6 assistant professor there, I'm emeritus now,
7 but I taught there, so I was not a bureaucrat
8 if that's what you're stating.

9 Q: Well, I'm not stating anything, I'm
10 just inquiring.

11 A: Well, fine, have I answered it?

12 Q: Yeah, I think so. When did you stop
13 seeing people in your private practice?

14 A: When I went in the service.

15 Q: And that was 1942?

16 A: That's correct.

17 Q: And when did you return from the
18 service?

19 A: March of '46.

20 Q: Did you see anyone outside on a
21 regular basis, not the isolated case for
22 friend or family member, but did you see
23 anyone on a regular basis outside the
24 Monsanto company family after that?

25 A: There were occasional cases referred

1 to me of an occupational nature outside of
2 Monsanto during my years from 1946 to -- '46
3 on -- '44 on, yes, sir. But those were --
4 then I was associated, after I retired I was
5 associated with the Barnes Hospital Health
6 Care which is associated with Washington
7 University and I diagnosed -- I diagnosed
8 cases that may have an occupational
9 condition. I diagnosed individuals who were
10 sent to the clinic to see, they may have said
11 this man has a heart condition, can he do
12 this kind of work? I saw these people. I
13 was there on the basis of three hour, four
14 hour basis three day a week for about eight
15 years after 1974. So I saw people there.

16 Q: Tell me about the organization of
17 the medical department at Monsanto, tell me
18 how it evolved over the years, when did it
19 first start?

20 A: It started with myself and a
21 secretary.

22 Q: When was that?

23 A: This is after I came back from the
24 service.

25 Q: All right.

1 A: You don't want before that?

2 Q: There wasn't a medical department
3 before that; was there?

4 A: Well, I was a plant physician at the
5 Queeny plant which was, Q-U-E-E-N-Y, which
6 was in St. Louis, also called Plant A, that
7 the position there was to take care of the
8 occupational conditions and the injuries and
9 to set up a preventive medical service. And
10 then after about a year or so after that if a
11 problem arose at one of the other plants
12 management would look around and say what are
13 we doing? And somebody would say, well, we
14 have got a doctor over at the Queeny plant,
15 let's send him out. So I was sort of, in
16 essence, a medical director without
17 portfolio. And then when I came back in 1946
18 we set a new department, a central medical
19 department was started and I was given the
20 responsibility for the overseeing and the
21 staffing of medical departments in our
22 various laboratories and plants.

23 We started, as I said, that was back
24 in '46, with myself and a secretary.
25 Sometime in '47 or '48 we engaged our first

1 industrial hygienist. In the early fifties,
2 what I ended up, when I retired from there we
3 had four industrial hygienists. Around 1950,
4 I think, or early fifties we engaged our
5 first toxicologist. When I retired in '74 we
6 had four toxicologists. We picked up a
7 librarian along the way, and I think that's
8 the way it evolved personnel wise.

9 Q: Where was the office located when
10 you left in 1974?

11 A: In St. Louis, in St. Louis at the
12 headquarters.

13 Q: Did it maintain central files on the
14 health of all the employees of the Monsanto
15 Company?

16 A: The central -- no, at the central
17 file, no. The individual files were kept at
18 the plants.

19 Q: Did the medical department
20 headquarters here in St. Louis contain all of
21 the inquiries that you had gotten on the
22 various chemicals produced by Monsanto?

23 A: Yes, there was a policy that was
24 stated by the management of all inquiries
25 concerning possible ill effects or

1 information or inquiries asking for -- asking
2 for information about the toxicology or the
3 safe handling of our products would be
4 referred to the medical department, and we
5 kept copies of those. I mean, we kept
6 carbons of those letters, they were all
7 answered. I would say if there were
8 telephone conversations, some of them were
9 telephone, I don't know if I dictated the
10 file copy at all on telephone answers that I
11 gave, but certainly the written ones we kept
12 a copy of.

13 Q: Did you keep copies of your written
14 responses also?

15 A: Beg your pardon?

16 Q: Did you also keep copies of your
17 written responses in addition to the
18 inquiries?

19 A: Oh, sure, we kept a copy.

20 Q: Did you have a name for that file or
21 was it for each chemical?

22 A: It was for each chemical, and we
23 also, we had a plant file and a product file,
24 and anyone inquiring about a product file
25 went into the individual product file for

1 that company. If it was phthalic anhydride,
2 P-H-T-H-A-L-I-C, A-N-H-Y-D-R-I-D-E, it went
3 into the phthalic anhydride file.

4 Q: And was there a file for the PCB's?

5 A: Yes, sir.

6 Q: And when did that file first open?

7 A: I don't know.

8 Q: Had it been there when you arrived?

9 A: No. I can't -- there was not -- I
10 don't know if there was a file anyplace in
11 the company on PCB's. There must have been
12 some information because after I was there in
13 '36 to '37 I started receiving copies of
14 information they included in the file, in
15 somebody file.

16 Q: Why would that have come to your
17 attention?

18 A: They were glad to buck the job to
19 me.

20 Q: What was the job?

21 A: Well, at that particular time there
22 was a question of would we support work at
23 Harvard that was sponsored originally by the
24 Hallowax Corporation on investigations of
25 PCB's and chlorinated naphthalene,

1 N-A-P-H-T-H-A-L-E-N-E.

2 Q: We are going to talk about that in a
3 minute, but let me ask you this. When you
4 would make a response to an inquiry about the
5 effects of the chemical were you able to just
6 write that letter straight out or did
7 management want to review it?

8 A: Nobody reviewed it. I wrote it
9 straight out.

10 Q: Did you ever discuss your response
11 with management before making it on any
12 chemical?

13 A: I might have said what is Baker
14 Chemical Company doing with this particular
15 product, but I didn't say this is what I'm
16 going to tell Baker Chemical about the
17 toxicology or the safe handling data on this
18 product. That was my responsibility and I
19 did it myself without anybody editing it.

20 Q: Did you solely decide how much
21 information to give the inquirer?

22 A: Well, it was easy, I gave them
23 everything we had.

24 Q: You mentioned to me that Monsanto
25 did not have a laboratory for it's own animal

1 studies. When did it acquire such a lab?

2 A: We started discussions about it in
3 1973 and it came to fulfillment in '75 or
4 after I left, I left in '75 or '76.

5 Q: Why wasn't there a lab at Monsanto
6 before that day?

7 A: We didn't have a flow, enough of a
8 flow of products to justify in my mind the
9 staffing of a laboratory. We had -- we were
10 getting very adequate service from places we
11 were sending the material to. If we had an
12 inhalation study to be done we -- there were
13 specialists in that. We sent some of that to
14 Saranec Laboratory in New York,
15 S-A-R-A-N-E-C, Laboratory in New York. We
16 sent work on inhalation to the University of
17 Cincinnati Kettering, K-E-T-T-E-R-I-N-G,
18 Laboratory, and if we had long term studies
19 or other studies -- we didn't have the wide
20 variety of specialists that you need. You
21 need biochemists, you need pathologists, you
22 need a great number of people of varying
23 specialties that we didn't think that it was
24 justified of getting. We were getting the
25 data that we needed and the reports were

1 accepted by every government authority we
2 sent them to, Department of Agriculture, Food
3 and Drug Administration. They were quite
4 happy with our arrangement.

5 Q: Then why is it that you felt it
6 necessary to change that arrangement in 1974
7 if you had been happy with it before then?

8 A: Well, I believe the volume of
9 toxicological work increased exponentially.
10 We were more in the agricultural business
11 where it was necessary to do more analysis
12 on -- toxicological analysis on herbicides.
13 And toxicologist, toxicological
14 investigations were just demanded by more
15 government agencies.

16 Q: Had they not been demanded would
17 Monsanto have been interested in doing them?

18 MR. DAVIDSON: I will object, that's
19 pure speculation.

20 A: Certainly because we did an all
21 awful lot of work that was not demanded
22 before. There was a demand by the government
23 agencies. We were not forced into building a
24 laboratory because of the government.

25 Q: (By Mr. Warshauer) Who were the

1 toxicologists that were at Monsanto there at
2 the end?

3 A: At the end?

4 Q: At the end of your career at
5 Monsanto?

6 A: Dr. Levinskys, George Levinskys,
7 L-E-V-I-N-S-K-S-A-S, I think, Levinskys, Dr.
8 Fred Johannesen, J-O-H-A-N-N-E-S-E-N, Dr.
9 Paul Wright, W-R-I-G-H-T. There was somebody
10 else's name I don't remember.

11 Q: Were these competent toxicologists
12 in your opinion?

13 A: Yes, sir, they were all Ph.D.'s.
14 Dr. Levinskys was a toxicologist for
15 American Cyanamid when we recruited him,
16 American Cyanamid, C-Y-A-N-A-M-I-D. Dr. Fred
17 Johannesen was a Ph.D. and was a recent
18 graduate. There were no really toxicological
19 majors in universities until I guess around
20 sixties or seventies. Most of the people
21 were either pharmacologists or physiologists
22 gravitated to the toxicology. Dr. Hunt came
23 from Johnson and Johnson Pharmaceutical
24 House.

25 Q: Dr. Hunt?

1 A: William, he's dead, he was our first
2 toxicologist.

3 Q: You mentioned that there were no
4 majors. Who would you consider to be a
5 toxicologist now that is someone that is a
6 major or whose work you respect?

7 MR. DAVIDSON: Object to the form.
8 Are you asking him for the names of someone?

9 MR. WARSHAUER: Yeah.

10 A: When I said majors I meant a major
11 field of study. I didn't mean a prominent
12 toxicologist.

13 Q: Are there any prominent
14 toxicologists to your knowledge that you
15 particularly respect?

16 A: Well, I think George Levinskis is,
17 he's retired from Monsanto, and I think Fred
18 Johannesen is a prominent toxicologist, but
19 it all depends what you mean by prominent.
20 If you mean by prominent somebody who writes
21 a great deal, then I believe you have to go
22 to the academicians of the government people
23 who seem to have time to do this writing.
24 Most industrial scientists, unless they are
25 in pure research, don't really do a great

1 deal of literature writing.

2 Q: Among the academicians is there
3 anyone whose name in particular stands out to
4 you?

5 A: No, I haven't been picking
6 toxicologists for quite some time.

7 Q: I understand you were a member of
8 various associations, the Manufacturers
9 Chemical Association, National Agricultural
10 Chemical Association as medical advisors on
11 those?

12 A: As what?

13 Q: In your field as a medical doctor in
14 those organizations?

15 A: Yes.

16 Q: Did you ever discuss PCB's with
17 them?

18 A: I don't believe in a formal way. We
19 certainly -- they may have asked me questions
20 about it. These are medical advisory
21 committees that you were talking about?

22 Q: Yes, sir.

23 A: Certainly the N-A-A-C-P, that's the
24 National Agricultural Chemical Manufacturers
25 Association, the topic did not come up. It

1 may have in the Manufacture Chemist's
2 Association but I don't have any recollection
3 of any discussion about it.

4 Q: And did you participate in the
5 Poison Control Center out of Washington?

6 A: I was a consultant. I didn't do
7 much participation. They would send me a
8 bundle of cards and ask me to review what
9 they were advising people to do in a case of
10 poisoning. This was not a very extensive
11 deal, it was a pro bono deal. And --

12 Q: Did you ever get any cards that were
13 related to poisoning from PCB's?

14 A: Did I ever get any cards from a
15 relationship --

16 Q: You said they sent you cards?

17 A: Yes. No, I never did.

18 Q: Okay. Well, speaking of PCB
19 poisoning, if I was -- somehow had a child
20 who drank PCB's by accident, clearly, what
21 would be the appropriate reaction?

22 A: What would be the appropriate what?

23 Q: Reaction for someone who is trying
24 to help that person, do you induce vomiting,
25 do you feed them salt?

1 A: Induce vomiting, yes, induce
2 vomiting and watch for possible liver
3 effects. Give high carbohydrate diet. There
4 have been no -- PCB's obviously is an
5 industrial chemical and is not intended to be
6 taken internally. It is not a household
7 compound, so this question never came up. I
8 have never received any letter. It would be
9 a telephone call obviously. I have never
10 received to the best of my knowledge a
11 recollection of anybody saying I drank, my
12 child drank an ounce of PCB's or a teaspoon
13 of PCB's. It has a relatively mild to
14 moderate oral, LD50, around three point one,
15 something like that, grams per kilogram of
16 weight. So it is not in the ballpark with
17 parathion, P-A-R-A-T-H-I-O-N, or sodium
18 cyanide.

19 Q: It is not acutely toxic in small
20 doses; is that correct?

21 A: In small doses, no, but it is --
22 it's an industrial chemical that is mild to
23 moderate acute oral toxicity.

24 Q: Now, have you ever written any
25 materials for general publication in any

1 scientific journals or anywhere else
2 concerning the health effects of PCB's?

3 A: No, sir, I have not.

4 Q: How about concerning the health
5 effects of any chemicals?

6 A: I was an author on -- one of the
7 authors on scientific articles on bladder
8 cancers occurring after occupational exposure
9 to para-amino biphenyl P-A-R-A, A-M-I-N-O,
10 B-I-P-H-E-N-Y-L.

11 Q: And that was one of the carcinogens
12 that we mentioned earlier this morning?

13 A: Yes.

14 Q: During your years at Monsanto did
15 any of the people who worked there in your
16 medical department publish anything for
17 publication in the scientific or general
18 press concerning the health effects of PCB's?

19 A: Are you talking about safety data
20 sheets or bulletins, or are you talking about
21 scientific articles?

22 Q: I'm talking about things that would
23 be distributed beyond the users, things that
24 would be in the general industrial medicine,
25 for example.

1 A: I don't recall.

2 Q: When you came to Monsanto what year
3 was that?

4 A: '36.

5 Q: How big was it then, how many
6 employees, do you recall?

7 A: We had seven or eight plants, and
8 about seventy million dollars in sales, and I
9 guess they might have had less than ten
10 thousand employees.

11 Q: And when you left in 1974 had it
12 grown considerably?

13 A: They had fifty-five plants in the
14 United States and in Europe. They had sales
15 of three billion, and they had about -- well,
16 I think I said how many plants and how many
17 employees.

18 Q: How many employees, you did not say?

19 A: I thought there were about fifty
20 thousand.

21 Q: When you first got there how many --
22 well, what was Monsanto then?

23 A: What was it?

24 Q: Yeah.

25 A: It was a chemical manufacturing

1 organization.

2 Q: How many chemicals did it make?

3 A: I don't remember. Twenty,
4 twenty-five, thirty, I don't know.

5 Q: And by the time you left do you know
6 how many chemicals it made?

7 A: I certainly don't, but they were
8 making plastics, they were making fibers,
9 they made nylon, they made acrylan, they made
10 agricultural chemicals, herbicides,
11 insecticides when I left, and they made a
12 pretty full range of organic chemicals, but I
13 don't know how many, a couple hundred. And
14 their catalog, I don't recall seeing their
15 catalog for a long time.

16 Q: You told me that or I understand
17 that one of the things you did was write the
18 warnings for PCB's; is that correct?

19 A: Yes, sir.

20 Q: Did you write the warnings for any
21 other chemicals during your years at
22 Monsanto?

23 A: Anything that had to do with safe
24 handling of a chemical apart from fire and
25 explosion I wrote.

1 Q: How many chemicals do you think that
2 you wrote the instructions or warnings for
3 with respect to human safety?

4 A: Gosh, I don't remember.

5 Q: More than a hundred?

6 A: I would be guessing. I just don't
7 know.

8 Q: If I was to look at, say, 1960,
9 would there have been any other chemicals
10 that you were providing warnings for the
11 words of which were essentially identical to
12 the warnings that you provided with PCB's?

13 A: At one particular time the
14 government or some states asked for a
15 particular type of warning on chlorinated
16 hydrocarbons, and that may very well be that
17 there was some information somewhat similar
18 to information on PCB's on other chlorinated
19 hydrocarbons, but I don't -- I can't tell you
20 any particular chemical at this -- this time.

21 Q: Earlier I asked you whether you ever
22 did, ever followed Monsanto workers all the
23 way to the grave so to speak, and you told me
24 that you followed them until their
25 retirement. Was there a reason you never

1 checked to see whether there was any kind of
2 pattern in your employees to see if they were
3 dying from the same causes?

