
Depo of George Roush, JR., M.D. Monsanto v Aetna February 18, 1993 Cr.54456.0

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**CONDENSED TRANSCRIPT & CONCORDANCE
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[1] - SUBJECT TO PROTECTIVE ORDER -
IN THE SUPERIOR COURT OF THE STATE OF
DELAWARE

[2] IN AND FOR NEW CASTLE COUNTY

[3] ----- x

[3] MONSANTO COMPANY, :

[4] :
[4] Plaintiff, :

[5] :
[5] :

[6] -vs- : CA No. 88C-JA-118-1-CV

[7] :
[7] :

[8] AETNA CASUALTY & SURETY : C-1-90-492

[9] COMPANY, et al., :

[10] :
[10] :

[11] Defendants, :

[12] ----- x

[13] DEPOSITION OF GEORGE ROUSH, JR., M.D.

[14] Thursday, February 18, 1993

[15] Wilmington, Delaware

[16] Deposition of GEORGE ROUSH, JR., M.D., called

[17] for examination pursuant to agreement by counsel, at

[18] the law offices of Duane, Morris & Heckscher, Suite

[19] 1500, 1201 Market Street, at 10:00 a.m., before CRAIG

[20] L. KNOWLES, Court Reporter, when were present on behalf
[21] of the respective parties:

[22] - continued -

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[1] APPEARANCES:

[2] JOSEPH M. JONES, ESQ.

[3] Schwalb, Donnenfeld, Bray & Silbert

[4] 1025 Thomas Jefferson Street, N.W.

[5] Suite 300

[6] Washington, D.C. 20007

[7] On behalf of the Plaintiff.

[8] NANCY L. WALSH, ESQ.

[9] Wiley, Rein & Fielding

[10] 1776 K Street, N.W.

[11] Washington, D.C. 20006

[12] On behalf of the Defendant Travelers Indemnity

[13] Co.

[14] Co.

[15] Co.

[16] Co.

[17] Co.

[18] Co.

[19] Co.

[20] Co.

[21] Co.

[22] Co.

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[1] C O N T E N T S

[2] WITNESS EXAMINATION

[3] George Roush, Jr.

[4] by Ms. Walsh 5

[5] by Ms. Walsh 5

[6] E X H I B I T S

[7] ROUSH DEPOSITION NUMBER IDENTIFIED

[8] ROUSH DEPOSITION NUMBER IDENTIFIED

[9] Exhibit 1 46

[10] Exhibit 2 136

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[18] Exhibit 10 191

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[1]
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[3] Exhibit 13 223
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[6] AFTERNOON SESSION 126
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[1] P R O C E E D I N G S:

[2] Whereupon,

[3] GEORGE ROUSH, JR., M.D.,

[4] was called for examination by counsel for Defendants

[5] and, having been first duly sworn by the Notary Public,

[6] was examined and testified upon his oath as follows:

[7] EXAMINATION BY COUNSEL FOR DEFENDANTS

[8] BY MS. WALSH:

[9] Q. Good morning, Dr. Roush. My name is Nancy

[10] Walsh. I am a lawyer with the firm of Wiley, Rein &

[11] Fielding in Washington. I represent The Travelers

[12] Indemnity Company in this lawsuit that has brought us

[13] here today.

[14] Let me tell you some ground rules. I know

[15] from looking at your documents you have been deposed

[16] before but just a quick refresher may help. If you

[17] don't understand the question, let me know and I will

[18] rephrase it, try to make it more clear.

[19] The court reporter is taking down everything

[20] we say, so please try to give verbal answers, not

[21] nodding your head or saying "uh-huh," it's difficult

[22] for him to take that down. So please try to bear that

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[1] in mind.

[2] As we talked about before, we will take breaks

[3] about once an hour, but if you would like them more

[4] frequently let me know.

[5] You have just been sworn to tell the truth and

[6] your testimony is the same as if you were testifying in

[7] a court of law, despite the somewhat more informal

[8] setting.

[9] One last reminder. The rule in Delaware

[10] prohibits you from discussing the substance of your

[11] testimony with your attorney until the deposition is

[12] concluded.

[13] Any questions?

[14] A. No, I don't think so.

[15] Q. Have you been deposed before?

[16] A. Yes.

[17] Q. Can you estimate how many times?

[18] A. Fifteen to 20 times.

[19] Q. Were those lawsuits involving Monsanto?

[20] A. Some of them.

[21] Q. Do you recall whether you were testifying as

[22] an expert witness for Monsanto in most of those

Page 7

[1] depositions?

[2] A. I never heard a discussion whether I was there

[3] as an expert witness.

[4] Q. Did you review any documents in preparation

[5] for this deposition?

[6] A. I reviewed a statement or some discussion on

[7] topics, but nothing of technical.

[8] Q. But you did review some documents in

[9] preparation for the deposition?

- [10] A. Books, a couple of books.
 [11] Q. Books, okay. What books?
 [12] A. Patty.
 [13] Q. That is comparable to Sax, isn't it?
 [14] A. Yes.
 [15] Q. A toxicology treatise?
 [16] A. Yes.
 [17] Q. All right.
 [18] A. That is what I looked at most, is toxicology.
 [19] Q. All right.
 [20] A. Related to health, environment related to
 [21] health.
 [22] Q. These were books?

Page 8

- [1] A. Yes.
 [2] Q. Do you recall besides Patty the names of any
 [3] of the books that you reviewed?
 [4] A. I looked at an OSHA document on a number of
 [5] chemicals in which they have established PEL's,
 [6] permissible exposure limits.
 [7] Q. Did you review any documents that were
 [8] Monsanto documents in preparation for the deposition?
 [9] I just want to be clear.
 [10] A. No.
 [11] Q. Did you discuss the testimony that you are
 [12] going to give today with anybody else besides your
 [13] attorney?
 [14] A. No.
 [15] Q. Did you meet with your attorney in preparing
 [16] for this deposition?
 [17] A. With this attorney or some other?
 [18] Q. Yes, with Mr. Jones.
 [19] A. Yesterday.
 [20] Q. For how long?
 [21] A. Too long.
 [22] Q. Can you give me just a general time estimate?

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- [1] A. Three, four hours.
 [2] Q. Is Mr. Jones your attorney for purposes of
 [3] this litigation?
 [4] A. I think so.
 [5] Q. Are you paying for his services?
 [6] A. I don't think so.
 [7] Q. Is Monsanto paying for his services?
 [8] A. I wouldn't know.
 [9] Q. All right.
 [10] A. That shows how much contact we have had.
 [11] Q. What I would like to do first, Dr. Roush, is
 [12] go through and get an idea of your educational
 [13] background. Would you be able to start with college
 [14] and tell me your sort of education as it progressed?
 [15] A. Went to the University of Wisconsin.
 [16] Q. When did you graduate?
 [17] A. It's very peculiar, I was in the Army.
 [18] Q. All right.
 [19] A. I was in the Army, and so during that time I
 [20] was going to Wisconsin. I went there three years.
 [21] Q. All right.
 [22] A. Went into the Army. Came out. Went to

Page 10

- [1] medical school. And when I was finishing medical
 [2] school I wrote back and said, hey, give me my
 [3] bachelor's degree from Wisconsin. So I graduated from
 [4] Wisconsin in '51.
 [5] Q. All right.
 [6] A. I mean from Washington University in '51,
 [7] medical school.
 [8] Q. So you got your M.D. and your bachelor's
 [9] degree in the same year?
 [10] A. Yes.
 [11] Q. Technically, okay.
 [12] A. After that?
 [13] Q. Let me ask you one thing. What was your
 [14] bachelor's degree in, was it in a particular major or
 [15] field of study?
 [16] A. Sure.

- [17] Q. What was it?
 [18] A. Mathematics.
 [19] Q. So you have a bachelor's in mathematics from
 [20] the University of Wisconsin and an M.D. from -
 [21] A. Washington University in St. Louis.
 [22] Q. Both of those were awarded in '51?

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- [1] A. Yes.
 [2] Q. After that?
 [3] A. Internship. I went to Marquette University in
 [4] Milwaukee, '51 and '52.
 [5] Q. What was your internship in?
 [6] A. General medicine.
 [7] Q. And then what did you do after your
 [8] internship?
 [9] A. University of Pittsburgh.
 [10] Q. All right.
 [11] A. Master's in public health.
 [12] Q. All right.
 [13] A. And occupational medicine.
 [14] Q. What year did you get the master's in public
 [15] health?
 [16] A. One year.
 [17] Q. So '53?
 [18] A. '52, '53.
 [19] Q. All right.
 [20] A. And then I had a fellowship from National
 [21] Heart Institute for one year.
 [22] Q. What kind of work did you do during the

Page 12

- [1] fellowship?
 [2] A. Studied biochemistry of the failing heart.
 [3] Q. All right.
 [4] A. 1954, 1955.
 [5] Q. All right.
 [6] A. NIH, Bethesda, the Cancer Institute in
 [7] chemotherapy for cancer.
 [8] Q. All right.
 [9] A. '55 - '56, Staten Island Marine Hospital,
 [10] internal medicine.
 [11] Q. All right.
 [12] A. '56 - '57, back at the University of
 [13] Pittsburgh.
 [14] Q. Right.
 [15] A. In medicine.
 [16] Q. When you were at Staten Island Marine
 [17] Hospital, what kind of work did you do in internal
 [18] medicine?
 [19] A. Internal medicine.
 [20] Q. Can you give me just sort of a brief idea of
 [21] what that consisted of?
 [22] A. It's really a residency in medicine.

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- [1] Q. Okay.
 [2] A. '57 I am back in Pittsburgh.
 [3] Q. Yes.
 [4] A. And I got my first full-time job at the
 [5] University of Pittsburgh, and I was assistant professor
 [6] of occupational medicine.
 [7] Q. Give me a brief idea of what the study of
 [8] occupational medicine consists of.
 [9] A. It's to prepare physicians to meet the
 [10] requirements of both the plants, as well as what the
 [11] public expects of a doctor doing his job.
 [12] Q. When you say plants, what kind of plants does
 [13] that field encompass?
 [14] A. It covers all, I would say all of medicine.
 [15] That is being kind of broad, but it's plants where
 [16] it's - U.S. Steel.
 [17] Q. All right.
 [18] A. Was in Pittsburgh. A large company. They
 [19] were there to take care of the workers who get injured
 [20] at work, because that is a traumatic job, and decide
 [21] when a man can go back to work, do the best they can to
 [22] get him prepared to get back to work.

Page 14

- [1] Q. So that -
 [2] A. But then if you go into Dupont here, they have
 [3] a large toxicology unit where they study what the
 [4] effect of the products they make on a biologic
 [5] specimen, whether it's a rat, a mouse or a man.
 [6] Q. Let me stop you here, because you said your
 [7] first full-time job was when you were assistant
 [8] professor, correct?
 [9] A. Yes.
 [10] Q. Your first full time job was when you were
 [11] assistant professor at the University of Pittsburgh?
 [12] A. Yes.
 [13] Q. Let me stop you here. Throughout your
 [14] education, which I see you did a lot of post-graduate
 [15] training, were there any honors or awards that you
 [16] recall that you got?
 [17] A. No, all I have is a master's in public health.
 [18] Q. At any time during the course of your
 [19] education, and let me just confine this to your formal
 [20] education up to '57, did you get any formal training in
 [21] waste disposal, chemical waste disposal?
 [22] A. No.

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- [1] Q. Now is that true through your working career,
 [2] your time at Monsanto as well as previously?
 [3] A. When we start talking from 1957 we are talking
 [4] about a changing expectation of the public. I start
 [5] out, if you ask me about what environment requires of
 [6] us, is the first thing they were worried about is air
 [7] pollution.
 [8] Muskie was senator from Maine, and he set up
 [9] the first law on air pollution control. He didn't
 [10] worry about water, didn't worry about any other kind of
 [11] contamination because the concern was they were seeing
 [12] smog.
 [13] So our learning and our expectations changed
 [14] with time.
 [15] Q. Right, I understand what you are saying. I
 [16] certainly understand the point that you are making,
 [17] which I think is that environmental consciousness
 [18] became much more acute later on, is that correct?
 [19] A. Yes, and rightly or wrongly.
 [20] Q. Right. All I am asking is just the simple
 [21] question, did you during your working career get any
 [22] formal training in chemical waste disposal?

