

IN THE UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

NEVADA POWER COMPANY, etc.,)
)
 PLAINTIFF,)
)
 -vs-)
)
 MONSANTO COMPANY, etc.,)
 et al.,)
)
 DEFENDANTS.)

CV-S-89-555-LDG

COPY

DEPOSITION OF E. SCOTT TUCKER

PURSUANT TO NOTICE AND/OR AGREEMENT OF THE PARTIES, THE
DEPOSITION OF JAMES S. TUCKER WAS TAKEN COMMENCING AT THE
HOUR OF 9:03 A.M. ON THE 30TH DAY OF MARCH, 1993, AT THE
OFFICES OF HAYNSWORTH, MARION, MCKAY & GUERARD, GREENVILLE,
SOUTH CAROLINA.

REPORTED BY: KARLA T. PITTMAN

CANNON COURT REPORTING
221 LAKE CIRCLE DRIVE
GREENVILLE, SOUTH CAROLINA 29609

(803) 232-9517

APPEARANCES:

RALPH A. BRADLEY, ESQUIRE
BRADLEY & MERRELL
c/o JONES, JONES, CLOSE & BROWN, CHARTERED
700 BANK OF AMERICA PLAZA
300 SOUTH FOURTH STREET
LAS VEGAS, NEVADA 89101-6026

..... ON BEHALF OF THE PLAINTIFF

BRUCE A. FEATHERSTONE, ESQUIRE
KIRKLAND & ELLIS
SUITE 4000, 1999 BROADWAY
DENVER, COLORADO 80206

..... ON BEHALF OF THE DEFENDANTS

ALSO PRESENT: LIZ JEANIE

STIPULATIONS:

THIS DEPOSITION IS BEING TAKEN PURSUANT TO FEDERAL RULES OF
CIVIL PROCEDURE. THE DEPONENT DOES NOT WAIVE THE RIGHT TO
READ AND SIGN THE TRANSCRIPT OF THE DEPOSITION.

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1 E. SCOTT TUCKER,
2 HAVING BEEN FIRST DULY SWORN, WAS EXAMINED AND TESTIFIED AS
3 FOLLOWS:

4 EXAMINATION BY MR. BRADLEY:

5 Q. DR. TUCKER, MY NAME IS RALPH BRADLEY, AND WE
6 INTRODUCED OURSELVES TO ONE ANOTHER JUST A FEW MOMENTS
7 AGO; IS THAT TRUE?

8 A. YES, SIR.

9 Q. YOU KNOW THAT I REPRESENT NEVADA POWER COMPANY IN THIS
10 LAWSUIT THEY'VE BROUGHT AGAINST MONSANTO, GENERAL
11 ELECTRIC, AND WESTINGHOUSE, YES?

12 A. YES. IS THAT AN ANSWER FOR ME OR DO YOU WANT ME TO
13 ANSWER THAT?

14 Q. I DO WANT YOU TO ANSWER THAT.

15 A. YES, SIR.

16 Q. HAVE YOU HAD YOUR DEPOSITION TAKEN BEFORE?

17 A. YES, SIR.

18 Q. DO YOU KNOW THE PURPOSES OF A DEPOSITION?

19 A. YES, SIR.

20 Q. ARE YOU HERE TODAY REPRESENTED BY AN ATTORNEY?

21 A. YES, SIR.

22 Q. IF DURING THE COURSE OF THIS EXAMINATION YOU WANT TO
23 TAKE A BREAK, JUST LET ME KNOW AND WE'LL ACCOMMODATE
24 YOU, ALL RIGHT?

25 A. OKAY, THANK YOU.

1 Q. AND IF DURING THE COURSE OF THIS EXAMINATION I ASK A
2 QUESTION THAT YOU DON'T UNDERSTAND, PLEASE TELL ME,
3 ALL RIGHT?

4 A. YES, SIR.

5 Q. DID YOU REVIEW ANY DOCUMENTS IN PREPARATION FOR
6 TODAY'S DEPOSITION?

7 A. YES, SIR.

8 Q. WHICH DOCUMENTS DID YOU REVIEW?

9 A. A NUMBER OF THEM. I DON'T REMEMBER SPECIFICALLY, NOR
10 COULD I POSSIBLY NAME EACH ONE INDIVIDUALLY. BUT I'M
11 SURE THAT THAT COULD BE PRODUCED IF YOU NEED IT.

12 Q. TELL ME THE NATURE OF THE DOCUMENTS THAT YOU REVIEWED.

13 A. THE NATURE OF THE DOCUMENTS WERE RELATIVE TO PCBs AND
14 A LOT OF THE WORK THAT I DID FOR MONSANTO FROM THE
15 LATE '60s TILL '70s, AND IN THAT REGION.

16 Q. DID YOU REVIEW LETTERS WRITTEN BY YOU?

17 A. MEMOS.

18 Q. DID YOU REVIEW LETTERS OR MEMOS WRITTEN TO YOU?

19 A. YES.

20 Q. DID YOU REVIEW MINUTES OF MEETINGS?

21 A. YES.

22 Q. DID YOU REVIEW COPIES OF LETTERS NOT WRITTEN TO YOU OR
23 BY YOU, BUT WHICH YOU WERE COPIED?

24 A. YES.

25 Q. DID YOU REVIEW ANY STUDIES OR REPORTS?

1 A. YES.

2 Q. TELL ME WHAT YOU REMEMBER ABOUT THE STUDIES OR REPORTS
3 THAT YOU REVIEWED.

4 A. THE STUDIES AND REPORTS THAT I REVIEWED WERE PRIMARILY
5 ONES THAT I AUTHORED.

6 Q. HAVING TO DO WITH WHAT?

7 A. HAVING TO DO WITH POLYCHLORINATED BIPHENYLS.

8 Q. AND WHAT ABOUT POLYCHLORINATED BIPHENYLS?

9 A. HAVING TO DO WITH ANALYTICAL CHEMISTRIES, HAVING TO DO
10 WITH TISSUE RESIDUE STUDIES, AND HAVING TO DO WITH
11 BIODEGRADATION STUDIES.

12 Q. DO YOU RECALL ANY OTHER KIND OF DOCUMENT THAT YOU
13 REVIEWED TO PREPARE FOR TODAY'S DEPOSITION THAT WE DID
14 NOT DISCUSS?

15 A. NOT UNLESS YOU'D LIKE TO BE MORE SPECIFIC.

16 Q. I'M NOW INTERESTED IN EXAMINING YOUR EDUCATIONAL
17 BACKGROUND. CAN YOU GIVE ME A HISTORY OF YOUR
18 EDUCATIONAL ACHIEVEMENTS BEGINNING WITH COLLEGE?

19 A. YES. EXCUSE ME FOR A SECOND. DO THEY HAVE A COPY OF
20 MY RESUME OR COULD IT BE MADE AVAILABLE TO THEM, OR DO
21 YOU WANT ME TO JUST GIVE A BRIEF --

22 MR. FEATHERSTONE:

23 NO TO THE FIRST QUESTION, POSSIBLY YES TO THE SECOND.
24 I MEAN, I'M NOT SURE I EVEN HAVE A CURRENT ONE. AND
25 THEN THIRD, IT'S HIS EXAMINATION, IF YOU WANT TO

1 DICKER WITH HIM ON THAT.

2 WITNESS CONTINUES:

3 A. NO, I DON'T HAVE TO DICKER. I'LL JUST SAY AND THEN
4 YOU CAN TELL ME IF THAT'S ENOUGH, OKAY?

5 Q. YES, THAT'S GOOD.

6 A. EXCELLENT. LET'S SEE. WELL, I RECEIVED A BACHELOR'S
7 DEGREE -- WELL, I RECEIVED AN ASSOCIATES DEGREE,
8 REALLY, FROM THE UNIVERSITY OF MICHIGAN EXTENSION
9 LOCATED IN FLINT, MICHIGAN. I RECEIVED A BACHELOR'S
10 DEGREE FROM MICHIGAN STATE UNIVERSITY, I BELIEVE THAT
11 WAS IN 1963, AND I RECEIVED A PH.D. FROM THE
12 UNIVERSITY OF IOWA, IOWA CITY, IOWA, IN THE AREA OF
13 ANALYTICAL AND ORGANIC CHEMISTRY IN -- WELL, I
14 COMPLETED MY WORK IN 1967, AND MISSED THE DATE FOR
15 SUBMISSION OF THESIS, AND SO DID NOT RECEIVE MY PH.D.,
16 IT WASN'T AWARDED UNTIL '68. BUT I JOINED MONSANTO, I
17 THINK, IN 1967. YOU DID SAY EDUCATIONAL BACKGROUND?

18 Q. YES.

19 A. AND LET'S SEE. I HAD A NASA TRAININGSHIP, N.S.F.
20 SCHOLARSHIP, 3.97 OUT OF FOUR IN GRADUATE SCHOOL. YOU
21 ASKED FOR QUALIFICATIONS, CORRECT?

22 Q. YES. WHEN DID YOU HAVE YOUR NASA TRAINING?

23 A. I BELIEVE I RECEIVED THAT RIGHT AFTER I WENT TO
24 UNIVERSITY OF IOWA. I TAUGHT FOR ABOUT A SEMESTER,
25 AND THEN I WAS AWARDED THE NASA TRAININGSHIP BY THE

1 COLLEGE OF SCIENCES, SO THAT WOULD BE 1963, '64.

2 Q. WHAT TYPE OF TRAINING DID YOU RECEIVE FROM NASA?

3 A. IT WASN'T TRAINING; IT WAS A SCHOLARSHIP TO SPONSOR
4 THE RESEARCH THAT I DID.

5 Q. AND, FOR THE RECORD, WHAT IS NASA?

6 A. IT IS NATIONAL AERONAUTICAL AND SPACE ADMINISTRATION.

7 Q. AND WHAT RESEARCH DID THEY SPONSOR FOR YOU?

8 A. WELL, THE PH.D. THESIS THAT I WROTE WAS, LET'S SEE, AN
9 ANALYTICAL INVESTIGATION OF SOME MONO-2-AZA ARYLH
10 HYDRAZONES.

11 Q. YOU PROBABLY OUGHT TO SPELL THAT FOR THE BENEFIT OF
12 THE COURT REPORTER.

13 A. WELL, THE MONO-2 ASA, YOU WANT ME TO SPELL THAT PART?

14 Q. YES.

15 A. LET ME SEE HOW GOOD MY MEMORY IS. M-O-N-O DASH 2 DASH
16 A-Z-Y-L -- IT WOULD BE A-Z-A, AZA, A-R-Y-L-H, AND THEN
17 HYDRAZONES, H-Y-D-R-A-Z-O-N-E-S.

18 Q. AND DID ANY OF THAT RESEARCH RELATE TO POLYCHLORINATED
19 BIPHENYLS?

20 A. NO, SIR.

21 Q. AND IS THAT THE RESEARCH THAT THEY SPONSORED FOR YOU
22 WAS THE WORK THAT YOU DID FOR YOUR PH.D.?

23 A. CORRECT.

24 Q. AND WHEN DID YOU HAVE AN N.S.F. FELLOWSHIP?

25 A. I BELIEVE I STATED THAT IT STARTED IN 1963 OR '64, AND

1 WENT THROUGH '67. I BELIEVE IT WAS FOR ABOUT THREE
2 YEARS.

3 Q. AND FOR THE RECORD, WHAT IS N.S.F.?

4 A. AGAIN?

5 Q. FOR THE RECORD, WHAT IS N.S.F.?

6 A. EXCUSE ME, LET ME BACK UP. I THOUGHT YOU SAID NASA.
7 I WILL TRY TO LISTEN MORE CLOSELY. N.S.F. STANDS FOR
8 NATIONAL SCIENCE FOUNDATION, AND I HAD A TRAININGSHIP
9 OR A SPONSORSHIP WHEN I WAS AT MICHIGAN STATE, AND
10 THAT WOULD BE FROM ABOUT, I THINK IT WAS 1962 TO '63,
11 AND WHAT THEY DID WAS THEY PAID ME TO WORK WITH ONE OF
12 THE PROFESSORS AT THE UNIVERSITY THERE ON SCIENTIFIC
13 PROBLEMS.

14 Q. WHAT KIND OF SCIENTIFIC PROBLEMS?

15 A. WELL, WE STUDIED FLUORESCENTS AND FLUOROGRAPHIC
16 PROPERTIES OF DIFFERENT METAL KEYLAYS.

17 Q. DID ANY OF THAT WORK RELATE TO POLYCHLORINATED
18 BIPHENYLS?

19 A. NO, SIR.

20 Q. DID MONSANTO SEEK YOU OUT OR DID YOU SEEK MONSANTO OUT
21 WHEN YOU BEGAN WORK FOR THEM?

22 A. BOTH.

23 Q. WHAT JOB TITLE DID YOU HAVE WHEN YOU JOINED MONSANTO
24 IN 1967?

25 A. I BELIEVE IT WAS SENIOR ANALYTICAL CHEMIST.

1 Q. WHAT IS AN ANALYTICAL CHEMIST?

2 A. IT'S A CHEMIST WHO SPECIALIZES IN ANALYZING AND
3 CHARACTERIZING MOLECULAR AND ATOMIC CONSTITUENTS. WE
4 MEASURE THINGS.

5 Q. WHAT WORK DID YOU DO AS A SENIOR ANALYTICAL CHEMIST
6 FOR MONSANTO WHEN YOU BEGAN THERE IN 1967?

7 A. WELL, I STARTED OUT IN AN ANALYTICAL SECTION SUPPORT
8 GROUP FOR THE ORGANICS DIVISION OF THE MONSANTO
9 CHEMICALS COMPANY, AND SO I PROVIDED ANALYTICAL
10 CHEMISTRY SUPPORT FOR THE ORGANIC DIVISION.

11 Q. WHAT TYPE OF ANALYTICAL CHEMISTRY SUPPORT DID YOU
12 PROVIDE TO THE ORGANIC DIVISION IN 1967?

13 A. INITIALLY, THE FIRST ASSIGNMENT I HAD DEALT PRIMARILY
14 WITH METAL SPECTROSCOPY IN TERMS OF ATOMIC ABSORPTION
15 AND ATOMIC EMISSION, AND IN TERMS OF X-RAY TYPE
16 MEASUREMENTS. SUBSEQUENT TO THAT, I SUPERVISED A WET
17 CHEMISTRY GROUP THAT MEASURES THE WET CHEMISTRY
18 PROPERTIES OF THINGS AND THE PHYSICAL PROPERTIES OF
19 THINGS, AND THEN IN ADDITION TO THAT AT SOME POINT I
20 WAS ASSIGNED TO BEGIN, I'M NOT SURE EXACTLY WHEN THAT
21 WAS, BUT TO BEGIN TO WORK ON METHODOLOGIES FOR PCB
22 ANALYSIS.

23 Q. HOW LONG WERE YOU A SENIOR ANALYTICAL CHEMIST?

24 A. I THINK THE DURATION WAS ROUGHLY ABOUT THREE YEARS.

25 Q. AND IT WAS DURING THAT THREE YEARS THAT YOU BEGAN TO

1 WORK ON METHODOLOGIES FOR PCB ANALYSIS?

2 A. YES.

3 Q. WHY WAS IT THAT YOU BEGAN WORK ON METHODOLOGIES FOR
4 PCB ANALYSIS?

5 A. I BELIEVE THAT SINCE I HAD JUST COME OUT OF THE
6 UNIVERSITY AND HAD NOT BEEN ASSIGNED TO A LOT OF
7 DIFFERENT SPECIFIC THINGS AT MONSANTO, IN OTHER WORDS,
8 I DIDN'T HAVE A BIG BURDEN OF DUTIES, AND THE FACT
9 THAT I WAS PROBABLY IN THE LEADING FRONT, FROM A
10 TECHNOLOGY VIEWPOINT, WAS THE REASON THAT I WAS
11 ASSIGNED TO DEVELOP THE NEW TECHNOLOGIES REQUIRED TO
12 DO THE MEASUREMENTS.

13 Q. HOW WERE YOU IN THE LEADING FRONT FROM A TECHNOLOGY
14 VIEWPOINT?

15 A. CAN YOU SPEAK UP, PLEASE?

16 Q. YES. HOW WERE YOU IN THE LEADING FRONT FROM A
17 TECHNOLOGY VIEWPOINT REGARDING METHODOLOGIES FOR PCB
18 ANALYSIS?

19 A. HAVING JUST COMPLETED A PH.D. AT A BIG TEN UNIVERSITY
20 WHICH WAS IN THE AREA OF ANALYTICAL AND ANALYTICAL
21 ORGANIC CHEMISTRIES, I WAS AWARE OF A LOT OF
22 ANALYTICAL TECHNIQUES THAT WERE GENERALLY EMPLOYED TO
23 DO ALL SORTS OF DIFFERENT KINDS OF MEASUREMENTS.

24 Q. WHEN YOU --

25 A. THAT --

1 Q. -- OH, I'M SORRY. GO AHEAD.

2 A. THAT MAY NOT HAVE BEEN, YOU KNOW, USED IN THE INDUSTRY
3 FOR A LARGE NUMBER OF YEARS.

4 Q. WHEN YOU BEGAN YOUR WORK AS A SENIOR ANALYTICAL
5 CHEMIST WITH MONSANTO, WAS IT YOUR OPINION THAT
6 BECAUSE OF YOUR TRAINING WITH YOUR BIG TEN UNIVERSITY
7 THAT YOU WERE MORE AWARE OF ANALYTICAL TECHNIQUES USED
8 TO DO DIFFERENT TYPES OF MEASUREMENTS THAN THE
9 EXISTING MONSANTO EMPLOYEES WITH WHOM YOU WORKED?

10 MR. FEATHERSTONE:

11 OBJECT TO THE FOUNDATION, LACK OF FOUNDATION.

12 EXAMINATION CONTINUES BY MR. BRADLEY:

13 Q. GO AHEAD AND ANSWER.

14 A. IS THAT A MULTIPLE QUESTION?

15 Q. NO. THE QUESTION BASICALLY IS I WANT TO KNOW WHETHER
16 WHEN YOU JOINED MONSANTO IN 1967, YOU FELT THAT YOUR
17 TRAINING IN ANALYTICAL METHODOLOGIES FOR CHEMICAL
18 ANALYSIS WAS MORE SOPHISTICATED THAN THE MONSANTO
19 EMPLOYEES WITH WHOM YOU WORKED?

20 A. I WOULD HAVE TO ANSWER THAT QUESTION YES AND NO.
21 THERE WERE A NUMBER OF MONSANTO EMPLOYEES THAT I
22 WORKED WITH, SOME OF WHICH DIDN'T HAVE PH.D.S, SOME
23 WHICH WERE TECHNICIANS, SOME WHICH WERE BUSINESS FOLKS
24 AND THINGS OF THAT SORT, SO THE ANSWER TO YOUR
25 QUESTION IS YES AND NO.

- 1 Q. SO THAT THERE WERE SOME EXISTING MONSANTO EMPLOYEES
2 WHO HAD THE SAME BACKGROUND AND INFORMATION REGARDING
3 METHODOLOGIES FOR CHEMICAL ANALYSIS AS YOU DID WHEN
4 YOU BEGAN YOUR WORK WITH MONSANTO?
- 5 A. I'M SURE THAT THERE WERE PEOPLE THERE WHO HAD SIMILAR
6 BACKGROUNDS AND KNOWLEDGE. I MEAN, WE ARE ALL
7 ANALYTICAL CHEMISTS IF THAT'S YOUR QUESTION.
- 8 Q. NO, THAT WASN'T MY QUESTION, BUT YOU'VE ANSWERED IT
9 SUFFICIENTLY.
- 10 A. THANK YOU.
- 11 Q. WHAT WORK DID YOU DO ON METHODOLOGIES FOR PCB ANALYSIS
12 AS A SENIOR ANALYTICAL CHEMIST WITH MONSANTO?
- 13 A. I WAS, AS I RECALL, INITIALLY GIVEN THE ASSIGNMENT
14 REVIEWING METHODS THAT HAD BEEN USED BY SOREN JENSEN
15 AND GUNTHER WIDMARK IN THEIR UNPUBLISHED STUDIES OF
16 ENVIRONMENTAL SAMPLES FOR PCBs.
- 17 Q. WHO GAVE YOU THAT ASSIGNMENT?
- 18 A. I BELIEVE THAT ASSIGNMENT INITIALLY CAME FROM BOB
19 KELLER, DR. BOB KELLER, WHO WAS MY IMMEDIATE
20 SUPERVISOR, AND/OR ELMER WHEELER.
- 21 Q. WERE YOU TOLD WHY YOU WERE GIVEN THE ASSIGNMENT?
- 22 A. CAN YOU BE MORE SPECIFIC?
- 23 Q. YES. WERE YOU TOLD WHY IT WAS MONSANTO WANTED YOU, AS
24 AN EMPLOYEE, TO REVIEW METHODS USED BY JENSEN AND
25 WIDMARK?

1 A. JENSEN AND WIDMARK HAD REPORTED FINDING CONSTITUENTS
2 IN THE SAMPLES THAT THEY LOOKED AT THAT WERE OF
3 IMPORTANCE TO MONSANTO.

4 Q. AND THE CONSTITUENTS WERE PCBs?

5 A. THERE WAS SOME CONFUSION INITIALLY, AND THAT CONFUSION
6 WENT ON FOR A WHILE, BUT EVENTUALLY IT WAS
7 STRAIGHTENED OUT AND IT WAS DETERMINED THAT THEY WERE
8 POLYCHLORINATED BIPHENYLS. THE ORIGINAL INFORMATION
9 THAT CAME OVER FROM EUROPE TALKED ABOUT DIPHENOLS, AND
10 THAT'S A DIFFERENT COMPOUND THAN POLYCHLORINATED
11 BIPHENYLS, SO IT TOOK A LITTLE WHILE TO STRAIGHTEN OUT
12 THAT AND TO DECIDE EXACTLY WHAT THEY WERE TALKING
13 ABOUT.

14 Q. WOULD YOU SPELL FOR ME DIPHENOLS?

15 A. D-I-P-H-E-N-Y-L, DIPHENOLS, P-H-E-N-O-L-S.

16 Q. IS DIPHENOLS DIFFERENT THAN DIPHENYLS WITH A Y-L-S?

17 A. YES.

18 Q. WHAT DID YOU DO WHEN YOU REVIEWED THE METHODS USED BY
19 JENSEN AND WIDMARK?

20 A. AS A RESULT OF REVIEWING THE METHODS OR --

21 Q. NO, I MEAN --

22 A. WHEN I REVIEWED THEM, I REVIEWED THEM, AND I LOOKED AT
23 THEM TO SEE HOW THEY DID IT, WHAT ANALYTICAL
24 TECHNIQUES THEY USED --

25 Q. AND THAT WAS BASED UPON --

1 A. -- AND EQUIPMENT.

2 Q. I'M SORRY.

3 A. GO AHEAD.

4 Q. BASED UPON THEIR UNPUBLISHED REPORT?

5 A. I CAN'T REMEMBER EXACTLY, BUT I THINK WE HAD BEEN
6 GIVEN AN UNPUBLISHED REPORT THROUGH OUR FOLKS IN THE
7 U.K.

8 Q. AND BY REVIEWING METHODS THEN WHAT YOU MEAN IS THAT
9 YOU READ THE UNPUBLISHED REPORT AND REVIEWED THE
10 METHODOLOGY USED BY JENSEN AND WIDMARK AS DESCRIBED IN
11 THE UNPUBLISHED REPORT?

12 A. CORRECT.

13 Q. AND WHAT DID YOU DO AFTER REVIEWING THOSE METHODS, IF
14 ANYTHING?

15 A. AFTER I REVIEWED THOSE METHODS, I GAVE THE PEOPLE, MY
16 PEOPLE, A SUMMARY OF WHERE WE WERE AT RELATIVE TO WHAT
17 WE NEEDED TO DO TO BEGIN MAKING THOSE KINDS OF
18 MEASUREMENTS, ESTABLISHING THOSE TECHNIQUES IN OUR
19 LABORATORIES.

20 Q. ESTABLISHING THE TECHNIQUES USED BY JENSEN AND
21 WIDMARK?

22 A. YES.

23 Q. AND WHO WERE YOUR PEOPLE THAT YOU WERE REPORTING TO?

24 A. BOB KELLER, AS I MENTIONED EARLIER. I BELIEVE AT THAT
25 TIME WHILE I WAS A SENIOR ANALYTICAL CHEMIST, I ALSO

1 WORKED FOR MARTIN DIETRICH WHO WORKED FOR BOB KELLER.

2 Q. DID YOU WRITE A REPORT REGARDING YOUR REVIEW OF THE
3 METHODOLOGIES USED BY JENSEN AND WIDMARK?

4 A. NO.

5 Q. WHY NOT?

6 A. I GUESS I WASN'T ASKED TO.

7 Q. DID YOU WRITE A REPORT REGARDING YOUR RECOMMENDATION
8 OF WHAT MONSANTO NEEDED TO DO IN ORDER TO HAVE THE
9 SAME TECHNOLOGIES AVAILABLE AS JENSEN AND WIDMARK DID
10 IN THEIR UNPUBLISHED STUDIES?

11 A. THE QUESTION IS DID I WRITE A SPECIFIC REPORT DEALING
12 WITH THAT SUBJECT?

13 Q. YES.

14 A. NO.

15 Q. I TAKE IT THEN YOU REPORTED THIS INFORMATION, AND BY
16 THIS INFORMATION I MEAN YOUR ASSESSMENT OF THE
17 TECHNOLOGICAL NEEDS OF MONSANTO TO COME UP TO THE
18 ANALYTICAL STANDARDS OF JENSEN AND WIDMARK, YOU
19 REPORTED THAT TO BOB KELLER?

20 A. CORRECT.

21 MR. FEATHERSTONE:

22 OBJECT TO THE FORM.

23 THE WITNESS:

24 OH, SORRY.

25 EXAMINATION CONTINUES BY MR. BRADLEY:

1 Q. YOU REPORTED THAT TO BOB KELLER?

2 MR. FEATHERSTONE:

3 OBJECT TO THE FORM.

4 MR. BRADLEY:

5 THE RULE IS THAT YOU ANSWER ANYHOW UNLESS YOU'RE
6 INSTRUCTED NOT TO ANSWER.

7 THE WITNESS:

8 REPEAT THE QUESTION.

9 MR. FEATHERSTONE:

10 YES, MR. BRADLEY IS CORRECT. UNLESS I INSTRUCT YOU
11 NOT TO ANSWER A QUESTION, I OBJECT, AND THEN YOU
12 RESPOND EITHER ANSWERING THE QUESTION OR TELLING MR.
13 BRADLEY THAT YOU DON'T UNDERSTAND, OR WHATEVER SUITS
14 YOU.

