

COPY

IN THE DISTRICT COURT OF THE UNITED STATES
EASTERN DISTRICT OF KENTUCKY
PIKEVILLE DIVISION

EQUITABLE RESOURCES ENERGY
COMPANY, a West Virginia
Corporation,

Plaintiff,

VS.

No. 91-441

MONSANTO COMPANY, a
Delaware Corporation,

Defendant.

DEPOSITION OF JOHN CRADDOCK, PH. D.
TAKEN ON BEHALF OF THE PLAINTIFF.

September 9, 1992

RICHARD E. SCHROEDER

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1 IN THE DISTRICT COURT OF THE UNITED STATES
2 EASTERN DISTRICT OF MISSOURI
3 EASTERN DIVISION

4 EQUITABLE RESOURCES ENERGY)
5 COMPANY, a West Virginia)
6 Corporation,)

6 Plaintiff,)

7 VS.) No. 91-441

8 MONSANTO COMPANY, a)
9 Delaware Corporation,)

10 Defendant.)

11 DEPOSITION OF JOHN CRADDOCK, PH. D.,
12 produced, sworn, and examined on the part of the
13 PLAINTIFF, used in an action pending in the United
14 States District Court within and for the Eastern
15 Division of the Eastern Judicial District of
16 Missouri, in re: EQUITABLE RESOURCES ENERGY
17 COMPANY, a West Virginia Corporation, VS. MONSANTO
18 COMPANY, a Delaware Corporation, on September 9,
19 1992, at the office of Husch, Eppenberger, Donohue,
20 Cornfeld & Jenkins, 100 North Broadway, St. Louis,
21 Missouri, before Richard L. Saunders, a Notary
22 Public within and for the City of St. Louis, State
23 of Missouri.

18 A P P E A R A N C E S:

19 McCoy, Baker & West
20 309 North Broadway
21 Lexington, Kentucky 40592-1660
22 By: Michael D. Baker, Esq.
23 And Charles E. Beal, II, Esq.
24 For The Plaintiff.

25 VanAntwerp, Monge, Jones & Edwards
26 1544 Winchester Avenue - Fifth Floor
27 Ashland, Kentucky 41101
28 By: Gregory L. Monge, Esq.
29 For The Defendant.

1 JOHN CRADDOCK, PH. D.,

2
3 of lawful age, produced, sworn, and examined on
4 behalf of the PLAINTIFF, deposes and says:

5 DIRECT EXAMINATION

6 BY MR. BAKER:

7 Q. Mr. Craddock, my name is Michael Baker, and
8 Mr. Beal and I represent Equitable in this case.
9 We're in a law firm in Lexington, Kentucky.

10 I assume you have probably had this
11 done to you once or twice before. I will say that
12 the way we try to do things, I'm not here to match
13 wits with you, to try to trick you into saying
14 something you don't mean. I'm here to try to get
15 some information. This is our first deposition in
16 this case, so some of the questions that we ask may
17 seem elementary, and sometimes it's because we don't
18 know. Other times maybe we do know but there are
19 things we need to get nailed down early on in the
20 case.

21 If I ask you anything you don't
22 understand, please don't answer. Just ask me to
23 rephrase it or to explain it. I'll be happy to do
24 that because, like I said, I'm not here to try to
25 trick you into saying something you don't mean to

1 say.

2 What is your name, please?

3 A. John Craddock.

4 Q. Mr. Craddock, where do you live?

5 A. 6 Ferrand Woods, St. Louis, Missouri.

6 Q. And approximately how old are you?

7 A. Figure that out. 56.

8 Q. What's your educational background?

9 A. I have a B. S. in Chemistry from Memphis
10 State University and a Ph. D. in Organic Chemistry
11 from Vanderbilt University.

12 Q. When did you obtain your Ph. D.?

13 A. 1961.

14 Q. Where did you go to work after that?

15 A. Right out of school I went to work for
16 M. W. Kellogg Engineering Company in New York City.

17 Q. And, generally, what was your job there?

18 A. I was a research chemist in their research
19 laboratories in Jersey City.

20 Q. How long did you stay in that position?

21 A. I was with Kellogg until 1965.

22 Q. Then where did you go?

23 A. Joined Monsanto in 1965 in St. Louis.

24 Q. Have you been working for Monsanto in St.
25 Louis all the time since 1965?

1 A. That's correct.

2 Q. What was your job in 1965?

3 A. I joined Monsanto in 1965 as a research
4 group leader.

5 Q. And what did that mean?

6 A. I came into the Central Research Department
7 and I had a group of three or four younger chemists,
8 junior chemists, and a couple of technicians
9 reported directly to me.

10 Q. And how long did you stay in that position?

11 A. Two or three years probably.

12 Q. Did you get a promotion?

13 A. I did. Then moved to something like a
14 group leader II. These are more or less pay
15 grades. You sort of move up the chain.

16 Q. Did you have additional responsibilities in
17 that job?

18 A. Yes. The group got larger, a couple more
19 people. I had responsibility for interfacing with
20 the Engineering Department.

21 Q. How long did you remain a group leader II
22 approximately?

23 A. Probably three or four years.

24 Q. Then you got another promotion?

25 A. At some point along the way I became what

1 was classified in those days as a senior research
2 group leader and I held that position as long as I
3 was in the Corporate Research Department.

4 Q. Then at some point you left the Corporate
5 Research Department?

6 A. In about 19 -- I'd say 1971 I was loaned to
7 what was in those days known as the Hydrocarbons &
8 Polymers Division as -- what was the title we called
9 them in those days? A commercial development
10 manager.

11 Q. That was the Hydrocarbon --

12 A. And Polymers. No longer exists.

13 Q. And how long were you on loan to that
14 division?

15 A. I was with them from '71 to probably '74.

16 Q. Then did you go to a different division?

17 A. 1974 I moved into Monsanto Industrial
18 Chemicals Company as a manager of commercial
19 development in the Food & Fine Chemicals Division.

20 Q. Is that a separate corporation?

21 A. Monsanto Company owns all the Monsanto
22 leader divisions or groups, or sometimes they call
23 them chemical companies. The corporate structure
24 changes. We just changed back from companies.
25 We're now groups again, so --

1 Q. I understand how those things can happen.
2 But Monsanto Company --

3 A. Monsanto Company is the principal entity,
4 and I work for Monsanto Company.

5 Q. You worked for different -- either
6 divisions or groups within that company all this
7 time?

8 A. That's correct.

9 Q. And what did you do in the production
10 development of Food & Fine Chemicals Division?

11 A. In the Food & Fine Chemicals I was a
12 manager of commercial development and my job was to
13 interface with customers and with regulatory
14 agencies, to move new products from the laboratory
15 or to find new uses for existing products.

16 Q. And how long did you stay in that division?

17 A. Probably until about '77, '78.

18 Q. Then where did you go?

19 A. Then I stayed in the Monsanto Industrial
20 Chemicals Company but I moved into the newly formed
21 Environmental Operations Department.

22 Q. And have you remained in that department?

23 A. I've essentially remained in that type of
24 function. I moved from the Monsanto Industrial
25 Chemicals Company, Environmental Operations

1 Department, to the corporate staff in roughly 1984
2 or '83, sometime thereabout.

3 Q. And have you had any other jobs since then?

4 A. No. I essentially have the same function
5 with the corporate staffs.

6 Q. What is your current position with the
7 corporate staff?

8 A. My title is product and environmental
9 safety/regulatory affairs director. I'm in the
10 Corporate Environmental Safety Health Department.

11 Q. And what does your current job entail
12 besides testifying?

13 A. I have to do with product stewardship for
14 products that we no longer manufacture. We
15 primarily provide information to former customers,
16 regulatory agencies, the media, anybody who has
17 questions about products that we no longer
18 manufacture, which includes PCB's.

19 I provide regulatory management for
20 our existing U. S. Plants, for products that we make
21 under the Toxic Substances Control Act which are
22 regulated under TSCA, T-S-C-A. That's an acronym
23 for Toxic Substances Control Act.

24 Along with these products, we provide
25 health and safety information, which includes

1 Material Safety Data Sheets, any product questions
2 that people have favorable to replacement and so
3 forth.

4 Q. When did you first become familiar with
5 PCB's?

6 A. I became familiar with PCB's when I worked
7 in the laboratory, Corporate Research Department.
8 We used PCB's as a routine heat exchange fluid for
9 safety purposes.

10 Q. Would that have started in 1965?

11 A. In that time frame, you know, probably
12 somewhere from '65 to '70. It was a routine tool
13 that was available in the laboratories.

14 Q. In your training at Memphis State and
15 Vanderbilt did you study anything about PCB's?

16 A. No, not that I recall.

17 Q. So your first familiarity was after you
18 first started working for Monsanto?

19 A. Right.

20 Q. And I assume in your first job prior to
21 Monsanto you had no involvement or knowledge of
22 PCB's?

23 A. I don't recall PCB's at all.

24 Q. Just for the record, what does "PCB" mean?

25 A. PCB is an acronym for the chemical family

1 chlorinated biphenyls.

2 Q. Is that a chlorinated hydrocarbon?

3 A. It is a chlorinated hydrocarbon of a
4 specific type.

5 Q. Are there chlorinated hydrocarbons that are
6 not PCB's?

7 A. There are literally thousands of
8 chlorinated hydrocarbons.

9 Q. Also, for the record, what is a PCT?

10 A. PCT is an acronym for another family of
11 chlorinated hydrocarbons, polychlorinated
12 terphenyls.

13 Q. Are there chlorinated hydrocarbons that are
14 still commonly used?

15 A. Many. For instance, common dry cleaning
16 fluids are chlorinated hydrocarbons.

17 Q. And I assume you say there are chlorinated
18 hydrocarbons that are safe for use?

19 A. I think that's a fair statement.
20 Chlorinated hydrocarbons have many similar
21 properties, chemically, as well as health and
22 safety.

23 Q. Were you involved in the decision by
24 Monsanto to stop producing PCB's?

25 A. No, that was before my tenure in this

1 position.

2 Q. Were you involved in the decision by
3 Monsanto to stop producing PCT's?

4 A. No.

5 Q. Are you the person who signed the answers
6 to the first set of interrogatories served by us in
7 this case?

8 A. Yes, I am.

9 Q. In response to the production of documents?

10 A. Yes, that's correct.

11 MR. BAKER: We have not yet asked that you
12 identify a corporate representative for purposes of
13 deposition. I would ask if Mr. Craddock is
14 authorized to speak on behalf of Monsanto as to the
15 areas that were asked in the interrogatories in this
16 deposition.

17 MR. MONGE: For the record, as we said in
18 our answers to the interrogatories, that basically
19 no one person has all the knowledge, and
20 Dr. Craddock has put his signature to it based upon
21 information that's been all gathered together, but
22 as to whether he will be the corporate
23 representative for 30(b)(6) representative, I don't
24 know that that's accurate at this point, Mike. And
25 since you asked specifically for him and didn't ask

1 for a 30(b)(6) representative, I really can't say
2 that he will be.

3 Q. (By Mr. Baker) Have you been involved in
4 working with Monsanto in other litigation involving
5 PCB's?

6 A. To some extent, yes.

7 Q. Have you testified in any trials?

8 A. I think one.

9 Q. Do you recall the style of the case or
10 where the case was?

11 A. Yeah, this was a special case. I don't
12 know exactly what -- it was handled -- it was in San
13 Francisco and it's a case where they have a sort of
14 administrative judge, both sides agree to dispute.
15 Is that what they call it?

16 MR. MONGE: I think there was an
17 arbitration of some kind.

18 Q. (By Mr. Baker) Do you know who the
19 plaintiff was in that case?

20 A. It was a list of plaintiffs. It was called
21 the Wynne Market Plaza cases.

22 Q. Have you given depositions in any other
23 litigation involving PCB's?

24 A. Yes.

25 Q. Approximately how many times?

1 A. Three or four.

2 Q. Do you know if there are transcripts of
3 those depositions or of your testimony in the San
4 Francisco case?

5 A. I'm sure there is because there was a court
6 reporter.

7 MR. BAKER: Is there any objection to our
8 obtaining transcripts of his prior testimony?

9 MR. MONGE: I don't know about the
10 arbitration. I'm really not sure what that was
11 about or whether there was, but if there are
12 publicly recorded transcripts of evidence of his
13 testimony in public records, we will certainly
14 undertake to see if we've got those or you can get
15 them.

16 MR. BAKER: I will ask then if you will
17 produce any transcripts of his testimony in cases
18 involving questions concerning PCB's, or if they
19 exist and there is some objection to it, inform us
20 they exist and the basis for the objection.

21 MR. MONGE: We'll do that right well.

22 Q. (By Mr. Baker) I assume -- in fact, I'm
23 confident there have been cases for a number of
24 years against Monsanto concerning PCB's.

25 When did you first become involved in

1 either representing the company or participating in
2 decisions with regard to litigation over PCB's?

3 A. I guess I don't understand the question,
4 don't know how to answer it.

5 MR. MONGE: If you don't understand it,
6 just tell him you don't understand it.

7 THE WITNESS: It's kind of complex.

8 Q. (By Mr. Baker) Let me try to simplify it
9 then.

10 In 1971 you left the corporate
11 research department and went on loan to the
12 Hydrocarbon & Polymer Division?

13 A. Correct.

14 Q. Were you involved with work with PCB's at
15 all during that period?

16 A. No.

17 Q. Were you involved in any PCB litigation
18 during that period?

19 A. No.

20 Q. In 1974 you became manager of commercial
21 development for product development through the Food
22 & Fine Chemicals Division.

23 Were you involved with PCB's at all
24 during that period?

25 A. No.

1 Q. Or in any litigation concerning PCB's?

2 A. No.

3 Q. When you were in the Environmental
4 Operations Department were you involved with PCB
5 litigation at all?

6 A. No PCB litigation.

7 Q. So your involvement with PCB litigation
8 began sometime after you moved to the corporate
9 staff?

10 A. It began after 1980, because the function
11 moved to the corporate staff in '84. My involvement
12 with PCB's began roughly in 1980, total involvement.

13 Q. Would Mr. Papageorge -- or is it
14 Papageorge?

15 A. Papageorge.

16 Q. Would he have been involved with PCB's
17 earlier than you were?

18 A. I don't know if there was litigation prior
19 to that time.

20 Q. We can ask him.

21 In your current position are you
22 involved at all in testing new chemicals or new
23 substances to determine whether they are hazardous
24 and whether they should be marketed?

25 A. No, I'm not.

1 Q. Were you involved in any of that kind of
2 activity in any of your previous positions?

3 A. Yes, I was.

4 Q. When did that begin and how long were you
5 involved in that?

6 A. When I was in the commercial development
7 function, the first commercial development function
8 which would move to Hydrocarbons & Polymers
9 Division, which is roughly '71.