Page 16

- [1] A. No.
 [2] Q. During your working career did you ever take
 [3] any courses or receive any training on environmental
 [4] pollution cleanup?
 [5] A. No.
 [6] Q. Same question in terms of environmental
 [7] pollution prevention?
 [8] A. No.
 [9] Q. Same question with respect to detecting
 [10] environmental pollution?
 [11] A. Did I have a course, you are asking me?
 [12] Q. Yes.
 [13] A. Training?
 [14] Q. I am saying during your formal education or
 [15] during your working career do you recall that you ever
 [16] had any formal training in, and my last question was
 [17] detecting environmental pollution.
 [18] A. No.
 [19] Q. Same question in terms of waste disposal
 [20] methods? When I say waste disposal methods I should
 [21] say chemical waste disposal methods.
 [22] A. No.

Page 17

- [1] Q. Same question in terms of construction of
 [2] disposal pits for chemical waste?
 [3] A. No.
 [4] Q. Same question with respect to landfills?
 [5] A. No.
 [6] Q. Same question with respect to waste
 [7] incineration, chemical waste incineration?

- [8] A. Training in?
 [9] Q. Right, formal training.
 [10] A. All training. No.
 [11] Q. During your formal education or your working
 [12] career did you ever have any formal training on
 [13] pollution abatement or reduction?
 [14] A. No.
 [15] Q. How about how to address groundwater or soil
 [16] pollution?
 [17] A. No.
 [18] Q. Did you have any formal training with respect
 [19] to the properties of soil or geology?
 [20] A. No.
 [21] Q. I think this is the last one. In your formal
 [22] education or your working career did you ever receive

Page 18

- [1] any formal training with respect to groundwater?
 [2] A. No.
 [3] Q. I will be more specific later in terms of
 [4] informal exposure to these areas.
 [5] A. Could I say something?
 [6] Q. Sure.
 [7] A. The questions you asked me.
 [8] Q. Yes.
 [9] A. Was not addressed at the schools of public
 [10] health, either. We couldn't have gotten the courses
 [11] you were asking of me. It goes back to my statement of
 [12] where we are in our expectation.
 [13] Q. Right.
 [14] A. But, so I would suspect in the last four or
 [15] five years there has been a change in schools of public
 [16] health, where they are becoming more and more involved.
 [17] Q. Right. So you are saying a lot of the things
 [18] I mentioned were not available at the time you were
 [19] going to school.
 [20] A. It wasn't even a subject of interest.
 [21] Q. I understand.
 [22] A. They could have been, but they were too

Page 19

- [1] involved in other things.
 [2] Q. Let's start, and what I would like to do just
 [3] to make it easier I think is go through and get an
 [4] overview of your job history, and then what we will do
 [5] is go back and focus on your time at Monsanto. But I
 [6] kind of want to get a background of what you did
 [7] through the years.
 [8] So we started out in 1957 at the University of
 [9] Pittsburgh.
 [10] A. Yes.
 [11] Q. As an assistant professor in medicine, is that
 [12] correct?
 [13] A. Yes -
 [14] Q. What did you teach?
 [15] A. In occupational medicine?
 [16] Q. In occupational medicine, yes. Was the name
 [17] of the course you taught Occupational Medicine?
 [18] A. Yes.
 [19] Q. How long did you remain in that position?
 [20] A. Can I do it my way, rather than yours?
 [21] Q. Sure, whatever is easier.
 [22] A. So when you find out how this is complicated.

Page 20

- [1] While I was at the University of Pittsburgh they were
 [2] doing studies at Callery Chemical Company and the
 [3] effect of these chemicals on man.
 [4] Q. Callery is?
 [5] A. C-a-l-l-e-r-y. They got in trouble and asked
 [6] me to go out there so I became consultant medical
 [7] director at about the same time, so I had two jobs
 [8] going currently.
 [9] In a year or two I became medical director,
 [10] rather than just consultant medical director.
 [11] In 1952. 1952. My time is lost somewhere.
 [12] Q. That is okay. You said you started at the
 [13] University of Pittsburgh in 1957?
 [14] A. Right.

[15] Q. If this helps you, just from looking at your
[16] documents I think you might mean '62, right? You were
[17] medical director at Callery starting in '62?
[18] A. In 1962 I went to the University of
[19] Louisville.
[20] Q. Okay.
[21] A. And there I did cardiac catheterizations on
[22] people with heart trouble.

Page 21

[1] In 1963 I went to University of Cincinnati,
[2] and there I became associate professor of occupational
[3] medicine.

[4] Q. Is the University of Cincinnati associated
[5] with Kettering Lab?

[6] A. Kettering Laboratory is a part of the
[7] Department of Preventive Medicine.

[8] Q. All right.

[9] A. And it was the facility in which they did
[10] toxicology and things related to public health.

[11] Q. All right.

[12] A. And preventive medicine.

[13] Q. How long were you at Cincinnati?

[14] A. Five years.

[15] Q. Okay.

[16] A. To '68.

[17] Q. All right.

[18] A. 1968 I went to Tulane Medical School in New
[19] Orleans.

[20] Q. All right, what did you do there?

[21] A. I was professor of medicine. And my job was
[22] environmental health, environmental medicine,

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[1] toxicology.

[2] Q. Is that different than occupational medicine?

[3] A. It's broader. One was related just to
[4] occupation, and mine was general toxicology.

[5] Q. How did you familiarize yourself with that
[6] field, given that it sounds like you didn't have formal
[7] training in it during your education?

[8] A. When I was back at Kettering Laboratory I
[9] became medical director of the Ethyl Corporation. How
[10] this, I will show you how that relates. I was
[11] occupational medicine professor, and the Ethyl
[12] Corporation made the anti-knock compound that becomes
[13] the thing that makes gasoline work well. And the
[14] quarrel was about lead in gasoline. Maybe you have
[15] heard that.

[16] Q. Right, okay.

[17] A. But that was a big issue.

[18] Q. All right.

[19] A. My responsibility was trying to find out, does
[20] lead in gasoline pose a public health matter.

[21] Q. So that was your focus at ethyl?

[22] A. Yes.

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[1] Q. All right.

[2] A. And I did that until 1972, and then I went to
[3] Monsanto.

[4] Q. So you started at Monsanto in 1972?

[5] A. Yes.

[6] Q. Let me stop you there. When you went, from
[7] 1962 to 1963, you were at the University of Louisville
[8] Medical School?

[9] A. Yes.

[10] Q. Working in cardiology?

[11] A. Yes.

[12] Q. This was after you had been an assistant
[13] professor of occupational medicine and the medical
[14] director for Callery Chemical, is that right?

[15] A. Yes.

[16] Q. Were you doing occupational medicine related
[17] work in your cardiology work at Louisville?

[18] A. No.

[19] Q. Did it relate at all to toxicology or
[20] occupational medicine?

[21] A. No, it relates to occupational medicine.

[22] Q. In what way?

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[1] A. The people who work have heart trouble, and
[2] somebody's got to decide whether that person with heart
[3] trouble can do the job in which they were entrusted.

[4] Q. So would it be fair to say that occupational
[5] medicine consists not only of toxicology and exposure
[6] concerns, but also the fitness of a particular worker
[7] for a particular job?

[8] A. That certainly is part of it. We have, in
[9] occupational medicine we have trauma, we have chemicals
[10] that are toxic and we have got people who have to do
[11] those things.

[12] And the question whether they can work there,
[13] a man has pain in his chest, has a heart attack, breaks
[14] his leg, has a leg taken off, the question is can he go
[15] to work.

[16] You hear the discussion going today about
[17] whether women can do the job the man does?

[18] Q. Right.

[19] A. Well, that was a part of it back then.

[20] Q. All right.

[21] A. I used to see, a man, people would walk past
[22] my office down to where they worked. And one man I

Page 25

[1] remember so well, he had injured his knee, and he went
[2] to the hospital and had it operated on. And he then
[3] walked down to path. He looked ten times worse than he
[4] had been before he had his surgery.

[5] Get back to the fact I have got a man who has
[6] to do the job and the question of whether he has the
[7] physical capabilities of doing it.

[8] Q. All right.

[9] A. That is a major issue.

[10] Q. When you say environmental health with respect
[11] to the work you did at Tulane, what does that
[12] encompass?

[13] A. The people who are in the hospitals may say
[14] that his inability to work, because they made him do
[15] certain things physically or that he was having
[16] complaints because of his work, and the man who takes
[17] care of him in his private practice says I don't know
[18] anything about those things. And so they would refer
[19] him to me.

[20] Q. So would it be fair to characterize it as the
[21] effect of any workplace environment on the health of
[22] the worker?

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[1] A. Sure.

[2] Q. All right.

[3] A. It was about that time that there was concern
[4] about pollution that was started just about then.

[5] Q. Okay.

[6] A. It was on the Mississippi River. And the
[7] medical students came over to my lab, and their
[8] question was, what are we going to do about this
[9] polluted river?

[10] Q. Okay, so that would be -

[11] A. That is the kind of question.

[12] Q. - environmental effect?

[13] A. Yes.

[14] Q. Was it, if you remember, this was around mid
[15] '60s, is that correct?

[16] A. Late '60s.

[17] Q. Late '60s. So was it in the late '60s that
[18] you began to see concerns in your field with respect to
[19] environmental pollution effect on workers?

[20] A. Well, yes, plus the environment, since I said
[21] I was doing lead, and that in the environment.

[22] Q. Would that be the earliest time that things

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[1] like exposure to lead or environmental pollution was
[2] known?

[3] A. During that time there was a plant up the
[4] river, Mississippi, that was treating lead and getting
[5] rid of the waste products, and they were throwing it in

[6] the river. A pound, you know, a pound in the
[7] Mississippi River, they couldn't find it that next day.
[8] But that is true of all, all companies were doing the
[9] same thing, throwing waste into the rivers. The
[10] question is how much.

[11] Get back to Tulane. The students were brought
[12] in to me and they said we want to do something about
[13] all this pollution from the chemical companies. I said
[14] to them, if we can get rid of the human waste that is
[15] in the river it would do a lot more to the health than
[16] clearing up that one pound of mercury. So it was just
[17] really going to get started.

[18] So they said, you have been working on lead,
[19] can you help us do a study on lead? And so we brought
[20] in a car from ethyl and took the exhaust from that and
[21] put it into a container, into a box where we had - we
[22] put the rats into a box where they breathed that air,

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[1] and then I had another box where they didn't have.
[2] The rats in the box where the lead was had
[3] better lungs than the ones that didn't have it. And
[4] all of medical school was starting to worry about where
[5] this fit.

[6] But it's so demanding in terms of time.
[7] Q. So the awareness was being heightened in the
[8] late '60s?

[9] A. Yes, that's right.

[10] Q. Okay.

[11] A. At the same time we were talking about, I was
[12] involved in space medicine, I helped to design the
[13] first space capsule in terms of requirements in space.
[14] Now I wasn't with the one that finally became accepted
[15] by NASA, but I am sure part of your recommendations of
[16] what was required became a part of it. I became a part
[17] of submarine medicine.

[18] Q. Okay.

[19] A. Not broadly, but like everyone else, there are
[20] a whole lot of pieces that become a part of it.

[21] Q. You started at Monsanto in 1972?

[22] A. (Witness nods head.)

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[1] Q. I am sorry, is that a yes?

[2] A. Yes.

[3] Q. What was your first position at Monsanto?

[4] A. Associate medical director.

[5] Q. For the whole company?

[6] A. Yes.

[7] Q. How long did you stay in the position of
[8] associate medical director?

[9] A. I went there with the recognition I would be
[10] medical director in a year.

[11] Q. So did you become medical director -

[12] A. Next year.

[13] Q. In '73?

[14] A. Yes.

[15] Q. Before I ask you more detailed questions about
[16] both those positions at Monsanto, are you retired from
[17] Monsanto?

[18] A. Yes.

[19] Q. Do you receive a pension from Monsanto?

[20] A. No.

[21] Q. Are you a Monsanto stockholder?

[22] A. No.

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[1] Q. You don't own any Monsanto stock?

[2] A. No.

[3] Q. So you are retired from Monsanto?

[4] A. Yes.

[5] Q. What year did you retire?

[6] A. 1988.

[7] Q. Have you done consulting work for Monsanto
[8] since 1988?

[9] A. I have had a contract that I was to come in
[10] once or twice, every month or two I would go in.

[11] Q. What kind of work did you do?

[12] A. Helped them to decide what they should be

[13] doing next or interpret what they had to work on.

[14] Q. Okay, and -

[15] A. I was a part of a committee that included two
[16] people from New York State Medical School and from
[17] University of Wisconsin and from Vanderbilt, and I was
[18] the fifth one.