15 THE WITNESS:

16 THANK YOU. REPEAT THE QUESTION, PLEASE.

17 EXAMINATION CONTINUES BY MR. BRADLEY:

18 Q. YES. DID YOU REPORT TO BOB KELLER YOUR ASSESSMENT OF
19 MONSANTO'S NEEDS TO DEVELOP THE SAME TECHNOLOGICAL
20 ABILITIES THAT WERE USED BY JENSEN AND WIDMARK?

21 A. YES.

22 Q. DID MONSANTO DO ANYTHING TO DEVELOP THOSE
23 TECHNOLOGIES?

24 A. YES.

25 Q. WHAT DID THEY DO?

1 A. WELL, I HAD ASCERTAINED WHAT TYPE OF EQUIPMENT WE HAD,
2 WHAT TYPE OF EQUIPMENT WE NEEDED, AND AFTER
3 DISCUSSIONS WITH OTHER FOLKS, DECIDED HOW MUCH WE
4 NEEDED TO SPEND TO GET WHAT WE NEEDED, AND WE DID
5 THAT. WE TALKED WITH THE INSTRUMENT MANUFACTURERS,
6 TALKED WITH PEOPLE WHO USE THE INSTRUMENT
7 MANUFACTURING EQUIPMENT THAT WE WERE LOOKING AT TO
8 ASSESS WHICH WAS BEST, AND THINGS OF THAT SORT, AND
9 THEN, ULTIMATELY, WE ORDERED SOME EQUIPMENT.

10 Q. WERE THE ANALYTICAL METHODS USED BY JENSEN AND WIDMARK
11 METHODS THAT YOU HAD STUDIED DURING THE TIME YOU WERE
12 RECEIVING YOUR PH.D.?

13 A. THE SPECIFIC PROCEDURES USED BY WIDMARK WERE NOT
14 STUDIED BY ME DURING MY PH.D. THESIS WORK.

15 Q. DO YOU KNOW WHETHER THE ANALYTICAL METHODS USED BY
16 JENSEN AND WIDMARK HAD BEEN REPORTED IN ANY
17 PUBLICATION PRIOR TO THE UNPUBLISHED STUDY THAT YOU
18 REVIEWED?

19 A. NO.

20 Q. WAS THERE SOMETHING UNIQUE ABOUT THE ANALYTICAL
21 METHODS USED BY JENSEN AND WIDMARK?

22 A. YES.

23 Q. WHAT WAS UNIQUE ABOUT IT?

24 A. THE UNIQUE ASPECT, AS I RECALL, WAS THE COUPLING OF AN
25 L.K.B. MASS SPECTROMETER TO A GAS CHROMATOGRAPH.

1 Q. WHY WAS THAT UNIQUE?

2 A. BECAUSE IT HADN'T BEEN DONE BEFORE.

3 Q. WHAT WAS INVOLVED IN COUPLING THOSE TWO?

4 A. WELL, YOU HAVE TO DESIGN A PHYSICAL CONNECTION BETWEEN
5 THE TWO, AND THERE'S AN INHERENT MISMATCH BETWEEN THE
6 TWO. A MASS SPECTROMETER INSIDE OPERATES AT A VACUUM,
7 AND A GAS CHROMATOGRAPH INSIDE OPERATES AT A HIGH
8 PRESSURE WITH GASES, SO YOU HAD TO DESIGN AN INTERFACE
9 THAT WOULD ALLOW THE TWO TO BE HOOKED TOGETHER AND TO
10 TRANSFER THOSE THINGS THAT YOU WANT THAT ARE COMING
11 THROUGH THE GAS CHROMATOGRAPH INTO THE MASS
12 SPECTROMETER, BUT THROWING AWAY 99 PERCENT, OR BETTER,
13 OF THE OTHER STUFF THAT'S COMING OUT OF THE GAS
14 CHROMATOGRAPH.

15 Q. DID JENSEN AND WIDMARK HAVE A NAME FOR THE DEVICE THAT
16 CONNECTED THOSE TWO APPARATUS?

17 A. NOT TO MY KNOWLEDGE. IT'S AN INTERFACE, I MEAN --

18 Q. DID THE UNPUBLISHED STUDY REPORT THE PHYSICAL
19 CHARACTERISTICS OF THE INTERFACE DEVELOPED BY JENSEN
20 AND WIDMARK?

21 A. NO.

22 Q. DID MONSANTO DEVELOP ITS OWN INTERFACE FOLLOWING THE
23 UNPUBLISHED STUDY BY JENSEN AND WIDMARK?

24 A. YES, BUT MUCH LATER. THERE WAS AN ALTERNATE TECHNIQUE
25 INVOLVED THAT WAS NOT AS DEFINITIVE AS GC/MASS SPEC,

1 BUT THAT WAS MUCH EASIER.

2 Q. WERE YOU INVOLVED IN THE DEVELOPMENT OF THE INTERFACE?

3 A. THAT INTERFACE WAS PRIMARILY DEVELOPED, AS I RECALL,
4 BY JIM MIEURE AND JIM CONVERSE, AND I PARTICIPATED,
5 BUT IT WAS MAINLY THEIR SHOW.

6 Q. AND DO YOU KNOW WHEN THEY DEVELOPED THAT INTERFACE?

7 A. I DON'T RECALL, BUT THERE WAS A FAIR AMOUNT OF WORK
8 THAT WAS DONE PRIOR TO ACTUALLY DOING THAT.

9 Q. DO YOU KNOW WHETHER ANYONE WITHIN MONSANTO REQUESTED
10 INFORMATION FROM JENSEN AND WIDMARK REGARDING WHAT
11 THEY USED AS AN INTERFACE?

12 A. NO.

13 Q. DO YOU KNOW WHETHER JENSEN AND WIDMARK CLAIMED ANY
14 PATENT INTEREST IN THE INTERFACE?

15 A. NO.

16 Q. WHAT OTHER WORK DID YOU DO AS A SENIOR ANALYTICAL
17 CHEMIST REGARDING YOUR WORK ON THE METHODOLOGIES FOR
18 PCB ANALYSIS, IF ANY?

19 A. THE ALTERNATE METHOD THAT I MENTIONED WAS ELECTRON
20 CAPTURE GAS CHROMATOGRAPHY AND THAT WAS THE INITIAL
21 PROCEDURE THAT WAS SET UP.

22 Q. WHEN WAS THAT SET UP INITIALLY?

23 A. WELL, IT WAS AN EVOLUTIONARY SITUATION IN THE SENSE
24 THAT IT WAS STARTING FROM ZERO, PROBABLY BETWEEN '67
25 AND '70.

1 Q. WHAT ROLE DID YOU HAVE IN DEVELOPMENT OF THE ELECTRON
2 CAPTURED GAS CHROMATOGRAPHY?

3 A. THE TECHNIQUE HAD ALREADY BEEN DEVELOPED A LONG TIME
4 AGO BY PHYSICAL CHEMISTS FOR OTHER REASONS, BUT THERE
5 WAS AN INSTRUMENT COMPANY THAT MANUFACTURED A GAS
6 CHROMATOGRAPH WITH AN ELECTRON CAPTURE DETECTOR, AND,
7 IN FACT, I THINK THERE WERE SEVERAL INSTRUMENT
8 COMPANIES THAT MANUFACTURED THEM. AFTER REVIEWING
9 THOSE COMPANIES, I INITIATED THE PURCHASE OF AN
10 INSTRUMENT. I BELIEVE IT WAS AN F AND M 402 ELECTRON
11 CAPTURED GAS CHROMATOGRAPH.

12 Q. WHAT OTHER WORK DID YOU DO, IF ANYTHING, AS A SENIOR
13 RESEARCH CHEMIST WITH MONSANTO ON WORKING
14 METHODOLOGIES FOR PCB ANALYSIS?

15 A. WE ALSO INITIATED, AT A LATER DATE, THE DEVELOPMENT OF
16 EXTRACTION, CLEAN UP, CONCENTRATION, AND CHEMICAL
17 VERIFICATION TECHNIQUES.

18 Q. WHEN DID YOU DEVELOP EXTRACTION TECHNIQUES?

19 A. DURING THE PERIOD OF TIME FROM ABOUT 1967 TO '70 OR
20 SO.

21 Q. AND WHAT DO YOU MEAN BY EXTRACTION TECHNIQUES?

22 A. WHAT I MEAN IS THAT IF THE PCBs, OR THE CONSTITUENT
23 THAT YOU'RE LOOKING FOR, ARE IN SOIL, WATER, ROCKS,
24 WHATEVER, THAT YOU NEED A TECHNIQUE TO EXTRACT THOSE
25 FROM THAT MATRIX AND GET IT INTO A MATRIX THAT ALLOWS

1 YOU TO MANIPULATE, AND THAT MANIPULATED IT INTO A
2 COMPATIBLE FORM SO THAT YOU CAN EVENTUALLY PUT IT IN
3 THE INSTRUMENTS THAT IDENTIFY AND DETECT CONSTITUENTS
4 THAT YOU'RE LOOKING FOR.

5 Q. DO YOU KNOW WHETHER JENSEN AND WIDMARK HAD DEVELOPED
6 EXTRACTION TECHNIQUES?

7 A. YES.

8 Q. AND HAD THEY DEVELOPED THOSE PRIOR TO 1967?

9 A. YES.

10 Q. AND WERE THE EXTRACTION TECHNIQUES THAT MONSANTO
11 DEVELOPED SIMILAR TO THOSE DEVELOPED BY JENSEN AND
12 WIDMARK?

13 A. SIMILAR BUT DIFFERENT.

14 Q. HOW WERE THEY DIFFERENT?

15 A. DIFFERENT IN THAT THEY WERE ORIENTATED PRIMARILY
16 TOWARD PCBs, WHEREAS THE TECHNIQUES THAT JENSEN AND
17 WIDMARK USED WERE DERIVED FROM THOSE THAT HAD BEEN
18 USED FOR A WHILE TO ANALYZE ENVIRONMENTAL SAMPLES FOR
19 DDT AND OTHER TYPES OF CHLORINATED HYDROCARBONS.

20 Q. WHAT EQUIPMENT, IF ANY, DID YOU USE TO EXTRACT PCBs
21 FROM DIFFERENT MEDIUMS SUCH AS WATER OR SOIL?

22 A. DEPENDS ON WHETHER YOU'RE DEALING WITH A LIQUID OR A
23 SOLID, DEPENDS ON WHAT TYPE OF SOLID YOU'RE DEALING
24 WITH. WATER IS RELATIVELY STRAIGHTFORWARD IN THE
25 SENSE THAT YOU CAN EXTRACT LOW LEVELS OF HYDROPHOBIC

1 MATERIALS FROM WATER BY USING SOLVENTS LIKE HEXANE,
2 AND USING A SEPARATORY FUNNEL, AND SEPARATING THE TWO,
3 AND THEN CONCENTRATING THEM AND CLEANING THEM UP AND
4 EVENTUALLY RUNNING THEM THROUGH ONE OR MORE TYPES OF
5 INSTRUMENTATION TO IDENTIFY AND QUANTITATE WHAT'S
6 THERE.

7 Q. WAS THE ABILITY TO USE HEXANE SEPARATORY FUNNELS AND
8 THEN RUNNING IT THROUGH DIFFERENT INSTRUMENTATION, WAS
9 THAT PROCESS AVAILABLE TO MONSANTO PRIOR TO 1967?

10 A. THE INDIVIDUAL OPERATIONAL UNITS WERE AVAILABLE TO
11 FOLKS, I WOULD IMAGINE, PRIOR TO 1957 IF THEY HAD A
12 NEED AND/OR DESIRE.

13 MR. FEATHERSTONE:

14 '67.

15 WITNESS CONTINUES:

16 A. '67, IS THAT WHAT YOU SAID?

17 Q. THAT IS WHAT I SAID.

18 A. IF THEY HAD A NEED AND/OR DESIRE TO DO THAT.

19 Q. WAS IT ALSO AVAILABLE PRIOR TO '57?

20 A. YOU WOULD HAVE TO BE MORE SPECIFIC BECAUSE YOU'RE
21 TALKING ABOUT A MYRIAD OF TECHNIQUES. I MEAN, WHERE
22 SEPARATORY FUNNELS HAVE BEEN AROUND SINCE PEOPLE KNEW
23 HOW TO BLOW GLASS, SO --

24 Q. HOW ABOUT HEXANE?

25 A. -- I DON'T UNDERSTAND YOUR QUESTION. HEXANE?

- 1 Q. YES.
- 2 A. HEXANE IS A SOLVENT.
- 3 Q. HOW LONG HAS IT BEEN IN EXISTENCE?
- 4 A. OH, GOD, SINCE GOD CREATED HYDROCARBON, AND I'M NOT
- 5 TRYING TO BE FLIPPANT, BUT THAT'S REALITY.
- 6 Q. AND THE DIFFERENT INSTRUMENTATION THAT YOU USED TO
- 7 EXTRACT PCBs FROM WATER, WERE THOSE INSTRUMENTS
- 8 AVAILABLE PRIOR TO 1957?
- 9 A. OKAY, THEY WEREN'T INSTRUMENTS.
- 10 Q. ALL RIGHT.
- 11 A. THEY WERE GLASSWARE AND LABORATORYWARE, AND, SURE
- 12 BEAKERS AND SEPARATORY FUNNELS AND THOSE KINDS OF
- 13 THINGS HAVE BEEN AVAILABLE FOR A LONG PERIOD OF TIME.
- 14 Q. DID YOU PREPARE A DOCUMENT DESCRIBING THE METHODOLOGY
- 15 USED BY MONSANTO TO EXTRACT PCBs FROM SOLIDS?
- 16 A. YES. ONCE IT HAD BEEN COMPLETELY WORKED OUT. IT WAS
- 17 MULTI-STEP, AND ONCE IT HAD BEEN VALIDATED, THERE WAS
- 18 A DOCUMENT PUBLISHED. I BELIEVE THAT WAS IN '71 OR
- 19 SOMETHING LIKE THAT.
- 20 Q. WAS IT PUBLISHED IN A SCIENTIFIC JOURNAL?
- 21 A. NO. THE INITIAL PUBLICATION OF THAT PARTICULAR ITEM
- 22 WAS A SPECIAL STUDY INTERNAL TO MONSANTO.
- 23 Q. IN YOUR WORK TO DEVELOP A METHODOLOGY FOR THE
- 24 EXTRACTION OF PCBs FROM SOLIDS, DID YOU WORK WITH
- 25 ANYONE FROM GENERAL ELECTRIC?

- 1 A. NO, NOT INITIALLY.
- 2 Q. IN YOUR WORK TO DEVELOP EXTRACTION TECHNIQUES FOR PCBs
- 3 FROM SOLIDS, DID YOU WORK WITH ANYONE FROM MONSANTO --
- 4 OR, EXCUSE ME, WESTINGHOUSE?
- 5 A. NO.
- 6 Q. AND AT SOME POINT DID YOU WORK WITH SOMEONE FROM
- 7 GENERAL ELECTRIC REGARDING EXTRACTION TECHNIQUES TO
- 8 OBTAIN PCBs FROM WATER OR SOLIDS?
- 9 A. YES.
- 10 Q. WITH WHOM DID YOU WORK?
- 11 A. I DON'T RECALL.
- 12 Q. DO YOU RECALL WHEN YOU WORKED WITH SOMEONE FROM G.E.
- 13 ON THAT TOPIC?
- 14 A. NOT SPECIFICALLY.
- 15 Q. DO YOU RECALL WHETHER IT WAS DURING THE THREE-YEAR
- 16 PERIOD WHEN YOU WERE A SENIOR ANALYTICAL CHEMIST?
- 17 A. IT WAS PROBABLY NOT DURING THAT PERIOD.
- 18 Q. WAS IT DURING A PERIOD THAT PRECEDED 1975?
- 19 A. YES.
- 20 Q. DO YOU KNOW WHETHER PRIOR TO YOUR WORK TO DEVELOP
- 21 EXTRACTION TECHNIQUES FOR PCBs, WHETHER GENERAL
- 22 ELECTRIC WAS ALSO UNDERTAKING THAT KIND OF WORK?
- 23 A. NO.
- 24 Q. DO YOU KNOW WHETHER WESTINGHOUSE HAD UNDERTAKEN THAT
- 25 KIND OF WORK PRIOR TO MONSANTO DEVELOPING TECHNIQUES

1 TO EXTRACT PCBs --

2 A. NO.

3 Q. -- FROM DIFFERENT MATERIALS? WHEN YOU BEGAN WORK WITH
4 MONSANTO, HOW MANY DEPARTMENTS OR DIVISIONS WERE
5 WORKING ON PCBs?

6 A. THAT'S A DIFFICULT QUESTION TO ANSWER BECAUSE OF THE
7 DEFINITIONS INVOLVED WITH DEPARTMENTS AND/OR
8 DIVISIONS, BUT PCBs HAD BEEN A PRODUCT OF THE COMPANY
9 SINCE THEY PURCHASED SWAN CHEMICAL COMPANY ABOUT 1935,
10 SO THERE WAS NATURALLY AN R AND D GROUP ASSOCIATED
11 WITH DEVELOPMENT OF THOSE MATERIALS. THERE WERE
12 ANALYTICAL SUPPORT GROUPS THAT PROVIDED THEM WITH SOME
13 SUPPORT. THERE WAS OBVIOUSLY A PRODUCTION GROUP.
14 THERE WAS AT LEAST TWO PRODUCTION UNITS IN THE UNITED
15 STATES. THERE WERE PROBABLY SALES AND MARKETING FOLKS
16 ASSOCIATED WITH IT. DIELECTRIC TESTING SITUATIONS.
17 THERE WERE A LOT.

18 Q. WAS THERE A GROUP REFERRED TO AS THE BUSINESS GROUP
19 WHEN YOU BEGAN WORK IN 1967 RELATING TO PCBs?

20 A. NO.

21 Q. DURING THE COURSE OF YOUR EMPLOYMENT WITH MONSANTO,
22 WERE YOU EVER ADVISED THAT THERE WAS A GROUP OF PEOPLE
23 KNOWN AS THE BUSINESS GROUP WITHIN MONSANTO WORKING
24 WITH PCBs?

25 A. NO.

1 Q. DID YOU HAVE ACCESS TO A LIBRARY TO ASSIST YOU IN YOUR
2 WORK DURING THE THREE YEARS YOU WERE A SENIOR
3 ANALYTICAL CHEMIST WITH MONSANTO?
4 A. YES.
5 Q. WHAT LIBRARY DID YOU HAVE ACCESS TO?
6 A. THERE WAS A LIBRARY AT OUR CREVE COEUR FACILITY.
7 Q. WHAT IS YOUR CREVE COEUR FACILITY?
8 A. THAT'S WHERE MONSANTO'S INTERNATIONAL HEADQUARTERS IS
9 LOCATED IN MISSOURI.
10 Q. IS THAT ON THE MONSANTO CAMPUS?
11 A. YES. CREVE COEUR IS IN MISSOURI, AND MONSANTO'S
12 INTERNATIONAL HEADQUARTERS IS LOCATED ON OLIVE
13 BOULEVARD IN CREVE COEUR.
14 Q. HOW DID YOU REFER TO THE LIBRARY BETWEEN '67 AND '70,
15 DID IT HAVE A SPECIAL NAME?
16 A. NOT THAT I RECALL.
17 Q. DO YOU RECALL WHERE IT WAS PHYSICALLY LOCATED?
18 A. LET'S SEE. SORT OF. I DON'T RECALL THE EXACT LETTER
19 OF THE BUILDING, AND THINGS OF THAT SORT, BUT IF I
20 WERE TO DRIVE OUT ON TO THE CAMPUS I COULD PROBABLY
21 DRIVE UP IN FRONT AND PARK AND FACE THE BUILDING.
22 Q. DURING THE --
23 A. IF IT WERE STILL WHERE IT WAS.
24 Q. DURING THE FIRST THREE YEARS OF YOUR EMPLOYMENT WITH
25 MONSANTO, WHAT WORK, IF ANY, DID YOU DO WITH ELMER

1 WHEELER?

2 A. I DID A FAIR AMOUNT OF WORK ASSOCIATED WITH PCBs WITH
3 ELMER WHEELER.

4 Q. WHAT KIND OF WORK DID YOU DO WITH ELMER WHEELER?

5 A. I PROVIDED ANALYTICAL EXPERTISE AND UNDERSTANDING IN
6 MY AREA OF EXPERTISE TO ELMER WHEELER.

7 Q. WHAT KIND OF ANALYTICAL EXPERTISE AND UNDERSTANDING
8 WERE YOU GIVING TO ELMER WHEELER REGARDING PCBs?

9 A. OH, HOW THE TECHNIQUES THAT WERE USED AS WE DEVELOPED
10 THEM TO MEASURE PCBs WORKED, WHAT THEY WERE TELLING US
11 AS THAT KIND OF STUFF EVOLVED, AND THAT KIND OF THING.

12 Q. WHAT DO YOU MEAN WHEN YOU SAY "WHAT THEY WERE TELLING
13 US AS THAT KIND OF STUFF EVOLVED"?

14 A. WELL, WHEN YOU LOOK FOR THINGS IN SAMPLES AND YOU READ
15 THE LITERATURE AND YOU HEAR WHAT OTHER PEOPLE ARE
16 SAYING AND THAT KIND OF STUFF, AND YOU'RE A TRAINED
17 SCIENTIST, YOU BEGIN TO HYPOTHEZIZE AS TO WHAT'S GOING
18 ON AND HOW THINGS ARE WORKING. AND I THINK PEOPLE WHO
19 ARE VERY KNOWLEDGEABLE NOW THROUGH EXPERIENCE FORGET
20 THE STATE OF THE ART IN THE 1960s RELATIVE TO OUR
21 UNDERSTANDING OF THE ENVIRONMENT. AND I WOULD
22 BASICALLY SAY THAT AT THAT POINT IN TIME, WE DIDN'T
23 UNDERSTAND THE ENVIRONMENT VERY MUCH AT ALL AND WE
24 WERE JUST LEARNING, SO EVERY ENVIRONMENTAL MEASUREMENT
25 THAT ANYBODY MADE WAS PROVIDING US NEW INFORMATION ON

1 HOW WE WERE IMPACTING THE ENVIRONMENT AND THAT KIND OF
2 THING. SO, YOU KNOW, IT WAS LIKE WE WERE TRYING TO
3 FIGURE OUT A PUZZLE THAT WE DIDN'T UNDERSTAND YET.

4 Q. FOR THE RECORD, I MOVE TO STRIKE THE ANSWER AS
5 NON-RESPONSIVE. WHEN YOU BEGAN WORK WITH MONSANTO,
6 WHAT KIND OF WORK WAS ELMER WHEELER DOING?

7 A. ELMER WHEELER WAS IN THE MEDICAL DEPARTMENT.

8 Q. DID YOU HAVE REGULAR MEETINGS DURING THE THREE YEARS
9 YOU WERE A SENIOR ANALYTICAL CHEMIST WITH DR. WHEELER?

10 A. WE HAD REGULAR MEETINGS, BUT THEY WEREN'T NECESSARILY
11 SCHEDULED.

12 Q. DID DR. WHEELER INDICATE TO YOU WHAT HE WAS DOING
13 WITHIN THE MEDICAL DEPARTMENT RELATIVE TO PCBs?

14 A. YES.

15 Q. WHAT DID HE TELL YOU HE WAS DOING?

16 A. AS I RECALL, ELMER WAS IN CHARGE OF DETERMINING
17 OVERALL WHAT WAS GOING ON FROM A TOXICOLOGICAL
18 VIEWPOINT AND FROM AN ENVIRONMENTAL VIEWPOINT.

19 Q. DURING THAT THREE-YEAR PERIOD OF TIME, WHAT DID DR.
20 WHEELER INDICATE TO YOU WAS OCCURRING OVERALL FROM A
21 TOXICOLOGICAL VIEWPOINT REGARDING PCBs?

22 MR. FEATHERSTONE:

23 OBJECT TO THE FORM OF THE QUESTIONING.

24 WITNESS CONTINUES:

25 A. I'M HAVING REAL PROBLEMS WITH THAT QUESTION BECAUSE IT

1 WOULD BE VERY DIFFICULT TO UNDERSTAND THE ANSWER. CAN
2 YOU BE MORE SPECIFIC, PLEASE?

3 Q. YES, I'M INTERESTED IN KNOWING WHAT DR. WHEELER TOLD
4 YOU DURING THE THREE-YEAR PERIOD YOU WERE A SENIOR
5 ANALYTICAL CHEMIST WHAT HE WAS DOING TO DETERMINE THE
6 OVERALL TOXICOLOGICAL VIEWPOINT OF PCBs?

7 A. ELMER WAS WORKING WITH EXPERTS LIKE MYSELF, AND
8 OUTSIDE CONSULTANTS, IN TERMS OF DESIGNING LABORATORY
9 STUDIES THAT WOULD HELP US ELUCIDATE WHAT WAS GOING ON
10 IN THE ENVIRONMENT WITH PCBs.

11 Q. DID ELMER WHEELER EVER INDICATE TO YOU DURING THIS
12 THREE-YEAR PERIOD WHAT THE TOXICOLOGICAL
13 CHARACTERISTICS WERE OF PCBs?

14 A. YES.

15 Q. WHAT DID HE TELL YOU?

16 A. HE REITERATED TO ME THE INFORMATION THAT WAS AVAILABLE
17 FROM TOXICOLOGY STUDIES WHICH HAD SHOWN THAT PCBs WERE
18 VERY INNOCUOUS FROM ACUTE AND CHRONIC VIEWPOINT, AND
19 THAT THERE HAD BEEN A LONG NUMBER OF YEARS OF WORK
20 HISTORY WITH NO PROBLEMS.

21 Q. DID DR. WHEELER INDICATE TO YOU THAT PCBs ARE ABSORBED
22 THROUGH THE SKIN?

23 A. I DON'T RECALL THAT HE DID SPECIFICALLY, NO.

24 Q. DID DR. WHEELER INDICATE TO YOU THAT WORKERS IN THE
25 EARLY 1930s DEVELOPED SEVERE CASES OF CHLORACNE WHEN

1 EXPOSED TO A COMBINATION BY CHLORINATED NAPHTHALENE
2 AND PCBs?

3 MR. FEATHERSTONE:

4 OBJECT TO THE FORM OF THE QUESTION.

5 EXAMINATION CONTINUES BY MR. BRADLEY:

6 Q. LET ME ASK IT ONE MORE TIME THEN. DID DR. WHEELER
7 INDICATE TO YOU THAT IN THE 1930S GENERAL ELECTRIC
8 WORKERS REPORTED SOME CASES OF SEVERE CHLORACNE FROM
9 EXPOSURE TO HALOWAX WHICH WAS A COMBINATION OF
10 CHLORINATED NAPHTHALENE AND CHLORINATED DIPHENYL?