4 A: Well, I thought if they hadn't died
5 after thirty or forty years after that that
6 was a pretty long latency period, and I
7 didn't believe that if we didn't have any
8 occupational illnesses at that time we were
9 not going to have any in the future.

10 We did have a cancer index that we
11 followed people who were insured by Monsanto
12 and the insurance was -- at first it was
13 partially paid by the employee, then it was a
14 hundred percent paid by Monsanto. So
15 everybody was -- when it was partially paid
16 we had about a ninety-five percent
17 enrollment, but then when it was paid by
18 Monsanto everybody was enrolled. We did keep
19 a record of all retirees as well as workers
20 who had an insurance claim for a malignancy.
21 That was not an epidemiological study, it was
22 an index that we looked to see if there were
23 clusters of illnesses at any particular
24 plant.

25 Q: And what did you call that?

1 A: A cancer index.

2 Q: Where was it maintained?

3 A: It was maintained in my office in
4 St. Louis.

5 Q: And did you ever find that there
6 were clusters of any sort?

7 A: I did not.

8 Q: Did you ever compare the cancers
9 that were being experienced to those cancers
10 that were being experienced outside the
11 Monsanto family of workers, that is to the
12 general public?

13 A: Did I?

14 Q: Yes, sir.

15 A: Well, I -- we obviously had a lot of
16 cancers of the lungs. After all, thirty -- a
17 third of the people in the United States are
18 going to die of cancer if they live long
19 enough, and of those cancers in men who are
20 the predominant sex of Monsanto employees and
21 were smokers, an awful lot of them had
22 cancers of the lung. I mean, I don't know
23 what the percentage in the United States of
24 cancers of the lung are in the ordinary run
25 of the mill working class male, but looking

1 over the cancer index every quarter I did not
2 see what appeared to be to be a predominance
3 in any particular one cancer, and I compared
4 that in that sense to what I knew was
5 happening in the world at large.

6 Q: But you did no formal
7 epidemiological study; is that correct?

8 A: I did not, no, sir.

9 Q: And the only way to find the answer
10 to that question would have been to do an
11 appropriate and formal epidemiological study?

12 MR. DAVIDSON: Object to the form.

13 A: A formal one would certainly be more
14 accurate, yes, sir.

15 Q: What would you think was the single
16 most toxic chemical Monsanto manufactured
17 during your tenure there?

18 A: Parathion.

19 Q: And did you write the warnings on
20 parathion?

21 A: Yes.

22 Q: And what if you recall did that
23 warning say?

24 A: I don't recall, but we knew there
25 was an antidote for Parathion, antipede, and

1 we put that on that. I don't think we were
2 concerned about the vapor inhalation, we were
3 concerned about the mist that a person might
4 be exposed to. Parathion, remember now we
5 are talking about a condition that you could
6 get ill very rapidly and conceivably could
7 die within one or two days. We did not have
8 any -- I'm not sure if we had have any deaths
9 in our customers or not. There was one that
10 people took our Parathion and mixed it with
11 something for tobacco, tobacco use, and
12 merchandised this in glass bottles, and there
13 were fatalities of that case, but that was
14 the only case that I ever recall, but
15 Parathion was the most toxic compound we had.

16 Q: Did you use the word death as a
17 potential risk in your warning?

18 A: I can't answer that, I don't know.

19 Q: In all the warnings that you ever
20 wrote for Monsanto, did death or any synonym
21 of death, was that ever used?

22 A: No, sir, because we knew that if the
23 people followed the instructions and warnings
24 we gave them they wouldn't get sick, much
25 less die.

1 Q: Do you believe it was Monsanto's
2 duty or job to be knowledgeable about the
3 toxic effects of it's chemicals that it
4 produced?

5 A: Yes, sir, it was.

6 Q: Do you have an idea in your mind as
7 to who should be more knowledgeable, Monsanto
8 when they made a chemical, or the customer to
9 whom they sold it?

10 MR. DAVIDSON: Object.

11 A: Well, you've got two factors here.
12 One is the inherent toxicity of the product.
13 That is Monsanto's responsibility. The other
14 is the exposure to the product, that is the
15 customer's responsibility. He knows how he's
16 going to use it. We don't know how he's
17 going to use it. So we give them warnings
18 that no matter how he uses it if he follows
19 these warnings he will be safe.

20 Q: Did you believe that it was
21 Monsanto's role to give information about the
22 toxic effects of it's chemicals which was
23 both bad for the company or not, that
24 reflected badly on the product, that it is
25 very toxic, as well as information that

1 didn't reflect quite as badly on the product
2 that is not quite as toxic, for example?

3 MR. DAVIDSON: Object to the form.

4 A: I really don't know what you're
5 saying.

6 Q: (By Mr. Warshauer) Okay. That's
7 fine. If Monsanto had information that a
8 given product was exceedingly dangerous to
9 humans, at what point did you believe that
10 Monsanto should tell their customers, if
11 ever, about that danger?

12 MR. DAVIDSON: Object to the form.

13 A: As soon as we found out. Whenever
14 we knew it, if we knew that a compound was
15 going to be dangerous to a customer we told
16 the customer.

17 Q: (By Mr. Warshauer) How long did you
18 wait, how sure did you have to be before you
19 told the customer that this has a potentially
20 toxic effect?

21 A: Well, I don't think I can answer
22 that. I think it varied by whether we just
23 had a hunch or whether we had -- whether it
24 looked like it might be, but we certainly
25 always erred on the side of saying if you

1 have this type of exposure you may have
2 problems.

3 Q: Did you ever keep information about
4 the toxic effects of your products secret
5 from your customers?

6 A: No, sir, I do not recall any
7 instance where that happened.

8 Q: Did you ever in your opinion fail to
9 disclose to your customers that because of
10 toxic effects the product should not be used
11 in certain fashions?

12 A: Well, in other words, if we were
13 basing an industrial chemical, did we ever
14 tell a person don't use this as a food, is
15 that what you're saying?

16 Q: That would be one example.

17 A: Well, I never said that because we
18 sell it as industrial chemical. We don't
19 expect a person to put it on pancakes.

20 Q: Well, let's take your next example.
21 Did there ever come -- let's take your
22 example and take it a step further. Did
23 there ever come a time that you can recall in
24 which Monsanto was aware that a chemical was
25 being used in a fashion that it came in

1 contact with food, but did not tell all of
2 it's customers that that was a bad idea?

3 MR. DAVIDSON: Object to the form.

4 A: I don't recall any instances like
5 that.

6 Q: (By Mr. Warshauer) Was Monsanto's
7 interest in making profits from the sale of
8 it's chemicals considered by you in any
9 fashion in the information that you
10 disseminated with the chemicals?

11 A: No, sir, when I -- if we are talking
12 now about the toxicity of a product or the
13 warnings or the cautions or the use of the
14 product, the profit was not at all important,
15 it was not a factor. I was never told by
16 anybody in management that that should
17 influence my decision.

18 Q: When you drafted material safety
19 data sheets, were they ever reviewed by
20 management before they went out with the
21 product?

22 MR. DAVIDSON: Well, I object, I'm
23 not sure he has testified he ever drafted a
24 material safety data sheet.

25 Q: (By Mr. Warshauer) Did you ever

1 draft any portion of a material safety data
2 sheet?

3 A: Yes.

4 Q: And am I correct in understanding
5 that the portion that you would draft would
6 relate to warnings and instructions for safe
7 use for humans?

8 A: With the exception of fire and
9 explosion.

10 Q: All right. With respect to the
11 portion of these material safety data sheets
12 that you had responsibility for was your
13 writing or wording ever edited or reviewed by
14 management?

15 A: Well, I can't say that they may not
16 have seen it, but I can say that at no time
17 was the factual material changed by
18 management. What went on there was what I --
19 the information, conceivably, there could be
20 some change in semantics or something that we
21 might have had to change phrases to get it on
22 the label, but the information put on was not
23 subject to review by management from the
24 standpoint of changing the actual thrust of
25 the warning.

1 MR. DAVIDSON: We have been going
2 about an hour and twenty minutes.

3 (Recess)

4 Q: (By Mr. Warshauer) Before we took a
5 break you had used the word semantics to
6 describe some of the changes that management
7 may have made in your warnings or
8 instructions, that they may have changed
9 words. Do you think that the choice of words
10 is important in the effectiveness of a
11 warning?

12 A: I don't know, I mean I think you can
13 be positive in several different ways. So I
14 don't -- I think that there are ways to
15 express your meaning in several different
16 ways. So in that sense the choice is not so
17 overwhelming or so important, but there --
18 all I have to say is you've got to be sure
19 your words get your thinking across.

20 Q: With respect to warnings which do
21 you think would give the reader the idea that
22 something was the most dangerous, and I will
23 give you three words, hazard, warning, or
24 danger or caution, I will give you four
25 words.

1 MR. DAVIDSON: Object to the form.

2 A: What I would think?

3 Q: Yes, sir.

4 A: I think it depends on the different
5 product that you're talking about. I think
6 that -- I don't know how a worker would react
7 unless I knew how he was going to be exposed
8 to the product, whether or not he would react
9 differently to warning or danger or caution.
10 If it were a product that -- if he were
11 handling dynamite and he hadn't handled it
12 before I think danger would be a better word.
13 But in industrial chemicals where the
14 hazard -- where the exposure could be -- vary
15 a great deal I don't think I could make a
16 distinction at this time about that.

17 Q: Did you make a distinction when you
18 were writing the warnings that accompanied
19 Monsanto's products?

20 A: What I wrote on there, on Monsanto's
21 labels and bulletins, I put down what I
22 thought was adequate and complete enough to
23 keep the man from having any problem, any
24 harm to himself or to his people who were
25 working around there.

1 Q: To your knowledge has Monsanto ever
2 refused to market a chemical that it could
3 otherwise sell at a profit because that
4 chemical was too toxic for humans?

5 A: Yes, sir.

6 Q: What chemicals?

7 A: We had a deicer that was supposed to
8 be used on airplanes. I don't recall the
9 chemical, but it did have some embryological
10 problems in females, in animals in the female
11 sex, and I said we don't use it. There may
12 have been others -- there may have been
13 others but I just don't recall them now.

14 Q: When was this deicer chemical
15 thought about?

16 A: Well, I have been gone for eighteen
17 years so it was about ten years before that,
18 so it was twenty-eight years ago.

19 Q: Had it been marketed and then
20 withdrawn, or was it just considered?

21 A: Just considered.

22 Q: And how was it that it came to your
23 attention that it would have, I guess
24 teratogenic effects, is that the word?

25 A: Yes, that's correct. It came

1 because we had a system which we called our
2 201 procedure in which if a compound were
3 going to be marketed it was sent to the
4 medical department along with it's proposed
5 use and with the chemical and physical
6 characteristics of the material. Then we
7 looked it over from that standpoint of
8 marketing, and either approved it for that
9 particular use, or disapproved it. So I
10 believe it came that way.

11 Q: Was PCB ever subjected to that kind
12 of review before Monsanto began marketing it
13 to your knowledge?

14 A: No, to my knowledge, no, because
15 when Monsanto started marketing it they took
16 over the product before I came there. They
17 also took it over from Swon Chemical Company
18 which they acquired from the manufacturer for
19 about five -- several years before Monsanto
20 started manufacturing it. So the answer is,
21 no.

22 Q: Did you ever have any books or
23 guides or manuals which assisted you in
24 choosing the words that you wanted, that you
25 chose to use in your warnings and

1 instructions that you wrote?

2 A: I don't know of any books. At some
3 time there were committees of the
4 Manufacturing Chemist's Association, and also
5 there was one committee of the government
6 that may have put out booklets or memorandas
7 that came across my desk, but outside of
8 those I don't recall anything.

9 Q: And did you maintain those booklets
10 and memoranda in your library or files there
11 in the medical department?

12 A: I don't know whether I did or not.
13 They were not very prominent to me as far as
14 making my caution statements and putting
15 my -- putting the information that I thought
16 was needed on the label. I looked them over
17 and that was about it.

18 Q: Why weren't they prominent to you?

19 A: Beg your pardon?

20 Q: You said they were not very
21 prominent to me. Why is that?

22 A: Well, I don't think they offered
23 anything or provided any knowledge than what
24 I already possessed.

25 Q: What was your practice with respect

1 to advising your customers of possible health
2 risks versus known health risks?

3 A: Well, I didn't give them any advice
4 about non-health risks. I don't know what
5 you mean by that.

6 Q: Possible versus known, I don't know
7 that you heard me correctly.

8 A: Possible versus what?

9 Q: For example, did you tell people
10 that our ABC chemical is thought to possibly
11 cause birth defects, or did you wait until
12 that was known before you would tell them?

13 A: No, I don't believe we -- if we were
14 convinced in our own mind that there was even
15 a reasonable possibility of a compound having
16 any particular type of effect we would have
17 told the customer. If it were just somebody
18 said -- this one individual might say one
19 case report may say this may have happened
20 when someone was exposed to your compound ten
21 years ago, we would not tell a customer that
22 because from my -- in my thinking I do not
23 believe that was a realistic statement that
24 the man made.

25 Q: Did it matter to you the severity of

1 what happened when you made the decision
2 whether or not to communicate this isolated
3 event?

4 MR. DAVIDSON: Object, vague and
5 unclear.

6 A: Well, first of all that never did
7 occur. But if this man said I took a
8 teaspoon full, my son took a teaspoon full of
9 your medicine and dropped over dead, that
10 would certainly have interested me and that
11 would have been a concern and I would have
12 run the happening down, and if it looked at
13 all like there was some truth in the
14 statement, in the allegation, I would
15 certainly have investigated, and if it turned
16 out to be true we would have told the
17 customer that.

18 Q: When you put out a warning
19 concerning your chemicals, a warning that you
20 wrote on behalf of Monsanto, did you intend
21 for your -- for the customers of Monsanto to
22 rely on that warning?

23 A: Yes, sir.

24 Q: In your years at Monsanto did you
25 ever take any steps to determine the

1 sophistication or level of knowledge of
2 customers about particular products?

3 A: Did I ever -- repeat the sentence,
4 please.

5 Q: Did you ever take any steps to
6 determine the sophistication or level of
7 knowledge about a particular Monsanto product
8 held by the customer?

9 A: Yes.

10 Q: And how did you do that?

11 A: I talked to the medical directors, I
12 talked to the medical director of GE, I
13 talked to the medical director of
14 Westinghouse, about their knowledge about our
15 products and I found out that they knew as
16 much as I did.

17 Q: Did you ever take any steps to
18 insure that the warnings and instructions
19 that you put with a product were actually
20 being followed in the field?

21 MR. DAVIDSON: Are you referring to
22 him, personally?

23 Q: The medical department.

24 A: No, sir, we told the customer
25 everything we knew about the product. We put

1 the safe handling data on the label. If
2 the -- if we also recognized in some
3 instances that these were very sophisticated
4 companies with medical departments with
5 industrial hygienist departments, and we knew
6 from contact with those individuals that they
7 were as good as we were in the medical field.
8 There were some cases with insecticides where
9 the person was sort of a mom and pop
10 operation and was using a -- using our
11 parathion and we did check on them, yes, sir.

12 Q: How did you do that?

13 A: We had our industrial hygienist go
14 out to their plant.

15 Q: Did you ever find that a customer
16 was so careless in the use of your product
17 that you just decided not to sell it to them
18 anymore?

19 A: Did I?

20 Q: Did Monsanto to your knowledge?

21 A: I don't know anything about
22 Monsanto, but the medical department would
23 have never made that decision.

24 Q: Did the medical department ever
25 recommend that the chemical not be sold to a

1 customer because this customer was misusing
2 it in a fashion that would be dangerous to
3 humans?

4 A: We never did because I never found
5 that out.

6 Q: Is a warning which only communicates
7 half of a danger a warning which can be
8 misleading and dangerous?

9 MR. DAVIDSON: Object to the form.

10 A: I don't know what you mean by half
11 the danger.

12 Q: (By Mr. Warshauer) Well, if a
13 chemical had effects which ranged from
14 irritation to cancer and the warning said
15 something to the effect, warning, this
16 chemical is an irritant, would that warning
17 be one that's adequate?

18 MR. DAVIDSON: Object to the form of
19 the question. It's hypothetical and calls
20 for speculation. It is not related to the
21 facts of this case.

22 A: You are only putting in one of the
23 statements. Suppose they said this is an
24 irritant, do not get on your hands, avoid
25 continuous or repeated skin contact. If your

1 clothed are soaked with it get it off, that
2 would be -- protect the fella against
3 irritation, it would protect against cancer,
4 protect against anything.

