

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

NEVADA POWER COMPANY, a :
Nevada corporation, :
Plaintiff, :
VS. : CV-S-89-555-LDG-LRL
MONSANTO COMPANY, a :
foreign corporation; :
GENERAL ELECTRIC COMPANY, :
a foreign corporation; :
WESTINGHOUSE ELECTRIC :
CORPORATION; a foreign :
corporation; and DOES I :
XXV, inclusive, :
Defendants. :

**READING
COPY**

DEPOSITION OF ROBERT EMMET KELLY, M.D.
VOLUME II
TAKEN ON FEBRUARY 16, 1994

**MARTIN & ASSOCIATES
CERTIFIED COURT REPORTERS**

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I N D E X

THE WITNESS: ROBERT EMMET KELLY, M.D.
VOLUME II

<u>EXAMINATION:</u>	<u>PAGE</u>
By Mr. Bauer (Continued)	183
By Mr. Kim	200

NO EXHIBITS MARKED

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24 ALSO PRESENT:

25 Ms. Lynette Weldon

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1 The oral videotaped deposition of
2 ROBERT EMMET KELLY, M.D., was continued on
3 February 16, 1994, beginning at 9:16 a.m.,
4 in the offices of Husch & Eppenberger,
5 100 N. Broadway, Suite 1300, St. Louis,
6 Missouri, before Irma L. Reyes, a Certified
7 Court Reporter and Notary Public in and for
8 the State of Texas, pursuant to Notice and
9 Agreement, the Federal Rules of Civil
10 Procedure, and the following stipulation and
11 waiver of counsel:

12 IT WAS STIPULATED AND/OR AGREED
13 that the deposition is to be signed by the
14 witness before any Notary Public or officer
15 authorized to administer oaths.

16 IT WAS FURTHER STIPULATED AND/OR
17 AGREED that the court reporter could swear
18 the witness with the same force and effect as
19 if she were a Notary Public in and for the
20 State of Missouri.

21

22 - - - - -

23

24 THE VIDEOGRAPHER: Today is the
25 16th of February, 1994. It's 16 minutes

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1 after 9:00 o'clock. We're back on the
2 record.

3

4

ROBERT EMMET KELLY, M.D.,

5

was called as a witness and, having been

6

previously duly sworn, testified as follows:

7

8

EXAMINATION (Continued)

9

BY MR. BAUER:

10

Q. Dr. Kelly, I'd like to continue with your

11

testimony about the Industrial Bio-Test's

12

toxicity testing of PCBs in the 1969 through

13

1970's -- the time period.

14

A. Yes, sir.

15

Q. You already testified yesterday about the

16

summaries that you received from Industrial

17

Bio-Test.

18

A. Yes, sir.

19

Q. In the early 1970's did Monsanto also receive

20

a set of final reports from Industrial

21

Bio-Test?

22

A. Yes, sir.

23

Q. Do you recall approximately when those

24

reports were received?

25

A. In November of 1971.

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1 Q. Do you have Exhibit 35 in front of you?

2 A. Yes, I do.

3 Q. Can you identify that for us, please?

4 A. This is a report from Industrial Bio-Test of
5 a two-year chronic oral study, toxicity
6 study, with Aroclor 1260 in albino rats.
7 This was supported by Monsanto.

8 Q. Did you receive in the 1970 to 1971 time
9 period similar reports for all the other
10 studies conducted by Industrial Bio-Test,
11 such as the three-generation reproduction
12 study and the mutagenicity -- mutagenicity
13 studies?

14 A. Yes, sir.

15 Q. Now, were copies of all the final reports
16 shared with the Federal Government?

17 A. Yes, they were.

18 Q. With whom in the Federal Government?

19 A. We sent some to the -- we sent all of them to
20 the FDA. We sent some to Dr. Berger, who
21 was -- he was the President's chief scientist
22 on -- I don't know what. But he was -- he
23 was chief scientific adviser. And some were
24 sent to the agriculture department. I say
25 "some," all of them. Everybody got the same

1 package, which was everything we had.

2 Q. Do you recall whether anyone from Industrial
3 Bio-Test also presented summaries of the
4 information learned in the tests at any
5 conferences?

6 A. Yes.

7 Q. Could you describe those, please?

8 A. The conferences?

9 Q. The conferences.

10 A. I was not at the conferences.

11 Q. Do you recall --

12 A. Yes, but --

13 Q. -- when and where any of them were?

14 A. Yes.

15 Beg pardon?

16 Q. Do you recall when and where any of those
17 conferences were?

18 A. Sometime, I believe, in 1971 or early '72,
19 after he finished his work.

20 Q. In your judgment, Dr. Kelly, did the various
21 reports -- well, strike that.

22 Let me start with this: Did you
23 personally review the various IBT reports
24 with respect to PCBs?

25 A. Yes, I did.

1 Q. Did others within the medical department also
2 review them?

3 A. Yes, they did.

4 Q. Who else do you recall?

5 A. Wheeler did. Levinskas did. Hunt -- Hunt
6 did. I don't recall when Hunt died; but if
7 he were living, he were -- I don't know. He
8 died just around that time.

9 Q. In your judgment, Dr. Kelly, did the IBT
10 studies that you received in 1970 and 1971
11 demonstrate that PCBs were highly toxic on an
12 oral chronic basis?

13 A. No, they were not.

14 Q. Did you personally tour the Industrial
15 Bio-Test facilities while the studies were
16 being conducted?

17 A. Yes. Frequently.

18 Q. Do you recall approximately how often you
19 were there?

20 A. Sometime twice a year, always one a year. I
21 would say I was there about -- a three -- a
22 two-year study takes about three years by the
23 time you do the preliminary work, by the time
24 you do the pathology after the two years'
25 testing. So in those three years, I was

1 probably up there five times.

2 Q. Did you ever form the opinion that the PCB
3 studies being performed for Monsanto by
4 Industrial Bio-Test were being conducted in a
5 less than a professional manner?

6 A. No. I've been to several toxi -- no, I did
7 not. I've been to several toxicological
8 laboratories, both in England and in the
9 United States; and these facilities and the
10 way the -- I saw the housing of the animals
11 and the housekeeping of the -- of the animals
12 that were used was top drawer, as far as I
13 was concerned.

14 Q. Did Monsanto ever instruct Industrial
15 Bio-Test to fabricate data for the PCB
16 studies?

17 A. Absolutely not.

18 Q. To your knowledge, did Industrial Bio-Test
19 fabricate -- fabricate any data for the PCB
20 studies?

21 A. I have no knowledge of such action.

22 Q. I'd like to go back now, Dr. Kelly, to where
23 we left off in the chronology of the reports
24 of PCBs being present in the environment.

25 When we left off with that topic

1 awhile ago, we were at the -- we had talked
2 about Jensen and Widmark and the early
3 reaction to -- within Monsanto to those
4 findings. Do you recall any significant
5 events in the 1968 time period with respect
6 to PCBs in the environment?

7 A. Well, there were quite a few significant
8 things. They found them to be more spread --
9 widespread. The presence was more widespread
10 than we thought. Also, in 1968, if I'm not
11 confused about the dates, Dr. Risebrough
12 found that there was some thinning of egg
13 shells in avian species that might be
14 attributed to the ingestion of PCBs.

15 Q. Do you recall reviewing Dr. Risebrough's
16 paper in 1968?

17 A. Do I recall?

18 Q. Did you read Dr. Risebrough's paper when it
19 was published?

20 A. I don't know whether I read it '68 or '69.

21 Q. But at some point in time, shortly after
22 Dr. Risebrough published his paper, did you
23 read that?

24 A. Yes, I did.

25 Q. All right. And did others within Monsanto

1 read that paper, as well?

2 A. Yes, they did.

3 Q. Was Dr. Risebrough's paper the first
4 publication that reported finding PCBs in the
5 environment in the United States?

6 A. Yes. To the best of my knowledge.

7 Q. Who within the medical department had the
8 most day-to-day involvement with respect to
9 the issue of PCB in the environment in the
10 1968-1969 time period?

11 A. Elmer Wheeler.

12 Q. Was he working closely with someone from the
13 business group that dealt with PCBs?

14 A. Oh, yes. The business group was very, very
15 involved. I don't know the name of the
16 individual. It could have been Bergen, it
17 could have been Springgate. I just don't
18 know. But he was certainly involved all the
19 time.

20 Q. Do you recall attending a meeting in November
21 of 1969 where the topic of PCBs in the
22 environment was discussed with Monsanto's
23 senior management?

24 A. Yes, I do.

25 Q. Would you turn to Exhibit 37, please?

1 A. Yes. I have it.

2 Q. Could you identify that document for the
3 record?

4 A. Yes. This is "Minutes of the Meeting of the
5 Corporate Development Committee" of the
6 Monsanto Company, November the 17th, 1969.

7 Q. Were you present at that meeting, Dr. Kelly?

8 A. Yes, I was.

9 Q. Did -- were you distributed copies of the
10 minutes after the meeting was concluded?

11 A. Abstract parts of the minutes. Anything
12 dealing with PCBs, I was; but they -- I'm
13 sure they had other things on their mind at
14 that time.

15 Q. The Exhibit 37 lists Mr. E. J. Bock as the
16 chairman of the corporate development
17 committee in November of Nineteen Sixty -- in
18 November of 1969. How far up in Monsanto's
19 management was Mr. Bock?

20 A. As high up as you can go. He was the CEO.

21 Q. And what was the "corporate development
22 committee"?

23 A. It was a group -- I'll read their titles.
24 Bible was -- these were all officers of the
25 copy. Bible was head of administration. Eck

1 was head of manufacturing. Gillis was head
2 of sales. Charlie Sommer was the chairman of
3 the board. Putzell was a general counsel,
4 and Ehlers was also -- he was a secretary to
5 the assistant. These are the people that ran
6 the company.

7 Q. What was the purpose of this meeting in
8 November of 1969?

9 A. We wanted to bring the management of the
10 company up-to-date on what the problem was,
11 what we were going to do about it, and what
12 the ramifications may be for the company.

13 Q. Who -- strike that.

14 Was there a presentation given by
15 the medical department at the November of
16 1969 meeting?

17 A. Yes, there was. In addition to presentations
18 by the organic division, which -- you want me
19 to tell who these were at the bottom that
20 were present? C. J. Smith and Mason were
21 management of the organic division. Tom K.
22 Smith was a vice-president in charge of the
23 organic division. Bergen was probably
24 product manager of the -- of the fluids
25 department. Springgate was in some -- same

1 similar situation. Rodney Harris was a
2 lawyer. I don't recall who Miller and
3 Robinson were.

4 Q. Who in the medical department gave the
5 presentation of the medical department's
6 portion of the meeting?

7 A. The best to my recollection, I started off
8 and turned it over to Wheeler.

9 Q. The second page of Exhibit 37 has an item on
10 the bottom entitled, "Plan of Action." And
11 then there are 12 numbered paragraphs on the
12 next page. Was that 12-point plan of action
13 approved by the corporate development
14 committee in November of 1969?

15 A. Yes, it was.

16 Q. The first point of the program is to "appoint
17 a Project Manager responsible for" all --
18 "for the overall management of the Aroclor
19 pollution problem." Was that done?

20 A. Yes, it was.

21 Q. Who was given that position?

22 A. William Papageorge.

23 Q. Do you recall when he assumed that position?

24 A. I thought it was January the 1st, 1970.

25 Q. Thereafter, was Mr. Papageorge the person

1 within Monsanto who had day-to-day
2 responsibility for the problem of Aroclor
3 being in the environment?

4 A. Yes.

5 Q. Was he also the one with the most day-to-day
6 responsibility for disseminating information
7 to customers about that problem?

8 A. Yes.

9 Q. Did you ever learn that Monsanto was
10 protecting its profit from Aroclor regardless
11 of the expense to the environment?

12 A. No, sir, I never did.

13 Q. Did you ever hear Mr. Bock make a statement
14 to the contrary?

15 A. Very much so. I can't forget that because
16 after we laid all this thing out on the
17 table, then Bock, who was the CEO, said, "If
18 we can't beat this problem, we're going to
19 just give up the ship as far as PCBs are
20 concerned and stop manufacturing them." He
21 was quite emphatic. He said, "We want to be
22 a good neighbor. We're" -- "we want" --
23 "we're just as worried about the bald eagle
24 and the peregrine falcon as the next
25 person." So he was very cognizant of the

1 problems of environmental pollution at that
2 time.

3 Q. Let's back up again to 1968.

4 Do you recall learning of a problem
5 in Japan that related to a PCB product there?

6 A. Yes, I did.

7 Q. Could you describe that for us?

8 A. This was termed "Yusho," Y-u-s-h-o. It
9 appeared that a Japanese PCB called Canaclor,
10 which was manufactured in a somewhat
11 different process that Monsanto did their
12 PCBs -- it also was proved later to have
13 contaminants to a degree that were not
14 present in any of the Monsanto products --
15 was used as a heat transfer agency to do
16 something with rice oil, to warm it up or
17 something. Obviously to warm it up. And it
18 leaked in it. And how long this leak
19 occurred and how hot the temperature was, I
20 don't know.

21 But it was then used -- it was
22 sold -- the rice oil was sold with no
23 knowledge that -- the leakage of the fluid
24 into the material. And people used it to
25 cook soy bean pancakes or some staple of the

1 Japanese diet. I don't know. But they used
2 it very frequently over a period of months;
3 and about a thousand people developed
4 problems, mostly dermatological. There were
5 no deaths, as I recall; but the
6 dermatological manifestations were pretty
7 severe. There were some other systemic
8 things. There were pains in peripheral
9 duritis, some pains in the extremities, as I
10 remember. And it was quite a problem.

11 Q. Do you recall approximately when you started
12 hearing reports about what you've identified
13 as the Yusho incident?

14 A. Sometime after -- sometime in 1969. Because
15 we didn't have a very large presence in Japan
16 at that time like we did in Europe where we
17 heard things pretty early. And I don't think
18 anybody in St. Louis subscribed to Japanese
19 newspapers. And we didn't subscribe to the
20 Japanese scientific literature. So it was --
21 it wasn't an awful lot in the United States
22 until, I think, '69, sometime in '69.

23 Q. Did you and others within the medical
24 department make efforts to learn more about
25 the Yusho incident after you got the first

1 reports?

2 A. Well, we did. But our resources were pretty
3 limited. There wasn't much to learn until we
4 got some translations of the Japanese
5 article. We did have some connection in
6 Japan with some of the Japanese companies;
7 and we had a regional vice-president over in
8 Japan, a John Durland, whom we would write to
9 and say, "What's going on? Where do you find
10 out about this?"

11 Q. Did you and others within the medical
12 department at Monsanto review English
13 language publications about Yusho as they
14 came out in the later years?

15 A. Yes. Certainly did.

16 Q. You mentioned in your answer describing the
17 Yusho incident that there were -- it later
18 developed that there were some impurities in
19 the rice oil, as well as PCBs. Was one of
20 those impurities known by the name
21 "polychlorinated dibenzofurans"?

22 A. Yes.

23 Q. For the sake of brevity, I'm going to refer
24 to that as "furans" in the rest of your
25 deposition. So if I use the word "furans,"

1 will you understand that I actually mean
2 "polychlorinated dibenzofurans"?

3 A. Yes.

4 Q. Did you and others in the medical department
5 read articles in the 1970 time period by
6 Dr. Vos about the identification of furans in
7 some peak commercial PCB mixtures?

8 A. Yes, I did.

9 Q. What do you recall generally about Dr. Vos'
10 report?

11 A. Well, Dr. Vos was a European. I think he was
12 Swedish or Hollandsch. I don't know where.
13 Certainly Western Europe. He analyzed PCBs
14 manufactured by Monsanto; PCBs manufactured
15 by a German organization Vateche, V-A-S-F;
16 and some French PCBs. I don't know if it was
17 French or Italian; but there was several
18 European manufacturers, as well as Monsanto.

19 He found furans in the European
20 samples from the two manufacturing companies
21 in Europe that he examined. He did not find
22 any and did not report any and reported a
23 negative finding of furans in the Monsanto
24 product.

25 Q. Did Dr. Vos identify furans as a more toxic

1 compound than PCBs?

2 A. Oh, several magnitudes. Probably 500 to a
3 thousand times as toxic as PCB.

4 Q. After learning that Dr. Vos had detected
5 levels of furans in European PCBs but
6 reported that he had not been able to detect
7 them in Aroclors manufactured by Monsanto,
8 did Monsanto undertake its own efforts
9 analytically to look for furans in its PCBs?

10 A. Yes. Starting sometime in 1970, up until I
11 retired in '74 and afterwards, it was my
12 impression they continued looking. By the
13 time I retired, up till November the 30th,
14 1974, I have no recollection of any reports
15 that we found any, even though we were
16 looking in our particular product.

17 It's my understanding also that
18 afterwards, after their analytical, expertise
19 became more exact. They were able to find
20 some small amounts in our particular
21 product.

22 Q. All right.

23 A. But I have not seen those reports. But up
24 till the time I retired, all the reports were
25 negative.

1 Q. Let's go back, Dr. Kelly, to Exhibit 36,
2 which is an October 21, 1968, memorandum from
3 Elmer Wheeler to W. R. Richard. And there
4 are carbon copies to a number of other
5 people.

6 Do you recall receiving a copy of
7 this memorandum in 1968?

8 A. After looking at it, I recall it, yes.

9 Q. The attachment to this memorandum, which is
10 not in the exhibit, is described as
11 Risebrough's presentation. Was this the
12 first time you received a copy of
13 Dr. Risebrough's paper showing the presence
14 of PCBs in the American environment and
15 reporting finding them in various fish and
16 birds in California?

17 A. The best of my recollection, it was.

18 Q. Dr. Kelly, I started this examination by
19 mentioning to you that the plaintiff in this
20 case was Nevada Power Company, which is a
21 utility in Nevada.

22 A. Yes, sir. I recall that.

23 Q. To your knowledge, did Monsanto ever make any
24 misrepresentation about PCBs to Nevada Power
25 Company?

1 A. No, sir.

2 Q. To your knowledge, did Monsanto conceal any
3 information about PCBs so as to deceive
4 Nevada Power about the risks or hazards of
5 PCBs?

6 A. No, sir.

7 MR. BAUER: That's all the
8 questions I have for direct examination.

9

10 EXAMINATION

11 BY MR. KIM:

12 Q. Dr. Kelly, can you hear me?

13 A. Yes, I can. Thank you.

14 Q. My name is John Kim.

15 A. Yes, Mr. Kim.

16 Q. And I'm a lawyer who, along with
17 Mr. Gallagher, has been hired by Nevada Power
18 Company. You understand by virtue of this
19 lawsuit our company has sued Monsanto
20 Chemical Company, General Electric, and
21 Westinghouse for what we allege to be the
22 fraudulent sale of dielectric fluids
23 containing PCBs?

24 A. Yes, sir.

25 Q. As a result of that, we are in somewhat of an

1 adversarial position today. I only say that
2 because sometimes, as your attorneys will
3 tell you, I can ask convoluted or confusing
4 questions. And I'd like to reach an
5 agreement with you that if I do so, that you
6 and I can understand that all you have to do
7 is tell me you don't understand and I'll try
8 again.