[19] Q. What was the committee called?

[20] A. Biohazards Committee.

[21] Q. Were you on the Biohazards Committee before
[22] you left Monsanto?

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[1] A. No, I set up the Biohazards Committee.

[2] Q. This was after retiring?

[3] A. No, I had to set it up before.

[4] Q. And then were you a member of the committee
[5] before 1988?

[6] A. Before that I was the one who said what they
[7] did.

[8] Q. All right.

[9] A. I was the director.

[10] Q. So you weren't a committee member until after
[11] you retired?

[12] A. Right.

[13] Q. Can you give me sort of a broad idea of what
[14] the Biohazards Committee did?

[15] A. One of them was a professor of biochemistry,
[16] another one was a professor of toxicology, another one
[17] was a specialist in cancer. I think that's it.

[18] Q. What were you the specialist on?

[19] A. Well, until 1988 I told them what we are going
[20] to work on this next meeting.

[21] Q. As medical director?

[22] A. Correct.

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[1] Q. All right.

[2] A. After that I became a participant in telling
[3] what the practical issues are and how what they were
[4] doing applied.

[5] Q. To occupational -

[6] A. Monsanto's needs.

[7] Q. When you say Monsanto's needs, are you talking
[8] about concerns regarding occupational medicine?

[9] A. Yes, and broader than that, environmental
[10] issues.

[11] Q. How long after 1988 when you were a member of
[12] the committee did you remain on the Biohazards -

[13] A. I still am.

[14] Q. You still are, okay.

[15] You said you had a contract, so Monsanto paid
[16] you based on an amount set forth in your contract after
[17] you retired?

[18] A. Yes.

[19] Q. You continue to be compensated under that
[20] contract?

[21] A. Yes.

[22] Q. Are you being compensated by Monsanto for your

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[1] time in this deposition?

[2] A. We never discussed it.

[3] Q. You don't know one way or the other no.

[4] Q. All right.

[5] A. Sometimes I get paid and sometimes I do not
[6] when I get involved in depositions.

[7] Q. All right. Under your contract for the
[8] Biohazards Committee work is that an hourly rate?

[9] A. Day.

[10] Q. Daily rate?

[11] A. By day.

[12] Q. How much is the daily rate?

[13] A. It's a thousand dollars for two days.

[14] Q. Is that the rate that you are compensated in
[15] the depositions that you have appeared previously?

[16] A. Very similar, it's not the same but it's
[17] almost. It depends how long the day is.

[18] Q. You don't have a separate agreement for
[19] deposition testimony?

[20] A. No.
 [21] Q. Do you know whether you are being compensated
 [22] by Monsanto for time spent preparing for this

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[1] deposition?
 [2] A. Sometimes I don't get involved with
 [3] compensation, so I can't tell you what is going to take
 [4] place.
 [5] Q. In terms of this deposition, though.
 [6] A. Yes.
 [7] Q. Do you know whether you are going to be
 [8] compensated for your prep time?
 [9] A. I do not.
 [10] Q. All right.
 [11] A. Or even for the deposition.
 [12] Q. Okay. When you started as associate medical
 [13] director at Monsanto, the medical director at that time
 [14] was Dr. Robert Emmett Kelly, is that right?
 [15] A. It was R. E. Kelly. He was Emmett to us.
 [16] Q. Did Dr. Kelly hire you?
 [17] A. Yes.
 [18] Q. Was he your direct boss?
 [19] A. Yes.
 [20] Q. Can you give me a general idea of what your
 [21] duties were as associate medical director?
 [22] A. Occupational medicine varied, we have sort of

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[1] implied that.
 [2] Q. All right.
 [3] A. The people that worked in headquarters did
 [4] examinations. Monsanto has a program set up where they
 [5] get physical examinations on a periodic basis to
 [6] everyone who wants an examination.
 [7] Q. These are the headquarter employees?
 [8] A. That was mine, but at the plants where they
 [9] are big enough to have a full-time physician there is a
 [10] physician at that plant who does the same thing.
 [11] Q. So you were in charge of that program for St.
 [12] Louis?
 [13] A. And for the rest of the country, too.
 [14] Q. All right.
 [15] A. But I really can't say that. Dr. Kelly and I,
 [16] we divided up responsibility.
 [17] Q. Did you oversee the plant physicians for the
 [18] plants that you were responsible for?
 [19] A. Yes.
 [20] Q. Were you responsible for the Texas City plant?
 [21] A. Yes, but, you see, once a year, and by that
 [22] year I was out of that responsibility.

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[1] Q. I see.
 [2] A. So that timing gets difficult.
 [3] Q. During the year that you were associate
 [4] medical director, did you work closely with Dr. Kelly?
 [5] A. Yes.
 [6] Q. Daily contact with him?
 [7] A. Yes.
 [8] Q. Were there any, and again, this is directed
 [9] toward your time as associate medical director, were
 [10] there any special assignments or special projects that
 [11] you had particular responsibility for?
 [12] A. Not in that first year.
 [13] Q. So it was very broad?
 [14] A. Right. It was trying to learn what is out
 [15] there.
 [16] Q. Would it be fair to say it was almost training
 [17] for the -
 [18] A. Yes.
 [19] Q. - medical director position?
 [20] A. Yes.
 [21] Q. Who else did you work with when you were
 [22] associate medical director?

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[1] A. Well, that is people whom Dr. Kelly had in his
 [2] office.
 [3] Q. Do you recall any names?

[4] A. Oh, yes. It was Elmer Wheeler.
 [5] Q. All right. Anyone else?
 [6] A. Elmer Wheeler had some notoriety. He had been
 [7] director, or president of the International Hygiene
 [8] Association.
 [9] Q. So he was an industrial hygienist?
 [10] A. Yes.
 [11] Q. All right.
 [12] A. At least he functioned at it.
 [13] Q. All right.
 [14] A. It was broader than that.
 [15] Q. Did you work closely with Mr. Wheeler?
 [16] A. Yes.
 [17] Q. All right.
 [18] A. He went with me to some of the plants that I
 [19] wanted to see, he went with me to Texas City, for
 [20] instance.
 [21] Q. Anyone else you worked closely with during
 [22] your -

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[1] A. We had Jack Garrett.
 [2] Q. All right.
 [3] A. Who was an industrial hygienist who worked
 [4] with Elmer and Dr. Levinskas, who was the toxicology
 [5] person.
 [6] Q. All right.
 [7] A. For Monsanto at that time. He started
 [8] toxicology.
 [9] Q. What kind of things did you work on with, is
 [10] it Mr. Garrett or Dr. Garrett?
 [11] A. Mr. Garrett.
 [12] Q. Mr. Garrett. What kind of things did you work
 [13] on?
 [14] A. He worked for Elmer, not with me.
 [15] Q. Okay.
 [16] A. So he would talk with me about what he was
 [17] doing, but we didn't get involved in any study
 [18] together.
 [19] Q. How about Dr. Levinskas, did you do any work
 [20] with him?
 [21] A. No.
 [22] Q. During your time as assistant medical

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[1] director, did you do any work with state or federal
 [2] regulatory agencies?
 [3] A. No.
 [4] Q. Who was responsible for that in the Medical
 [5] Department?
 [6] A. If there was some contact with Washington it
 [7] was Dr. Kelly.
 [8] Q. During the time you were assistant medical
 [9] director and I realize this is just that one year, did
 [10] you do any work on chemical waste disposal?
 [11] A. PCB's.
 [12] Q. What did your work with PCB's involve?
 [13] A. Mr. Wheeler, I am talking about what other
 [14] people did.
 [15] Q. Okay.
 [16] A. He was involved in following PCB's as a health
 [17] issue, as a public health issue, government relation.
 [18] It was about that time they found that PCB's were
 [19] present in water.
 [20] Q. Just to make sure I understand, were you doing
 [21] any work personally with Mr. Wheeler on this?
 [22] A. No, I was understanding what the issue was.

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[1] What's the big deal, you know.
 [2] Q. Because a year later he would be reporting to
 [3] you?
 [4] A. Yes.
 [5] Q. All right.
 [6] A. But not only that, since I hadn't been
 [7] thinking about PCB's before, why had it become an
 [8] issue.
 [9] Q. All right.
 [10] A. What is the issue.

- [11] Q. Was that the only involvement with waste
[12] disposal, chemical waste disposal issues you recall?
[13] A. Yes.
[14] Q. All right.
[15] A. But that was a big one. See, we were involved
[16] on PCB's in Scandinavia. It was about that time that
[17] there was a big poisoning episode that took place in
[18] Japan, and how did we get into this, you know?
[19] Q. Right, okay. In the assistant medical
[20] director position was there any work during that year
[21] you did on pollution issues?
[22] A. I don't think so.

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- [1] Q. I know you said you didn't work with the
[2] regulatory agencies during that year, but did you do
[3] any work with respect to complying with regulatory or
[4] permit limits?
[5] A. No. The place we were working was in
[6] compliance of the exposure of the workers for Monsanto.
[7] Q. Okay.
[8] A. That we guaranteed to the workers as well as
[9] to Monsanto that no one's going to be exposed to the
[10] chemicals Monsanto is making.
[11] Q. When you say the place we are working, are you
[12] saying Monsanto headquarters or whatever plant you were
[13] involved with?
[14] A. In the plants where the material was being
[15] made, that the workers that were making them were not
[16] being exposed at a level that was inconsistent with the
[17] government requirement.
[18] Q. That was a goal of the Medical Department?
[19] A. Yes.
[20] Q. All right.
[21] A. Responsibility.
[22] Q. That would be a responsibility to keep

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- [1] exposure within OSHA limits?
[2] A. Yes.
[3] Q. Would that also be NIOSH limits?
[4] A. At that time the relationship between NIOSH,
[5] they reported to different heads, one reported to EPA
[6] and the other one reported to NIH, or to the National
[7] Institutes of Health. So they were almost at
[8] loggerheads in terms of what were the levels that were
[9] expected.
[10] Q. All right?
[11] A. We had to work with both, obviously.
[12] Q. Were there any other regulatory agencies that
[13] had limits that the Medical Department had
[14] responsibility to stay within?
[15] A. That is a very broad question. We have got 15
[16] plants.
[17] Q. Right.
[18] A. And there were state health officers that
[19] could be interested in what -
[20] Q. So it would be the state equivalent of OSHA or
[21] NIOSH?
[22] A. Right.

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- [1] Q. All right.
[2] A. But they didn't really get very much involved,
[3] they didn't have the kind of staffs that NIH has.
[4] Q. You said 15 plants. Monsanto is more than 15
[5] plants, right?
[6] A. Large plants.
[7] Q. So you are talking about the 15 largest?
[8] A. Yes.
[9] Q. Was Texas City included in that?
[10] A. Yes.
[11] Q. Do you recall during your time as associate
[12] medical director you had to do any projects involving
[13] pollution abatement or reduction?
[14] A. No.
[15] Q. No involvement with anything relating to that?
[16] A. No.
[17] Q. Let me make sure you understood me. When I

- [18] said pollution abatement or reduction, I meant
[19] abatement or reduction of environmental pollution?
[20] A. Yes.
[21] Q. You understood that?
[22] A. Yes.

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- [1] Q. Finally, did you do any work during your year
[2] as associate medical director with respect to
[3] environmental pollution cleanup?
[4] A. No.
[5] Q. All right.
[6] A. You see, if you ask that question to someone
[7] from government they would have said no, too. Back at
[8] that time there was little or no effort being made to
[9] clean these up.
[10] Q. Right, there were not ongoing cleanups.
[11] A. That's right.
[12] Q. Okay, I understand.
[13] A. So our awareness and concern about the
[14] environment has increased.
[15] Q. Yes, I understand that. I am basically just
[16] trying to be thorough.
[17] A. So what you talk about then, you can't talk
[18] about, you have got to somehow keep it in context.
[19] Q. Sure.
[20] A. PCB's was an ongoing when I came, it was a
[21] very big issue.
[22] Q. But are you saying that at that time -

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- [1] A. National issue.
[2] Q. But are you saying, I mean when you answered
[3] no to my question in terms of I didn't do any work with
[4] respect to environmental pollution cleanup, are you
[5] saying there wasn't any ongoing PCB cleanup that I was
[6] working on?
[7] A. No.
[8] Q. There wasn't?
[9] A. No.
[10] Q. I think we understand each other. I am more
[11] trying to get an idea of what the scope of your
[12] responsibilities were.
[13] A. Yes, but you see when you talk about what
[14] scope is, if no one else was doing it in the world,
[15] then what are we talking about when you say what nobody
[16] else is doing.
[17] Q. Right.
[18] A. But if you get to PCB's that would be a good
[19] example of what is done.
[20] Q. All right.
[21] A. Because that happens just about this time.
[22] When Emmett retired, it was that time I went to the

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- [1] first national meeting and it was on PCB's.
[2] MS. WALSH: I want to show you a document.
[3] Would you mark this Roush Exhibit 1.
[4] (Deposition Exhibit 1 was marked for
[5] identification.)
[6] BY MS. WALSH:
[7] Q. Dr. Roush, this is marked Roush Exhibit 1.
[8] The rules require we use your name in marking the
[9] exhibit. I would appreciate if throughout the
[10] deposition you would be sure to handle the copy with
[11] the sticker, that way we know you are looking at the
[12] official copy that is going to be attached to the
[13] transcript.
[14] Could you take just as long as you need to
[15] read through this?
[16] (Witness examines document.)
[17] BY MS. WALSH:
[18] Q. You have had a chance to look at Exhibit 1?
[19] A. Yes.
[20] Q. This is a September 26, 1973 memo. Is that
[21] your signature at the end of page 2?
[22] A. Yes.