10 Q. In 1971, and, say, for five years
11 thereafter did Monsanto develop new products?

12 A. Yes, they did.

13 Q. In general terms, how many new products
14 would they have developed?

15 MR. MONGE: To the extent that you know the
16 answer to that question.

17 A. I don't have a number. Dozens would be a
18 guess.

19 Q. (By Mr. Baker) That's good enough for our
20 purposes. Was there testing prior to marketing
21 those products to determine both what they would do
22 and how well they would do it, as well as whether
23 they were safe for use and how they should be
24 disposed of?

25 MR. MONGE: Let me just have an objection

1 to the form of the question, and probably should
2 have objected earlier on the use of the term "safe"
3 because that can connote a lot of things. It might
4 be safe for one application and not safe for another
5 application. But with that objection, I'll let him
6 answer.

7 THE WITNESS: Okay, what's the question
8 again?

9 Q. (By Mr. Baker) Let me try to rephrase the
10 question again. I'm not trying to trick you into
11 adopting the word "safe," but from, say, 1971 when
12 you first became involved with testing products,
13 say, for the next five years or so, did Monsanto
14 conduct tests concerning applications and safety of
15 their products?

16 A. Yes.

17 Q. What kind of testing was done?

18 A. There's a general health and safety screen
19 that's done that's recognized by the regulatory
20 agencies and the acute test for short-term exposure,
21 and this includes ingestion, dermal testing. The
22 various routes that this particular chemical would
23 commonly be exposed to people, those routes were
24 tested first in a series of acute short-term tests,
25 and then following that, depending on the result of

1 the test and the outlook of the market, then you
2 went on to more detail testing.

3 Q. Did you do animal testing?

4 A. Yes, animal testing is involved.

5 Q. Testing on humans?

6 A. No. Human testing is not allowed in this
7 country.

8 Q. What kinds of animal testing would you have
9 done for a new chemical product?

10 MR. MONGE: Again, objection to the
11 generality, but understanding that he's just
12 speaking in general terms, to the extent that you
13 can answer that, go ahead.

14 A. Depending on the particular use of the
15 screen, there are standard test protocols. Usually
16 these involve mice. You start with the lower
17 species, mice, then you move up to rodents.
18 Ultimately, you move up to things the size of dogs,
19 apes, monkeys and so forth. And there's also tests
20 that are done in avian and fish species.

21 Q. (By Mr. Baker) What are you trying to
22 determine with these tests?

23 A. In the acute test you are trying to
24 determine the exposure level at which any -- guess
25 I'm trying to think of the word -- that any chronic

1 or any clinical signs of health effects will occur.

2 Q. And are you looking at a broad spectrum of
3 adverse health effects?

4 A. Yes, there's a generally defined protocol
5 of what you're looking for in these tests.

6 Q. And generally what kinds of health effects
7 are you looking for or hoping not to find?

8 A. Well, in the acute test, the first test,
9 you are really looking for a lethal dose, to see
10 what is the maximum tolerated dose and you're
11 looking to see if there are any overt signs of
12 irritation, rash, any kind of manifestation of a
13 possible health factor.

14 When you move to the higher species of
15 animals the longer term studies can involve lifetime
16 feeding studies at various doses up to the maximum
17 minimum tolerated doses. You actually dissect the
18 organs of the animal and you look for everything you
19 look for in an autopsy, everything from organ
20 development, tumorigenic cancer effects, neurological
21 disorders.

22 These tests, by the way, are not done
23 by someone such as myself. These are done by
24 trained board-certified pathologists,
25 toxicologists. It's very specialized type of

1 testing.

2 Q. Are there national guidelines for this kind
3 of product testing?

4 A. These are evolving. There have been
5 standard protocols that have been accepted over the
6 years and these have changed as the body of
7 information has gotten done, but yes, there are.
8 And there were guidelines and at the time the
9 testing was done according to accepted national
10 standards that were applicable and in force at the
11 time.

12 Q. What agency or agencies would adopt or
13 promulgate guidelines for this kind of testing?

14 MR. MONGE: Just let me -- during what
15 period of time?

16 Q. (By Mr. Baker) Okay, let's say from 1971
17 to the present, if it has changed since '71.

18 A. It has changed since '71. Changed
19 significantly.

20 Q. Why don't we start with '71 and go
21 forward? Then we'll start with '71 and go
22 backward.

23 A. I'm not sure if I can give you an exact
24 chronology of this, but up until probably the '60's
25 and '70's the only protocols that were established

1 were by the Food & Drug Administration, and these
2 were primarily for chemicals which would be used as
3 a drug or a therapeutic ingredient to be ingested or
4 used on humans or as a food which would be ingested
5 or used on humans. Included in this, they have a
6 definition of things that are used on foods for
7 consumption by humans. The food and drug
8 regulations also include things that you feed to
9 animals which would be fed to humans.

10 At some point in time the
11 U. S. Department of Agriculture had certain test
12 protocols that came in and these sort of evolved as
13 for chemicals which were used in animal feeds
14 primarily, and that was probably 1970, pre-1970.
15 Since 1970, as more and more government agencies
16 have proliferated and science has moved forward,
17 these have changed.

18 At one point in time they established
19 the Environmental Protection Agency and I think the
20 EPA was first established probably in the early
21 '70's and they began to regulate under something
22 known as FIFRA, F-I-F-R-A, which is the Federal
23 Insecticide, Fungicide & Rodenticide Act. I believe
24 that's what the initials stand for. And this began
25 to regulate pesticides as they were called, which

1 were things we used to control pests; bugs, rodents
2 and so forth.

3 Then this has been extended then to
4 look at agricultural chemicals, things which you
5 used on farms which would leave a residue on a crop
6 which might subsequently be ingested by humans or
7 animals. And there's some overlap with respect to
8 the FIFRA group under EPA and the FDA and USDA who
9 regulate the foodstuffs, so these have evolved since
10 then and as these have evolved more and more
11 standards have been developed for testing. It was
12 only fairly recently that a standard good laboratory
13 practices act was passed which requires standard
14 practices in laboratories for animal maintenance,
15 feeding, cleaning, caring and record keeping has
16 come around. That's roughly in the early '80's to
17 maybe the mid-'80's.

18 Q. Okay, Mr. Craddock, in the '50's and '60's
19 were there any nationally accepted testing
20 guidelines that would be applicable to a chemical
21 such as PCB?

22 MR. MONGE: If you know.

23 A. Prior to the federal guidelines,
24 professional societies, which include the
25 membership, established the practices such as the

1 AMA did for physicians, the American Chemical
2 Society did for chemistry, there's a society of
3 toxicologists, veterinarians and so forth, and these
4 different groups established the protocols and
5 practices that we used in testing the animals or
6 products or whatever that involved their
7 professions.

8 Q. (By Mr. Baker) Do you know what kinds of
9 guidelines were in place for PCB's in the 1950's and
10 the 1960's?

11 A. From my readings, there were essentially
12 very few. It was the same as for any other
13 chlorinated organic industrial chemical.

14 Q. And then your testimony is that primarily
15 the guidelines in place during that period were for
16 foods or drugs to be ingested?

17 A. Well, they were for -- there were tests --
18 they weren't tests that were established by -- these
19 chemicals were not tested for food use but the
20 testing procedures were the ones that were
21 applicable to foods because these were the most
22 stringent test procedures that were available at the
23 time, so the acute screens that were used for these
24 chemicals were the ones that were basically used for
25 testing any chemicals for the acute screen.

1 Q. If Monsanto or some other company were
2 today to develop a chemical, a new one, say PCB's
3 had not been discovered or developed until today;
4 what kind of testing would be required prior to
5 marketing?

6 MR. MONGE: Let me object to the relevance
7 of that on the basis that it really asks him to
8 assume something that hasn't happened, didn't happen
9 and won't happen. But I mean to the extent that he
10 can speculate on that or wants to answer that
11 question, I will let him go ahead and answer.

12 Q. (By Mr. Baker) You may answer.

13 A. About the best thing that I can say about
14 that was in 1979 the National Academy of Sciences
15 published a monograph on polychlorinated biphenyls.
16 They looked at what was known about PCB's, what was
17 known about the testing, what was known about the
18 required testing systems that were required by the
19 government agencies in power, and the most stringent
20 testing system for new chemicals on the market was
21 the FIFRA test system. And they looked at the
22 testing that had been done for PCB's and compared it
23 to what was required by the FIFRA act in 1979 and
24 they concluded that PCB's had had all of the testing
25 prior to that time that would have been required in

1 1979 for any new chemical going on the market and
2 that PCB's would have passed the FIFRA test system.

3 Q. At what point in time? Let me rephrase
4 that. You said that was a conclusion they reached
5 in 1979?

6 A. 1979.

7 Q. Was that testing that had been done through
8 1979 or testing that had been done through 1957 or
9 what point in time?

10 A. It's probably testing that would have been
11 done up through 1978 and early 1979.

12 Q. To the extent you know, does your company
13 take the position that the testing required by FIFRA
14 was done prior to their marketing of PCB's?

15 MR. MONGE: If you know the answer. I
16 don't want you to speculate on it.

17 A. No, I started to say the testing that was
18 done, all of this was before my time because I
19 became involved in 1980. But this is a published
20 document that's available.

21 Q. (By Mr. Baker) Who published that
22 document?

23 A. The National Academy of Sciences in
24 Washington, D. C.

25 Q. Do you know if that's something that is

1 currently available?

2 A. It's available in good libraries. It has
3 been out of print but I think it has been reprinted
4 because it's commonly available in good libraries,
5 good laboratories, certainly available at the
6 National Academy of Science library in Washington.

7 Q. Let me ask you an easier question. Do you
8 have a copy of it?

9 A. I had a copy at one time and I may still
10 have it in my bookcase.

11 MR. BAKER: Do you have any objection to
12 producing that for us?

13 MR. MONGE: How big is it?

14 THE WITNESS: (Indicating.)

15 MR. MONGE: No.

16 MR. BAKER: If you give us the front page,
17 we'll try to find it somewhere else.

18 MR. MONGE: If we got a copy of it I don't
19 have any objection to that, so we'll make a note.

20 MR. BAKER: I'd ask that you either produce
21 it for us or give us some identifying front page or
22 something.

23 MR. MONGE: I will. If I got a copy of it
24 I'll give it to you.

25 It's a monograph, right?

1 THE WITNESS: It's a monograph.

2 Q. (By Mr. Baker) If you were to develop a
3 new chemical today -- I won't ask about hypothetical
4 PCB's, but I assume that Monsanto develops new
5 products regularly. On a new chemical product, not
6 for food or drugs but a chemical product for a
7 lubricant or any other external use, what kind of
8 testing are you required to do today before
9 marketing that product?

10 A. I don't know the details of what's required
11 but there is an established federal protocol now, a
12 detailed protocol for any new chemical that's to
13 come on the market, everything, including a
14 premanufacturing notice. I think this is now
15 required under EPA.

16 Q. Is that more stringent than it was in 1979?

17 A. I'd have to guess.

18 MR. MONGE: Don't guess. Don't guess.

19 A. Okay, don't know.

20 Q. (By Mr. Baker) You testified earlier that
21 you did participate in animal studies or conduct
22 animal studies?

23 A. I managed the budgets and the planning of
24 those, yes.

25 Q. Among the possible health effects that

1 you're looking for or hoping to avoid are you
2 looking at whether a substance may cause cancer?

3 A. Absolutely.

4 Q. Tumors?

5 A. Absolutely.

6 Q. Do you look at mutation of cells?

7 A. Which is one of the standard protocols,
8 yes.

9 Q. You look at effect on reproduction?

10 A. Yes, this is standard.

11 Q. Are you familiar with the steps that
12 Monsanto took for new products prior to 1970 in
13 assessing the risk of the products?

14 A. No.

15 Q. Do you know who would be who is still
16 living today?

17 A. That's hard to -- Mr. Papageorge, you have
18 his name. He was involved. I don't know whether he
19 was involved in -- you know, in this time, but he's
20 certainly one that might know or have -- it was
21 during his generation when this was done.

22 Q. Do you know of any other persons who are
23 living who may have participated in testing of PCB's
24 between the 1930's and 1971?

25 A. Yeah, I think the director of our Medical

1 Department is still alive and well, Dr. Emmett
2 Kelly.

3 Q. Do you know where Dr. Kelly lives now?

4 A. He lives in St. Louis somewhere.

5 Q. Is he retired?

6 A. I think he has an active retirement. I
7 don't know exactly what -- I know he has some
8 volunteer clinics. I don't know whether he does
9 anything else now, but he's retired from Monsanto.

10 Q. And Dr. Kelly is a physician, is he not?

11 A. He is a physician.

12 Q. Are you familiar with the former Monsanto
13 product Pydraul AC?

14 A. Yes, I am.

15 Q. Do you know approximately when Monsanto
16 began producing Pydraul AC?

17 A. Only from reading the literature, but
18 probably in the '50's, early '60's, something like
19 that.

20 Q. Do you know what the components of Pydraul
21 AC were?

22 A. Off the top of my head, I don't know. I'd
23 have to look that up.

24 Q. It did contain polychlorinated biphenyls?

25 A. Yes, I know it did.

1 Q. What is Aroclor?

2 A. Aroclor is a registered trademark owned by
3 Monsanto Company for the general family of
4 polychlorinated polyphenyls. It is not a synonym
5 for PCB's.

6 Q. Polychlorinated polyphenyls?

7 A. Correct.

8 Q. So a PCT would be Aroclor?

9 A. PCT could be sold under the trademark
10 Aroclor. The trademark doesn't necessarily describe
11 the product. It's like some of the federal
12 trademark laws. It's just a name, that this is your
13 product.

14 Q. I have seen different numbers attached to
15 the name Aroclor. I believe that those numbers
16 reflect a percentage of chlorine.

17 Can you enlighten us some on that?

18 A. In addition to Aroclor being a registered
19 trademark of Monsanto, I think that the Aroclor with
20 the following digits were also registered
21 trademarks. The combination of the trademark
22 Aroclor with the other identifying code defined the
23 product. For example, Aroclor 1242, that was a
24 particular industrial grade chemical.

25 Q. Do you know what the 12 meant on that?

1 A. For certain of the Aroclors, and you'd have
2 to look at the specific products, the 12 indicated
3 that it contained 12 carbon atoms, and it was our
4 internal nomenclature for polychlorinated biphenyls,
5 the 1200 series. These were for pure
6 polychlorinated biphenyls.

7 Q. Do you know what the 42 number meant?

8 A. For a certain of the 1200 series, and this
9 is not a generic universal name, but the last two
10 digits indicated the average percent chlorine in the
11 industrial grade mixture, so which was an
12 identifying label of name for that particular
13 product.

14 Q. Do you know whether Pydraul AC contained
15 Aroclor 1254?

16 A. I'd have to look it up because there are
17 lists of these things and I'm not sure. I just have
18 to look it up.

19 Q. Assume that it did, because what we have
20 seen says that was the Aroclor in Pydraul AC. What
21 would the 1254 have meant?