5 Q: But do you feel like a warning that
6 merely mentioned the irritating properties of
7 the chemical would actually get the point
8 across even though it instructed not to
9 inhale, ingest or absorb the chemical, if
10 indeed the danger was much worse than
11 irritation?

12 MR. DAVIDSON: Same objection.

13 A: Well, you're giving a scenario that
14 isn't realistic from my point of view. An
15 irritation can occur against -- from one
16 application, from one unwise skin contact
17 with a material. If a compound can cause a
18 cancer to the skin, it causes cancer
19 someplace else after an absorption, that has
20 to be a repeated process that I do not
21 believe needs to be put on the label.

22 Q: Why?

23 A: Because there is only so much you
24 can put on the label. There is -- what you
25 have to put on a label is how to prevent

1 anything from happening, and it's not
2 important from my point of view to tell them
3 what is liable to happen.

4 Q: Now, what I want to make sure I
5 understand, sir, is your belief and your
6 practice in the area of warnings. Is it your
7 belief that a warning that instructs someone,
8 that first cautions them about irritation and
9 then instructs them not to ingest, absorb or
10 inhale the product, would be as effective as
11 a warning that advised about both irritation
12 and a life threatening disease such as
13 cancer, and also instructed them to avoid
14 absorption, inhalation or ingestion of a
15 product?

16 MR. DAVIDSON: Object to the form of
17 the question as being compound, confusing,
18 irrelevant, not related to the facts of this
19 case and purely speculative.

20 A: I lost my concentration. Would you
21 repeat that?

22 Q: (By Mr. Warshauer) Sure. Do you
23 believe that a warning that says something to
24 this effect, this product is a skin irritant,
25 avoid prolonged skin contact, inhalation, and

1 ingestion, would be as effective as a warning
2 that said this product is a skin irritant and
3 causes cancer, avoid prolonged skin contact,
4 inhalation or ingestion.

5 MR. DAVIDSON: Same objection.

6 A: We are talking about a product that
7 causes cancer in humans?

8 Q: (By Mr. Warshauer) Yes.

9 A: Well, I think it depends on the
10 product. The EPA and in the State of
11 California has put on bags of sand this
12 compound can cause cancer, and I don't
13 believe that that warning is at all
14 effective. If somebody is buying a sack full
15 of sand from the Monterrey peninsula to put
16 in his child's sand box I don't believe they
17 pay any attention to it.

18 So in that particular instance a
19 warning is not particularly effective. I
20 think it depends on the product, it depends
21 on the exposure that the person conceivably
22 could have, and it depends on whether the
23 facts are correct.

24 Q: I want to make sure I understand
25 your response. Do you have an opinion as to

1 which of those two warnings, examples that I
2 gave you, would be the most effective in
3 protecting a man from cancer?

4 MR. DAVIDSON: Objection.

5 A: Well, I have to clarify my statement
6 because in the first place I would have to
7 know, does this material even cause cancer in
8 somebody?

9 Q: (By Mr. Warshauer) Well, assume it
10 does from my example.

11 A: Well suppose we do not manufacture
12 saccharine any more. Saccharine if given
13 five percent of the diet causes cancer in
14 rats. If you put down on that warning may
15 cause cancer, should you put down may, that
16 is a half truth by itself, because you would
17 have to say may cause cancer when given in
18 five percent of the diet to rats. So I don't
19 know how effective that particular type of
20 warning is. I don't think I can make a
21 generalized answer to your question.

22 Q: In your role as a person writing
23 warnings for Monsanto did you make the
24 judgment call as to whether to include the
25 more serious consequences along with the less

1 serious consequences, or did you include it
2 all and then let the ultimate user make the
3 decision on how to interpret your warning?

4 A: I made a decision that if -- that my
5 warnings were completely -- were complete
6 enough to save the worker, to avoid any ill
7 effect on the worker, and I didn't have to
8 put on there this may cause liver trouble if
9 you disregard these instructions.

10 Q: With respect to PCB's then you made
11 a conscious decision not to include liver
12 problems as one of the elements of your
13 warnings?

14 A: On the label. In the bulletins we
15 put out we did say, give all these
16 possibilities of what happened in animals and
17 what happened in acute episodes of breathing
18 the material from leaks at elevated
19 temperatures.

20 Q: When did you start putting that out
21 in the bulletins?

22 A: When it was used -- when we started
23 using it for heat transfer agencies, heat
24 transfer systems, and when we used it for
25 hydraulic fluids, but we always had on our

1 bulletins do not inhale a material above
2 the -- once there was an MAC or TLV
3 established we put down what was the TLV or
4 what was the MAC.

5 Q: When is it, do you recall what year
6 it was that you began putting this more
7 specific information about the dangers of the
8 PCB products in heat transfer mediums and
9 hydraulic fluids?

10 A: The possible dangers?

11 Q: The specific possible dangers, you
12 mentioned the liver problems and the findings
13 in animals?

14 A: Some time in the fifties.

15 Q: Let's talk about PCB's in
16 particular. I know we have talked about them
17 off and on, but let's focus on that for a
18 little while. Am I correct in understanding
19 that Monsanto was the only United States
20 manufacturer of that product?

21 A: Only which?

22 Q: United States manufacturer?

23 A: To the best of my knowledge that is
24 true. I'm not certain, but that's my
25 impression that they were.

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1 have a chlorinated dibenzofuran, let's just
2 call them furans for simplicity.

3 Q: Okay. Do you know who developed
4 polychlorinated biphenyls, PCB's, in the
5 United States?

6 A: No, I do not. Well, I know General
7 Electric has a patent on it so they must have
8 developed it.

9 Q: Did Monsanto make it under license
10 for GE -- under license under GE's patent?

11 A: They made it according to their
12 specifications, they must have done it -- we
13 didn't infringe on their patent, but I don't
14 know the legal ramifications of how Monsanto
15 made it, but I know that some cases we said
16 produced for General Electric and some cases
17 we didn't.

18 Q: Okay. In some cases you produced
19 for other people like Westinghouse?

20 A: Yes, true.

21 Q: But the PCB was still GE's patented
22 chemical; is that correct?

23 A: That's correct.

24 Q: Do you have any understanding as to
25 how when Monsanto began the manufacturing of

1 this stuff in the place of the Swon Chemical
2 Company how it began to market PCB's?

3 A: I guess they took the customers that
4 Swon had, but I don't know. I'm not in the
5 marketing department. I don't know.

6 Q: Well, did anybody ever consult the
7 medical department about potential uses for
8 PCB's to broaden the sales base?

9 MR. DAVIDSON: At any time?

10 Q: (By Mr. Warshauer) In the forties.

11 A: I don't recall whether they did or
12 not.

13 Q: In the fifties?

14 A: Anytime, I don't recall whether they
15 talked to us. I can't answer that. They may
16 have and they may have not, I don't know.

17 Q: Well, can you tell me some of the
18 products that you understand the PCB's were
19 used in when you first came with Monsanto?

20 A: Yes, they were used as dielectrics.

21 Q: Anything else?

22 A: That was the only one that I recall.
23 They were using it when I first came with
24 Monsanto.

25 Q: And did they develop additional

1 products as time went by?

2 A: Yes, they did.

3 Q: Tell me about some of those
4 products.

5 A: Well, they used PCB's as a heat
6 transfer agent. They used it in hydraulic
7 fluid. They used it as a plasticizer. They
8 used it in carbonless carbon paper.

9 Q: Before they used PCB's in these
10 applications which came into being after you
11 got there, and as I understand it everything
12 but dielectric fluid would have been an
13 application after you got there?

14 A: Everything except the dielectrics,
15 yes.

16 Q: Correct?

17 A: Yes.

18 Q: Did they consult the medical
19 department about whether there would be human
20 health concerns?

21 A: Yes.

22 Q: Tell me about that.

23 A: Well, hydraulic fluids, they knew
24 that there was liable to be some exposure at
25 elevated temperatures, and we didn't have

1 information on long term testing of the
2 material at elevated temperatures. So we ran
3 tests on two of the PCB's for five months at
4 elevated temperatures that simulated using in
5 die cast operations to find a safe level.

6 Q: Did it turn out that that level was
7 safe?

8 A: Yes, it was accepted by the U.S.
9 Government.

10 Q: I didn't ask that. The government
11 thinks lots of things are safe are unsafe.

12 A: Beg you pardon, I don't hear.

13 Q: I didn't ask about that. Did it
14 turn out, regardless of the government's
15 thoughts did it turn out to be safe?

16 A: Yes.

17 MR. DAVIDSON: As to what?

18 MR. WARSHAUER: As to the level we
19 were talking about.

20 MR. DAVIDSON: As to what?

21 A: Yes.

22 MR. WARSHAUER: The exposure to
23 hydraulic fluids.

24 A: Yes.

25 Q: (By Mr. Warshauer) Have you ever

1 heard of something called montar?

2 A: I vaguely remember it and I have no
3 recollection of what it went into or what it
4 was.

5 Q: Somebody told me that it was what
6 was left at the bottom of the cauldron when
7 they made PCB's.

8 MR. DAVIDSON: Object.

9 A: I can't answer that yes or no.

10 Q: (By Mr. Warshauer) Do you have any
11 idea of how that product was marketed?

12 A: No, sir, I do not know at this time.

13 Q: Do you have any idea of the health
14 effects of that product on humans?

15 A: If it was marketed we had acute oral
16 LD50 on the material. We did that on all our
17 products that we marketed, but I don't know
18 anything more about it than that. I recall
19 no inquiries from customers and I recall no
20 literature stating toxicity yes or no on the
21 product.

22 Q: With respect to dielectric fluids am
23 I correct that those were called askerals?

24 A: Yes, that's a generic name for a
25 relatively non-flammable dielectric.

1 Q: All right. With respect to the
2 askerals that contained PCB's could you tell
3 me some of the brand names that -- under
4 which they were marketed?

5 A: Yes. GE's brand name was Pyranol,
6 Westinghouse's was Inerteen. I didn't know
7 any other brand. I-N-E-R-T-E-E-N. We are
8 talking about the U.S.?

9 Q: Yes, sir. Using either Inerteen or
10 Pyranol as an example can you tell me what
11 the constituent parts of a typical dielectric
12 fluid to be used in a transformer were?

13 A: Well, I would have to be pretty
14 general in my statement. I'm not a
15 manufacturing individual but the product,
16 some were complete askeral with a scavenger
17 to pick up chlorine. Some were complete
18 Aroclors, I say some, some, some dielectrics
19 were. Some were PCB's with varying
20 percentage of trichlorobenzene. It all
21 depends, we manufactured the material for GE
22 and Westinghouse's specifications.

23 Q: With respect to the chlorinated
24 benzene constituent of askerals did you ever
25 do any studies to determine the toxicity of

1 that chemical?

2 A: No, sir, there was a great deal of
3 that material in the literature.

4 Q: And were you satisfied that that was
5 sufficient in the --

6 A: Beg your pardon?

7 Q: Were you satisfied that that
8 information was adequate and accurate?

9 A: Yes, sir.

10 Q: Did you ever do a study of the
11 health effect of the chlorinated benzenes
12 with the PCB, the two chemicals together?

13 A: Yes, sir.

14 Q: And when did you do that?

15 A: I don't know if it was in the
16 sixties or not, I'm not sure, but we did our
17 package of acute toxicity testing on the two
18 materials.

19 Q: And did you do that for Westinghouse
20 or GE?

21 A: No, we did it for ourself.

22 Q: Did you provide the information to
23 Westinghouse or GE?

24 A: I don't know if we did or not.

25 Q: Are you familiar with any of the

1 breakdown chemicals of the chlorinated
2 benzenes that would be in askerals?

3 A: Breakdown from what?

4 Q: When it breaks down when it
5 degrades, when it is subjected to heat or
6 fire, or any of those of concern to me from a
7 toxic point of view?

8 A: From --

9 Q: Chlorinated benzenes.

10 A: From chlorinated benzenes? Well,
11 one of the compounds from -- at a particular
12 temperature range can be dioxin from
13 chlorinated benzenes, not from PCB's.

14 Q: And did you consider dioxins a toxic
15 chemical?

16 A: Yes, certainly.

17 Q: When did you first recognize dioxins
18 as a toxic chemical?

19 A: The fifties.

20 Q: And why did that come to your
21 attention?

22 A: Because dioxin had occurred in the
23 manufacture of herbicides.

24 Q: Where?

25 A: In Germany and the United states.

1 Q: Okay. Did this occur in the
2 manufacture of herbicides by Monsanto?

3 A: Among other people. There were
4 several companies that manufactured the
5 herbicides that had a starting point of a
6 material that could cause -- that could
7 contain dioxin.

8 Q: Where was the facility that Monsanto
9 had experienced these contaminants?

10 A: Nitro, West Virginia.

11 Q: Had there been any human health
12 effects associated with them?

13 A: Yes.

14 Q: Were those serious?

15 A: There were two types of exposure.
16 One, we had an uncontrolled reaction in a
17 trichlorophenyl processor in which there was
18 an explosion and it formed a condition, a
19 product, the residue was a gunk that we could
20 not analyze, it was charred material, so we
21 did not, but we developed pretty serious
22 chloracne from that, and there were also some
23 systemic effects. In our regular run of the
24 mill, a run of the mill production we did
25 have chloracne, but no systemic effects.

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1 MR. DAVIDSON: I would like to note
2 an objection for the record to the last
3 question as to being irrelevant.

4 A: Yes, I should say there were no
5 PCB's at Nitro.

6 Q: What is the systemic effect?

7 A: What were they?

8 Q: Yes.

9 A: Peripheral neuritis,
10 N-E-U-R-I-T-I-S, peripheral neuritis, pains
11 in the -- along the course of some of the
12 nerves of the body, of the extremities.

13 Q: What was the chemical that was used
14 as the scavenger?

15 A: I don't know. It was used in a
16 small percentage and I don't know whether we
17 put it in or whether Westinghouse or GE put
18 it in.

19 Q: Do you know anything about it's
20 toxicity?

21 A: Except that when it had the finished
22 product we tested the whole product so we
23 knew the toxicity of the complete product.

24 Q: Do you know anything about it's
25 qualities as a latent toxin, that is that it

1 would take a long time for it to be a danger
2 to someone, for it to be realized as a
3 danger?

4 MR. DAVIDSON: Object, he said he
5 doesn't even know what it is. How can he
6 possibly know anything about it?

7 MR. WARSHAUER: That's what amazes
8 me, too.

9 Q: (By Mr. Warshauer) Do you know
10 anything about the latent effects of the
11 scavenger chemicals?

12 A: No, sir, not at this time. I may
13 have known it twenty years ago but I don't
14 know it now.

15 (Recess)

16 Q: (By Mr. Warshauer) Before we took
17 the break we were talking about PCB's.

18 A: Yes, sir.

19 Q: And we had talked a little bit about
20 chlorinated benzenes and what happens when
21 they breakdown sometimes into polychlorinated
22 dibenzene dioxins?

23 A: Yes, sir.

24 Q: And we talked about your knowledge
25 of the scavenger chemical. Now let's talk

1 about the PCB's themselves.

2 A: Yes, sir.

3 Q: Are you familiar with any chemicals
4 which they form, we talked about furans
5 earlier. Okay. So let's focus on the
6 furans. What role does a furan play in
7 Aroclor?

8 A: In what capacity?

9 Q: Does it serve any useful function?

10 A: No, sir.

11 Q: Does it belong there?

12 A: It's a contaminant that's not
13 manufactured on purpose.

14 Q: Can it be eliminated?

15 A: I don't know.

16 Q: When did you first become aware that
17 furans could contaminate PCB's?

18 A: When? In 1970 when a Dr. Voss in
19 Sweden tested Monsanto PCB's and French PCB's
20 and either German or Italian PCB's and
21 according to his analytical methods he found
22 levels of PCB's, I don't recall the amount
23 but it was parts per million in French and in
24 European PCB's, two European PCB's, but he
25 did not find it in the Monsanto PCB's

1 according to his report.

2 Q: And was the Voss study your first
3 knowledge that PCB's could be contaminated by
4 furans?

5 A: I think so. I'm not completely
6 certain, but that's the first published
7 material I saw. I do not know whether I had
8 some knowledge before then but I doubt if I
9 did, but I don't recall.