9 A. Yes, sir. Thank you.

10 Q. Have you given your deposition before?

11 A. Yes.

12 Q. And I will tell you up front, to be frank,
13 that I've read some of your past testimony.
14 So perhaps a lot of this can go quickly.

15 A. Yes, sir.

16 Q. But as of 1990, I understood that you had
17 gived 50 prior depositions -- you had
18 testified 50 times either by deposition or
19 trial. Is that your recollection?

20 A. I don't think so. I think 50 is high. I
21 think --

22 Q. Correct me.

23 A. I think it would be in the 20's to 30's,
24 would be tops. I don't think it was 50.

25 Q. Okay. Do you have a recollection of in your

1 deposition in a case -- do you remember
2 testifying in a case called "In re: Paoli"?

3 A. I remember the term. This was with
4 Pennsylvania, but I don't remember when
5 I -- I do not recall my deposition, and I
6 have not seen my Paoli deposition. If I was
7 deposed in it, I haven't seen it for quite
8 some time.

9 Q. I understand, Doctor. The confusion that I
10 have is in the Paoli deposition, you had
11 indicated that as of that date, you had
12 testified approximately 50 times. And I
13 don't mean to dispute that number. But let's
14 take your number of only testifying 20
15 times. Does that number --

16 A. Twenty to 30, I said.

17 Q. Up to today's date?

18 A. Yes, sir.

19 Q. And in each of those instances, how many
20 times did you testify on behalf of Monsanto
21 Chemical Company?

22 A. I don't exactly know your term, "on behalf of
23 Monsanto." I was testifying in some of those
24 as to the facts that I knew them. Those
25 facts were on behalf of both sides,

1 obviously. I was --

2 Q. Certainly you've never been critical of
3 Monsanto Chemical Company's testing and
4 protocol, have you?

5 A. I haven't finished yet.

6 Q. Excuse me, Doctor.

7 A. I was -- I was also testifying sometime as an
8 expert in PCBs.

9 Now, I'm sorry I had to interrupt
10 you. I'm finished with that answer.

11 Q. How many times have you testified, in those
12 20 to 30 times, has Monsanto Chemical Company
13 been a party to the litigation?

14 A. Probably 16 or 17 times. If over 25, there
15 were probably 22 times. I testified once in
16 a case with Illinois Central. There was
17 another case involving PCBs. I forget who
18 the defendant was, but they are not all
19 Monsanto cases.

20 Q. Of the 20 -- let's use 25.

21 A. Yes, sir.

22 Q. Can we use that?

23 A. Yes, sir.

24 Q. And I'm not going to hold you to that
25 number.

1 Of the 25 times, how many times
2 have you testified as an expert on behalf of
3 Monsanto Chemical Company?

4 A. I find it hard to make -- to remember that.
5 I would say probably half the time.

6 Q. In the other instances --

7 A. As a fact witness.

8 Q. In your testimony as a fact witness, have you
9 ever given any criticism as to the testing
10 and research protocol employed by Monsanto
11 Chemical Company in the production and sale
12 of any of their industrial chemicals?

13 A. Wait. Repeat that. That's a little
14 convoluted.

15 Q. I agree. It was.

16 Have you ever criticized Monsanto
17 Chemical for their research and testing
18 protocol pursuant to any industrial chemicals
19 that they sold?

20 A. No. I don't -- are we talking now about
21 research as far as the toxicological -- well,
22 no, I haven't. Because I was in charge of
23 that. I'd be criticizing myself.

24 Q. And we certainly don't want you to do that,
25 Doctor.

1 A. I won't.

2 Q. Your testimony is, as I understand it, then,
3 that of the 25 times you've testified, 22
4 times Monsanto has been a party?

5 A. Yes.

6 Q. Have you ever testified on behalf of a
7 plaintiff in any of the 25 times?

8 A. No, sir. I was never called.

9 Q. And you've never testified different to that?

10 A. I've never testified different to what?

11 Q. To never testifying on behalf of a plaintiff?

12 A. In anything?

13 Q. In anything.

14 A. Oh, yes. I've testified for the plaintiffs
15 in other cases outside of PCB.

16 Q. From the time period of 1936 up until 1990,
17 how many times have you testified on behalf
18 of a plaintiff?

19 A. Two or three, I believe.

20 Q. And again, I guess my confusion comes,
21 Doctor, in that that answer differs with the
22 answer that you gave in your Paoli
23 deposition.

24 MR. BAUER: Objection. Lacks
25 foundation.

1 MR. KIM: Well, I'm sure it does,
2 Scott.

3 Q. (By Mr. Kim) The testimony you gave there
4 was --

5 MR. KIM: And I'm not trying to
6 impeach him. I'm just trying to clarify
7 something.

8 Q. (By Mr. Kim) The testimony that you gave
9 there was you had only testified one time on
10 behalf of a plaintiff. Do you have a
11 recollection of what other instances that you
12 have testified on behalf of a plaintiff?

13 A. Yes. Once was a case with an engineer for a
14 railroad, was exposed to diesel fumes in a
15 roundhouse. I remember that quite a bit.
16 That was one time I testified on behalf of
17 the defendant.

18 It may be some of the confusions
19 with -- because sometimes the plaintiff would
20 send me a medical report and I would send it
21 back to them with a -- or rather, I'd tell
22 them, "My opinion is different than what you
23 are going to want." And he would call me up
24 and say, "Send me the report back."

25 So, I mean, I may have been asked

1 to testify by the plaintiff, preliminary
2 request; but then on further thinking, after
3 feeling what my thoughts on the matter was,
4 he decided I would not be helpful to his
5 case.

6 Q. And those would have been instances where
7 they would have asked you for some sort of
8 causative correlation between some health
9 problem he had and a chemical or a producing
10 agent?

11 A. That's correct.

12 Q. And in those two instances where you did not
13 testify, you gave a preliminary opinion that
14 you could find no causative factors?

15 A. That's correct.

16 Q. And so they asked you not to testify?

17 A. That's correct. Well, they -- not to
18 testify. They just didn't ask me to testify.

19 Q. Have you had occasion to testify before any
20 governmental agencies, whether it be Federal
21 or state?

22 A. No, sir, I have not.

23 Q. Have you had occasion to file any affidavits
24 on behalf of Monsanto Chemical Company in any
25 insurance coverage litigation concerning

1 polychlorinated biphenyls, furans, or
2 dioxins?

3 A. None that I can recall.

4 Q. Between the years of Nineteen Thirty -- I
5 believe you told us you started in '36?

6 A. Six.

7 Q. -- and 1974, Monsanto Chemical Company was
8 your sole employer with the exception of your
9 stint in the Armed Forces?

10 A. As far as employee -- being an employee was
11 concerned, yes. I did do -- I did see an
12 occasional case for a diagnosis for various
13 people around St. Louis.

14 Q. For the most part, for those 38 years the
15 only paycheck you really ever drew was from
16 Monsanto Chemical Company?

17 A. That's correct.

18 Q. Today are -- after you retired in 1974 from
19 Monsanto, I believe you testified that you
20 did some consulting work?

21 A. Yes. I did -- I was -- for a year I was
22 retained as a consultant. I believe that was
23 to back up Dr. Rousch if he needed any
24 backup, which he didn't need much. I saw a
25 couple of plants, investigated problems in a

1 couple of plants, none of which had to do
2 with PCBs. One was a Texaco plant, and the
3 other was a -- an insecticide operation.

4 Q. Kind of a transition period?

5 A. I think so.

6 Q. Did you do any other work as a consultant in
7 that year for any other companies outside of
8 Monsanto?

9 A. Which years? In that one year?

10 Q. In that one year after your retirement.

11 A. '75?

12 Q. Yes, sir.

13 A. No, I did not in '75.

14 Q. From 1976 forward, did you do any consulting
15 for any other companies outside of Monsanto?

16 A. Well, at some time I was a medical director
17 of the Consolidated Aluminum Company. That
18 was -- took about 30 days a year. And this
19 was an organization that had three smelters
20 and some smaller manufacturing units. I was
21 associated with the Sutter Industrial
22 Occupational Medical Clinic, which eventually
23 became the Barnes Health Service. I was
24 there till -- three mornings a week until, I
25 guess, sometime in the late Eighties, I

1 believe.

2 Q. During that time period, were you also still
3 doing some consulting work for Monsanto
4 Chemical Company?

5 A. I was -- I was given -- I did some work on --
6 that wasn't consulting work. It was case
7 basis -- on a case basis in legal things like
8 this, in legal situations.

9 Q. And that's -- would that have been the time
10 period in which you testified that
11 approximately 25 times that we've talked
12 about earlier?

13 A. Yes, sir.

14 Q. When is the last testimony, prior to this
15 case involving Nevada Power Company, that you
16 gave concerning PCBs?

17 A. Frankly, I don't remember. It was sometime
18 in 1993, but I don't remember.

19 Q. On approximately how many occasions have you
20 testified on behalf of Monsanto Chemical
21 Company on issues concerning polychlorinated
22 biphenyls?

23 MR. BAUER: Object to the form.

24 A. Well, all the times I've testified in cases
25 involving Monsanto at Monsanto's behest was

1 the 20 to 22 that I mentioned. Sometimes I
2 was subpoenaed by the plaintiff. I don't
3 know if that means I'm testifying for
4 Monsanto or not.

5 Q. (By Mr. Kim) In those 22 times you certainly
6 never criticized your work?

7 A. Didn't criticize myself. No, I did not.

8 Q. Did you -- were you critical of anyone at
9 Monsanto Chemical Company?

10 A. In depositions?

11 Q. Or court testimony.

12 A. In court testimony? I don't recall doing it,
13 no.

14 Q. Okay. Are you still a shareholder in
15 Monsanto Chemical Company today?

16 A. A very moderate shareholder.

17 Q. When you say "moderate," could you amplify
18 for this jury how much stock you own in
19 Monsanto Chemical Company?

20 A. Yes. About a thousand shares.

21 Q. And what is, in dollar amount, that interest
22 in Monsanto Chemical Company today?

23 A. Today? Seventy-eight thousand -- it's 78 to
24 78,000.

25 Q. Do you have any involvement from a financial

1 standpoint with Westinghouse Electric
2 Company?

3 A. No, sir.

4 Q. General Electric?

5 A. I did have some shares at GE which I have
6 gave to my children about ten years ago.

7 Q. Outside of that, you have no --

8 A. I have no shares in GE.

9 Q. Have you ever testified in cases in which
10 Westinghouse and/or General Electric have
11 been parties?

12 A. I think there was one, but I don't remember
13 the details. I don't know the name of it.

14 Q. They've never hired you?

15 A. No. I've never received a check from
16 Westinghouse or GE.

17 Q. Okay. Mr. Bauer went through your background
18 a little bit. One thing I wanted to ask you
19 was -- and we don't have the benefit of your
20 CV today -- is whether you have ever
21 published any articles on the subject of
22 polychlorinated biphenyls.

23 A. I have not.

24 Q. Have you ever published an article concerning
25 polychlorinated dibenzodioxins?

1 A. No, I have not.

2 Q. How about polychlorinated dibenzofurans?

3 A. I have not.

4 Q. Your testimony and the basis of your
5 testimony concerning PCB, then, is primarily
6 based upon the studies that you ordered, as
7 well as your experience over the thirty-eight
8 some years that you were at Monsanto
9 Chemical?

10 A. As well as reading all the literature on the
11 material in the English language. Yes. Most
12 of the literature -- I can't say I read all
13 of it. Most of the literature related to
14 PCBs in the English language.

15 Q. And you began to read most of the English
16 literature concerning these subjects sometime
17 in 1936 and forward?

18 A. '36, '37, yes, and forward.

19 Q. Certainly you would have read the litany of
20 literature in the Forties?

21 A. Well, not in the four years I was in the
22 Service, I wasn't -- didn't. But certainly
23 in the Forties, I read it, yeah. The
24 others -- periods I was gone from '42
25 to '46. And so the other years I read it.

1 Q. When you came back from the Service in '47,
2 did you make some attempt --

3 A. '46. I came back in the middle of '46.

4 Q. Excuse me, Doctor. When you came back from
5 the Service in the middle of '46, did you
6 make some attempt to review the literature
7 that had been published during the time in
8 which you served?

9 A. Yes, I did. There wasn't much. In fact,
10 there was very little of new literature.
11 There was an awful rehashing of the
12 literature by various people, but nobody had
13 done any new work on it.

14 Q. Prior to your deposition today, have you had
15 an occasion to talk with any of the fine
16 attorneys in this room?

17 A. Yes. I've talked to Mr. Scott -- Mr. --

18 THE WITNESS: What's your last
19 name?

20 MR. BAUER: Bauer.

21 A. -- Bauer.

22 Q. (By Mr. Kim) The gentleman who questioned
23 you earlier in this deposition?

24 A. That's correct. That's correct.

25 Q. Have you had occasion to speak with anyone

1 else?

2 A. About this case or about the weather or about
3 I talked to --

4 Q. About this case. I'm sorry, Doctor.

5 A. No, I have not.

6 Q. Was Mr. Bauer the only person present in your
7 meeting?

8 A. Well, sometime I think Mr. Featherstone put
9 his head in the door once in a while.
10 Sometime some of the counsel, in-house
11 counsel at Monsanto, put their head in the
12 door, too. But Mr. Bauer was the man I was
13 talking to.

14 Q. Had -- did a gentleman by the name of Bob
15 Kaley stick his head in the door while you
16 were having conversations with Mr. Bauer?

17 A. No. But I've talked to Bob Kaley quite
18 frequently.

19 Q. You've talked to Mr. Kaley, in fact, on
20 numerous occasions concerning your testimony,
21 have you not?

22 A. Not concerning my testimony. I've talked to
23 him about information that -- chemical
24 information that I was not cognizant of.

25 Q. You are not a chemist, are you?

1 A. No, I'm not.

2 Q. Nor are you an analytical chemist?

3 A. No, I am not.

4 Q. And you have previously relied upon Mr. Kaley
5 for such information as that which concerns
6 the creation of furans?

7 MR. BAUER: Object to the form.

8 A. Not necessarily Mr. Kaley because there's
9 been information in the literature about the
10 creation of furans. And Mr. Kaley came, as I
11 remember, rather late in the -- I don't know
12 when he first came to Monsanto, but Bob was a
13 relatively recent addition to Monsanto. As
14 far as I know.

15 Q. (By Mr. Kim) Part of the job
16 responsibilities and duties that you
17 described for Mr. Bauer included the ordering
18 and review of all toxic properties of -- with
19 respect to any industrial chemical
20 manufactured by Monsanto Chemical Company; is
21 that correct?

22 A. Yes, sir. To see if -- to see what
23 information there was and whether any more
24 information was needed.

25 Q. Indeed, part of your responsibilities would

1 include looking at the toxic properties of
2 new materials prior to manufacturing; is that
3 correct?

4 A. Yes, I think that's true.

5 Q. In other words, you would want to look at the
6 raw materials that form the feedstock of that
7 chemical?

8 A. Yes, sir.

9 Q. And look at their toxic propensities?

10 A. Yes, sir.

11 Q. You would also want to look at the
12 by-products of that product to see if there
13 were any toxic properties there?

14 A. If any by-products were known.

15 Q. And by "by-products," we're talking about
16 such things that may happen with heating; is
17 that correct?

18 A. Well, a chemical reaction, yes.

19 Q. How about the metabolism process within a
20 human body?

21 MR. BAUER: Object to the form.

22 A. No, sir. I do not believe that that was
23 reviewed for industrial chemicals because the
24 theory in industrial -- in occupational
25 medicine is to keep it out of your body.

1 Q. (By Mr. Kim) Would you agree with me that
2 Monsanto Chemical Company has a corporate
3 philosophy that it wants to manufacture and
4 market safe products?

5 A. Yes, it does.

6 Q. They want to manufacture and market safe
7 industrial chemicals?

8 A. Yes, sir.

9 Q. Part of that analysis is a concern for the
10 health of individuals who may be exposed to
11 that industrial chemical; is that correct?

12 A. Yes, sir.

13 Q. Another factor that Monsanto Chemical Company
14 wishes to consider or should consider is the
15 environmental concerns of that industrial
16 chemical?

17 A. You're talking about right now? Or what are
18 you talking about? What time frame?

19 Q. Well --

20 A. Because environmental concerns were not a big
21 problem in the 1930's and Forties or
22 Fifties. They certainly have been in the
23 Seventies and Eighties and Nineties.

24 Q. I understand that they weren't a problem in
25 the Thirties, Forties, and Fifties; but my

1 question, Dr. Kelly, is: During that time
2 period of 1930, 1940, and 1950, did Monsanto
3 have a corporate philosophy that it did not
4 want to introduce an industrial chemical that
5 may cause environmental contamination?

6 A. They did not knowingly want to introduce it.

7 Q. Would you agree with me that it would be
8 prudent manufacturing and marketing practice
9 on the -- on behalf of Monsanto Chemical
10 Company to have done prior testing as to the
11 raw materials that made up the feedstock of
12 the chemical sold?

13 MR. BAUER: Object to the form.

14 Lacks foundation.

15 A. Let me get this straight. Monsanto buys a
16 product from Supplier A.

17 Q. (By Mr. Kim) No, sir. And let's just use --

18 A. How do they get the feedstock? They don't
19 make it themselves.

20 Q. Sure.

21 A. We have to start with something.

22 Q. Right.

23 A. What's your question?

24 Q. I'm -- my question, Dr. Kelly, is: Would
25 Monsanto undergo efforts to determine the

1 toxicity of all the individual compounds that
2 make up the feedstock of the final product?

3 MR. BAUER: Object to the form.

4 A. I'm -- we try to find out what the toxic
5 properties of the chemicals that we use to
6 make our finished product. These chemicals
7 were bought from somebody. They were bought
8 from oil companies, or they were bought from
9 other chemical companies. We didn't go out
10 and drill a hole for the chemical for
11 ourself. We did try to find out what
12 information was available on -- from the
13 toxicological point of view on these raw
14 materials. Yes, sir. We did that.

15 Q. (By Mr. Kim) And as I understand your
16 testimony, then, Monsanto never did any
17 independent testing on its own of the raw
18 materials that made up the feedstock?

19 MR. BAUER: Object. Object to the
20 form. Mischaracterizes his testimony.

21 A. I can't answer that because I do not believe
22 that is correct. We did -- if we got a
23 product from somebody else, we would write
24 them and say, "What do you know about the
25 toxicological properties of this product?"

1 If they answered, which usually happened, "We
2 don't know anything about it," then we would
3 look to see if there was anything in the
4 literature to see -- then I would talk to my
5 conferrers in the same business who might be
6 using the product. If this were a "me, too"
7 product -- in other words, some other company
8 had been making it first -- I would talk to
9 the medical director of Dow or DuPont to say,
10 "What do you know about this? You've been
11 making this for a long time. Have you had
12 any problems?" And he'd say, "No." Well,
13 then, I wouldn't go any further than that.

14 If there was nothing known about
15 it, we would run our basic tox -- our acute
16 toxicity studies on this particular product,
17 even though it was not our product. Yes,
18 sir.

19 Q. (By Mr. Kim) Would you run those studies
20 in-house at Monsanto?

21 A. No, we did not run them in-house. We ran
22 them at Scientific Associates and Younger
23 Laboratories, which were two relatively small
24 toxicological laboratories in St. Louis.