22 A. In that case it would have indicated it was
23 a polychlorinated biphenyl fluid that contained 54
24 percent chlorine on the average.

25 Q. You know how many chlorine molecules were

1 attached to the structure in 1254?

2 A. Well, these are industrial grade fluids, so
3 Aroclor 54 is not a single component, it is a
4 distribution of components made by a chemical
5 reaction, but the average number of chlorines would
6 correspond to, I believe, five.

7 Q. So there would be some with more and some
8 with less?

9 A. Some with less.

10 Q. How would you test a substance to determine
11 whether it contained PCB's and what percentage of
12 chlorine or whether it had Aroclor 1254, 1242 or
13 some other kind of Aroclor? How would you test
14 that?

15 MR. MONGE: You talking about any substance
16 or looking at this particular substance to
17 distinguish it from a 1242?

18 MR. BAKER: Maybe I should narrow that
19 down.

20 Q. (By Mr. Baker) First, in general terms, if
21 I have a truckload of dirt here and want you to
22 determine whether it has PCB's in it, what kind of
23 testing would you do?

24 A. Talking about today's time frame?

25 Q. Today, yes.

1 A. Yeah, there are standard analytical tests
2 for various chemicals. These tests are generally
3 recommended by the ASTM, the American Society for
4 Testing Materials, which, again, is a private
5 society of the analysts who are involved in the
6 profession, who have developed standard protocols.
7 Most of these have been accepted by the federal
8 regulatory agencies as the standard methods of
9 preferred methods to use for testing.

10 For polychlorinated biphenyls there
11 are a number of standard tests, depending whether
12 it's soil, water or what not. Generally, it's done
13 by a chemical extraction or workup. This will vary,
14 depending on the media, and then the extract is
15 analyzed by a gas chromatograph.

16 Q. How would you distinguish between Aroclor
17 1254, Aroclor 1242 or any other in the range of the
18 different PCB's?

19 A. These are distinguished by comparison with
20 a known authentic sample of the original material.

21 Q. If you had a truckload of dirt that had
22 been exposed to Aroclor 1254, would there be a
23 possibility of having changes within that sample
24 that would cause some of the tests to say that there
25 was 1242 or 1260 or any of the other numbers?

1 A. There's an effect known as the weathering
2 effect. If the material has been exposed to soil,
3 to microbes, to the elements; wind, rain, heat, what
4 not, there will be some changes over the years.
5 There are more sophisticated tests that you can do.
6 Gas chromatograph coupled to a mass spectrometer in
7 comparison with specific individual peaks that are
8 in a sample, you wind up with a statistical
9 probability, what the sample is. What you generally
10 say though is if you have a truckload of soil that
11 this is like an Aroclor 1254 material, for example,
12 there were probably a dozen other kinds of PCB's
13 manufactured in the world by other companies. These
14 other companies didn't necessarily make samples of
15 their material available for comparison. Monsanto
16 did, and so the standard and the synonym has been
17 kept in. But to tell whether it's an Aroclor 1254
18 or a Kaneclor 500, which is a Japanese product, and
19 Clophen 50, which is a German equivalent, you would
20 be hard pressed to tell the difference, but you
21 would say it is like an Aroclor 54. It has
22 predominately five chlorines from the distribution,
23 but these were different, and if you compared all
24 the samples of these, if you could get them, they
25 would be different.

1 Q. You have named two other products that you
2 said were made in other countries and similar to
3 1254. Are there others?

4 A. Yes.

5 Q. Can you name any of those?

6 A. They were made in Spain, they were made in
7 Czechoslovakia, they were made in the iron curtain
8 countries. We don't even know the names of what
9 those were. They were just turning up now. But
10 Germany, Spain, France. Protolac. These are listed
11 in various EPA publications, in the NAB book, but
12 Germany, France, Spain Italy, Italian PCB's,
13 Japanese, they were made world wide.

14 Q. So I guess if you went to the north pole
15 and found a sample of ice that had something that
16 was similar to a 1254, you might say maybe that was
17 made by some other company?

18 A. You might say that. As a matter of fact,
19 PCB's have been found on islands. There are some
20 islands up in Michigan in the middle with no
21 industry. PCB's are carried strictly by air
22 currents around the world, no industrial contact,
23 and they have found PCB's from atmospheric
24 deposition on this island and all they can say is
25 it's PCB's. It might be like something -- they are

1 not sure what they are because they are mixed and
2 mingled with the air and may have been around a half
3 a dozen times, and that is part of the scientific
4 dilemma.

5 Q. And to your knowledge is there any way to
6 test the sample you referred to on the island to
7 determine whether it came from Monsanto or from
8 Germany or Japan or whatever?

9 A. Not to my knowledge, but the standard that
10 is used is it's Aroclor-like and it's primarily --
11 because those are the standards that have been
12 available. Monsanto made standards available for
13 research world wide.

14 Q. Ignoring the iron curtain countries for a
15 moment, outside the iron curtain countries do you
16 have an idea in general of what percentage of PCB's
17 were manufactured by Monsanto and what percentage
18 were manufactured in other countries?

19 MR. MONGE: If you know, and I assume
20 you're talking about -- I shouldn't assume anything,
21 I've done that too much, but that could have changed
22 over a period of time. There may still be some
23 production going on. I mean, if he knows, I'm glad
24 for him to answer.

25 A. That's hard to answer the question the way

1 that it's framed.

2 Q. (By Mr. Baker) Let me ask you a whole
3 bunch of little questions then.

4 Are you aware of any companies
5 manufacturing PCB's today?

6 A. Today I think I assume PCB's production
7 world wide has been stopped.

8 Q. Does that include the former iron curtain
9 countries?

10 A. Yes, but that's strictly speculation.

11 Q. When did Monsanto cease production of
12 PCB's?

13 A. 1977.

14 Q. When did Monsanto cease production of
15 Aroclor 1254?

16 A. 1977.

17 Q. Between 1977 and today were there other
18 countries that produced PCB's?

19 A. Yes, there were.

20 Q. To the extent that you know, tell us who
21 did it and for how long a period after 1977 they
22 did.

23 A. Most of the Europeans continued to produce
24 PCB's up until the mid-'80's. Germany may have
25 stopped first. The French and the Spanish

1 purportedly produced PCB's up until the '87, '88
2 time frame for sale world wide.

3 Q. Now, for the period from the beginning of
4 time through 1977, do you have a general idea of
5 what percentage of the world wide production of
6 PCB's was done by Monsanto and what percentage was
7 done by other companies?

8 A. No. Be hard to guess because -- the other
9 companies other than Monsanto, nobody has generally
10 published their world wide figures or provided their
11 information on PCB's even to the European common
12 market, the NATO, or to the World Health
13 Organization. The only hard numbers are Monsanto
14 numbers.

15 Q. If a plant in Kentucky used Pydraul AC for
16 15 years or more and samples were taken inside and
17 outside that plant and a substance that was similar
18 to Aroclor 1254 was found in several of those
19 samples and I were to ask you, what do you think the
20 source of that would have been, what would your
21 answer be?

22 MR. MONGE: Calls for speculation, but go
23 ahead.

24 A. Well, if they used Pydraul AC and if
25 Pydraul AC contains 1254, which I believe it does,

1 and they purchased Pydraul AC and you know what was
2 bought was in the drums, there is a high probability
3 that it's 1254.

4 Q. (By Mr. Baker) Could you personally try to
5 make a case that it wasn't a Monsanto product?

6 MR. MONGE: Object to that because that
7 calls for this witness to speculate on what he
8 personally would do, and I don't think we have -- I
9 don't think it's been raised. I don't think we
10 raised that as a defense, although there certainly
11 are areas very close to there that we have reason to
12 believe that there have been foreign PCB's used, but
13 we haven't --

14 MR. BAKER: Are you instructing him not to
15 answer that question?

16 MR. MONGE: No, he can answer for whatever
17 it's worth.

18 THE WITNESS: What's the question now?

19 Q. (By Mr. Baker) The question was: Based on
20 your knowledge, could you personally make a case,
21 using our hypothesis, that what was found was not a
22 Monsanto product?

23 A. You could always make a case. I think it
24 would be a case of how strong the scientific base
25 was. You would have to look at what the evidence

1 was.

2 Q. I won't ask you any more about that, in any
3 event.

4 Do you know when Monsanto first
5 started manufacturing Pydraul? You said you thought
6 it was the mid-'50's or so.

7 MR. MONGE: Pydraul AC?

8 A. I don't know definitely. I think Pydraul
9 AC I think was about the mid-'50's, early '60's.

10 Q. (By Mr. Baker) Do you know when Monsanto
11 first started moving PCB's?

12 A. Monsanto bought Swan Chemical Company in
13 1935, so Monsanto assumed the manufacture of PCB's
14 from Swan's plant and bought the Aroclor trademark
15 from Swan, so 1935 is the start date.

16 Q. And Swan had one plant that manufactured
17 PCB's?

18 A. That's correct.

19 Q. Where was that located?

20 A. Anniston, Alabama.

21 Q. Do you know when that plant opened?

22 A. I believe 1929.

23 Q. And Monsanto acquired the entire Swan
24 Company or some portion of that?

25 MR. MONGE: If you know.

1 A. I don't know. I've never seen a document.

2 Q. (By Mr. Baker) That's fine. Now, Monsanto

3 had another plant then where they manufactured

4 PCB's, did they not?

5 A. That's correct.

6 Q. Just one additional plant?

7 A. That's correct.

8 Q. Where was that located?

9 A. That was at Sauget, Illinois.

10 Q. Is that just across the river from St.

11 Louis?

12 A. That's correct.

13 Q. First, when did that plant open

14 approximately?

15 A. I don't know when the plant opened.

16 Q. Was it already open in '35 or sometime

17 after the Swan plant?

18 MR. MONGE: If you don't know --

19 MR. BAKER: If you don't know, that's

20 fine.

21 A. I don't.

22 Q. (By Mr. Baker) Do you know when Monsanto

23 began producing PCB's in the Illinois plant?

24 A. I don't know for a fact. About the time

25 that the Anniston facility stopped, okay?

1 Q. To your knowledge, for most of the time
2 between 1935 and 1977, Monsanto had one plant
3 producing PCB's?

4 MR. MONGE: Let me just say that you can go
5 ahead and answer that but you probably would get a
6 better answer to that kind of question from
7 Mr. Papageorge.

8 MR. BAKER: I'll just wait until tomorrow.
9 I don't want to put you on the spot on something you
10 don't know about.

11 Q. (By Mr. Baker) Are you familiar with the
12 uses of Pydraul AC?

13 A. From reading in the literature.

14 Q. In general, what was Pydraul AC used for?

15 A. Pydraul AC was generally sold for use as a
16 compressor lubricant.

17 Q. Was there also other uses?

18 A. It was used for other things but I think
19 its primary use was as a compressor lubricant. It
20 may have been used as a lubricant for other types of
21 equipment. Sometimes customers would use the same
22 fluid for various other pieces of equipment.

23 Q. What was the major selling point for
24 Pydraul AC that distinguished it from other
25 lubricants?

1 A. Safety, flame resistance, fire safety,
2 resistance to explosion.

3 Q. For companies who began using Pydraul AC as
4 a lubricant, what kind of lubricants did it replace?

5 A. Generally hydrocarbon lubricants.

6 Q. Petroleum base products for the most part?

7 A. Yes.

8 Q. And Pydraul AC was a synthetic replacement
9 for petroleum-based lubricants?

10 A. Synthetic is a hard definition in chemistry
11 to come by because hydrocarbon lubricants are
12 synthetic. They are made from crude oil. PCB's raw
13 materials come from crude oil but it replaced
14 straight hydrocarbons with just carbon and hydrogen
15 molecules which have a tendency to burn readily,
16 explode.

17 Q. But Pydraul AC was much more stable than
18 the products it replaced?

19 A. Absolutely.

20 Q. And that was the major selling points for
21 it?

22 A. Absolutely.

23 Q. From the beginning I assume that Monsanto
24 understood that Pydraul AC was a very stable
25 product, would you not say?

1 MR. MONGE: If you know.

2 A. Have from the very beginning. I don't
3 know, I was not involved in it. I assume so, but I
4 don't know.

5 Q. (By Mr. Baker) But at least when they
6 began making Pydraul AC and selling it as a
7 substitute for less stable petroleum-based products
8 they used, that it was much more stable?

9 A. From my reading, okay, of the literature
10 and the records that we have, Pydraul AC was
11 developed in response to request from the gas
12 industry for a much safer flame-resistant,
13 explosive-resistant lubricant because of several
14 catastrophic events that happened at compressor
15 stations.

16 Q. Do you know whether there were any studies
17 done prior to 1966 by Monsanto concerning the
18 biodegradability of Pydraul AC or PCB's in general?

19 A. I don't know.

20 Q. You don't know if there weren't any, but --

21 A. I don't know if they were or there
22 weren't. Biodegradability studies, by the way,
23 weren't routine studies that were done until some
24 point in time, and I don't know what that was.
25 Might have been the '70's or something, but they

1 were not a standard of the industry.

2 Q. Do you know what studies, if any, were done
3 by Monsanto prior to 1966 concerning the potential
4 adverse health effects of Pydraul?

5 A. I don't know of specific studies, no.

6 Q. Do you know of any studies done prior to
7 1966 concerning potential adverse health effects of
8 PCB's in general?

9 A. Yes. PCB's in general, but specifically
10 Monsanto Aroclor PCB's, the industrial grades as
11 manufactured by Monsanto, which means these are the
12 things that are manufactured from the plant
13 production line stuff, these things were tested for
14 acute health effects. Up until 1970 it's my
15 understanding that acute screens had been done,
16 chronic health effects, up through long-term animal
17 feeding studies had been done on some species.

18 Q. Do you know when those began?

19 A. Late '60's -- late '60's I would guess.

20 Q. Do you know of any such studies that were
21 done prior to 1966?

22 A. I couldn't say. I don't know if there were
23 or there weren't.

24 Q. We talked about biodegradability. Is it
25 biodegradability or is there another term,

1 biodegradation?

2 A. Both terms are used, biodegradability or
3 biodegradation.

4 Q. Do you know if prior to 1970 Monsanto had
5 done biodegradation studies on any other chemicals?

6 A. I don't know.

7 Q. Do you know anything about profitability of
8 PCB's and Pydraul AC?

9 A. No.

10 Q. That takes care of a whole bunch of
11 questions.

12 A. I'm not as old as I look. This was a gone
13 product when I became involved.

14 Q. I'm not as old as I look either. I believe
15 you mentioned gas chromatography earlier --

16 A. Yes.

17 Q. -- in some of our questions about how we
18 determine what was in a sample. When was that
19 developed?

20 A. It's hard to say. The first gas
21 chromatograph that I personally used was when I was
22 at graduate school -- when was that? 1958 to 1961,
23 so gas chromatography was in its infancy in 1960,
24 and the first reports of gas chromatography were
25 probably in the early 1960's.