11 A. NO.

12 Q. IS CHLORINATED DIPHENYL THE SAME AS PCBs?

13 A. YES.

14 Q. IS CHLORINATED DIPHENYL THE SAME AS CHLORINATED
15 BIPHENYL?

16 A. YES.

17 Q. DID DR. WHEELER INDICATE TO YOU THAT STUDIES HAD SHOWN
18 PCBs HAD AN ADVERSE IMPACT ON THE LIVER OF
19 EXPERIMENTAL ANIMALS?

20 A. YES.

21 Q. WHAT DID DR. WHEELER TELL YOU ABOUT THOSE STUDIES?

22 MR. FEATHERSTONE:

23 OBJECT TO THE FORM OF THE QUESTIONING.

24 WITNESS CONTINUES:

25 A. IT WAS GENERALLY KNOWN THAT CHLORINATED HYDROCARBONS,

1 OF WHICH PCBs WERE A CLASS OF COMPOUNDS, DID HAVE
2 IMPACTS ON LIVER AND THINGS OF THAT SORT. HOWEVER,
3 PCBs WERE NOT OF THE SAME ORDER AND MAGNITUDE OF
4 CONCERN. IN FACT, WAY LESS CONCERN THAN THINGS LIKE
5 TETRACHLOROETHYLENE AND METHYLENE CHLORIDE AND COMMON
6 SOLVENTS, SO THEY WERE DISCUSSED IN THAT CONTEXT. I
7 DON'T BELIEVE I REALLY EVER SAW -- I TAKE THAT BACK.
8 I DID SEE SOME INFORMATION AT VERY HIGH EXPOSURE
9 LEVELS THAT SHOWED SOME INDICATIONS OF AN IMPACT IN
10 ANIMALS.

11 MR. FEATHERSTONE:

12 CAN WE TAKE A BREAK?

13 MR. BRADLEY:

14 YES, LET'S TAKE 10 OR 15 MINUTES.

15 (BRIEF RECESS).

16 Q. DR. TUCKER, WHILE YOU WERE WORKING WITH ELMER WHEELER
17 AT MONSANTO DURING YOUR FIRST THREE YEARS THERE, DID
18 DR. WHEELER TELL YOU THAT IF THERE IS A SUFFICIENT
19 CONCENTRATION OF PCBs ON THE SKIN TO CAUSE A SKIN
20 CONDITION OR RASH, SYSTEMIC POISONING MAY OCCUR IN
21 SOME PEOPLE WHO ARE HYPERSENSITIVE TO PCBs?

22 A. NO.

23 Q. AS AN ANALYTICAL CHEMIST, DO YOU KNOW WHAT SYSTEMIC
24 POISONING IS?

25 A. NOT AS AN ANALYTICAL CHEMIST, I DON'T REALLY THINK I

1 UNDERSTAND SYSTEMIC POISONING NECESSARILY.

2 Q. WHAT IS YOUR UNDERSTANDING OF SYSTEMIC POISONING?

3 A. A POISONED SYSTEM. I MEAN, I WOULD DERIVE THAT FROM
4 THE WORDS. I'M NOT A TOXICOLOGIST.

5 Q. DID DR. WHEELER TELL YOU DURING THE THREE YEARS YOU
6 WERE A SENIOR ANALYTICAL CHEMIST THAT THE TOXICITY OF
7 VAPORS OF AROCLOR 1242 AND 1254 WERE DOCUMENTED AS
8 EARLY AS 1956?

9 A. NO.

10 Q. DO YOU KNOW WHAT IS MEANT BY THE TERM POLYCHLORINATED
11 DIBENZOFURANS?

12 A. YES.

13 Q. DO YOU KNOW WHETHER POLYCHLORINATED DIBENZOFURANS WERE
14 PRESENT IN THE POLYCHLORINATED BIPHENYLS MANUFACTURED
15 BY MONSANTO?

16 A. I KNOW THEY ARE NOT PRESENT.

17 Q. WERE THEY PRESENT IN ANY OF THE AROCLOR FORMULATIONS
18 EVER MANUFACTURED BY MONSANTO TO THE BEST OF YOUR
19 KNOWLEDGE?

20 A. NO.

21 Q. DO YOU KNOW WHETHER PCBs HAVE BEEN FOUND IN HUMAN
22 MOTHER'S MILK?

23 A. NO.

24 Q. DO YOU KNOW WHETHER PCBs PASS THROUGH THE MOTHER'S
25 PLACENTA TO THE FETUS?

- 1 A. NO.
- 2 Q. ARE YOU FAMILIAR WITH THE TERM BIOMAGNIFICATION?
- 3 A. YES.
- 4 Q. WHAT IS IT?
- 5 A. IT REFERS TO CONCENTRATION OF CONSTITUENTS IN
- 6 BIOLOGICAL SYSTEMS PREFERENTIALLY.
- 7 Q. DO YOU KNOW WHETHER PCBs BIOMAGNIFY IN THE HUMAN FOOD
- 8 CHAIN?
- 9 A. I DON'T UNDERSTAND THE QUESTION. CAN YOU DEFINE HUMAN
- 10 FOOD CHAIN FOR ME?
- 11 Q. WELL, LET ME ASK YOU THIS QUESTION: AS A CHEMIST, ARE
- 12 YOU FAMILIAR WITH THE TERM FOOD CHAIN?
- 13 A. YES.
- 14 Q. AND WHAT DOES THAT MEAN TO YOU?
- 15 A. IT MEANS STARTING OUT WITH THE LOWEST ORGANISM UP TO
- 16 THE HIGHEST ORGANISM, THE ORDER.
- 17 Q. AND ARE HUMAN BEINGS AT THE TOP OF THE FOOD CHAIN?
- 18 A. OKAY, YES.
- 19 Q. AND DO YOU KNOW THEN WHETHER PCBs BIOMAGNIFY IN THE
- 20 FOOD CHAIN?
- 21 A. YES.
- 22 Q. WELL, LET ME ASK THIS QUESTION: ARE YOU FAMILIAR WITH
- 23 THE TERM SYNERGISM?
- 24 A. YES.
- 25 Q. WHAT IS SYNERGISM?

1 A. THE SIMPLEST DEFINITION THAT I COULD GIVE WOULD BE TWO
2 PLUS TWO EQUALS FIVE.

3 Q. DO YOU KNOW WHETHER PCBs CAN WORK SYNERGISTICALLY WITH
4 OTHER COMPOUNDS BY IMPAIRING THE IMMUNE SYSTEM?

5 A. NO.

6 Q. DID DR. WHEELER, OR ANYONE WITHIN MONSANTO'S MEDICAL
7 DEPARTMENT, EVER REPORT TO YOU THAT PCB CONTACT WITH
8 THE SKIN CAN CAUSE SYSTEMIC INFECTION INCLUDING
9 INJURIOUS EFFECTS ON THE LIVER?

10 A. NO.

11 Q. DID DR. WHEELER, OR ANYONE ELSE WITHIN MONSANTO, EVER
12 REPORT TO YOU THAT CHRONIC POISONING MAY OCCUR WITH
13 REPEATED EXPOSURES TO SUFFICIENT CONCENTRATIONS OF PCB
14 VAPOR?

15 A. NO.

16 Q. DID DR. WHEELER, OR ANYONE ELSE WITHIN MONSANTO, EVER
17 REPORT TO YOU THAT REPEATED EXPOSURES TO PCB VAPOR MAY
18 PRODUCE INTERNAL BODILY INJURY WHICH MAY BE DISABLING
19 OR COULD BE FATAL?

20 A. NO.

21 Q. DID DR. WHEELER, OR ANYONE ELSE, EVER REPORT TO YOU
22 THAT ON JULY 8, 1970, MONSANTO KNEW THAT LOWER
23 TEMPERATURES WOULD ONLY VAPORIZE THE AROCLORS AND
24 CREATE ATMOSPHERIC POLLUTION, OR WORSE YET, WOULD FORM
25 BY PARTIAL OXIDATION MATERIALS WHICH COULD BE HIGHLY

1 TOXIC, EXAMPLE, FURANS AND DIOXINS?

2 A. NO.

3 Q. DO YOU AGREE THAT FURANS HAVE ONE OF THE MOST EXTREME
4 TOXICITIES OF ANY COMPOUND SINCE THE BEGINNING OF
5 CHEMISTRY?

6 A. NO.

7 MR. FEATHERSTONE:

8 OBJ---

9 EXAMINATION CONTINUES BY MR. BRADLEY:

10 Q. DID DR. WHEELER, OR ANYONE ELSE WITHIN MONSANTO, EVER
11 REPORT TO YOU THAT AS OF APRIL OF 1955, PRODUCTION
12 WORKERS MANUFACTURING PCBs EXPERIENCED CHLORACNE,
13 GASTRIC TROUBLES AND LIVER TROUBLES?

14 A. NO.

15 Q. WHILE YOU WERE A MONSANTO EMPLOYEE, DID YOU EVER HEAR
16 OF A CONGRESSMAN WHOSE NAME WAS WILLIAM F. RYAN?

17 A. I DON'T RECALL IT SPECIFICALLY.

18 Q. PRIOR TO 1972 WHILE YOU WERE AT MONSANTO, DID YOU
19 LEARN OF ANY CONGRESSIONAL ACTION THAT WAS
20 CONTEMPLATED REGARDING PCBs?

21 A. NO.

22 Q. WHAT'S YOUR RESIDENCE ADDRESS?

23 A. 261 NORTH MCALLISTER, LIBERTY, SOUTH CAROLINA 29657.

24 Q. YOU INDICATED EARLIER THAT YOU HAD HAD YOUR DEPOSITION
25 TAKEN BEFORE, CORRECT?

1 A. YES.

2 Q. TELL ME WHEN YOU HAD YOUR DEPOSITION TAKEN.

3 A. RELATIVE TO?

4 Q. ANYTHING.

5 A. OH, GOSH, I'M 53 YEARS OLD. THE LAST TIME I HAD MY
6 DEPOSITION TAKEN WAS APPROXIMATELY A LITTLE LESS THAN
7 A YEAR AGO, AND IN, I BELIEVE, JUNE, TOWARD THE END OF
8 THE MONTH.

9 Q. WHAT WAS THAT CASE ABOUT?

10 A. THAT WAS ABOUT PCBs.

11 Q. WHAT ABOUT PCBs?

12 A. IT HAD TO DO WITH PCB CONTAMINATION OF, AS I RECALL,
13 PIPELINE TRANSFER OF NATURAL GASES.

14 Q. WHERE WAS YOUR DEPOSITION TAKEN?

15 A. IT WAS TAKEN HERE IN GREENVILLE.

16 Q. DO YOU KNOW WHERE THE LAWSUIT WAS FILED?

17 A. I BELIEVE IT WAS IN CALIFORNIA.

18 Q. DO YOU RECALL THE NAME OF THE ATTORNEY TAKING YOUR
19 DEPOSITION?

20 A. I HAVE IT IN MY RECORDS. I BELIEVE HIS FIRST NAME WAS
21 FRITZ, BUT I DON'T RECALL HIS LAST NAME. OR THAT
22 COULD HAVE BEEN HIS LAST NAME.

23 Q. WHAT OTHER DEPOSITIONS DO YOU RECALL HAVING TAKEN?

24 A. WELL, ONE THAT COMES TO MIND WAS IN, GOSH, LET'S SEE,
25 IT WAS THE, SHOOT, '80s, I GUESS, AND IT WAS RELATIVE

1 TO OUTBOARD MARINE LITIGATION AND PCBs.

2 Q. ANY OTHER DEPOSITIONS REGARDING PCBs?

3 A. NOT THAT COME TO MIND.

4 Q. WHAT WAS THE NATURE OF THE TESTIMONY THAT YOU GAVE IN
5 THE LAWSUIT HAVING TO DO WITH PCB CONTAMINATION ON
6 PIPELINE TRANSFER OF NATURAL GASES?

7 A. FACT WITNESS.

8 Q. ON WHAT FACTS?

9 A. PCBs.

10 Q. WHAT ABOUT --

11 A. ANALYTICAL.

12 Q. ON ANALYTICAL WHAT?

13 A. ANALYTICAL WAS MY AREA OF EXPERTISE WHEN I WORKED FOR
14 MONSANTO, AND I WORKED ON THE ANALYTICAL CHEMISTRY OF
15 POLYCHLORINATED BIPHENYLS.

16 Q. DO YOU HAVE A COPY OF THE TRANSCRIPT THAT WAS PREPARED
17 OF YOUR DEPOSITION?

18 A. NO, SIR.

19 Q. DO YOU RECALL SIGNING A TRANSCRIPT OF YOUR DEPOSITION?

20 A. I THINK I DID, YES.

21 Q. DID YOU HAVE AN ATTORNEY WHEN THIS DEPOSITION WAS
22 TAKEN?

23 A. YES.

24 Q. WHO WAS YOUR ATTORNEY THEN?

25 A. I REFERRED TO THE GENTLEMAN AS FRITZ. I CAN GET

1 SPECIFICS, I DON'T RECALL.

2 Q. DO YOU RECALL THE NAME OF FRITZ' LAW FIRM?

3 A. AGAIN, AS I INDICATED CLEARLY TO YOU EARLIER, SEVERAL
4 TIMES NOW, I DON'T REMEMBER THE GENTLEMAN'S NAME. I
5 CAN GET THAT INFORMATION IF YOU NEED IT.

6 Q. WELL, WHAT WOULD YOU DO TO GET THE INFORMATION? DO
7 YOU HAVE IT HERE WITH YOU?

8 A. I HAVE HIS BUSINESS CARD AT HOME IN MY DESK.

9 Q. WELL, LET ME ASK YOUR ATTORNEY WHETHER THAT
10 INFORMATION WILL BE PROVIDED TO ME.

11 MR. FEATHERSTONE:

12 ARE YOU ASKING FOR IT?

13 MR. BRADLEY:

14 YES.

15 MR. FEATHERSTONE:

16 THEN I'LL TAKE IT UNDER ADVISEMENT.

17 EXAMINATION CONTINUES BY MR. BRADLEY:

18 Q. THEN AT THE RISK OF IRRITATING YOU FURTHER, I KNOW
19 YOU'VE SAID THAT YOU DON'T RECALL HIS NAME, BUT MY
20 LAST QUESTION TO YOU WAS WHETHER YOU RECALL HIS LAW
21 FIRM, WHICH IS A SEPARATE QUESTION.

22 A. FIRST OF ALL, I'M NOT IRRITATED. I AM CURIOUS HOW YOU
23 CONTINUE TO ASK THE SAME QUESTION AND GET THE SAME
24 ANSWER AND EXPECT DIFFERENT RESULTS.

25 MR. FEATHERSTONE:

1 DOCTOR, HIS QUESTION IS DO YOU REMEMBER THE NAME OF
2 FRITZ' LAW FIRM?
3 WITNESS CONTINUES:
4 A. NO.
5 Q. DO YOU RECALL WHERE HIS LAW FIRM WAS LOCATED?
6 A. CALIFORNIA.
7 Q. LET ME ASK IT THIS WAY. WHAT WAS YOUR NEXT JOB TITLE
8 FOLLOWING YOUR WORK AS SENIOR ANALYTICAL CHEMIST?
9 A. GROUP LEADER.
10 Q. WHAT DID YOU DO AS GROUP LEADER?
11 A. I SUPERVISED A GROUP OF PEOPLE THAT WORKED ON
12 ANALYTICAL CHEMISTRY PROBLEMS ASSOCIATED WITH THE
13 DIVISION THAT WE SUPPORTED, AND I BELIEVE WE WERE
14 MONSANTO INDUSTRIAL CHEMICALS COMPANY AT THAT TIME.
15 Q. WHEN DID YOU BEGIN WORK AS GROUP LEADER?
16 A. I BELIEVE IT WAS ABOUT THREE YEARS AFTER I JOINED
17 MONSANTO, SO IT WOULD BE PROBABLY IN '70 OR '71.
18 Q. DID YOU HAVE PEOPLE WORKING FOR YOU WHEN YOU WERE
19 GROUP LEADER?
20 A. YES.
21 Q. HOW MANY DID YOU HAVE WORKING FOR YOU?
22 A. IT VARIED. ANYWHERE FROM, I GUESS, ONE TO PROBABLY
23 11.
24 Q. WHAT WORK, IF ANY, DID YOU DO RELATIVE TO PCBs AS A
25 GROUP LEADER?

- 1 A. CONTINUED SUPERVISING THE DEVELOPMENT OF THE
2 ANALYTICAL METHODOLOGIES, THE ESTABLISHMENT OF THOSE
3 METHODOLOGIES IN MONSANTO LABORATORIES, AND THE
4 VALIDATION OF THE RESULTS PRODUCED BY THOSE
5 METHODOLOGIES WHEN APPLIED.
- 6 Q. WERE THE ANALYTICAL METHODOLOGIES AGAIN TO DETERMINE
7 THE PRESENCE OR ABSENCE OF PCBs?
- 8 A. YES.
- 9 Q. IN YOUR WORK AS GROUP LEADER, WERE YOU ALSO ADDRESSING
10 THE ISSUE OF WHETHER PCBs BIODEGRADE?
- 11 A. YES.
- 12 Q. WHAT DOES BIODEGRADATION MEAN?
- 13 A. BIODEGRADATION MEANS THAT THE MOLECULE IN QUESTION
14 UNDERGOES DEGRADATION IN THE BIOLOGICAL SYSTEM.
- 15 Q. AND WHAT IS DEGRADATION IN THE BIOLOGICAL SYSTEM?
- 16 A. MOST BIOLOGICAL SYSTEMS, BACTERIAL ON UP, USE
17 MOLECULES AS BUILDING BLOCKS AND ENERGY SOURCES. TO
18 DO THAT THEY TAKE THEM APART TO GAIN ENERGY, AND THEN
19 REARRANGE SOME OF THE CONSTITUENTS ASSOCIATED WITH
20 THOSE MOLECULES INTO BUILDING BLOCKS FOR THEIR
21 PARTICULAR SYSTEM.
- 22 Q. WHAT DOES IT MEAN TO DEGRADE IN A BIOLOGICAL SYSTEM?
- 23 A. TO DEGRADE, IN GENERAL, HAS TO DO WITH EITHER
24 OXIDATION OR REDUCTION OF THE MOLECULAR STRUCTURE OF
25 THE MATERIAL THAT'S BEING EXPOSED TO THE SYSTEM. IT

1 CAN, IN SOME INSTANCES, LEAD TO COMPLETE
2 MINERALIZATION TO CARBON DIOXIDE MINERAL SALTS.

3 Q. CAN THERE BE DEGRADATION WITHOUT COMPLETE
4 MINERALIZATION?

5 A. YES.

6 Q. HOW IS THAT EXPRESSED THEN IF YOU HAVE A COMPOUND THAT
7 DEGRADES, BUT NOT TO COMPLETE MINERALIZATION? DO YOU
8 EXPRESS IT IN TERMS OF PERCENT OR YEARS, HALF LIVES,
9 HOW DO YOU EXPRESS THAT?

10 A. IT'S USUALLY A RATE, AND A RATE INVOLVES A NUMERATOR
11 AND A DENOMINATOR, SO IT WOULD PROBABLY DISCUSS
12 DISAPPEARANCE IN SOME PERIOD OF TIME WITH AMOUNT BEING
13 THE NUMERATOR AND TIME BEING THE DENOMINATOR.

14 Q. DID YOU DETERMINE WHETHER THE PCB PRODUCTS
15 MANUFACTURED BY MONSANTO BIODEGRADE?

16 A. YES.

17 Q. DO YOU RECALL WHICH PCB PRODUCTS YOU EXAMINED TO
18 DETERMINE WHETHER THEY BIODEGRADE?

19 A. YES.

20 Q. WHICH ONES?

21 A. AROCLOR 1221, AROCLOR 1232, AROCLOR 1242, AROCLOR
22 1254, AROCLOR 1260, MCS-1016, 1043, ARE THE ONES THAT
23 COME TO MIND IMMEDIATELY.

24 Q. DID ANY OF THOSE AROCLORS OR MCSs UNDERGO COMPLETE
25 MINERALIZATION?

1 A. YES.

2 Q. WHICH ONES?

3 A. THE LOWER CHLORINATED ONES.

4 Q. WHICH WOULD HAVE BEEN WHAT?

5 A. AROCLOR 1221, AROCLOR 1232, AND TO SOME DEGREE AROCLOR

6 1242.

7 Q. HOW LONG DID IT TAKE FOR 1221 TO COMPLETELY

8 MINERALIZE?

9 A. THE DEGRADATION, AS I RECALL, AROCLOR 1221

10 CONSISTENTLY DISAPPEARED WITHIN A 24-HOUR PERIOD IN

11 ONE OF THE PARTICULAR TYPES OF TESTS THAT WE USED.

12 Q. AND HOW LONG DID IT TAKE TO DISAPPEAR IN THE OTHER

13 TYPES OF TESTS THAT YOU USED?

14 A. SOME TIMES LONGER. THE OTHER TESTS WERE LESS

15 INTENSIVE FROM THE VIEWPOINT OF HAVING LESS BACTERIA

16 AVAILABLE, AND THE FACT THAT THE BACTERIA WEREN'T

17 ACTIVATED.

18 Q. AND HOW LONG DID IT TAKE FOR 1232 TO COMPLETELY

19 MINERALIZE?

20 A. I DON'T RECALL SPECIFICALLY, BUT THERE'S PUBLISHED

21 INFORMATION AVAILABLE.

22 Q. AND YOU INDICATED TO SOME DEGREE 1242 COMPLETELY

23 MINERALIZED. WHAT DID YOU MEAN BY THAT?

24 A. I MEANT THAT A PERCENTAGE OR A PORTION OF AROCLOR 1242

25 UNDERWENT COMPLETE MINERALIZATION.

1 Q. WHEN YOU WERE STUDYING THE DEGRADATION OF AROCLOR
2 1221, DID YOU STUDY ANY SOIL SAMPLES WHERE AROCLOR
3 1221 WAS FOUND TO EXIST?

4 A. I DON'T RECALL, BUT I DON'T THINK SO.

5 Q. WERE YOU BASICALLY WORKING IN THE LABORATORY WITH YOUR
6 FLASKS AND OTHER LABORATORY EQUIPMENT TO DETERMINE
7 WHETHER AROCLOR 1221 WOULD BIODEGRADE UNDER LABORATORY
8 CONDITIONS?

9 A. YES.

10 Q. WOULD THAT BE TRUE AS WELL FOR THE OTHER AROCLORS?

11 A. YES.

12 Q. WHAT WORK DID YOU DO NEXT FOLLOWING YOUR WORK AS GROUP
13 LEADER?

14 MR. FEATHERSTONE:

15 DO YOU WANT HIS NEXT JOB?

16 EXAMINATION CONTINUES BY MR. BRADLEY:

17 Q. GIVE ME YOUR NEXT JOB TITLE.

18 A. I THINK AT SOME POINT I BECAME A SENIOR RESEARCH
19 SPECIALIST.

20 Q. WHAT WORK DID YOU DO AS SENIOR RESEARCH SPECIALIST?

21 A. PROVIDED ANALYTICAL INFORMATION RELATIVE TO OTHER
22 PRODUCTS.

23 Q. WHEN DID YOU BECOME A SENIOR RESEARCH SPECIALIST?

24 A. I DON'T RECALL SPECIFICALLY WITHOUT MY RESUME.

25 Q. DO YOU RECALL WHETHER IT WAS BEFORE OR AFTER 1975?

1 A. NO, SIR.

2 Q. DO YOU RECALL WHETHER IT WAS BEFORE OR AFTER 1980?

3 A. IT HAD TO BE BEFORE OR AFTER THAT.

4 Q. WHY?

5 A. I BELIEVE I LEFT MONSANTO IN 1978; IS THAT CORRECT?

6 MR. FEATHERSTONE:

7 I THINK THAT'S RIGHT.

8 WITNESS CONTINUES:

9 A. YEAH.

10 Q. WHAT OTHER PRODUCTS WERE YOU PROVIDING ANALYTICAL
11 INFORMATION ON AS A SENIOR RESEARCH SPECIALIST?

12 A. ANY OF THE PRODUCTS OF THE ORGANICS DIVISION,
13 PLASTICISORS, A VARIETY OF PRODUCTS.

14 Q. DID IT INCLUDE PRODUCTS THAT CONTAINED PCBs?

15 A. NO.

16 MR. FEATHERSTONE:

17 CAN WE TAKE A MINUTE OR TWO, RALPH?

18 MR. BRADLEY:

19 SURE.

20 (BRIEF RECESS).

21 EXAMINATION CONTINUES BY MR. BRADLEY:

22 Q. DR. TUCKER, I'M NOW GOING TO SHOW YOU PLAINTIFF'S
23 EXHIBIT 1427 AND ASK YOU TO REVIEW THAT.

24 A. (REVIEWS DOCUMENT).

25 Q. IS THIS A DECEMBER 3, 1969, MEMORANDUM THAT YOU WROTE

1 TO C. PATON AND J.T. GARRETT?

2 A. YES.

3 Q. IS THIS A TRUE AND ACCURATE COPY OF THE MEMORANDUM
4 THAT YOU SENT?

5 A. IT LOOKS TO BE SO.

6 Q. DID YOU GENERATE THIS DOCUMENT ON OR ABOUT THE DATE
7 THAT'S INDICATED OF DECEMBER 3, 1969?

8 A. YES.

9 Q. WHAT DOES THIS DOCUMENT INDICATE?

10 A. IT INDICATES THAT SAMPLES HAD BEEN TAKEN VERY CLOSE TO
11 A PLANT THAT WAS USING AROCLOR, AND THAT WE FOUND
12 FRESH UNADULTERATED AROCLOR IN THE DISCHARGE, AND THAT
13 THERE'S A GRADIENT THAT LOOKS LIKE WHAT YOU MIGHT
14 EXPECT.

15 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES
16 WHILE YOU WERE EMPLOYED AT MONSANTO?

17 A. MOST LIKELY, YES.

18 MR. BRADLEY:

19 BRUCE, I DON'T THINK I HAVE AN EXTRA COPY OF THAT ONE.
20 AND THAT'S GOING TO BE TRUE FOR SOME OF THE OTHER
21 EXHIBITS THAT I'M GOING TO HAVE HIM GO THROUGH, SO
22 WE'LL MAKE COPIES FOR YOU WHEN WE'RE FINISHED.