25 Q. The reason I ask that, Doctor, is in the

1 stack of exhibits that your attorney went
2 through -- that Mr. Bauer went through with
3 you earlier, I didn't notice any tests with
4 respect to the toxic properties of any of the
5 raw materials that make up the chemical
6 compound known as "polychlorinated
7 biphenyl." Were those tests done at Monsanto
8 Chemical Company?

9 A. Well, let's take what is used for -- to make
10 up polychlorinated biphenyl. You take
11 benzene. Certainly there's lots and lots of
12 information on benzene in the literature. We
13 didn't have to run any tests on benzene.

14 Q. And that literature indicates that benzene is
15 highly toxic?

16 A. Well, it's a toxic compound, certainly.

17 Q. Has a propensity to cause some forms of
18 leukemia?

19 A. Yes, it does. We're talking about benzene,
20 yes.

21 Then chlorine, certainly everybody
22 knows what chlorine is. It's a war gas.
23 It's used also in other areas, like making
24 pure water. Chlorine in the acid form is in
25 everybody's stomach.

1 So we do the toxicity of those
2 things. We weren't going to investigate the
3 toxicity of chlorine or benzene.

4 Q. Doctor, let me interject right here. Did
5 Monsanto ever investigate any of the toxic
6 propensities of chlorinated benzenes prior to
7 the sale of polychlorinated biphenyls?

8 A. Now, there's a whole group of chlorinated
9 bi -- of chlorinated hydrocarbons, the
10 chlorinated benzenes. There's
11 monochlorobenzene, dichlorobenzene,
12 trichlorobenzene. No, I don't think we
13 manufactured -- I don't think we manufactured
14 any of the chlorinated benzenes. We may have
15 manufactured trichlorobenzene for a short
16 period of time, but there was literature on
17 that. We -- no. The answer is "no," we did
18 not.

19 Q. And what did the literature indicate to you
20 with respect to the toxic potential of
21 trichlorobenzene?

22 MR. BAUER: Object to the form.
23 Indefinite as to time.

24 A. Well, it's a solvent.

25 Q. (By Mr. Kim) During the 1930's.

1 A. It's a solvent that is -- can be absorbed by
2 inhalation. It's a material that can cause
3 liver damage if you absorb enough of it,
4 either by swallowing or inhalation. I'm not
5 certain about its absorption through the
6 skin.

7 Q. You would agree with me that some of the
8 products that were used in the dielectric
9 fluids by Westinghouse and General Electric
10 were a combination of approximately 70
11 percent polychlorinated biphenyls and 30
12 percent trichlorobenzene?

13 A. Yes, sir.

14 Q. Did Monsanto ever undergo any tests as to
15 whether there was a synergistic effect by the
16 combination of such chemicals?

17 A. Yes, we did. We ran -- as I testified
18 yesterday, we ran on Inerteen and a -- a
19 Westing -- of Pyranol PPO, if that's -- or
20 maybe it was Inerteen PPO.

21 Q. Monsanto never tested with respect to
22 Inerteen or Pyranol, how that broke down in
23 the human body?

24 A. No, we did not.

25 Q. You never ran a study that would look at the

1 blood or urine in the metabolized residues
2 found in such?

3 A. No, we did not.

4 Q. Before we get any further into the testing,
5 would you agree with me that a manufacturer
6 who is selling industrial chemical compounds
7 must foresee its reasonable uses and
8 potential exposures to humans?

9 MR. BAUER: Object to the form.

10 A. I do not know how a manufacturer can foresee
11 how a product is going to be used. We know
12 that it's going to be used in some cases. We
13 know if it's a dielectric, it's going to be
14 used in an electrical application. But we
15 don't know what a manufacturer is liable to
16 use a product for. There are secrets in
17 the -- proprietary secrets in the chemical
18 industry.

19

20 (Whereupon Mr. Gallagher leaves the
21 proceedings.)

22

23 Q. (By Mr. Kim) Your testimony is that it was
24 prudent on the part of Monsanto to sell
25 chemical products without an analysis of its

1 foreseeable uses?

2 MR. BAUER: Object to the form.

3 A. No.

4 Q. (By Mr. Kim) Is that correct?

5 A. No.

6 MR. BAUER: Object to the form of
7 the question. Mischaracterizes his
8 testimony.

9 MR. KIM: Hey, Scott, he can
10 correct me.

11 MR. BAUER: Mischaracterizing his
12 testimony is an objection to the form,
13 Mr. Kim. And if you mischaracterize his
14 testimony, I will object.

15 A. Will you repeat the question, Mr. Kim?

16 Q. (By Mr. Kim) You bet.

17 As I understood your answer -- and
18 correct me if I'm wrong -- you testified that
19 Monsanto could not and did not necessarily
20 foresee all intended uses of its chemical
21 product?

22 A. That is correct. Somebody could call up
23 Monsanto and say, "I want a taker of 'X,'
24 Product X." We would send them a bulletin
25 that would show what we knew about the

1 toxicological properties of it. We would
2 send them information about the safe handling
3 data. But we would not require them to tell
4 us what they were using it for.

5 Q. Would you send information along with that
6 product to whatever manufacturer saying, "You
7 should not mix this chemical with the
8 following because it produces these toxic
9 results"?

10 A. If we knew it did, we would tell them that;
11 but there was no way we were going to take
12 this product and mix it with every known
13 chemical that could possibly be mixed with
14 it.

15 Q. Did Monsanto -- with respect to
16 polychlorinated biphenyls --

17 A. Yes, sir.

18 Q. -- during the time period you were at
19 Monsanto, did Monsanto ever engage in any
20 analysis that sought to identify reasonable
21 and foreseeable uses of the product?

22 MR. BAUER: Objection. Lacks
23 foundation.

24 A. We -- when the environmental aspects of PCBs
25 became prominent, we stopped selling the

1 material for -- in areas that we thought we
2 could not control the dissemination of the
3 product.

4 Q. (By Mr. Kim) That would have been in 1967,
5 somewhere in that time?

6 A. A little later than that.

7 Q. Prior to 1966, Monsanto Chemical Company did
8 not engage in such analysis; is that correct?

9 A. The medical department did not. I'm not -- I
10 cannot speak for Monsanto.

11 Q. During the time period that you were at
12 Monsanto, were you aware of any corporate
13 effort to identify the foreseeable means of
14 exposure to humans of polychlorinated
15 biphenyls?

16 A. Say that over. I --

17 Q. That was a bad question.

18 During the time period you were at
19 Monsanto, did the company engage in any
20 analysis with respect to the different ways
21 in which a human may be exposed to PCBs?

22 A. Well, there are only three ways you can get
23 exposed. You can swallow it. You can get
24 exposed through the skin. It can be exposed
25 by breathing the vapors. We recognize the

1 fact that we did not recommend it to be taken
2 internally. It was not a food chemical. We
3 did --

4 Q. It's not like table salt?

5 A. No, it isn't. But table salt isn't so good,
6 either. So if you're talking about -- if you
7 want to get down to the nits and gnats of
8 LD₅₀ and stuff like that. But we did
9 recognize the fact --

10 Q. Well, just out of curiosity, Doctor --

11 A. 4. It's 4. 4 grams per kilo for salt.

12 Q. Salt?

13 A. Yes.

14 Q. Is salt more toxic than PCB?

15 A. No, of course not.

16 Q. Is PCBs more toxic than salt?

17 A. Yes, certainly.

18 Q. Any representation to the contrary you would
19 find a misrepresentation?

20 A. Yes. But what I am representing is that all
21 chemicals have a toxic potential. Now,
22 getting -- what was your question again? We
23 got off on a sidetrack.

24 Q. We did. I'm very interested about salt.

25 Did Monsanto during the time period

1 of 1930 to 1974, when you retired, ever
2 engage in any analysis concerning the
3 mechanisms of exposure to humans?

4 A. I don't know what you mean by "the
5 mechanisms."

6 Q. It's not clear.

7 What I'm talking about are
8 instances, for instance, where an
9 occupational worker may work on a daily basis
10 with his hands in the chemical. Or did they
11 engage in any analysis on whether capacitors
12 and transformers could leak and the type of
13 exposure a worker would be exposed to in that
14 instance?

15 A. Well, we took that into consideration when we
16 said, "Do not" -- "avoid repeated or
17 continuous skin contact." We took the
18 possibility of leaks into consideration when
19 we stated it in our literature and on our
20 labels, "Do not breathe in confined spaces or
21 in elevated temperatures." The material at
22 ambient temperatures, at room temperature,
23 does not present a danger.

24 So we took it to the -- account
25 those particular possibilities and so warned

1 them about it. We didn't go out and make an
2 investigation of where the material could
3 leak or be open -- leak in the industry.

4 Q. Certainly Monsanto Chemical Company knew of
5 the potentials for leaks and accidental
6 exposures to polychlorinated biphenyls?

7 A. Yes. There are always leaks.

8 MR. BAUER: Mr. Kim?

9 A. The chemical industry --

10 MR. BAUER: I'd like to continue
11 the practice of breaking Dr. Kelly's
12 deposition approximately every hour or when
13 you reach a --

14 MR. KIM: No problem.

15 MR. BAUER: -- convenient breaking
16 point.

17 MR. KIM: I'm here.

18 THE VIDEOGRAPHER: We're going off
19 the record. It's 12 minutes after 10:00
20 o'clock. This is the end of Tape No. 3.

21

22 (A recess was taken.)

23

24 THE VIDEOGRAPHER: It's 28 minutes
25 after 10:00 o'clock. This is the beginning

1 of Tape No. 4, and we're back on the record.

2 Q. (By Mr. Kim) Doctor, I understand that
3 recently you testified on behalf of Monsanto
4 in a case involving the Brio dump site in
5 Texas; is that correct?

6 A. I testified in this case. I have to object
7 to it on behalf of Monsanto.

8 Q. Sure. You --

9 A. I don't know -- I don't know by whom I was
10 subpoenaed.

11 Q. You gave testimony in that case?

12 A. Yes, I did.

13 Q. Can you amplify for me on what subjects you
14 testified on?

15 A. I really can't. I mean, I don't think I read
16 my deposition in that case.

17 Q. Do you have a recollection of some of the
18 topic areas?

19 A. Well, I think they were on the general
20 toxicity of PCBs, what we -- what we did
21 about them. There was considerable
22 discussion about PCBs in landfills, but
23 that's all I remember.

24 Q. Would your testimony have been to the aspects
25 that PCBs were safe?

1 MR. BAUER: Object to the form.

2 A. "Safe" is a term that needs more definition.

3 Q. (By Mr. Kim) You understand that the Brio
4 case involved a landfill or an allegation of
5 dumping of wastes that included PCBs that may
6 have migrated to the groundwater in the
7 surrounding neighborhoods?

8 A. That was a supposition, yes. It was brought
9 up. I have no evidence of that.

10 Q. I assume your testimony was that PCBs and the
11 other compounds associated with that dump
12 could not have caused the harms that were
13 being alleged by the children and the
14 families in that case?

15 MR. BAUER: Object to the form.

16 A. They never -- that was never brought up in my
17 case, in my deposition. They didn't -- I had
18 never seen any of the medical records. So
19 that was not brought up.

20 Q. (By Mr. Kim) Is this a deposition that
21 Mr. Jamail took?

22 A. Yes.

23 Q. Do you have a copy of that deposition?

24 A. No, I do not.

25 Q. Okay. When we took our break, we were

1 talking about foreseeing reasonable uses of
2 chemical compounds. Can we agree that it's
3 also prudent on the part of a manufacturer,
4 prior to marketing and selling a chemical --
5 industrial chemical, to foresee the hazards
6 associated with such chemicals?

7 A. Hazards to whom or to what? What hazards?

8 Q. Any hazards associated with that chemical.
9 In other words, we don't blindly want to sell
10 industrial chemicals without knowing what
11 their toxicity or reactions may be?

12 A. Well, that's true, yes.

13 Q. Okay. And can we agree that it would be
14 prudent on the part of a manufacturer if
15 after identifying such hazards, that we seek
16 to eliminate those hazards to the extent that
17 we can without compromising the utility of
18 the industrial compound?

19 A. Well, remember now -- that can't be answered
20 "yes" or "no" because that's a little
21 confusing to me. The hazard is in the
22 customer's plant; is that correct? Is that
23 what we're talking about?

24 Q. No, sir. Let's take, for example, benzene.

25 A. Yes.

1 Q. And we know that -- we can agree that benzene
2 is toxic?

3 A. Yes, sir.

4 Q. And that it forms cancers and certain forms
5 of leukemia?

6 A. I don't know about cancers. It does form
7 certain forms of leukemia.

8 Q. Can we agree that if a manufacturer is going
9 to sell benzene compounds, that, to the
10 extent possible, it should try and eliminate
11 through the development of that chemical
12 those mechanisms that cause that harm?

13 MR. BAUER: Object to the form.
14 Vague.

15 A. I'm confused about the mechanism. Are you
16 talking a mechanism of the chemical itself?
17 You should somehow withdraw the ability of
18 benzene to cause leukemia?

19 Q. (By Mr. Kim) Absolutely. If you can.

20 A. It would be nice if you could, but --

21 Q. Sometimes you can't?

22 A. Well, I don't know anybody who -- yes,
23 there's certainly an awful lot of times.
24 Most of the times you can't.

25 Q. Well, if you can't, can we agree that it

1 would be prudent on the part of a
2 manufacturer to at least guard against or
3 inhibit exposure to that particular mechanism
4 which may cause the harm?

5 A. Yes. But we -- you do that by telling the
6 worker or the customer how to avoid
7 problems. You do not police his area.

8 Q. Exactly. If you cannot eliminate the hazard
9 or harm and you cannot guard against it
10 within the instructional integrity of the
11 product, then at the very least you should
12 warn them --

13 A. Yes.

14 Q. -- about the possible harms?

15 A. Yes. You warn about the properties of the
16 material. He -- the user is the one that
17 knows what his exposure is.

18 Q. In order to do such and to identify such
19 hazards, can we agree that it's important to
20 have some testing done on the product prior
21 to its sale?

22 A. Yes, sir.

23 Q. And that testing, from a prudent
24 manufacturing standpoint, should include, to
25 the extent possible, acute exposures?

1 A. Yes, sir.

2 Q. Chronic exposures?

3 A. No. No, sir. No. Because by and large, an
4 industrial chemical is not tested for chronic
5 exposure because you do not want chronic
6 exposure. You -- you can warn against
7 chronic exposure; but you cannot warn against
8 acute exposures because you know you're going
9 to have spills, you know things are going to
10 happen where you get an acute exposure. But
11 you cannot --

12 Q. Well, Doctor, how can you warn against
13 chronic exposures when you don't know the
14 effects of that exposure because you've done
15 no testing?

16 MR. BAUER: Object to the form.
17 Calls for speculation in the -- this
18 hypothetical whatever. You moved from all
19 products down to some specific hypothetical
20 product, I take it.

21 A. Will you repeat your question, please?

22 Q. (By Mr. Kim) You bet. And your attorney is
23 going to object to about every question; but
24 as long as you and I have an understanding,
25 we'll try and get through this.

1 Can we --

2 MR. BAUER: Move to strike the
3 characterization of counsel about my conduct.

4 MR. KIM: Is there anything else
5 you have, Scott? Anything else?

6 MR. BAUER: Go on.

7 Q. (By Mr. Kim) Doctor, how can you warn about
8 the effects of chronic exposure if you
9 undertake no chronic testing to determine
10 what the effects of chronic exposure are?

11 A. Because you can make a judgment call from the
12 acute testing of a product and from the
13 experience of the people who have been
14 exposed to that during the past years. You
15 can make a judgment call. You do not have to
16 have chronic animal testing.

17 Q. And Doctor, I think this is where you and I
18 are having difficulty is because I'm talking
19 about prior to the sale commercially of a
20 product. Do you agree that testing should be
21 done prior to the introduction of an
22 industrial chemical in the commercial market?

23 MR. BAUER: Object to the form.
24 Calls for speculation.

25 A. Yes, some testing should be done.

1 Q. (By Mr. Kim) And we can agree that at least
2 acute testing should be done prior to the
3 commercial sale of products?

4 A. Yes, sir.

5 Q. But we have a difference on whether chronic
6 testing should be done prior to the --

7 A. Yes.

8 Q. -- sale of a compound?

9 A. Yes.

10 Q. Because as I understand your testimony -- and
11 your attorney will object as a
12 mischaracterization, and you correct me if
13 I'm wrong. But as I understand your
14 testimony, it is because we can draw
15 inferences from the acute testing?

16 A. And the experience of the exposure to humans
17 in our manufacturing, yes.

18 Q. But prior to the sale of such compounds,
19 there will be -- there would be no such
20 manufacturing experience?

21 A. Oh, yeah.

22 MR. BAUER: Object to the form.
23 Calls for speculation. Is an incomplete
24 hypothetical.

25 A. No, that is not correct.

1 Q. (By Mr. Kim) Okay. Do you think it's
2 necessary within the acute testing to do
3 exposure modalities?

4 A. What do you mean by "exposure modality"?

5 Q. The mode of exposure.

6 A. Yes.

7 Q. We can agree that toxicity may vary depending
8 on the route of exposure?

9 A. Somewhat, yes.

10 Q. Sometimes -- what are the routes of exposures
11 you understand?

12 A. Well, it's either you take it orally, it's
13 absorbed through the skin, or absorbed
14 through the lungs.

15 Q. Can we agree that at least acute testing
16 should be done with respect to all three
17 modes of exposure prior to the commercial
18 sale of industrial chemicals?

19 MR. BAUER: Object to the form.

20 A. If there is a possible -- the answer is
21 "yes."

22 MR. KIM: And Scott, I'll give you
23 a running objection to the form on every
24 question if you want it.

25 MR. BAUER: I'll state my

1 objections to the form to questions that have
2 problems with them so that you have an
3 opportunity to correct them.

4 Q. (By Mr. Kim) Do you feel that it's also
5 necessary to provide adequate warnings and
6 labels to the customers and end users of
7 industrial chemicals?

8 A. You have two questions there. One is
9 customers.

10 Q. You're right. Let's break that down.

11 A. Yes.

12 Q. Customers first.

13 A. Yes.

14 Q. How about end users?

15 A. I think that is a customer's responsibility.
16 We give him the information, and it's up to
17 the customer to give his customers the
18 information.

19 Q. Would that be your opinion even if in its
20 hazard analysis Monsanto Chemical Company
21 knew that end users would be exposed to such
22 chemicals?

23 MR. BAUER: Objection. Calls for
24 speculation.

25 A. That's really a speculation. I can't -- I

1 can't answer an assumption. I just don't
2 know.

3 Q. (By Mr. Kim) Do you know if during the time
4 period when -- as you testified earlier, you
5 had access to some of the corporate
6 executives at Monsanto Chemical Company; is
7 that correct?

8 A. I had access to the people?

9 Q. Yes.

10 A. Yes.

11 Q. And you entertained dialogue in
12 correspondence to your duties as medical
13 director of Monsanto Chemical Company?

14 A. With whom?

15 Q. With some of the corporate executives.

16 A. Yes.

17 Q. Such as Mr. Bock and those gentlemen.

18 A. Yes.

19 Q. Do you have any recollection if you engaged
20 in conversations concerning the type of
21 people who may possibly be exposed to
22 polychlorinated biphenyls?