1 Q. Do you know or have you read anything that
2 would tell you when Monsanto first received notice
3 that PCB's had been found in tissue samples?

4 A. Yes, from my reading and discussions at
5 Monsanto there was a report from Sweden. Some
6 Swedish researchers had found PCB's in the tissues
7 of either some fish or some birds. They were
8 looking for DDT and found an unknown --

9 Q. Would that have been an article published
10 in The New Scientist magazine about 1966?

11 A. That sounds reasonable, by Soren Jensen.

12 Q. And you were at that time I believe a work
13 group leader, not quite a group leader II?

14 A. I was barely at Monsanto at that time.
15 That was in 1966.

16 Q. Was that something that was discussed at
17 your level at all during that period?

18 A. I don't recall that.

19 Q. What's the basis for your knowledge of the
20 1966 report?

21 A. From reading the history of PCB's and the
22 available records and files of Monsanto and the EPA
23 and the National Academy of Sciences and the
24 published material that's available.

25 Q. Is that something that has occurred since

1 1970 or were you familiar with it before 1970?

2 A. No, that's occurred since I took this
3 function in 1980.

4 Q. Do you know or have you read in company
5 documents or learned from other persons at the
6 company what Monsanto's response was to that 1966
7 study?

8 A. Yes, from reading Monsanto's reports and
9 reports that Monsanto made to various federal
10 regulatory agencies, Monsanto discussed it
11 internally, and I think that people from Monsanto's
12 laboratories and St. Louis offices actually went to
13 Sweden to try to talk to Jensen to try to work with
14 him to determine what the peaks were and so forth.
15 We might have even provided him samples of material
16 to use for his comparative analytical studies.

17 Q. Do you know whether Monsanto conducted any
18 studies on its own?

19 A. I don't know specifically what studies
20 Monsanto did or did not do. I just don't know.

21 Q. Would Papageorge know about that?

22 A. Mr. Papageorge would know. I think he was
23 the man who was involved at that time.

24 Q. Was Dr. Kelly involved at all at that time?

25 A. Dr. Kelly was the medical director at that

1 time, so he would probably have known.

2 Q. During that time period from 1966 through
3 1970, after the report out of Sweden Monsanto
4 continued producing PCB's and Pydraul AC, did it
5 not?

6 A. From what time frame?

7 Q. From 1966 through 1970.

8 A. Through 1966 to a point in 1970. There's a
9 point in 1970 when Monsanto voluntarily stopped
10 selling PCB's for certain type uses, which included
11 the lubricant uses. These were defined as open
12 uses.

13 Q. Up to that point where you started
14 discontinuing production for certain uses between
15 1966 and 1970, in that time period did Monsanto take
16 any other steps either to protect its workers --
17 first let's talk about protecting workers first.

18 Did Monsanto take any additional steps
19 to protect it's workers from PCB exposure. To the
20 extent that he knows and has read, I have no problem
21 with him answering, but, again, I think that those
22 kinds of questions, you are going to get much better
23 information out of Mr. Papageorge. But having said
24 that, he can certainly answer to the extent of his
25 knowledge.

1 A. I don't know of any specific different
2 actions that were taken because the plants required
3 certain precautions for chlorinated organic
4 chemicals, and PCB's was created as a chlorinated
5 organic chemical and those safeguards were adequate.

6 Q. (By Mr. Baker) You don't know of any
7 safeguards between '66 and '70?

8 A. I don't know of any other.

9 Q. Do you know of any warnings to customers
10 made between 1966 and, let's say, the beginning, the
11 end of 1969?

12 A. I don't know -- I don't know specifically
13 in those days, no.

14 Q. Then you indicated that things started to
15 change in 1970?

16 A. Correct.

17 Q. Ultimately that led to discontinuing PCB
18 use for some uses?

19 A. Correct.

20 Q. Can you tell us when that process started
21 and, to your knowledge, what occurred along the way?

22 A. Until the discontinued use?

23 Q. Yes.

24 A. From my reading, Monsanto was concerned
25 about the reports of environmental persistence.

1 That was a new issue at the time. This was not an
2 issue that the scientific community was even aware
3 of or had been concerned with before.

4 Q. Environmental what?

5 A. Persistence. This means lack of
6 degradation. It just remains. PCB's weren't a
7 stable compound. It was designed to be a stable
8 compound, to be chemically inert so it wouldn't burn
9 readily, it would not explode, but in 20/20
10 hindsight you said, well, it should be persistent.
11 But from the time of the first reports it was a very
12 active program in the Monsanto research community
13 and that there was a function -- I don't know the
14 title of the function at the time. We call it
15 product acceptability now, which it's a manager who
16 is responsible for communicating health and safety
17 results for signet products, seeing that products
18 are acceptable according to the standards in place
19 by the public and the professional or technical
20 groups or regulatory groups at the time. They have
21 begun to look at this quite closely.

22 I know that Mr. Papageorge made
23 several trips to talk to people who had reported
24 these things. Monsanto searched the literature to
25 see what, if any, reports were available. When the

1 concern about chlorinated organic chemicals being
2 persistent came up, DDT was the prime question at
3 this time. This was about the time of Rachel
4 Carson's book Silent Spring. This was the first
5 published -- first major published piece of
6 literature that questioned the persistence of
7 chlorinated chemicals in the environment.

8 There were groups that were formed
9 within the scientific community that Monsanto
10 participated in. I know Mr. Papageorge represented
11 Monsanto with a group called The Interagency Task
12 Force on PCB's which was formed by the U. S.
13 Government and industry which included all of the
14 government agencies that were available at the
15 time. EPA I don't think was in force at this time,
16 and these started meeting in 1970; scientists from
17 industry, from the government, and I ought to
18 include Department of Commerce, FDA, USDA, it's just
19 an alphabet soup of government agencies, but this
20 report's available.

21 Mr. Papageorge was there and
22 represented Monsanto. All the information that
23 Monsanto had on testing, anything that we had, and
24 this is published in their report at this time.

25 Q. Approximately when was that?

1 A. The meetings began roughly in 1970, maybe
2 '69, about that time frame. The report was
3 finished in May of 1972. Drafts were out in '71.
4 Typical of a government report, it takes however
5 long it takes to get the thing printed and
6 published, but Monsanto participated in all these
7 scientific discussions. Monsanto made the decision
8 unilaterally that if there was concern about PCB's
9 building up in the environment, that it was
10 persistent, that they would take what steps that
11 were available to prevent its buildup until we could
12 determine if there was any harm. There was, and
13 there still is, a question within the scientific
14 community as to what, if any, harm is caused by
15 PCB's persistence from the environment. Health
16 effects were not the question at the time.

17 And so Monsanto took steps to limit
18 sales of PCB's, what they've defined as open uses,
19 and this has since crept, by the way, into the
20 regulatory life of the Toxic Substances Control
21 Act. Monsanto limited sales of PCB's for any open
22 uses. They continued sales for only totally
23 enclosed uses, which were certain electrical
24 applications and transformers which were defined as
25 being closed, and electrical capacitors which were

1 defined as being closed. Monsanto considered at the
2 time totally stopping manufacturing PCB's until --

3 Q. Was this in 1970?

4 A. This time frame, '70 to '72, but at the
5 request of the U. S. Government and electrical
6 manufacturers Monsanto continued to manufacture
7 PCB's for electrical uses because they were afraid
8 they would totally shut down electric power
9 distribution in this country because PCB's came in
10 with the electrification of America. To distribute
11 electrical power you almost had to have PCB's in the
12 equipment or for safety and for flame resistance.

13 So as a result of these meetings and
14 all Monsanto restricted PCB's sales to only what was
15 defined as totally enclosed uses, and this is
16 documented in the Interagency Task Force report. As
17 a matter of fact, Russell Trayne, who came in as the
18 first administrator of the EPA, said -- I don't know
19 if it's in this report or a subsequent report, that
20 Monsanto took steps which no agency in the U. S.
21 Government had the authority to do to limit sales
22 and use of this chemical at this time.

23 Q. Your first limiting of the use, did that
24 have anything to do with processing of food or
25 preparation of food?

1 A. No. PCB's were industrial chemicals. They
2 generally weren't sold for use with food products to
3 my knowledge. When you say for food products you
4 haven't defined what you mean.

5 MR. MONGE: If you've got a specific fluid
6 in mind, that might be helpful to him.

7 A. Pydrauls were not sold for food products.

8 Q. (By Mr. Baker) I understand that. What is
9 Therminol?

10 A. Therminol is a registered trademark of
11 Monsanto Company for flame-resistant heat transfer
12 fluids.

13 Q. Was there more than one Therminol?

14 A. Yes, and there is more than one family of
15 Therminols. To help you out, there is a Therminol
16 FR system and there's the Therminol system.

17 Q. Did some or all of those contain PCB's?

18 A. Therminols?

19 Q. Yes.

20 A. Therminols do not contain PCB's.

21 Q. Any Therminols at all?

22 A. Just the trademark Therminol is not a PCB.

23 Q. Any products that included Therminol that
24 have PCB's in them?

25 A. Therminol FR contained PCB's. Therminol

1 flame resistance -- I'm not trying to play games,
2 just trying to educate you, but the Therminol
3 trademark is alive and used today. They don't
4 contain any PCB's. They are the standard of the
5 industry for safety and for flame resistance, and
6 the Therminol heat and transfer fluid trademark is
7 alive, sold today, every day, used all over the
8 world.

9 Q. But there was a fire-resistant Therminol
10 that did contain PCB's?

11 A. That was manufactured and sold up until
12 about 1970, that's correct.

13 Q. And was that used at all in the preparation
14 of foods?

15 A. There were food processors who used heat
16 transfer fluids in the processing of foods
17 preparation. I don't know how broadly you construe
18 that.

19 Q. I don't mean to be difficult at all. It
20 was used in the processing of foods?

21 A. Yes.

22 Q. And was it your testimony that Monsanto
23 stopped selling Therminol with PCB's in 1970,
24 approximately 1970?

25 A. Monsanto stopped selling Therminol FR which

1 contained PCB's in roughly 1977, in that time
2 frame. There was a phaseout period and in roughly
3 1970 Monsanto announced that there was an
4 environment persistence problem; they were working
5 on what to do, and in this time frame from roughly
6 1970 to early '72 or late '71 all these open used
7 products that contained PCB's sales were stopped.
8 Is that a good enough answer?

9 Q. That's good enough for that question, thank
10 you. What did Monsanto tell its customers who had
11 been buying Therminol FR about this change?

12 A. I don't recall the specifics. The first
13 notices were when the environmental persistence came
14 out and Monsanto notified customers in general of
15 products that contained PCB's, okay, that PCB's had
16 been found in the environment and might have even
17 mentioned in Sweden that they were thought to build
18 up like DDT were and that Monsanto was going to look
19 into this and that probably some general -- I don't
20 know if it's -- general warnings like don't get it
21 on the ground, treat it like industrial chemicals.

22 Q. Were there any such warning letters before
23 1970?

24 A. To my knowledge there were a group of
25 letters that were sent in the early '70's. I can't

1 say as to what was done before that.

2 MR. MONGE: Again, go ahead and get the
3 information you can out of him, Mike, but I think
4 Mr. Papageorge will give you more.

5 MR. BAKER: I believe you.

6 Q. (By Mr. Baker) I don't want you to try to
7 answer anything you don't know the answer to, but
8 like I told you in the beginning, we're starting
9 from scratch here.

10 What's your familiarity with the
11 series of warning letters -- or, I'm sorry, series
12 of letters that went to customers concerning PCB's
13 in Monsanto products?

14 A. I have read these as a historical
15 document. I don't recall the specifics of the
16 number or the contents of these things but I have --
17 at one time I have read these.

18 Q. You weren't involved at all in the decision
19 to send them?

20 A. No, these were in the '70's. I only became
21 involved in the '80's.

22 Q. Are you familiar with labeling of Pydraul
23 AC?

24 A. Yes, I have read the historical files of
25 the labeling of various products.

1 Q. Was there ever a label on Pydraul AC
2 containers that mentioned PCB?

3 A. I don't know. I can't answer ever.

4 Q. Have you seen any Pydraul AC label that
5 mentioned PCB?

6 A. I don't know that I've ever seen a Pydraul
7 AC label, period.

8 Q. Do you know if other Pydraul products had
9 labels that mentioned PCB's?

10 A. At what time frame?

11 Q. First, at any time, and then we'll try to
12 narrow it down.

13 MR. MONGE: If you don't know, just tell
14 him you don't know, John.

15 A. I really don't know specifically.

16 MR. MONGE: How about a five-minute break?

17 MR. BAKER: Let's take a five-minute
18 break.

19 (A brief recess was taken.)

20 Q. (By Mr. Baker) Do you know a man by the
21 name of Cumming Paton or Paton?

22 A. Yes, I've met him.

23 Q. Do you know if he's still alive?

24 A. I believe he's still alive and I believe he
25 still works for Monsanto.

1 Q. So you believe he lives in the St. Louis
2 area?

3 A. I don't know. He was in the International
4 Division. I don't know where in the world he is
5 now.

6 Q. I don't guess you know what his position is
7 with the company now either?

8 A. Today, I don't know.

9 Q. Do you know in the early to mid-'70's what
10 his position was with the company?

11 A. I don't know his exact title at that time.

12 Q. Do you know in general what he did?

13 A. He was involved with PCB's, whether it was
14 product market or management or marketing or what
15 not, but he was involved with PCB's in the '70's
16 time frame.

17 Q. We have premarked a number of exhibits and
18 they are not in order. We use them in depositions
19 but they have our marks on them and I suppose the
20 court reporter may want to use some other
21 identifying mark, but this is a document we have
22 marked as Plaintiff's Exhibit 2.

23 I'll ask you first if you are familiar
24 with this document.

25 MR. MONGE: Take your time, take a look at

1 it. Why don't we use his marks, and if we end up
2 with missing numbers, if they are not there, they
3 will use your markings.

4 MR. BAKER: We will guarantee we will have
5 missing numbers.

6 A. I don't remember this document specifically
7 but the contents are familiar and the attachment
8 I've seen and some of the historical files.

9 Q. (By Mr. Baker) Let me just quickly go
10 through the names on here since you're our first
11 witness and tell me what you know about these
12 persons; what their job was then, whether they still
13 worked for the company.

14 You already know about Papageorge.
15 J. F. Stapleton?

16 A. Stapleton was in the Law Department at that
17 time. He may have been the head of the
18 Environmental Section.

19 Q. Do you know if he's still living and/or
20 working with Monsanto?

21 A. I think he's dead.

22 Q. P. S. Park has a hyphen and something else
23 there. I thought maybe an address.

24 A. E Building was the law building, probably
25 was an address. He was -- he retired several years

1 ago. He was the environmental counsel at the time
2 he retired.