10 Q: Had you had any knowledge before
11 then would you have thought it reasonable to
12 share that knowledge with your customers?

13 A: Well, I don't believe it was
14 reasonable, it would be reasonable, because
15 we had tested the toxicology of the product
16 itself and the product, if it did contain
17 furans which we did not know about we still
18 had tested what if any the furans in their
19 parts per million added to the PCB's. If
20 you're testing soup you get the whole
21 toxicity of value, of the soup itself. If
22 you've got a few extra carrots in there and
23 you're -- they don't add anything particular
24 to the amount of the toxicity from the soup
25 you test, we tested the material. If it had

1 furans in there we had tested the PCB's with
2 furans. We didn't know until -- in fact,
3 when I left Monsanto I had seen no reports
4 that we had found PCB's, I mean furans in our
5 PCB's.

6 Q: By 1974 you were still of the belief
7 that there were no furans in Monsanto PCB's?

8 A: I wasn't of the belief there weren't
9 any. I was of the belief we didn't find
10 them.

11 Q: Were you of the belief they were
12 there?

13 A: There might have been, yes.

14 Q: In 1970 did you think they were
15 there?

16 A: Well, I don't know. It all depends
17 what you mean by -- maybe it was part per
18 trillion or something. I don't know how far
19 down Voss went, but he didn't find any so I
20 believed him. I didn't think he was wrong on
21 us and right on the other two, but
22 conceivably they might have been but I have
23 no idea whether they were, as I said, parts
24 per billion or trillion at that time.

25 Q: Did you have -- when did you first

1 have an understanding of how furans could --
2 be created from PCB's?

3 A: I guess sometime in the seventies.

4 Q: And what was your understanding of
5 the process by which furans would be created
6 from PCB's?

7 A: That if they were subjected to heat,
8 if PCB's were subjected to heat at a certain
9 temperature, I'm not sure about that
10 temperature, I don't know whether there was
11 six hundred degrees centigrade or Fahrenheit,
12 there was a window between six and eight
13 hundred degrees that they could be formed,
14 don't hold me to those two figures, but then
15 after eight hundred degrees they were
16 destroyed, that's the understanding I had,
17 still have.

18 Q: In your role as a person involved in
19 providing warnings to the customers of
20 Monsanto did you ever give them any specific
21 knowledge of the -- or information of the
22 existence of furans in the PCB's being sold
23 by Monsanto?

24 A: I'm sure I answered questions about
25 that and gave them information about it in

1 the letters that I sent people, yes.

2 Q: Did you tell them about the toxicity
3 of furans?

4 A: I don't recall what I told them.

5 Q: What is your understanding as you
6 sit here today about the relative toxicity of
7 furans versus PCB's?

8 A: I think they are much more toxic.

9 Q: On a scale of a hundred with one
10 hundred being the most toxic substance that
11 you can possibly think of and one being the
12 safest substance that you can possibly think
13 of where would a furan go on that scale if
14 you can use that scale?

15 MR. DAVIDSON: Object to the form.

16 A: I couldn't hear it, what?

17 MR. DAVIDSON: I just objected to
18 the form.

19 A: Gosh, I don't know. I know they are
20 more toxic. They are considerably more toxic
21 than PCB's. How they are in relationship to
22 other compounds, there are all sorts of
23 toxicity, you get hydrogen cyanide. Is that
24 going to be a hundred? That will kill you.
25 They use that in the death chamber. They

1 don't use furans, obviously, so it is
2 somewhat less toxic. It is less toxic than
3 hydrocyanide and it's more toxic than an
4 awful lot of industrial chemicals.

5 Q: When you were at Monsanto who were
6 the biggest customers of the Aroclor
7 dielectric fluids?

8 A: I don't know. I would imagine GE
9 but I'm not certain, I don't know.

10 Q: Would Westinghouse be in the group
11 of the largest customers?

12 A: Yes, I thought you said the largest.

13 Q: The biggest, meaning plural.

14 A: Well, I think Westinghouse and GE
15 were, yes, were the largest customers.

16 Q: Can you think of any other customers
17 that were large purchasers of Aroclor
18 dielectric fluids?

19 A: I don't know. I mean, there were
20 other transformer manufacturers, there was
21 Allis Chalmers, there was Packard, there was
22 Maloney Electric, but I don't know what their
23 relationship was as far as their total usage
24 of PCB was concerned.

25 Q: What was your understanding of what

1 Westinghouse knew about PCB's?

2 A: My understanding was that they knew
3 as much if not more about the toxicity and
4 safe handling procedures to be used with
5 PCB's.

6 Q: And how did you arrive at that
7 understanding?

8 A: Well, one, from talking to their
9 medical director who was T. Lyle Hazlett,
10 H-A-Z-L-E-T-T. I met him quite frequently at
11 industrial medical meetings, and then we had
12 correspondence with their industrial hygiene
13 department. I knew they had very high grade
14 industrial hygienists. They were thought
15 of -- one of them was president of the
16 American Industrial Hygiene Association. And
17 my impression was that they were a top drawer
18 medical organization and a top drawer
19 industrial hygienist department.

20 Q: Did you ever visit their medical
21 department?

22 A: No, sir, not that I can recall.

23 Q: Did you ever visit their industrial
24 hygiene department?

25 A: No, sir, I did not.

1 Q: Did you ever visit any laboratories
2 that they may have had?

3 A: I don't think I -- I don't believe
4 so. I don't think I did.

5 Q: Did you ever -- did you review any
6 literature that they may have been putting
7 out concerning PCB's?

8 A: After my retirement from Monsanto I
9 saw --

10 Q: During the period of time when you
11 worked there.

12 A: No, sir, I did not.

13 Q: Okay. After you worked there?

14 A: Yes, I did.

15 Q: What did you see?

16 A: I've seen safe handling data and
17 I've seen safety data sheets from
18 Westinghouse Electric. I've seen
19 toxicological, a toxicological report that I
20 was told came from their files.

21 Q: What toxicological report was that?

22 A: I found out a Dr. Vonottingen's,
23 V-O-N-O-T-T-I-N-G-E-N, report.

24 Q: Did you know at any time while you
25 were working at Monsanto that Westinghouse

1 had the Vonottingen report in it's files?

2 A: No, sir, I did not.

3 Q: And do you know when Westinghouse
4 first got that report?

5 A: No, sir, I do not.

6 Q: Did you ever visit a Westinghouse
7 facility, a manufacturing facility that used
8 dielectric fluids?

9 A: No, sir, I did not.

10 Q: What knowledge did you have -- let
11 me go back, you mentioned that you had seen
12 the safe handling sheets, material safety
13 data sheets?

14 A: Yes, sir.

15 Q: And you had seen them only after
16 you've left Monsanto; is that correct?

17 A: Yes, sir.

18 Q: Did you find the warnings and
19 instructions within those sheets to be
20 adequate?

21 A: Yes, sir.

22 Q: Is that the same warning that
23 Monsanto would have issued had it issued --
24 been responsible for issuing Westinghouse's
25 warnings for it?

1 A: You mean -- let's repeat that, are
2 you asking me --

3 Q: I want to repeat it. Would you have
4 been satisfied to use that same warning
5 language and those same handling instructions
6 for Monsanto's products, PCB products?

7 A: When, what point in time, any time?

8 Q: 1972.

9 A: Well, I never really looked at it
10 from that point of view, but I would say that
11 it appeared to me to be quite adequate, and
12 without me knowing what was Monsanto supposed
13 to do with their -- I lost the gist of your
14 question.

15 Q: Well, I was just wondering if --

16 A: If I were writing it for
17 Westinghouse or for Monsanto or what?

18 Q: That's a better question. If you
19 were writing the ones for Westinghouse would
20 you have changed anything they were putting
21 out in the warnings you saw?

22 A: I would have to know more about
23 their exposure. I said I have never been in
24 their plants. I never saw how they used the
25 product so I can't comment on their safe or

1 their warning, safe handling data. Toxicity,
2 as I said repeatedly, has two phases. One,
3 the inherent toxicity of the product, and the
4 other, the exposure or the potential
5 exposure.

6 Q: Did they leave anything out with
7 respect to risks?

8 A: This -- what is this?

9 Q: Did they fail to warn of any
10 particular risk that you think they should
11 have warned of?

12 A: Gosh, I can't comment. I don't
13 know. I don't recall until I scrutinize it
14 that thoroughly.

15 Q: But it is without question true that
16 at no point in time while you were at
17 Monsanto did you review their warnings?

18 A: That is correct.

19 Q: What did Dr. Hazlett tell you about
20 their knowledge of PCB's at Westinghouse?

21 A: Well, I can't quote his exact words
22 but in our conversations he gave me the
23 impression that he knew whatever was in the
24 published literature, he knew there wasn't
25 much in the published literature. He knew

1 about the action of PCB's both on animals and
2 the lack of it on his workers. I would say
3 are you having any trouble with PCB's and he
4 would say no, I remember that.

5 Q: Did you talk about liver problems
6 with Dr. Hazlett?

7 A: No, but if I said you don't have any
8 trouble and he didn't have any trouble, I
9 didn't say did you have liver trouble, did
10 you have diabetes, did you have -- but he
11 gave me the impression he was not having any
12 problems with his workers who were exposed to
13 PCB.

14 Q: Did you ever ask to see his worker's
15 health records?

16 A: No, sir, I did not. It would be
17 like asking him to see your income tax. No,
18 it wasn't my business. If he tells me he's
19 not having any trouble do I want to impeach
20 him by asking him for his records? Certainly
21 I didn't.

22 Q: Wouldn't that be a valuable source
23 of information to Monsanto as to the true
24 health effects of it's products?

25 A: I thought I had the true effects. I

1 was talking to a man who was very well
2 respected in industrial medicine who had the
3 reputation of being honest and capable.

4 Q: Did you ever discuss lung cancer
5 with Dr. Hazlett?

6 A: No, sir.

7 Q: With respect to PCB's?

8 A: No, sir.

9 Q: Did you ever discuss furans with
10 Dr. Hazlett?

11 A: Well, I do not know when Dr. Hazlett
12 died, but furans were not recognized as a
13 radiant or contaminant of PCB's in the days
14 when I talked with him which was in the
15 thirties and forties.

16 Q: After the thirties and forties did
17 you discuss PCB's and their effects on humans
18 with anyone at Westinghouse other than
19 Dr. Hazlett?

20 A: Did I myself? No, people in the
21 medical department did, but not I.

22 Q: And what do you understand these
23 people in the medical department discovered
24 when they talked to people at Westinghouse?

25 A: What did they what?

1 Q: What did they discover when they
2 talked to people at Westinghouse?

3 A: Well, that was not the purpose of
4 their correspondence. They were answering
5 questions that were raised by the industrial
6 hygienist at Westinghouse. We had sent them
7 information on Treon's work. We had sent
8 them information on material put out by the
9 America Industrial Hygiene Association, and
10 Mr. Wheeler had quite a lot of correspondence
11 with a Mr. Spiker of Westinghouse.

12 Q: Well, if Westinghouse knew so much
13 about PCB's why would they have asked you for
14 answers?

15 A: I don't know.

16 Q: Did you ever discuss with them the
17 potential for dioxins in chlorobenzenes,
18 chlorinated benzenes?

19 A: No, sir, I did not.

20 Q: Why not?

21 A: Well, the situation never came up.

22 Q: Forgive me if I already asked this,
23 why didn't you discuss the furans with him?

24 A: At what -- what would be the point
25 of the discussion? I said before that the

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1 amount of furans that were present in
2 Monsanto PCB did not contribute materially to
3 the overall toxicity of our PCB's.

4 Q: Does the level of furans increase as
5 the PCB's are aged?

6 A: To the best of my knowledge, no, but
7 you will have to ask somebody more
8 knowledgeable than I, but as I recall we used
9 some -- we tested some used transformer PCB
10 and did not find that aging issue meant --
11 turned it, increased the percentage of
12 furans. This occurred after I left because
13 we didn't find any, we were unable to find it
14 in our own material before I left, or at any
15 rate I didn't know about it.

16 Q: What kind of analytical tools did
17 you have to use to find these chemicals?

18 A: You mean I or Monsanto?

19 Q: Monsanto.

20 A: Well, they were what they thought
21 was a state of the art, but when they went
22 over to Sweden they found out that Woodmark
23 and Jensen were using gas chromatography with
24 electron capture. I don't know what they
25 were, but they didn't have the sophisticated

1 tools that Jensen and Woodmark had, so they
2 ordered them, but you don't go to Radio Shack
3 and order these things off the counter so it
4 took quite a little while to get the
5 apparatus that they could use.

6 Q: You mentioned the Vonettingen study.
7 What are your thoughts about that?

8 A: I thought it was a pretty well
9 carried out series of experiments for 1936, I
10 believe. I don't know the date of it but I
11 thought it was in the thirties that his
12 report was dated.

13 Q: Well, did you think it was
14 elaborately carried out?

15 A: It was what?

16 Q: Was it elaborately carried out,
17 carefully carried out?

18 A: Yes, it seemed to be. Yes, he did
19 inhalation, he did feeding, he checked the
20 ingredients in Inerteen.

21 Q: When did Dr. Hazlett die do you
22 think?

23 A: I don't know.

24 Q: Can you give me a decade? Well,
25 when was the last time you communicated with

1 him in his role at Westinghouse?

2 A: I can't be certain about that but I
3 would know it was in the late forties, and
4 after I came back from the service and I was
5 full fledged medical record, but I don't know
6 when the last time I saw him was and I don't
7 know when he died.

8 Q: Did you have any kind of personal
9 contact with anybody else at Westinghouse
10 after Dr. Hazlett left?

11 A: There was a fella, I think by the
12 name of Clark, but I don't recall too much
13 about him, that was, and I'm not exactly sure
14 if that's the right person or I had thought
15 he was. I knew he was in Pittsburgh and I
16 thought he was at Westinghouse, but I'm not
17 certain of it.

18 Q: Did you ever have any meetings with
19 Westinghouse people in the medical
20 department, or any of your people on your
21 behalf had meetings with Westinghouse to
22 discuss PCB's in particular?

23 A: I think people in the medical
24 department had meetings with some
25 Westinghouse people right about the time I

1 retired. I was not present at those meetings
2 but that would be in '75, '74-'75 they were
3 industrial hygiene people that met with some
4 other either manufacturing people or
5 industrial hygiene people.

6 Q: When you first started with Monsanto
7 in a full-time capacity after you returned
8 from the war at that time could you tell me
9 what you believed to be the human health risk
10 associated with PCB's?

11 A: Yes, I believe there was no human
12 risk associated with the use of PCB if you
13 avoided repeated or prolonged skin contact
14 and if you did not breath the material at
15 elevated temperatures or in confined spaces,
16 I believe that if you had a bucket of PCB's
17 sitting on the floor here you could breath it
18 all day because the vapor pressure was such
19 that you wouldn't get exposed to it a
20 significant amount.

21 Q: Why was elevated temperature an
22 essential element?

23 A: Because you have to heat a compound
24 to increase it's vapor pressure. If it's a
25 liquid and you don't get any fumes from it,

1 you aren't breathing it if you aren't getting
2 any vapors, if you elevated the temperature
3 you do. It is as simple as that.

4 Q: Well, take this glass of water, for
5 example, it's at room temperature?

6 A: Yes.

7 Q: If I came back in two weeks it would
8 be empty. Where would it go if it was not
9 elevated beyond it's vapor pressure?

10 A: First of all, I don't know if you
11 came back in two weeks it would be empty.
12 I'm not sure that's true.

13 Q: Well, do you think --

14 A: It's got a very low vapor pressure.
15 Water has a -- if you boil it obviously you
16 get steam, but I don't know, if you leave a
17 glass of water here in a room, I've never
18 checked it, I saw no reason to check it.

19 Q: Well, things dry out in rooms
20 without getting to be --

21 A: Well sooner or later they dry out,
22 but let's be specific. You said if you left
23 this glass of water here at room temperature,
24 you came back in two weeks it would be empty.
25 I'm not sure that's correct.

1 Q: All right. Would you agree that
2 some portion of it would be gone?

3 A: Some portion, yes, would be gone.

4 Q: If this glass was full of PCB's
5 instead of water and I came back in two weeks
6 would some portion of that also be gone?