23 A. Yes. It varied with the time frame.

24 Q. In the 1930's did you foresee that industrial
25 workers in the Monsanto plants or

1 Westinghouse plants or GE plants would be
2 exposed to polychlorinated biphenyls?

3 A. I did not know what circumstances in
4 Westinghouse or GE was -- were that might
5 expose them. I just did not know. I knew
6 what happened -- would happen at Monsanto,
7 yes.

8 Q. Based upon your knowledge of what happened at
9 Monsanto, did you arrive or did you even
10 think about any conclusions as to whether
11 Westinghouse or General Electric workers may
12 be exposed to such chemicals?

13 A. Well, I thought about it; but I knew nothing
14 about their operations. I was never in a
15 Westinghouse plant or GE plant.

16 Q. Did you seek to investigate the occupational
17 settings of those companies to whom you sold
18 polychlorinated biphenyls?

19 A. No. Because I knew that these were both
20 sophisticated companies. I knew they both
21 had industrial hygiene people. I knew they
22 both had a very excellent reputation in their
23 medical department, and I knew also they knew
24 as much about the material as we did. After
25 all, this was General Electric's product.

1 Q. Then you foresaw that General Electric or
2 Westinghouse would take the polychlorinated
3 biphenyls that you sold them, put them in
4 some product or form, and sell them on; is
5 that correct?

6 A. Yes.

7 Q. You knew that the polychlorinated biphenyl
8 fluid or compound was being passed on down
9 the retail chain; is that correct?

10 A. "Retail"? I don't know what you mean by
11 that.

12 Q. The distributive chain.

13 A. Yes. It's not going to a hardware store.

14 Q. No, sir. But in other words, Westinghouse
15 and General Electric were not the final user
16 of the product?

17 A. No, sir.

18 Q. Did Monsanto Chemical Company ever engage in
19 any analysis concerning warnings or labels
20 that would reach the ultimate user of the
21 product?

22 A. The medical department did not. I cannot
23 speak for the rest of Monsanto.

24 Q. Of course, any warning or label that was
25 written or drafted during the time period of

1 1936 to -- excuse me -- from the time period
2 of 1946 until 1974 would have to have been
3 approved by the medical department?

4 A. That's correct.

5 Q. And during that time period, you were the
6 head of the medical -- you were the medical
7 director?

8 A. Yes, I was.

9 Q. Would that have been -- made you the No. 1
10 man in that department?

11 A. Yes.

12 Q. So you would have seen any warning or label?

13 A. Yes. But remember, we had people in the
14 development department who talked to GE and
15 Westinghouse. We had people in the marketing
16 department who knew from their information
17 obtained from the medical department what the
18 toxicity was, what the warning statements
19 were. And whether they had contact with GE
20 or Westinghouse, I don't know. But I have to
21 repeat my statement, that GE and Westinghouse
22 knew as much about the toxic properties and
23 the way to avoid -- and the way to avoid any
24 harm. They knew as much as we did, probably
25 more.

1 Q. Because of their occupational experiences?

2 A. Yes. It was occupational experiences and
3 probably the dealings with their customers.

4 Q. Was there correspondence that went back and
5 forth between Monsanto and your medical
6 department and various individuals in
7 corresponding positions at Westinghouse and
8 General Electric?

9 A. There was correspondence I've seen with
10 Westinghouse. I have not seen
11 correspondence, to the best of my
12 recollection, with GE.

13 Q. Did you try and share the knowledge y'all had
14 accumulated collectively about PCBs during
15 this time period?

16 A. Oh, certainly. I mean, the representative --
17 yes. Representatives from GE and
18 Westinghouse were at the Drinker symposium.
19 Any information we published, our inhalation
20 studies, which is available to everybody in
21 the Country.

22 Q. Tell me what your sources of information were
23 with respect to the toxic properties of those
24 raw materials that made up the feedstock of
25 polychlorinated biphenyl.

1 A. Well, as I said earlier, the sources were the
2 literature; and there was an enormous amount
3 of literature on benzene. There was
4 certainly enormous amount of information on
5 chlorine dating back to World War II, World
6 War I. It had a lot -- much earlier than
7 that. That's the sources of -- it was common
8 knowledge in the medical profession. Not
9 only occupational medicine, but the medical
10 profession knew about it.

11 Q. What were your -- did you have occasion to
12 look at employee complaints with respect to
13 benzene and chlorine?

14 A. We did not have a -- yes. But we did not
15 have any complaints, that I recall, about
16 benzene.

17 Q. How about customer complaints?

18 MR. BAUER: Object to the form.

19 A. We didn't sell benzene to customers.

20 Q. (By Mr. Kim) How about internal testing?
21 Did you have access to any internal, in-house
22 Monsanto studies concerning benzene?

23 A. No, sir. We did not do any in-house studies
24 on benzene. There was adequate -- adequate
25 studies in the literature.

1 Q. How about occupational testing? Occupational
2 studies?

3 A. There were -- at various periods of time,
4 there were occupational, epidemiological
5 studies on benzene.

6 Q. How about Government testing?

7 A. Who?

8 Q. Government testing, state or Federal?

9 A. I don't recall the Government testing. I
10 mean, there may have some. I do not recall
11 them.

12 Q. What were your sources of information on the
13 toxic properties of chlorinated benzenes?

14 A. The literature.

15 Q. Anything else?

16 A. Well, there may have been topics -- there may
17 have been presentations on the toxicity of
18 chlorine and benzene in some of the meetings
19 that I went to, some of the occupational
20 medical meetings I went to. But the
21 literature was fairly adequate on the
22 toxicity of the chlorinated benzenes.

23 Q. Did you have any information or evidence
24 concerning the breakdown or by-products of
25 chlorinated benzenes in the human body?

1 A. No, sir. I do not recall any.

2 Q. In the environment?

3 A. I don't know about the chlorinated benzene.

4 Later in the -- about in the Seventies, there
5 was information available about the breakdown
6 of chlorinated -- polychlorinated biphenyls
7 in the environment.

8 Q. Mr. Bauer presented a number of studies that
9 he discussed with you in his examination of
10 you, and I want to talk about that. But
11 prior to talking about those, I want to ask
12 you some questions about what Monsanto did
13 not test about.

14 As I understand your testimony --
15 and correct me if I'm wrong -- as the medical
16 director of Monsanto, you were responsible
17 for ordering or directing all studies to be
18 done concerning polychlorinated biphenyls
19 during the time period of 1936 to 1974?

20 A. Not all studies. All studies relating to the
21 toxic properties of the material.

22 Q. Okay. And as the director of Monsanto
23 Chemical Company with that charge, I
24 understand that you never requested any
25 epidemiological studies with respect to PCBs

1 to be done during that time period?

2 A. That is correct.

3 Q. You never tested for furan decomposition
4 during that time period?

5 A. What is the time period again?

6 Q. 1936 to 1974, the entire time you were
7 employed.

8 A. Yes. They tested. They didn't find it.
9 They tested it from -- they would look at it
10 from the late Sixties, '69, and through the
11 Seventies. Till I retired, there was -- they
12 were looking for it, certainly.

13 Q. Out of curiosity, Doctor, when did Monsanto
14 Chemical Company first become aware that
15 their PCB products might be contaminated with
16 polychlorinated -- with polydibenzofurans?

17 MR. BAUER: Object to the form.
18 Vague.

19 A. I'd have to assume. I do not know when
20 they -- when Monsanto -- what was the
21 question?

22 Q. (By Mr. Kim) When did Monsanto first learn
23 that their polychlorinated biphenyls might be
24 contaminated with trace amounts of
25 polychlorinated dibenzofurans?

1 MR. BAUER: Same objection.

2 A. I do not know when anybody at Monsanto first
3 learned about the possibility. They may have
4 had this possibility in their mind. They
5 were looking for it. So I imagine it was
6 pretty close to when they started looking.

7 Q. (By Mr. Kim) Which was?

8 A. Late Sixties, early Seventies.

9 Q. We can agree that furans are much more toxic
10 than PCBs?

11 A. Yes, sir.

12 Q. We can agree that furans -- well, strike
13 that.

14 Did Monsanto Chemical Company ever
15 engage in any analysis to identify the
16 contaminants or, as you called in your
17 direct, scavenger chemicals that made up the
18 polychlorinated biphenyl compound?

19 MR. BAUER: Object to the form.

20 A. No, sir, they did not. They put the
21 scavengers in, as I remember, at the request
22 of their major consumers, Westinghouse or
23 GE. We did not manufacture the scavengers,
24 to the best of my knowledge. We didn't test
25 them, to answer your question.

1 Q. (By Mr. Kim) Monsanto never, under your
2 direction as medical director at Monsanto
3 Chemical Company, engaged in any studies to
4 determine the synergistic effects of these
5 scavenger compounds with your polychlorinated
6 biphenyl?

7 A. Well, certainly when we tested the material,
8 we tested everything that was in it. In
9 other words, if you're testing soup, you get
10 the toxicological information on the soup.
11 You don't test the individual carrots or the
12 onions or anything else in there. So
13 whatever we tested on polychlorinated
14 biphenyl, we tested the base material with
15 whatever else was supposed to be in there.

16 Q. Of course, when you say "we," Monsanto had to
17 contract out such testing because during the
18 time period that you were medical director at
19 Monsanto, Monsanto Chemical Company did not
20 have its own testing laboratories; is that
21 correct?

22 A. Yes. I don't see the difference. We got the
23 information. We paid for the information.
24 Whether we paid for it in-house or out-house,
25 it's the same thing.

1 Q. And we're going to talk about those payments
2 in a while.

3 Did Monsanto Chemical Company ever
4 test for the breakdown or decomposition
5 products of polychlorinated biphenyl?

6 A. Yes.

7 Q. During the time period that you were medical
8 director?

9 A. Yes.

10 Q. Have you ever testified to the contrary?

11 A. Now, let's be sure we're talking about the
12 same thing. They tested for the breakdown
13 periods -- products when lightning might
14 strike a transformer. They're looking for
15 breakdown material there. That's what I
16 testified for -- about.

17 Q. How about when PCBs entered the human body?
18 Did Monsanto Chemical Company ever engage in
19 any testing with respect to how it
20 metabolized or broke down in the human body?

21 A. No.

22 Q. Or in any of the by-products that may occur
23 through such decomposition?

24 A. In the human body?

25 Q. Or metabolism.

1 A. In the metabolism? No, sir.

2 Q. Did you ever order any studies to check what
3 residues or by-products might be present in a
4 human's blood or urine who is exposed to
5 PCBs?

6 A. When the instrumentation became available and
7 the analytical expertise became available, we
8 had some fat studies carried out in
9 St. Louis. Not on employees, but on
10 individuals who had died of other reasons, at
11 the coroner's office.

12 Q. Have you ever testified to the contrary with
13 respect to that? And I'm talking
14 specifically about the time period of 1936 to
15 1974 when you retired.

16 A. It all depends when I testified. I do not
17 know when I found out about the -- oh, until
18 1974?

19 Q. Yes, sir.

20 A. I don't know when they did that. I thought
21 they did that after 1974.

22 Q. Okay. Did you ever order or direct any
23 studies to be done dealing with the enzyme
24 reactions that PCB may cause in humans?

25 A. We ran enzyme studies on some of our workers,

1 but we did not study the mechanisms of how
2 the enzymes were formed or why they were
3 formed or anything of that sort.

4 Q. And this was during the time period 1936 to
5 1974?

6 A. Yes, sir.

7 Q. And as -- and I think we talked about this,
8 but just one more time. As I understand it,
9 you never directed or asked for any studies
10 that dealt with the synergistic effects of
11 PCBs and other compounds?

12 A. Well, I told you we've testified -- I
13 testified that we examined the acute toxicity
14 of compounds of both Inerteen and Pyranol,
15 which had at that time trichlorobenzene in
16 it.

17 Q. What other compounds did it have in it?

18 A. I don't know. We made it according to their
19 specifications. I don't know what it was.

20 Q. Did you ever do any testing on the
21 synergistic effect of those compounds that
22 may occur with respect to heat?

23 MR. BAUER: Object to the form.

24 A. No, sir, that I could recollect.

25 Q. (By Mr. Kim) How about the relationship and

1 the effect of those compounds on humans who
2 may have preexisting liver problems?

3 A. How about it? What? Is this a question?

4 Q. Yeah. Was a test ever directed with respect
5 to that?

6 MR. BAUER: Object to the form.

7 Vague.

8 A. No, sir, we did not.

9 Q. (By Mr. Kim) Did you ever direct a test to
10 be done on -- with respect to how those PCB
11 products related to individuals who may drink
12 alcohol?

13 A. No, sir, we did not.

14 Q. Were any comparison -- comparison analysis
15 made during the time you were medical
16 director on the relationship between
17 polychlorinated biphenyls and DDT?

18 A. Were any -- say that over. I lost my
19 concentration.

20 Q. Did Monsanto Chemical Company seek to engage
21 in any analysis that would have compared the
22 similarities or differences between PCBs and
23 DDT during the time period that you were at
24 Monsanto?

25 MR. BAUER: Objection.

1 Foundation.

2 A. Not that I know of.

3 Q. (By Mr. Kim) As the medical director of
4 Monsanto Chemical Company from the time
5 period of 1936 to 1974, were you aware of
6 whether Monsanto Chemical Company
7 manufactured DDT?

8 A. We did at some time. I do not know how long
9 we manufactured it or when we manufactured
10 it.

11 Q. Did Monsanto manufacture DDT during the time
12 period you were employed?

13 A. Yes, I think they did. I do not know how
14 long or when.

15 Q. Would the toxicological testing and analysis
16 have fallen under the department of the
17 medical director during -- with respect to
18 DDT, as well?

19 A. When we -- we did not, to the best of my
20 knowledge, test the toxicological properties
21 of DDT because when we manufactured DDT, the
22 toxicological product -- properties were
23 well-known.

24 Q. Did Monsanto engage in any analysis that
25 compared DDT and PCBs?

1 MR. BAUER: Objection.

2 Foundation.

3 A. I really don't know what you mean by
4 "analysis." Did we check to see if PCB was
5 an insecticide vis-a-vis DDT?

6 Q. (By Mr. Kim) No, sir. Did Monsanto engage
7 in any or did you direct any studies to be
8 done talking about the chemical similarities
9 between DDT and PCB?

10 A. What kind of studies?

11 Q. Analytical chemistry.

12 A. I don't know.

13 Q. Would that have been something that would
14 have been under your direction at -- during
15 this time period?

16 A. Well, I'm sure that people that manufactured
17 DDT for Monsanto knew the chemical
18 formulation of DDT. They also knew the
19 chemical formulation of PCBs. Is that what
20 you're asking? Did we compare those two?

21 Q. Absolutely.

22 A. Well, I find that hard to answer, Mr. Kim,
23 because you have to know the formulation of
24 DDT how to make it, don't you?

25 Q. Absolutely.

1 A. Well, they made it.

2 Q. Monsanto made it?

3 A. Yes.

4 Q. Monsanto had to have known the formulation?

5 A. Yes.

6 Q. And Monsanto also made PCBs?

7 A. Yes.

8 Q. Monsanto had to have known the formulation
9 from a chemical standpoint of PCBs?

10 A. Yes.

11 Q. In 1968 when the Jensen study came out,
12 Monsanto had a concern that the PCBs being
13 reported in the animals and species in that
14 study might actually just be DDT; is that
15 correct?

16 A. I don't know if you -- if it's -- yes. If
17 it's a concern, we were interested to know
18 what he was finding, whether it was DDT or
19 whether it was PCB.

20 Q. And my question is: Given that study and
21 given the analysis that went on afterward,
22 did Monsanto Chemical Company ever engage in
23 any study or analysis or discussion that
24 discussed the chemical similarities or
25 differences between DDTs and PCBs?

1 MR. BAUER: Objection.

2 Foundation.

3 A. I don't know whether they did or not.

4 Q. (By Mr. Kim) Did anyone under your charge in
5 the medical department?

6 A. No, sir. We knew that DDT was DDT is an
7 insecticide. We knew that PCB was a
8 different formulation, different chemical
9 structure, and was a dielectric, a
10 plasticizer.

11 Q. You would agree with me that DDT persists in
12 the environment?

13 A. Yes.

14 Q. And you would agree with me that it has now
15 been found, since the Jensen study and
16 forward, that PCBs may accumulate in the
17 environment, as well?

18 A. Yes, sir.

19 Q. Did that similarity cause any concern about
20 the chemical relationship and
21 nonbiodegradable -- biodegradability of both
22 chemicals to Monsanto Chemical Company and in
23 particular the medical department?

24 A. No, sir, it did not.

25 Q. Let's talk about some of the studies that you

1 discussed earlier with Mr. Bauer.

2 MR. KIM: Let's take about a
3 two-minute break and let me bring my
4 notebooks out.

5 THE VIDEOGRAPHER: We're going off
6 the record. It's one minute after 11:00
7 o'clock.

8

9 (A recess was taken.)

10

11 THE VIDEOGRAPHER: It's 11 minutes
12 after 11:00 o'clock. We're back on the
13 record.

14 Q. (By Mr. Kim) Doctor, I want to turn and talk
15 specifically about some of the testimony that
16 was developed yesterday in Mr. Bauer's
17 examination.

18 A. Yes, sir.

19 Q. As I understand, you were formally named
20 medical director in 1946?

21 A. That's correct.

22 Q. Part of your responsibilities during that
23 time period would have included developing
24 the industrial hygiene program for Monsanto
25 Chemical Company?

- 1 A. Yes, sir.
- 2 Q. In other words, that would entail such duties
3 as monitoring the workplace?
- 4 A. That's correct.
- 5 Q. Monitoring or testing for exposures or leaks?
- 6 A. Yes, sir.
- 7 Q. Did Monsanto Chemical Company ever do any
8 atmospheric testings while you were there at
9 Monsanto Chemical Company?
- 10 A. Atmospheric testing in their plants?
- 11 Q. Yes, sir.
- 12 A. Yes, sir.
- 13 Q. Did the atmospheric concentrations -- were
14 atmospheric concentrations for PCBs ever
15 measured?
- 16 A. Yes, sir.
- 17 Q. Which plants were they measured at?
- 18 A. I know Anniston. I'm not -- I don't recall
19 whether we did it at East St. Louis or not.
- 20 Q. East St. Louis would also be --
- 21 A. The Krummerich plant, the Sauget plant.
- 22 Q. Okay. Do you have a recollection of what the
23 measurements of those atmospheric testings
24 were? And if you don't, you don't.
- 25 A. No. My recollection was that they were under

1 the point five milligrams per cubic meter.

2 Q. And your testimony, as I understood it
3 yesterday, was point five milligrams per
4 cubic meter fell within the MAC, or maximum
5 allowable concentration?