3 Q. To your knowledge is he still living?

4 A. As far as I know.

5 Q. T. O. Gossage?

6 A. He's retired from Monsanto Company. I
7 think he's CEO of Hercules Company.

8 Q. You know what his position was with
9 Monsanto roughly in 1973?

10 A. He was in Marketing. Could have been
11 either director of sales or director of marketing.

12 Q. W. N. Maddox?

13 A. I don't know him, no.

14 Q. Then there are a number of persons down
15 here that this Cumming Paton memo was sent to.
16 Let's just run through the list and quickly identify
17 those to the extent that you can.

18 J. Armentor?

19 A. Don't know him.

20 Q. R. S. Bevacqua?

21 A. He was a salesman.

22 Q. Boutin or Boutin?

23 A. Don't know him.

24 Q. J. G. Bryant?

25 A. He was a salesman.

1 Q. R. J. Christman?
2 A. No.
3 Q. C. L. Clay?
4 A. No.
5 Q. P. D. Craska?
6 A. No.
7 Q. H. R. Ford?
8 A. I think he was a salesman.
9 Q. Are there any names you see on here who are
10 persons other than salesmen?
11 A. I would imagine this was the sales force,
12 just from the office addresses at that time, you
13 know. Salesmen change.
14 Q. And you did not get a copy of this memo at
15 that time? You've just seen parts of it.
16 A. At this time I was doing other things.
17 Probably Hydrocarbons Division.
18 Q. I'll ask that be identified but we're not
19 moving to admit it.
20 Show you a document we have marked as
21 Plaintiff's Exhibit 3, which is a document that was
22 produced by you in response to our request for
23 production of documents.
24 MR. MONGE: By "you," meaning Monsanto?
25 MR. BAKER: Monsanto. My first question

1 is: Is there a better copy somewhere?

2 MR. MONGE: I don't know. I expect there
3 might be but I don't know that. What that says is
4 -- help me out. Log of PCB incineration letters,
5 customers, and Monsanto something, and I know that,
6 Mike, because I've asked that same question.

7 MR. BAKER: I would ask on the record if
8 you find one that's a better copy, would you please
9 produce one for us?

10 MR. MONGE: I think the rest of the
11 document, from my review of it, is legible. The
12 only illegible part of it that I have had trouble
13 with was the same thing you did, and that was the
14 cover sheet. If we can find something better, I
15 will, but I don't know that there is anything else.

16 Q. (By Mr. Baker) Mr. Craddock, I will ask
17 you if you are familiar with this document.

18 A. I don't think I've ever seen this before.

19 Q. I will not ask any further questions about
20 it. Let me ask you a general question about the
21 documents.

22 Who were the persons responsible for
23 putting together the documents in response to our
24 request for production of documents?

25 A. The Law Department staff.

1 Q. Were you involved at all in putting them
2 together?

3 A. I read the questions and the answers and
4 what not and looked at some of the things that were
5 put together, but I did not --

6 MR. BAKER: I will ask, is there someone
7 with the Law Department staff who will be available
8 to answer questions about where these came from or
9 do they all claim some kind of privilege?

10 MR. MONGE: I don't know the answer to that
11 at this time, so I'll defer that, but I will respond
12 to you on that. That's about the best I can tell
13 you at this time, Mike.

14 MR. BAKER: Mr. Craddock, if you were not
15 involved in putting together the documents and if
16 you were not in a position when most of these
17 documents in the '60's and early '70's were prepared
18 and circulated, I don't think I will waste your time
19 in going through each of those and asking you
20 questions about them.

21 I will say that we may try many of
22 them with Mr. Papageorge tomorrow, but at some point
23 we will like to have someone produced who can
24 respond to questions about these documents.

25 MR. MONGE: Again, I'll withhold response

1 to that other than to say I rather suspect that on
2 many of the documents that you will receive answers
3 from Mr. Papageorge that will probably satisfy your
4 inquiries on those.

5 Q. (By Mr. Baker) Are you familiar with a
6 condition known as chloracne?

7 A. Yes, I've heard of chloracne and I've read
8 some about it.

9 Q. What is chloracne?

10 A. Chloracne is a very special severe case of
11 acne. It's almost a misnomer according to
12 physicians that I've talked to. It's caused by
13 exposure to certain types of chlorinated chemicals.
14 It's pustules that resemble teenage acne, except
15 it's much more severe.

16 Q. Has there been a problem with workers or
17 was there a problem with workers who manufactured
18 PCB's developing chloracne?

19 A. From the literature in the early '30's
20 there were some reports of some skin problems of
21 some plant workers. That's about the only report
22 that I know of that's published.

23 Q. This may be a futile gesture but I'll ask
24 you if you know of any steps Monsanto took to study
25 that problem and to attempt to remedy it.

1 MR. MONGE: Let me just object to the
2 question on the basis that his early activity was in
3 the early '30's and I believe the incident he's
4 referring to was prior to Monsanto's ownership of
5 the Swan Chemical facility. With that objection and
6 clarification, he can answer, if he knows.

7 A. Dr. Kelly was involved with some material
8 and it's my recollection just from reading the
9 literature and was about the transition of the plant
10 from Swan to Monsanto that there were some workers
11 who had some skin problems and there was some
12 studies that were done I believe at Harvard or
13 somewhere that Monsanto instigated and sponsored and
14 this information is published in the open
15 literature.

16 It's my understanding from reading the
17 literature it was more of a personal hygiene problem
18 rather than a specific PCB problem. It's very hard
19 to determine what it was. If you read the
20 literature, they talk about PCB's and other things
21 such as chlornaphthalenes which are much more --
22 other chlorinated compounds with impurities are much
23 more known to cause severe problems that you have.
24 PCB's are not really considered by most physicians
25 that I've talked to to cause chloracne. They cause

1 some skin rash but it's not as severe as chloracne.

2 If you talk to a dermatologist, there
3 are a couple who say they have only see seen one or
4 two cases of chloracne in their whole career.

5 Chlorinated hydrocarbons in general
6 can give some people allergic reaction. For
7 instance, people that can't wear suits that are dry
8 cleaned, they get the same type of thing. They get
9 the red rashes and what not, but that's not
10 chloracne. But it's not the severe pustules stuff,
11 so there's some misunderstanding and misthought
12 about what chloracne is. There are some reports in
13 the literature, and Dr. Kelly would be involved with
14 that.

15 Q. Is it the position of Monsanto that PCB's,
16 particularly the more highly concentrated 1254 or
17 1260, that they do not cause potential health
18 problems?

19 MR. MONGE: Let me object to the form of
20 the question. You used the term "highly
21 concentrated," and I --

22 MR. BAKER: If I change it to "more
23 concentrated" would that change the objection?

24 MR. MONGE: No, it really wouldn't, because
25 I'm not sure what that means in terms of that

1 question, but he may know.

2 A. Let me help you, okay? Aroclors are all
3 highly concentrated. Aroclors are a hundred percent
4 PCB's. They are just different fractions, okay?
5 They are different products, okay? So all Aroclors
6 are highly concentrated.

7 Q. (By Mr. Baker) What I mean is with more
8 chlorine content is what I mean.

9 Is it the position of Monsanto that
10 Aroclor 1254 is not hazardous to human health or
11 does Monsanto agree that there are potential health
12 hazards to 1254?

13 MR. MONGE: To the extent the question can
14 be answered in that form, you may answer it.
15 Understanding that he's just -- it's a general
16 question.

17 A. It's Monsanto's position, and it's my
18 professional position, that PCB's are no more
19 hazardous to human health than any other chlorinated
20 organic chemical. This is based upon published
21 health studies, epidemiological reviews done
22 primarily in government and university laboratories
23 where they've collected extensive data on
24 occupational exposed workers. These are the most
25 exposed people, exposed a 40-hour work week, some of

1 them as long as 20 or 30 years in manufacturing
2 facilities other than Monsanto plants, primarily
3 because Monsanto manufacturing facilities, they are
4 closed units. There are places that these are used
5 in other manufacturing facilities where people
6 actually come into daily skin contact and based upon
7 the published information and the health studies
8 that's available in the literature, it's our
9 position that PCB's are no more harmful to human
10 health than other chlorinated hydrocarbons, and --

11 Q. Okay, does Monsanto take the position as to
12 whether Aroclor 1254 is more or less biodegradable
13 than other chlorinated hydrocarbons?

14 A. It's a generally accepted principle of
15 chemistry and science that the more chlorine content
16 on the specific molecule, the less biodegradable
17 that it is, so we believe that chlorinated
18 hydrocarbons, including PCB's, are biodegradable to
19 a certain extent. It's just a question of a
20 chemical reaction.

21 For years people said PCB's don't
22 biodegrade and we now know that's wrong. And the
23 EPA is trying to write into the regulations
24 technologies to allow bioremediation of contaminated
25 soil. It's a question of reaction. And it's a

1 generally accepted principle of science that the
2 higher the chlorine, the slower the rate.

3 Q. And Aroclor 1254 has a high chlorine level?

4 A. Well, it's higher than 48 but it's less
5 than 60 or 68. It's intermediate.

6 Q. If special biodegradation efforts are not
7 made, how long does it take for Aroclor 1254 to
8 biodegrade?

9 A. This is a subject of conjecture because
10 biodegradation is a function of the natural
11 microorganisms in the soil and the local conditions,
12 but it's a generally accepted principle in
13 regulatory agencies, for instance, that monochloro
14 biphenyls degrades -- has a half-life, say, of the
15 order of days. A dichloro is the order of weeks. A
16 trichloro biphenyl is the order of months, the time
17 it takes for half of it to decrease. When you get
18 higher than that, it moves up to the order of
19 years. And these haven't been characterized because
20 it's harder to make those measurements but this is
21 the way the scientific theory is evolving. I don't
22 think there's a published number for 1254, which
23 would be essentially a penta, a five chlorine
24 average.

25 Q. As you increase that, it is not a

1 mathematical progression, it's more a geometrical
2 progression; is it not?

3 MR. MONGE: Objection, unless you --

4 A. That's hard to define. It's just inherent
5 in the chemistry of the beast. You'd actually have
6 to make the measurements to see.

7 Q. (By Mr. Baker) Do you have an opinion as
8 to the half-life of Aroclor 1254 under ordinary
9 conditions? I know that's a general phrase and may
10 draw an objection, but I --

11 MR. MONGE: It will draw an objection
12 because it is a general phrase and he has indicated
13 that in many cases, in all cases, it depends upon
14 the nature of the local terrain, the condition of
15 the soil and so forth. With that objection and
16 trying to keep things going here, if he can answer
17 it.

18 A. It's the order of years, okay? Whether the
19 half-life is five or 10 years, I don't think those
20 measurements have been made, but it would vary
21 because of local conditions.

22 Q. (By Mr. Baker) Have you seen any studies
23 that would give us estimates under any conditions?

24 A. There are beginning to be, in the
25 literature, published studies. I don't know whether

1 they've actually put half-lives to these or not but
2 there are studies in the Hudson River published by
3 General Electric Company, but I don't recall any
4 half-lives of being --

5 Q. Does Monsanto acknowledge that there are
6 plants such as perhaps the Kentucky Hydrocarbon
7 Plant in Kentucky -- and I'm not asking you to speak
8 specifically to that, but do you acknowledge that
9 there are plants where PCB's are in the soil?

10 A. Yes, there are places where PCB's are in
11 the soil from spills, accidents and so forth.

12 Q. Do you acknowledge that there are places
13 where PCB's have escaped through the normal use of
14 the product?

15 MR. MONGE: Object to the term "normal use
16 of the products." And I think in fairness to the
17 witness, Mike, that normal use of the product would
18 include all kinds of things because PCB's, as you
19 know, were used in many different settings and I
20 think in fairness to him you ought to pin that down
21 a little bit more specific, but he can answer. I'll
22 let him answer.

23 A. I'll answer with a qualifier. For
24 instance, today PCB's are allowed to be used for the
25 rest of their useful life in electrical transformers

1 and capacitors under certain conditions. Their
2 normal use is hanging on a pole. Every time there
3 is a lightning storm these things escape because if
4 lightning hits one of those things EPA says that's
5 not a spill, nobody spilled it. Under normal use
6 conditions, material ruptured, whatever it was, and
7 it contaminated the ground under it, and so that's a
8 fact.

9 Q. (By Mr. Baker) In such instances where the
10 ground is found to be contaminated by PCB's, is it
11 Monsanto's position that there should be some effort
12 undertaken to clean that up?

13 A. Yes.

14 Q. So while you don't admit that there are
15 health risks from it, you do agree that where there
16 are spills, they should be cleaned up?

17 A. It's required by federal regulations.

18 Q. But aside from the question of federal
19 regulations.

20 A. We would clean up PCB's as we would clean
21 up any other industrial chemical, you know. At our
22 plant we have plant safety and maintenance practice
23 codes that require that if we spill water our men
24 are required to clean that up to certain standards,
25 you know. If they spill anything they are required

1 to maintain that area.

2 Q. The cleanup for PCB's is generally a little
3 more complicated than cleaning up water though; is
4 it not?

5 A. In some cases, yes.

6 Q. And more expensive?

7 A. In some cases.

8 Q. Does Monsanto have a position as to who
9 should be responsible for paying for the cleanup of
10 spills of PCB's?

11 MR. MONGE: Object to that; instruct him
12 not to answer. That calls for a legal conclusion
13 and this witness will not be allowed to answer that.

14 Q. (By Mr. Baker) To prove that we are going
15 to have some exhibits that are numbered, for the
16 time being I'll show you a document that's marked as
17 Plaintiff's Exhibit 13 and ask you if you are
18 familiar in general with this kind of document, and
19 then specifically with this particular one.

20 A. I am familiar with this type of document.
21 I have probably seen a form of this 54. Yes, I'm
22 familiar with this type of --

23 Q. First, what is an MSDS?

24 A. MSDS is an acronym for Material Safety Data
25 Sheet.

1 Q. And with whom were those required to be
2 filed?

3 A. I don't think they are required to be filed
4 with anybody. They were required to be prepared,
5 and the regulation on these have changed and I can't
6 tell you exactly what they were.

7 In the original days when OSHA started
8 you were required to have Material Safety Data
9 Sheets in your plant for materials that were in your
10 plant primarily for the use of workers or anybody
11 who was in the area who wanted to see what chemicals
12 they might become involved in, what was known about
13 them, so I guess to qualify my answer, you were
14 supposed to keep a file of them in your own
15 facility.

16 Q. And what kinds of facilities were required
17 to keep a set of these documents?

18 A. I think anybody who used these chemicals.
19 If you used certain chemicals or ingredients in your
20 facility, anything from things like floor cleaning
21 materials, if they contained certain chemicals or
22 gasoline, you had to have them as well as other
23 industrial chemicals.

24 Q. This is a document Monsanto produced to us
25 in response to our request for production of

1 documents. I will ask you if this is the MSDS sheet
2 for Aroclor 1254 at Monsanto. If you can tell me
3 the date. There are different dates on here.

4 A. It's my understanding from reading this,
5 okay, this is a Material Safety Data Sheet for this
6 particular product. The trade name is Aroclor
7 1254. It was prepared in May of 1971 according to a
8 certain OSHA format, okay?