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- [1] Q. So you prepared this?

[2] A. Yes.
 [3] Q. Is this Monsanto letterhead?
 [4] A. Yes.
 [5] Q. This is, September 26, 1973, would you still
 [6] have been associate director?
 [7] A. Yes.
 [8] Q. Since Dr. Kelly is listed on the c.c. list? I
 [9] am sorry, is that a yes?
 [10] A. Yes.
 [11] Q. Who is John Fox?
 [12] A. He worked at the Texas City plant.
 [13] Q. Do you recall what he did?
 [14] A. He was sort of the environmentalist at Texas
 [15] City.
 [16] Q. Do you recall why you would have been giving
 [17] him the results of a urinary phenol study?
 [18] A. Why I would?
 [19] Q. Yes.
 [20] A. Because, he did this because I asked him to.
 [21] Q. So he actually did the work?
 [22] A. Yes.

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[1] Q. Do you recall whether there was a concern
 [2] about benzene exposure in 1973?
 [3] MR. JONES: Objection, vague.
 [4] BY MS. WALSH:
 [5] Q. You can answer.
 [6] A. I can't recall.
 [7] Q. All right.
 [8] A. But I can tell you what it was.
 [9] Q. What was it?
 [10] A. Urinary phenols. We all put out phenols in
 [11] our urine and the levels are related to exposure to
 [12] benzene.
 [13] Q. Do you -
 [14] A. Not necessarily.
 [15] Q. All right.
 [16] A. But it is related to it. And the question is
 [17] trying to find out the little bit that is not.
 [18] Q. All right.
 [19] A. Or if the exposures are very high like this
 [20] zeal whose name is listed that is where the
 [21] occupational exposure was higher.
 [22] Q. So you did a study -

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[1] A. This is occupational medicine, this is not
 [2] environmental medicine.
 [3] Q. How did those differ in your view?
 [4] A. This is a man's excretion of phenol in his
 [5] urine as related to their exposure to benzene. But
 [6] it's occupational medicine because we have to be able
 [7] to separate that that we are measuring deciding whether
 [8] it's from other things that you do that produce phenols
 [9] or whether it's due to the benzene.
 [10] Q. Do you recall why you wanted to determine
 [11] workplace exposure to benzene?
 [12] A. Because we want to know a man's exposure to
 [13] benzene.
 [14] Q. Why did you want to know that exposure?
 [15] A. Because we wanted to know all chemical
 [16] exposure. People working in a plant, as we said
 [17] earlier, are exposed to chemicals and we want to know,
 [18] keep up to date on what the effect of those chemicals
 [19] are on them. This is one way of doing it.
 [20] Q. My question is, was there a specific concern
 [21] about the properties of benzene at that time that
 [22] motivated this study?

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[1] MR. JONES: Objection, vague.
 [2] BY MS. WALSH:
 [3] Q. You can answer.
 [4] A. We were interested in whether a man had an
 [5] excess exposure to benzene, and this is one way to do
 [6] it.
 [7] Q. Right.
 [8] A. So we had a test that said - down here where

[9] it said we did blood counts?
 [10] Q. Right.
 [11] A. Really what we wanted to measure are blood
 [12] counts, but the blood counts can't be measured in 1 out
 [13] of 50. Your blood count is different than mine. If I
 [14] use blood counts, I have got to explain that
 [15] difference.
 [16] Q. Okay.
 [17] A. That is harder than to do it this way.
 [18] MR. JONES: Just off the record.
 [19] (Off-the-record discussion.)
 [20] MS. WALSH: Let's go back on.
 [21] BY MS. WALSH:
 [22] Q. I understand what you are saying about the

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[1] methodologies that are discussed here. My question
 [2] is -
 [3] MS. WALSH: Let me rephrase that.
 [4] BY MS. WALSH:
 [5] Q. Was benzene known to be a carcinogen in 1973?
 [6] MR. JONES: Objection, vague.
 [7] A. Yes.
 [8] BY MS. WALSH:
 [9] Q. Was that why you started to study exposures of
 [10] workers to benzene?
 [11] A. They had been studying benzene in the blood
 [12] for a long time before that.
 [13] Q. Monsanto had?
 [14] A. Sure.
 [15] Q. As part of a routine monitoring at plants?
 [16] A. No, related to their exposure to benzene.
 [17] Q. Do you recall when studies with respect to
 [18] benzene began?
 [19] A. No.
 [20] Q. Would it have been before your time at
 [21] Monsanto?
 [22] A. Yes.

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[1] Q. Based on your knowledge of occupational
 [2] medicine prior to your time at Monsanto, do you have a
 [3] general recollection of when concern about benzene as a
 [4] carcinogen arose?
 [5] MR. JONES: Same objection, he can only
 [6] testify as to what he was concerned about.
 [7] BY MS. WALSH:
 [8] Q. Right, that is what I am asking. Based on
 [9] your experience do you remember the earliest that there
 [10] was a concern about benzene as a carcinogen?
 [11] A. In the '50s.
 [12] Q. In the '50s?
 [13] A. Maybe earlier.
 [14] Q. Do you know that from work you did, or from
 [15] literature?
 [16] A. I taught it.
 [17] Q. As a result of this urinary phenol study were
 [18] there any changes in worker handling procedures with
 [19] respect to benzene?
 [20] A. No.
 [21] Q. Why was that?
 [22] A. It didn't improve our ability to decide how

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[1] much exposure to benzene there was.
 [2] Q. All right.
 [3] A. The statement where it says a study of the
 [4] hemograms revealed there was no clear benzene effect.
 [5] Q. All right.
 [6] A. So we were successful, and if we did it more
 [7] it was to ensure we stayed successful.
 [8] Q. Was your conclusion from the urinary phenol
 [9] study that urinary phenol studies couldn't tell you the
 [10] exposure to benzene, or was your conclusion that there
 [11] wasn't an unacceptable exposure to benzene?
 [12] MR. JONES: Objection, leading.
 [13] MS. WALSH: You can have your objection to
 [14] leading.
 [15] MR. JONES: Correct.

[16] MS. WALSH: Defendants disagree with it for
[17] the record.
[18] A. It says there are five explanations.
[19] BY MS. WALSH:
[20] Q. Right.
[21] A. And our conclusions was that workers do absorb
[22] benzene, you can't work with it without exposure. This

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[1] group was not above the TLV.
[2] Q. That is "threshold limit value?"
[3] A. Yes.
[4] Q. But I guess what I am saying is, I understand
[5] what the points of the memo were. What I don't
[6] understand from the memo and what I am asking you if
[7] you recall is, was the conclusion that the urinary
[8] phenol study is a good test, is an accurate test, our
[9] workers are below TLV levels, or was the conclusion
[10] that the urinary phenol study is not a good test to
[11] measure benzene exposure?
[12] A. It's like everything in medicine, it depends.
[13] Q. Okay.
[14] A. You look at a population. And if the benzene
[15] is in the normal range and if I have got somebody who
[16] then has a urinary phenol that is up, that urinary
[17] phenol is not related to this or else he had an
[18] exposure that they didn't investigate, in other words
[19] he tried to hide it.
[20] So the follow-up of this is it's good for
[21] looking at individual cases rather than having a survey
[22] that we set this up to do.

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[1] Q. Okay.
[2] A. So we are still talking medicine, though.
[3] Q. I think I may be sounding more complex than
[4] what I am trying to be. Let me just tell you the
[5] background of my question and why I am asking. I don't
[6] have the transcript in front of me, but I am telling
[7] you the best of my recollection.
[8] In Mr. Fox's deposition my understanding was
[9] that his thought on this urinary phenol study was that
[10] there were too many other factors that influenced the
[11] urinary phenol level for it to have a lot of usefulness
[12] to measure benzene exposure, but he didn't recall
[13] whether the test was changed or whether the phenol
[14] study continued, albeit with flaws, and what I am
[15] asking is do you recall based on the conclusions about
[16] the urinary phenol study whether you continued to use
[17] it at Monsanto?
[18] A. The fact that it didn't go up and that it can
[19] only be used to pick up high exposures or I will have
[20] higher exposures that aren't related to it, that we did
[21] not continue it.
[22] Q. Do you recall whether you instituted other

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[1] tests to measure benzene exposure?
[2] A. OSHA.
[3] Q. All right.
[4] A. Has a requirement that if the blood, if the
[5] exposure to benzene is high then you have got to do
[6] blood counts more frequently.
[7] Q. Okay.
[8] A. And the reason that is taking place is because
[9] blood counts are done all the time, that is a routine.
[10] We don't have to learn to do that. We don't have to
[11] follow through like you would with the phenol.
[12] Q. Okay.
[13] A. In other words, phenol is not a substitute for
[14] doing blood counts.
[15] Q. So there were government guidelines in terms
[16] of how you had to -
[17] A. Not then, but there was, discussion was taking
[18] place on this.
[19] Q. Were there eventually government guidelines in
[20] terms of how you had to address benzene exposures?
[21] A. There is now.
[22] Q. There is now, okay.

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[1] A. Yes.
[2] Q. Was there in 1980?
[3] A. Yes, you know, not - not one that we had to
[4] follow.
[5] Q. Do you recall in the early, mid '70s whether
[6] there were any recommended examination procedures for
[7] workers who may have been exposed to benzene?
[8] MR. JONES: Objection, vague. Recommended by
[9] whom, government?
[10] MS. WALSH: Recommended by government or
[11] recommended by Monsanto.
[12] A. Well, if it was recommended by Monsanto we
[13] would be doing it.
[14] BY MS. WALSH:
[15] Q. All right.
[16] A. The quarrel is when did we know clear
[17] enough - there is still a quarrel.
[18] Q. In terms of what?
[19] A. Yes.
[20] Q. What was Monsanto's examination procedure for
[21] workers that may have been exposed to benzene?
[22] A. I told you we did on a regular basis once a

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[1] year or more, we would do a physical examination on
[2] everyone that worked for Monsanto.
[3] Q. Okay.
[4] A. Included in that would be those people exposed
[5] to benzene.
[6] Q. All right.
[7] A. And then doing that we would then get the
[8] blood counts that would enable us to determine whether
[9] they were having excess exposure.
[10] Q. So that would be part of their annual
[11] physical?
[12] A. That's right.
[13] Q. Okay.
[14] A. And the other thing is that we knew there was
[15] exposure to benzene so they were monitoring the
[16] exposure to benzene. So we had two cross-checks.
[17] Q. You are anticipating my next question, that is
[18] when you started as medical director was there a
[19] medical monitoring program for benzene?
[20] A. That was a blood count.
[21] Q. That was a blood count?
[22] A. Yes.

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[1] Q. Was that something Monsanto initiated itself,
[2] or was that government mandated?
[3] A. I can't, I don't remember.
[4] Q. Do you recall -
[5] A. But you see when you take these things out of
[6] context, there was one big episode of benzene poisoning
[7] in Dayton, Ohio, where rubber people who were working
[8] with benzene and had exposure and their blood counts
[9] were affected by it.
[10] OSHA is still using that study from the early
[11] '50s to decide what there should be an exposure. In my
[12] teaching - oh, they were worried the one part per
[13] million, TLV is one part per million. In my teaching I
[14] said you don't see an effect below 25 ppm. That 25 ppm
[15] effect you get is not going to be the one we worry
[16] about here.
[17] Q. All right.
[18] A. Over in, we always talk about this, when you
[19] take everything out of context, over in Turkey there
[20] is, they are having a business, it's called cottage
[21] industries.
[22] And the people who worked in these small

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[1] plants, they were putting rubber soles on shoes. They
[2] had to paint the shoes with benzene to make the rubber
[3] attach. Their exposure was over a hundred ppm. They
[4] got leukemia.
[5] Q. Okay.
[6] A. So that is far removed from what we were

[7] talking about because we were trying to tell whether we
[8] could tell if there was any abnormal.