23 MR. FEATHERSTONE:

24 ALL RIGHT. BUT THIS IS THE COPY THAT YOU WANT THE
25 COURT REPORTER TO HAVE?

1 MR. BRADLEY:

2 YES.

3 EXAMINATION CONTINUES BY MR. BRADLEY:

4 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 408.

5 A. (REVIEWS DOCUMENT) .

6 MR. FEATHERSTONE:

7 ARE THE COPIES THAT YOU'RE GOING TO INCLUDE WITH THE
8 TRANSCRIPT ONES WITH OR WITHOUT THE HIGHLIGHTING?

9 MR. BRADLEY:

10 WITHOUT.

11 EXAMINATION CONTINUES BY MR. BRADLEY:

12 Q. HAVE YOU HAD A CHANCE TO REVIEW THAT?

13 A. GIVE ME ANOTHER COUPLE OF MINUTES. (REVIEWS
14 DOCUMENTS) . YES.

15 Q. HAVE YOU EVER SEEN THAT DOCUMENT BEFORE TODAY?

16 A. I BELIEVE I HAVE.

17 Q. THAT'S AN OCTOBER 1971 MEMO?

18 A. OCTOBER 28, 1971.

19 Q. AND ARE YOU LISTED AS SOMEONE WHO RECEIVED A COPY OF
20 IT?

21 A. YES. I RECEIVED A CARBON COPY OR A CC.

22 Q. MAY I SEE THAT?

23 A. SURE.

24 Q. DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF THE
25 MEMORANDUM THAT YOU RECEIVED?

1 A. YES.

2 Q. CAN YOU TELL WHO THE AUTHOR OF THAT MEMORANDUM IS?

3 A. YES.

4 Q. AND WHO IS THE AUTHOR?

5 A. THE AUTHOR IS R.E. KELLER.

6 Q. AND WAS DR. KELLER YOUR BOSS AT SOME POINT?

7 A. YES.

8 Q. AND DOES THAT MEMO DESCRIBE EVENTS THAT OCCURRED ON OR
9 ABOUT OCTOBER 26, 1971?

10 A. IT INDICATES THAT THE MEMO WAS WRITTEN ON OCTOBER 28,
11 1971, SO THE EVENTS PROBABLY OCCURRED PRIOR TO THAT.

12 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
13 FILES AT MONSANTO?

14 A. I MAY HAVE OR I MAY NOT HAVE SINCE IT'S A CC AND NOT
15 AN ORIGINAL DOCUMENT I WROTE.

16 Q. IS THIS THE TYPE OF DOCUMENT THAT YOU WOULD EXPECT
17 MONSANTO WOULD KEEP WITHIN ITS CORPORATE FILES AS PART
18 OF ITS REGULARLY CONDUCTED BUSINESS?

19 A. YES.

20 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 338 AND
21 ASK YOU TO REVIEW THAT DOCUMENT.

22 A. (REVIEWS DOCUMENTS) .

23 MR. FEATHERSTONE:

24 LET'S GO OFF THE RECORD.

25 (OFF THE RECORD DISCUSSION)

1 MR. FEATHERSTONE:

2 DO YOU WANT HIM TO READ THE ENTIRE DOCUMENT?

3 MR. BRADLEY:

4 NO.

5 MR. FEATHERSTONE:

6 I THINK, DOCTOR, THAT MR. BRADLEY WANTS TO ASK YOU THE
7 FOUNDATIONAL QUESTIONS RELATIVE TO THE DOCUMENT. IF
8 HE ASKS YOU ANY SUBSTANTIVE QUESTIONS REGARDING THE
9 CONTENTS, YOU CAN READ IT AS NEED BE AT THAT TIME.

10 (PLAINTIFF'S EXHIBIT 338A, PRESENTATION TO INTERDEPARTMENTAL
11 TASK FORCE, HERETO ATTACHED).

12 WITNESS CONTINUES:

13 A. OKAY. THE DOCUMENT'S CONFUSING IN THE SENSE THAT
14 THERE ARE MULTIPLE DOCUMENTS AND THEY'RE STAPLED
15 TOGETHER AND THEY COVER A PERIOD OF AT LEAST FIVE
16 YEARS, SO --

17 Q. DOCTOR, I'M NOW GOING TO SHOW YOU WHAT I'VE MARKED FOR
18 IDENTIFICATION AS PLAINTIFF'S EXHIBIT 338A AND ASK YOU
19 TO REVIEW THAT FOR ME.

20 A. DOES REVIEWING IT IN THIS PARTICULAR SITUATION MEAN
21 READING IT IN TOTAL OR --

22 Q. I NEED YOU TO REVIEW IT WITH SUFFICIENT DETAIL SO THAT
23 YOU CAN IDENTIFY IT FOR ME AND TELL ME WHETHER IT'S A
24 TRUE AND ACCURATE COPY.

25 A. (WITNESS REVIEWS).

1 MR. FEATHERSTONE:

2 ALL RIGHT. WHAT ARE WE DOING WITH RESPECT TO WHAT YOU
3 HAD ORIGINALLY MARKED AS EXHIBIT 338, HAS THAT BEEN
4 WITHDRAWN? IS THAT GOING INTO THE RECORD?

5 MR. BRADLEY:

6 WELL, I WOULD PREFER WITHDRAWING IT IF YOU DON'T HAVE
7 A PROBLEM WITH MY WITHDRAWING IT.

8 MR. FEATHERSTONE:

9 I DON'T.

10 MR. BRADLEY:

11 ALL RIGHT, 338 IS WITHDRAWN FROM THIS RECORD.

12 EXAMINATION CONTINUES BY MR. BRADLEY:

13 Q. HAVE YOU HAD A CHANCE TO REVIEW IT?

14 A. YES.

15 Q. DID YOU MAKE A PRESENTATION TO THE INTERDEPARTMENTAL
16 TASK FORCE ON PCBs IN WASHINGTON, D.C. ON MAY 15,
17 1972?

18 A. YES.

19 Q. WAS YOUR PRESENTATION ON THE ASSESSMENT OF THE
20 BIOLOGICAL PERSISTENCE OF POLYCHLORINATED BIPHENYLS?

21 A. YES.

22 Q. WHAT IS PLAINTIFF'S EXHIBIT 338A? IS IT A TRANSCRIPT
23 OF THE COMMENTS YOU PRESENTED TO THE INTERDEPARTMENTAL
24 TASK FORCE ON PCBs IN WASHINGTON D.C. ON MAY 15, 1972?

25 A. YES.

1 Q. HAVE YOU SEEN THIS DOCUMENT BEFORE TODAY?

2 A. YES.

3 Q. DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF THE
4 INFORMATION YOU PRESENTED TO THE INTERDEPARTMENTAL
5 TASK FORCE ON PCBs IN WASHINGTON, D.C. ON MAY 15,
6 1972?

7 A. YES.

8 Q. DID THE INFORMATION THAT YOU PRESENTED TO THE
9 INTERDEPARTMENTAL TASK FORCE ON PCBs RELATE TO WORK
10 THAT YOU WERE UNDERTAKING IN YOUR ROLE AS AN
11 ANALYTICAL CHEMIST AT MONSANTO?

12 A. YES.

13 Q. DID YOU MAINTAIN A COPY OF THIS EXHIBIT IN YOUR FILE
14 AT MONSANTO?

15 A. YES.

16 Q. AND DID YOU MAINTAIN IT IN YOUR FILE AS PART OF THE
17 REGULARLY CONDUCTED BUSINESS OF MONSANTO?

18 A. YES. IT'S BEEN POINTED OUT TO ME THAT THE DOCUMENT'S
19 INCOMPLETE, AND THAT'S CORRECT, BUT WHAT'S THERE IS
20 ACCURATE.

21 MR. FEATHERSTONE:

22 IT'S MISSING THE SLIDES.

23 EXAMINATION CONTINUES BY MR. BRADLEY:

24 Q. WHEN YOU LEFT MONSANTO IN 1978, DID THE SLIDES STILL
25 EXIST?

1 A. OH, YES, ABSOLUTELY.

2 MR. FEATHERSTONE:

3 YOU HAVE THEM, MR. BRADLEY. THERE'S A DOCUMENT THAT
4 HAS BEEN PRODUCED IN THE CASE THAT HAS ESSENTIALLY
5 THIS PRESENTATION WITH THE SLIDES.

6 MR. BRADLEY:

7 OKAY.

8 WITNESS CONTINUES:

9 A. THOSE SLIDES AND THAT PRESENTATION WERE DISTRIBUTED
10 FREELY.

11 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1603 AND
12 ASK THAT YOU REVIEW IT FOR THE PURPOSE OF IDENTIFYING
13 IT.

14 A. (REVIEWS DOCUMENTS) .

15 Q. HAVE YOU HAD A CHANCE TO REVIEW PLAINTIFF'S EXHIBIT
16 1603?

17 A. YES.

18 Q. IS THIS A TRUE AND ACCURATE COPY, ABSENT THE SLIDES
19 REFERRED TO IN IT, OF A PRESENTATION YOU MADE ON
20 SEMI-CONTINUOUS ACTIVATED SLUDGE DEGRADATION STUDIES?

21 A. NO.

22 Q. AND WHAT IS NOT TRUE AND ACCURATE ABOUT IT?

23 A. FIRST OF ALL, THERE'S A REDUNDANT COPY OF THE
24 ASSOCIATED CHARTS, WHICH I DON'T HAVE ANY IDEA WHY
25 IT'S HERE. AND THEN, IN ADDITION TO THAT, THERE'S

1 INFORMATION ADDED AT THE END RELATIVE TO RESIDUE
2 STUDIES AND I DON'T NECESSARILY KNOW THAT THEY ARE
3 REFERRED TO IN THE TEXT WHICH DEALS WITH
4 BIODEGRADATION USING BACTERIAL DEGRADATION ROUTINES.
5 SO THE DOCUMENT APPEARS TO BE SEVERAL DOCUMENTS KIND
6 OF PUT TOGETHER SOMEHOW.

7 Q. DO YOU SEE THE NUMBERS DOWN AT THE VERY BOTTOM THAT
8 BEGIN 740?

9 A. YES, SIR.

10 Q. WOULD YOU TURN TO THE SECTION OF THE EXHIBIT THAT --
11 NOT THAT CONTAINS REDUNDANT GRAPHS, BUT THE SECTION
12 THAT CONTAINS INFORMATION ON RESIDUE THAT YOU DO NOT
13 BELIEVE WAS PART OF YOUR PRESENTATION.

14 A. (COMPLIES) OKAY.

15 Q. AND WHAT ARE THE NUMBERS AT THE BOTTOM?

16 A. 740264.

17 Q. AND THAT'S THE BEGINNING OF THE STUDY THAT YOU DO NOT
18 BELIEVE WAS PART OF YOUR PRESENTATION?

19 A. WHICH PRESENTATION?

20 Q. THE PRESENTATION THAT'S REFERRED TO ON THE BEGINNING
21 PAGE OF PLAINTIFF'S EXHIBIT 1603.

22 MR. FEATHERSTONE:

23 IN OTHER WORDS, HE'S ASKING WHETHER THAT'S THE
24 BEGINNING OF THE PAGES THAT DON'T RELATE TO
25 SEMI-CONTINUOUS ACTIVATED SLUDGE DEGRADATION STUDIES.

1 WITNESS CONTINUES:

2 A. YES. THANK YOU.

3 MR. FEATHERSTONE:

4 LET'S GO OFF THE RECORD.

5 (OFF THE RECORD DISCUSSION)

6 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1603A,
7 SEMI-CONTINUOUS ACTIVATED SLUDGE DEGRADATION STUDIES
8 PRESENTATION, HERETO ATTACHED) .

9 EXAMINATION CONTINUES BY MR. BRADLEY:

10 Q. DR. TUCKER, WHILE WE WERE OFF THE RECORD YOU WENT
11 THROUGH PLAINTIFF'S EXHIBIT 1603 AND REMOVED FROM THAT
12 EXHIBIT ANY DOCUMENTS THAT DID NOT RELATE TO THE
13 PRESENTATION YOU MADE ON SEMI-CONTINUOUS ACTIVATED
14 SLUDGE DEGRADATION STUDIES; IS THAT TRUE?

15 A. THAT'S CORRECT, AS WELL AS A REDUNDANT COPY OF THE
16 SLIDES.

17 Q. AND I'M NOW GOING TO WITHDRAW REFERENCE TO PLAINTIFF'S
18 EXHIBIT 1603, AND NOW REFER YOU TO PLAINTIFF'S EXHIBIT
19 1603A. AND IS THAT A COPY OF THE MATERIALS YOU USED
20 WHEN YOU GAVE A PRESENTATION ON THE SEMI-CONTINUOUS
21 ACTIVATED SLUDGE DEGRADATION STUDIES?

22 A. YES.

23 Q. DOES THAT APPEAR TO BE A TRUE AND ACCURATE COPY OF THE
24 MATERIALS THAT YOU PRESENTED?

25 A. YES.

1 Q. WHEN DID YOU MAKE THE PRESENTATION?

2 A. I'M TRYING TO REMEMBER. I GET THIS ONE CONFUSED WITH
3 THE PRESENTATION THAT WAS MADE TO THE
4 INTERDEPARTMENTAL TASK FORCE. THEY WERE, I THINK,
5 DIFFERENT IN THE SENSE THAT THIS ONE AS WELL AS
6 TALKING ABOUT PCBs, TALKED ABOUT THE USE OF THE
7 SEMI-CONTINUOUS ACTIVATED SLUDGE DEGRADATION TEST TO
8 EVALUATE THE BIODEGRADABILITY OF THE CHEMICAL
9 COMPOUND.

10 Q. IF THE PRESENTATION TO THE INTERDEPARTMENTAL TASK
11 FORCE WAS IN 1972, WOULD THAT HELP YOU PLACE A DATE ON
12 THIS PRESENTATION?

13 A. YES.

14 Q. WHAT'S YOUR BEST ESTIMATE OF THE DATE THEN OF THIS
15 PRESENTATION?

16 A. ON OR ABOUT 1972.

17 Q. DOES THIS DOCUMENT DESCRIBE THE WORK THAT YOU WERE
18 DOING WITHIN MONSANTO REGARDING SEMI-CONTINUOUS
19 ACTIVATED SLUDGE DEGRADATION?

20 A. YES.

21 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES
22 AT MONSANTO?

23 A. YES.

24 MR. BRADLEY:

25 I'M NOW GOING TO ASK THAT THIS BE MARKED AS 1603B.

1 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT 1603B, GRAPHIC
2 DEPICTION OF AROCLOR 1221 RIVER WATER BIODEGRADATION STUDY,
3 HERETO ATTACHED).

4 EXAMINATION CONTINUES BY MR. BRADLEY:

5 Q. DR. TUCKER, 1603B CONTAINS TWO PAGES THAT YOU REMOVED
6 FROM THE ORIGINAL 1603; IS THAT TRUE?

7 A. YES.

8 Q. AND WHAT IS 1603B?

9 A. 1603B ARE TWO PAGES THAT GRAPHICALLY DEPICT WHAT
10 HAPPENS TO AROCLOR 1221 IN A BIODEGRADATION STUDY IN
11 RIVER WATER.

12 Q. AND IS THAT A STUDY THAT YOU PERFORMED IN YOUR
13 LABORATORY WITHIN MONSANTO?

14 A. YES.

15 Q. IS THAT A TRUE AND ACCURATE COPY OF THE GRAPHS THAT
16 YOU PREPARED AS PART OF YOUR WORK WITHIN MONSANTO?

17 A. THE PAGES ACTUALLY REFER TO TWO DIFFERENT THINGS. THE
18 TOP PAGE REFERS TO WHAT WE JUST TALKED ABOUT. THE
19 BACK PAGE, UPON CLOSER LOOK, REFERS TO SEMI-CONTINUOUS
20 ACTIVATED SLUDGE WHICH IS A DIFFERENT TECHNIQUE.

21 MR. FEATHERSTONE:

22 LET'S GO OFF THE RECORD.

23 (OFF THE RECORD DISCUSSION).

24 EXAMINATION CONTINUES BY MR. BRADLEY:

25 Q. DR. TUCKER, YOU HAVE NOW REMOVED THE SECOND PAGE OF

1 1603B, SO THAT AS IT PRESENTLY EXISTS, 1603B IS A
2 ONE-PAGE EXHIBIT; IS THAT CORRECT?

3 A. YES, SIR.

4 Q. AND IS THAT EXHIBIT SOMETHING THAT YOU MAINTAINED
5 WITHIN YOUR FILES WITHIN MONSANTO AS PART OF YOUR
6 REGULARLY CONDUCTED BUSINESS THERE?

7 A. YES.

8 Q. AND DID YOU GENERATE THIS EXHIBIT DURING THE PERIOD OF
9 TIME YOU WERE WORKING ON THE BIODEGRADATION STUDY OF
10 AROCOR 1221?

11 A. YES.

12 Q. WHAT DOES THAT EXHIBIT SHOW?

13 A. IT SHOWS THAT WHEN YOU INOCULATE RIVER WATER WITH
14 AROCOR 1221, THAT EVEN UNDER THOSE VERY LOW BACTERIAL
15 BUG POPULATIONS, AND THINGS OF THAT SORT, THAT AROCOR
16 1221 UNDERGOES BIODEGRADATION.

17 MR. BRADLEY:

18 LET'S GO OFF THE RECORD ONE MORE TIME.

19 (OFF THE RECORD DISCUSSION) .

20 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1603C,
21 BIODEGRADATION STUDY, HERETO ATTACHED) .

22 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1603D,
23 COMPILATION OF RESIDUE STUDIES, HERETO ATTACHED) .

24 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT 1603E,
25 SEMI-CONTINUOUS ACTIVATED SLUDGE BIODEGRADATION STUDIES ON

1 AROCLOR 1242, HERETO ATTACHED) .

2 EXAMINATION CONTINUES BY MR. BRADLEY:

3 Q. DR. TUCKER, I'M NOW GOING TO SHOW YOU PLAINTIFF'S
4 EXHIBITS 1603C. IS THIS THE PORTION OF THE ORIGINAL
5 1603 THAT WAS REDUNDANT?

6 A. YES.

7 Q. I'M GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1603D, THIS
8 WAS REMOVED BY YOU WHEN YOU SEPARATED PLAINTIFF'S
9 EXHIBIT 1603, CORRECT?

10 A. YES.

11 Q. AND WHAT IS PLAINTIFF'S EXHIBIT 1603D?

12 A. IT IS A COMPILATION OF RESIDUE STUDIES DEPICTED
13 GRAPHICALLY AND OTHERWISE IN ABION AND RAT, AND TO
14 SOME EXTENT, FISH STUDIES.

15 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1603E.
16 WAS THIS THE SEPARATE PAGE THAT YOU REMOVED FROM
17 1603B?

18 A. YES.

19 Q. AND WHAT IS 1603E?

20 A. 1603E IS A SEMI-CONTINUOUS ACTIVATED SLUDGE
21 BIODEGRADATION OF AROCLOR 1242 SHOWING THE MIXED
22 LIQUOR IN THE SEMI-CONTINUOUS ACTIVATED SLUDGE UNIT
23 BEFORE AND AFTER FEEDING, AND THESE ARE EXTRACTS OF
24 THAT MIXED LIQUOR AND ELECTRON CAPTURED CHROMATOGRAMS
25 OF THE MATERIALS THAT WERE EXTRACTED.

1 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1504 AND
2 ASK YOU TO REVIEW THAT FOR ME, PLEASE.

3 A. (REVIEWS DOCUMENT). OKAY, I'VE REVIEWED THE DOCUMENT.

4 Q. IS THIS A MEMORANDUM THAT YOU AUTHORED NOVEMBER 20,
5 1973, TO W.B. PAPAGEORGE?

6 A. YES.

7 Q. AND DOES IT DESCRIBE EVENTS THAT OCCURRED CLOSE TO THE
8 DATE YOU AUTHORED THE DOCUMENT?

9 A. YES.

10 Q. IS THIS A TRUE AND ACCURATE COPY OF THE MEMORANDUM YOU
11 SENT TO W.B. PAPAGEORGE ON NOVEMBER 20, 1973?

12 A. WITH THE EXCEPTION THAT THERE'S NOT A COPY OF THE
13 PAPER TO BE PUBLISHED IN ATMOSPHERIC ENVIRONMENTAL,
14 COPY ATTACHED, ASSOCIATED WITH THE DOCUMENT.

15 Q. OTHER THAN THAT, IT'S A TRUE AND ACCURATE COPY?

16 A. IT APPEARS TO BE SO, YES, SIR.

17 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
18 FILES AT MONSANTO AS PART OF YOUR REGULARLY CONDUCTED
19 BUSINESS?

20 A. YES.

21 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1249.

22 A. (REVIEWS DOCUMENT).

23 Q. HAVE YOU COMPLETED YOUR REVIEW?

24 A. YES, SIR.

25 Q. HAVE YOU SEEN THIS EXHIBIT PREVIOUS TO TODAY'S

1 DEPOSITION?

2 A. PROBABLY, BUT I DO NOT RECALL IT SPECIFICALLY TODAY.

3 Q. SO YOU WOULDN'T BE ABLE TO TELL US WHETHER IT'S A TRUE

4 AND ACCURATE COPY OR YOU WOULD BE ABLE TO TELL US?

5 A. IN REVIEWING IT, I HAVE NO REASON TO SUSPICION THAT

6 IT'S NOT A TRUE AND ACCURATE COPY.

7 Q. THIS IS A MARCH 8, 1974, MEMORANDUM BY H.S. BERGEN TO

8 A NUMBER OF PEOPLE INCLUDING YOU; IS THAT CORRECT?

9 A. THAT'S CORRECT.

10 Q. AND THE SUBJECT IS POLYCHLORINATED BIPHENYL EFFLUENT

11 STANDARDS?

12 A. YES, SIR.

13 Q. IS THIS A DOCUMENT THAT WAS GENERATED SHORTLY AFTER AN

14 INDUSTRY-MONSANTO MEETING ON THE PCB EFFLUENT

15 STANDARDS?

16 A. IT SAYS THAT, YES.

17 Q. AND IS THIS THE KIND OF DOCUMENT THAT MONSANTO WOULD

18 MAINTAIN IN ITS FILES AS PART OF ITS REGULARLY

19 CONDUCTED BUSINESS?

20 A. YES.

21 Q. I'M GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1560 AND ASK

22 YOU TO REVIEW THAT.

23 A. DO YOU WANT ME TO PASS 1249 ON?

24 Q. YES.

25 A. (REVIEWS DOCUMENTS). I'VE REVIEWED THE DOCUMENT.

1 Q. IS THIS DOCUMENT A SET OF MINUTES OF A MEETING HELD
2 DECEMBER 1, 1972, IN MONSANTO'S RESEARCH CENTER IN ST.
3 LOUIS, MISSOURI THAT YOU AUTHORED?

4 A. YES.

5 Q. THE LAST SENTENCE OF IT INDICATES AN OUTLINE OF THE
6 SUBJECTS REVIEWED FOLLOWS. BUT THAT'S NOT PRESENT
7 WITH THIS EXHIBIT.

8 A. RIGHT.

9 Q. WITH THAT UNDERSTANDING, DOES THIS APPEAR TO BE A TRUE
10 AND ACCURATE COPY OF THE MINUTES OF THE MEETING THAT
11 YOU PREPARED REGARDING THE DECEMBER 1, 1972, MEETING
12 REFERENCED IN THE EXHIBIT?

13 A. LET'S PUT IT THIS WAY, IT DOESN'T APPEAR NOT TO BE.
14 THIS WAS A LONG TIME AGO AND THIS HAS OBVIOUSLY BEEN
15 EXTRACTED FROM A LARGER DOCUMENT.

16 Q. DO YOU SEE ON PAGE TWO SOME HANDWRITING?

17 A. YES, I DO.

18 Q. IS THAT YOUR HANDWRITING?

19 A. NO, IT'S NOT.

20 Q. IS THIS THE SORT OF DOCUMENT THAT YOU WOULD MAINTAIN
21 AS PART OF THE FILES THAT YOU HAD WITHIN MONSANTO AS
22 PART OF YOUR REGULARLY CONDUCTED BUSINESS?

23 MR. FEATHERSTONE:

24 WITH OR WITHOUT THE HANDWRITING?

25 MR. BRADLEY:

1 AS IT IS.

2 MR. FEATHERSTONE:

3 WITH THE HANDWRITING.

4 WITNESS CONTINUES:

5 A. I WOULD MAINTAIN A COPY OF IT, BUT I WOULD DOUBT THAT
6 MY COPY WOULD HAVE THE HANDWRITING ON IT.

7 Q. ABSENT THE HANDWRITING, IT IS A DOCUMENT THAT YOU
8 WOULD EXPECT WAS WITHIN YOUR FILING SYSTEM AT
9 MONSANTO?

10 A. YES.

11 Q. AND THE NEXT TO THE LAST SENTENCE SAYS, "THE REMAINDER
12 OF THE MEETING WAS SPENT REVIEWING CURRENT AND FUTURE
13 MICC PCB DEFENSE WORK." MY FIRST QUESTION IS: WHAT
14 WAS MICC?

15 A. MONSANTO INDUSTRIAL CHEMICAL COMPANY.

16 Q. AND WHAT PCB DEFENSE WORK WERE YOU REFERRING TO IN
17 THAT SENTENCE IN THIS EXHIBIT?

18 A. IT HAD BECOME COMMON USAGE TO TALK ABOUT PCB DEFENSE
19 WORK IN THE SENSE THAT THE COMPANY WAS DEFENDING PCB
20 AGAINST UNWARRANTED ALLEGATIONS.

21 Q. WHAT WERE THE UNWARRANTED ALLEGATIONS YOU WERE
22 DEFENDING AGAINST?

23 A. MAINLY BY CONJECTURE BY PEOPLE OUTSIDE MONSANTO WHO
24 REALLY DON'T HAVE ENOUGH INFORMATION TO SAY WHAT THEY
25 WERE SAYING.

1 Q. AND WHAT WERE THEY CONJECTURING THAT MONSANTO
2 DISAGREED WITH?

3 MR. FEATHERSTONE:

4 OBJECT TO THE FORM OF THE QUESTION.

5 WITNESS CONTINUES:

6 A. IN GENERAL SOME OF THE IMPACTS THAT THEY WERE
7 ATTRIBUTING TO THE AROCLOR PRODUCT LINE.

8 Q. WHICH IMPACTS?

9 MR. FEATHERSTONE:

10 SAME OBJECTION.

11 WITNESS CONTINUES:

12 A. I DON'T RECALL SPECIFICALLY.

13 Q. DO YOU RECALL WHETHER FOR THESE UNWARRANTED
14 ALLEGATIONS REGARDING AROCLOR WHETHER MONSANTO HAD
15 DATA TO SHOW THAT THE ALLEGATIONS WERE, IN FACT,
16 UNWARRANTED?