6 A. For 1254 it was 12, and for 1242 it was
7 1 milligram per cubic meter.

8 Q. When did Monsanto Chemical Company first
9 start making atmospheric measurements?

10 A. I don't recall the exact date. I think it
11 was sometime probably in the Fifties. I'm
12 not sure.

13 Q. Prior to 1950 -- or the Fifties when these
14 atmospheric tests were done, did the
15 occupational workers -- and I'm not going to
16 hold you to that specific date. Your
17 attorney is having a hemorrhage over here.
18 Did the --

19 MR. BAUER: Objection. Move to
20 strike.

21 Q. (By Mr. Kim) Did the workers --

22 MR. BAUER: It's --

23 Q. (By Mr. Kim) -- at Monsanto --

24 MR. KIM: Excuse me. Are you -- do
25 you have anything else?

1 MR. BAUER: Just ask questions,
2 John.

3 Q. (By Mr. Kim) Did the workers have knowledge
4 of the fact that they were working with a
5 polychlorinated biphenyl?

6 A. Yes, sir.

7 Q. Was it called a "polychlorinated biphenyl"
8 during that time period, or was it still
9 called a "chlorinated diphenyl"?

10 A. I think it was "diphenyl" at that time.

11 Q. And what representations during the 1950's
12 did Monsanto make to its occupational workers
13 as to the toxicity of the material that they
14 were working with?

15 A. We stated it was a mild to moderate
16 industrial -- mild to moderate toxicity for
17 an industrial chemical.

18 Q. Did you tell them how that toxicity might
19 manifest itself?

20 A. Not -- no, sir.

21 Q. You did not tell them that one sign of such
22 toxicity could be chloracne?

23 A. No, sir. We did not because we did not have
24 chloracne in our Monsanto employees.

25 Q. You did not tell them that literature and

1 studies indicated that there might be some
2 liver problems associated with exposure to
3 polychlorinated biphenyls or chlorinated
4 diphenyls?

5 A. No, sir. Because we were quite sure they
6 were not getting any liver problems.

7 Q. Why were you quite sure they were not going
8 to get any liver problems?

9 A. Because they were examined yearly.

10 Q. And during this -- were they all examined by
11 you, Dr. Kelly?

12 A. No. None of them were examined by me. The
13 only ones -- time I ever examined people, I
14 saw some of the skin conditions that they
15 had, residues from the Swann episode.

16 Q. Of course, those workers ultimately became
17 Monsanto workers?

18 A. That's correct.

19 Q. And we can agree that in that instance there
20 was a chloracne outbreak?

21 A. Yes, sir.

22 Q. Now, your testimony yesterday was the
23 outbreak was not caused specifically by a
24 chlorinated diphenyl but because of a bad
25 benzene in the mixture?

1 A. Yes, sir.

2 Q. Okay. And that was documented in the -- was
3 it the Jones and Alden study?

4 A. That was their opinion, also.

5 Q. Okay. And that is one of the studies that
6 you relied upon in determining that there
7 would be no chloracne or liver problems in an
8 occupational setting?

9 A. In that -- in an occupational setting with
10 Monsanto. In addition to that particular
11 study, there were about two to three years of
12 exposure with a new benzene formulated
13 diphenyl; and no chloracne had occurred.

14 Q. Did Monsanto during the time period of 1936
15 to the mid-1950's subscribe to the theory
16 that if you prevented all means of exposure
17 to the chemical compound, then the
18 corresponding toxicity would have no
19 consideration?

20 MR. BAUER: Object to the form.

21 A. Well, I don't think that ever came up. The
22 theory was we knew what the toxicity was. We
23 knew how to avoid the exposure. Yes, sir.

24 Q. (By Mr. Kim) The reason I ask, Doctor, is I
25 have a notation -- and it's not exact of what

1 you testified as to yesterday, and I just
2 wanted to clarify that for me -- where I
3 thought you told Mr. Bauer that if there were
4 no means for exposure, then toxicity became
5 of no consideration.

6 A. Well, if you knew that that condition was
7 going to keep on existing, certainly you
8 always have a consideration for the toxicity
9 of the compound. But if you know that there
10 are not -- it's not going to be an exposure,
11 that is not a salient point in your thinking.

12 Q. And when we're talking about exposures to
13 occupational workers, we have to account for
14 not only those exposures that may occur
15 through some failure in the hygiene program,
16 but also those failures that may occur
17 accidentally?

18 A. I do not know what you mean by the "failure
19 in the hygiene program." You mean the worker
20 is sloppy?

21 Q. No. What I'm talking about, Dr. Kelly, is
22 the fact that the hygiene program may be
23 established where we allow PCB vapors at more
24 than 5 milligrams per cubic --

25 A. Point five.

1 Q. Point five. Excuse me.

2 A. Well, there may be episode -- may be times
3 when that is exceeded. But that's also -- at
4 times, some leaks.

5 Q. Right. And that would just be a breakdown in
6 the industrial hygiene program?

7 MR. BAUER: Object to the form.

8 A. Well, I don't think there's any relevancy
9 between that and the industrial hygiene
10 program.

11 Q. (By Mr. Kim) Okay. You have to anticipate
12 that workers may be exposed through accidents
13 that may occur in the workplace?

14 A. Yes, sir.

15 Q. Did Monsanto ever contemplate that its
16 occupational workers would never be exposed
17 to PCBs?

18 A. No, sir. We never --

19 Q. Toxicity should have always been a
20 consideration, then?

21 A. It was.

22 Q. The first exhibit, if you'll turn to
23 Exhibit 1 --

24 A. Yes, sir.

25 Q. -- that Mr. Bauer and you discussed yesterday

1 was the Jones and Alden study; is that
2 correct?

3 A. Yes, sir.

4 Q. Do you make a distinction between "acute
5 poisoning" and "systemic poisoning"?

6 A. No, sir. They're talking about two different
7 things.

8 Q. So you do make a distinction between the two?

9 A. Yes. There's acute local poisoning, there's
10 acute systemic poisoning. There is a
11 difference.

12 Q. Can you tell this jury what you understand
13 the difference to be between the "acute local
14 poisoning" and "systemic poisoning"?

15 A. Yes. If you spill turpentine on your hands,
16 you will get redness and chapping on your
17 hands. If you have an acute -- if you put
18 aniline on your hands, you will get an
19 absorption of aniline; and that will cause
20 "systemic poisoning."

21 Q. Systemic poisoning -- one method of
22 determining "systemic poisoning" is by
23 looking at an individual's signs or symptoms;
24 is that correct?

25 A. Well, you don't see the symptoms. I mean,

1 you listen to the symptoms.

2 Q. You made a distinction yesterday between
3 "signs" and "symptoms" -- and I believe, as
4 I understand it -- and correct me if I'm
5 wrong -- that "symptoms" are what a worker or
6 a person would describe to you as to what
7 they're feeling. They're more subjective?

8 A. Yes.

9 Q. And a "sign" is something that can be
10 objectively observed or clinically
11 determined?

12 A. Yes, sir.

13 Q. For instance, chloracne would be a sign of
14 systemic poisoning?

15 A. Yes, sir.

16 Q. A symptom -- what are some of the symptoms
17 that a doctor or occupational director may
18 elicit? Would loss of weight be a symptom?

19 A. Yes, sir.

20 Q. Would chronic fatigue be a symptom?

21 A. Yes, sir.

22 Q. Joint pain?

23 A. Yes, sir.

24 Q. Loss of appetite?

25 A. Yes, sir.

- 1 Q. Loss of libido?
- 2 A. Yes, sir.
- 3 Q. Do you have an opinion as to whether systemic
4 poisoning is more likely to occur with acute
5 exposure or chronic exposure to an activator?
- 6 A. To which?
- 7 Q. To a chemical compound.
- 8 A. Well, do you want to be specific about the
9 chemical compound? I mean, if you take
10 cyanide, you get an acute exposure, you get
11 an acute problem. You do not get chronic
12 problems from small amounts of cyanide.
- 13 Q. There is -- I agree. We never get a chance
14 to learn about the symptoms in those
15 instances, do we?
- 16 A. That's correct.
- 17 Q. No one to talk to. In those instances -- and
18 let's just use polychlorinated biphenyls.
- 19 A. Yes, sir.
- 20 Q. -- where there is a potential -- let's say
21 it's been alleged that there could be
22 systemic poisoning.
- 23 A. Yes, sir.
- 24 Q. Do you have an opinion, as the medical
25 director of Monsanto, as to whether those

1 symptoms are likely to develop as a result of
2 acute exposure or more so because of chronic
3 exposure to PCBs?

4 MR. BAUER: Object to the form.

5 A. Well, I can only tell you what my experience
6 has been. We have heard of episodes of acute
7 exposures to PCBs at elevated temperatures
8 that give liver problems. We have not had
9 any reports of chronic -- of symptoms or
10 problems occurring from chronic exposure.
11 Conceivably you could get both. If you
12 inhale a great deal of PCBs at elevated
13 temperatures, you're going to get a chemical
14 hepatitis and liver problems.

15 Q. (By Mr. Kim) Monsanto Chemical Company never
16 engaged or requested chronic testing until
17 the IBT studies; is that correct?

18 MR. BAUER: Object to the form.

19 Vague.

20 A. We did what was accepted in those days in the
21 Fifties as chronic inhalation studies. We
22 ran them for 150 days. That's five months.
23 That was a chronic testing.

24 Q. (By Mr. Kim) Monsanto Chemical Company never
25 ordered or directed testing to be done that

1 were lifetime studies with respect to the
2 particular species involved in the study?

3 A. Until the Seventies.

4 Q. Until the Seventies?

5 A. Until '68, yes.

6 Q. And that was the testing done by Industrial
7 Bio-Test?

8 A. Bio-Test. Bio-Test Laboratories.

9 Q. Okay. Turning to the Jones and Alden study,
10 or Exhibit 1, if you'll turn to Page 1024 of
11 that study.

12 A. Yes, sir.

13 Q. And I'm under the caption where it says,
14 "Report of a Case."

15 A. Yes, sir.

16 Q. Do you accept the findings of Jones and
17 Alden?

18 MR. BAUER: Object to the form.

19 A. To his findings? What he saw? Yes. I don't
20 accept some of his opinions.

21 Q. (By Mr. Kim) Do you accept the proposition
22 that he saw a condition that could be
23 described today as chloracne?

24 A. Yes, sir.

25 Q. Do you accept the proposition that he

1 observed workers who complained of lassitude?

2 A. Yes, sir. I believe I've seen that in there
3 someplace. Yes, I do.

4 Q. And Doctor, let's -- I want you to be clear.
5 It's under "Report of a Case." It's about
6 nine lines down.

7 A. Lassitude. Yes. He complained in December
8 of 1933 of lassitude.

9 Q. Loss of appetite?

10 A. Yes.

11 Q. Loss of libido?

12 A. Yes.

13 Q. Would that cause you some concern about
14 systemic poisoning?

15 A. In this particular case, with that particular
16 chlorinated diphenyl benzene, yes.

17 Q. Aside from changing out the benzene, did
18 Monsanto Chemical Company engage in any
19 further analysis with respect to its
20 chlorinated diphenyl product to determine
21 whether systemic poisoning was likely with
22 chronic exposure?

23 MR. BAUER: Object to the form.
24 Mischaracterizes his testimony that Monsanto
25 was the company that switched the benzene

1 supply.

2 A. Repeat it.

3 Q. (By Mr. Kim) Aside from ensuring that the
4 PCBs that Monsanto were selling did not
5 contain the same benzene compound as that
6 analyzed in the Jones and Alden study, did
7 Monsanto Chemical Company under your
8 direction -- excuse me. Did Monsanto
9 Chemical Company engage in any studies as to
10 the effects of systemic poisoning from
11 chronic exposure?

12 MR. BAUER: Object to the form.

13 A. Yes, we did. We did not do animal studies,
14 but we examined our workers who had chronic
15 exposure to certain amounts of chlorinated
16 biphenyl. And they had no systemic effects.

17 Q. (By Mr. Kim) On Page 1027 --

18 A. Yes, sir.

19 Q. -- at the very top, Jones and Alden found
20 that 23 of the 24 men working with
21 chlorinated diphenyl during a period from the
22 summer of 1932 to October of 1933 reported
23 chloracne; is that correct?

24 A. That's what he says, yes, sir.

25 Q. And several other -- several of them had -- I

1 can't read it -- some other problems, at the
2 very end of that paragraph. And your copy is
3 probably more clear than mine.

4 A. Well, he said some of them had abscesses.
5 Some of them -- well, the acne went along --
6 went forward to abscesses or confluence of
7 several of the acneform nodules became
8 infected.

9 Q. On Page 1029, did that cause you any further
10 concern during that time period as to
11 systemic poisoning associated with --

12 A. In that time period I was not with Monsanto.
13 These were not Monsanto employees. This is
14 1933 he's talking about. I came with the
15 company in '36, and I think Monsanto took
16 over Swann in 1935 when all the problem was
17 gone.

18 Q. You would agree with me -- and I think you
19 testified yesterday -- that Monsanto relied
20 in part upon the experiences that Swann had
21 had in determining the toxicological
22 properties of PCBs?

23 A. Yes, sir. Not the toxicological properties,
24 but the hazards involved.

25 Q. What did Monsanto rely upon in 1936 when you

1 first were hired, if you know, as to the
2 toxicological properties of its PCB product?

3 A. I do not know what they relied on before I
4 came with the company.

5 Q. Do you know if Monsanto Chemical Company ever
6 ordered any independent test to be done
7 concerning toxicology with respect to its PCB
8 product prior to you starting work there?

9 A. I do not know whether they did or not. I've
10 seen no reports.

11 Q. Have you asked for such reports?

12 A. I'm sure I did. I can't be sure. Said, "Did
13 you do anything about this?"

14 Q. And the response was?

15 A. I have no recollection of it.

16 Q. Okay. On Page 1029 --

17 A. Yes, sir.

18 Q. -- the second to the last paragraph, Jones
19 and Alden note that: "It seems that it may
20 be readily assumed that our problem as to the
21 causative agents of the acneform eruption was
22 connected with the chlorinated products of
23 the impurities present in the crude
24 benzene."

25 A. Yes, sir.

1 Q. Did that cause you, at the time that you read
2 this article, to be concerned about
3 chlorinated benzene products within the PCBs?

4 A. Chlorinated benzene products?

5 MR. BAUER: Objection. Lacks
6 foundation.

7 A. Yes. I didn't know exactly what Jones was
8 talking about.

9 Q. (By Mr. Kim) Okay.

10 A. We had two years of Swann experience, two
11 years of our own with an absence of any
12 problems with our workers. So this appeared
13 to be of historical interest.

14 Q. The problem, as they determined in the last
15 sentence, became difficult because the --
16 "The problem hence becomes difficult of
17 exact solution, and it is necessary to resort
18 to a reasonable deductive hypothesis." Do
19 you see that?

20 A. Yes, I see it.

21 Q. Did you agree with Jones and Alden in that
22 instance?

23 MR. BAUER: Object to the form.

24 Q. (By Mr. Kim) When you read it.

25 A. Well, I don't know about how it was necessary

1 to resort to a reasonable deductive
2 hypothesis. I don't know what he was talking
3 about at that time.

4 Q. Do you have any idea -- and you may not -- as
5 to whether Monsanto Chemical Company, anyone
6 there, engaged in such hypothesis?

7 A. At what time frame? I don't even know what
8 hypothesis it was. So I don't know what they
9 might have -- had given consideration to.

10 Q. What particular parts of the Jones and Alden
11 report do you not agree with?

12 A. Well, I would say the one thing that I
13 disagree with is where he stated someplace in
14 this that the complaints of a worker was due
15 to his ethnic background.

16 Q. Is that the instance where the doctor
17 discounted the complaint of lassitude because
18 he thought it was indicative of the normal
19 temperament of the Negro man during this time
20 period?

21 A. That's correct.

22 Q. It's amazing this really existed in 1935,
23 isn't it?

24 A. Well...

25 Q. Did Monsanto Chemical Company, as a result of

1 the Jones and Alden study, after you read it,
2 ever engage in any analytical studies to
3 determine the chemical variances that may
4 occur in the manufacturing process of its
5 polychlorinated biphenyls?

6 A. I do not know if they did or not. That would
7 be under the analytical department. It would
8 not have been under the medical department.

9 Q. Do you have a recollection -- and you may not
10 know -- of when the analytical department was
11 formed at Monsanto?

12 A. Long before I got there.

13 Q. In any event, you were not given any
14 information as to the analytical work that
15 may or may not have been done by that
16 department?

17 A. That's correct.

18 Q. Have you ever been given any information from
19 the analytical department?

20 A. Oh, I've seen points of some things.

21 Q. At what time period?

22 A. Well, I guess I've seen them off and on
23 during the course of my employment there.
24 But I don't know the specifics.

25 Q. No recollection?

1 A. We still talking about PCBs or anything?

2 Q. PCBs.

3 A. I've had oral reports of the absence of
4 benzofurans in our product.

5 Q. When did you receive those reports?

6 A. '70, '71. I received no positive reports by
7 the time I left there.

8 Q. Doctor, I know you're not a chemist; but do
9 you know what chlorinated diphenylene oxide
10 is?

11 A. Yes.

12 Q. Is it a furan?

13 A. I could -- I don't -- if it's -- yes, if --
14 if it's -- if it has two oxygens, it's a
15 dioxin. If it has one oxygen in the
16 connection between the benzene rings, it's a
17 furan. If it's chlorinated.

18 Q. Yes. And that's what I'm talking about.

19 A. Yeah.

20 Q. And there was, to your knowledge, prior to
21 sometime in the Seventies, no reports to you
22 as to the existence of furans within the PCB
23 product?

24 A. That's correct.

25 Q. Would it have caused you some concern,

1 Doctor, if prior to 1970 there had been
2 information that furans might be a
3 contaminant in the PCB product?

4 MR. BAUER: Objection. Vague.
5 Calls for speculation.

6 A. In the overall picture, it might have been --
7 it might have been of concern because it was
8 a product we didn't want in there. But we
9 had tested the toxicity of the material, and
10 the furans were in there if there were -- and
11 if they were in there, were tested. So I was
12 sure that a moderate -- a trace more of the
13 material of the furans would not alter the
14 toxicity of the finished products. And after
15 all, what we were selling was a finished
16 product.

17 Q. (By Mr. Kim) I think we can agree, though,
18 that Monsanto never did any testing with
19 respect to the breakdown or decomposition
20 products of its PCB fluids?

21 A. No, I don't think we can agree on that at
22 all.

23 Q. Can we agree that Monsanto did testing -- are
24 you saying that Monsanto did testing prior to
25 1970 as to what would happen to PCBs if

1 heated to 600 degrees --

2 A. I don't know what --

3 Q. -- and a person were exposed, rather --
4 whether acutely or chronically?

5 A. I don't know if they did or not. That would
6 be the analytical department. I knew they
7 did do testing on arcing of transformers and
8 lightning strikes of transformers, but the
9 temperature involved is a factor that I just
10 don't know about.

11 Q. And by the same token, we can agree that the
12 medical department under your direction never
13 did any testing as to the by-product or
14 decomposition products of its PCB compound in
15 humans through the metabolic process?

16 MR. BAUER: Objection. Vague. Do
17 you mean the test was on human beings?

18 A. That's what I was going to ask. Would you
19 repeat that question?

20 Q. (By Mr. Kim) Sure. Did Monsanto Chemical
21 Company ever engage in any human testing
22 where they checked for the residue
23 metabolized within the blood and urine of
24 humans that would have given some indication
25 as to the chemical reaction or mechanism of

1 the ingestion, absorption, or inhalation of
2 its PCB dielectric product?