[9] Q. I understand that. Let me just say, because I
[10] was drawing a distinction before, tell me if you are
[11] unclear on the timeframe I am asking about. In general
[12] what I am going to ask you about from here on out
[13] throughout the deposition covers your whole time as
[14] associate medical director or medical director at
[15] Monsanto, in other words it covers your years at
[16] Monsanto.

[17] A. Yes.

[18] Q. One last question about benzene. Do you
[19] recall whether you were or anyone in your department
[20] did any carcinogenicity studies on benzene?

[21] A. You can't do carcinogenicity studies on
[22] benzene.

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[1] Q. Why not?

[2] A. Because exposures aren't high enough.

[3] Q. All right.

[4] A. We didn't have the kind of exposures they had
[5] at Goodrich in Dayton.

[6] The quarrel today that is about benzene and
[7] man's exposure is do we have to go down to one part per
[8] million and lower, and they say well we can't get down
[9] there, then they find out they can, then the quarrel
[10] goes away once we have established they can do it,
[11] whether it was necessary or not.

[12] Q. Okay.

[13] A. It's a health issue that we, like so many
[14] things, whether it's AIDS or whatever.

[15] Q. So are you saying it was the determination of
[16] the Medical Department that exposure was low so there
[17] wasn't a need for carcinogenicity studies?

[18] A. Well - oh, yes.

[19] Q. But the Medical Department had the technology
[20] and the ability to do carcinogenicity studies, is that
[21] right?

[22] A. A carcinogenicity study is related to the dose

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[1] of what you are exposing them.

[2] Q. All right.

[3] A. It's not a different study, it's related -
[4] Monsanto we were working at one part per million. To
[5] get into the cancer level at which it happens it's over
[6] a hundred ppm.

[7] Now the issue today is how do you know that if
[8] you did a large enough population that you wouldn't
[9] find cancer at one part per million? I don't know how
[10] to do that study because they would have to have such a
[11] large population.

[12] Q. But did you study the Monsanto workers that
[13] were exposed to benzene?

[14] A. It's the same study.

[15] Q. So inherent in the monitoring and - inherent
[16] in the monitoring you did for benzene would be a
[17] carcinogenicity result?

[18] A. We would be able to, carcinogenicity on this
[19] is leukemia.

[20] Q. Right.

[21] A. It's acute myelogenous leukemia.

[22] Q. All right.

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[1] A. You don't see it, but if we say, well, let's
[2] make real sure that we don't see it, then you use the
[3] one part per million standard.

[4] Q. All right.

[5] A. It's a matter of how far, how safe. If it
[6] cost a million dollars to do it, we wouldn't be doing
[7] it.

[8] Q. All right.

[9] A. It has a relationship that, dose, we talk
[10] about our dose was one ppm, in order to get leukemia
[11] it's a hundred ppm or higher, and if they do get it
[12] they don't get it in the form in which they say it.
[13] Our problem is we can't tell the leukemia that any

[14] person gets from the leukemia that a man that works
[15] with benzene gets, when this could be the kind he would
[16] have gotten if he hadn't worked with benzene.

[17] But if we got a man who has leukemia, we sure
[18] go back to that plant and make sure that their
[19] exposures are low.

[20] Q. Okay.

[21] A. You know, that's common sense.

[22] MS. WALSH: That is all for Exhibit 1.

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[1] Would you like a break? We have gone about an
[2] hour, why don't we take a five-minute break.

[3] THE WITNESS: Very good.

[4] (Recess.)

[5] MS. WALSH: We are back on the record.

[6] BY MS. WALSH:

[7] Q. During your time at Monsanto, so this would be
[8] from 1972, on, were there any responsibilities you had
[9] that were outside your job titles, what I am thinking
[10] of is examples, as examples would be committees or
[11] special assignments or special areas of expertise?

[12] A. I don't know whether the question can be
[13] answered with a yes or a no. What is the question?

[14] Q. I am asking if there were things you did
[15] outside your job title in the course of your work at
[16] Monsanto. In other words did you have any special
[17] assignments or committee assignments that weren't part
[18] of being medical director that, in other words I am
[19] trying to be thorough in terms of what kind of work did
[20] you do and was there work you did that was outside your
[21] job title?

[22] A. No.

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[1] Q. No, okay. When you started as medical
[2] director did you receive any additional formal
[3] training?

[4] A. No.

[5] Q. Outside your work at Monsanto were you a
[6] member of any professional organizations?

[7] A. I was a part of the Occupational Medicine
[8] Association.

[9] Q. Did you do any work with them?

[10] A. Yes.

[11] Q. What did you do with them?

[12] A. Help explain to them about chemicals. In
[13] other words I participated in increasing their
[14] knowledge of these chemicals.

[15] Q. Was the Occupational Medicine Association, did
[16] they have some kind of role in disseminating chemical
[17] information?

[18] A. They have an annual meeting.

[19] Q. All right.

[20] A. And I was the director of a subcommittee on
[21] toxicology.

[22] Q. Okay.

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[1] A. As well as how to monitor it. I was a part of
[2] the American Conference of Government and Industrial
[3] Hygienists that writes the TLV's.

[4] Q. Okay. Any -

[5] A. I was a member of the Medical Directors Forum,
[6] where we communicate back and forth how they do that as
[7] opposed to how we do it, in other words increasing the
[8] knowledge of the whole group.

[9] And I was a member of the Rammazini Society.

[10] Q. What is that?

[11] A. It's a committee, or a group of 30 physicians
[12] who practice occupational medicine. And you can't be a
[13] member of that august organization as long as there are
[14] 30 people in it, so it's a selective group.

[15] Q. Is it similar to the other organizations you
[16] have named in that their role is to disseminate
[17] information?

[18] A. No.

[19] Q. What did they do?

[20] A. Rammazini?

[21] Q. Yes.
[22] A. They talk about their relative successes and

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[1] failures.
[2] Q. All right.
[3] A. In other words it improves the general
[4] standard of the whole group by meeting together.
[5] Q. Information sharing within the group?
[6] A. Yes.
[7] Q. Do you know what the Industrial Medicine
[8] Association is?
[9] A. That is part of the occupation -
[10] Q. Okay. Were you part of the industrial hygiene
[11] foundation?
[12] A. No.
[13] Q. I am not sure if this is before or after your
[14] time at Monsanto. Some of the documents I have looked
[15] at say that you did some work for the Lead Institute,
[16] is that right? Is that part of your work at Ethyl?
[17] A. Yes.
[18] Q. What is the Lead Institute, is that a separate
[19] thing?
[20] A. Yes.
[21] Q. So it's not part of Ethyl?
[22] A. What?

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[1] Q. The Lead Institute is not part of Ethyl?
[2] A. No, no.
[3] Q. What is the Lead Institute?
[4] A. The Lead Institute is the, an organization in
[5] which those people interested in lead.
[6] Q. When were you a member?
[7] A. From the time I went to Ethyl Corporation
[8] until I left.
[9] Q. Until you left Ethyl?
[10] A. Yes.
[11] Q. Did you do any projects for the Lead
[12] Institute?
[13] A. It's hard for me to answer the question. I
[14] can't answer that question.
[15] Q. You don't remember?
[16] A. Yes, but my assignment, I can't say whether
[17] I - since I was doing it within the lead industry and
[18] I did a study, would I be doing it for the lead
[19] industry, was I doing it for myself or for Ethyl. All
[20] three of them have interests in that.
[21] Q. Would the majority of your work on lead be the
[22] project you worked on at Ethyl?

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[1] A. Yes.
[2] Q. So that was the main, that was the main thrust
[3] of all your work on lead?
[4] A. Lead in gasoline was a national issue.
[5] Q. Right?
[6] A. I became one of their spokesmen. We had
[7] national meetings at which I attended and I would
[8] always give - the subject of how much lead you got in
[9] your body and was it coming from lead in gasoline or
[10] was it from some other source.
[11] Q. Okay.
[12] A. Just now they are now talking about kids
[13] saying they shouldn't have any lead.
[14] Q. In your studies of lead in gasoline were you
[15] determining acceptable amounts of lead that could be in
[16] gasoline?
[17] A. That would be a consequence.
[18] Q. All right.
[19] A. But our responsibility was to tell them what
[20] would happen if they took it out in terms of man's
[21] exposure.
[22] Q. So your work was, if you reduce the lead in

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[1] gasoline, here are the health effects?
[2] A. No, mine was whether they would have any
[3] effect on the lead you have got in your body.
[4] Q. Whether reducing lead in gasoline reduced

[5] overall -
[6] A. Yes.
[7] Q. - lead levels in humans?
[8] I am sorry, is that a yes?
[9] A. Yes.
[10] Q. What was your conclusion?
[11] A. You see, it's not - if I say yes or no, it
[12] doesn't really answer the question of what was being
[13] done. I can't answer that question by a yes or no.
[14] Q. Let me rephrase it, I may not have been clear.
[15] Did you conclude that lowering the amount of lead in
[16] gasoline would lower the amount of lead within people's
[17] bodies?
[18] A. Yes.
[19] Q. Okay.
[20] A. But, see, that doesn't answer, because if it's
[21] all within the normal limits, like everything else, we
[22] all don't have the same thing of most things, but if I

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[1] studied them would I be able to detect a difference in
[2] this group. And the answer is probably yes.
[3] Q. At some point during those years they phased
[4] out leaded gasoline, correct?
[5] A. Who phased them out.
[6] Q. The manufacturers, didn't they?
[7] A. No.
[8] Q. When was leaded gasoline phased out?
[9] A. About the time I came here.
[10] Q. About the time you started at Monsanto?
[11] A. Yes.
[12] Q. In '72?
[13] A. Yes.
[14] Q. So that was after your study -
[15] A. But you see there is a great quarrel going
[16] before, can they get it done.
[17] Q. When you say can we get it done, can we get
[18] the levels of lead in gasoline down?
[19] A. No, whether we can - it has - now we are
[20] talking about the chemistry, can you have a gasoline
[21] that works in our cars today without lead.
[22] Q. Okay.

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[1] A. That was the question.
[2] Q. All right.
[3] A. Then the next question, if they say yes, what
[4] would happen if you did that?
[5] Q. Did any of your work on the lead in gasoline
[6] project involve looking at the health effects of other
[7] exposures to lead?
[8] A. All these questions are not simple yes or no
[9] answers.
[10] Q. Okay. Well, that is not really, I mean, what
[11] I am asking about is the scope of what you looked at in
[12] terms of lead exposure, in other words, I am saying
[13] is -
[14] A. That is a different question, when you talk
[15] about the scope.
[16] Q. Okay. In terms of learning about the health
[17] effects or the amount of lead that would be -
[18] A. Big difference.
[19] Q. Okay.
[20] A. Between health effects and amount of lead.
[21] Q. Were you looking at the health effects of lead
[22] exposure, or were you looking at the effect on the

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[1] limits within the body?
[2] A. It comes back almost to the same question we
[3] had on phenol.
[4] Q. Okay.
[5] A. The difference between those who have some
[6] level and some other level, we did a study of, went
[7] along the highways with cars running back and forth and
[8] their exhaust, and we analyzed the amount of lead in
[9] those people who lived adjacent to the roadway and all
[10] the way back as far as we could go and then we did
[11] enough of it so we were convinced of the magnitude of

[12] the difference. That is not, health is nothing, just
 [13] talking about how much there is.
 [14] Q. So you were solely looking at the amount -
 [15] A. In that study.
 [16] Q. In that study.
 [17] A. Yes.
 [18] Q. Did you do other work with respect to exposure
 [19] or the amount of lead in the body in other projects
 [20] that you worked on?
 [21] A. If you go around the world, we did. We got
 [22] lead from the Aborigines in Australia, the Incas, South

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[1] America, the amount of lead in Italy, because they get
 [2] so much lead from their wine.
 [3] And then we would do studies. We have people
 [4] inside of a little chamber and we have them breathing
 [5] increasing amounts, how much would it have to increase
 [6] before we could tell whether it was increased or not.
 [7] Q. You studied, you read about these various
 [8] studies?
 [9] A. We studied them.
 [10] Q. You actually took part in -
 [11] A. We got blood samples.
 [12] Q. Was that part of your work at Ethyl?
 [13] A. Yes.
 [14] Q. Okay.
 [15] A. See, that is all part of the environmental
 [16] business and what are you trying to prove when you do
 [17] it.
 [18] Q. The thing that I am not understanding is was
 [19] your work, was one of the consequences of your work
 [20] some kind of determination of this as an acceptable
 [21] amount of lead to have in the body?
 [22] A. Well, it depends who, I don't make that

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[1] decision, Monsanto doesn't - I mean Ethyl didn't make
 [2] that decision.
 [3] Q. Okay.
 [4] A. Dupont didn't make that decision.
 [5] Q. Would there be someone who would make that
 [6] decision or some entity?
 [7] A. The government.
 [8] Q. So you were going by government limits?
 [9] A. No, no, they were going to establish. If we
 [10] can get to the place where we can say they can get the
 [11] lead down then EPA can say we are going to lower it
 [12] down to that. Or they can say that is not Lowe enough,
 [13] and so they went down until they got lead out of
 [14] gasoline.
 [15] Q. All right.
 [16] A. And my testimony, practical. I said you can't
 [17] take lead out of gasoline in national forums. I said
 [18] if you do, you are going to have to put something in
 [19] its place. No, they said.
 [20] Have you gone, have you gotten gas at a
 [21] filling station?
 [22] Q. Yes.