17 A. YES.

18 Q. DO YOU RECALL WHETHER ANY OF THE ALLEGATIONS INCLUDED
19 THAT EXPOSURE TO AROCLOR COULD CAUSE CHLORACNE?

20 A. NO.

21 Q. DO YOU RECALL WHETHER ANY OF THE ALLEGATIONS WERE THAT
22 IF SOMEONE WAS EXPOSED TO AROCLOR AND DEVELOPED A SKIN
23 RASH, THAT IT COULD BE A SIGN OF A SYSTEMIC POISONING?

24 A. NO.

25 Q. DO YOU RECALL WHETHER ANY OF THE ALLEGATIONS INCLUDED

1 A CLAIM THAT AROCLOR WAS A POISON?

2 A. NO.

3 Q. DO YOU RECALL WHETHER ANY OF THE CLAIMS HAD TO DO WITH
4 WHETHER AROCLORS CONTAINED POLYCHLORINATED
5 DIBENZOFURANS?

6 A. NO.

7 Q. WHEN YOU ANSWERED NO, IS IT NO, YOU DON'T RECALL OR,
8 NO, THOSE WEREN'T THE CLAIMS?

9 A. IN THAT PARTICULAR INSTANCE THE DIOXINS -- YOU DID SAY
10 DIOXINS, CORRECT?

11 Q. I SAID POLYCHLORINATED DIBENZOFURANS.

12 A. FURANS. ALLEGATIONS HAD BEEN MADE, AND WE HAD SHOWN
13 THAT THERE WAS NONE IN THERE THAT WAS DETECTABLE. SO
14 THERE WAS NO NEED TO WORRY ABOUT THOSE AS BEING
15 UNWARRANTED.

16 Q. FORGIVE ME IF I'VE ASKED YOU THIS BEFORE. DO YOU KNOW
17 WHETHER POLYCHLORINATED DIBENZOFURANS HAVE EVER BEEN
18 SHOWN TO BE PRESENT IN PCBs MANUFACTURED BY MONSANTO?

19 A. NO.

20 Q. NO, YOU DON'T KNOW OR, NO, THEY DO NOT --

21 A. I DO NOT KNOW IF THEY EVER HAVE BEEN SHOWN TO BE
22 PRESENT IN POLYCHLORINATED BIPHENYLS MANUFACTURED BY
23 MONSANTO.

24 MR. FEATHERSTONE:

25 YOU DID, IN FACT, ASK THAT EARLIER TODAY.

1 EXAMINATION CONTINUES BY MR. BRADLEY:

2 Q. WHEN DID YOU CEASE WORKING AS A GROUP LEADER AND
3 BECOME A SENIOR RESEARCH SPECIALIST?

4 A. I GUESS, TO THE BEST OF MY RECOLLECTION, THAT WAS
5 SOMEWHERE BETWEEN '75, '76, IN THAT RANGE, 1975, 1976.

6 MR. BRADLEY:

7 LET'S GO OFF THE RECORD BRIEFLY.

8 (OFF THE RECORD DISCUSSION) .

9 (BRIEF RECESS) .

10 EXAMINATION CONTINUES BY MR. BRADLEY:

11 Q. DR. TUCKER, I'VE NOW SHOWN YOU EXHIBIT 1438. THAT
12 DOCUMENT IS ENTITLED "BIODEGRADABILITY OF AROCLOR
13 1221." IS THAT CORRECT?

14 A. YES.

15 Q. AND AS I UNDERSTAND IT FROM A DISCUSSION WE HELD
16 BRIEFLY OFF THE RECORD, NOT ALL OF WHAT IS WITHIN
17 PLAINTIFF'S EXHIBIT 1438 NECESSARILY RELATES TO
18 BIODEGRADABILITY OF AROCLOR 1221; IS THAT CORRECT?

19 A. YES.

20 Q. WOULD YOU GO THROUGH THAT EXHIBIT AND REMOVE FOR ME
21 ANYTHING THAT YOU DETERMINE DOES NOT RELATE TO THE
22 BIODEGRADABILITY OF AROCLOR 1221.

23 MR. FEATHERSTONE:

24 WELL, MR. BRADLEY, DO YOU WANT HIM TO REMOVE ANYTHING
25 THAT DOES NOT RELATE TO BIODEGRADABILITY OF AROCLOR

1 1221, OR DO YOU WANT HIM TO REMOVE ANYTHING THAT IS
2 NOT PART OF THE SPECIAL STUDY NUMBER 7217?

3 EXAMINATION CONTINUES BY MR. BRADLEY:

4 Q. ACTUALLY MR. FEATHERSTONE IS CORRECT. I WANT YOU TO
5 REMOVE ANYTHING THAT'S NOT PART OF THE SPECIAL STUDY
6 7217, WITH THE JOB NUMBER THAT'S REFERENCED AT THE TOP
7 OF THE EXHIBIT.

8 A. (COMPLIES). OKAY, I'VE DONE THAT. I HAVE DONE THAT.

9 Q. AND I'M NOW GOING TO, WITH YOUR ATTORNEY'S PERMISSION,
10 REMARK 1438 AS 1438A.

11 MR. FEATHERSTONE:

12 WELL, A PORTION OF 1438 IS BEING REMARKED AS 1438A.

13 EXAMINATION CONTINUES BY MR. BRADLEY:

14 Q. I'M MARKING AS 1438A, THOSE SETS OF PAPERS THAT YOU
15 REMOVED FROM THE ORIGINAL 1438; IS THAT CORRECT?

16 A. YES, THAT'S CORRECT.

17 Q. I'M REFERRING NOW TO 1438A, AND ASK MY FIRST QUESTION
18 IS: IS THAT A TRUE AND ACCURATE COPY OF THE SPECIAL
19 STUDY 7217 REGARDING BIODEGRADABILITY OF AROCLOR 1221?

20 A. (REVIEWS DOCUMENT). YES.

21 Q. IS THIS A PAPER THAT YOU WROTE WITH V.W. SAEGER?

22 A. YES.

23 Q. WHO WAS V.W. SAEGER?

24 A. V.W. SAEGER WAS A PH.D. PHYSICAL CHEMIST THAT WORKED
25 FOR ME AND RAN THE BIODEGRADATION PROGRAM.

1 Q. AND THIS EXHIBIT 1438A WAS WRITTEN IN AUGUST OF 1974?

2 A. THAT IS CORRECT.

3 Q. DID YOU MAINTAIN A COPY OF THIS EXHIBIT WITHIN YOUR
4 FILES WITHIN MONSANTO AS PART OF YOUR REGULARLY
5 CONDUCTED BUSINESS THERE?

6 A. YES.

7 Q. WOULD YOU NOW LOOK AT 1438B, WHICH I AM NOW HAVING
8 MARKED.

9 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1438B,
10 HANDWRITTEN REPORT, HERETO ATTACHED).

11 MR. BRADLEY:

12 OFF THE RECORD.

13 (OFF THE RECORD DISCUSSION).

14 EXAMINATION CONTINUES BY MR. BRADLEY:

15 Q. I'VE NOW SHOWN YOU WHAT'S BEEN MARKED FOR
16 IDENTIFICATION AS EXHIBIT 1438B. CAN YOU TELL ME WHAT
17 THAT DOCUMENT IS?

18 A. THE FIRST TWO PAGES APPEAR TO BE HANDWRITTEN NOTES OF
19 MINE REFERRING TO SEMI-CONTINUOUS ACTIVATED
20 BIODEGRADATION STUDIES. THE THIRD PAGE, COPY OF
21 ELECTRON CAPTURED CHROMATOGRAMS OF AROCLOR 1242 AFTER
22 FEEDING, MIXED LIQUOR AFTER FEEDING, MIXED LIQUOR
23 BEFORE FEEDING. 740507 IS A COMPARISON OF MATERIAL
24 CALLED FRACTIONATED 1130, AROCLOR 1242B WHICH IS
25 LABELED FRACTIONATED 1142, AND THEN AROCLOR 1242. THE

1 PAGES 740508 THROUGH 740514 APPEAR TO BE BAR CHARTS
2 RELATING DEGRADATION TO HOMOLOG DISTRIBUTION.

3 MR. FEATHERSTONE:

4 BEFORE DR. TUCKER GOES ON, THE NUMBERS HE'S BEEN
5 USING, ARE THESE NUMBERS THAT NEVADA POWER HAS PLACED
6 ON THE DOCUMENTS?

7 MR. BRADLEY:

8 YES.

9 WITNESS CONTINUES:

10 A. THE FINAL PAGES, 740515 THROUGH 740530 APPEAR TO BE A
11 PRESENTATION OF SOME SORT THAT WAS PREPARED BY
12 CUMMINGS PATON HAVING TO DO WITH WHEN, WHERE, AND WHY
13 OF THE PCB SITUATION.

14 Q. THE PORTION OF THAT EXHIBIT THAT BEGINS AT 740504,
15 YOUR HANDWRITTEN NOTES.

16 A. SEVEN FORTY --

17 Q. FIVE ZERO FOUR, YOUR HANDWRITTEN NOTES.

18 A. YES.

19 Q. THROUGH 740514.

20 A. YES.

21 Q. DO THOSE ALL RELATE TO SEMI-CONTINUOUS ACTIVATED
22 SLUDGE BIODEGRADATION STUDIES?

23 A. AS I STATED EARLIER, THE FIRST THREE PAGES, 74504,
24 505, AND 506 FOR SURE.

25 Q. YES.

1 A. 740507 JUST SHOWS THE ELECTRON CAPTURE PATTERNS FOR
2 THE THREE DIFFERENT PCB MATERIALS.

3 Q. DOES THAT RELATE IN ANY WAY TO SEMI-CONTINUOUS
4 ACTIVATED SLUDGE BIODEGRADATION?

5 A. NO.

6 Q. OKAY.

7 A. FOLLOWING THAT ON 740508 THROUGH 740514, THE FIRST
8 PAGE OF THAT SERIES DOES HAVE SEMI-CONTINUOUS
9 ACTIVATED SLUDGE WRITTEN ON IT, AND PROBABLY REFERS TO
10 THAT. THE REST APPEAR TO, BUT I'D HAVE TO REALLY LOOK
11 AT THE DATA. THEY DO NOT HAVE ACTIVATED SLUDGE
12 WRITTEN ON THEM, BUT THEY COULD BE THAT. THEN THE
13 REST OF THE DOCUMENT ARE, OH, SALES, AND FIGURES,
14 AND --

15 Q. I'M NOW GOING TO ASK YOU TO REMOVE FROM EXHIBIT 1438B
16 THE PAGES THAT BEGIN WITH 740515.

17 A. 74515.

18 Q. WITH YOUR ATTORNEY'S CONSENT.

19 MR. FEATHERSTONE:

20 LET'S GO OFF THE RECORD.

21 (OFF THE RECORD DISCUSSION).

22 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1438C,
23 SEMI-CONTINUOUS ACTIVATED SLUDGE BIODEGRADATION STUDY,
24 HERETO ATTACHED).

25 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1438D,

1 ELECTRON CAPTURED CHROMATOGRAMS, HERETO ATTACHED) .

2 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1438E,
3 SEMI-CONTINUOUS ACTIVATED SLUDGE TEST, HERETO ATTACHED) .

4 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT NUMBER 1438F,
5 MEETING NOTES, HERETO ATTACHED) .

6 EXAMINATION CONTINUES BY MR. BRADLEY:

7 Q. DR. TUCKER, YOU'VE NOW, AT MY REQUEST, TAKEN WHAT WAS
8 MARKED AS PLAINTIFF'S EXHIBIT 1438B AND SEPARATED THAT
9 DOCUMENT INTO 1438C, D, E, AND F; IS THAT CORRECT?

10 A. THAT'S CORRECT.

11 Q. I'M NOW GOING TO REHAND TO YOU 1438B AND ASK YOU TO
12 DESCRIBE WHAT IT IS AS IT PRESENTLY EXISTS HAVING BEEN
13 SEPARATED.

14 A. IT'S HANDWRITTEN NOTES OF MINE WHICH MAY HAVE BEEN
15 COPIED FROM A LAB BOOK.

16 Q. DOES THAT EXHIBIT APPEAR TO BE A TRUE AND ACCURATE
17 COPY OF THE NOTES THAT YOU WROTE?

18 A. YES.

19 Q. AND IS THAT THE SORT OF DOCUMENT YOU WOULD MAINTAIN
20 WITHIN YOUR FILES AT MONSANTO AS PART OF YOUR
21 REGULARLY CONDUCTED BUSINESS?

22 A. YES.

23 Q. AND DOES IT DESCRIBE EVENTS OCCURRING ON OR ABOUT THE
24 TIME THAT THEY OCCURRED?

25 A. I DON'T SEE ANY REFERENCE TO ANY DATE. IT IS AN

1 EXCERPT.

2 Q. THE DOCUMENT BEGINS BY SAYING AFTER ITS TITLE OF
3 SEMI-CONTINUOUS ACTIVATED SLUDGE BIODEGRADATION
4 STUDIES, IT SAYS, "WE HAVE BEEN OPERATING FOUR SAS
5 UNITS FOR APPROXIMATELY FOUR TO FIVE MONTHS NOW AND
6 HAVE STUDIED AROCLOR 1221, 1242, 1242 PLUS BIPHENYL,
7 1248 AND," SOMETHING OR OTHER, "1228."

8 A. UH-HUH (AFFIRMATIVE).

9 Q. WHAT IS THE SOMETHING OR OTHER?

10 A. AROBROM 1228.

11 Q. AND WAS THIS DOCUMENT WRITTEN SHORTLY AFTER YOU BEGAN
12 OPERATING THE UNITS FOR THE FOUR TO FIVE MONTHS, AND
13 AFTER YOU HAD STUDIED AROCLOR 1221, 42 AND THE 42 PLUS
14 BIPHENYL AND THE OTHER COMPOUNDS REFERRED THERE IN
15 THAT FIRST PARAGRAPH?

16 A. I'M NOT SURE HOW YOU DEFINE SHORTLY, BUT IT WAS
17 PROBABLY WRITTEN FOUR OR FIVE MONTHS AFTER WE STARTED
18 RUNNING THE SEMI-CONTINUOUS ACTIVATED SLUDGE UNITS.

19 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED WITHIN YOUR
20 FILES AT MONSANTO AS PART OF YOUR REGULARLY CONDUCTED
21 BUSINESS?

22 A. YES.

23 Q. I'M NOW GOING TO SHOW PLAINTIFF'S EXHIBIT 1438C AND
24 ASK YOU TO IDENTIFY THAT.

25 A. IT'S A PAGE WITH TWO CHARTS ON IT WHICH ARE ELECTRON

1 CAPTURED CHROMATOGRAMS OF AROCLOR 1242 EXTRACTED FROM
2 SEMI-CONTINUOUS ACTIVATED SLUDGE MIXED LIQUOR AFTER
3 FEEDING AND BEFORE FEEDING.

4 Q. THIS IS A ONE-PAGE DOCUMENT THAT YOU REMOVED FROM WHAT
5 HAD BEEN 1438B?

6 A. YES.

7 Q. I'M GOING TO SHOW YOU 1438D WHICH IS ALSO A ONE-PAGE
8 DOCUMENT THAT YOU REMOVED FROM 1438B; IS THAT CORRECT?

9 A. YES.

10 Q. WHAT IS THAT DOCUMENT?

11 A. THAT'S A ONE-PAGE DOCUMENT THAT HAS THREE ELECTRON
12 CAPTURED CHROMATOGRAMS ON IT. ONE OF A MATERIAL
13 CALLED FRACTIONATED 1130, THERE'S ANOTHER OF A
14 MATERIAL CALLED AROCLOR 1242B, AND ANOTHER OF AROCLOR
15 1242.

16 Q. WHAT DOES THAT DOCUMENT SHOW, IF ANYTHING?

17 A. IT SHOWS THE HOMOLOG DISTRIBUTION OF THESE THREE
18 DIFFERENT MATERIALS AS A FUNCTION OF THE DEGREE OF
19 CHLORINATION.

20 Q. I'M NOW GOING TO SHOW YOU 1438E, WHICH IS A SEVEN-PAGE
21 SET OF DOCUMENTS THAT YOU REMOVED FROM 1438B; IS THAT
22 CORRECT?

23 A. YES.

24 Q. WHAT IS THAT EXHIBIT?

25 A. IT APPEARS TO BE SOMEONE ATTEMPTING TO PREPARE A BAR

1 CHART RENDITION THAT WOULD DEPICT THE DEGRADATION OF
2 POLYCHLORINATED BIPHENYLS.

3 Q. DID YOU PREPARE THAT EXHIBIT?

4 A. NO, SIR.

5 Q. I'M NOW GOING TO SHOW YOU 1438F, WHICH YOU ALSO
6 REMOVED FROM WHAT HAD BEEN MARKED AS 1438B; IS THAT
7 CORRECT?

8 A. YES, SIR.

9 Q. IS TODAY THE FIRST DAY YOU'VE SEEN THAT EXHIBIT?

10 A. COMPILED IN THIS FASHION, YES.

11 Q. DID YOU PARTICIPATE IN A MEETING ATTENDED IN PART BY
12 C. PATON WHERE THE OBJECTIVES WERE A PROGRESS REPORT
13 ON LABORATORY BIODEGRADATION OF PCBs?

14 A. I DON'T RECALL THE MEETING SPECIFICALLY.

15 Q. I DRAW YOUR ATTENTION TO THE PAGE MARKED 740518.

16 A. YES, SIR.

17 Q. IT SAYS, "MONSANTO PCB SALES IN U.S.A. (MILLION
18 POUNDS) ."

19 A. YES, IT DOES.

20 Q. HAVE YOU SEEN THAT PAGE BEFORE?

21 A. I CANNOT ATTEST TO HAVING SEEN THIS SPECIFIC PAGE
22 BEFORE, BUT I'VE SEEN NUMBERS OF THIS SORT BEFORE.

23 Q. DO YOU KNOW WHETHER MONSANTO IN 1970 SOLD ROUGHLY 74
24 MILLION POUNDS OF PCBs IN THE UNITED STATES?

25 A. NO.

1 Q. WOULD YOU NOW TURN TO 740522.

2 A. OKAY.

3 Q. AT THE TOP IT SAYS, "CAPACITOR FLUIDS WHY CONVERT TO
4 AROCLOR 1016?" DO YOU SEE THAT?

5 A. YES, SIR.

6 Q. UNDER NUMBER ONE IT SAYS, "NINE-FOLD REDUCTION IN PCBs
7 OF PENTACHLORO AND HIGHER." WAS THERE AN EFFORT TO
8 CONVERT TO AROCLOR 1016 BECAUSE THERE WOULD BE A
9 NINE-FOLD REDUCTION OF PCBs OF PENTACHLORO AND HIGHER?

10 A. YES.

11 Q. WHY WAS MONSANTO INTERESTED IN HAVING A REDUCTION IN
12 PCBs OF PENTACHLORO AND HIGHER?

13 A. IT HAD BEEN SHOWN THAT PENTACHLORO BIPHENYLS TOOK VERY
14 LONG PERIODS OF TIME IF THEY WERE RELEASED INTO THE
15 ENVIRONMENT TO UNDERGO DEGRADATION, AND IT WAS FELT
16 THAT IF THESE MATERIALS WERE REMOVED FROM AROCLOR, AND
17 IF THE AROCLORS WERE USED IN CLOSED SYSTEMS, THAT ANY
18 THAT MIGHT BE INADVERTENTLY RELEASED WOULD UNDERGO
19 MORE RAPID DEGRADATION IF THEY DID NOT CONTAIN THE
20 PENTACHLORO AND HIGHER.

21 Q. PRIOR TO MONSANTO'S CONVERSION TO AROCLOR 1016, WHICH
22 AROCLOR PRODUCTS CONTAINED PCBs OF PENTACHLORO AND
23 HIGHER?

24 A. ALL AROCLOR PRODUCTS TO ONE DEGREE OR ANOTHER DOWN TO
25 THE MOLECULAR LEVEL CONTAINED EACH OF THE ISOMERS.

- 1 Q. SO THEY ALL CONTAINED PENTACHLORO AND HIGHER?
- 2 A. YES.
- 3 Q. UNDER NUMBER TWO ON WHY CONVERT TO AROCLOR 1016 IT
- 4 SAYS, "100-FOLD REDUCTION IN PCBs OF HEXACHLORO AND
- 5 HIGHER." WAS THERE AN EFFORT WITHIN MONSANTO TO
- 6 CONVERT TO AROCLOR 1016 BECAUSE THERE WOULD BE A
- 7 100-FOLD REDUCTION IN PCBs OF HEXACHLORO- AND HIGHER?
- 8 A. YES.
- 9 Q. WHY WAS IT IMPORTANT TO MONSANTO TO HAVE A REDUCTION
- 10 IN PCBs OF HEXACHLORO- AND HIGHER?
- 11 A. THE INFORMATION THAT HAD BEEN GENERATED TO DATE,
- 12 AGAIN, INDICATED THAT THE HIGHER THE DEGREE OF
- 13 CHLORINATION OF THE BIPHENYL MOLECULE, THE MORE
- 14 RESISTANT IT WAS IN THE ENVIRONMENT TO ULTIMATE
- 15 DEGRADATION, AND AS SUCH, TO MANUFACTURE A PRODUCT
- 16 THAT HAD MINIMUM IMPACT ON THE ENVIRONMENT, YOU WOULD
- 17 WANT TO PROBABLY REMOVE THE MORE RESISTANT ISOMERS.
- 18 Q. WHEN DID MONSANTO LEARN THAT THE HEXACHLORO- AND
- 19 HIGHER PCBs WERE MORE DIFFICULT TO BIODEGRADE?
- 20 A. THERE WAS NO ONE MINUTE, HOUR, OR DAY THAT THAT
- 21 PARTICULAR KNOWLEDGE CAME TO ANYBODY. IT WAS AN
- 22 EVOLUTIONARY PROCESS IN WHICH MORE AND MORE
- 23 INFORMATION BECAME AVAILABLE, AND WE DEVELOPED A
- 24 THEORY AND REDUCED IT TO PRACTICE WITH PROOF IN TERMS
- 25 OF WHAT WAS ACTUALLY GOING ON IN THE ENVIRONMENT.

1 Q. WHEN DID IT BECOME REASONABLY CLEAR TO YOU THAT PCBs
2 OF HEXACHLORO- AND HIGHER HAD MORE DIFFICULTY
3 BIODEGRADING IN THE ENVIRONMENT?

4 A. AS WE BEGAN TO LOOK AT MORE AND MORE ENVIRONMENTAL
5 SAMPLES THAT WERE FURTHER AND FURTHER AWAY FROM
6 EXPOSURE TO FRESH PCBs, WE BEGAN TO SEE PATTERNS
7 DEVELOP WHEREBY HIGHER HOMOLOGS WERE PRESENT.

8 Q. CAN YOU PUT A TIME FRAME ON IT FOR ME?

9 A. YES. I WOULD SAY THAT WE BECAME FAIRLY KNOWLEDGEABLE
10 ABOUT THAT KIND OF THING SOMETIME AFTER 1970, '71.

11 Q. I'M NOW GOING TO ASK YOU TO TURN YOUR ATTENTION TO
12 740525.

13 A. OKAY.

14 Q. AS PART OF YOUR WORK WITHIN MONSANTO, DID YOU EVER
15 BECOME AWARE OF THE POTENTIAL RATE OF ESCAPE OF PCBs
16 TO THE ENVIRONMENT?

17 A. RESTATE THAT QUESTION, PLEASE, OR REPEAT IT.

18 MR. BRADLEY:

19 WOULD YOU READ IT BACK.

20 (REQUESTED QUESTION READ BY THE COURT REPORTER).

21 WITNESS CONTINUES:

22 A. YES.

23 Q. AND WITHIN MONSANTO, WAS THERE AN ACCEPTED FAILURE
24 RATE FOR CAPACITORS --

25 MR. FEATHERSTONE:

1 OBJECT --

2 EXAMINATION CONTINUES BY MR. BRADLEY:

3 Q. -- FOR DETERMINING THE RATE OF PCB ESCAPE TO THE
4 ENVIRONMENT?

5 A. NO.

6 MR. FEATHERSTONE:

7 OBJECT TO THE FORM OF THE QUESTION.

8 EXAMINATION CONTINUES BY MR. BRADLEY:

9 Q. WAS THERE, WHILE YOU WERE AT MONSANTO, A DISCUSSION OF
10 A CAPACITOR FAILURE RATE OF TWO TENTHS OF ONE PERCENT
11 PER YEAR?

12 A. I DO NOT RECALL THAT.

13 Q. DO YOU RECALL IN THE THOUSANDS OF POUNDS WHAT THE RATE
14 OF PCB ESCAPE TO THE ENVIRONMENT WAS ESTIMATED TO BE
15 BY MONSANTO BETWEEN 1967 AND 1970?

16 A. NO.

17 Q. DO YOU HAVE THAT INFORMATION FOR ANY OF THE YEARS THAT
18 YOU WORKED AT MONSANTO?

19 A. COULD YOU PLEASE SPECIFY HAVING THE INFORMATION?

20 Q. WELL, BECOMING AWARE OF THE INFORMATION REGARDING THE
21 RATE OF THE PCB ESCAPE TO THE ENVIRONMENT.

22 A. THE INFORMATION I'M SURE WAS GENERATED, BOTH ON A
23 HYPOTHETICAL BASIS AND THEN BASED ON PRODUCTION
24 INFORMATION. BUT IT WAS ANCILLARY TO MY TECHNICAL
25 JOB, AND SO I DIDN'T NECESSARILY PAY ATTENTION TO IT

1 OR WORRY ABOUT IT.

2 Q. WHETHER YOU PAID ATTENTION TO IT, OR BECAME WORRIED
3 ABOUT IT, THOUGH, DID YOU EVER BECOME AWARE OF THE
4 INFORMATION REGARDING THE THOUSANDS OF -- WHATEVER
5 AMOUNT OF POUNDS OF PCBs WERE THOUGHT TO BE ESCAPING
6 INTO THE ENVIRONMENT DURING THE TIME YOU WERE EMPLOYED
7 AT MONSANTO?

8 A. I BECAME AWARE OF A NUMBER OF THEORETICAL ESTIMATES,
9 YES.

10 Q. AND WHO DEVELOPED THE THEORETICAL ESTIMATES?

11 A. ANYBODY WHO FELT THEY HAD ACCESS TO THE INFORMATION
12 NECESSARY TO DO SO AND WERE INTERESTED IN THE PROBLEM.
13 IT WAS NOT ONLY INTERNAL, IT WAS EXTERNAL. PEOPLE
14 LIKE E.N. NESBITT, BELL CEREPHAN (ph) THE EPA, YOU
15 NAME IT.