3 A. Yes, we did.

4 Q. When?

5 A. In about 1972 or 1973, I examined our workers
6 at our Krummerich plant and I tested the
7 blood for the presence of PCBs in the blood.

8 Q. I understand that. But did you test -- or
9 did you correspond that test with the
10 analytical chemistry department as to what
11 other possible metabolites may exist because
12 of some chemical reaction or enzyme process
13 that occurs in processing the PCB compound?

14 A. No, sir, I did not.

15 Q. Did Monsanto Chemical Company have any idea
16 of how PCBs would react chemically and
17 enzymatically within the human body once
18 ingested, absorbed, or inhaled?

19 A. I don't know what you mean, "react
20 chemically." Would you explain that?

21 Q. You would agree, Doctor, that if you ingest,
22 inhale, or absorb a PCB, that it will -- the
23 body is going to do something with it?

24 A. Yes.

25 Q. Does Monsanto have any testing as to what

1 that chemical mechanism is as to how the PCB
2 passes through the body?

3 A. No, sir.

4 Q. Does Monsanto Chemical Company have
5 information as to whether there may be a
6 breakdown or decomposition of the product
7 once ingested, absorbed, or inhaled in the
8 human body?

9 MR. BAUER: Object to the form.
10 It's -- I mean, you're asking "does." And I
11 take it you really mean prior to 1974, but
12 you're asking "does." And --

13 Q. (By Mr. Kim) During any time of your
14 employment.

15 MR. BAUER: And the other thing is
16 you -- do you mean, still, human bodies as
17 opposed to looking at metabolites in
18 animals? Is that -- is that --

19 MR. KIM: Yeah. I think the
20 question said "human body."

21 A. In humans? No, we did not.

22 Q. (By Mr. Kim) Do you have any idea of whether
23 the absorption, inhalation, or ingestion of
24 PCBs may form some synergistic response to a
25 person with a preexisting liver injury?

1 A. Well, first of all, it isn't a synergistic
2 response, Mr. Kim, if the insult to the liver
3 from a preexisting disease had occurred.

4 Q. How about an enhancement --

5 A. Huh?

6 Q. -- of the liver injuries?

7 A. What?

8 Q. Excuse me. How about, instead of synergistic
9 response, an enhancement of the injuries of
10 someone with a liver injury preexisting?

11 A. No. But we do -- no, we did not.

12 Q. Did Monsanto Chemical Company, during the
13 time period that you were charged with
14 directing toxicological testing from 1946 to
15 1974, engage in any testing that would have
16 indicated whether a person with a preexisting
17 liver injury was more susceptible to a
18 toxicological response from the ingestion,
19 inhalation, or absorption of PCBs?

20 A. No, sir, we did not.

21 Q. Did Monsanto Chemical Company and the medical
22 department under your direction during the
23 years 1946 to 1974 engage in such testing
24 with respect to the enhancement or
25 synergistic effects of a person ingesting,

1 inhaling, or absorbing PCBs who had a
2 tendency to drink alcohol?

3 A. No, sir.

4 Q. Did Monsanto Chemical Company ever do --
5 while you were medical director during the
6 years of 1946 to 1974, ever do any testing
7 that analyzed the effects of PCBs and its
8 reaction with alcohol?

9 A. No, sir.

10 Q. Certain liver enzymes? Any liver enzymes?

11 A. I don't know exactly -- know how they would
12 do that, but they did not.

13 Q. Okay. The next exhibit is No. 2; and I
14 believe that was the Drinker study that
15 became the source of some controversy, as I
16 understood your testimony yesterday.

17 A. Controversy over description of what was
18 what, yes.

19 Q. Yeah. There was a question as to whether the
20 product he identified was a chlorinated
21 naphthalene or a chlorinated diphenyl?

22 A. No. A chlorinated diphenyl or a chlorinated
23 diphenyl benzene.

24 Q. Okay. If you'll turn to Page 292 of the
25 study --

1 A. Yes, sir.

2 Q. -- the paragraph numbered "4" --

3 A. Yes, sir.

4 Q. -- which -- and I will indicate that you can
5 find it on Page 291 -- are the results of
6 inhalation experiments?

7 MR. BAUER: Are you asking him to
8 turn to Page 292?

9 MR. KIM: Well, and I'm just --

10 Q. (By Mr. Kim) Did you not understand what I
11 was saying?

12 A. Yes. It's a -- Channel 4 -- I mean,
13 Paragraph 4 is listed under the "Results of
14 Inhalation Experiments."

15 Q. Right.

16 MR. FEATHERSTONE: Too much video
17 in this room, I guess.

18 Q. (By Mr. Kim) Under that paragraph, we can at
19 least agree that as of September of 1937,
20 Dr. Drinker was reporting that animals
21 exposed to chlorinated diphenyl and such
22 there were no abnormalities seen in living
23 rats. However, after six weeks' exposure,
24 there was slight liver damage which advanced
25 during the next two months.

1 A. Yes, sir. That's --

2 Q. Do you see that?

3 A. Yes, I do.

4 Q. And "the changes consisted in slight to
5 moderate swelling of the liver cells, an
6 increased granularity and many mitotic
7 figures."

8 A. Yes, sir.

9 Q. "Hyalinization was always present as a result
10 of the inhalation of chlorinated diphenyl."

11 A. Yes, sir.

12 Q. That's what he reported, at least in
13 September of 1937?

14 A. Yes.

15 Q. What does "hyalinization" mean?

16 A. That's really scar tissue. It's the presence
17 of hyalin in the cell.

18 Q. If you will turn -- did that in and of itself
19 cause any concern to Monsanto at the time --

20 A. No.

21 Q. -- you received this report?

22 A. Well, if we were to accept the fact that we
23 didn't know whether we were of the opinion
24 that he was not using chlorinated diphenyl,
25 he was using chlorinated diphenyl benzene, it

1 was of interest to us; but we did know that
2 the liver very probably was a target organ of
3 chlorinated diphenyl. Certainly of
4 chlorinated diphenyl benzene.

5 Q. At any time period -- at any time during the
6 period of 1936 to 1946, did Monsanto Chemical
7 Company warn its workers that the liver was
8 the target organ of exposure?

9 A. No, sir, we did not.

10 Q. Just directly across in the next column to
11 Paragraph 4, under the heading "Functional
12 appraisal of liver damage" --

13 A. Yes, sir.

14 Q. -- "caused by certain chlorinated
15 naphthalenes and by chlorinated diphenyl" --
16 do you see where I am?

17 A. Yes, sir.

18 Q. Somewhere down there it says that "the health
19 of workers in these compounds has been good
20 with the exception of the fact that in
21 isolated incidents [sic] jaundice has
22 occurred which upon at least three occasions
23 has gone onto acute yellow atrophy."

24 A. Yes, sir.

25 Q. Are you with me there?

1 A. Yes, sir.

2 Q. And again, that's talking about the liver?

3 A. Yes, sir.

4 Q. Can we agree that Dr. Drinker's study in
5 September of 1937 was predicated in part on
6 the observation of three occupational deaths,
7 which are noted at the front of the study?

8 A. Yes. Let's be precise about what the deaths
9 were from. They were from chlorinated
10 naphthalene.

11 Q. Right. Did Monsanto Chemical Company ever
12 engage in any analysis as to the relationship
13 between its PCB products and the relationship
14 between chlorinated diphenyl benzene?

15 MR. BAUER: Objection. Vague --

16 A. Say that --

17 MR. BAUER: Objection. Vague and
18 foundation.

19 A. Say that over again, please.

20 Q. (By Mr. Kim) During the time period of 1936
21 to 1947, did Monsanto Chemical Company and
22 the medical department under your direction
23 ever charge any testing facility to
24 investigate the relationship between
25 chlorinated diphenyl benzene and its poly --

1 polychlorinated biphenyl product it was
2 selling?

3 A. What was the time frame?

4 Q. 1946 to -- 1936 to 1946.

5 MR. BAUER: Objection. Vague and
6 lacks foundation.

7 A. I don't know when we did testing on
8 chlorinated diphenyl benzene. I don't
9 recall.

10 Q. (By Mr. Kim) I understand, Doctor. And I
11 think I've confused you.

12 My question is: Was there any
13 comparison analysis done between the
14 properties of polychlorinated biphenyls and
15 chlorinated diphenyl benzenes?

16 A. Well, there certainly were physical
17 properties that were an awful lot different.

18 Q. How about the decomposition of such products?

19 A. That would have been an analytical problem.
20 It was not done in our -- the medical
21 department.

22 Q. And again, you were never presented with any
23 information as to that from the analytical
24 department, as you recall?

25 A. No, sir, I was not.

- 1 Q. Okay. If you'll turn with me to Page 297,
2 the bottom right-hand quadrant --
- 3 A. Yes, sir.
- 4 Q. -- where it is headed, "Chlorinated
5 diphenyl."
- 6 A. Yes, sir.
- 7 Q. Are you with me? There it indicates that
8 feeding with respect to this experiment began
9 on May 4, 1936, and was discontinued on
10 May 10th.
- 11 A. Yes, sir.
- 12 Q. By May 12th, seven of the ten rats were dead?
- 13 A. Yes, sir.
- 14 Q. And the three remaining were sacrificed. It
15 also indicates at the very end of that
16 paragraph that the liver changes began at
17 once?
- 18 A. Yes, sir.
- 19 Q. And there were no other changes in other
20 organs?
- 21 A. Yes, sir.
- 22 Q. Again indicating, at least in September of
23 1937, that the liver was the target organ?
- 24 A. Yes, sir.
- 25 Q. It talked about a second group of ten rats

1 that were fed a different dosage; is that
2 correct?

3 A. Yes, sir.

4 Q. And again, those rats that died -- at the
5 very end of the column -- showed losses in
6 weight; is that correct?

7 A. Yes.

8 Q. And that they had liver lesions?

9 A. Yes, sir.

10 Q. At the top of the very next page.

11 A. Yes, sir.

12 Q. And again, as a result of this study in 1937,
13 Monsanto never warned its workers or anyone
14 about the aspects of the liver being a
15 possible target organ of PCB exposure?

16 MR. BAUER: Object to the form.

17 Lacks foundation.

18 A. No, we did not warn them about that. But we
19 prevented it. They didn't have any symptoms
20 or any liver problems. Why warn them about
21 something they don't have or weren't going to
22 get?

23 Q. On Page 298 --

24 A. Yes, sir.

25 Q. -- under the heading of "Discussion" --

1 A. Yes, sir.

2 Q. -- 11 lines down, it says: "It is most
3 remarkable, too" -- are you with me?

4 A. Yes, sir.

5 Q. -- "that all the compounds tested attacked
6 the liver and the liver alone."

7 A. Yes, sir.

8 Q. Again, a reasonable reading is that the liver
9 is the target organ of chlorinated diphenyl
10 or chlorinated diphenyl benzene if you assume
11 that those were, indeed, the chemicals tested
12 during 1937 or '36?

13 A. Yes, sir.

14 Q. The Monsanto response to this study was to
15 question it; is that correct?

16 A. Yes. We wanted to get the facts.

17 Q. And you called Dr. Drinker?

18 A. Yes, I did.

19 Q. You had concerns as to whether it was
20 chlorinated diphenyl or a Monsanto
21 chlorinated diphenyl or actually some other
22 product; is that not correct?

23 A. Or we had no record of selling Halowax
24 chlorinated diphenyl. We had records of
25 selling them chlorinated diphenyl benzene.

1 So I called Dr. Drinker and said, "Where did
2 you get the product that you were calling
3 'chlorinated diphenyl'?"

4 Q. And in actuality, Monsanto sent Dr. Drinker
5 some of its product for further testing; is
6 that correct?

7 A. Yes. That was honest to goodness chlorinated
8 diphenyl, chlorinated to as close of 65 as we
9 possibly could.

10 Q. And Dr. Drinker, based upon those tests,
11 submitted another report to Monsanto Company
12 based upon those tests?

13 A. Not only to Monsanto Company, he published
14 another report.

15 Q. And that was the recant in the 1939 article?

16 A. In the 1939 article, yes, sir.

17 Q. After this initial article in 1937, there was
18 a symposium held; was that not correct?

19 A. Yes, sir.

20 Q. You attended that symposium?

21 A. Yes, I did.

22 Q. There were representatives from General
23 Electric there?

24 A. Yes.

25 Q. There was a Dr. von Oettingen?

- 1 A. Yes.
- 2 Q. Did you know him?
- 3 A. Yes, I did.
- 4 Q. Did you know the -- was he -- did you know
5 the relationship between Dr. von Oettingen
6 and Westinghouse?
- 7 A. No, I did not.
- 8 Q. How about between he and Haskell
9 Laboratories?
- 10 A. Well, he worked for Haskell Laboratories.
- 11 Q. Do you know --
- 12 A. He was a director of it.
- 13 Q. Do you have any knowledge of the relationship
14 between Haskell Laboratories and Westinghouse
15 during that time period?
- 16 A. No, sir.
- 17 Q. Okay. You made a comment during the
18 symposium that has also been published in the
19 Journal of Industrial Hygiene and Toxicology;
20 is that not correct? Page 307.
- 21 A. Yes, sir.
- 22 Q. Where you noted that, "I can't contribute
23 anything to the lab studies, but there have
24 been" -- "there has been quite a little human
25 experimentation in the last several years,

1 especially at our plants where we have been
2 manufacturing this chlorinated diphenyl."

3 A. Yes, sir.

4 Q. You also indicate that at least on one
5 occasion, you did have a more or less
6 extensive series of skin eruptions "which we
7 were never able to attribute as to cause,
8 whether it was an impurity in the benzene we
9 were using or to the chlorinated diphenyl."

10 A. Yes, sir.

11 Q. Do you recall making those statements?

12 A. I don't know if I made it exactly that way
13 because I think I would have said that it
14 was -- occurred at the Swann Chemical
15 Company. It did not occur at Monsanto.

16 Q. You would agree that Monsanto bought Swann
17 Chemical?

18 A. Oh, sure.

19 Q. Okay. Is it --

20 A. What it was what I said, we had been
21 manufacturing it. It really wasn't us. It
22 was Swann.

23 Q. Do you still agree with the substance or
24 characterization of that statement in the
25 Journal of Industrial Hygiene and Toxicology

1 in September of 1987?

2 MR. BAUER: Object to the form.

3 A. What? The substance?

4 Q. (By Mr. Kim) Sure.

5 A. Well, I admit -- I agree that we -- that
6 there was a outbreak of chloracne due to the
7 manufacture of chlorinated diphenyl when it
8 was being manufactured by Swann at one
9 particular period in time when they were
10 using a different benzene than our regular
11 supplier, yes, sir.

12 Q. You also further state that: "We have never
13 had any systemic reactions at all in our
14 men."

15 A. That is correct.

16 Q. Now, was there a medical monitoring program
17 in place at Monsanto between the years 1936
18 and 1950?

19 A. Yes.

20 Q. Did you do such medical monitoring?

21 A. Did I myself personally? No. We had a
22 physician there.

23 Q. Was it at your direction?

24 A. Yes, sir.

25 Q. When he took the history, was that history

1 done pursuant to instructions that you'd
2 given him about possible PCB effects?

3 A. Yes.

4 Q. He knew to ask for liver conditions?

5 A. No question, yes.

6 Q. He knew to ask and check for dermatitis or
7 chloracne conditions?

8 A. Yes, sir.

9 Q. Did he know to ask for people who had
10 preexisting liver injuries?

11 A. Well, I presume he did. I cannot answer
12 that.

13 Q. Did he know to ask --

14 A. Well, he was a physician. And if you're
15 checking with liver -- liver problems, you
16 ask if they had any previous symptoms of
17 liver illness.

18 Q. Was there any written protocol as to what you
19 wanted that physician to gather in this
20 medical monitoring?

21 A. I don't recall of any, no; but I've talked to
22 him frequently when I was -- when he was
23 there.

24 Q. Did he understand that a loss in weight,
25 fatigue, loss of libido, loss of appetite may

1 be symptoms of a systemic poisoning?

2 A. Yes, I'm sure he did.

3 Q. Do you know whether he asked for such
4 conditions?

5 A. You usually do not ask the individual for the
6 loss of libido. You certainly -- in any
7 physical examination, you ask about
8 tiredness, pains of diarrhea or whatever.
9 What other symptoms you mentioned?

10 Q. Joint pain?

11 A. Joint pains, yes, I'm sure he did.

12 Q. Was the medical monitoring program that this
13 physician engaged in done specifically with
14 the idea of exposure to PCBs in mind?

15 A. No, sir, it was not. It was part of an
16 examination for the entire wage roll group.

17 Q. Did Monsanto Chemical Company, during the
18 time period of 1936 to 1950, engage in any
19 further studies that could attribute the
20 cause of chloracne to either chlorinated
21 diphenyl benzene or polychlorinated
22 biphenyls?

23 MR. BAUER: Object to the form.

24 A. Say that over.

25 Q. (By Mr. Kim) You had -- what I'm getting at,

1 Doctor, is within your statement on Page 307
2 of the symposium, you indicated that: "We
3 were never able to attribute as to cause
4 whether it was an impurity in the benzene or
5 to the chlorinated diphenyl."

6 A. Yes, sir, that's what I said.

7 Q. Did Monsanto Chemical Company engage in any
8 further studies to further determine this?

9 A. Well, we examined -- you're talking about
10 animal studies or human studies? Human
11 studies --

12 Q. Animal studies first.

13 A. Animal studies, we did not.

14 Q. Human studies?

15 A. Human studies, we examined our people that
16 were working with chlorinated diphenyl and
17 found no chloracne or systemic symptoms or
18 signs.

19 Q. Aside from the chlorination, how does
20 trichlorobenzene differ from just the general
21 benzene compound that was discussed -- that
22 you discussed here?

23 MR. BAUER: Objection.

24 Foundation.

25 Q. (By Mr. Kim) If you know.

1 A. Well, yes. Certainly it's got one less
2 benzene ring. It's got three chlorine atoms
3 and one benzene radical. And chlorinated
4 biphenyl has two of them. Two benzene
5 rings. Chlorinated terphenyl or chlorinated
6 diphenyl benzene has three.

7 Q. Is a chlorinated benzene more dangerous than
8 just a regular benzene?

9 MR. BAUER: Objection. Vague.

10 A. I don't think so. I think benzene is worse.

11 Q. (By Mr. Kim) The use of trichlorobenzene
12 causes you -- in the PCB compound causes you
13 no concern from a medical standpoint?

14 A. Cause of what?

15 Q. Trichlorobenzene. Do you know whether
16 trichlorobenzene was used in some of the GE
17 and Westinghouse dielectric products?

18 A. Yes, it was.

19 Q. Does the presence of trichlorobenzenes in
20 combination with polychlorinated benzene --
21 polychlorinated diphenyl cause you any
22 concern from a toxicological standpoint?

23 MR. BAUER: Objection. Vague.

24 A. Well, yes. We recognize that it has some
25 toxicity. We recognize that we had studies

1 on both the combination and our chlorinated
2 diphenyl. We did not find that addition of
3 chlorinated -- of trichlorobenzene enhanced
4 the toxicity from the acute point of view,
5 particularly markedly.

6 Q. (By Mr. Kim) Did you ever -- did Monsanto
7 Chemical Company and the medical department
8 while you were in charge ever commission any
9 testing that would determine how
10 trichlorobenzene would break down upon
11 ingestion, absorption, or inhalation in the
12 human body?