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[1] A. Yourself?
 [2] Q. Yes.
 [3] A. Have you ever looked at the little tag that is
 [4] on that pump?
 [5] Q. Yes.
 [6] A. What does it say?
 [7] Q. The little octane number?
 [8] A. No, no.
 [9] Q. Unleaded.
 [10] A. What?
 [11] Q. What, the fact that it's unleaded gasoline?
 [12] A. Yes, but that is, it says that if you take
 [13] lead out of gasoline it now makes this gasoline a
 [14] carcinogen.
 [15] Q. Okay.
 [16] A. Talk about big issue as a public issue.
 [17] Nobody even talks about it. Talk about cancer and
 [18] things, but when they want to do something else they

[19] will accept the cancer issue.
 [20] Q. All right.
 [21] A. But it says don't breathe this gasoline
 [22] because it produces cancer in animals.

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[1] Q. Okay.
 [2] A. You can see how complicated this is, we can
 [3] talk about lead the rest of the day.
 [4] Q. So to some extent you were looking at the
 [5] health effects of lead in that you were looking at how
 [6] people were affected by breathing a certain amount?
 [7] A. We didn't have any problem with effects.
 [8] Q. Okay.
 [9] A. There were no effects.
 [10] Q. What I don't understand is what was the goal
 [11] of all this research?
 [12] A. We were, my goal was to be able to tell the
 [13] world whether that lead in gasoline was going to
 [14] produce a measurable effect on people.
 [15] Q. Okay.
 [16] A. Now the decision, once we get there and say
 [17] there is a difference, somebody says what are we going
 [18] to do with this now that we know it?
 [19] Q. You said was lead in gasoline going to produce
 [20] a measurable effect on people, right?
 [21] A. Yes.
 [22] Q. Did you find that lead in gasoline did produce

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[1] a measurable effect on people?
 [2] A. Would you call cancer a measurable effect?
 [3] Q. Yes.
 [4] A. It's put on the stamp on that pump, and you
 [5] don't pay any attention to it.
 [6] Q. You are not talking about lead then, you are
 [7] talking about what was substitute for lead, is that
 [8] right?
 [9] A. Right, but that is an issue. In other terms
 [10] if I say I am going - how low is the lead in gasoline,
 [11] the levels in people are lower than they were back
 [12] then, but the question is why are they lower? That is
 [13] where I come back in again, this is an environmental
 [14] problem, what is the source of the lead?
 [15] Q. Right. So your study of the effect on humans
 [16] was more on the reduction of lead than the existence of
 [17] lead, is that correct?
 [18] A. Or else of those people who are living where
 [19] they have exposure to lead are they being adversely
 [20] affected.
 [21] Q. I understand.
 [22] A. Everything I talk about is dose related.

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[1] Q. When you say dose related, you mean above TLV?
 [2] A. No, we haven't said there is, there is no TLV
 [3] when we talk about the lead levels now.
 [4] Q. All right.
 [5] A. But there are in occupation, but it's higher
 [6] than that level. And the changing issue of what, on
 [7] the lowering lead, there was a fellow in Cincinnati who
 [8] did lead in the teeth, the deciduous teeth of newborns,
 [9] and they said that the levels were higher in some than
 [10] in others. And those who had some, that affected the
 [11] IQ of the kids.
 [12] Q. Did any of your work as medical director at
 [13] Monsanto involve lead, in other words did you continue
 [14] to use any of your expertise about lead in any projects
 [15] when you became medical director?
 [16] A. Practically, no.
 [17] Q. No?
 [18] A. No.
 [19] Q. At the Texas City plant there was an ethylene
 [20] process, correct?
 [21] A. Ethylene?
 [22] Q. Ethylene.

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[1] A. Yes.
 [2] Q. I believe a by-product of that was something

[3] called lead pot tars. Do you know what those are?
 [4] A. No.
 [5] Q. You don't?
 [6] A. No.
 [7] Q. Ethylene. And so there was an Ethylene
 [8] Department at Texas City?
 [9] A. I think so.
 [10] Q. Do you know what lead pot oil is?
 [11] A. No.
 [12] Q. No, okay.
 [13] A. No, there is a, we are getting off into
 [14] chemistry.
 [15] Q. Right. I am more asking -
 [16] A. So I am -
 [17] Q. I just want to know whether your expertise in
 [18] lead caused you to have any exposure in lead pot oils
 [19] in terms of just knowing about it or in working with
 [20] them.
 [21] A. The question about chemicals that are found, I
 [22] think that the anti-knock compounds that have replaced

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[1] lead are something that are made from ethylene so they
 [2] are involved to a degree.
 [3] But I am saying I think, when I say "I think,"
 [4] because that is chemistry.
 [5] Q. All right. Do you recall in 1964 that you
 [6] wrote an article for the Annual Review of Pharmacology
 [7] with Dr. Kehoe on Inorganic Toxicology?
 [8] A. Yes.
 [9] Q. Do you recall what the article was about?
 [10] A. A review of metals.
 [11] Q. All right.
 [12] A. And the toxicology of metals.
 [13] Q. Would it be fair to say that you were
 [14] summarizing findings of recent studies?
 [15] A. What had been written. That is what a review
 [16] article is, is summarizing what has been written.
 [17] Q. Did you, if you recall, do any research
 [18] personally or were you purely doing this review from
 [19] literature?
 [20] A. From library review.
 [21] Q. Who is Dr. Kehoe?
 [22] A. He was the director of the Kettering

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[1] Laboratory and he was a man almost single-handedly that
 [2] permitted lead in gasoline to be marketed.
 [3] Q. All right.
 [4] A. They couldn't make it, and this was in Dayton,
 [5] they couldn't get control of the tetraethyl lead, so
 [6] that people weren't getting sick from it. And so he
 [7] set up a facility at the Kettering Laboratory so he
 [8] could advise the industry and the world, because we
 [9] wouldn't have had cars if it hadn't have been for
 [10] Kehoe, because they said that we can't have tetraethyl
 [11] lead.
 [12] He just died at 99 in the last month.
 [13] Q. Are you saying that he found a substitute for
 [14] tetraethyl lead?
 [15] A. No, no, no.
 [16] Q. No?
 [17] A. He found how to use tetraethyl lead in cars so
 [18] they could go on having that lead anti-knock.
 [19] Q. Oh, okay. Do you recall your article you
 [20] wrote with Dr. Kehoe contained some information about
 [21] the toxicology of lead?
 [22] A. I am sure there is.

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[1] Q. Okay.
 [2] A. But Dr. Kehoe would have done it.
 [3] Q. Dr. Kehoe would have done it, it wouldn't have
 [4] been you?
 [5] A. No, I wrote it, but he very carefully penciled
 [6] out what he didn't like about it.
 [7] Q. Let me just ask you, do you recall, based on
 [8] what you remember about writing the article and the
 [9] research you did for the article, was it known in 1964

[10] when you wrote the article that it was important to
 [11] avoid breathing lead?
 [12] MR. JONES: Objection, vague, competence.
 [13] A. Ask the question again.
 [14] BY MS. WALSH:
 [15] Q. Was it known in 1964 that it was important to
 [16] avoid breathing lead or lead compounds?
 [17] A. All the things we have said about lead here in
 [18] this room has been related to lead in air.
 [19] Q. So lead in air, I know we have been talking
 [20] about it, but we haven't talked about the idea of
 [21] whether it's something that was known that it should
 [22] have been avoided or not.

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[1] A. Well, the avoidance was not my subject.
 [2] Q. Right.
 [3] A. The question is, is what do you do and will
 [4] that lower the lead in air and will that lead in air
 [5] affect those who are breathing it?
 [6] Q. What is the answer to that?
 [7] A. It all depends.
 [8] Q. On the dose?
 [9] A. Depends on dose.
 [10] Q. Was it known in 1964 that it was important to
 [11] avoid breathing air that had any amount of lead in it?
 [12] MR. JONES: Same objection.
 [13] A. The man who works in a plant exposed to lead,
 [14] his blood lead, lead in his blood, we call it his blood
 [15] lead, goes up. The man who, or the family who lives
 [16] along the highway, the quarrel is does he have more?
 [17] And my answer is intuitively, without having done the
 [18] studies, is yes.
 [19] I believe in conservation of energy and, so it
 [20] does. And the question is, is it important how much it
 [21] does, because that is really what this is all about.
 [22] Those who wanted to get rid of it said it was

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[1] worthwhile.
 [2] BY MS. WALSH:
 [3] Q. Is lead something that stays in the blood? In
 [4] other words, is it possible for one's blood level to
 [5] decrease if you take away the exposure of lead?
 [6] A. If I may quote Dr. Kehoe?
 [7] Q. Sure.
 [8] A. He says it takes as long to get rid of it as
 [9] it took to get it. If you have been exposed for two,
 [10] three, five years, they take you out of the exposure
 [11] and it comes out in five years.
 [12] It's much like radioactive material, if you
 [13] are exposed to uranium and it gets put in bone the lead
 [14] apparently goes to the same place in bone as your
 [15] radioactive material.
 [16] Q. So in the case of chronic exposure it would
 [17] take some kind of time period for the blood levels to
 [18] decrease?
 [19] A. Yes. Now I still go back to are we talking
 [20] about a lot or a little bit you want to talk about,
 [21] because I said if you are exposed to more you are going
 [22] to get it.