16 Q. AND WHAT WERE THE THEORETICAL ESTIMATES OF PCB ESCAPE
17 TO THE ENVIRONMENT THAT YOU BECAME AWARE OF WHILE AT
18 MONSANTO?

19 MR. FEATHERSTONE:

20 OBJECT TO THE FORM OF QUESTIONING.

21 WITNESS CONTINUES:

22 A. SPECIFICALLY POUND-WISE AND THINGS LIKE THAT?

23 Q. YES.

24 A. I HAVE NO RECOLLECTION.

25 Q. I'M NOW GOING TO SHOW PLAINTIFF'S EXHIBIT 682 AND ASK

1 YOU TO REVIEW THAT. ONE OF THE THINGS I'M GOING TO
2 ASK YOU TO DO IS TO IDENTIFY FOR ME WHETHER THE
3 EXHIBIT CONTAINS PARTS THAT SHOULD BE SEPARATED AS
4 WE'VE SEPARATED OTHER EXHIBITS.

5 A. (REVIEWS DOCUMENTS) .
6 (OFF THE RECORD DISCUSSION) .
7 (BRIEF RECESS) .

8 EXAMINATION CONTINUES BY MR. BRADLEY:

9 Q. DR. TUCKER, I'M NOW GOING TO SHOW YOU PLAINTIFF'S
10 EXHIBIT 1571 WHICH IS ENTITLED "DETERMINATION OF
11 AROCLORS AND RELATED PRODUCTS IN MIXED LIQUOR SAMPLES
12 FROM SEMI-CONTINUOUS ACTIVATED SLUDGE UNITS BY
13 ULTRAVIOLET ABSORPTION." IT HAS A METHOD NUMBER 7117,
14 A JOB NUMBER 1348006. LET ME ASK YOU TO REVIEW THAT
15 FOR ME, PLEASE.

16 A. I HAVE PREVIOUSLY REVIEWED THIS.

17 Q. IS THIS A DOCUMENT THAT YOU PREPARED WITH O. HICKS AND
18 V. SAEGER ON 6 OF '71?

19 A. YES.

20 Q. IS THIS A TRUE AND ACCURATE COPY OF THE JOB NUMBER
21 1348006 THAT YOU PREPARED WITH O. HICKS AND V. SAEGER
22 IN JUNE OF '71?

23 A. UH-HUH (AFFIRMATIVE). YES.

24 Q. WHAT IS THIS DOCUMENT?

25 A. THIS WAS A METHOD WHICH ESTABLISHES THAT ULTRAVIOLET

1 ABSORPTION CAN BE USED TO MONITOR SEMI-CONTINUOUS
2 ACTIVATED SLUDGE DEGRADATION OF THE CONSTITUENTS
3 CALLED OUT IN THE METHOD.

4 Q. AND DID YOU AUTHOR THIS DOCUMENT ON OR ABOUT THE TIME
5 YOU MADE THE DETERMINATION OF AROCLORS AND RELATED
6 PRODUCTS IN MIXED LIQUOR SAMPLES AS IS REFERRED TO IN
7 THE TITLE OF THIS EXHIBIT?

8 A. YES.

9 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAIN IN YOUR FILES
10 AT MONSANTO AS PART OF YOUR REGULARLY CONDUCTED
11 BUSINESS?

12 A. YES.

13 Q. WOULD YOU LOOK AT PAGE TWO OF THAT EXHIBIT UNDER
14 RECOVERY DATA.

15 A. YES.

16 Q. YOU HAVE LISTED AROCLOR 1242, AND SOME OTHER AROCLORS,
17 AND SOME OTHER CHEMICALS THERE, CORRECT?

18 A. YES.

19 Q. AND LET'S BEGIN WITH AROCLOR 1242. THERE IS A FIGURE
20 83.8 PLUS OR MINUS 1.3% RECOVERED. DID I READ THAT
21 CORRECTLY?

22 A. YES, YOU DID.

23 Q. WHAT DOES THAT MEAN?

24 A. IT MEANS THAT WHEN THE ACTIVATED SLUDGE SAMPLE WAS
25 SPIKED WITH A KNOWN LEVEL OF THE CONSTITUENT IN

1 QUESTION, AROCLOR 1242, AND THEN RUN THROUGH THE
2 PROCEDURE, THAT THE AMOUNT RECOVERED WAS 83.8 PLUS OR
3 MINUS 1.3% OF WHAT WAS ADDED.

4 Q. DOES THE NUMBER THAT YOU PUT THERE NEXT TO AROCLOR
5 1242, HAVE ANYTHING TO DO WITH THE ABILITY OF AROCLOR
6 1242 TO BIODEGRADE?

7 A. NOPE. NO, IT DOES NOT.

8 Q. WHAT WAS THE PURPOSE IN CONDUCTING WHATEVER YOU DID
9 THAT'S REFERRED TO IN PLAINTIFF'S EXHIBIT 1571?

10 A. TO ESTABLISH THE VALIDITY OF THE METHOD FOR MEASURING
11 THE CONSTITUENT IN QUESTION IN THE MATRIX BEING
12 ANALYZED.

13 Q. I'M NOW GOING TO HAND YOU PLAINTIFF'S EXHIBIT 1436.

14 A. (REVIEWS DOCUMENT) .

15 Q. HAVE YOU SEEN PLAINTIFF'S EXHIBIT 1436 PRIOR TO
16 TODAY'S DEPOSITION?

17 A. YES.

18 Q. DID YOU AUTHOR THAT?

19 A. IT APPEARS SO, EVEN THOUGH IT'S NOT SIGNED BY ME, AND
20 I WOULD THINK THAT I DID AUTHOR IT. YES.

21 Q. WHAT IS THAT EXHIBIT?

22 A. WELL, IT'S ENTITLED POLYCHLORINATED BIPHENYL
23 BIODEGRADATION STUDIES, AND APPEARS TO BE A SUMMARY
24 REPORT ON BIODEGRADATION STUDIES.

25 Q. DO YOU RECALL ROUGHLY WHAT PERIOD OF TIME IT WAS THAT

1 YOU GENERATED THAT REPORT?

2 A. WELL, IT WOULD HAVE TO BE AFTER 1971.

3 Q. IS THAT --

4 A. OR IN 1971.

5 Q. DOES THAT APPEAR TO BE A TRUE AND ACCURATE COPY OF THE
6 REPORT YOU GENERATED?

7 A. TO THE BEST OF MY ABILITY IT APPEARS TO BE SO.

8 Q. DID YOU MAINTAIN A COPY OF THAT IN YOUR FILES AT
9 MONSANTO AS PART OF YOUR REGULARLY CONDUCTED BUSINESS?

10 A. YES.

11 Q. CAN I SEE IT FOR A MOMENT?

12 A. YES.

13 MR. FEATHERSTONE:

14 OFF THE RECORD.

15 (OFF THE RECORD DISCUSSION).

16 EXAMINATION CONTINUES BY MR. BRADLEY:

17 Q. IN PARAGRAPH FOUR YOU INDICATE, "IN AN ATTEMPT TO
18 ANSWER THESE QUESTIONS, A NUMBER OF COMPARATIVE
19 EXPERIMENTAL LABORATORY STUDIES OF THE AROCLOR
20 PRODUCTS HAVE BEEN CARRIED OUT TO DETERMINE THE EXTENT
21 TO WHICH THESE MATERIALS ARE DEGRADED BY BACTERIAL
22 ABION, ANIMALIA AND AQUATIC ORGANISMS." IS THAT
23 CORRECT?

24 A. WHAT YOU READ OR WHAT I SAID?

25 Q. YES.

1 A. WHAT I SAID?

2 Q. WHAT I READ IS A CORRECT READING OF PARAGRAPH FOUR?

3 A. YES.

4 Q. AND IS THIS PAPER AN ATTEMPT TO EXPLAIN THE STUDIES
5 THAT ARE REFERRED TO IN THAT PARAGRAPH?

6 A. NO.

7 Q. DOES PLAINTIFF'S EXHIBIT 1436 HAVE A DISCUSSION OF THE
8 LABORATORY STUDIES THAT'S REFERRED TO IN THIS
9 PARAGRAPH?

10 A. YES.

11 Q. AND WAS PLAINTIFF'S EXHIBIT 1436 WRITTEN SHORTLY AFTER
12 THE LABORATORY STUDIES WERE COMPLETED THAT WERE
13 REFERRED TO IN PARAGRAPH FOUR?

14 A. THESE STUDIES WEREN'T NECESSARILY COMPLETED, THEY MAY
15 HAVE BEEN ONGOING. BUT THEY WERE WRITTEN AT SOME
16 POINT IN TIME WHEN SOME OF THE STUDY HAD BEEN DONE.
17 AND, IN FACT, AS YOU CAN SEE, IT'S LIKE 1971 OR SO.

18 Q. THIS EXHIBIT HAS SOME HANDWRITING ON IT. IS THAT
19 HANDWRITING YOURS?

20 A. (REVIEWS DOCUMENT). NO.

21 Q. CAN YOU TELL WHOSE HANDWRITING THAT IS?

22 A. NO.

23 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1508
24 WHICH IS AN OCTOBER 13, 1971, LETTER FROM P.G.
25 BENIGNUS TO DR. TOM DEACON OF WESTINGHOUSE ELECTRIC,

1 CORRECT?

2 A. THAT'S CORRECT.

3 Q. HAVE YOU SEEN THIS DOCUMENT ON ANY PRIOR OCCASION?

4 A. YES.

5 Q. THE BLIND COPY REFERENCE AT THE TOP RIGHT-HAND PORTION

6 OF THAT EXHIBIT HAS YOUR NAME THERE, SCOTT TUCKER. IT

7 ALSO HAS THE NUMBER 1760, CORRECT?

8 A. CORRECT.

9 Q. WHAT DOES THE 1760 REFER TO?

10 A. IT'S A MAIL CODE.

11 Q. DID YOU RECEIVE A COPY OF THIS LETTER?

12 A. IT SAYS I DID, I CAN'T ATTEST TO THAT FACT. I'M SURE

13 I DID.

14 Q. AND DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF

15 THE LETTER THAT YOU RECEIVED FROM MR. BENIGNUS TO DR.

16 DEACON?

17 A. YES.

18 Q. CAN YOU TELL IF THIS IS A DOCUMENT WRITTEN ON MONSANTO

19 LETTERHEAD?

20 A. NO, NOT FROM THE COPY I HAVE.

21 Q. DID MONSANTO EVER HAVE A LETTERHEAD THAT HAD A LITTLE

22 CIRCLE AT THE TOP OR AS PART OF IT?

23 A. NO, IT LOOKS LIKE HOLE PUNCHES.

24 Q. DID YOU KEEP A COPY OF THIS LETTER AS PART OF YOUR

25 RECORD KEEPING SYSTEM IN MONSANTO?

1 A. I PROBABLY DID, YEAH.

2 Q. AND YOU KEPT THAT AS PART OF THE REGULARLY CONDUCTED

3 BUSINESS YOU DID AS A MONSANTO EMPLOYEE?

4 A. YES.

5 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1542.

6 YOU HAVE REVIEWED THAT DOCUMENT DURING THE LUNCH HOUR,

7 HAVE YOU NOT?

8 A. YES.

9 Q. IS THIS A DOCUMENT YOU SAW PRIOR TO TODAY'S

10 DEPOSITION?

11 A. YES.

12 Q. AND IT SHOWS THAT YOU RECEIVED A COPY OF THIS EXHIBIT,

13 CORRECT, UP IN THE RIGHT-HAND CORNER?

14 A. IT SHOWS THAT BOB KELLER AND MYSELF RECEIVED A COPY OF

15 IT.

16 Q. AND THIS IS A LETTER FROM J.R. DURLAND TO W.B.

17 PAPAGEORGE?

18 A. CORRECT.

19 Q. DID MONSANTO HAVE A MITSHUBISHI CHEMICAL COMPANY?

20 A. YES.

21 Q. THAT WAS LOCATED IN TOKYO, JAPAN?

22 A. I BELIEVE SO. IT WAS IN JAPAN, THAT WAS FOR SURE. IT

23 MIGHT HAVE BEEN MULTIPLE PLACES.

24 Q. DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF THE

25 LETTER THAT YOU RECEIVED FROM MR. DURLAND TO MR.

1 PAPAGEORGE?

2 A. (REVIEWS DOCUMENT). YES.

3 Q. DID YOU KEEP A COPY OF THIS EXHIBIT AS PART OF THE
4 REGULARLY CONDUCTED BUSINESS YOU UNDERTOOK AT
5 MONSANTO?

6 A. IF INDEED I RECEIVED IT, WHICH IT INDICATES THAT I DID
7 IN CONJUNCTION WITH KELLER, I WOULD HAVE KEPT
8 CORRESPONDENCE LIKE THAT IN MY FILES.

9 Q. DID YOU DO ANY WORK WITH MR. PAPAGEORGE WHILE YOU WERE
10 EMPLOYED AT MONSANTO?

11 A. YES.

12 Q. WHAT KIND OF WORK DID YOU DO WITH HIM OTHER THAN WHAT
13 YOU DESCRIBED EARLIER? WELL, LET ME REPHRASE THE
14 QUESTION. YOU INDICATED THIS MORNING THAT YOU WORKED
15 ON BIODEGRADATION STUDIES OF PCBs, CORRECT?

16 A. CORRECT.

17 Q. YOU ALSO INDICATED THIS MORNING THAT YOU WORKED ON THE
18 DEVELOPMENT OF ANALYTICAL METHODOLOGIES RELATING TO
19 PCBs, CORRECT?

20 A. CORRECT.

21 Q. DID YOU DO ANY WORK WITH MR. PAPAGEORGE RELATING TO
22 PCBs OTHER THAN THE WORK YOU WERE DOING RELATIVE TO
23 BIODEGRADATION AND THE DEVELOPMENT OF ANALYTICAL
24 METHODOLOGIES?

25 A. YES.

1 Q. WHAT OTHER WORK DID YOU DO WITH MR. PAPAGEORGE?

2 A. BILL PAPAGEORGE WAS PART OF A NUMBER OF TEAMS THAT
3 WERE ACTIVELY TRYING TO UNDERSTAND WHAT WAS GOING ON,
4 AND MAKING SURE WHATEVER INFORMATION WE GOT WAS GIVEN
5 OVER TO OUR CUSTOMERS AS SOON AS WE GOT IT. AND I
6 PARTICIPATED WITH BILL AS A ANALYTICAL EXPERT IN THE
7 AREAS OF ANALYTICAL CHEMISTRY AND BIODEGRADATION AND
8 OFTEN WENT ALONG WITH HIM TO REGULATORY AGENCIES, TO
9 CUSTOMERS, AND TO OTHER FOLKS TO PRESENT THAT
10 INFORMATION.

11 Q. WHICH CUSTOMERS DID YOU GO VISIT WITH MR. PAPAGEORGE
12 TO RELATE THAT INFORMATION?

13 A. ALMOST ALL OF OUR SIGNIFICANT CUSTOMERS, GENERAL
14 ELECTRIC, WESTINGHOUSE, FOR CERTAIN.

15 Q. DID YOU GO TO ANY TRADE ASSOCIATIONS COMPRISED IN
16 WHOLE OR IN PART OF ELECTRICAL UTILITY COMPANIES WITH
17 MR. PAPAGEORGE TO RELATE WHAT INFORMATION YOU HAD
18 REGARDING THE TOXICITY OF PCBs?

19 A. I WAS NOT A TOXICOLOGIST. IF I WENT WITH BILL TO
20 THESE KINDS OF MEETINGS I WOULD HAVE BEEN TALKING IN
21 MY AREA OF EXPERTISE WHICH WAS ANALYTICAL CHEMISTRIES
22 OF PCBs AND THE BIODEGRADATION STUDIES IN TISSUE
23 RESIDUES, AND I PROBABLY MAY HAVE, EITHER HE OR PAUL
24 BENIGNUS.

25 Q. DO YOU RECALL WHICH TRADE ASSOCIATIONS COMPRISED IN

1 WHOLE OR IN PART OF ELECTRICAL UTILITY COMPANIES YOU
2 MADE THESE PRESENTATIONS TO WITH MR. PAPAGEORGE?
3 A. NO, I DO NOT.
4 Q. HAVE YOU EVER SPOKEN WITH ANYONE FROM NEVADA POWER
5 COMPANY?
6 A. NO, SIR.
7 Q. HAVE YOU EVER SPOKEN WITH ANYONE WHO WAS THEN EMPLOYED
8 BY AN ELECTRICAL UTILITY COMPANY?
9 A. CAN YOU REPHRASE THAT QUESTION SO I CAN UNDERSTAND IT?
10 Q. WHILE A MONSANTO EMPLOYEE, DID YOU EVER HAVE A
11 CONVERSATION WITH ANY EMPLOYEE OF AN ELECTRICAL
12 UTILITY COMPANY REGARDING PCBs?
13 A. NOT TO THE BEST OF MY RECOLLECTION.
14 Q. DO YOU KNOW WHETHER IN 1971 BILL PAPAGEORGE WAS IN
15 COMMUNICATION WITH THE MONSANTO MITSHUBISHI CHEMICAL
16 COMPANY?
17 A. WELL, I HAVE A MEMO IN FRONT OF ME THAT WOULD INDICATE
18 THAT HE WAS CONTACTED BY SOMEBODY, AND IT WAS ONE OF
19 OUR COMPANIES, SO I DON'T KNOW SPECIFICALLY. BUT --
20 Q. THIS EXHIBIT APPEARS TO BE WRITTEN AFTER MR.
21 PAPAGEORGE SHARED SOME INFORMATION WITH MITSHUBISHI
22 MONSANTO CHEMICAL COMPANY?
23 A. YES.
24 Q. I'M NOW GOING TO SHOW YOU EXHIBIT 1544. THAT IS ALSO
25 A DOCUMENT THAT YOU REVIEWED OVER THE LUNCH HOUR; IS

1 THAT CORRECT?

2 A. YES.

3 Q. AND THIS IS ENTITLED "MCS-1016, AN ENVIRONMENTALLY
4 COMPATIBLE AROCLOR"?

5 A. YES.

6 Q. AND IT HAS THE WORD CONFIDENTIAL AT THE TOP.

7 A. YES.

8 Q. AND IN THE TOP RIGHT-HAND CORNER IT REFERS TO SPECIAL
9 STUDY 71-2, JOB NUMBER 13480.

10 A. YES.

11 Q. HAVE YOU SEEN THIS DOCUMENT PRIOR TO TODAY'S
12 DEPOSITION?

13 A. YES.

14 Q. IS THIS A DOCUMENT THAT YOU AUTHORED?

15 A. YES.

16 Q. DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF THE
17 DOCUMENT YOU AUTHORED IN FEBRUARY OF 1971 ENTITLED,
18 "MCS-1016, AN ENVIRONMENTALLY COMPATIBLE AROCLOR"?

19 A. YES.

20 Q. AND WAS THE REPORT AN EFFORT TO BRING TOGETHER ALL OF
21 THE INFORMATION GENERATED BY MONSANTO, AND OTHERS,
22 THAT SUPPORTS THE CONTENTION THAT AN ENVIRONMENTALLY
23 COMPATIBLE AROCLOR CAN BE MANUFACTURED? I'M REFERRING
24 TO THE FIRST SENTENCE OF THE FIRST PARAGRAPH.

25 A. (REVIEWS DOCUMENT). YES.

1 Q. AND DID YOU WRITE THIS REPORT BASED UPON THE
2 INFORMATION THAT YOU HAD IN YOUR POSSESSION THAT WAS
3 GENERATED BY MONSANTO, AND OTHERS, THAT SUPPORTS THE
4 CONTENTION THAT AN ENVIRONMENTALLY COMPATIBLE AROCLOR
5 CAN BE MANUFACTURED?

6 A. YOU'RE GOING TO HAVE TO DO THAT ONE AGAIN.

7 Q. DID YOU WRITE THIS REPORT AFTER YOUR RECEIPT OF THE
8 INFORMATION THAT HAD BEEN GENERATED TO THAT POINT BY
9 MONSANTO, AND OTHERS, THAT SUPPORTED THE CONTENTION
10 THAT AN ENVIRONMENTALLY COMPATIBLE AROCLOR COULD BE
11 MANUFACTURED?

12 A. YES.

13 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES
14 IN MONSANTO AS PART OF YOUR REGULARLY CONDUCTED
15 BUSINESS ACTIVITIES?

16 A. YES.

17 MR. FEATHERSTONE:

18 OFF THE RECORD.

19 (OFF THE RECORD DISCUSSION).

20 Q. DR. TUCKER, I'M NOW GOING TO SHOW YOU PLAINTIFF'S
21 EXHIBIT 1514 WHICH IS ANOTHER OF THE EXHIBITS THAT I
22 ASKED YOU AND YOUR ATTORNEY TO REVIEW OVER THE LUNCH
23 HOUR; IS THAT CORRECT?

24 A. YES, SIR.

25 Q. IS THIS A JANUARY 29, 1970, MEMORANDUM WRITTEN BY YOU,

1 BY J. L-I-T-S-C-H-G-I, AND B.J. WESTENBERGER?

2 A. YES.

3 Q. AND IT'S TO R.E. KELLER IN RESEARCH?

4 A. YES.

5 Q. AND THE SUBJECT MATTER IS AROCLOR WILDLIFE MONTHLY

6 SUMMARY?

7 A. YES.

8 Q. IS THIS A TRUE AND ACCURATE COPY OF THE REPORT THAT

9 YOU GENERATED WITH THOSE TWO OTHER INDIVIDUALS ON

10 JANUARY 29, 1970?

11 A. YES.

12 Q. THE INITIAL SENTENCE INDICATES, "THE INITIAL

13 BIOLOGICALLY POPULATED RIVER WATER DEGRADATION STUDY

14 ON AROCLORS 1221, 1242, 1248, AND 1254 HAS BEEN

15 COMPLETED." IS THAT CORRECT?

16 A. YES.

17 Q. DOES THIS MEMORANDUM DISCUSS THE COMPLETION OF THOSE

18 STUDIES?

19 A. (REVIEWS DOCUMENTS). IT DISCUSSES THE INITIAL

20 COMPLETION OF THE INITIAL PHASE.

21 Q. AND WAS THIS MEMORANDUM WRITTEN SHORTLY AFTER THE

22 INITIAL PHASE WAS COMPLETED?

23 A. YES.

24 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR

25 FILES WITHIN MONSANTO AS PART OF ITS REGULARLY

1 CONDUCTED BUSINESS ACTIVITIES?

2 A. YES.

3 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1605.
4 IS THAT ALSO A DOCUMENT THAT I ASKED YOU TO REVIEW
5 DURING THE LUNCH HOUR WITH YOUR ATTORNEY?

6 A. YES, IT IS.

7 Q. THIS IS ENTITLED, "BIODEGRADATION STUDIES FIRST
8 QUARTER 1970." IS THAT CORRECT?

9 A. YES.

10 Q. AND ON THE SECOND PAGE, IT INDICATES THAT THIS
11 DOCUMENT WAS WRITTEN JOINTLY BY YOU AND R.E. KELLER IN
12 APRIL OF 1970; IS THAT CORRECT?

13 A. CORRECT.

14 Q. WHAT IS THIS DOCUMENT?

15 A. IT'S A ROUGH DRAFT SUMMARY REPORT OF PROGRESS ON
16 BIODEGRADATION.

17 Q. AND WAS IT WRITTEN SHORTLY AFTER COMPLETION OF
18 BIODEGRADATION STUDIES?

19 A. IT WAS WRITTEN SHORTLY AFTER THE COMPLETION OF THIS
20 ASPECT OF BIODEGRADATION STUDIES INVOLVING NATURAL
21 WATERS, YES.

22 Q. AND DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF
23 THE REPORT GENERATED BY YOU AND R.E. KELLER IN APRIL
24 OF 1970?

25 A. IT APPEARS TO BE A ROUGH DRAFT PRELIMINARY REPORT THAT

1 MAY -- THAT'S ACCURATE, BUT NOT NECESSARILY A FINAL
2 REPORT.

3 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
4 FILES WITHIN MONSANTO AS PART OF ITS REGULARLY
5 CONDUCTED BUSINESS?

6 A. YES.

7 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 701. IS
8 THIS A DOCUMENT THAT YOU REVIEWED WITH YOUR ATTORNEY
9 DURING THE LUNCH HOUR?

10 A. YES.

11 Q. IS THIS EXHIBIT ENTITLED, "A STUDY OF AROCLOR CHEMICAL
12 CLEAN-UP PROCEDURES FOR USE WITH ELECTRON CAPTURED GAS
13 CHROMATOGRAPHY METHODS"?

14 A. YES.

15 Q. JOB NUMBER 1630346?

16 A. YES.

17 Q. WAS IT WRITTEN BY YOU AND W.J. LITSCHGI,
18 L-I-T-S-C-H-G-I, AND R.E. KELLER IN MARCH OF 1970?

19 A. YES.

20 Q. AND IS THIS A TRUE AND ACCURATE COPY OF THE REPORT
21 AUTHORED BY YOU AND THOSE OTHER TWO GENTLEMEN IN MARCH
22 OF 1970?

23 A. YES.

24 Q. AND WAS THIS EXHIBIT WRITTEN FOLLOWING COMPLETION OF
25 THREE CHEMICAL CLEAN-UP PROCEDURES ON THE AROCLOR 1200

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SERIES?

A. YES. IT WAS WRITTEN AFTER THE EVALUATION OF THE THREE
CHEMICAL CLEAN-UP PROCEDURES.

Q. AND DID YOU CONDUCT THE CHEMICAL CLEAN-UP PROCEDURES,
IS THAT A STUDY THAT YOU UNDERTOOK?

A. MYSELF AND THE INDIVIDUALS IN QUESTION, YES.

Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
FILES WITHIN MONSANTO AS PART OF ITS REGULARLY
CONDUCTED BUSINESS ACTIVITIES?

A. YES.

MR. BRADLEY:

OFF THE RECORD.

(OFF THE RECORD DISCUSSION).

EXAMINATION CONTINUES BY MR. BRADLEY:

Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 696. IS THAT
A DOCUMENT THAT YOU'VE REVIEWED DURING THE LUNCH HOUR
WITH YOUR ATTORNEY?

A. YES, IT IS.

Q. IS THIS A DOCUMENT THAT WAS AUTHORED IN MARCH OF 1973
BY YOU, BY W.M. MEES, M-E-E-S, BY W.J.
L-I-T-S-C-H-G-I, AND JAY COWELL?