13 A. No, sir, we did not.

14 MR. KIM: Take a break?

15 THE WITNESS: I'm all right.

16 MR. BAUER: Let's take a break,
17 Dr. Kelly.

18 THE VIDEOGRAPHER: We're going off
19 the record. It's 12:00 o'clock. This is the
20 end of Tape No. 4.

21

22 (A recess was taken.)

23

24 THE VIDEOGRAPHER: It's ten minutes
25 after 12:00 o'clock. This is the beginning

1 of Tape No. 5, and we're back on the record.

2 Q. (By Mr. Kim) Doctor, if you'll turn to your

3 Deposition Exhibit No. 3, which I believe you

4 identified yesterday as a 1938 article

5 written by Drinker and some other

6 individuals; is that correct?

7 A. '39.

8 Q. '39? I thought this --

9 A. Is that '38?

10 Q. February of '38 --

11 A. Oh.

12 Q. -- is what I thought this was.

13 A. Oh, okay. Yes, sir.

14 Q. Is this the article in which Dr. Drinker

15 questions his use of the compounds? What is

16 your understanding?

17 A. Questions his use? I mean --

18 Q. Questions the identity of the compounds he

19 tested in 1937.

20 A. No. It was the next article.

21 Q. Okay. This was --

22 A. The '59 article.

23 Q. This article, as well, caused you some

24 concerns because you had questions as to

25 whether it was a chlorinated diphenyl benzene

1 or chlorinated diphenyl that he had tested?

2 A. That's correct.

3 Q. Just very quickly, if you'll turn to Page 123
4 of this study -- excuse me. 121.

5 A. Yes, sir.

6 Q. The last paragraph of the first column, first
7 sentence, at least as of February of 1938,
8 Dr. Drinker felt that: "Of the various
9 chlorinated hydrocarbons tested, chlorinated
10 diphenyl gave evidence of being the most
11 toxic"?

12 A. Yes, sir, that's what is stated.

13 Q. And at the top of the second column he went
14 on to indicate that when combined with carbon
15 tetrachloride and alcohol, it produced
16 extensive liver necrosis and was highly
17 fatal?

18 A. Yes, sir.

19 Q. "Chlorinated diphenyl fed in small doses
20 produced similar but more marked liver
21 injury. In large doses this compound was
22 highly fatal."

23 That's what he stated, at least, in
24 February of 1938?

25 A. Yes. But I don't know what he's referring to

1 when he says chlorinated diphenyl produced
2 similar but more marked liver injury. I
3 thought he was talking about chlorinated
4 diphenyl all the way along. What he referred
5 to was chlorinated diphenyl.

6 Q. Absolutely. At least, that's what he thought
7 in February of 1938?

8 A. Yes.

9 Q. And that was the state of the literature in
10 1938?

11 A. That was what?

12 Q. The state of the literature in 1938?

13 A. Yes.

14 Q. That is what Monsanto Chemical Company, at
15 least from a review of the scientific and
16 medical literature, would have seen in 1938?

17 A. Yes, sir.

18 Q. In 1938 did Monsanto engage in any further
19 testing to determine the toxicity of
20 chlorinated diphenyls?

21 A. Yes. We engaged with Drinker to test
22 chlorinated diphenyl.

23 Q. And indeed --

24 A. We disputed his idea that he tested
25 chlorinated diphenyl.

1 Q. Outside from engaging with Dr. Drinker, who
2 had done the original study, did Monsanto
3 Chemical Company engage the services of any
4 other scientific facility to try and repeat
5 the results that Dr. Drinker had found in
6 1938?

7 A. No. We were convinced that Drinker was an
8 adequate experimenter; and all he had to do
9 was get the right material, give it the right
10 name.

11 Q. You paid Dr. Drinker for those studies,
12 didn't you?

13 A. Some of it was done under the combined
14 payment by Halowax, to which we contributed;
15 and some of the later studies was defrayed by
16 Monsanto itself.

17 Q. The report in which Dr. Drinker did his work
18 with the Monsanto chemical chlorinated
19 diphenyl was paid for by Monsanto Chemical
20 Company, was it not?

21 A. We paid it out of -- yes. I'm not sure,
22 though.

23 Q. Okay. The last page, Page 123 now, second --

24 A. Yes.

25 Q. -- second column, Paragraph 5 --

1 A. Yes, sir.

2 Q. -- where it says: "Administration of small
3 sublethal doses of carbon tetrachloride and
4 alcohol to rats whose livers have already
5 been injured by" -- "by the compounds under
6 consideration is highly fatal and produces
7 massive necrosis of the liver."

8 A. Yes, sir.

9 Q. That's what he stated in 1923; is that
10 correct?

11 A. In Nineteen which?

12 MR. BAUER: Object to the form.

13 Q. (By Mr. Kim) Excuse me. I mean, 1938.

14 A. Yeah.

15 Q. February of 1938.

16 A. Yes, sir.

17 Q. Did Monsanto Chemical Company share the same
18 opinion as to those conclusions in 1938?

19 MR. BAUER: Object to the form.

20 A. No, sir. We didn't believe he had tested
21 chlorinated diphenyl in that manner.

22 Q. (By Mr. Kim) And you as medical director did
23 not believe in that hypothesis in 1938?

24 MR. BAUER: Object to the form.

25 A. No. I believed it as far as chlorinated

1 naphthalene was concerned, but I didn't
2 believe it as far as chlorinated diphenyl.

3 Q. (By Mr. Kim) In 1938 did Monsanto engage in
4 any further testing, outside of Dr. Drinker,
5 to determine the repeatability of this
6 information?

7 A. No. We knew it was going to be repeated,
8 though.

9 Q. By Dr. Drinker?

10 A. Yes.

11 Q. Indeed, Dr. Drinker prepared that report and
12 gave it to Monsanto Chemical Company, as we
13 see in Exhibit 5, I believe?

14 A. Yes, sir.

15 Q. If you'll turn -- is that the report that
16 Dr. Drinker gave to Monsanto after you gave
17 him the Monsanto chlorinated diphenyls?

18 A. Yes, sir.

19 Q. If you'll turn to -- let's see how yours is
20 numbered -- what is Bates stamped as
21 Page 118916.

22 MR. BAUER: Do you know what "Bates
23 stamp" is, Doctor?

24 THE WITNESS: Yes.

25 MR. BAUER: It's the production

1 number down there.

2 THE WITNESS: Yeah. Uh-huh.

3 Q. (By Mr. Kim) It's the fifth page. If you
4 could turn to the fifth page.

5 A. 915 or 916?

6 Q. 916.

7 A. Oh, 916.

8 Q. Headed with heading "Chlorinated Diphenyl" --

9 A. Right.

10 Q. -- "Compound 1268"?

11 A. Right.

12 Q. First sentence indicates that: "This
13 material was furnished by...Monsanto Chemical
14 Company"?

15 A. Yes, sir.

16 Q. In the last paragraph of that first page, he
17 indicates that: "The condition described
18 above caused swelling and increased
19 granularity of the liver cells."

20 A. Yes, sir.

21 Q. And at the very end, he indicated that: "The
22 carbon tetrachloride-alcohol test was
23 positive after 52 days, which indicates that
24 though liver damage was apparently slight
25 some degree of harm had been done to the

1 organ." Is that correct?

2 A. That's what he states, yes, sir.

3 Q. Can we agree, then, that based upon this,
4 there is some indication, again, in Nineteen
5 Thirty -- September of 1938 that the liver
6 is, indeed, the target organ of chlorinated
7 diphenyls?

8 A. Yes.

9 Q. If you'll turn to the next page, first full
10 paragraph, last sentence: "When sacrificed
11 72 and 141 days after removal from exposure
12 it was observed that the swelling of the
13 liver cells had disappeared, but the granular
14 and hyaline material remained in the liver
15 cells and had apparently become permanent."

16 A. Yes, sir.

17 Q. Did that cause you any concerns as the
18 medical director of Monsanto Chemical Company
19 whose workers may or may not have been
20 exposed through various routes of exposure to
21 its PCB product?

22 A. Well, we certainly were interested in his
23 statement. You forgot -- inadvertently left
24 out the next sentence that said: "There was
25 absolutely no progression of damage after

1 removal from exposure." So --

2 Q. But the damage had occurred and was
3 permanent?

4 A. Well, let's -- what are we talking about in
5 "damages"? We're talking about no --
6 hyaline inclusions were rare. There was
7 increased granularity of the liver cells.
8 There was some swelling of the liver cells.
9 The swelling was gone, but the granular and
10 hyaline material remained in the liver
11 cells. Well, that's the result of the scar
12 tissue that was formed. Certainly there was
13 some damage in the liver but it was healed
14 and there was no progression of the illness.

15 Q. Would the presence of granularization and
16 scarring in the liver have caused you some
17 concern, as the medical director of Monsanto
18 Chemical Company, with respect to any
19 systemic effects of PCB exposure?

20 A. Well, yes. There was some mild clinical
21 effects, yes. But they were not progressive,
22 and they were not serious.

23 Q. Did it cause you some concern, as medical
24 director of Monsanto, after receiving this
25 report, that the tests done in conjunction

1 with the carbon tetrachloride alcohol test
2 was positive?

3 MR. BAUER: Object to the form.

4 A. Well, this was a test that certainly hasn't
5 been used lately. It was a test by Drinker.
6 We do know that carbon tetrachloride is a
7 very serious liver toxin. It shows that if
8 you have a damaged liver and you take carbon
9 tetrachloride, you will get a much worse,
10 more aggravated damaged liver. Yes, it did
11 cause us concern from that point of view.

12 Q. (By Mr. Kim) As medical director of Monsanto
13 Chemical Company, did it give any cause for
14 concern that there may be some synergistic or
15 enhancement of injury considerations with
16 respect to chlorinated diphenyls?

17 MR. BAUER: Object to the form.

18 A. Chlorinated diphenyl enhancement of injury by
19 what? Would you repeat it?

20 Q. (By Mr. Kim) In -- yeah. As medical
21 director of Monsanto Chemical, did it cause
22 you some concern in 1938 when you received
23 this Drinker report that chlorinated
24 diphenyls in combination with carbon
25 tetrachloride alcohol caused any enhancement

1 of liver injuries or systemic poisoning?

2 A. Yes.

3 Q. Did Monsanto after September of 1938 engage
4 any subsequent testing facility or scientific
5 organization to attempt to repeat the
6 findings found by Dr. Drinker in September of
7 1938?

8 A. At any time? We did never -- we never
9 repeated the chlor -- the chlor -- carbon
10 tetrachloride test. That was really not a
11 standard test. I don't recall seeing it in
12 any other literature outside of Drinker's.
13 We did not.

14 Q. Did Monsanto Chemical Company by virtue of
15 their medical monitoring program ever warn
16 workers or screen workers who might have
17 preexisting liver injuries?

18 A. We did not screen them. Whether we --
19 whether Dr. Martin talked to the workers
20 about excessive alcohol use, I can't answer.

21 Q. On page -- two pages over, the middle of the
22 page, second full paragraph, second
23 sentence --

24 A. Yes, sir.

25 Q. -- it says: "The question as to why

1 #1268" -- and I assume that's the Chlorinated
2 Diphenyl 1268?

3 A. Yes.

4 Q. -- "the most highly chlorinated compound
5 tested, proved but slightly harmful" --

6 A. Wait. I'm on the wrong page. What page?
7 You said two -- you're all on 18?

8 MR. FEATHERSTONE: Yeah.

9 A. Right?

10 Q. (By Mr. Kim) Yes.

11 A. Okay.

12 Q. Second paragraph, second sentence, right in
13 the middle.

14 A. I have it now. Right.

15 Q. Okay. Starting with, "The question as to why
16 #1268" --

17 A. Yes, sir. I see it.

18 Q. Okay.

19 -- "the most highly chlorinated
20 compound tested" -- and here I assume we're
21 still talking about the Chlorinated Diphenyl
22 No. 1268?

23 A. Yes, sir.

24 Q. -- "proved but slightly harmful cannot be
25 answered with any definiteness."

1 A. Yes, sir.

2 Q. What did Monsanto Chemical Company, as a
3 result of this statement, do to attempt to
4 clarify the toxicology -- toxicological
5 issues with respect to chlorinated diphenyls?

6 A. We knew what the toxicological information
7 that was obtained was. We had it. Drinker
8 found it. We did not investigate the
9 mechanism of it, but we were -- of the lack
10 of toxicity. But we were just happy to have
11 the results that he said were -- was of
12 slight toxicity, slightly harmful.

13 Q. Doctor, what's your opinion of what is
14 "slightly harmful"?

15 A. Two drinks of alcohol is slightly harmful.

16 Q. But in that case, Doctor, you'd agree that we
17 know that with some certainty, that the cause
18 of that harm is the two drinks of alcohol?

19 A. Yes.

20 Q. Is that correct?

21 A. Yes.

22 Q. Did it cause you some concern about the lack
23 of definiteness as to why the Chlorinated
24 Diphenyl 1268 was proving slightly harmful?

25 MR. BAUER: Object to the form.

1 A. Well, we knew that it had some toxicity. We
2 never denied that 1268 did not have some
3 toxicity.

4 Q. (By Mr. Kim) I understand that. But did it
5 cause you some concern that you could not
6 precisely define the mechanism of toxicity?

7 A. No, it didn't. We knew that it was a slight
8 toxicity. We knew what the exposure or lack
9 of exposure was. So we thought we had all
10 the information we needed to protect our
11 workers and our customers.

12 Q. The next sentence states: "It has been
13 suggested that the toxicity of all these
14 chlorinated compounds, even though of varied
15 composition, may depend on the ability of the
16 animal to decompose them after lodgment in
17 the tissues, and that this decomposition
18 might be shown by an increase in the chlorine
19 in the urine and suitably conducted feeding
20 experiments"; is that correct?

21 A. That's what he says, yes, sir.

22 Q. Do you agree or disagree with that statement?

23 A. Disagree what way?

24 Q. Did you have any disagreements with that
25 statement when he reported it to you and

1 Monsanto Chemical in 1938?

2 A. Well, this is a hypothesis that he had.

3 Q. Did you agree with the hypothesis or disagree
4 with the hypothesis?

5 A. Not necessarily. I don't recall if I did or
6 not. It may not have been absorbed. There
7 may be a lot of reasons why it wasn't.

8 Q. Did it cause Monsanto and the medical
9 department under your direction in 1938 any
10 concern as to questions of decomposition
11 within the animals after ingestion or
12 inhalation?

13 MR. BAUER: Object to the form.

14 A. No, sir. Because here he is talking about
15 the toxicity of it regardless of what the
16 decomposition products were. And we found
17 out the toxicity. That's what we wanted to
18 find out. We wanted to find out the
19 toxicity, the target organ; and we knew the
20 routes of exposure. We had enough
21 information to protect our workers and our
22 customers.

23 Q. (By Mr. Kim) We talked earlier, Doctor; and
24 I think agreed that with respect to how
25 chlorinated diphenyls chemically break down

1 in the human body, no tests were done?

2 A. That's correct.

3 Q. Were they ever done with respect to animals?

4 A. They may have done some in the reactive work
5 in the 1970's. I cannot answer -- certainly
6 not in the Thirties and Forties, no, sir.

7 Q. Were they ever done while you were the
8 medical director of Monsanto between 1936 and
9 1974?

10 A. We took the -- we received the tissues from
11 the rabbit and from the dog -- rat
12 experiments, but I do not believe they were
13 analyzed before I left.

14 Q. Were the blood and urine of those animals
15 taken, as well, samples taken?

16 A. I can't answer that. I don't recall that.

17 Q. There was no measurement that you recall of
18 the metabolites or any residues that may have
19 been left in those dogs?

20 A. No, sir.

21 Q. If you'll turn to Exhibit No. 6, which I
22 believe is the article in 1939 where
23 Dr. Drinker addresses the misidentification
24 of the chemical compound in his earlier work;
25 is that correct?

1 A. Yes, sir.

2 Q. And by this time he's also had an opportunity
3 to report to Monsanto in September of 1938
4 his findings based upon the compound that
5 Monsanto provided him?

6 A. Yes, sir.

7 Q. On Page 158 --

8 A. Yes, sir.

9 Q. -- the very last sentence of the first
10 column, Dr. Drinker notes: "We have no
11 information as to whether this last compound
12 lacks toxicity because it is not broken down
13 in the body, but that would seem the probable
14 explanation." Is that correct?

15 A. That's the statement made there, yes.

16 Q. Did it cause Monsanto any concern that the
17 compound did not break down in the body?

18 MR. BAUER: Objection. Lacks
19 foundation.

20 A. No, sir. We were examining this material to
21 see if it was toxic or not. And it was found
22 out to be of a very low toxicity; and at that
23 particular point, we were not concerned about
24 why it was low -- having low toxicity.

25 Q. (By Mr. Kim) As of 1939, we can agree that

1 there had been no chronic studies done with
2 respect to the breakdown of chlorinated
3 diphenyls at the direction of Monsanto
4 Chemical Company?

5 A. Now, you're shifting back to diphenyls.
6 We're talking about di -- you mean -- that's
7 correct. He was mentioning -- he brought in
8 chlorinated diphenyl benzene. But I'm
9 confused myself here.

10 Q. Well --

11 A. Say the sentence -- ask your question over,
12 please.

13 Q. I think we can have some amplification
14 because in the sentence before the one I
15 read, it said: "On inquiry it was found that
16 substance 6" -- which is the chlorinated
17 diphenyl benzene --

18 A. Yes, sir.

19 Q. -- "was in reality a mixture of chlorinated
20 diphenyl and chlorinated diphenyl benzene and
21 that number 13 was actually chlorinated
22 diphenyl."

23 A. Right.

24 Q. Okay. "We have no information as to whether
25 this last compound" -- which would be No. 13,

1 the chlorinated -- "lacks toxicity because it
2 is not broken down in the body, but that
3 would seem the probable explanation."

4 A. Yes, sir.

5 Q. Did I read that correctly?

6 A. Yes, you did.

7 Q. And the jury will make their own
8 determination of what he was referring to.
9 But my question to you is: Did it cause you,
10 as the medical director of Monsanto in charge
11 of warnings and the industrial hygiene of
12 your employees, any concern from a
13 toxicological standpoint that chlorinated
14 diphenyls were not broken down in the body?

15 MR. BAUER: Objection. Lacks
16 foundation.

17 A. I don't recall what my thinking was at that
18 time.

19 Q. (By Mr. Kim) Did you, as the medical
20 director of Monsanto Chemical Company, engage
21 in any chronic studies that would have looked
22 at the chronic effects of chlorinated
23 diphenyl in the human body?

24 A. No, sir. In the human body? We did not
25 experiment with the human body.

1 Q. How about any lifetime animal testing?

2 A. Not until 1968.

3 Q. Well, then, how did you know what would
4 happen to an individual who had a PCB in his
5 body that didn't break down over an extended
6 period of time?

7 MR. BAUER: Object to the form.

8 Q. (By Mr. Kim) You couldn't know anything.

9 MR. BAUER: Object to the form.

10 Argumentative.

11 A. That isn't quite true because you're saying
12 that the material is not broken down in the
13 body. He is not saying that the material
14 stays in the body. It's excreted. He takes
15 this by mouth, and it's gone. It's
16 excreted. He didn't say that it's not
17 excreted.