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[1] Q. When you say you are going to get it, what
 [2] does that mean?
 [3] A. I can measure it if you are exposed long
 [4] enough.
 [5] Q. All right.
 [6] A. And if I have the right tool to measure it.
 [7] Q. Did you ever do any research or learn anything
 [8] about exposure to lead by ingesting it?
 [9] A. If we don't have lead in air you will still
 [10] have lead in your body.
 [11] Q. How will that get there?
 [12] A. From your food.
 [13] Q. All right.
 [14] A. Or from the cans in which it was stored or
 [15] what we do in making things that's got some lead in it.
 [16] Q. In the mid '60s timeframe do you know whether

[17] there were efforts being made to determine what the
 [18] acceptable amount of lead in air or lead in food or
 [19] containers was?
 [20] A. That is what we were working on long before
 [21] that.
 [22] Q. When you say we were working on -

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[1] A. What is a safe level of exposure to lead.
 [2] Q. Was that something that the government
 [3] mandated at that time?
 [4] A. There was a discussion.
 [5] Q. But there were not firm government rules?
 [6] A. Not until they took lead out of gasoline.
 [7] Q. Would it be acceptable to have lead in
 [8] drinking water?
 [9] MR. JONES: Objection, vague.
 [10] A. What do you mean by objectionable?
 [11] BY MS. WALSH:
 [12] Q. Acceptable. I said would it be acceptable to
 [13] have lead in drinking water?
 [14] A. We have had lead in our drinking water
 [15] practically always.
 [16] Q. So some level is acceptable?
 [17] A. The question is in whose eyes, if it's so low
 [18] we can hardly measure it. And the last time they were
 [19] saying if you, we don't want you to have an exposure to
 [20] lead anymore.
 [21] They will say open the faucet and let it run
 [22] for a little bit, then take your sample, because there

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[1] is lead in the pipes.
 [2] Q. Okay.
 [3] A. And you say is that bad? We have been doing
 [4] it for almost as long as we have had pipes.
 [5] Q. During your time as a medical director at
 [6] Monsanto you were responsible for the whole Monsanto
 [7] Company?
 [8] A. Ask that again, was I what?
 [9] Q. Your position was company-wide, correct, you
 [10] were medical director for the whole company?
 [11] A. Yes.
 [12] Q. You have talked a little bit about how you and
 [13] Dr. Kelly when you were associate directors split up
 [14] the plants. But as medical director did you have
 [15] specific plants that you were responsible for?
 [16] A. When I was medical director I was responsible
 [17] for all the plants.
 [18] Q. In terms of specific work on individual
 [19] plants, though, did you have special responsibility for
 [20] any particular plants?
 [21] A. I had other physicians working for me.
 [22] Q. And the people who reported to you would have

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[1] that specific responsibility?
 [2] I am sorry, is that a yes?
 [3] A. Yes.
 [4] Q. Who did you report to as medical director?
 [5] A. I reported to a number of people.
 [6] Q. Who were they?
 [7] A. One was Mr. Throdahl.
 [8] Q. What was his position?
 [9] A. Vice president.
 [10] Q. Vice president of the whole Monsanto Company?
 [11] A. No. Well, vice president of research.
 [12] Q. All right.
 [13] A. And vice president in charge of the health
 [14] issue.
 [15] Q. Was Mr. Throdahl a doctor?
 [16] A. No.
 [17] Q. Obviously not. Was he your direct boss?
 [18] A. Yes.
 [19] Q. Did you report to anyone else besides Mr.
 [20] Throdahl?
 [21] A. After he retired.
 [22] Q. Who was that after he retired?

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[1] A. Mr. Senger.
 [2] Q. Did you continue to work with Mr. Garrett when
 [3] you became medical director?
 [4] A. Yes.
 [5] Q. Did you continue to work with Mr. Wheeler?
 [6] A. Mr. Wheeler retired very shortly after I came
 [7] aboard.
 [8] Q. Did someone replace Mr. Wheeler?
 [9] A. That is the reason he retired partially,
 [10] because Garrett took his place.
 [11] Q. And did you continue to work with Mr.
 [12] Levinskas?
 [13] A. Yes.
 [14] Q. Anyone else you worked closely with during
 [15] your time as medical director?
 [16] A. Dr. Gaffey.
 [17] Q. Who is that?
 [18] A. Pardon?
 [19] Q. What did Dr. Gaffey do?
 [20] A. He is an epidemiologist.
 [21] Q. When you were medical director at Monsanto was
 [22] the department organized the same way during all, let's

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[1] see, you were in that position for 15 years.
 [2] A. Yes.
 [3] Q. Was the department organized the same way all
 [4] 15 years?
 [5] A. We built a toxicology laboratory shortly after
 [6] I became medical director.
 [7] Q. So that was a new component of the Medical
 [8] Department?
 [9] A. Yes.
 [10] Q. Where was the toxicology lab?
 [11] A. It was separated from the rest of the company,
 [12] and it was within two or three blocks of the medical
 [13] school.
 [14] Q. All right.
 [15] A. Washington University Medical School.
 [16] Q. Why did you build it?
 [17] A. So we could understand more about the
 [18] toxicology of chemicals.
 [19] Q. How did Monsanto study toxicology prior to
 [20] building the toxicology lab?
 [21] A. That is before me.
 [22] Q. All right, well -

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[1] A. I started working towards that laboratory
 [2] about the time I became medical director.
 [3] Q. How about in the interim while you were still
 [4] at Monsanto but before the lab was built, how did they
 [5] study toxicology?
 [6] A. Before I came.
 [7] Q. The toxicology lab took some time to build, is
 [8] that correct?
 [9] A. Yes.
 [10] Q. So there were years there when you were
 [11] operating as either assistant or medical director?
 [12] A. Yes.
 [13] Q. Before the lab was built?
 [14] A. Yes.
 [15] Q. So how did Monsanto study toxicology before
 [16] that, was it simply a smaller part of the Medical
 [17] Department, or were you farming out your toxicology
 [18] studies, or how was that working?
 [19] A. When we, before we had the laboratory built we
 [20] used contract laboratories, like everyone else.
 [21] Q. And when you say like everyone else, like
 [22] other chemical companies?

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[1] A. All chemical companies that had need for that
 [2] kind of information.
 [3] Q. Was Monsanto the first to have its own
 [4] toxicology lab?
 [5] A. No.
 [6] Q. So part of the Medical Department that was new
 [7] when you came in was the toxicology lab?

[8] A. Was after I was there.
 [9] Q. Right. Was industrial hygiene a part of the
 [10] Medical Department?
 [11] A. That was Garrett.
 [12] Q. That was Mr. Garrett's, he headed up the
 [13] industrial hygiene section?
 [14] A. And his team.
 [15] Q. All right.
 [16] A. He had industrial hygienists working for him.
 [17] Q. Would it be correct to call it the industrial
 [18] hygiene section?
 [19] A. Yes.
 [20] Q. So the toxicology lab was the toxicology
 [21] section?
 [22] A. Yes.

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[1] Q. What other sections were there in the Medical
 [2] Department?
 [3] A. This Gaffey that I -
 [4] Q. All right.
 [5] A. And he is an epidemiologist.
 [6] Q. Any other sections of the Medical Department?
 [7] A. We had another unit, we were talking about the
 [8] examinations that we did every year?
 [9] Q. Yes.
 [10] A. They sent those back to us and we had a group
 [11] whose responsibility was to organize those medical
 [12] reports.
 [13] Q. When you say organize did Medical Department
 [14] personnel interpret the results of the annual
 [15] physicals?
 [16] A. No.
 [17] Q. Who did that?
 [18] A. The ones who did the examinations.
 [19] Q. So the plant physicians?
 [20] A. Yes.
 [21] Q. How did you in the Medical Department interact
 [22] with the plant physicians? In other words what was the

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[1] working relationship?
 [2] A. Very good.
 [3] Q. Did St. Louis Medical Department dictate what
 [4] the plant physicians did?
 [5] A. Infrequently, but yes.
 [6] Q. So would it be fair to say St. Louis would
 [7] determine what the policy was and pass it on to the
 [8] plants?
 [9] A. Yes.
 [10] Q. Did all the major plants, let's say the 15
 [11] biggest, have a plant physician?
 [12] A. There were five or six that had a full-time
 [13] physician.
 [14] Q. All right.
 [15] A. There were probably five, seven that had
 [16] somebody come in.
 [17] Q. Okay.
 [18] A. And the rest of them, we sent them out for the
 [19] examinations.
 [20] Q. Did the Texas City plant have a physician?
 [21] A. Yes. Yes.
 [22] Q. Do you recall who it was?

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[1] A. No.
 [2] Q. How big was the Medical Department?
 [3] A. Depends on when you ask the question.
 [4] Q. How about in the '70s?
 [5] A. A hundred.
 [6] Q. Was there some kind of reorganization that
 [7] made the size change?
 [8] A. Yes.
 [9] Q. How did that work?
 [10] A. Toxicology was taken, or the laboratory was
 [11] taken out of my responsibility.
 [12] Q. So you built it and they took it away?
 [13] A. That's not unusual.
 [14] Q. When did the toxicology lab move out of your

[15] area of responsibility, just generally, if you
 [16] remember?
 [17] A. About five to seven years before I retired.
 [18] Q. We have talked about, you have known Mr.
 [19] Garrett, and for a short time Mr. Wheeler, Dr.
 [20] Levinskas, Dr. Gaffey.
 [21] Was it a small number of people including
 [22] these people that reported directly to you as medical

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[1] director?
 [2] A. That reported directly to me?
 [3] Q. Yes.
 [4] A. Yes.
 [5] Q. Anyone else that you have left out that
 [6] reported directly to you as medical director?
 [7] A. The physician responsible for the occupational
 [8] medicine.
 [9] Q. Who would that be?
 [10] A. Dr. Coleman. C-o-l-e-m-a-n.
 [11] Q. So there was the toxicology section for some
 [12] time, the industrial hygiene section, an epidemiology
 [13] section, an occupational medicine section and the
 [14] section that dealt with organizing the annual physical
 [15] exams, is that right?
 [16] A. There was no one responsible for organizing,
 [17] there was a group of them.
 [18] Q. Would that be all the sections of the Medical
 [19] Department as you remember it?
 [20] A. I think so.
 [21] Q. Did the Medical Department during your time as
 [22] the medical director do any work with regulatory

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[1] agencies?
 [2] A. I am not sure what you mean by do work with
 [3] them.
 [4] Q. Did Medical Department personnel ever have to
 [5] interact with regulatory agency personnel?
 [6] A. Most often it was by our intent, not theirs.
 [7] Q. What do you mean by that?
 [8] A. Well, we wanted to go and talk to them about
 [9] something.
 [10] Q. Which agencies would the Medical Department
 [11] have an interest in talking to?
 [12] A. Those that could give us advice on how they
 [13] were going to handle a certain subject.
 [14] Q. All right.
 [15] A. We would want to be consistent with what they
 [16] were or understand where they were going.
 [17] Q. Would the Medical Department then be
 [18] concentrating on the agencies that set exposure limits?
 [19] MS. WALSH: Let me rephrase.
 [20] BY MS. WALSH:
 [21] Q. Would the Medical Department be concerned
 [22] primarily with regulations that were put forth by

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[1] agencies that set exposure limits?
 [2] A. That's one kind.
 [3] Q. Can you think of any other kind?
 [4] A. How their - has anything to do with health.
 [5] How to measure the materials to which they are exposed.
 [6] Q. All right.
 [7] A. When they measured it did they know the
 [8] effect? If there was a question about one of our
 [9] plants, we would go to talk to them, what we were going
 [10] to do. Anything having to do with health.
 [11] Q. All right.
 [12] A. They were supposed to be the health leaders.
 [13] Q. Do you recall during your time as medical
 [14] director whether you or anyone in your department
 [15] worked with or sought information from EPA?
 [16] A. I don't recall.
 [17] Q. You don't recall either way?
 [18] A. That doesn't mean there couldn't have been
 [19] because there is lots of people looking.
 [20] Q. Would the Medical Department or could the
 [21] Medical Department have had occasion to need

(22) information from state environmental regulatory

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- [1] agencies?
 [2] MR. JONES: Objection, speculation.
 [3] BY MS. WALSH:
 [4] Q. If you know.
 [5] A. Information on what?
 [6] Q. Anything relating to health.
 [7] A. That's a very broad subject.
 [8] Q. I am just asking if you recall any instances
 [9] where in seeking information relating to health the
 [10] Medical Department had to interact or get information
 [11] from environmental regulatory agencies.
 [12] A. And state.
 [13] Q. And state.
 [14] A. Our effluents that go into the river, someone
 [15] has to talk to somebody about it. There's a standard.
 [16] The government, the state sets how much you can put
 [17] out. So we had to get permit.
 [18] But we didn't do that, that is not
 [19] occupational medicine's problem.
 [20] Q. So in terms of, would there have been anything
 [21] with respect to effluent permits that the Medical
 [22] Department would have been involved with?

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- [1] A. No.
 [2] Q. No, okay. Would it have been environmental
 [3] affairs or environmental control that would be the
 [4] parts of the company that would have interaction with
 [5] EPA and -
 [6] A. That wasn't my assignment.
 [7] Q. You don't know?
 [8] A. No.
 [9] Q. Did you personally ever have to work with or
 [10] get information from EPA or any state environmental
 [11] regulatory agencies?
 [12] A. We have to talk about what kind of questions
 [13] or what kind of things we talked about. Did I talk to
 [14] them?
 [15] Q. Yes.
 [16] A. Did I talk to them to tell them what's going
 [17] on?
 [18] Q. Yes.
 [19] A. Is that the kind of question, that is not -
 [20] Q. I am just asking about any contact that you
 [21] had in the Medical Department had with environmental
 [22] regulatory agencies, was that part of what you did in

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- [1] the Medical Department.
 [2] A. Are you talking about OSHA or NIOSH, or are
 [3] you talking about EPA?
 [4] Q. I am talking about EPA, because it seems to me
 [5] that OSHA or NIOSH would deal with health from the
 [6] standpoint of exposure limits, correct?
 [7] A. OSHA would talk to us about that.
 [8] Q. All right.
 [9] A. Air pollution.
 [10] Q. See, I think this is sounding more complex
 [11] than it is. I am just asking if there was anything
 [12] that was within the Medical Department's duties that
 [13] made it so that they had to work with or seek
 [14] information from EPA or the state equivalent of EPA.
 [15] A. I don't know.
 [16] Q. You don't recall?
 [17] A. That doesn't mean that someone from our
 [18] department wasn't asked by someone to do it.
 [19] Q. Okay. Do you recall whether you personally
 [20] ever had to interact with EPA or state environmental
 [21] regulators?
 [22] A. Yes. We talked about some chemicals.