7 A: Yes.

8 Q: And where would it go?

9 A: Into the air.

10 Q: Okay. Would it be safe for me to
11 breath that?

12 A: Would it be safe?

13 Q: Yes.

14 A: Certainly.

15 Q: And how is it that you arrive at
16 that conclusion?

17 A: Because I arrived at it two ways.
18 We had people breathing the material at room
19 temperature during work, and they did not get
20 any illness. We had laboratory tests where
21 we ran acute studies that we tried to get a
22 saturated atmosphere with PCB's. And they
23 were at room temperature and there was no ill
24 effects. We had long term testing of five
25 months on PCB's at elevated temperatures

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1 where we found that a safe limit for PCB
2 Aroclor number 1242, was one million grams
3 per cubic meter, and for 1254 was five
4 milligrams per cubic meter, .5 million
5 milligrams per cubic, meter. That's how I
6 arrived at that time.

7 Q: Well, sir, if people were beginning
8 to show ill effects now and they were
9 beginning to have higher incidence of cancer
10 now what would that say to you about the
11 levels that you thought were safe then?

12 MR. DAVIDSON: Object, vague and
13 unclear.

14 A: First of all, I'm not sure that's
15 occurring. You are giving me a statement
16 without any facts to show --

17 Q: I said if, I didn't ask you to
18 agree. Only, that if, in fact, people were
19 getting cancers now at higher rates and that
20 these people were exposed to PCB's at the
21 levels that you suggested were safe, what
22 does that say to you about your safe levels
23 then?

24 A: That is a pretty awkward question
25 you are giving. As I understand it you're

1 saying if people -- if people were -- I'm
2 supposed to assume that if people were
3 getting cancers at higher rates, higher rates
4 versus they weren't getting any cancers at
5 all under the safe limit, under the maximum
6 allowable concentration, if they were getting
7 cancers later on what would that say about
8 the safe limit?

9 Q: Yes, sir.

10 A: Well, if they weren't getting any
11 cancers at the safe limit the safe limit was
12 still safe.

13 Q: How fast -- how long did you study
14 people at the safe limit to see whether or
15 not they would get a cancer?

16 A: Twenty years.

17 Q: And is this the study you told me
18 about earlier that you reviewed your
19 insurance records?

20 A: Yes, well, yes, that's correct.

21 Q: Was there any other study?

22 A: By me, no.

23 Q: By anyone?

24 A: Beg your pardon?

25 Q: By anyone.

1 A: Well, epidemiological studies, yes.

2 Q: Like Zach and Mush?

3 A: Yes.

4 Q: And they found increased levels of
5 lung cancer?

6 A: No, they didn't. That is a
7 misstatement. You did not finish the
8 statement. They showed an increase in lung
9 cancer in relationship to the incidence of
10 cancer in the United States in males as a
11 whole. When they took St. Clair County where
12 our plant was located where the majority of
13 the workers lived there was no increase in
14 lung cancer.

15 Q: Can you eliminate the possibility
16 that your plant contributed to the lung
17 cancer rates for everybody in St. Charles
18 County?

19 A: Again, I said you cannot prove a
20 negative, but certainly in St. Charles County
21 there were an enormous amount of
22 environmental factors that contributed, and
23 also the Munch study was not correlated with
24 smoking, and as I mentioned the first thing
25 this morning, if you have a confounding

1 factor like smoking and you do not take that
2 into account any statement you make about the
3 importance of the incidence of malignancy, of
4 lung cancer, is certainly flawed.

5 Q: Is smoking a confounder or a
6 synergistic effect in your opinion?

7 A: You've got two different things.
8 It's confounding as far as the
9 epidemiological problem is concerned. We are
10 not talking about synergism, and as far as
11 epidemiology is concerned whether or not
12 smoking has some synergism on lung cancer I
13 don't know.

14 Q: Do you think that the exposure to
15 PCB's increase a smoker's likelihood of lung
16 cancer, or do you have an opinion?

17 A: I do not believe so, no.

18 Q: Okay. And how do you arrive at
19 that?

20 A: Well, you have certain clinical
21 impressions that you gather over a lifetime
22 of being with individuals who are exposed to
23 PCB who smoked or didn't smoke.

24 Q: Now, I started this series of
25 questions by asking you, what were Monsanto's

1 or your knowledge of PCB's dangerous to
2 humans when you returned from the war. You
3 told me there wouldn't be any if they
4 followed your instructions.

5 A: I don't hear you.

6 Q: I asked you --

7 A: I heard the first part. I didn't
8 hear the last part.

9 Q: I think we talked in the last few
10 minutes, that it was your opinion there
11 wouldn't be any risk if they avoided
12 prolonged skin exposure and inhalation at
13 elevated temperatures and didn't eat the
14 stuff?

15 A: Yes.

16 Q: Assuming that they were somehow
17 overexposed because they didn't heed or
18 understand or follow your instructions, did
19 you understand there to be any disease
20 processes in the decade after you returned
21 from the war associated with PCB's?

22 A: There were no reports of any
23 illnesses in workers in the decade following
24 my return from the war. In fact, a very
25 prominent epidemiologist and government

1 researcher, Dr. Renata Kimbrell, stated as
2 late as 1987 that with the exception of
3 chloracne there were no reasonable reports of
4 any illness in workers from PCB's.

5 Q: Well, do you think -- I didn't ask
6 you about reports, I asked you what disease
7 processes could be associated with
8 overexposure. Is chloracne one of those
9 processes?

10 A: Yes, or exposure, yes, sir.

11 Q: Are there any others?

12 A: Yes, you get liver trouble.

13 Q: Okay. Any others?

14 MR. DAVIDSON: Are you still talking
15 about the decade after he returned from the
16 war?

17 MR. WARSHAUER: Yes.

18 A: I'm not even sure about the liver
19 trouble if we are talking about the decades
20 from '46 to '56?

21 Q: (By Mr. Warshauer) Yes, sir.

22 A: Certainly in the time of Treon work
23 we found -- we were convinced that the target
24 organ was the liver. Also, at the time of
25 the Swon episode which was not -- was found

1 to be not due to PCB, but to a contaminant of
2 the Swon PCB's, there was some liver trouble
3 to the best of my knowledge.

4 Q: What was that contaminant?

5 A: They didn't ever find it out.

6 Q: Could it have been furans?

7 A: It could have been a lot of things,
8 but they didn't find it out.

9 Q: Any other things that you were aware
10 of in that decade following your return from
11 the war?

12 A: Any other things?

13 Q: You've mentioned chloracne and
14 livers and you're not sure about the liver.
15 Was there anything else?

16 A: No, sir, I'm not -- I don't know of
17 any.

18 Q: Okay. Let's take the next decade
19 which I believe would be '56 to '66, 1956 to
20 1966, did any other disease processes come to
21 your attention that could be associated with
22 the overexposure to PCB's during that decade?

23 A: No, sir.

24 Q: And how about the last decade you
25 were with Monsanto, '66 to 1976, in fact,

1 that goes a little beyond your formal
2 relationship with Monsanto, but I think I'm
3 correct in saying that you did some
4 continuing consulting work in that last year
5 or so?

6 A: Yes, the last year, 1975, none of
7 that was associated with PCB's. That was all
8 plant problems at two of our plants, at Nitro
9 and Pensacola.

10 Q: Well, at any rate, in that last
11 eight or nine year period did any other
12 disease processes come to your attention that
13 might be associated with PCB's?

14 A: There were none that I thought were
15 significantly associated with PCB's, no,
16 disease processes, yes, sir. Obviously there
17 were allegations by various writers that
18 might have stated somewhat differently, but I
19 did not agree and I believe that the majority
20 of scientific belief was on my side on that.

21 Q: And what were these writers saying?

22 A: Which writers now?

23 Q: The ones who pointed out some
24 additional things that you didn't agree with?

25 A: There were occasional case reports,

1 that's what I meant.

2 Q: What kinds of cases were being
3 reported?

4 A: Whenever the man had an idea of
5 trying to make an association between
6 employee's work history and whatever illness
7 he had fallen err to. There were cases of
8 brain cancer, an occasional case of that.

9 Q: Back before you left Monsanto people
10 had told you about brain cancers?

11 A: No, I forgot that you had that
12 qualification in.

13 Q: Yes.

14 A: No, sir, then the answer is I don't
15 recall any case reports.

16 Q: You've talked about some of the
17 people who were doing research for Monsanto.
18 You have talked briefly about the Drinker
19 research that Halowax Corporation was
20 involved in?

21 A: Yes, sir.

22 Q: Did Monsanto participate in that?

23 A: Yes, they did.

24 Q: Where did you have to go to get
25 authority to spend the money on that project?

1 A: I don't know to whom I reported at
2 that time. I probably talked to the head of
3 the division that made the Aroclors to get
4 the money.

5 Q: Okay. Now were you satisfied with
6 the initial report?

7 A: No, I was not.

8 Q: And what did you do about it?

9 A: I -- this additional report stated
10 by Dr. Drinker that an Aroclor or chlorinated
11 biphenyl chlorinated to sixty-five percent
12 was quite toxic. I was disturbed because
13 first of all we did not manufacture a PCB
14 that was chlorinated to sixty-five percent.
15 The closest was 1262 which went to sixty-two
16 percent, and the other to 1268, which was
17 chlorinated to sixty-eight percent.

18 Q: What was --

19 A: I haven't finished.

20 Q: Go ahead, please?

21 A: So I wrote, I called Dr. Drinker and
22 said what goes on, where did you get a PCB
23 chlorinated to sixty-five percent and he said
24 I got it from Halowax. Well, I said we
25 didn't sell them a compound chlorinated to

1 sixty-five percent. Let me send you some
2 production material of the closest one we
3 have to it, that's 1268. So we ran that and
4 found the results were completely different
5 by a factor of twenty, a twentieth as toxic
6 as the material, as the report he had given
7 on the compound that he said was chlorinated
8 diphenyl. It turned out that the material
9 was chlorinated diphenyl benzene, and this
10 Dr. Drinker, if you have his 1939 report,
11 which I'm sure you have, he stated that he
12 was in error in his '37 report.

13 Q: If I was to have purchased Aroclor
14 1262 from Monsanto in 1937, what range of
15 chlorination would that include? How
16 accurate and exact would that be?

17 A: Well, there were isomers in there,
18 there were compounds in there that had
19 chlorination of varying degrees, and it may
20 have had some fifty-four, they may have had
21 some sixty-eight, but the average was
22 chlorinated to sixty-two percent of the whole
23 final product.

24 Q: On any given batch of Aroclor 1262
25 did you have knowledge of whether or not it

1 would have been reprocessed if it had come
2 out at sixty-one percent or sixty-three
3 percent?

4 A: I don't know anything about that.

5 Q: Do you know whether there was an
6 acceptable range set by the manufacturing
7 people at Monsanto?

8 A: Well, there was specifications and
9 I'm sure that they adhered to the
10 specifications, but I don't know what those
11 specifications were either from a dielectric
12 standpoint, from a physical properties
13 statement, or a chemical property.

14 Q: You know Mr. Papageorge; don't you?

15 A: Yes, I do.

16 Q: And he ran, actually managed two of
17 the plants at which PCB was manufactured; is
18 that correct?

19 A: I knew he managed one of them, I
20 don't know if he did two, but I know he did
21 Anniston.

22 Q: And that was the largest facility
23 where Monsanto made PCB's?

24 A: Yes, it was, yes, it was.

25 Q: If he told me about a range of

1 PCB's, a range of chlorinazation as being
2 acceptable would I be reasonable in trusting
3 his thoughts on that?

4 A: Yes.

5 Q: Okay. Would he know more than you
6 on that issue?

7 A: Much more.

8 Q: On the PCB's that you sent to
9 Drinker for his second study do you know
10 anything about the process by which that
11 batch was made?

12 A: It was production line process. It
13 was -- instead of putting the material into a
14 fifty-five gallon drum and shipping it out
15 they put some of it into a couple of quart
16 bottles and sent it to me and I sent it to
17 Drinker. It was not a laboratory compound.
18 It was a production run compound.

19 Q: If Monsanto didn't make a sixty-five
20 percent chlorinated biphenyl product then
21 what is it that Drinker tested the first
22 time?

23 A: He tested -- he must have tested
24 4465, which is a chlorinated diphenyl benzene
25 which is an entirely different compound than

1 chlorinated diphenyl, and that one is
2 chlorinated to sixty-five percent.

3 Q: Do you know if Halowax had that
4 chemical?

5 A: No, but if they tested, if Drinker
6 was correct in his statement saying that he
7 tested one at sixty-five percent, that's the
8 one he had because that's the only one
9 Monsanto made.

10 Q: You told me that Monsanto used the
11 Kettering Laboratories?

12 A: That's correct.

13 Q: And did Monsanto pay for those
14 testing also?

15 A: Did they what?

16 Q: Did Monsanto also pay for that
17 testing?

18 A: Kettering?

19 Q: Yes.

20 A: Yes, certainly.

21 Q: And Cyanimide?

22 A: Cyanamide?

23 Q: No, Saranec, Saranec, can't read my
24 writing here, Monsanto paid for that testing
25 also?

1 A: Yes.

2 Q: They used a company called
3 Scientific Associates at one time?

4 A: Yes.

5 Q: And they paid for that testing also?

6 A: Yes.

7 Q: Who would negotiate and supervise
8 the agreements with these outside testers?

9 A: Well, I don't think there was any
10 negotiation. We would say we want -- if we
11 are talking about Scientific Associates or
12 the Younger Laboratories which was the two
13 laboratories in St. Louis that we ran acute
14 testing on we said we want this package. We
15 want the compound tested for skin absorption,
16 skin irritation, oral LD50, inhalation at
17 saturated atmospheres, as saturated as you
18 can get at ambient temperatures, and do it.

19 Q: Who picked the animals?

20 A: Usual testing on animals is rats for
21 everything except the skin absorption, and
22 that's usually rabbits because you cannot get
23 as much stuff on a rat's skin.

24 Q: Do you think that animal studies
25 have relevance to human beings?

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1 A: They have some relevance, yes.

2 Q: And what can they help us understand
3 about human beings?

4 A: Well, they can't help us understand
5 about human beings because human beings are a
6 little different species than a rat or a
7 rabbit, but they can tell you what the --
8 presumably the target organ in the animal is
9 and you might accept that as very probably
10 that will be the target animal -- target
11 organism in a human, but again toxicity is
12 determined not only by the inherent toxicity
13 as found out by animals, that's all you can
14 test them on, but it is also, there is a
15 certain clinical observation that you have of
16 workers from the time of the pilot plant,
17 from the research bench to the pilot plant
18 through your manufacturing operation, that
19 gives you a lot of human observation, of
20 human information on the toxicity of the
21 product.

22 Q: Did you ever visit the facilities at
23 Industrial Biotest?

24 A: Often.

25 Q: Why did you visit there often?

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1 A: Because we were running an awful lot
2 of compounds for quite a number of years.

3 Q: What did you think of their
4 facility?

5 A: I thought they were top drawer.

6 Q: What do you think of the integrity
7 of the laboratory as you sit here today?

8 A: All the time up to 1974 when I
9 stopped having anything to do with them I
10 thought their integrity was excellent.

11 Q: Did they ever change the wording of
12 their reports at your direction?

13 A: At my direction, no, but at one time
14 they changed a report not in the -- they
15 never changed the facts of the report. They
16 changed one where we are looking for a
17 malignancy for cancers they didn't find any,
18 so they had a report that said slightly
19 tumorigenic. And George Lavinskis talked to
20 them and said in one of your previous reports
21 you've said no carcinomas were found. Did
22 you find any in this? And they said, no, and
23 he said well, why don't you say that? That's
24 the only thing that I know about ever
25 changing any wording in any of their reports.

1 Q: Why did you care?

2 A: I didn't see it in the first place.
3 Why did I say it, why did he say it?

4 Q: Why would Monsanto care?

5 A: Well, if you're looking for a
6 compound to see whether it's carcinogenic or
7 not and you don't find any cancers why don't
8 you say that in the report?

9 Q: And have you read the background
10 data of the IBT testing on -- for Monsanto?

11 A: Yes, yes.

12 Q: And you're convinced that none of
13 that indicated either cancer or precancerous
14 tumors growth?

15 A: Now, wait just a minute, it depends
16 on what you mean by precancerous. As far as
17 the liver is concerned, what these people
18 found was not in their opinion or in mine,
19 precancerous. By precancerous -- well,
20 you've got to tell me what you mean by
21 precancerous, but the usual definition of
22 precancerous is something that's going to
23 turn into a cancer.