A. YES.

Q. AND IS THIS A DOCUMENT THAT'S REFERRED TO BY JOB
NUMBER 1348006?

A. YES.

1 Q. AND IT'S A DETERMINATION OF POLYCHLORINATED BIPHENYL
2 RESIDUES IN WHITE LEGHORN CHICKENS FROM A TOXICITY
3 REPRODUCTION AND RESIDUE STUDY WITH AROCLOR 1242,
4 AROCLOR 1254, AND AROCLOR 1260?

5 A. YES.

6 Q. DID THE EXHIBIT COVER THE RESULTS OF THE ANALYSIS OF
7 BIOLOGICAL SAMPLES FROM AN INDUSTRIAL BIO-TEST STUDY
8 ON THE SAME SUBJECT?

9 A. YES.

10 Q. AND WAS THE REPORT GENERATED SHORTLY AFTER YOU AND
11 THESE THREE OTHER GENTLEMEN UNDERTOOK YOUR ANALYSIS OF
12 THOSE BIOLOGICAL SAMPLES FROM IBT STUDY J7300?

13 A. YES.

14 Q. AND IS THIS A TRUE AND ACCURATE COPY OF THE REPORT
15 GENERATED BY YOU AND THOSE THREE OTHER GENTLEMEN?

16 A. YES.

17 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES
18 AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
19 BUSINESS ACTIVITY?

20 A. YES.

21 Q. I'M NOW SHOWING YOU A COPY OF PLAINTIFF'S EXHIBIT
22 1536. IS THAT A DOCUMENT THAT YOU AND YOUR ATTORNEY
23 REVIEWED DURING THE LUNCH HOUR?

24 A. YES, IT IS.

25 Q. IS THIS A DOCUMENT THAT YOU'VE SEEN BEFORE TODAY'S

1 DEPOSITION?

2 A. YES, IT IS.

3 MR. FEATHERSTONE:

4 OKAY, BEFORE WE GO ANY FURTHER, MR. BRADLEY, SO
5 THERE'S NO MISUNDERSTANDING, WILL YOU AGREE THAT YOU
6 PROVIDED TO ME AND TO THE WITNESS A GROUP OF DOCUMENTS
7 THAT YOU ASKED US TO REVIEW DURING THE LUNCH HOUR FOR
8 PURPOSES OF SPEEDING UP THE EXAMINATION?

9 MR. BRADLEY:

10 YES.

11 MR. FEATHERSTONE:

12 YES. AND WHEN YOU HAVE REFERRED TO IN YOUR
13 EXAMINATION THAT THIS IS A DOCUMENT THE WITNESS
14 REVIEWED WITH ME DURING THE LUNCH HOUR, IT'S ONE OF
15 THE GROUP OF DOCUMENTS YOU GAVE TO US.

16 MR. BRADLEY:

17 YES. AND IT CAME ABOUT IN OUR ATTEMPT TO SPEED UP THE
18 DEPOSITION.

19 MR. FEATHERSTONE:

20 CORRECT.

21 EXAMINATION CONTINUES BY MR. BRADLEY:

22 Q. IS THIS A MEMO WRITTEN BY ELMER WHEELER TO W.R.
23 RICHARD?

24 A. YES, SIR.

25 Q. AND IT HAS THE DATE OF OCTOBER 21, 1968?

1 A. YES.

2 Q. AND IT INDICATES THAT ATTACHED TO THE LETTER IS A
3 TECHNICAL PAPER WHICH YOU AND DR. WHEELER HAD PICKED
4 UP IN WASHINGTON; IS THAT CORRECT?

5 A. YES.

6 Q. DO YOU RECALL PICKING UP A TECHNICAL PAPER IN
7 WASHINGTON WITH DR. WHEELER?

8 A. NOT SPECIFICALLY.

9 Q. AND IS PLAINTIFF'S EXHIBIT 1536 A TRUE AND ACCURATE
10 COPY OF THE LETTER FROM DR. WHEELER TO W.R. RICHARD,
11 AND A TRUE AND ACCURATE COPY OF THE TECHNICAL PAPER
12 ATTACHED TO THE LETTER?

13 A. THEY APPEAR TO BE COMPLETE.

14 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
15 FILES AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
16 BUSINESS?

17 A. YES.

18 Q. DO YOU RECALL GOING TO WASHINGTON WITH DR. WHEELER TO
19 HEAR A PRESENTATION BY A GENTLEMEN WHOSE LAST NAME IS
20 RICEBROUGH TO -- WELL, EXCUSE ME. LET ME STOP THE
21 QUESTION.

22 MR. FEATHERSTONE:

23 OFF THE RECORD.

24 (OFF THE RECORD DISCUSSION).

25 EXAMINATION CONTINUES BY MR. BRADLEY:

1 Q. LET ME TRY THAT QUESTION AGAIN. DO YOU RECALL
2 OBTAINING WITH DR. WHEELER IN WASHINGTON D.C. FROM THE
3 NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION A COPY OF
4 A PAPER PREPARED BY A RESEARCHER WHOSE LAST NAME IS
5 RICEBROUGH?

6 A. I DO NOT SPECIFICALLY RECALL IT.

7 Q. DR. TUCKER, I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT
8 693. DID YOU REVIEW THIS DOCUMENT OVER THE LUNCH
9 HOUR?

10 A. YES.

11 Q. IS THIS A DOCUMENT AUTHORED BY YOU, W.M. MEES,
12 M-E-E-S, W.J. L-I-T-S-C-H-G-I, AND JAKE COWELL IN
13 DECEMBER OF '72?

14 A. YES.

15 Q. BY THE WAY, HOW DO YOU PRONOUNCE THE GENTLEMAN WHOSE
16 LAST NAME IS L-I-T-S-C-H-G-I?

17 A. I NEVER THOUGHT YOU'D ASK. LITSCHGI.

18 Q. AND THIS EXHIBIT IS ENTITLED, "DETERMINATION OF
19 POLYCHLORINATED BIPHENYL RESIDUES IN BEAGLE DOG
20 TISSUES FROM A TWO-YEAR ORAL CHRONIC TOXICITY STUDY."
21 CORRECT?

22 A. YES.

23 Q. WAS THAT A STUDY THAT YOU PARTICIPATED IN?

24 A. YES.

25 Q. AND DOES THIS EXHIBIT REPORT THE RESULTS OF THAT

1 STUDY?

2 A. YES.

3 Q. DOES IT APPEAR THAT THIS EXHIBIT IS A TRUE AND
4 ACCURATE COPY OF THE REPORT THAT WAS GENERATED BY YOU
5 AND THOSE THREE OTHER GENTLEMEN IN DECEMBER OF '72?

6 A. YES.

7 Q. AND WAS THIS EXHIBIT WRITTEN SHORTLY AFTER COMPLETION
8 OF THE TWO-YEAR ORAL CHRONIC TOXICITY STUDY REGARDING
9 BEAGLE DOG TISSUES?

10 A. YES.

11 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
12 FILES WITHIN MONSANTO AS PART OF ITS REGULARLY
13 CONDUCTED BUSINESS ACTIVITIES?

14 A. YES.

15 Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 689. IS THAT
16 A DOCUMENT THAT YOU REVIEWED DURING THE LUNCH HOUR
17 TODAY?

18 A. YES, IT IS.

19 Q. IS THIS A DOCUMENT THAT YOU AUTHORED IN DECEMBER OF
20 1971 WITH B.W. SAEGER AS INDICATED ON PAGE SIX?

21 A. WHICH PAGE SIX?

22 Q. AT THE TOP, THE THIRD LINE THAT SAYS PAGE SIX. YOU
23 HAVEN'T GOTTEN TO IT YET.

24 A. OH, I SEE. PAGE SIX?

25 MR. FEATHERSTONE:

1 THIS SAYS PAGE FOUR.

2 WITNESS CONTINUES:

3 A. OH, PAGE FOUR. I'M DYSLEXIC.

4 Q. ARE YOU THERE?

5 A. YES.

6 Q. AND THE TITLE OF THIS IS "BIODEGRADATION TESTING OF
7 POLYCHLORINATED BIPHENYLS"?

8 A. YES.

9 Q. IS THIS A TRUE AND ACCURATE COPY OF THE REPORT
10 GENERATED BY YOU AND B.W. SAEGER IN DECEMBER OF 1971?

11 A. YES.

12 Q. AND WAS THIS EXHIBIT WRITTEN SHORTLY AFTER YOU AND
13 B.W. SAEGER OBTAINED DATA REGARDING THE
14 BIODEGRADABILITY OF VARIOUS PCB PRODUCTS?

15 A. YES.

16 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
17 FILES AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
18 BUSINESS ACTIVITIES?

19 A. YES.

20 Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 688. IS THAT
21 A DOCUMENT YOU REVIEWED DURING THE LUNCH HOUR TODAY?

22 A. YES.

23 Q. IS THIS DOCUMENT ENTITLED "DETERMINATION OF
24 POLYCHLORINATED BIPHENYL RESIDUES IN RATS FROM 30-DAY
25 AROCOR FEEDING STUDIES"?

1 A. YES.

2 Q. AND IS THIS A DOCUMENT AUTHORED BY YOU, W.J. LITSCHGI,
3 AND B.J. WESTENBERGER IN SEPTEMBER OF 1970?

4 A. YES.

5 Q. AND AT SOME POINT DID YOU AND THOSE TWO GENTLEMEN
6 ANALYZE TISSUES FOR RESIDUAL PCBs THAT WERE INITIALLY
7 ANALYZED BY INDUSTRIAL BIO-TEST LABORATORIES REGARDING
8 A 30-DAY TISSUE COLLECTION STUDY IN ALBINO RATS WITH
9 AROCLOR 1242, AROCLOR 1254, AND AROCLOR 1260?

10 MR. FEATHERSTONE:

11 MAY I HEAR THE QUESTION, PLEASE?

12 (OFF THE RECORD DISCUSSION).

13 (REQUESTED QUESTION READ BY THE COURT REPORTER).

14 MR. FEATHERSTONE:

15 IS THAT WHAT YOU ORIGINALLY MEANT TO ASK, BY
16 INDUSTRIAL BIO-TEST?

17 MR. BRADLEY:

18 NO. LET ME REPHRASE THE QUESTION.

19 EXAMINATION CONTINUES BY MR. BRADLEY:

20 Q. PRIOR TO SEPTEMBER OF 1970, DID MONSANTO REQUEST THAT
21 INDUSTRIAL BIO-TEST LABORATORY CARRY OUT A 30-DAY
22 TISSUE COLLECTION STUDY IN ALBINO RATS WITH AROCLOR
23 1242, AROCLOR 1254, AND AROCLOR 1260?

24 A. YES.

25 Q. AND DOES PLAINTIFF'S EXHIBIT 688 DEAL WITH THE

1 SUBSEQUENT ANALYSIS OF THOSE TISSUES FOR RESIDUAL
2 PCBs?

3 A. YES.

4 Q. AND WAS THE EXHIBIT WRITTEN SHORTLY AFTER YOU AND
5 THOSE TWO GENTLEMEN HAD COMPLETED YOUR SUBSEQUENT
6 ANALYSIS OF THOSE TISSUES FOR RESIDUAL PCBs?

7 A. YES.

8 MR. BRADLEY:

9 CAN WE GO OFF THE RECORD?

10 (OFF THE RECORD DISCUSSION)

11 EXAMINATION CONTINUES BY MR. BRADLEY:

12 Q. IS THIS A TRUE AND ACCURATE COPY OF THE REPORT
13 GENERATED BY YOU AND THOSE TWO GENTLEMEN IN SEPTEMBER
14 OF '70?

15 A. YES.

16 Q. DID YOU MAINTAIN A COPY OF THIS EXHIBIT IN YOUR FILES
17 AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
18 BUSINESS ACTIVITY?

19 A. YES.

20 Q. I NOW ONLY HAVE ONE OF THESE. I'M NOW SHOWING YOU
21 PLAINTIFF'S EXHIBIT 1515. DID YOU REVIEW THAT
22 DOCUMENT DURING THE LUNCH HOUR TODAY?

23 A. YES, I DID.

24 Q. IS THIS A DOCUMENT THAT YOU HAVE SEEN PRIOR TO TODAY'S
25 DEPOSITION?

1 A. I DO NOT RECALL SPECIFICALLY.

2 Q. I TAKE IT THEN YOU WOULDN'T KNOW IF THIS IS A TRUE AND
3 ACCURATE COPY OF A LETTER WRITTEN BY JIM BRYANT TO MR.
4 LOU SHOAFF ON APRIL 24, 1970?

5 A. COULD BE, BUT I CAN'T TESTIFY IF I CAN'T RECALL IT.
6 AND I DON'T, SO --

7 Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 1565. IS THAT
8 A DOCUMENT THAT YOU REVIEWED DURING THE LUNCH HOUR
9 TODAY?

10 A. YES, IT IS.

11 Q. IS THIS A DOCUMENT YOU HAD SEEN PRIOR TO TODAY'S
12 DEPOSITION?

13 A. YES, IT IS.

14 Q. IS THIS A MEMO FROM W.R. RICHARD TO JOHN MASON WITH A
15 CC TO YOU, AMONG OTHERS?

16 A. YES, IT IS.

17 Q. AND IT'S DATED SEPTEMBER 7, 1971?

18 A. YES, IT IS.

19 Q. IS THIS A TRUE AND ACCURATE COPY OF THE MEMO WRITTEN
20 BY W.R. RICHARD TO JOHN MASON ON SEPTEMBER 7, 1971?

21 A. YES.

22 Q. WERE THERE DISCUSSIONS WITHIN MONSANTO REGARDING PCBs
23 AND WHAT SHOULD BE DISCUSSED WITH THE FOOD AND DRUG
24 ADMINISTRATION REGARDING PCBs ON OR ABOUT SEPTEMBER OF
25 1971?

- 1 A. I DON'T RECALL.
- 2 Q. IN SEPTEMBER OF 1971, DID MONSANTO HAVE KNOWLEDGE
- 3 REGARDING THE BIODEGRADABILITY OF CHLORINATED
- 4 BIPHENYLS?
- 5 A. YES.
- 6 Q. AND DID THEY HAVE INFORMATION CORRELATING PCBs WITH
- 7 TOXICITY IN RATS?
- 8 A. I DON'T RECALL. THAT WASN'T MY AREA OF EXPERTISE OR
- 9 CONCERN.
- 10 Q. DOES THIS DOCUMENT APPEAR TO BE WRITTEN ABOUT THE TIME
- 11 THAT MONSANTO GAINED INFORMATION REGARDING
- 12 BIODEGRADABILITY OF CHLORINATED BIPHENYLS?
- 13 A. (REVIEWS DOCUMENT). YES.
- 14 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES
- 15 WITHIN MONSANTO AS PART OF ITS REGULARLY CONDUCTED
- 16 BUSINESS?
- 17 A. YES.
- 18 Q. I NOW SHOW YOU PLAINTIFF'S EXHIBIT 1439. IS THAT A
- 19 DOCUMENT YOU REVIEWED DURING THE LUNCH HOUR TODAY?
- 20 A. YES, IT IS.
- 21 Q. IS THIS A MEMO WRITTEN BY W.R. RICHARD TO YOU AND R.H.
- 22 MUNCH?
- 23 A. YES, IT IS.
- 24 Q. AND IT'S A MEMO DATED JANUARY 11, 1971, AND IT'S
- 25 REGARDING AROCLOR MCS-1016?

1 A. YES, IT IS.

2 Q. WAS THIS EXHIBIT WRITTEN ON OR ABOUT THE TIME THAT
3 MONSANTO RECEIVED SOME INFORMATION CONCERNING THE
4 BIODEGRADABILITY OF MCS-1016?

5 A. YES.

6 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
7 FILES AS PART OF MONSANTO'S REGULARLY CONDUCTED
8 BUSINESS?

9 A. YES.

10 Q. FORGIVE ME IF I'VE ASKED IT BEFORE, DOES THIS APPEAR
11 TO BE A TRUE AND ACCURATE COPY?

12 A. YES, IT DOES.

13 Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 1546. IS THIS
14 A DOCUMENT THAT YOU REVIEWED DURING THE LUNCH HOUR
15 TODAY?

16 A. YES, IT IS.

17 Q. AND IT'S ENTITLED "ASSESSMENT OF THE PERSISTENCE OF
18 POLYCHLORINATED BIPHENYLS IN BIOLOGICAL SYSTEMS"?

19 A. YES, IT IS.

20 Q. IS THIS A REPORT THAT YOU AUTHORED?

21 A. (REVIEWS DOCUMENT). YES, IT IS.

22 Q. AND IS THIS A TRUE AND ACCURATE COPY OF THE REPORT YOU
23 PREPARED ENTITLED "ASSESSMENT OF THE PERSISTENCE OF
24 POLYCHLORINATED BIPHENYLS IN BIOLOGICAL SYSTEMS"?

25 A. IT'S A TRUE AND ACCURATE COPY OF OVERHEADS WHICH IS A

1 REPORT OR PRESENTATION, OR WHATEVER.

2 Q. AND ON THE SECOND PAGE THERE IS SOME HANDWRITING. IS

3 THAT YOURS?

4 A. (REVIEWS DOCUMENT). NO, IT'S NOT.

5 Q. AND WHAT WAS THE PURPOSE IN DEVELOPING THIS EXHIBIT?

6 A. TO PROVIDE AN ASSESSMENT BASED ON INFORMATION

7 GENERATED TO DATE ON THE PERSISTENCE OF

8 POLYCHLORINATED BIPHENYLS IN BIOLOGICAL SYSTEMS.

9 Q. AND I THINK YOU INDICATED IT WAS PART OF A SLIDE

10 PRESENTATION?

11 A. YES, THESE ARE OVERHEADS.

12 Q. AND DO YOU RECALL TO WHOM YOU PRESENTED THIS

13 INFORMATION AS OVERHEADS?

14 A. NOT SPECIFICALLY.

15 Q. DO YOU RECALL WHEN YOU PREPARED THIS MATERIAL?

16 A. NO, SIR, I DO NOT, NOT SPECIFICALLY.

17 Q. EARLY '70S?

18 A. AS I STATED, I DON'T RECALL SPECIFICALLY. IT COULD

19 HAVE BEEN.

20 Q. I KNOW YOU DON'T RECALL SPECIFICALLY, BUT I'M

21 INTERESTED IF YOU RECALL GENERALLY. DO YOU KNOW

22 GENERALLY WHETHER IT'S LIKELY TO HAVE BEEN PREPARED

23 BETWEEN 1970 AND 1975? CAN YOU ANSWER THAT?

24 A. I CAN ANSWER THAT IT PROBABLY WAS PREPARED IN THAT

25 REGION, YES.

1 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
2 FILES AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
3 BUSINESS ACTIVITIES?

4 MR. FEATHERSTONE:

5 ALL RIGHT. NOW, WITH OR WITHOUT THE HANDWRITING SINCE
6 HE DOESN'T RECOGNIZE THIS? I MEAN, JUST SO IT'S MORE
7 CLEAR, MR. BRADLEY, I HAVE, AND THE WITNESS HAS NO
8 DOUBT THAT HE PREPARED THE OVERHEADS AND THAT THEY'RE
9 HIS, BUT SOMEBODY OBVIOUSLY DOODLED ON MAYBE A COPY OF
10 THESE THINGS.

11 EXAMINATION CONTINUES BY MR. BRADLEY:

12 Q. ABSENT THE HANDWRITING ON PAGE TWO, IS THAT A DOCUMENT
13 THAT YOU MAINTAINED IN YOUR FILE SYSTEM AT MONSANTO AS
14 PART OF ITS REGULARLY CONDUCTED BUSINESS ACTIVITY?

15 A. YES. PROVIDED IT'S ALSO ABSENT THE HANDWRITING ON THE
16 OTHER PAGES THAT WERE ON HERE. THESE ARE OVERHEADS.
17 I WOULDN'T HAVE HANDWRITING ON THEM.

18 Q. ALL RIGHT, WITH THAT UNDERSTANDING. I'M NOW SHOWING
19 YOU PLAINTIFF'S EXHIBIT 682. IS THIS A DOCUMENT THAT
20 YOU REVIEWED DURING TODAY'S LUNCH HOUR?

21 A. YES, IT IS.

22 Q. I NOTICE THAT YOU HAVE REMOVED SOME OF THE PAGES; IS
23 THAT CORRECT?

24 A. I HAVE SEPARATED ONE SECTION FROM ANOTHER.

25 Q. AND LET'S MARK THE SECOND SECTION 682A.

1 (COURT REPORTER MARKS PLAINTIFF'S EXHIBIT 682A, TABLE
2 LISTING PRIMARY AND ULTIMATE BIODEGRADABILITY RESULTS OF
3 DIELECTRIC FLUIDS AND COMPONENTS, HERETO ATTACHED).

4 EXAMINATION CONTINUES BY MR. BRADLEY:

5 Q. IS PLAINTIFF'S EXHIBIT 682 AN ARTICLE YOU PREPARED
6 ENTITLED "ACTIVATED SLUDGE PRIMARY BIODEGRADATION OF
7 POLYCHLORINATED BIPHENYLS"?

8 A. YES, IT IS.

9 Q. IS THIS EXHIBIT A TRUE AND ACCURATE COPY OF THE
10 PUBLICATION THAT YOU GENERATED WITH THAT TITLE?

11 A. YES, IT IS.

12 Q. AND WAS IT WRITTEN IN MARCH OF 1975?

13 A. IT WAS PUBLISHED IN MARCH OF 1975. IT HAD BEEN
14 THROUGH PEER GROUP REVIEW AND THINGS OF THAT SORT.
15 IT'S THE DATE OF PUBLICATION.

16 Q. AND WAS IT WRITTEN SHORTLY AFTER YOU, AND THE OTHER
17 AUTHORS, GATHERED THE INFORMATION THAT'S CONTAINED IN
18 THIS PUBLICATION?

19 A. YES.

20 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
21 FILES AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
22 BUSINESS ACTIVITY?

23 A. YES.

24 MR. BRADLEY:

25 CAN WE GO OFF THE RECORD.

1 (OFF THE RECORD DISCUSSION) .

2 EXAMINATION CONTINUES BY MR. BRADLEY:

3 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 682A.
4 AND IS THAT A DOCUMENT THAT YOU REVIEWED DURING THE
5 LUNCH HOUR TODAY?

6 A. YES, IT IS.

7 Q. WHAT IS THAT EXHIBIT?

8 A. THIS EXHIBIT IS A TABLE THAT LISTS PRIMARY AND
9 ULTIMATE BIODEGRADABILITY RESULTS OF DIELECTRIC FLUIDS
10 AND COMPONENTS.

11 Q. IS THIS A DOCUMENT YOU GENERATED?

12 A. YES.

13 Q. WHEN DID YOU PREPARE THIS DOCUMENT?

14 A. I DON'T RECALL SPECIFICALLY.

15 Q. DID YOU PREPARE IT AT OR ABOUT THE TIME YOU GOT THE
16 INFORMATION THAT'S CONTAINED IN THE EXHIBIT? LET ME
17 REPHRASE THE QUESTION. DID YOU PREPARE THIS EXHIBIT
18 SHORTLY AFTER YOU GATHERED THE INFORMATION THAT'S
19 CONTAINED IN THE EXHIBIT?

20 A. YES, IT'S THE RESULTS OF ONGOING STUDIES.

21 Q. AND IS THIS A TRUE AND ACCURATE COPY OF THE DOCUMENT
22 THAT YOU GENERATED WITH THAT TITLE?

23 A. IT APPEARS TO BE SO, YES.

24 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES
25 AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED

1 BUSINESS ACTIVITY?

2 A. YES.

3 Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 694. IS THAT
4 A DOCUMENT THAT YOU REVIEWED DURING THE LUNCH HOUR
5 TODAY?

6 A. YES, IT IS.

7 Q. AND THAT'S ENTITLED "ANALYSIS OF BIOLOGICAL MATERIALS
8 FOR POLYCHLORINATED BIPHENYLS"?

9 A. YES, IT IS.

10 Q. AND THIS WAS A REPORT GENERATED BY YOU, W.M. MEES,
11 W.J. LITSCHGI, AND R.E. KELLER IN MARCH OF 1970?

12 A. YES, IT IS.

13 Q. WAS THE REPORT IDENTIFIED AS PLAINTIFF'S EXHIBIT 694,
14 INTENDED TO DESCRIBE A METHODOLOGY FOR THE
15 DETERMINATION OF THE AMOUNT AND TYPE OF
16 POLYCHLORINATED BIPHENYLS IN BIOLOGICAL MATERIALS?

17 A. YES, IT WAS.

18 Q. AND WAS THE REPORT WRITTEN SHORTLY AFTER YOU AND THE
19 OTHER AUTHORS DEVELOPED THE METHODOLOGY FOR THE
20 DETERMINATION OF THE AMOUNT AND TYPE OF
21 POLYCHLORINATED BIPHENYLS IN BIOLOGICAL MATERIALS?

22 A. YES, IT WAS.

23 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN THE
24 ORDINARY COURSE OF YOUR WORK AT MONSANTO?

25 A. THE DOCUMENT APPEARS TO HAVE SOME PROBLEMS ASSOCIATED

1 WITH IT THAT I WOULD LIKE TO COMMENT ON.
2 Q. WELL, ACTUALLY I WANT YOU TO COMMENT ON IT, BUT LET ME
3 ASK THIS LIMITED SERIES OF QUESTIONS BEFORE I DO, IF
4 YOU DON'T MIND.
5 A. ALL RIGHT.
6 Q. ACTUALLY, I'LL DO IT IN YOUR ORDER. TELL ME WHAT
7 PROBLEMS YOU SEE WITH THIS DOCUMENT.
8 A. IT APPEARS TO BE ONE SIDE OF A TWO-SIDED COPY. I
9 MEAN, THERE'S ONE, THREE, FIVE, SEVEN, NINE, 11, AND
10 THEN THE LAST PAGE IS COMPLETELY BLANK.
11 Q. ALL RIGHT.
12 MR. FEATHERSTONE:
13 OFF THE RECORD.
14 (OFF THE RECORD DISCUSSION).
15 Q. NOW, I'M SHOWING YOU WHAT'S BEEN MARKED FOR
16 IDENTIFICATION AS PLAINTIFF'S EXHIBIT 697. (REVIEWS
17 DOCUMENT). WHICH HAS THE SAME PROBLEM.
18 A. YES.
19 MR. FEATHERSTONE:
20 ARE WE ON THE RECORD HERE ON 697?
21 MR. BRADLEY:
22 WHICH I'VE INDICATED HAS THE SAME PROBLEMS.
23 MR. FEATHERSTONE:
24 LET'S GO OFF THE RECORD.
25 (OFF THE RECORD DISCUSSION).