18 Q. (By Mr. Kim) I'm sorry. I -- where did he
19 say it was excreted?

20 A. I -- he did not say that.

21 Q. How did Monsanto Chemical and you come to
22 that conclusion, that although not broken
23 down, it was excreted?

24 A. Well, if you take it and you don't get any
25 toxicity from the material, it either is

1 nontoxic or not absorbed from the gut.

2 Q. Of course, Doctor, we don't know whether it
3 was toxic or not over the long-term because
4 no chronic tests were done during that time
5 period?

6 A. That's correct.

7 Q. And, of course, we don't know whether it was
8 excreted or not because it was not identified
9 as such in Dr. Drinker's last report?

10 A. That's correct.

11 Q. And my question to you is: Given that vacuum
12 of information, how do we know what the
13 toxicological properties are of a compound
14 that may remain in the human body, whether in
15 the blood or in the fatty tissues, that is
16 not broken down over an extended period of
17 time, in 1938?

18 MR. BAUER: Object to the form.

19 A. We didn't know in animals. We did know that
20 it was not toxic from the long-term point of
21 view in humans because our clinical
22 experience with our workers by 1939, or '38
23 or '39, showed that there were no systemic
24 effects from chlorinated diphenyl.

25 Q. (By Mr. Kim) Were there any specific studies

1 undertaken with respect to these systemic
2 effects that you just mentioned in which the
3 workers were specifically questioned about
4 PCB exposure and symptoms?

5 A. They were certainly questioned about
6 symptoms. I do not know if they were
7 questioned about exposure, but the doctor
8 knew what the exposure in the plants were.

9 Q. Was the doctor specifically doing the
10 monitoring and the medical evaluation with an
11 idea of PCB exposure in mind?

12 A. I'm sure he was looking. Yes. He was doing
13 his examination to find out if there were any
14 illness or symptoms due to the work
15 environment that this worker was exposed to.

16 Q. With respect to PCBs?

17 A. With --

18 Q. Specifically?

19 A. He did it when they were -- no matter what
20 compound he was working with. He was
21 familiar with what the exposure was to our
22 various compounds in our various departments
23 at Anniston. And there weren't that many of
24 them.

25 Q. I understand, Dr. Kelly. My question is more

1 specific. Did the medical department or the
2 physician, as we have talked about, engage in
3 any specific medical monitoring program or
4 study that dealt specifically with PCB
5 exposure?

6 A. He ran some liver testing on the workers at
7 random intervals. He did not run them on
8 everyone, every day or every week. But he
9 ran some of them on the yearly examinations.
10 The tests at that time were ones that are not
11 used now. They were pretty rough tests, but
12 they were all that was available.

13 Q. And those liver exams were done specifically
14 with an idea of PCB exposure in mind?

15 A. Of possible liver effects in man, yes, sir.

16 Q. Specifically as a result of PCB exposure, not
17 other chemicals that Monsanto produced?

18 A. That's correct.

19 Q. Where are the results of that?

20 A. I don't know. That was in Nineteen, what,
21 Thirty-nine, Forty.

22 Q. Did Monsanto keep a record of such?

23 A. I'm sure they did. I don't know.

 Q. Did it ever form the basis of any in-house
 studies or publications?

1 A. We didn't -- publication, no. In-house
2 studies, I looked at them. I went to
3 Anniston at least once a year. I would look
4 at the records, and I would see the results.

5 Q. But as you sit here today and testify before
6 this jury, you can't produce any of the
7 underlying data that you're relying upon?

8 A. No, sir, I cannot.

9 Q. Can anyone at Monsanto?

10 MR. KIM: And perhaps that's better
11 directed at Monsanto's attorneys as to
12 whether that underlying data exists.
13 Mr. Bauer?

14 MR. BAUER: You're asking me a
15 question during the deposition?

16 MR. KIM: Yeah. I just want to
17 know whether it exists. And if so, will you
18 produce it?

19 MR. BAUER: You've asked me the
20 question. I'm not going to answer it on the
21 record during a deposition.

22 MR. KIM: Will you at least make
23 inquiry as to whether it exists?

24 MR. FEATHERSTONE: Mr. Kim, we'll
25 make inquiry and respond to your question,

1 unless we know what the information is. In
2 other words, we don't know whether the
3 records exist or not. These are records that
4 are sixty some years old.

5 MR. KIM: And Mister -- I'm just
6 asking if you'll make inquiry as to whether
7 they exist or not. Or are you going to
8 require me to do it by way of formal --

9 MR. FEATHERSTONE: We will make
10 inquiry --

11 MR. KIM: I mean --

12 MR. FEATHERSTONE: -- and respond
13 after the deposition.

14 MR. KIM: That's all I'm asking.

15 Q. (By Mr. Kim) All right. If you'll turn to
16 Exhibit No. 7 --

17 MR. KIM: You want to break,
18 Scott?

19 MR. BAUER: Well, I think maybe we
20 shouldn't go too much more today. But --

21 Q. (By Mr. Kim) -- which I believe is a study
22 done by Dr. Meigs, M-e-i-g-s?

23 A. Yes.

24 Q. And you testified yesterday that this was one
25 of the studies that you relied upon while

1 as -- while medical director at Monsanto to
2 determine the safety of PCB products?

3 A. No, sir. I didn't say that.

4 Q. Excuse me. I probably misunderstood you.
5 Tell me the significance of this article.

6 A. The significance to this article is that
7 people who were -- some workers who were
8 exposed to a PCB containing hydraulic -- heat
9 transfer fluid were exposed over some period
10 of time to some ill-defined chlorinated
11 diphenyl and developed a -- extremely mild
12 cases of chloracne. They were exposed to a
13 condition that was also poorly diagnosed. A
14 statement was made that they were exposed
15 to point one milligrams per cubic meter.

16 Q. How long were they exposed?

17 A. They don't know that, either.

18 Q. Does that cause you some concern as a medical
19 director, the question as to exposure?

20 A. Yes.

21 Q. And the length of exposure?

22 A. Yes. I didn't see how they could get any
23 product, no matter what their exposure was,
24 at point one milligrams per cubic meter.

25 Q. If you'll turn to the second page of that

1 study.

2 A. Can I tear it apart?

3 Q. You bet.

4 A. Oh, sorry. It did.

5 Q. When did you first tear it? No. I'm just
6 kidding. Strike that.

7 The second column underneath the
8 heading "Comment," the last paragraph.

9 A. Yes, sir.

10 Q. "The fact that tests of the air, even in the
11 presence of vapors, showed only negligible
12 amounts of chlorinated hydrocarbons indicates
13 that this type of intermittent but fairly
14 long" continuous -- "continued mild exposure
15 is not innocuous."

16 A. Yes.

17 Q. Did I read that correctly?

18 A. Yes, you did.

19 Q. Did that cause Monsanto -- did that cause
20 you, as the medical director of Monsanto
21 Chemical Company, any concern about the
22 length and route of exposure and its
23 attendant toxicities?

24 A. Yes, that caused me concern. It's
25 exemplified by my letter to Dr. Meigs shortly

1 after this appeared and his subsequent letter
2 to me.

3 Q. Well, we're going to get to those letters.

4 A. Well, fine. But --

5 Q. The second -- the next sentence says: "The
6 low concentration of the chlorinated diphenyl
7 in the air might account for the fact" --
8 "might account for the fact that lesions
9 developed in only 50% of those involved."
10 Did I read that correctly?

11 A. Yes, you did.

12 Q. Did that cause you, as the medical director
13 of Monsanto, some concern that low
14 concentrations of chlorinated diphenyls might
15 account for lesions in 50 percent of the
16 people exposed?

17 A. If he were -- if I were sure that it was a
18 low concentration, it would have. I was not
19 sure it was a low concentration. So I wrote
20 Meigs and said, "What do you think about this
21 concentration?"

22 Q. You questioned his report of the point one
23 milligrams per cubic meter in the air?

24 A. Yes, I did.

25 Q. In 1954 had Monsanto Chemical Company engaged

1 in any air concentration tests?

2 A. Yes.

3 Q. By 1954?

4 A. Yes. I think around '54. I'm not exactly
5 sure.

6 Q. Those would have been the Treon studies; is
7 that correct?

8 A. Well, that's what they did. You said
9 "tests," atmospheric tests.

10 Q. Yes.

11 A. Yes. But I don't know when we first did our
12 atmospheric sampling at Anniston.

13 Q. To what minute level could Monsanto, given
14 the technology in 1954, measure
15 concentrations?

16 A. I don't know. We could certainly go down, I
17 believe, to one -- point one. But I'm not
18 sure.

19 Q. Could you go less than point one? Do you
20 know?

21 A. I don't know. That's an analytical -- I
22 don't know.

23 Q. Do you have a recollection during that time
24 period of what the actual concentrations with
25 respect to PCB vapors were during that time

1 period?

2 A. It was something between nondetectable
3 and point five. I don't know which.

4 Q. Certainly that would include point five --

5 A. Yes.

6 Q. -- milligram per cubic meter?

7 A. Yes.

8 Q. Based upon that knowledge, that the Monsanto
9 concentration levels were between nondetect
10 and point five milligrams per cubic liter
11 [sic] and Dr. Meigs' results, which
12 indicated, in his opinion, at point one
13 milligrams per cubic meter, that lesions
14 could develop in 50 percent of the people
15 exposed, did that cause Monsanto Chemical
16 Company any medical and toxicological
17 concerns as a result of PCB exposure?

18 A. Yes, it did. Because as I said before, if it
19 could occur at point one, we were concerned.
20 And at that particular time, we were
21 already -- April, '64 -- '54, we were
22 starting the experiments at Kettering because
23 their report, which you have there someplace,
24 was sometime in either '54 or '55. That was
25 a five months' period that they examined the

1 rat experiment, and I don't know how long it
2 took afterwards before the final report was
3 done.

4 Q. Who paid for those Kettering studies?

5 A. Monsanto did.

6 Q. Who designed the protocol?

7 A. Dr. Treon.

8 Q. You had no part in designing the protocol of
9 those studies?

10 A. Well, sure. But he designed it. He -- I
11 said, "We want this tested at elevated
12 temperatures." And he was the expert in
13 laboratory work and toxicological work.

14 Q. While you were the medical director of
15 Monsanto, were you responsible for designing
16 any of the protocols of the studies that you
17 ordered?

18 A. Well, I had input in it; but I didn't tell
19 the people exactly how I wanted it to be
20 done. We picked experts -- experts and
21 listened to them.

22 Q. Who determined the hypothesis to be tested?

23 A. What do you mean by the "hypothesis to be
24 tested"?

25 Q. Well, who determined the objective of the

1 test?

2 A. I did. "What's a safe limit?"

3 Q. In response to Dr. Meigs' study, there is --
4 well, let's just get through the Meigs
5 stuff -- a series of correspondence in which,
6 just as in the Drinker report, you question
7 the wisdom of his product and exposure; is
8 that correct?

9 MR. BAUER: Object to the form.

10 A. The wisdom?

11 Q. (By Mr. Kim) Well, his identification.

12 A. What?

13 Q. You question Dr. Meigs' identification of the
14 product, do you not?

15 A. No, I didn't question. I just wanted to know
16 if he was sure about it and about the levels.

17 Q. And that was important?

18 A. Yes, certainly.

19 Q. In Exhibit No. 9 he responds to you, does he
20 not?

21 A. Yes.

22 Q. And in the first paragraph, he says:

23 "...since there is a tendency among all of
24 us to assume that certain conditions can be
25 characterized as 'safe' on the basis of

1 environmental studies alone."

2 Was that the same view and opinion
3 that Monsanto Chemical Company had in the
4 medical department in 1954?

5 MR. BAUER: Object to the form.
6 Can I hear that back?

7 THE WITNESS: I'd like to hear it,
8 too.

9 MR. KIM: Why don't I just rephrase
10 it.

11 MR. BAUER: All right.

12 Q. (By Mr. Kim) You received this letter,
13 didn't you?

14 A. Yes, I did.

15 Q. And Dr. Meigs in the first paragraph
16 indicates that, "There" -- quote: "There is
17 a tendency among all of us to assume that
18 certain conditions can be characterized as
19 'safe' on the basis of environmental studies
20 alone."

21 A. That's his statement, yes, sir.

22 Q. Did you, as the medical director of Monsanto
23 Chemical Company, agree or disagree with that
24 statement on May 7th of 1954?

25 A. I --

1 MR. BAUER: Object to the form.

2 A. I did not agree with the statement. I did
3 not include myself into -- into stating
4 that -- into a statement that if you have
5 environmental data that -- or below what was
6 accepted as a maximum allowable concentration
7 is safe, I believe that it's safe. Whether
8 Meigs believed it or not, I don't know. But
9 he --

10 Q. What -- excuse me. Go ahead.

11 A. He certainly is running in the face of an
12 awful lot of people who would disagree with
13 this statement.

14 Q. Including those people at Monsanto Chemical
15 Company?

16 A. I don't know about all of them. Including
17 me.

18 Q. What environmental studies did you have at
19 your disposal as the medical director of
20 Monsanto Chemical Company on May 7th of 1954
21 concerning polychlorinated biphenyls?

22 MR. BAUER: Objection. Vague.

23 A. We had the Drinker work. We had -- I don't
24 know when we got the Treon report. That was
25 around that time. It was either '54 or '55.

1 We had some spot samples at our Anniston
2 plant where the workers were being exposed to
3 small amounts of material and were having no
4 symptoms or signs.

5 Q. (By Mr. Kim) During the 1930's, did you have
6 the opportunity to review any work submitted
7 to Westinghouse by Dr. von Oettingen?

8 A. No, sir, I didn't. During the 1930's?

9 Q. Yes, sir.

10 A. No, sir.

11 Q. Just real briefly because this may eliminate
12 a lot of questions.

13 Let me show you a copy of a
14 document entitled "Medical Research Project
15 No. MR," dash, "46, The Toxicity and
16 Potential Dangers of Inerteen," which was
17 submitted by Dr. von Oettingen to
18 Westinghouse and ask if you've ever reviewed
19 that document.

20 MR. CAILTEAUX: Object to the form
21 of the question.

22 A. First of all, this does not say it was
23 submitted to Westinghouse. It was submitted
24 by von Oettingen.

25 Q. (By Mr. Kim) Well --

- 1 A. I have to disagree with that. Secondly, I
2 never saw this during my -- to the best of my
3 recollection, any time when I was with
4 Monsanto. I have seen it during some of
5 these 20 to 22 depositions, but I have not
6 seen it -- I did not see it, to the best of
7 my recollection, during any time at Monsanto.
- 8 Q. You have reviewed it?
- 9 A. Yes.
- 10 Q. Am I mistaken -- or can you tell me what the
11 file stamp at the bottom of that document is?
- 12 A. What the what?
- 13 Q. The file stamp.
- 14 A. You're talking to me?
- 15 Q. Yeah. The receipt? It was received by --
- 16 A. K82?
- 17 Q. -- Monsanto?
- 18 A. And there's a GBRN00 --
- 19 Q. Just above that. It looks like it's typing.
20 But it's a file --
- 21 A. This?
- 22 Q. Yeah. There you go.
- 23 A. Stamping? It says "Westinghouse Electric
24 Manufacturing Company, East Pittsburg,
25 Industrial Hygiene Laboratory, File Copy."

1 Q. We'll talk a little bit about this tomorrow,
2 but I think Mr. Bauer wants to shut it down
3 for the day.

4 A. You talking to me?

5 Q. I was just making a general comment.

6 A. Oh. I'm not included?

7 Q. No, you are. I was saying that I think
8 Mr. Bauer wants to shut it down. Are you
9 ready to quit for the day?

10 A. Oh, I'm all right. No.

11 MR. BAUER: We can go for a few
12 more minutes if you want to finish that
13 document. Or we can break and --

14 MR. KIM: Well, this document is
15 going to take a while.

16 MR. FEATHERSTONE: Then we ought to
17 break.

18 MR. BAUER: Then we'll break till
19 tomorrow.

20 THE VIDEOGRAPHER: We're going off
21 the record. It's 15 minutes after 12:00
22 o'clock. This is the end of Tape No. 5.

23

24 (Whereupon the deposition of Robert
25 Emmet Kelly, M.D., was recessed at

12:15 p.m. and is to be continued
at 9:00 a.m. on February 17, 1994.)

- - - - -

THE STATE OF Missouri :
COUNTY OF ST. LOUIS :

I, ROBERT EMMET KELLY, M.D., hereby
certify that I have read the foregoing
transcript of my testimony given in the
foregoing numbered and styled case and that
same is true and correct to the best of my
knowledge and belief.

I further certify that any and all
corrections have been made on a separate page
and initialed by me.

This the 30th day of
March, 1994.

Robert Emmet Kelly M.D.
ROBERT EMMET KELLY, M.D.

SUBSCRIBED AND SWORN TO BEFORE ME,
this the 30th day of March, 1994.

Josephine S. Niblock
Notary Public in and for
the State of MISSOURI

My Commission Expires

Job No. 94-512

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

Martin & Associates
(409) 762-2222

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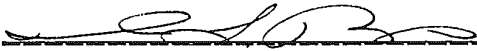
1 THE STATE OF TEXAS :

2 I, Irma L. Reyes, Certified
3 Shorthand Reporter in and for the State of
4 Texas, hereby certify that this deposition
5 transcript is a true record of the testimony
6 given by the witness named herein, after said
7 witness was duly sworn or affirmed by me.

8 I further certify that I am neither
9 attorney nor counsel for, related to, nor
10 employed by any of the parties to the action
11 in which this testimony was taken. Further,
12 I am not a relative or employee of any
13 attorney of record in this cause, nor do I
14 have a financial interest in the action.

15 Further certification requirements,
16 if any, pursuant to the Rules will be
17 certified to in the Supplemental Certificate
18 after they have occurred.

19 the 2nd Subscribed and sworn to on this,
20 day of March, 1994.

21
22 
23 _____
24 Irma L. Reyes, CSR
25 Certificate No. 4071
Expires December 31, 1994

My Notary Commission expires September 21,
1996

LIST OF CHANGES OR CORRECTIONS

To the Deposition of _____

If there are any changes or corrections, please list them below giving the page number, line number, and reason for the change.

The reasons for making changes are:

- (1) To clarify the record:
- (2) To conform to the facts:
- (3) To correct transcription errors:

Page No. 194 Line No. 9 Reason for Change misspelling
 Changed Canat Cancolor To Kanacolor

Page No. 195 Line No. 9 Reason for Change misspelling
 Changed Exutitus To neuritis

Page No. 197 Line No. 15 Reason for Change misspelling
 Changed Vateche To Bädische

Page No. 209 Line No. 2 Reason for Change mis transcription
 Changed Texaco To Texas Plant

Page No. 226 Line No. 23 Reason for Change mis transcription
 Changed Taker To Tanker

Page No. 263 Line No. 6 Reason for Change Typo
 Changed 12 To one half 1/2

Page No. 305 Line No. 22 Reason for Change typo
 Changed 59 To 39

Page No. 320 Line No. 4 Reason for Change misspelling
 Changed reactive To radioactive

Page No. 330 Line No. 23 Reason for Change woony transcription
 Changed product To problem

Plumett Kelly

Witness