24 Q: And your review of those IBT test
25 results satisfied you that there were no

1 precancerous findings?

2 A: That is correct.

3 Q: And I'm not limiting that to the
4 liver, I'm limiting that to any organ on any
5 of the animals sacrificed?

6 A: Yes, sir.

7 Q: Did Monsanto do any toxicological
8 work of it's own before 1973?

9 A: What do you mean of it's own?

10 Q: In-house.

11 A: No, sir. They didn't do it in '73
12 or '74 either.

13 Q: You mentioned that you had -- in
14 some of the pamphlets or materials that the
15 company PCB's and hydraulics and heat
16 transfer fluids mentioned the possibility of
17 liver disease; is that correct?

18 A: To the best of my recollection, yes.

19 Q: Was the possibility of liver disease
20 ever mentioned in any of your written
21 materials for dielectric fluids?

22 A: It may have. I don't -- I haven't
23 gone over that for quite sometime but it may
24 have, I just do not know the answer to that.

25 Q: Well, do you know whether or not it

1 would have been a good idea to put it in
2 there? I mean, what are your thoughts,
3 should you have, shouldn't you have?

4 MR. DAVIDSON: Object to the form,
5 speculation.

6 A: Well, it depends on who your
7 audience is. If you were talking to
8 scientists I think that it is agreeable to
9 put it in. If you are talking of putting it
10 on a label or to see it on the factory floor
11 by an individual who is not of scientific
12 bent I see no reason for putting it in.

13 Q: But isn't that the man who might
14 actually get the cancer, isn't he the one who
15 would be most interested in having the
16 information?

17 A: First of all, he isn't going to get
18 the cancer from PCB. Is that another
19 supposition or is that part of the --

20 Q: Well, I was choosing that. I didn't
21 mean cancer, we were talking about liver
22 injury. Isn't the person on the floor the
23 person who might get the liver injury?

24 A: Yes.

25 Q: Wouldn't you expect him to be the

1 one most interested in the information?

2 A: Well, I think he would be most
3 interested in how to avoid any problems, and
4 our labels that were on there that he saw
5 would have -- if he followed those would
6 avoid any problems, health problems.

7 Q: Did Monsanto ever test it's
8 employee's livers, those employees involved
9 in the manufacturer of PCB's?

10 A: Yes.

11 Q: And when was that done?

12 A: We did some in the thirties, but
13 the -- late thirties, but the liver function
14 studies at that time were two types, one
15 involved two and sometimes three
16 venesections, V-E-N-E-S-E-C-T-I-O-N-S,
17 venesections, and the other were tests that
18 were not too -- they are all out of date.
19 They don't use it any more. Following OSHA
20 we did do some testing, but I think that was
21 in the latter years of the manufacture we did
22 more extensive testing.

23 Q: So the testing that you did in the
24 thirties was before you even got to Monsanto;
25 is that correct?

1 A: Well, thirties go up to -- through
2 1939.

3 Q: Did you do any tests after you got
4 there?

5 A: Yes, this was in the thirties.

6 Q: And do you recall the results of the
7 test done once OSHA came into being?

8 A: No, because -- no, I don't, and I'm
9 not sure that those occurred while I was
10 still medical director.

11 Q: Have you ever become aware of
12 chloracne cases associated with PCB exposure?

13 A: Have I what?

14 Q: Have you ever been aware of
15 chloracne cases associated with PCB exposure?

16 MR. DAVIDSON: In any place or in
17 Monsanto workers?

18 Q: In any place.

19 A: I'm sorry, the end of your sentence
20 you sloughed off and I didn't hear.

21 Q: (By Mr. Warshauer) I'm sorry. Have
22 you ever been aware of PCB exposure causing
23 chloracne anywhere at any plant at any time?

24 A: Of Monsanto's, any plant, any place?

25 Q: Yes, sir.

1 A: At the Swon Chemical Company there
2 was an epidemic of chloracne at one period of
3 time before Monsanto acquired Swon Chemical
4 Company.

5 Q: Have you ever been aware of
6 chloracne being associated with exposure to
7 polychlorinated dibenzofurans at any time, at
8 any place?

9 A: You're not including plants, any
10 place?

11 Q: Any place and plants.

12 A: The Yusho episode in Japan was found
13 out by their scientists that furans present
14 in the Japanese PCB, which was manufactured
15 by a different process than Monsanto's PCB
16 and contained different contaminants, both at
17 the time of manufacture and in subsequent use
18 of the product, did cause chloracne.

19 Q: Did Monsanto ever have any kinds of
20 outbreaks of chloracne it associated with
21 exposure to furans to your knowledge?

22 A: No, sir, because in the first place
23 we were not able to find furans during my
24 stay at Monsanto. We did not have any
25 outbreak of chloracne due to any of our PCB

1 operations. We had chloracne from
2 pentachlorophenol, we had chloracne from a
3 herbicide, but not from PCB.

4 Q: You mentioned to me what you
5 consider to be safe levels of PCB's at one
6 milligram per liter?

7 A: For 1242, yes, sir.

8 Q: Are you aware of any safe levels for
9 furans?

10 A: No, sir, I am not.

11 Q: Is there a level of furans to which
12 you would rather not be exposed?

13 A: It wouldn't bother me if I was
14 exposed to seventeen parts per million or
15 five parts per million, that wouldn't bother
16 me.

17 Q: How about dioxins?

18 A: Five parts per million I wouldn't be
19 bothered about it.

20 Q: Do you know whether or not furans
21 and dioxins effect living organisms in a
22 similar fashion?

23 MR. DAVIDSON: Object, speculation
24 and vague.

25 A: Well, I don't know.

1 Q: (By Mr. Warshauer) You were talking
2 about the -- or we have talked briefly about
3 the testing that Monsanto had done on it's
4 PCB's. Would it be fair to say that the
5 primary focus of most of these tests was
6 short term acute problems?

7 A: No, sir, it would not be fair to say
8 it.

9 Q: Which of these tests were -- that
10 you were involved in in your years at
11 Monsanto, formally conducted tests or
12 studies, followed workers for long term
13 latent injury?

14 A: Wait, you're changing the ground
15 rules. I thought we were talking about
16 toxicological testing. Are we or are we not?

17 Q: Okay. Let's talk about
18 toxicological testing. Which of the
19 toxicological testing did you do that looked
20 for long term injury?

21 A: The inhalation studies at Kettering
22 Laboratory which lasted for five months were
23 considered at that time to be long term
24 testing.

25 Q: Do you consider them at this time to

1 be long term testing?

2 A: For inhalation, yes, I don't recall
3 seeing any inhalation studies longer than
4 five months even at this time. The testing
5 at Industrial Biotest was lifetime studies in
6 the rat, a two-year testing in dogs, plus
7 chickens.

8 Q: When did you first begin to think of
9 PCB's in relation to bioaccumulation?

10 A: 1969, around that, '68, '69.

11 Q: We talked earlier this morning about
12 non-biodegradability of PCB's?

13 A: Yes, sir.

14 Q: When you were aware of the
15 non-biodegradability of the PCB's did you at
16 that time think about PCB's moving up the
17 food chain in a bioaccumulative fashion?

18 A: Just about the same time. I'm not
19 sure of the timeframe, but it was six months
20 either way, six months following it, because
21 the first studies on PCB were
22 inter-environment. Subsequent to that, I
23 don't know the timeframe, it was found to be
24 present in avian species, A-V-I-A-N, avian
25 species. Then later than that it was found,

1 I think in the late sixties or '68, it was
2 found to be present, the possibility of it
3 being present in the food chain became
4 evident.

5 Q: Let's go back and look at the
6 forties, okay, in the nineteen forties and
7 fifties is it true that Monsanto was aware at
8 that time that PCB's were non-biodegradable?

9 A: That was their impression, yes.

10 Q: What was your thought at that time
11 about the accumulation of PCB's in a
12 bioaccumulative fashion, knowing that they
13 didn't degrade, did you have any idea or put
14 any thought into the idea that they may move
15 up the food chain and accumulate?

16 A: No, sir, I did not because when I
17 considered them to be a stable compound it
18 was not effected by solubility or other
19 factors.

20 Q: Does an animal, fish, shrimp, human,
21 bird, need a high concentration of PCB in
22 their blood or adipose tissue in order to
23 have -- to be suffering from adverse
24 consequences from exposures to PCB's?

25 MR. DAVIDSON: Object.

1 A: Do they have to have a high
2 concentration of PCB's in their blood and or
3 their fat tissue to suffer consequences of
4 illness of the disease; is that your
5 question?

6 Q: Yes, sir, yes, sir.

7 A: I don't know if I could answer that.
8 I do know that there are people that have had
9 high concentrations in their blood and in
10 their fat who haven't suffered from any overt
11 clinical disease, but I do not know if the
12 reverse -- I'm not sure about the reverse.
13 Certainly it's some time. I do not know what
14 the timeframe of the elevated blood and fat
15 levels would be in relationship to the
16 illness.

17 Q: Okay. Do you have an understanding
18 of how PCB's are metabolized or excreted from
19 humans once they are in our system?

20 A: There are hydroxylated and then
21 excreted. I don't -- presumably excreted in
22 the urine, presumably excreted in the stool,
23 but I don't know any more than that.

24 Q: Do you have an idea of the timeframe
25 it takes?

1 A: No, sir, I don't.

2 Q: Do you have an idea of the normal --
3 well, I guess there is no normal. Do you
4 have an idea of background levels of PCB that
5 might exist in the human beings in this room?

6 A: Yes, sir.

7 Q: And what is your understanding?

8 A: The background could be two to eight
9 parts per billion in the blood and two to
10 five parts, two to ten parts in the fat, per
11 million in the fat.

12 Q: Does that PCB belong there or does
13 it serve any good purpose for humans to have
14 it?

15 A: No, sir, it doesn't. I don't know
16 whether it serves a good purpose or not.

17 Q: Do you know if it serves a bad
18 purpose?

19 MR. DAVIDSON: Object.

20 A: I don't know if it serves any bad
21 purpose because almost everybody has some
22 PCB's in their blood or fat.

23 Q: And if it served a bad purpose then
24 everyone would be injured equally?

25 A: I didn't hear the last --

1 Q: If, in fact, it was a poison to
2 people at these background levels it would be
3 very difficult to tell because we wouldn't
4 have anybody to compare ourselves to; would
5 we?

6 MR. DAVIDSON: Object.

7 A: Well, you look at the person and
8 examine -- sorry.

9 MR. DAVIDSON: I just object on the
10 basis of being vague and unclear.

11 A: There have been studies of people
12 with background levels of PCB and they
13 haven't found any illness to compare them
14 with. Does this man have any illness, is
15 this woman sick with anything? Does she have
16 any symptoms, any problems?

17 Q: Can you rule out the possibility
18 that the general increase of cancer seen in
19 United States could be associated with
20 background levels of PCB's among other
21 chemicals?

22 MR. DAVIDSON: I object, that's
23 ridiculous and vague.

24 A: I didn't rule out --

25 MR. WARSHAUER: I'm going to object

1 to the objection. It is not ridiculous. It
2 might be vague. There are plenty of
3 scientists that believe that's true.

4 A: I don't hear this side play. I
5 can't hear it. Am I suppose to hear it?

6 MR. DAVIDSON: Just as well.

7 Q: (By Mr. Warshauer) Just as well.
8 Can you eliminate the possibility that the
9 background levels of PCB's have effected the
10 overall cancer rate in the United States?

11 MR. DAVIDSON: Object.

12 A: No, but I also can't eliminate the
13 fact that maybe it's acid rain, maybe it's
14 eating too much carbohydrates. There is an
15 awful lot of possibilities. Maybe it is a
16 general stress problem in the economy. I
17 don't eliminate any of those things. You
18 cannot prove a negative.

19 Q: Do you have an idea of what PCB does
20 to the soles of men's work boots who might
21 walk in it?

22 A: It all depends on what the makeup of
23 the sole is. If it's rubber it may
24 disintegrate the rubber. If it's a
25 artificial rubber it may do nothing to the

1 soles. If it's leather I think -- I don't
2 know what the action on leather is. It
3 probably may disintegrate the leather, I'm
4 not sure.

5 Q: Have you ever heard of PCB's being
6 considered as an estrogen imitator or a
7 hormone mimicer?

8 A: No, sir, I have not.

9 Q: When was the last time that you read
10 an article or scientific study on PCB's?

11 A: Any kind of a scientific study, I
12 mean epidemiological study, a toxicological
13 study?

14 Q: Yes, sir.

15 A: Last week.

16 Q: And what was that dated?

17 A: Beg your pardon?

18 Q: And what was the date of that study?

19 A: Well, oh, the date of the study,
20 probably the eighties.

21 Q: Did you read that last week just for
22 fun or for what reason?

23 A: No, not for fun. In preparation for
24 a deposition of a different suit, lawsuit.

25 Q: Did you ever have an opinion as to

1 PCB's being related -- overexposure to PCB's
2 being related to peripheral neuropathy?

3 A: PCB's by themselves?

4 Q: Yes, sir.

5 A: No, sir, I believe that some
6 contaminants in PCB's may have been claimed
7 to be present in -- to be a causative factor
8 in neuropathies.

9 Q: Okay. Would one of those
10 contaminants be furans?

11 A: Beg your pardon?

12 Q: Would one of those contaminants be
13 furans?

14 A: Yes, sir.

15 Q: Do you believe that a worker who
16 might have read one of the warnings that you
17 wrote about PCB's would have been reasonable
18 in relying on it for his own safety?

19 A: Yes, he was safe.

20 Q: Do you know if PCB's effect brain
21 cells?

22 A: No, sir, I do not.

23 Q: In thirty-seven years or
24 thirty-eight years or so that you were with
25 Monsanto did medical technology change?

1 A: Certainly.

2 Q: And did the ease at which liver
3 testing and liver function testing could be
4 done, did that change over time?

5 A: Yes.

6 Q: And until OSHA required it did you
7 ever think about doing it because it had
8 gotten easier?

9 A: No, that would not be the reason for
10 doing a test because it's easy to do it. You
11 do the test if you see any indication. If
12 you see a person who is healthy, who has no
13 symptoms there is no since doing a test on
14 them.

15 Q: Am I correct in understanding that
16 from the time you first arrived at Monsanto
17 until at least 1970 the warnings and
18 instructions relating to the toxicology of
19 PCB dielectrics, did not change?

20 A: To the best of my knowledge the
21 warnings -- you said until 1970?

22 Q: Yes, sir.

23 A: I do not know when we put the
24 environmental sticker on and when we changed
25 the environmental label. Environmental

1 label, that was right around 1970, but I
2 don't know if it was late in '70 or in '71.

3 Q: Other than the addition of an
4 environmental label and cautions about
5 spilling and concerns about certain animal
6 life, wild animal life, was there any change
7 about the human risk associated with PCB's
8 during that period?

9 A: No, sir, no, sir, there was not.

10 Q: What does serious internal reactions
11 mean to you?

12 A: What was a serious internal reaction
13 to what? I didn't hear it.

14 Q: I don't know. I read that somewhere
15 and I was curious what it means. What is a
16 serious internal reaction?

17 A: Are you talking about in the body or
18 in the --

19 MR. DAVIDSON: I will object.

20 A: In a political sense?

21 Q: In the body, human body.

22 A: I don't know. I don't believe I
23 used that term.

24 Q: Did you ever see that term used as a
25 warning relating to PCB's?

1 A: I don't recall if I ever did.

2 Q: Okay. If you saw -- what would you
3 think about such a warning, that one should
4 be cautious to avoid prolonged skin contact,
5 inhalation at elevated temperatures, and
6 ingestion in order to avoid serious internal
7 reactions? What would that say to you?

8 MR. DAVIDSON: Object to the
9 speculative nature of the question.

10 A: Well, that says you might have a
11 serious problem if you did any of those
12 things.

13 Q: What is a serious problem to you as
14 the medical director of Monsanto, what would
15 that mean, is that vomiting?

16 A: Again, I don't use that term and I
17 don't know what else was surrounding this
18 term, serious internal problem. I do not
19 put -- I cannot put myself in the mind frame
20 of somebody, mind set of somebody who is
21 using that. I don't know what he was
22 thinking of. If he was writing it for me I
23 would think this is -- could be serious.

24 Q: And what does serious mean to you,
25 is that serious --

1 A: Not trivial.

2 Q: Okay. Well, to some people severe
3 diarrhea would not be trivial. To other
4 people the definition of not trivial may be
5 much more severe. What is trivial?