9 Q. And on the second page of that about half
10 way down, Section 7, it has spill or leak
11 procedures. Who would have determined what those
12 procedures were? Is it something that a federal
13 agency has told you or something that Monsanto
14 decided especially?

15 A. I don't know, I wasn't involved in
16 preparation of this particular issue.

17 Q. But at that time, your spill and leak
18 procedures for Aroclor 1254 were apparently to
19 absorb other absorbent material, place in drums,
20 bury in approved chemical landfill in accordance
21 with state and legal regulations?

22 A. Correct.

23 Q. I can't read the form directly above that
24 statement I just told you. Below that it says
25 "Waste disposal method." Then refers to burning in

1 incinerators. What's the difference between those
2 two?

3 A. I would think the first was probably steps
4 to be taken or procedures to be followed. Then the
5 actual disposal might be cleanup procedures or steps
6 to take.

7 Q. How would you decide whether to burn it in
8 an incinerator or bury it in a chemical landfill?

9 A. Both of these say in accordance with local
10 and state regulations, so I would assume from
11 knowing what I know about MSDS now and from reading
12 this, there were probably set procedures at this
13 time that specified how and where chemicals could be
14 disposed of and that the first thing they told you
15 to do was you had to clean this up, and this is how
16 to clean it up. And then after you clean it up,
17 what do you do with it, and you have to follow the
18 existing regulations. And at this point in time
19 each state, each locale, some counties, have
20 different regulations. That's when the first
21 environmental regulations came to be. They were not
22 standard. EPA was probably not in place at this
23 time, and so the information is follow your local
24 regulation.

25 Q. So you didn't tell people to do anything

1 other than comply with state and local regu.

2 A. These were usually fairly specific,
3 state and local regulations theoretically met the
4 required safety and health requirements known at the
5 time.

6 Q. I agree you shouldn't tell them not to
7 comply with the state and local regulations, just a
8 question of the company position was if they comply
9 with state and local regulations, they don't need to
10 do anything else?

11 A. Fine. They would satisfy the health and
12 safety requirements that were known at the time.

13 Q. Now I want to show you another sheet marked
14 as Plaintiff's Exhibit 14, which appears to be more
15 current.

16 A. I'm very familiar with this, yes.

17 Q. What is this document?

18 A. This is a newer version of the Material
19 Safety Data Sheet that I caused to be issued and
20 drafted shortly after I got this position, and you
21 can see the date is September 1988, and I know this
22 because it's page 1 of 4.

23 The Material Safety Data Sheets
24 roughly at this point in time were undergoing
25 revisions that were going to be required by the

1 federal government within the next calendar year and
2 so we were getting lots of questions as to do you
3 have a Material Safety Data Sheet on PCB's.
4 Generally, they were for all types of products.

5 These things just didn't exist. There
6 is lots of confusion as to what is a PCB, what kind
7 of products and what not, so for our own use, for
8 our own plant facility use, for the general public
9 and regulatory agencies we produced what's called a
10 generic Material Safety Data Sheet for PCB's, which
11 is what this is.

12 Q. This document was prepared under your
13 direction?

14 A. This document was prepared under my
15 direction, yes, and my name appears on the last
16 page.

17 Q. Yes, and this document related to all PCB's
18 manufactured by Monsanto in 1980?

19 A. This document related to PCB's manufactured
20 by Monsanto and in general. We tried to put forth
21 as much information that was available in the public
22 domain as well as Monsanto's information relating to
23 these particular sections on PCB's.

24 Q. What persons would this have been made
25 available to?

1 A. This was made available to all of our
2 facilities. It was made available to any customers,
3 former customers, who requested it. It was made
4 available to regulatory agencies. EPA requested
5 these and used these. We sent these out by the
6 hundreds. As a matter of fact, this particular
7 safety data sheet was a new format and this was
8 approved by OSHA as being equivalent to the short
9 form you showed me previously.

10 Q. But as far as customers are concerned, you
11 sent this only to those that requested it?

12 A. That's correct, because you were not
13 required to produce this document because PCB's were
14 not manufactured. Therefore, the document was
15 prepared and it was made available to anyone who
16 requested it.

17 Q. On the first page, half way down the first
18 page, there's a heading, "Warning Statements," and
19 there are various forms of the labels there. It
20 says federal regulations under TSCA require that
21 PCB's be marked with these labels.

22 When did you first start using labels
23 such as this?

24 A. The TSCA regulations were promulgated May
25 31st 1979. They became effective July 2nd 1979, and

1 there was some grace period when these labels were
2 required to be used. Might have been a year later
3 but at that time period. As soon as they were
4 available people began to use them, including
5 Monsanto.

6 Q. And I notice in each of these the biggest
7 most bold-faced print on any of those labels has
8 three letters, PCB?

9 A. That's correct. These are specific PCB
10 labels. PCB's are the only chemical name in the
11 Toxic Substances Control Act.

12 Q. Prior to the effective date of TSCA did
13 you, or your company I mean, use labels that had PCB
14 in big bold-faced print?

15 MR. MONGE: Object to the form of the
16 question on what is big bold-faced print, but if he
17 knows, he can certainly answer.

18 A. There were some labels that were for PCB's
19 that were continued to be sold after the 1972 time
20 frame, and these were all labeled that it contains
21 PCB's in some way or another.

22 Q. (By Mr. Baker) Prior to the 1972 time
23 frame are you familiar with any label that Monsanto
24 produced that said PCB at all on it?

25 A. I don't know.

1 Q. You do have on the bottom of the front page
2 emergency and first aid procedures. The top of the
3 second page, occupational control procedures. Were
4 those different for PCB's than they were for other
5 compounds?

6 A. There are some differences. These are
7 generally -- these will apply to many industrial
8 chemicals and they will more specifically apply to a
9 lot of chlorinated organic chemicals as well as
10 PCB's. The first two, ingestion, skin contact, will
11 apply to anything except that -- well, it would
12 apply to any industrial chemical, so if you take the
13 name PCB out --

14 Q. Were these things required by federal law
15 or the things that Monsanto did on their own?

16 A. No, these were developed by Monsanto based
17 on our standard labeling practices and, again, some
18 were set up by industry groups.

19 Q. Under occupational control procedures, the
20 second heading there is Threshold Limit Value, TLV.
21 What is that?

22 A. OSHA had come into being, Occupational
23 Safety & Health Administration, at some point in
24 time about this time before 1980, I don't know
25 exactly when, probably the late '70's, and they had

1 begun to publish certain recommendations and
2 requirements. One thing OSHA published was -- this
3 is a particularly defined item, Threshold Limit
4 Value, and off the top of my head I can't tell you
5 exactly what it means because it differs a little
6 bit from a couple of other things, but the OSHA
7 standard and there's a table for various chemicals
8 that was subsequently incorporated into the OSHA
9 rules and regulations. So this is the inhalation
10 standard, the only one that I know of that has force
11 of law behind it. This is the standard for a plant
12 or manufacturing facility. Do not exceed these
13 values.

14 Q. That is for the air?

15 A. That's air.

16 Q. And I notice there are two different
17 strength or percentage chlorine PCB's listed there;
18 42 percent and 54 percent. I assume 42 percent is
19 Aroclor 42 and 54 percent is Aroclor 54?

20 A. That's correct, but the numbers are --
21 these are generic for any PCB's that had that
22 approximate content.

23 Q. Were there threshold limit values for any
24 other PCB's?

25 A. For whatever reason OSHA just decided to

1 pick two out of the range because they were a whole
2 range of products. These were the two that at this
3 time period were the most sold.

4 Q. So you believe the reason these two were
5 listed or were used by OSHA is they were most
6 prevalent?

7 MR. MONGE: If you know.

8 A. I don't know. That's my guess.

9 Q. (By Mr. Baker) It's interesting that 42
10 percent of Aroclor 1242 has a 1 milligram per -- is
11 that cubic meter?

12 A. Right.

13 Q. That's 1 milligram of PCB or 1242 per cubic
14 meter of air?

15 A. Correct.

16 Q. Then the 1254 limit is half that?

17 A. Right.

18 Q. Is that because someone thought that 1254
19 was twice as strong as 1242 in terms of potential
20 adverse effect?

21 A. I don't know what was in OSHA's mind when
22 they did that. I can speculate and give you some
23 technical answers. One is --

24 MR. MONGE: Don't speculate if you don't
25 know.

1 Q. (By Mr. Baker) I don't want you to
2 speculate, but if you can give me some technical
3 answers as to why it would be acceptable to have
4 twice as much 1242 as 1254 --

5 MR. MONGE: I don't mind him giving you
6 that but what I always concern myself with, Mike, is
7 that later on when we go to trial and you've got
8 somebody that comes on and says something completely
9 different and you put him on and he's trying to sit
10 there and defend what he said, and I don't want the
11 witness to get caught in that kind of a trap. But
12 with that understanding, if you want him to give you
13 what he thinks, I'll let him do that.

14 Q. (By Mr. Baker) What do you think?

15 A. I think it's not just a factor of two,
16 okay? I think they were trying to have a range.
17 They were always based on actual measurements. They
18 tried to do an inhalation chamber, and inhalation
19 chamber experiments are a real bear to do. 1254 is
20 so less volatile than 1242 because the difference in
21 the inhalation is 150 degrees centigrade trying to
22 get the maximum tolerated dose to cause an effect.
23 They put rats in these things and try to make them
24 start gasping or something. That's the way the
25 inhalation chamber is, that's what I think it is,

1 and you just have trouble heating it hot enough, you
2 know, to get that much in the air because, you know,
3 unless the air is that hot, it's going to condense
4 and come back out as vapor, so I think that was
5 probably the upper limit they could attain, and I
6 don't know if that caused a problem. You would have
7 to go read the OSHA reports to find out. But that
8 is the published standard, and very seldom do you
9 find that in any plant facility. You can't measure
10 it that high.

11 Q. I won't ask you any more about that. I'm
12 not trying to set you up --

13 A. No, but it's technical. It's a good
14 question, but you see how they do it --

15 Q. The physiological effects?

16 A. Yes.

17 Q. And this was something that was prepared by
18 you or under your direction?

19 A. This was prepared under my direction.

20 Q. And you mentioned literature reports about
21 PCB's impairing reproduction function in monkeys?

22 A. Right.

23 Q. And reports about Aroclor 1260 causing
24 liver cancer. Then you have a study that you say
25 you did that didn't produce cancers. Then down

1 below that --

2 A. National Cancer Institute did a study that
3 didn't produce cancer; not me, not myself.

4 Q. I thought the sentence before, that
5 Monsanto sponsored animal feeding studies.

6 A. I'm sorry, Monsanto sponsored the studies,
7 that's correct, and the National Cancer Institute
8 performed studies also, okay?

9 Q. Says it was not carcinogenic under the
10 conditions of their bioassay?

11 A. That's the wording, exactly, out of the
12 National Cancer Institute's report, they did not
13 find cancer.

14 Q. Do you know what the conditions of their
15 bioassay were?

16 A. They were pretty much the conditions of the
17 worker who found cancer. This has been a subject of
18 scientific disagreement for decades. As a matter of
19 fact, it has just recently been redone, all of the
20 studies, and there is a question -- the question,
21 even now, is: Do PCB's cause cancer at all?

22 Q. But then in the next paragraph you noted
23 that the consistent finding in animal studies is
24 that they produce liver injury following prolonged
25 repeated exposure by any route.

1 A. That's correct. Same as any other
2 chlorinated hydrocarbon. If you do that -- if you
3 substitute that, you could have taken that out and
4 put chlorobenzene, you get the same result. Dry
5 cleaning fluid, chlorethylene.

6 Q. And then, finally, on the next page, your
7 reactivity data, you don't list a half-life but you
8 didn't know that, but you didn't know is a fair
9 statement?

10 A. That's correct.

11 MR. BAKER: I would move Plaintiff's
12 Exhibit 14 be admitted into evidence.

13 MR. MONGE: I don't have any objection to
14 that.

15 Q. (By Mr. Baker) Are you familiar with a
16 recent study done I believe in 1991 I believe at the
17 Bloomington Westinghouse Plant by the OSHA?

18 A. I have read the abstract of that study in
19 some of the newspaper accounts.

20 Q. Have you seen the full report?

21 A. I don't know if I've seen the full report
22 or not. As I say, I've seen an abstract and
23 sometimes a summary report is like that and a full
24 report is like that. I don't think I've seen the
25 full report.

1 Q. But you have seen the abstract?

2 A. I have seen the abstract.

3 Q. Do you recall the conclusion in that
4 report?

5 A. I don't. There are a couple of reports
6 that have come out of that thing and I don't think
7 -- the results are somewhat contradictory from the
8 early reports to the later reports and I'd have to
9 have them in front of me to --

10 Q. If I told you that our view of that report
11 said that it concluded that exposure to PCB's may
12 cause a significant increase in the risk of brain
13 cancer, would you agree that was part of that report
14 or --

15 MR. MONGE: My objection is that's your
16 conclusion. He doesn't have the report in front of
17 him. He's told you that he doesn't recall exactly
18 what it said, but he can answer that to the extent
19 he can answer.

20 A. I remember that report came out. I think
21 it also says the results are not statistically
22 significant. In scientific lingo it means it's
23 probably not so.

24 Q. I object to that answer, but I guess that's
25 not my job.

1 Mr. Craddock, have there been
2 discussions, internal discussions, among Monsanto
3 executives concerning that report?

4 A. When you say internal discussions among
5 people in Monsanto, I've talked about it with people
6 that I work with, you know, because we follow these
7 things and we look at those things, and I don't know
8 how broadly they talk about it. I'm sure that they
9 have. I can't --

10 Q. I won't ask you any more about that.
11 Are you familiar at all with the
12 pamphlets that would have gone to some of the
13 customers who purchased Pydraul AC?

14 A. Old sales literature?

15 Q. Yeah.

16 A. No, most of that stuff's out of print.
17 It's not even available.

18 Q. Do you know a gentleman by the name
19 D. A. Olsen?

20 A. Yes.

21 Q. Is he still employed by Monsanto?

22 A. No, he's not.

23 Q. Is he still alive to your knowledge?

24 A. To my knowledge, he's still alive. Saw him
25 a couple of years ago at Christmas.

1 Q. Do you have any idea where he lives?
2 A. He may still live here in St. Louis.
3 Q. You know a gentleman or a person by the
4 name of N. S. Johnson?
5 A. I know the name. I don't know him
6 personally. I think he was a salesman at one point
7 in time.
8 Q. Do you know if he still is employed by
9 Monsanto?
10 A. No, I don't know.
11 Q. You don't know if he still lives in the St.
12 Louis area?
13 A. No.
14 Q. Do you know a gentleman by the name of
15 Larry Bradford?
16 A. I know the name but I don't know him
17 personally. I don't recall what his function was.
18 Q. You know whether he is employed with
19 Monsanto or lives in the St. Louis area?
20 A. I don't know.
21 Q. Do you know a gentleman by the name of
22 Howard Buergin?
23 A. I've met Howard Buergin and I know the
24 name. He's no longer with Monsanto.
25 Q. Do you know what his position was in the

1 early '70's?