1 EXAMINATION CONTINUES BY MR. BRADLEY:

2 Q. I'M NOW GOING TO SHOW YOU WHAT'S BEEN MARKED FOR
3 IDENTIFICATION AS PLAINTIFF'S EXHIBIT 701, AND SINCE I
4 ONLY HAVE ONE COPY OF IT I'M GOING TO HOLD IT HERE FOR
5 OUR REFERENCE. IS THIS A DOCUMENT THAT YOU REVIEWED
6 DURING THE LUNCH HOUR TODAY?

7 A. YES, IT IS. I WOULD LIKE TO REVIEW IT IN MY HANDS
8 AFTERWARDS, BUT --

9 Q. SURE.

10 A. -- AND I'LL DO IT IN FRONT OF YOU, BUT I CAN'T SEE IT
11 AT THAT DISTANCE, OKAY. (REVIEWS DOCUMENT). YES.

12 Q. AND IS THIS A DOCUMENT THAT WAS GENERATED BY YOU, W.J.
13 LITSCHGI, AND R.E. KELLER IN MARCH OF 1970?

14 A. YES, IT IS.

15 Q. AND IT IS ENTITLED "STUDY OF AROCLOR CHEMICAL CLEAN-UP
16 PROCEDURES FOR USE WITH ELECTRON CAPTURED GAS
17 CHROMATOGRAPHY METHODS"?

18 A. YES, IT IS. I BELIEVE WE VISITED THAT PROCEDURE
19 BEFORE.

20 MR. BRADLEY:

21 CAN WE GO OFF THE RECORD FOR A MOMENT?
22 (OFF THE RECORD DISCUSSION).

23 EXAMINATION CONTINUES BY MR. BRADLEY:

24 Q. I THINK I SHOWED YOU EXHIBIT 698, AND IS THAT A
25 DOCUMENT THAT YOU REVIEWED DURING THE LUNCH HOUR?

1 A. YES, IT IS.

2 Q. THIS IS ENTITLED "A TENTATIVE PROCEDURE FOR THE

3 DETERMINATION OF AIRBORNE POLYCHLORINATED BIPHENYLS"?

4 A. YES, IT IS.

5 Q. IS THIS A DOCUMENT AUTHORED BY YOU AND R.E. KELLER IN

6 NOVEMBER OF 1970?

7 A. YES, IT IS.

8 Q. IS THIS A TRUE AND ACCURATE COPY OF THE REPORT THAT

9 YOU AND R.E. KELLER GENERATED ON THAT DATE?

10 A. YES, IT IS.

11 Q. AND DID YOU WRITE THIS DOCUMENT SHORTLY AFTER

12 DEVELOPING A TENTATIVE PROCEDURE FOR THE DETERMINATION

13 OF AIRBORNE POLYCHLORINATED BIPHENYLS?

14 A. YES, I DID.

15 Q. AND DID YOU DEVELOP THE TENTATIVE PROCEDURE BASED UPON

16 THE WORK YOU WERE DOING AT MONSANTO?

17 A. YES, I DID.

18 Q. IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR FILES

19 AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED

20 BUSINESS ACTIVITY?

21 A. YES.

22 Q. I'M NOW GOING TO SHOW YOU PLAINTIFF'S EXHIBIT 1575 AND

23 ASK IF YOU'VE SEEN THAT DOCUMENT BEFORE. THIS ISN'T

24 ONE, I DON'T BELIEVE, THAT I ASKED YOU TO REVIEW

25 DURING THE LUNCH HOUR.

- 1 A. (REVIEWS DOCUMENT). THE QUESTION IS HAVE I SEEN THIS
2 DOCUMENT BEFORE?
- 3 Q. YES.
- 4 A. THE ANSWER IS YES.
- 5 Q. THIS INDICATES THAT YOU RECEIVED A CARBON COPY OF THIS
6 LETTER FROM W.R. RICHARD TO THE FILE REGARDING AROCLOR
7 ANALYSIS AND PESTICIDE RESIDUES, CORRECT?
- 8 A. YES, IT DOES.
- 9 Q. AND IT REFERENCES A VISIT TO PROFESSOR G. WIDMARK,
10 UNIVERSITY OF STOCKHOLM, MAY 5, 1969?
- 11 A. YES, IT DOES.
- 12 Q. AND THE DOCUMENT WAS WRITTEN AFTER PROFESSOR WIDMARK
13 MADE CERTAIN FINDINGS REGARDING CHLORINATED BIPHENYLS,
14 CORRECT?
- 15 A. YES.
- 16 Q. AND DOES THIS APPEAR TO BE A TRUE AND ACCURATE COPY OF
17 THE LETTER FROM W.R. RICHARD TO THE FILE THAT YOU
18 RECEIVED A CARBON COPY OF?
- 19 A. YES, IT DOES.
- 20 Q. AND IS THIS A DOCUMENT THAT YOU MAINTAINED IN YOUR
21 FILES AT MONSANTO AS PART OF ITS REGULARLY CONDUCTED
22 BUSINESS ACTIVITY?
- 23 A. YES.
- 24 Q. I'M NOW SHOWING YOU PLAINTIFF'S EXHIBIT 422 WHICH YOU
25 ALSO DID NOT REVIEW DURING THE LUNCH HOUR. IS THAT A

1 DOCUMENT YOU'VE SEEN BEFORE?

2 A. (REVIEWS DOCUMENT). I DO NOT SPECIFICALLY RECALL
3 SEEING THIS DOCUMENT.

4 Q. CAN YOU TELL FROM THE DOCUMENT WHO MIGHT BE ITS
5 AUTHOR?

6 A. NO, SIR, I CANNOT.

7 Q. I'M NOW GOING TO SHOW YOU, I'LL WITHDRAW THAT THEN
8 FROM THIS DEPOSITION, PLAINTIFF'S EXHIBIT 1415 AND ASK
9 YOU IF YOU CAN TELL ME WHAT THAT DOCUMENT IS.

10 MR. FEATHERSTONE:

11 ALL RIGHT, BUT YOU WITHDRAW IT MEANING YOU TOOK IT
12 BACK. WAS IT IDENTIFIED ON THE RECORD AS PLAINTIFF'S
13 EXHIBIT --

14 MR. BRADLEY:

15 422.

16 MR. FEATHERSTONE:

17 422?

18 MR. BRADLEY:

19 YES.

20 MR. FEATHERSTONE:

21 THAT'S HOW IT'S BEEN PREVIOUSLY MARKED IN OTHER
22 DEPOSITIONS?

23 MR. BRADLEY:

24 YES.

25 WITNESS CONTINUES:

1 A. CAN YOU RESTATE THE QUESTION, PLEASE?

2 Q. WELL, WHATEVER I HAD ASKED BEFORE, THE QUESTION IS:
3 HAVE YOU SEEN THIS DOCUMENT BEFORE TODAY'S DEPOSITION?

4 A. I DO NOT SPECIFICALLY RECALL THIS DOCUMENT.

5 Q. DO YOU RECALL IN 1970 LEARNING THAT MCS-1016 SHOWED
6 SOME EVIDENCE OF BIODEGRADATION, BUT NOT SIGNIFICANTLY
7 AT 95% -- OR EXCUSE ME, BUT WAS NOT SIGNIFICANT AT
8 95%?

9 A. I DO NOT RECALL THAT.

10 Q. DO YOU RECALL LEARNING IN LATE '70 THAT MCS-1242
11 SHOWED SOME EVIDENCE OF BIODEGRADATION, BUT WAS NOT
12 SIGNIFICANT AT 95%?

13 A. I DO NOT RECALL AN MCS-1242?

14 Q. DO YOU RECALL AN AROCLOR 1242?

15 A. YES, I DO.

16 Q. WHAT DOES IT MEAN TO BE SIGNIFICANT AT 95%?

17 A. IN WHAT CONTEXT?

18 Q. IN THE CONTEXT OF DETERMINING EVIDENCE OF
19 BIODEGRADATION?

20 A. I AM NOT A STATISTICIAN, AND TO ANSWER THAT QUESTION
21 CORRECTLY I WOULD NEED MORE SPECIFIC INFORMATION
22 RELATIVE TO CONDITIONS, AND THINGS OF THAT SORT,
23 CONFIDENCE LIMITS, YOU NEED TO KNOW THE NUMBER OF
24 VARIABLES AND THE VARIABLE INTERACTIONS THAT ARE
25 ASSOCIATED WITH IT TO UNDERSTAND WHAT IT SAYS, AND

1 THAT'S NOT ENOUGH INFORMATION FOR ME AS A
2 NON-STATISTICIAN.

3 Q. DID YOU LEARN IN LATE '70 THAT PCB COMPOUNDS, RANGED
4 FROM THE MOST TO LEAST DEGRADABLE, WERE MCS-1043,
5 MCS-1242, MCS-1016, AND AROCLOR 1254?

6 A. I'M GOING TO HAVE TO TAKE EXCEPTION WITH THE USE OF
7 THE TERM MCS-1242. AS I STATED EARLIER, I DO NOT
8 RECALL MCS-1242.

9 Q. WELL, DO YOU RECALL LEARNING IN LATE 1970 THAT
10 MCS-1043 WAS MORE DEGRADABLE THAN MCS-1016?

11 A. YES.

12 Q. DO YOU RECALL LEARNING IN LATE 1970 THAT BOTH MCS-1043
13 AND MCS-1016 WERE MORE DEGRADABLE THAN AROCLOR 1254?

14 A. YES.

15 Q. DURING THE COURSE OF YOUR DEPOSITION, YOU'VE DESCRIBED
16 VARIOUS STUDIES THAT YOU PARTICIPATED IN REGARDING
17 BIODEGRADATION OF PCBs, CORRECT?

18 A. YES.

19 Q. DID ANYONE FROM GENERAL ELECTRIC PARTICIPATE WITH YOU
20 REGARDING THOSE STUDIES?

21 A. WOULD YOU DEFINE PARTICIPATION FOR ME, PLEASE?

22 Q. DID THEY HELP DEVELOP THE PROTOCOL AND DEVELOP THE
23 DATA AND THE CONCLUSIONS BASED ON THE DATA FOR THOSE
24 STUDIES?

25 A. NO.

1 Q. WHAT DID THEY DO, IF ANYTHING, RELATIVE TO THOSE
2 STUDIES?

3 A. THE ONLY THING THAT I COULD COMMENT THAT THEY DID WAS
4 BECAME AWARE OF THE RESULTS AS THEY WERE GENERATED BY
5 US.

6 Q. AS I'VE DEFINED PARTICIPATION, DID ANYONE FROM
7 WESTINGHOUSE PARTICIPATE WITH YOU IN THOSE STUDIES?

8 A. NO.

9 Q. WERE YOU ASKED TO IDENTIFY DOCUMENTS TO BE PROVIDED TO
10 NEVADA POWER COMPANY IN THIS LITIGATION?

11 A. NO, SIR.

12 Q. WHAT WORK DID YOU DO ONCE YOU RETIRED FROM MONSANTO?

13 A. WELL, ACTUALLY I BELIEVE THAT IT'S MORE ACCURATE TO
14 SAY I LEFT MONSANTO RATHER THAN RETIRED, ALTHOUGH I'D
15 LIKE TO BE. I LEFT MONSANTO AND JOINED A COMPANY
16 CALLED AMERICAN MACHINE AND FOUNDRY, AMF, INCORPORATED
17 AT THEIR CORPORATE ENGINEERING CENTER IN STAMFORD,
18 CONNECTICUT WHERE I RAN PROCESS AND ANALYTICAL SUPPORT
19 GROUPS FOR THEIR MICROFLAKE DIVISION AND FOR THEIR
20 CUNA DIVISIONS AT THEIR CORPORATE CENTER.

21 Q. DID ANY OF THAT WORK HAVE TO DO WITH PCBs?

22 A. NO, SIR, IT DID NOT.

23 Q. AND WHAT WORK DID YOU DO FOLLOWING THAT WORK?

24 A. I WAS WITH AMF FOR SEVEN YEARS, AND I LEFT THEM WHEN
25 THEY WERE INVOLVED IN A HOSTILE TAKEOVER AND CORPORATE

1 RESEARCH WAS DISSOLVED, AND I JOINED A COMPANY CALLED
2 WASTE MANAGEMENT, INCORPORATED WITH THE ASSIGNMENT OF
3 BRINGING UP THEIR CORPORATE AND HAZARDOUS ANALYTICAL
4 LABORATORY IN CHICAGO.

5 Q. HOW LONG DID YOU WORK FOR WASTE MANAGEMENT?

6 A. I STILL AM PRESENTLY EMPLOYED BY WASTE MANAGEMENT.

7 Q. WHAT IS YOUR JOB THERE?

8 A. MY TITLE IS SENIOR DIRECTOR, ANALYTICAL PROGRAMS.

9 Q. AND IN THAT JOB DO YOU HAVE ANY RESPONSIBILITIES FOR
10 POLYCHLORINATED BIPHENYLS?

11 A. THE ANALYTICAL LABORATORIES THAT I RUN ANALYZE SAMPLES
12 FOR POLYCHLORINATED BIPHENYLS, AND WE USE EPA SWA46
13 PROCEDURES.

14 Q. YOUR LAB, THEN, IS GIVEN SAMPLES AND YOU'RE ASKED TO
15 DETERMINE WHETHER PCBs ARE PRESENT?

16 A. THAT'S CORRECT.

17 Q. ARE YOU ASKED TO DETERMINE WHETHER FURANS ARE PRESENT?

18 A. NO, SIR.

19 Q. ARE YOU ASKED TO DETERMINE WHETHER POLYCHLORINATED
20 DIBENZOFURANS ARE PRESENT?

21 A. I BELIEVE THAT'S WHAT I JUST ANSWERED, NO, SIR.

22 Q. DO YOU DETERMINE THE PRESENCE OF POLYCHLORINATED
23 DIBENZODIOXINS IN SAMPLES AS PART OF YOUR LAB WORK AT
24 WASTE MANAGEMENT?

25 A. NO, SIR. NONE OF LABORATORIES -- WELL, WITH THE

1 EXCEPTION OF ONE, ARE CLASS A LABORATORIES, SO WE
2 DON'T DO DIOXIN ANALYSIS.

3 MR. BRADLEY:

4 THOSE ARE ALL THE QUESTIONS THAT I HAVE. THANK YOU.

5 EXAMINATION BY MR. FEATHERSTONE:

6 Q. DR. TUCKER, I DO HAVE A FEW QUESTIONS. FIRST OF ALL,
7 WE'VE SEEN SEVERAL EXHIBITS DURING YOUR DEPOSITION
8 THAT CARRY THE LABEL "SPECIAL STUDY." WHAT WAS THE
9 SPECIAL STUDY DESIGNATION AS IT WAS USED AT MONSANTO
10 WHEN YOU WORKED THERE?

11 A. WELL, A SPECIAL STUDY WAS A SPECIAL STUDY, EXACTLY AS
12 IT SAYS. WE HAD NUMBERS THAT WERE DESIGNATED FOR
13 ANALYTICAL METHODS, AND THEN WE HAD NUMBERS THAT WERE
14 DESIGNATED FOR SPECIAL STUDIES THAT THE ANALYTICAL
15 CHEMISTRY GROUP DID.

16 Q. IS A SPECIAL STUDY BASICALLY THE FINAL REPORT?

17 A. YES.

18 Q. DID IT GO THROUGH A REVIEW PROCESS?

19 A. YES.

20 Q. WHEN YOU WERE WRITING A SPECIAL STUDY, WOULD YOU SEND
21 OUT A DRAFT FOR COMMENT?

22 A. YES.

23 Q. NOW, LET ME SHOW YOU SPECIFICALLY PLAINTIFF'S EXHIBIT
24 1436 AND ASK YOU WHETHER THAT IS A DOCUMENT THAT YOU
25 PREPARED AND THEN CIRCULATED FOR COMMENTS.

1 A. (REVIEWS DOCUMENT). IT'S A DOCUMENT I PREPARED. I'M
2 NOT SURE IT WAS A COPY THAT WAS CIRCULATED FOR
3 COMMENT.
4 Q. YOU TESTIFIED EARLIER THAT YOU COULD NOT RECOGNIZE THE
5 HANDWRITING ON PLAINTIFF'S EXHIBIT 1436; IS THAT
6 CORRECT?
7 A. YES, SIR.
8 Q. DO YOU KNOW WHETHER THE DOCUMENT WITH THE HANDWRITING
9 AND NOTATIONS WAS EVER RETURNED TO YOU IN THE COURSE
10 OF YOUR WORK AT MONSANTO?
11 A. NO, SIR.
12 Q. WHEN YOU TESTIFIED EARLIER TODAY THAT YOU KEPT COPIES
13 OF DOCUMENTS LIKE 1436 IN YOUR FILE, AND SPECIFICALLY
14 WITH REGARD TO THIS EXHIBIT, WERE YOU TALKING ABOUT
15 THE DOCUMENT WITH OR WITHOUT THE HANDWRITTEN COMMENTS?
16 A. THE DOCUMENT WITHOUT THE COMMENTS.
17 Q. EARLIER TODAY, INDEED AT THE BEGINNING OF YOUR
18 DEPOSITION, YOU WERE ASKED QUESTIONS ABOUT
19 BIODEGRADATION STUDIES YOU WERE INVOLVED IN, AND YOU
20 TESTIFIED THAT YOU STUDIED THE BIODEGRADATION OF
21 AROCLORS 1221, 1232, 1242, 1254, 1260, AND MCSS 1016
22 AND 1043. DID YOU STUDY THE BIODEGRADABILITY OF
23 AROCLOR 1016 WHILE YOU WERE WITH MONSANTO?
24 A. YES.
25 MR. BRADLEY:

1 OBJECT TO THE FORM OF THE QUESTION.

2 EXAMINATION CONTINUES BY MR. FEATHERSTONE:

3 Q. DID YOU DETERMINE WHETHER AROCLOR 1016 DOES OR DOES
4 NOT DEGRADE?

5 A. IT DEGRADES.

6 Q. YOU TESTIFIED THAT YOUR STUDIES SHOWED COMPLETE
7 MINERALIZATION, A TERM YOU DEFINED, OF LOWER
8 CHLORINATED COMPOUNDS. WHEN YOU MADE REFERENCE TO
9 LOWER CHLORINATED COMPOUNDS, WHAT WERE YOU TALKING
10 ABOUT?

11 A. TETRA AND LOWER. TETRACHLORINATED BIPHENYL AND
12 LOWER.

13 Q. ARE THOSE ALSO KNOWN AS HOMOLOGS?

14 A. YES.

15 Q. AND TETRACHLORINATED, DOES THAT MEAN FOUR CHLORINE
16 ATOMS ON A PCB MOLECULE?

17 A. ON A BIPHENYL MOLECULE, YES.

18 Q. AND WHEN YOU SAID TETRA- OR LOWER, YOU'RE TALKING
19 ABOUT A BIPHENYL MOLECULE WITH FOUR CHLORINE ATOMS OR
20 FEWER?

21 A. YES.

22 Q. FOR INSTANCE, THREE, TWO, OR ONE?

23 A. CORRECT.

24 Q. DID YOUR STUDIES OF MCS-1016 WHILE YOU WERE WITH
25 MONSANTO SHOW COMPLETE MINERALIZATION OF ALL OR PART

1 OF MCS-1016?

2 A. YES.

3 Q. CAN YOU BRIEFLY DESCRIBE WHAT THOSE STUDIES SHOWED?

4 A. IN GENERAL, THE STUDIES SHOWED THAT THE LOWER THE
5 DEGREE OF CHLORINATION OF THE BIPHENYL, THE MORE
6 READILY IT UNDERWENT DEGRADATION. AS THE CHLORINATION
7 OF THE BIPHENYL MOLECULE INCREASED, THE DEGRADATION
8 RATE DECREASED TO THE EXTENT THAT IN OUR EXPERIMENTS
9 IN THE TIMES THAT WE USED, AND THINGS OF THAT SORT, WE
10 WERE NOT SEEING ANY DEGRADATION OF THE PENTACHLORO
11 BIPHENYL AND ABOVE HOMOLOG OR ISOMERS.

12 Q. WHEN YOU SAY PENTACHLORO, YOU'RE TALKING ABOUT A
13 BIPHENYL MOLECULE WITH FIVE CHLORINE ATOMS?

14 A. THAT'S CORRECT.

15 MR. FEATHERSTONE:

16 NO FURTHER QUESTIONS.

17 REEXAMINATION BY MR. BRADLEY:

18 Q. HOW MANY CHLORINE ATOMS ARE THERE ON BIPHENYL
19 MOLECULES IN THE MCS-1016?

20 A. I BELIEVE THE PREDOMINANT HOMOLOG IN MCS-1016 IS A
21 TRICHLORO, BUT I'D HAVE TO SIT DOWN AND CALCULATE IT,
22 BUT I THINK THAT'S PRETTY CLOSE.

23 Q. THE AROCLORS THAT BEGIN WITH THE NUMBER 12, FOR
24 EXAMPLE, 1242, 1254, ARE THOSE COMPRISED OF BIPHENYL
25 MOLECULES WITH 12 CHLORINE ATOMS?

- 1 A. NO.
- 2 Q. WHAT DOES THE 12 REFER TO?
- 3 A. THE 12 REFERS TO THE FACT THAT IT'S A BIPHENYL.
- 4 Q. HAS NOTHING IT DO WITH THE NUMBER OF CHLORINE
- 5 ATOMS?
- 6 A. NO, SIR.
- 7 Q. I'M NOT CERTAIN NOW FROM YOUR TESTIMONY WHETHER YOUR
- 8 STUDIES DETERMINED WHETHER 1016 COMPLETELY -- MCS-1016
- 9 COMPLETELY DEGRADES. SO MY QUESTION TO YOU IS: FROM
- 10 YOUR STUDIES AT MONSANTO, DID YOU MAKE A DETERMINATION
- 11 THAT EVERY CONSTITUENT ELEMENT AND PART OF MCS-1016
- 12 BIODEGRADES?
- 13 A. WITHIN THE LIMITS OF THE EXPERIMENTAL VARIABILITY AND
- 14 THE ANALYTICAL PROCEDURES THAT WERE USED, YES.
- 15 Q. AND HOW LONG WOULD IT TAKE FOR THAT TO OCCUR?
- 16 A. THE PERIOD OF TIME THAT THE TESTS, THE SEMI-CONTINUOUS
- 17 ACTIVATED SLUDGE TESTS RAN FOR WERE 48 HOURS
- 18 IN-BETWEEN SAMPLING CYCLES, SO THE DEGRADATION RATE,
- 19 AND THE KEY OPERATOR THERE IS RATE, WAS QUOTED ON A
- 20 48-HOUR CYCLE. THE ASSUMPTION IS IS THAT THEY QUIT
- 21 PUTTING THE MATERIAL BACK IN, THAT IT WOULD CONTINUE
- 22 TO DEGRADE. IT'S A RATE STEP MUCH LIKE THE DECAY OF A
- 23 RADIOACTIVE ISOTOPE.
- 24 Q. IF MCS-1016 WERE SPILLED OUT INTO SOIL, WOULD IT
- 25 BIODEGRADE UNDER THE CIRCUMSTANCES OF BEING OUT IN THE

1 OPEN IN NATURE AS OPPOSED TO IN YOUR LABORATORY?

2 A. YES.

3 Q. AND HOW LONG WOULD IT TAKE TO BIODEGRADE IF IT WERE
4 EXPOSED TO SOIL OUT IN NATURE?

5 A. THAT WOULD DEPEND UPON THE AMBIENT TEMPERATURES, IT
6 WOULD DEPEND UPON THE ACTUAL CONCENTRATION OF THE
7 MATERIAL IN THE SOIL, IT WOULD DEPEND UPON THE
8 BIOLOGICAL POPULATION, THE BACTERIA THAT WERE THERE,
9 WHETHER THE BACTERIA HAD OTHER SOURCES OF CARBON. I
10 MEAN, IT WOULD DEPEND UPON A LOT OF THINGS. IF YOU
11 SATURATED THE SOIL WITH AROCLOR, OR SOMETHING OF THAT
12 SORT, IT MIGHT SIT THERE FOREVER.

13 Q. AND IF, LET'S SAY, A CUP OF IT WAS SPILLED, IS IT
14 POSSIBLE THAT IT WOULD BIODEGRADE WITHIN A
15 YEAR?

16 A. A CUP OF IT WAS SPILLED IN A CUP AREA?

17 Q. IN A CUP AREA.

18 A. IT PROBABLY WOULD STILL BE SITTING THERE IN A YEAR.

19 Q. IS IT POSSIBLE THAT IF A CUP WERE SPILLED IN A CUP
20 AREA THAT IT WOULD TAKE UP TO 50 YEARS TO
21 BIODEGRADE?

22 A. IT'S POSSIBLE. IT WOULD BE VERY DIFFICULT TO SEE THE
23 DEGRADATION RELATIVE TO THE BULK CONSTITUENTS UNTIL A
24 SIGNIFICANT AMOUNT OF THE MATERIALS HAD BEEN DEGRADED
25 BECAUSE YOU'RE TRYING TO MEASURE THE SMALL DIFFERENCE

1 BETWEEN TWO LARGE NUMBERS, WHICH EVERYBODY KNOWS IS
2 DIFFICULT.

3 MR. BRADLEY:

4 NOTHING FURTHER.

5 MR. FEATHERSTONE:

6 GOOD.

7 (THERE BEING NO FURTHER QUESTIONS, THE DEPOSITION WAS
8 CONCLUDED AT APPROXIMATELY 3:18 P.M.)

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CERTIFICATE

I, THE UNDERSIGNED, KARLA T. PITTMAN, NOTARY
PUBLIC IN AND FOR THE STATE OF SOUTH CAROLINA, DO HEREBY
CERTIFY THAT THE FOREGOING DEPOSITION WAS TAKEN ON THE 30TH
DAY OF MARCH, 1993;

THAT THE WITHIN DEPONENT WAS SWORN TO TELL THE
TRUTH AND THAT THE FOREGOING IS AN ACCURATE TRANSCRIPTION OF
THE TESTIMONY TAKEN UNDER OATH;

I FURTHER CERTIFY THAT I AM NEITHER COUNSEL NOR
SOLICITOR TO ANY OF THE PARTIES IN SAID SUIT, NOR INTERESTED
IN THE EVENT OF THE CAUSE.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND
AND SEAL THIS 15TH DAY OF APRIL, 1993.

COPY

KARLA T. PITTMAN (SEAL)
NOTARY PUBLIC FOR SOUTH CAROLINA
MY COMMISSION EXPIRES 5-8-02