6 MR. DAVIDSON: I object, calls for
7 pure speculation without any relation to any
8 facts --

9 A: I would be happy to look it up in
10 the dictionary so that we both know what we
11 are talking about, but I don't know what
12 you -- if you want me to say what trivial
13 means --

14 Q: To you.

15 A: To me?

16 Q: Yes, sir.

17 A: Not of great consequence.

18 Q: In relation to internal reactions
19 what would a trivial internal reaction be?

20 A: Something that made you belch.

21 Q: Okay. And in relation to internal
22 reactions could you name what you would
23 consider a serious internal reaction?

24 A: Yes, I think if you had something
25 and you started with a diarrhea that would be

1 serious. If you got sick to your stomach
2 that would be serious.

3 (Recess)

4 Q: (By Mr. Warshauer) During the period
5 of time when you were at Monsanto did you
6 think there was anyone else who had more
7 information about the toxicological effects
8 of PCB's than did Monsanto in the world?

9 A: I do not know what the Japanese had
10 as far as their information was concerned
11 after the sixties after their problem with
12 Yusho. I do not know what the Europeans did,
13 but I think certainly as far as the U.S. is
14 concerned we knew as much as anybody, more
15 than anybody.

16 Q: When these Swedish researchers at
17 the end of the sixties were discovering PCB's
18 sort of throughout the environment, even in
19 one of their children's hair, I believe I
20 read, did it concern Monsanto that PCB's were
21 showing up in humans who had never had an
22 industrial exposure to PCB's?

23 A: Yes, we were certainly interested in
24 it. Remember that we wanted to know whether
25 this was a European problem. We didn't know

1 whether these people were exposed to any of
2 the outflows from some of the European
3 plants. We were a pretty small factor in the
4 European PCB market, but it was certainly of
5 interest to us and some concern, yes, sir.

6 Q: When did you -- did you ever decide
7 to tell your customers that PCB's were
8 showing up in human beings?

9 A: Oh, I'm sure we did, but I don't
10 know when. I mean, I just don't know, but it
11 certainly was in the newspapers, that's where
12 I think I first heard about it, maybe. In
13 humans I don't know when I first heard about
14 it and I don't know what we may have told the
15 customers.

16 Q: Now, as the person responsible for
17 the medical department at Monsanto can you
18 tell me what kinds of safety procedures
19 Monsanto workers followed in the plants where
20 PCB's were made?

21 A: Yes.

22 MR. DAVIDSON: Object to the
23 relevance.

24 A: Beg your pardon?

25 Q: (By Mr. Warshauer) Go ahead.

1 MR. DAVIDSON: Go ahead.

2 A: Well, they didn't get it on them.
3 If they got on it on them they used -- they
4 had gloves and they used -- I think we
5 furnished boots, some type of boot. We had
6 a -- if there was spills, there are bound to
7 be spills around pumps, there are bound to be
8 spills in filling areas, we wiped up the
9 spills and discarded the rags in a closed
10 container. We had -- we had at the filling
11 of the fifty-five gallon drums, we had that
12 in an area that was ventilated.

13 Q: Did you provide them with changes of
14 clothing?

15 A: At some plants, in one of the plants
16 we did, but that was not just the PCB
17 workers. By union agreement at our plant in
18 Sauget, S-A-U-G-E-T, also called our
19 Krummerich, K-R-U-M-M-E-R-I-C-H, Plant, by
20 union negotiations people all through the
21 plant were given a change of clothes. There
22 was no exception. There was just not PCB's.
23 In Anniston we did not do that.

24 Q: Did you encourage people to take
25 showers at the end of the shift who were

1 working on PCB's?

2 A: I don't know if we encouraged them
3 universally or not. I do not know what the
4 manufacturing practice was.

5 Q: Would that have been a good practice
6 from a safety point of view for workers who
7 were exposed to PCB's?

8 A: It all depends. If they had gotten
9 material on their clothes, yes, not just a
10 drop, you know. I don't know what I could
11 say, considerable, if they got their
12 coveralls soaked with the stuff certainly we
13 would change it right then.

14 Q: How about respirators, were any of
15 the PCB workers provided with respirators?

16 A: They were available. I don't know
17 when they were used or when they were
18 abandoned. Whenever I was, and I was in
19 Anniston probably twenty times, I don't
20 recall seeing respirators for the people, on
21 the people, and I don't recall seeing areas
22 where respirators were needed.

23 Q: A minute ago you mentioned that
24 there were bound to be spills in pump areas.
25 Do you think that in industrial use of PCB's

1 it is virtually unavoidable to have some
2 spills and some vapors in the air?

3 A: Well, you've got two questions.

4 Q: Well, start it with spills.

5 A: Spills can occur in any chemical
6 operation. I don't say they occur everyday,
7 but they do occur. As far as material
8 volatilizing at room temperature, the
9 temperature that the PCB's were used, I don't
10 believe there was any vapor problem.

11 Q: But some spills were virtually
12 unavoidable in normal industrial application?

13 A: Well, some are, yes, some are
14 unavoidable.

15 MR. DAVIDSON: I would like to note
16 an objection on the record as being
17 speculative.

18 MR. WARSHAUER: Excuse me?

19 MR. DAVIDSON: I would like to note
20 an objection for the record as calling for
21 speculation.

22 Q: (By Mr. Warshauer) Can you think of
23 any chemicals of which you are aware,
24 chemicals or processes of which you were
25 aware before you left Monsanto that could

1 have term latent effect, in other words you
2 get exposed numerous small occasions, no one
3 exposure being particularly dangerous, but
4 the combined effect may have a detrimental
5 effect on a human down the road?

6 A: Well, we had a -- we were
7 manufacturing plutonium for the AEC they were
8 exposed to radioactivity, and the thinking
9 was that that may have a latent effect. I
10 didn't see any, but there was some thinking
11 that chemical -- oh, certainly that our
12 bladder, our amino biphenyl had a latency
13 period.

14 Q: When did you first become aware of
15 the latency period associated with those
16 kinds of either, exposure to plutonium or
17 exposure to the bladder carcinogen?

18 A: I think he told us when we started
19 making it.

20 Q: When was that?

21 A: Forties, I believe, sometime in the
22 late forties. We started before I came back
23 to the service. We were making it when I
24 came back.

25 Q: Did you see Monsanto as having any

1 role in warning it's customer's workers?

2 A: We had a role in explaining to our
3 customers what we knew about the toxicity of
4 Monsanto's products. We had a role in
5 explaining to our customers how to prevent
6 ill effects in their workers.

7 Q: Did you believe that -- oh, go
8 ahead.

9 MR. DAVIDSON: I don't think he's
10 finished.

11 A: I haven't finished.

12 Q: (By Mr. Warshauer) Please do.

13 A: We believed then that it was the
14 responsibility of the customer to warn his
15 customers because we didn't know in what
16 manner this material was going to be used and
17 what exposure would be contemplated.

18 Q: Am I fair if I summarize what you
19 said by saying that you believed your duty
20 ended with delivery to your customer along
21 with the warnings that you did provide?

22 A: Well, it didn't end because whenever
23 any of the customers would write Monsanto we
24 certainly gave them information.

25 Q: So in addition to continuing to

1 answer questions if I add that part of it,
2 the duty ended with the delivery of the
3 product and the warnings and the answering
4 any questions?

5 A: To our customer's customers, that's
6 correct.

7 Q: Do you have any idea how many
8 people, how many entities to which Monsanto
9 directly delivered PCB dielectric fluid?

10 A: No, sir, I do not.

11 Q: Could you describe for me what you
12 would consider to be unsafe conditions for
13 PCB exposure?

14 MR. DAVIDSON: I object as vague and
15 calling for speculation.

16 A: Well, yes, if the person were to
17 swallow it that would be unsafe. If you had
18 an operation that you were sucking the stuff
19 up through a tube like you siphon gasoline
20 that would be unsafe if you swallowed it. If
21 you used it in elevated temperatures for long
22 periods of time over the MAC that could be
23 considered unsafe. If you allowed it to
24 remain on the skin repeatedly or for a long
25 purpose, for a long time, that would be

1 unsafe.

2 Q: Define long time with respect to
3 skin contact.

4 A: Well, I think it is a judgment call
5 on everybody's different points of view. I
6 would say I would just have to speculate on
7 my definition of what long time is, a matter
8 of hours rather than minutes.

9 Q: When you included the term avoid
10 prolonged skin contact or essentially
11 identical warnings in the words that you
12 wrote, what did you intend the reader of that
13 warning to understand the term prolonged to
14 mean?

15 A: I intended them -- I intended the
16 reader to look at that warning and say in his
17 own mind prolonged means if I get something
18 on me, a considerable amount, I ought to
19 rinse, to get rid of it, I ought to wash it
20 off. I intended them not to consider I'll
21 wait until the end of the day or I will wait
22 until I have lunch before I wash this off.

23 Q: Are you familiar with the
24 Environmental Protection Agency's regulations
25 concerning the handling of transformers that

1 have more than fifty parts per million of
2 PCB's in them?

3 A: Not in detail no, sir, that occurred
4 after I left and I don't believe I've read
5 them. I may have read them but I certainly,
6 don't remember it.

7 Q: Assume that the Environmental
8 Protection Agency requires that transformers
9 with more than fifty parts per million be
10 handled basically to avoid all human contact
11 with the dielectric fluids. Do you think
12 that that's just overblown or is that a
13 reasonable level of protection or do you have
14 an opinion?

15 A: I think it's over conservative.

16 Q: At what level, if PCB's were in
17 mineral oil at what level do you think there
18 would be a concern about human health?

19 MR. DAVIDSON: I object and it is --
20 I object as irrelevant and calling for
21 speculation, not related to the facts of this
22 case.

23 A: Now, would you repeat your question?

24 Q: (By Mr. Warshauer) Yes, if there was
25 mineral oil that was a dielectric fluid and

1 it had some level of PCB's in it, at what
2 level in parts per million of PCB's in that
3 mineral oil do you believe people should
4 start handling it with particular care?

5 MR. DAVIDSON: I object again,
6 including the same objection, plus unclear
7 and vague.

8 A: Finished?

9 MR. DAVIDSON: (Nods head)

10 Q: (By Mr. Warshauer) Do you understand
11 the question?

12 A: Well, I'm trying to understand the
13 question. We told the people how to handle
14 our PCB's. If the person were using mineral
15 oil with one percent, five percent PCB in it
16 and he handled it the way we tell him to
17 handle PCB's, he would be perfectly safe. He
18 would not need a moon suit to wear.

19 Q: Let me show you a document that we
20 have marked -- I'm showing you an excerpt of
21 a document we have marked as Exhibit Number
22 2. It is just two pages. Do you recognize
23 what these pages have been copied from?

24 A: No, I do not know where they are
25 copied from. This seems like a pretty old

1 document.

2 Q: Okay. Could you read for me the
3 title of it?

4 A: The Aroclors Physical Properties Of
5 Suggested Applications. Application date, a
6 bulletin and so and so, fashioned by the
7 Monsanto Chemical Company.

8 Q: On the second page of that first
9 exhibit there is a section called toxicity?

10 A: Yes.

11 Q: Did you write that or participate in
12 the creation of that?

13 A: If this label or this bulletin
14 occurred after 1946 I definitely did. If it
15 occurred after 1937 I very probably had some
16 input in it. But I can't tell you because
17 they call it Monsanto Chemical Company and it
18 was changed to Monsanto Company some time
19 around the forties or fifties. I don't know
20 when it was -- when it was written.

21 Q: Okay. Well, if you would read that
22 toxicity section to yourself?

23 A: Yes, sir, I read it.

24 Q: Is that adequate information in your
25 opinion?

1 A: I think it's adequate enough as far
2 as the toxicology is concerned. It states
3 that draft ventilation and control of vapors
4 involved in elevated temperatures should be
5 provided and skin protection should be
6 avoided.

7 Q: Let me show you this next one which
8 is also an excerpt of a document that
9 Monsanto provided to us. I have marked this
10 one as Number 2 and could you read the title
11 of this one?

12 A: Physical Properties of the Aroclors.

13 Q: Okay. Do you recognize that title
14 page?

15 A: Yes, this again is a quite old
16 document.

17 Q: Okay. On the second of those two
18 pages there is also a title called Toxicity,
19 and if you would review that for me?

20 A: Yes, sir, I've read it.

21 Q: And does that warning appear to be
22 adequate to you, or that information about
23 toxicity appear to be adequate?

24 A: Well, I think it states that
25 prolonged exposure of vapors at high

1 temperatures or by repeated oral ingestion
2 will lead to systemic toxic effects. That's
3 adequate and that's correct. Repeated bodily
4 contact with the liquid Aroclors may lead to
5 an acneform skin eruption. At that time and
6 even subsequently people believed that an
7 acneform skin eruption, if you didn't get
8 that you would not get the anti-systemic
9 effects. So that's pretty adequate.
10 Suitable draft ventilation and control of
11 vapors at elevated temperatures, as well as
12 protection by suitable garments from
13 extensive bodily contact with liquid Aroclors
14 should prevent any untoward effects, I think
15 that's adequate.

16 Q: Okay.

17 MR. DAVIDSON: Just to clarify the
18 record, you were reading at that time from
19 what Mr. Warshauer has marked as Exhibit 2;
20 is that correct?

21 A: Yes.

22 MR. WARSHAUER: Page two of Exhibit
23 2.

24 MR. DAVIDSON: Page two of Exhibit
25 2, and earlier he was reading -- you read

1 from page two of Exhibit 1.

2 A: Right.

3 Q: (By Mr. Warshauer) I show you what
4 we have marked as Number 3. In fact, let me
5 show you Number 4 first so we can get this in
6 some sort of what I understand to be
7 sequential order.

8 MR. DAVIDSON: And do you want him
9 to look at 4 first?

10 Q: Yes, let me take a look at 4 first,
11 please, sir. Were you looking at 4 for me?

12 A: 4 first before 3?

13 Q: Before 3. With respect to Exhibit
14 Number 4 have you ever seen that document
15 before or what it purports to be?

16 A: Yes, yes, I have.

17 Q: Did you prepare or participate in
18 the preparation of any of the information on
19 that document concerning warnings and
20 toxicity?

21 A: Yes.

22 Q: And what is that document?

23 A: It's a safety data sheet, material
24 safety data sheet either required or asked
25 for by the U.S. Department of Labor.

1 Q: All right. Do you think the
2 information provided on that sheet with
3 respect to the toxicity of the Aroclor
4 product, PCB product, is adequate?

5 A: Well, we should have put on -- it
6 says, I don't know, limit, threshold limit
7 value, we didn't say none available. That
8 must have been an oversight because by the
9 time these safety data sheets came out we
10 knew what the maximum allowable concentration
11 was, but other than that, yes, I think it was
12 adequate. Avoid skin and eye contact, avoid
13 inhalation of vapors, yes, sir.

14 Q: Take a look at Number 3 now. What
15 date was Number 4, do you have an idea? Did
16 you participate in preparing that before you
17 left Monsanto?

18 A: Yes, sir.

19 Q: Okay.

20 A: Yes, I've read it.

21 Q: And do you know when that was
22 prepared?

23 A: I think it must have been after I
24 had gone because I don't know when the TASCA
25 regulations came out.

1 Q: Did you have any participation in
2 preparing it?

3 A: I don't recall this.

4 Q: Okay. Do you think the information
5 that it reflects with respect to toxicity and
6 handling procedures for PCB are adequate?

7 MR. DAVIDSON: Object.

8 A: Yes, sir, I can't read some of it.
9 I can't read the caution label. I can't read
10 that, but certainly it appears adequate to
11 me.

12 Q: (By Mr. Warshauer) Okay. Let me
13 show you what we've -- what I've marked as
14 Exhibit Number 5, and I've put a couple
15 little pieces of sticker there to cover some
16 numbers that I use internally that aren't
17 relevant here, but the big sticker has the 5
18 on it.

19 Can you take a moment to look at
20 that and tell me what you --

21 A: Yes, I remember this quite well.

22 Q: Okay. And what is that?

23 A: That's a memorandum from me to
24 Dr. Barrett at our London office.

25 Q: When is it dated?

1 A: 1955, September the 20th.

2 Q: And the bottom paragraph of the
3 first page, you seem to be concerned about
4 what juries would think. Why is it in 1955
5 you had a concern about juries and liver
6 injury from your PCB chemicals?