2 A. He might have been the division manager or
3 whatever it was, or the business group manager at
4 that point in time. He might be dead now.

5 MR. MONGE: I believe he is.

6 A. I think he's dead now.

7 Q. (By Mr. Baker) I only ask you these
8 questions because you're the first one here and you
9 signed interrogatories. We asked for production of
10 a number of documents and you provided us with a
11 number of documents. Part of that request was for
12 correspondence to and from Kentucky Hydrocarbon or
13 Equitable Resources. We were given copies of some
14 letters that were unaddressed that appeared to be
15 form letters that may have gone to any number of
16 companies, and I will tell you that many of those
17 things -- our position is that Kentucky Hydrocarbon
18 did not receive those.

19 I want to ask if there are any lists,
20 computer-generated or otherwise, that would show the
21 persons to whom these letters were sent or if there
22 are any copies that would have the addressee
23 actually listed on the letters?

24 A. To my knowledge there are no specific lists
25 of people who got those, or addressees. To my

1 knowledge those letters were sent to anybody that
2 was on a computer sales list that had bought those
3 products at a given time. Or whatever list. I
4 don't know whether it was computed at that time or
5 not, but it was the sales list, whatever it was at
6 that time.

7 Q. Who would know what companies were on that
8 list?

9 A. Well, as I say, I don't know if there is a
10 specific list. It would be a list of customers. If
11 we still have the list of customers it would be in
12 the archives with the rest of these documents. If
13 that was one of these specific requests in that
14 document, we made a diligent search. These people
15 were told to look and see if you can find these
16 specific things and specific things that you had
17 asked me.

18 Q. Now I'm more interested right now in
19 persons who might have actual knowledge. We're
20 talking about going back 20 years.

21 A. I don't know who is left who would have
22 that. I don't know. I don't know. I don't know
23 who was in the business group at that time other
24 than these letters that you showed me, and I don't
25 know who had responsibility for putting together

1 that mailing list.

2 Q. Something else that we've noticed. It
3 appears to me that there were certified letters sent
4 to certain Therminol customers. Do you know who
5 would have been involved in a decision to have sent
6 these letters in a way to have a record that they
7 had been sent and received to certain customers and
8 not send them to others?

9 A. I don't know. I wasn't involved at the
10 time and I don't know what the circumstances were,
11 why it was done one way or the other.

12 Q. Can you identify any of the persons who
13 were or might have been involved in that decision?

14 A. No, I couldn't tell you who was in what
15 position at that particular time off the top of my
16 head. I just don't know.

17 Q. You've testified about some letters that
18 went to customers starting in 1970.

19 A. Yes.

20 Q. Does Monsanto have a position as to which
21 of those letters, if any, they contend were sent to
22 Kentucky Hydrocarbon?

23 A. I think it's Monsanto's position that
24 Kentucky Hydrocarbon was on one of our customer
25 lists and we have records of sales to the entity,

1 whatever entity it was at the time. Companies
2 change name and addresses. They were specifically
3 sent a copy of that package of material.

4 Q. Of each of those?

5 A. Yes.

6 Q. So your position is that each of those were
7 sent to Kentucky Hydrocarbon?

8 A. It's my understanding.

9 Q. Other than copies of the form letters
10 without addressees, what evidence does Monsanto have
11 that any or all of those letters were sent to
12 Kentucky Hydrocarbon?

13 MR. MONGE: To the extent you know.

14 A. I don't know of any specific evidence that
15 we do have or that we don't have. I just don't
16 know. I was not involved, so I don't know.

17 Q. Who is C. B. Singleton? Did you know that
18 person?

19 A. I don't believe he was a salesman, I don't
20 know.

21 Q. We've already talked about Dr. Kelly I
22 believe. Do you know what salesmen or salesman
23 would have been responsible for Kentucky between
24 1966 and 1971?

25 A. No.

1 Q. Do you know what persons would have been
2 responsible for Pennsylvania?

3 A. No.

4 Q. Do you know anyone who could tell us what
5 salesmen were responsible for those areas?

6 A. I don't, I really don't.

7 Q. Do you know if the salesmen had territories
8 to service or if they were assigned just to
9 particular customers or how they were assigned?

10 A. At that particular time, I don't know. It
11 changed from management to management, how they run
12 their business.

13 Q. Mr. Craddock, in response to our request
14 for production of documents there were some invoices
15 produced and some computerized sales records
16 produced. Do you know the source of those
17 documents?

18 MR. MONGE: Do you have them?

19 MR. BAKER: Yes, I can show each of them to
20 you.

21 Q. (By Mr. Baker) First one is marked
22 Plaintiff's Exhibit 29.

23 A. This is a copy of a documents that we had
24 available in our archives.

25 Q. If I'm not mistaken, there were none of

1 these produced for periods prior to 1971, this kind
2 of invoice.

3 We know there were sales to Kentucky
4 Hydrocarbon several times before 1971. Is there a
5 reason that there would not have been an invoice
6 like this that you're aware of?

7 A. Monsanto has a published records retention
8 policy, okay, like the sales records and all sorts
9 of things. I don't know what the sales record
10 retention policy is, but normally it's nothing like
11 20-odd-years or something like this. PCB records,
12 there's a normal culling out period and they go from
13 files to archives for maybe five years and there was
14 a point in time that we started getting requests for
15 records, PCB records from the government, from
16 various people, and we saved what information that
17 was available was left in the archives and what we
18 say is if we have the document, we know it's there.
19 If we don't have it doesn't mean it didn't happen.
20 Just means we don't have the record. But that's the
21 reason. It depends on some -- as with any company,
22 some people adhere strictly to the record retention
23 and some people never throw anything away and, you
24 know, we gathered what records were available and
25 this was, you know, done when this even started

1 maybe before my predecessors and they started
2 putting this together. It just means if we have the
3 record, we know it happened. If we don't have the
4 record, we can't be sure. Doesn't mean it didn't.
5 Just means we didn't have the record.

6 Q. This Exhibit 29 does show a sale from
7 Monsanto to Kentucky Hydrocarbon Company, Langley,
8 Kentucky, shipped to Maytown, Kentucky of four
9 5-gallon cans of Pydraul AC in April of 1971.

10 MR. MONGE: Now that's Pydraul AC-A?

11 A. A.

12 Q. (By Mr. Baker) Okay. With the correction,
13 Pydraul AC-A, it does show that sale in April 1971,
14 does it not?

15 A. That's correct.

16 Q. What does the AC-A mean?

17 A. That, again, is an identifier to give you
18 that specific product, okay? And A was a variation
19 of AC. Off the top of my head I don't have that.
20 I'd have to look and see. It may have been --
21 there's no sense speculating. I'd have to look and
22 see.

23 Q. Do you know if Pydraul AC-A contained
24 PCB's?

25 A. I don't know without looking. I really

1 don't know. From the date, it could have been when
2 they were changing formulations that may not have
3 been a PCB formulation. There were attempts to have
4 less persistent environmentally persistent products
5 because you couldn't just yank everything from a
6 customer and put him out of business, and there were
7 graduations in trying to get people over this time
8 period when the PCB-containing products were no
9 longer sold, and since this was May of '71 this may
10 have been one of the first variations of the AC, but
11 I'd have to look it up to tell you.

12 Q. I would ask, first, at some point you do
13 that and have your counsel inform us of whether that
14 was a PCB product.

15 MR. MONGE: Why don't you ask that? Make a
16 note to yourself there to ask Mr. Papageorge that.

17 MR. BAKER: That may resolve that problem.

18 Q. (By Mr. Baker) While you're on the
19 subject, you talk about reformulations. When did
20 Monsanto begin reformulating Pydraul in formulas
21 without PCB's?

22 MR. MONGE: Pydraul generally or Pydraul
23 AC, Mike?

24 MR. BAKER: Both.

25 A. I don't have a specific date, but roughly

1 this 1971-1972 time frame. There's a whole new
2 series of products that came out that had different
3 letters following the Pydraul name.

4 Q. (By Mr. Baker) Between 1966 and 1970 after
5 the report from Sweden, before 1970 did Monsanto
6 undertake any research or any work in developing new
7 products to replace Pydraul or for Pydraul AC?

8 A. I don't know.

9 Q. What is a PCT?

10 A. PCT is a polychlorinated terphenyl, which
11 means it has three phenyl rings linked together.

12 Q. Did some or all of the products that
13 initially replaced PCB fluids, Pydraul fluids
14 containing PCB's, did they contain PCT?

15 MR. MONGE: Let me object to the question
16 about PCT. As I understand the thrust of your
17 complaint, you complained about PCB's and not PCT's,
18 so I would object to the relevancy of questions
19 relating to PCT's. He certainly can answer the
20 question with that understanding.

21 A. It depended on what the application was
22 because PCT's were bulkier hydrocarbon molecules,
23 they had different properties. PCB's, a lot of them
24 were solids at room temperature so, obviously, that
25 wouldn't make a good lubricant. It depended on what

1 it was formulated for and what else was in the
2 ingredient, but it did have -- it had the
3 fire-resistant, explosive-resistant property, so
4 where it could be used in some cases, it was used.

5 Q. So in some cases Pydraul fire-resistant
6 lubricants that contained PCB's were replaced by
7 Pydraul fire-resistant lubricants that contained
8 PCT's?

9 A. I say they may have been but I'd have to
10 look.

11 Q. If that is the case, were the PCT products
12 later replaced by other products that contained
13 either PCB's or PCT's?

14 MR. MONGE: Same objection to the
15 relevancy, but you may answer.

16 A. Yes. Ultimately, Pydraul fluids were
17 totally reformulated without PCB's and without
18 PCT's.

19 Q. Do you know what is contained in the
20 product that most closely resembles Pydraul AC, the
21 reformulated product that contained either PCB's or
22 PCT's?

23 A. I have to look it up. Off the top of my
24 head, I don't know.

25 Q. Are you familiar with Pydraul 90-E?

1 A. I know the name and know that it was a --
2 the "E" was in the first round of products that was
3 believed to be environmentally acceptable and "E"
4 was the code for that, but the 90, I can't tell you
5 what the other ingredients were. But the "E" is
6 strictly an identifier so you know that that was
7 specifically designed to be environmentally
8 acceptable.

9 Q. Do you know roughly when that product first
10 became available?

11 A. I can't tell you. Sometime after '72 I
12 would guess, plus or minus. I wouldn't say minus
13 but could be a year or two later.

14 Q. Is that product still being used?

15 A. I believe it is still sold. Monsanto no
16 longer has the Pydraul line but the trademark and
17 line has been sold to another company. But it's my
18 understanding it is still sold.

19 Q. Approximately when was that trademark sold?

20 A. In the past couple of years.

21 Q. To whom?

22 A. It's either -- there's two companies and it
23 might be Stauffer Chemical, S-T-A-U-F-F-E-R. One is
24 the food company. I think it's Stauffer Chemical
25 who is in the phosphate ester business.

1 Q. Is ester, is that related to the "E" in
2 90-E at all?

3 A. No, an ester is a chemical reaction to give
4 you a different class of compound.

5 Q. Does Monsanto currently make any
6 fire-resistant lubricants?

7 A. We may but I'm not sure because I'm not in
8 the product group. I just can't answer that. We
9 have some functional fluids but I'm not sure.

10 Q. But you did produce some other records
11 concerning sales to Kentucky Hydrocarbon. I'll just
12 go through these very quickly.

13 First is marked as Plaintiff's Exhibit
14 30 and I'll ask you if you can identify this. Says
15 "Sales Summary" at the top.

16 A. These are documents that went to the
17 salesmen each month so you could see what is being
18 sold to whom, and this was just a copy of one that
19 was found in our file.

20 Q. Is there anything on here that would
21 identify the salesman?

22 A. Probably one of the numbers should but I'm
23 not sure which one. I can't read the things at the
24 top. There should be an identifier on this there.
25 It either went to the sales -- either went back to

1 the salesman or went to the Marketing Department
2 showing shipment was made to that particular
3 customer at that time.

4 Q. Up in the far right-hand corner is a number
5 471, and I can't read --

6 A. I can't read that either.

7 Q. -- the legend on that?

8 MR. MONGE: We'll try and find you
9 something that shows what that is. I don't know
10 what it is either.

11 A. I can't read that. Maybe that's a page
12 number.

13 MR. MONGE: We'll find something and let
14 you know what that is.

15 Q. (By Mr. Baker) And this shows 165 pounds
16 apparently being sold to Kentucky Hydrocarbon in
17 Langley, K, which I assume is Kentucky, December
18 1959; is that correct?

19 A. That's correct. That's the way I read
20 that.

21 Q. In gallons, how much would 165 pounds be?

22 A. If it's a hundred percent PCB it's
23 approximately 12 and a half pounds per gallon.
24 That's a rough number you can use for all PCB's.

25 Q. So that would be about 15 gallons, or about

1 three 5-gallon cans?

2 A. That's what it looks like.

3 Q. I'll just quickly show you some other like
4 that. Exhibit 31 is a similar sheet. In the upper
5 right-hand column it has No. 573 and I can read a
6 P-A -- looks like a "G" there. It may be a page
7 number but we'll check on that tomorrow.

8 This, again, shows 55 pounds of
9 Pydraul AC being sold to Equitable Gas Company.
10 Doesn't have an address there.

11 Would there be anything in your
12 records that would show where that was shipped to?

13 A. Not -- I think this is probably the
14 document that we had that that was produced, I don't
15 know.

16 Q. That's in December 1966, is it not?

17 A. Yeah.

18 Q. I'll show you another one that's dated
19 December 1965. This says page number clearly at the
20 top. Now we know.

21 A. I'll stand corrected on one thing I said.
22 This might be the summary for the year. This could
23 be a year end summary, okay? I don't know whether
24 this is -- says by month so it's probably December.
25 Maybe just bought before the money ran out.

1 Q. This doesn't show any numbers on it.

2 Apparently there was a sale, December 1965, with
3 nothing on this sheet that would show how much.

4 A. This may have showed this customer didn't
5 buy anything.

6 Q. So, Mr. Craddock, you really don't know
7 what this represents, do you?

8 A. No, I don't.

9 Q. I think we have two more. This is one for
10 December 1967, has Kentucky Hydrocarbon Company
11 listed here, marked as Plaintiff's Exhibit No. 33.
12 And, again, this doesn't show any numbers for sales,
13 so I assume you have the same answer as you did for
14 the last one. You don't know whether there were
15 sales for that month or what this document
16 represents?

17 A. That's right.

18 Q. Up at the top of Exhibit 33, top left-hand
19 corner, is printed "Inorganic No. 2." I noticed on
20 the prior one it said "Direct No. 2."