7 A: Well, the liver injury -- you've got
8 two questions in there. Let's take liver
9 injury first. We knew that material in
10 elevated temperatures or in confined spaces
11 over enough period of time could cause liver
12 injury. We also knew that -- I also believed
13 that if we had such a situation and we were
14 talking about MAC's, the jury would not pay a
15 great deal of attention to it because in the
16 first place in England I didn't know how they
17 were going to use it. For all I knew they
18 might have been using it as a household
19 product where there would be no possibility
20 of an MAC being proven. And that was my
21 impression. Maybe I was wrong and the
22 impression is that I don't have the
23 experience with jurors that lawyers do, but
24 that's the impression that I had at that
25 time.

1 Q: Well, was it your role as the person
2 in the medical department to be concerned
3 about legal liability?

4 A: No, sir, it was not.

5 Q: Then why would you have written it?

6 A: Why? I don't know what I was
7 thinking in 1955.

8 Q: I show you what we have marked as
9 Number 6. Have you ever seen that?

10 A: Yes, I've seen it. I don't know
11 when I saw it. I don't know when I first saw
12 it. This was a rough draft dated 11/10/59 if
13 that is --

14 Q: Is it '69 or '59?

15 A: Oh, '69, sorry, '69.

16 Q: And did you ever see the final of
17 that?

18 A: I don't know if I did or not.

19 Q: Were you involved or consulted at
20 all in the preparation of a PCB abatement
21 plan or PCB handling plan?

22 A: Well, Wheeler was and Wheeler and I
23 discussed it, so indirectly I was consulted.

24 Q: Who were the people involved in
25 preparing that to your recollection?

1 A: Let's see what page that's on.

2 Q: I think I can find it for you.

3 A: Can you find it?

4 Q: Would it be an ad hoc committee
5 consisting of Mr.'s Farrar, Hodges, John,
6 Richard and Wheeler if you look right there?

7 A: Farrar, F-A-R-R-A-R, is a research
8 chemist. Paul Hodges was in the
9 manufacturing department, I don't know who
10 John was, whether he was in public relations
11 and I just don't know. Richard was in the
12 research department and Wheeler was in the
13 medical department.

14 Q: On November the 10th of 1969 was
15 Monsanto already aware of the Yusho incident?

16 A: Yes, sir

17 Q: And was it aware of the Yucheng
18 incident?

19 A: No, that occurred in the seventies.

20 Q: It says here on the fourth page of
21 this internal memo number three, man, and I'm
22 quoting, there is no harmful effect known to
23 man or other mammals after forty years of
24 production. Investigations are under way by
25 various sources.

1 Do you know why these gentleman
2 would have written that after Yusho and with
3 the knowledge that chloracne was a harmful
4 effect, that liver disease was a harmful
5 effect?

6 A: They said in production, didn't they
7 say that?

8 Q: No, they said after forty years of
9 production.

10 A: Yes, but the way I read this
11 after -- well, maybe that's why it was a
12 rough draft. They may have -- I cannot --
13 this was after Yusho and I had thought they
14 were referring to production, but I don't
15 know why they bring the term mammals in there
16 because we didn't have any of those in the
17 production department outside of man. I
18 don't know why it said there and I don't know
19 if it would be --

20 Q: Was that Monsanto's official company
21 position that it was not harmful to man?

22 A: No, it wasn't our official position.

23 Q: In 1969 what was the official public
24 position?

25 A: That if you got a sufficient amount

1 by inhalation, if you got a sufficient amount
2 by skin absorption, you could get systemic
3 illness as well as chloracne. Also, if you
4 treated the material in such a way that --
5 oh, at that time we didn't know what the
6 cause of Yusho was in '69, but we knew that
7 the Japanese PCB would, ingested, cause quite
8 a bit of trouble in about a thousand people.
9 That was Monsanto's official position. You
10 are taking a rough draft so I don't -- I
11 don't know what the final draft was if any.

12 Q: Had all your customers been advised
13 of PCB related toxicity by the date of this
14 memo, November of 1969?

15 A: I don't know. Well, it says on page
16 five, I'm quoting, all customers using the
17 products have not been officially notified
18 about known effects, nor our labels carry
19 this information.

20 Q: Was that a true statement?

21 A: I don't know if it was or not. I
22 mean, remember the labels -- he's talking
23 about known effects. In other words, our
24 labels do not say could cause chloracne if
25 you get too much on you over a prolonged

1 period of time. Our labels did not say you
2 were liable to get liver problems if you are
3 exposed to vapors at elevated temperatures,
4 it didn't say that.

5 Q: Did it --

6 MR. DAVIDSON: Are you finished?

7 A: Yes, and I'm also saying here you're
8 taking a draft statement which was supposed
9 to be an internal document, and I don't know
10 what the -- this is the first draft. I would
11 like to see the finished product of the draft
12 of the memorandum. I don't recall seeing
13 one, but --

14 Q: Did any of the gentleman who worked
15 on -- whose names appear as having worked on
16 the ad hoc committee that wrote that draft
17 ever discuss with you in 1969 or at any time
18 after November of 1969 the possibility of
19 changing the warnings and the labels to be
20 more specific?

21 A: Remember, you have two things. The
22 labels and the warnings, we did not discuss
23 changing the labels. We may have discussed
24 changing the information in our bulletins to
25 include more information. I don't know if we

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1 did or not. Not more information, but
2 different types of information.

3 Q: Do you remember attending some sort
4 of meeting in Massachusetts along with
5 Dr. Drinker and others maybe in 1936 or 7?

6 A: Yes, I do.

7 Q: And at that time did they discuss an
8 association between chloracne and PCB's?

9 A: They discussed primarily the
10 association between the use of Halowax
11 compounds, which were primarily chlorinated
12 naphthalamine of various chlorine
13 concentrations. In one of the Halowax
14 compounds, a ten percent solution, a ten
15 percent amount of chlorinated diphenyl
16 benzene was used. This was mistakenly
17 referred to as chlorinated diphenyls and
18 that's what they discussed.

19 Q: Let me show you what I've marked as
20 Plaintiff's Number 9. It has another sticker
21 on it so that we won't get confused about
22 stickering down the road. And have you ever
23 seen that?

24 A: Yes, I have.

25 Q: Okay. What is it?

1 A: This is part of the minutes of the
2 meeting of the corporate development
3 committee at Monsanto.

4 Q: How did it first come to your
5 attention?

6 A: I was sent a copy of it.

7 Q: Contemporaneously in 1969?

8 A: That's correct.

9 Q: Let me ask you that same question
10 about Number 6, this draft of the pollution
11 abatement plan?

12 A: I don't know whether I ever saw
13 that.

14 Q: You don't know if you saw that while
15 you were at Westinghouse?

16 A: I was never at Westinghouse.

17 Q: At Monsanto?

18 A: No, I don't recall if I ever saw it
19 then or not. I don't know if I did.

20 Q: Looking back at the one in your hand
21 which I believe is Number 9, it talks there
22 on the third page about changing the
23 packaging of the Aroclors. Did they ever
24 discuss that with you?

25 A: Wait until I see what it says.

1 Packaging? No, I believe that was -- no,
2 they did not discuss new packaging systems
3 for Aroclors with me. That was a
4 manufacturer decision. I would have nothing
5 to do with that.

6 Q: Well, with respect to packaging for
7 Aroclors if there was going to be a warning
8 or a label would that have involved you?

9 A: It certainly would have.

10 Q: And do you recall anybody coming to
11 you in 1969 or even in 1970 and asking you
12 about that?

13 A: I don't remember.

14 MR. DAVIDSON: You're referring to
15 about the packaging?

16 MR. WARSHAUER: About to the extent
17 that he would be involved in the packaging
18 with the warnings and the labels.

19 A: Well, I was involved in all warning
20 labels no matter what type of package it went
21 on. That was company policy.

22 MR. DAVIDSON: I think he has
23 already testified about labeling changes that
24 occurred in 1970.

25 Q: (By Mr. Warshauer) I've handed you a

1 document Number 10. I had a poor photocopy
2 and it has been retyped so that it is a
3 little more legible.

4 A: Yes, sir.

5 Q: Do you recognize that memorandum?

6 A: Yes, this is a memorandum from
7 Albert Wheeler discussing what occurred in a
8 meeting at the Kettering Institute between
9 Dr. Suskin of Kettering, K-E-T-T-E-R-I-N-G,
10 Laboratory, Dr. Obttel, O-B-T-T-E-L, from
11 BASF, all caps, and Mr. Weger, W-E-G-E-R, who
12 is I think in the safety department of
13 Monsanto.

14 Q: And what chemicals were they talking
15 about?

16 A: Trichlorophenate, trichlorophenyl.

17 Q: Is that a PCB?

18 A: No, sir, it is not.

19 Q: Were they talking about
20 dibenzofurans?

21 A: Well --

22 MR. DAVIDSON: I will object to the
23 relevance of Exhibit Number 10 and the line
24 of questioning arising out of it.

25 A: They mentioned the toxicity of

1 tetrachlorodiphenyloxide.

2 Q: What is tetrachlorodiphenyloxide?

3 A: That I believe is another name for
4 chlorinated dibenzofurans.

5 Q: And do you know why it is that the
6 name has changed, is it just an acronystic
7 name?

8 A: I don't know.

9 Q: One of the pages there there is
10 actually an illustration. I guess in the
11 second part of that, I will number that
12 second group, we're going to number that
13 little second page that's presently in your
14 hand as number eleven, I thought they were
15 stapled together. From on the second page of
16 Number 11 there is actually a illustration of
17 a molecule.

18 A: Yes, sir.

19 Q: What does that molecule appear to be
20 to you?

21 A: That is a -- he calls it chlorinated
22 diphenyloxide. It's chlorinated
23 diphenyloxide. This is chlorinated
24 dibenzofuran.

25 Q: Two benzene rings with an extra

1 oxygen?

2 A: That's correct.

3 Q: If we took away the oxygen --

4 A: Beg your pardon?

5 Q: If we took the oxygen out of that
6 particular molecule, one of the oxygens,
7 would it then look a lot like a
8 polychlorinated biphenyl?

9 MR. DAVIDSON: Object, it is vague
10 and unclear.

11 A: If there were no oxygen in there?

12 Q: (By Mr. Warshauer) Yes, sir.

13 A: Yes.

14 Q: Because it would be two benzene
15 rings?

16 A: Right.

17 Q: And that's what PCB's are?

18 A: Chlorinated benzene rings, right.

19 Q: Is Mr. Wheeler still alive?

20 A: No, he died about three years ago.

21 I would like to amplify that last
22 statement of mine. When you said if you take
23 an oxygen out you've got chlorinated
24 diphenyl, well it's an entirely different
25 product. I mean, taking oxygen out isn't

1 just a simple little matter. It changes the
2 whole structure of the compound. It changes
3 it's physical toxicological characteristics.

4 Q: What did you do to prepare for
5 today?

6 A: What did I do to what?

7 Q: To prepare for today.

8 A: I looked at some of the exhibits.

9 Q: What kind of exhibits?

10 A: I think they were plaintiff's
11 exhibits.

12 Q: All right. Did you look at
13 depositions?

14 A: Beg your pardon?

15 Q: Did you read any depositions?

16 A: Yes.

17 Q: Whose?

18 A: I read Dr. Steel's and Dr. Marker's.

19 Q: What do you think of Dr. Steel's
20 opinions about the correlation between PCB's
21 and brain cancer?

22 A: I don't agree with them.

23 Q: Why not?

24 A: Because I think he's wrong.

25 Q: Do you have any basis for that other

1 than your years of experience first hand as a
2 clinician?

3 A: Well, I would have to go over his
4 deposition page by page to -- which I will be
5 happy to do sometime, and explain why I
6 believe differently than he.

7 Q: Do you still own shares of Monsanto?

8 A: Yes, I do.

9 Q: And how many shares do you own?

10 A: Less than a thousand.

11 Q: And are you still getting a pension
12 from Monsanto?

13 A: Yes, I am.

14 Q: Is that around thirty-five thousand
15 a year or so?

16 A: Probably a little less, thirty-two,
17 thirty-three I thought, I'm not sure.

18 Q: Are you being paid by Monsanto to
19 appear here today as a consultant?

20 A: Beg you pardon?

21 Q: Are you being paid by Monsanto today
22 for your time?

23 A: No, I have been paid for
24 preparation. I don't exactly know what kind
25 of a witness I am here.

1 Q: Okay.

2 A: I received no subpoena so I don't
3 know what -- but I'm being paid for whatever
4 preparation I'm doing.

5 Q: And how much did you charge for
6 that?

7 A: Two hundred dollars an hour.

8 Q: Have you ever testified in any
9 deposition in which you've opined that PCB's
10 caused or contributed to the cause, to the
11 problem about which the person who claims
12 they were injured is complaining?

13 A: You're talking about depositions or
14 trials or both?

15 Q: Both.

16 A: Either one. And you're talking
17 about PCB's alone?

18 Q: Yes.

19 A: No, I have not.

20 Q: PCB's along with dibenzofurans?

21 A: Whatever the contaminant I have not.

22 Q: PCB's along with chlorbenzenes,
23 chlorinated benzenes?

24 A: I have not.

25 Q: Have you ever testified that

1 Monsanto's products, chemical of any kind
2 contributed to the personal injury of any
3 human?

4 A: Yes, I have.

5 Q: And what chemicals?

6 A: 245T at our Nitro plant.

7 Q: And that's dioxins?

8 A: Beg your pardon?

9 Q: 245T is a dioxin?

10 MR. DAVIDSON: Object.

11 A: It was never proven but I testified
12 that the workers exposed to 245T, we did not
13 know that there was dioxin in it at the time,
14 developed chloracne. I also testified that
15 they developed systemic illnesses.

16 Q: That's it.

17 MR. DAVIDSON: On the record. We
18 originally had indicated to Mr. Warshauer
19 that Dr. Kelly would be available today and
20 tomorrow, and that we are here and available
21 and Dr. Kelly still is available for him to
22 complete any questions that he might have.
23 And I am assuming by the statement you made
24 on the record a minute ago that you have
25 concluded your discovery examination at least

1 for the Fisher case?

2 MR. WARSHAUER: I've done four hours
3 worth for today and that concluded my
4 discovery examination for the Fisher case.

5 MR. DAVIDSON: Okay. That's fine.

6 MR. WARSHAUER: I understood I had
7 four hours and I took four hours and
8 thirty-seven seconds.

9 MR. DAVIDSON: But you also had four
10 more hours tomorrow if you elected to take
11 those.

12 MR. WARSHAUER: Could have taken
13 four and four and four and four. My
14 understanding was I could only take him four
15 hours at a clip and I'm finished now.

16 MR. DAVIDSON: I understand your --
17 you have completed your examination on this
18 discovery?

19 MR. WARSHAUER: Based on what I know
20 right now. That doesn't mean that two weeks
21 from now or six weeks from now I may come up
22 with something that's absolutely unknown to
23 me and I may want to ask about it, but I can
24 represent that, yeah, I've asked all the
25 questions I want to ask through February the

1 22nd based on my knowledge from February the
2 22nd.

3 MR. DAVIDSON: I understand and you
4 understand that we were and are here and
5 available to go tomorrow if you elected to do
6 that but you concluded the deposition.

7 MR. WARSHAUER: I asked all I know
8 through February the 22nd.

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1 STATE OF MISSOURI)

2) SS.

3 CITY OF ST. LOUIS)

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5 I, CYNTHIA R. ROLLBERG, a Notary
6 Public in and for the State of Missouri, duly
7 commissioned, qualified and authorized to
8 administer oaths and to certify to depositions,
9 do hereby certify that pursuant to notice
10 in the civil cause now pending and undetermined
11 In the United States District Court, Western
12 District of Virginia, Danville Division,
13 to be used in the trial of said cause in said
14 court, I was attended at the offices of Husch
15 & Eppenberger, 100 North Broadway, 13th Floor,
16 in the City of St. Louis, State of Missouri,
17 by the aforesaid witness; and by the aforesaid
18 attorneys; on the 22nd day of February, 1994.

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

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

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

15 Witness my hand and notarial seal at
16 St. Louis, Missouri, this _____ day of
17 _____, 1994.

18 My Commission expires September 13, 1997.

19 _____

20 Notary public in and for the
21 State of Missouri

22

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