21 Do you have any idea what those words
22 mean on these documents?

23 A. I don't know, they were just -- I don't
24 know whether it's accounting or billing or who put
25 out a series of reports, you know, and it's probably

1 just the name of the report.

2 Q. Finally, unless I have missed one, there is
3 Plaintiff's Exhibit 34, which is December 1968 and
4 is another sales summary form, says "Organic No. 2"
5 at the left-hand column. This shows Kentucky
6 Hydrocarbon Company and does list 226 pounds. Let
7 me ask you a couple of general questions about all
8 of these.

9 Is it your testimony that these were
10 found in your records and you don't know where they
11 came from or exactly what they mean?

12 A. My testimony is that these are from our
13 archives, okay? These are documents that have the
14 names of the companies that you asked us to
15 service. These are the records we have. It's a
16 sales summary. I don't know any more than that. It
17 indicates that summary of sales for the particular
18 entity, quantity at that particular time. That's
19 just the records that we have.

20 Q. You can't testify that these sales occurred
21 or that there weren't other sales to Kentucky
22 Hydrocarbon that aren't reflected on any of these
23 sheets?

24 A. That's correct.

25 Q. Are you familiar with a person by the name

1 of Farar Hodges? F-A-R-A-R is the way I have it.

2 A. No.

3 Q. Or John Richard Wheeler?

4 A. No.

5 Q. I believe you've probably answered this
6 about two or three times already in different
7 forms. Were you involved at all in the corporate
8 management committee in the early 1970's?

9 A. No.

10 Q. Are you familiar with a gentleman by the
11 name of John Mason?

12 A. There are several John Masons at Monsanto.
13 There is a contemporary of mine that I know very
14 well who came in as a chemist about the time I did.
15 That's one John Mason. He's now President of
16 Monsanto Fund.

17 There is another John Mason who is the
18 director or manager of University Relations. That's
19 two that I know.

20 Q. University Relations?

21 A. Yeah, colleges, grants and stuff like that,
22 recruiting, all that sort of thing.

23 Q. And both of those are still around the St.
24 Louis area?

25 A. Yes.

1 Q. Do you know a J. H. Davison?

2 A. Don't think so.

3 Q. In one of the earlier documents referring
4 to waste disposal -- it was the 1971 MSDS form --
5 you talked about incineration as a possible means of
6 waste disposal. I'll speak specifically about
7 Pydraul AC with 1254.

8 Does it take very high temperatures to
9 incinerate that product?

10 A. Again, this is a question of relatively how
11 high is high. Takes about 1,200 degrees
12 centigrade. That's significantly less than a blast
13 furnace that runs at 3,000 or so. Incineration is a
14 specific chemical process, a controlled process,
15 that's contrasted to open burning a brush pile and
16 burn it. So, relatively, it's high but it's not as
17 high as -- it's an intermediate range I would say.

18 Q. Did Monsanto have a specific incinerator
19 for PCB products?

20 A. We had an incinerator for PCB's products
21 with a specific for PCB's. I don't know the
22 particulars of that. We did burn PCB's and other
23 chlorinated products in an incinerator.

24 Q. At least you did have an incinerator that
25 you did use for PCB's. Maybe it's good for

1 something else too?

2 A. Right. It's designed for PCB's.

3 Q. Was there just one that was used for PCB's
4 to your knowledge?

5 A. Yes.

6 Q. Where was it located?

7 A. It was located in the Krummrich Plant at
8 Sauget, Illinois.

9 Q. When did you first start using that
10 incinerator for PCB products?

11 A. I don't know specifically when that
12 incinerator came along.

13 Q. Was it there prior to 1970?

14 A. I can't tell you when it came on but it was
15 certainly designed to be used at that plant. I
16 don't know the time.

17 Q. You don't know whether it was there in 1970
18 or not?

19 A. I believe it was there in 1970. I don't
20 know when it first came on though. I can't tell you
21 that.

22 Q. When Monsanto decided to phase out Pydraul
23 AC, what did you tell your customers about it and
24 what was your policy on products they may not have
25 used already?

1 MR. MONGE: To the extent that you know.

2 A. I don't know the specifics. The policy was
3 generally outlined in those series of form letters
4 that we've discussed and I don't know the business
5 arrangements with particular products, I can't
6 answer that.

7 Q. (By Mr. Baker) Do you know whether
8 Monsanto offered to buy back unused portions of
9 Pydraul AC?

10 A. I don't know.

11 Q. Do you know whether Monsanto offered to
12 incinerate leftover Pydraul AC for its customers?

13 A. As far as Pydraul AC, I can't specifically
14 answer, but I know that we had a plan and a program
15 and a policy to incinerate PCB's for our customers
16 that came in in this early '70's time frame when the
17 phaseout program came in, and the reason for this
18 was that the problem was persistence in the
19 environment. We were going to get out of the
20 business because we didn't want PCB's to be disposed
21 of improperly. We made available to our customers
22 the means that we had at our disposal for handling
23 products at our plant, and so the offer was made to
24 customers, if they would get the material to our
25 plant, I think they were required to pay shipping

1 and we would incinerate it for something like fuel
2 cost, which is like two or three cents a pound
3 versus --

4 Q. Did you take any steps to encourage them to
5 do that or offer them any incentive on replacement
6 products?

7 A. There were steps taken to encourage the use
8 of incineration but I don't know the details of
9 whether they were incentives or whether it was just
10 -- I know there were affirmative plans to make this
11 information known to the customers and to get them
12 to use it, and what they did, I don't know.

13 Q. What about customers who had a system where
14 they were using Pydraul AC and they wanted to switch
15 over to a non-PCB product? Did Monsanto do anything
16 to offer to clean out their systems for them or give
17 them advice on how to clean out the system or to
18 your knowledge was there any that have offered?

19 A. I really don't know. I wasn't involved
20 with that.

21 (A brief recess was taken.)

22 Q. (By Mr. Baker) Mr. Craddock, we'll try to
23 finish up here shortly.

24 We were talking about incineration,
25 and in your testimony you gave the answer I think

1 that was consistent with your answer to
2 interrogatories about incineration, that there was
3 some offer at a price for Monsanto to incinerate PCB
4 fluids for its customers.

5 Do you have any evidence that an offer
6 like that was ever made to Kentucky Hydrocarbon or
7 to Equitable?

8 A. I personally don't have anything. I think
9 if you request it in the interrogatory it was
10 included, you know, in the document production but I
11 personally don't have any evidence of it.

12 Q. You don't know of any written or oral
13 communications to Kentucky Hydrocarbon or Equitable
14 other than what you've produced?

15 A. That's correct. Personally, I have no
16 knowledge.

17 Q. I'm going to show you a document that you
18 produced to us that's marked as Plaintiff's Exhibit
19 69. This is a letter on Monsanto letterhead dated
20 December 21st 1979 to
21 Mr. Roger Williams at the EPA. It's signed by
22 Clayton Callis, director of Environmental
23 Operations.

24 Did you work for Mr. Callis, or with
25 him?

1 A. I worked with him during the time period
2 that I was in MIC Environmental Operations. He was
3 not my direct boss but he was the director of
4 Environmental Operations and my boss reported to
5 him.

6 Q. Are you familiar with the discussions that
7 led up to this letter?

8 A. No.

9 Q. Are you familiar with the situation that
10 caused this letter?

11 A. No, I'm not.

12 Q. Is Mr. Callis still alive today?

13 A. Yes, he is.

14 Q. Do you know if he works for Monsanto?

15 A. No, he's retired.

16 Q. Do you know whether he lives in the St.
17 Louis area?

18 A. I would say yes, except that he may still
19 have his house here. His wife died recently and I
20 heard that was living in Columbus, Ohio, and he
21 might be doing some work there for the American
22 Chemical Society. He's past President of the
23 American Chemical Society, so I don't know. He may
24 still have a mailing address.

25 Q. Are you familiar with a person named

1 W. N. Maddox?

2 A. No.

3 Q. G. R. Buchanan?

4 A. No.

5 Q. D. Wood?

6 A. David Wood probably, if that's David Wood.

7 Q. Is he still alive?

8 A. Still alive.

9 Q. Still works for Monsanto?

10 A. Still works for Monsanto I believe.

11 Q. Do you know what his job was with Monsanto
12 back in the '70's?

13 A. He was involved with PCB's at some time
14 period there before I became involved.

15 Q. We talked earlier about some of the acute
16 testing that was done on the PCB's in the Aroclor
17 products.

18 What sort of chronic testing -- first
19 of all, what's the difference between acute testing
20 and chronic testing?

21 A. Acute or short-term results just to get an
22 indication of a short-term exposure, like sometimes
23 we call it a casual exposure, okay; somebody
24 ingesting it quickly or getting it spilled on them
25 or walking through it, something like that, so acute

1 is usually -- some people describe it as a one time
2 short-term exposure.

3 Chronic exposure includes up to
4 lifetime studies for the specific species being
5 tested; high doses constantly for a lifetime.

6 Q. Did Monsanto conduct any chronic testing of
7 PCB's?

8 A. Yes, they did.

9 Q. Starting when?

10 A. Roughly in the late '60's, early '70's
11 maybe.

12 Q. So prior to the late '60's or early '70's
13 Monsanto had done no chronic testing?

14 A. I don't know to the extent. I know that
15 the lifetime studies were started about that time.
16 Whether they had done any preliminary stuff up to
17 then -- as I mentioned earlier, these things go in
18 stages and I just don't know the dates.

19 Q. Since 1935 have there been any other
20 manufacturers of PCB's in the United States?

21 A. EPA reports there was one, but it was small
22 and --

23 Q. Do you know who it was and roughly when?

24 A. I seen their name but if my life depended
25 on it, I couldn't tell you.

1 Q. It doesn't.

2 A. They were a small manufacturer.

3 Q. So it's safe to say that 99 percent or more
4 of the PCB's manufactured in the United States were
5 manufactured by Monsanto?

6 A. I don't know if it said 99 percent, but
7 Monsanto, we were a major producer of PCB's in the
8 United States.

9 Q. Do you know whether your production
10 increased or decreased between 1966 and 1970?

11 A. Offhand, I can't tell you, but these
12 numbers have been published. They are in EPA
13 reports, they are available.

14 Q. In the beginning I asked you about
15 testimony in prior litigation. Have you appeared
16 before Congress or any committees of Congress
17 concerning PCB's?

18 A. Yes.

19 Q. Approximately when and how many times?

20 A. I probably have been before Congressional
21 committees half a dozen times since -- probably
22 since 1983.

23 Q. Have you appeared before the EPA or any
24 branches of the EPA?

25 A. Yes.

1 Q. When and approximately how many times?

2 A. EPA, probably a half dozen to a dozen
3 times. Most recently was this past summer,
4 revitalization hearings in Washington.

5 Q. Do you know if there are any transcripts of
6 your Congressional testimony or your agency
7 testimony?

8 A. There probably are. They usually keep
9 transcripts I believe or copies of testimony is
10 provided to them.

11 Q. Do you know if Monsanto would have obtained
12 copies of those or any of those?

13 A. I don't believe they would. I testified in
14 my capacity as chairman of the Chemical
15 Manufacturers Association PCB panel and also as
16 cochairman of the industry PCB consensus group,
17 which is a consortium of trade associations working
18 with EPA regulations.

19 Q. Do you have copies of any of those
20 transcripts?

21 A. I wouldn't have transcripts. I may have
22 copies of my remarks.

23 MR. BAKER: I would ask, first, if Monsanto
24 has in its custody or control any transcripts of
25 Congressional testimony or administrative agency

1 testimony concerning PCB's by this witness, that we
2 be given copies of those.

3 And I would ask, second, if the
4 witness does not object, that you provide us with
5 copies of any of your remarks to Congress or any of
6 its committees or administrative agencies concerning
7 PCB's.

8 MR. MONGE: My response to that is I'll
9 find out what I can and I'll let you know one way or
10 the other.

11 Q. (By Mr. Baker) Mr. Craddock, you testified
12 earlier that Monsanto and others conducted animal
13 studies?

14 A. Yes.

15 Q. And that in the United States you couldn't
16 conduct studies on humans?

17 A. That's correct.

18 Q. But that your studies in the potential
19 adverse effects of substances on humans were done by
20 conducting studies with animals; is that correct?

21 A. Well, when you are testing chemicals the
22 standard protocol is to test animals, that's
23 correct.

24 Q. I assume one reason for this is you can't
25 do it on humans and probably would choose to use

1 rats instead, even if you could.

2 Is another reason that you believe you
3 learn something from the effect on animals that
4 translates into what the effect will be on humans?

5 A. Well, this is highly debatable as to how
6 direct you can translate animal effects to humans.
7 There are some things -- I guess it's generally
8 accepted that there is some effects, maybe 50 to 60,
9 70 percent of the time that you can predict, but
10 then you get to -- they are finding more and more
11 exceptions because the metabolism of different
12 species is totally different and therein lies the
13 problem. For instance, trying to think of an
14 example that they used -- there's something that
15 they tested on rats and it was very detrimental to
16 the rats but yet it turns out it's something that
17 doesn't have the same effect on humans. It's almost
18 like -- not a cancer cure but it's a significant
19 thing, but there's just drastic differences there.
20 A pharmacologist or toxicologist could explain that
21 better than I can.

22 Q. I'm not suggesting there aren't differences
23 but there are also some similarities is the reason
24 you use animals for testing?

25 A. Yes, 50 to 60 percent. It's not perfect

1 but it's the best system we've got.

2 MR. BAKER: Thank you for spending the
3 morning with us. We have no further questions of
4 this witness at this time.
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SIGNATURE OF WITNESS

JOHN CRADDOCK, Ph. D.

Subscribed and sworn before me this _____
day of _____, 1992.

Notary Public

My Commission Expires:

1 STATE OF MISSOURI)
2 CITY OF ST. LOUIS) SS

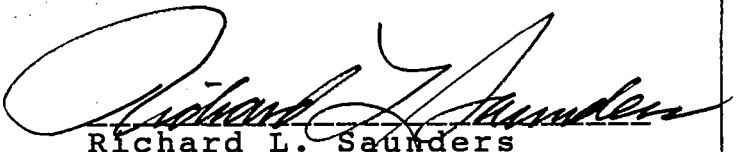
3 I, Richard L. Saunders, a Notary Public
4 within and for the State of Missouri, do hereby
5 certify that on September 9, 1992, at the office of
Husch, Eppenberger, Donohuye, Cornfeld & Jenkins,
100 North Broadway, St. Louis, Missouri,

6 JOHN CRADDOCK, Ph. D.,

7 who was by me first duly sworn to testify to the
8 truth and nothing but the truth concerning the
9 matters in controversy in this cause; that the
10 witness was thereupon carefully examined under oath
and said examination transcribed into
computer-assisted transcription under my
supervision.

11 IN WITNESS WHEREOF, I have hereunto set my
12 hand and affixed my seal on September 15, 1992.

13 My commission expires August 26, 1996.

14
15 
16 Richard L. Saunders
17 Notary Public.
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