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- [1] Q. Do you recall the specifics of those contacts?
 [2] You said you talked about some chemicals.
 [3] A. It was more seeking information, more than
 [4] anything else.
 [5] Q. Do you recall what kind of information you

- [6] were trying to get?
 [7] A. Whether they were concerned about chemicals.
 [8] Q. The regulators were?
 [9] A. Yes.
 [10] Q. But you were seeking information from them?
 [11] A. Whether they were talking about the same
 [12] chemicals.
 [13] Q. So were you saying are you concerned about
 [14] this chemical that Monsanto makes?
 [15] A. Yes. But they already knew about it.
 [16] Q. Can you recall -
 [17] A. It's sort of, it's a give and take as you go
 [18] down in improving knowledge.
 [19] Q. Do you recall any specific chemicals, are you
 [20] thinking of any specific chemicals in your answers?
 [21] A. No.
 [22] Q. No?

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- [1] A. Yes, I suppose a recent one is dioxin.
 [2] Q. All right.
 [3] A. Because that is a big issue, is what should we
 [4] do about it?
 [5] Q. So let me make sure I understand this. The
 [6] idea would be that you would know there is some concern
 [7] with the regulators about dioxin, so you would go to
 [8] them and ask what the concerns were so you could
 [9] address them, is that right?
 [10] A. No, it would be very - it would be, a lot of
 [11] the questions is, you build up to see where they are.
 [12] If they aren't very far along there is no sense
 [13] spending a great deal of time talking to them.
 [14] Q. All right.
 [15] A. On dioxin the perfect example is, you don't
 [16] remember, but we had Times Beach, and EPA became
 [17] involved. Times Beach wasn't Monsanto.
 [18] And I went and talked about Times Beach and I
 [19] talked about dioxin because it was important to us, not
 [20] Times Beach that they were concerned about.
 [21] So the answer yes, it wasn't us, we were
 [22] talking about Times Beach. But it was a government

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- [1] issue.
 [2] So I went and talked to them, said what are
 [3] you going to do about it? They said, well, we are
 [4] going to clean it up.
 [5] Went back to see them two or three years
 [6] later. They said if we knew then what we know now, we
 [7] wouldn't have done anything. See, it's not yes or no
 [8] or how or maybe, it has all kinds of things, things
 [9] that makes an answer.
 [10] But, you see, if you go back and talk about
 [11] dioxin, what they were trying to do, a lot depends on
 [12] what the state of their knowledge is. Whatever you do,
 [13] whether it's lead in gasoline or whatever, or benzene.
 [14] Q. How was finding out what the government was
 [15] going to do about cleaning up dioxin relevant to what
 [16] you were doing in the Medical Department?
 [17] A. We were concerned if we had a dioxin problem
 [18] as well.
 [19] Q. When you say dioxin problem, what do you mean
 [20] by that?
 [21] A. We had dioxin in our plants.
 [22] Q. You were manufacturing it?

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- [1] A. No, that is a by-product.
 [2] Q. Yes, sorry. It was a result of your
 [3] manufacturing process?
 [4] A. Yes.
 [5] Q. Would the Medical Department have any
 [6] involvement besides a concern about worker exposure?
 [7] A. Well, we have concern about the health of our
 [8] employees.
 [9] Q. So the Medical Department's concern would be
 [10] the health effects, is that right, would that be fair
 [11] to say?
 [12] A. Yes.

[13] Q. But would the Medical Department have any
[14] involvement if there was a dioxin cleanup that Monsanto
[15] had to undertake?
[16] A. Of course,
[17] Q. What would the involvement be?
[18] A. The workers that would clean it up that they
[19] don't get exposed to the dioxin, like they don't get
[20] exposed to the lead or to the things we have been
[21] talking about.
[22] Q. So basically the Medical Department was

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[1] involved in any area where workers would be working
[2] with chemicals?
[3] A. Right on.
[4] Q. All right.
[5] A. And the other one is, mere presence is not a
[6] basis for studying it.
[7] Q. What do you mean by that?
[8] A. We are back to lead. If I have got that much
[9] I don't have to worry about it, or if I have got
[10] benzene that much and this is how much it takes to
[11] cause them to get sick, I want to prove that that level
[12] is low and I don't have to worry about it.
[13] (Indicating.)
[14] Q. Let me just make sure I understand, because I
[15] think I do understand the scope of the Medical
[16] Department's involvement better at this point. If you
[17] had an environmental cleanup that Monsanto had to
[18] undertake, the Medical Department would be involved
[19] because workers' health would be at issue, is that
[20] right?
[21] A. Yes. That doesn't mean we have to do
[22] something.

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[1] Q. Right.
[2] A. We have to convince ourselves there is no
[3] problem.
[4] Q. You need to ascertain that there would not be
[5] a problem?
[6] A. That's right.
[7] Q. Would that be the sum total of the Medical
[8] Department's involvement in an environmental cleanup?
[9] A. We had dioxin cleanups.
[10] Q. All right.
[11] A. So we had workers involved in that.
[12] Q. But what I am saying is, is the concern about
[13] worker health and establishing that there are not
[14] health dangers the sum total of the Medical
[15] Department's role in an environmental cleanup?
[16] A. If we know something that the government
[17] doesn't know we tell them.
[18] Q. So you would also need to communicate with the
[19] government?
[20] A. Now most of it's related to health. But the
[21] EPA is interested in health, they are the ones that are
[22] writing the standards for lead in gasoline or whatever.

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[1] They are the ones who are interested in, were
[2] interested in PCB's.
[3] Q. Would the Medical Department need to be
[4] involved, let's talk about the dioxin example. Were
[5] there dioxin cleanups that you had to be involved with?
[6] A. Yes.
[7] Q. With respect to those dioxin cleanups did the
[8] Medical Department have input in deciding how to carry
[9] out the cleanup?
[10] A. No.
[11] Q. Would that be decided by the individual plant?
[12] A. Plant manager. You are out of my area.
[13] Q. All right.
[14] A. The responsibility there. But someplace in
[15] there the plant manager is much involved.
[16] Q. So in terms of using, if you were deciding
[17] between using incineration rather than soil removal,
[18] that wouldn't be the Medical Department's domain?
[19] A. We couldn't care less.

[20] Q. All right.
[21] A. Because how it's - we were talking about the
[22] dose, we can, if we can get that from this down to

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[1] this, that is our goal.
[2] (Indicating.)
[3] Q. Just for the record, what you are saying is
[4] that reducing the dose of chemicals that a worker is
[5] exposed to would be the domain of the Medical
[6] Department?
[7] A. That's right, I have been saying that
[8] practically all morning.
[9] Q. Right.
[10] A. It's the same subject. Our goal is to protect
[11] the worker, and we protect the worker by some kind of
[12] respiratory device.
[13] Q. Okay.
[14] A. Or clothing or gloves to protect the workers.
[15] Q. Would the Medical Department ever need to be
[16] involved in determining how contamination occurred
[17] prior to a cleanup?
[18] A. Conceivably, but practically not.
[19] Q. When you say conceivably -
[20] A. It could. We could be involved saying we
[21] found something here and would, we have to do something
[22] about it.

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[1] Q. Sharing information?
[2] A. Yes.
[3] Q. With the plant as it made that determination?
[4] A. Yes.
[5] Q. When you were medical director did you ever
[6] work on any projects that involved chemical waste
[7] disposal?
[8] A. That doesn't mean the department wasn't.
[9] Q. You personally?
[10] A. Right. Our Garrett group.
[11] Q. Yes.
[12] A. That knew about that unit, and we saw no
[13] health problem there. But in cleaning it up Garrett
[14] might help to straighten it out.
[15] Q. All right.
[16] A. Get it in the right place. Garrett would
[17] help, say, this is what we have got to clean up, not
[18] that.
[19] Q. When you say Garrett's group, you said he was
[20] the industrial hygiene section?
[21] A. Yes.
[22] Q. Right?

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[1] A. Yes.
[2] Q. Would it be fair to say that in terms of
[3] pollution issues that Mr. Garrett was the one with the
[4] expertise in the Medical Department?
[5] A. See, we are talking about questions that I
[6] really haven't been involved with. All I am saying is
[7] that he knew enough about it and how to monitor and
[8] things that would help the plant.
[9] Q. All right.
[10] A. So we were involved in how much contamination
[11] and where was it, so that Garrett and his group would
[12] be involved.
[13] Q. Tell me again specifically how they would be
[14] involved.
[15] A. They would know what to do, I mean how much
[16] there was.
[17] Q. How much contaminant there was, yes?
[18] I am sorry, is that a yes?
[19] A. Yes.
[20] Q. But if -
[21] A. We are out of my direct responsibility, and I
[22] am saying they would participate where it would be

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[1] helpful to Monsanto.
[2] Q. But still within the same role as you have
[3] described for the Medical Department, right?

[4] A. Practically, yes.
 [5] Q. When you say Garrett's team, are you talking
 [6] about a team of industrial hygienists?
 [7] A. Yes.
 [8] Q. What do industrial hygienists study?
 [9] A. The industrial hygienist is the man who goes
 [10] out and monitors and says that the benzene is below one
 [11] part per million, we don't have to worry about it.
 [12] Q. All right.
 [13] A. Or else he says they have got to do something.
 [14] And his goal is make them put on respiratory gadgets or
 [15] something to protect them until we get that benzene
 [16] under control.
 [17] Q. So worker exposure levels are the concern of
 [18] an industrial hygienist?
 [19] A. It's just as much the responsibility, concern
 [20] of the occupational physician because, he is worried
 [21] about what that does to them. One is trying to find
 [22] how much, and the other is saying does it do something

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[1] to him.
 [2] Q. What I am trying to find out is, I understand
 [3] Mr. Garrett headed the industrial hygiene section, but
 [4] did he have additional expertise or job
 [5] responsibilities outside the area of industrial
 [6] hygiene?
 [7] A. Practically. I don't think so, but you are
 [8] asking could he ever, I don't know.
 [9] Q. How about when he reported to you?
 [10] A. It wasn't a major issue. It could have been
 [11] at some time, but I don't recall.
 [12] Q. When you say it wasn't a major issue I am not
 [13] sure -
 [14] A. It doesn't happen every day.
 [15] Q. All right.
 [16] A. It could have happened sometime in the 15
 [17] years I was there.
 [18] Q. So based on your recollection the vast
 [19] majority of what Mr. Garrett did was industrial
 [20] hygienist work?
 [21] A. Yes, but I don't want to say that I have
 [22] answered all the questions about Garrett's job.

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[1] Q. Right. But Garrett reported directly to you,
 [2] right?
 [3] A. Yes.
 [4] Q. So you had an idea of what his job scope was,
 [5] right?
 [6] A. Yes, but he also can talk to anybody he wants
 [7] to in the company who would call him and he would
 [8] answer the question what needs to be done.
 [9] Q. Oh, I -
 [10] A. Without communicating to me because that was
 [11] part of his job.
 [12] Q. Right, I understand that.
 [13] A. Yes.
 [14] Q. Would it be fair to say that Mr. Garrett had
 [15] more involvement in pollution matters than you did?
 [16] A. When I came to Monsanto, the big issue was
 [17] PCB's. And as I said, that was Elmer Wheeler's
 [18] responsibility. But when he retired, Garrett took over
 [19] and did his job for him, the same kind of breadth.
 [20] But practically we handled all the problems we
 [21] were talking about within the Medical Department. So
 [22] it could happen they could be outside.

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[1] We were involved in dioxin at Nitro, the
 [2] Medical Department was involved in that even though it
 [3] was purely an environmental problem, an environmental
 [4] contamination problem. So we were interested and we
 [5] followed it and we knew where it was.
 [6] Q. I am just trying to understand the difference
 [7] between substantive areas of expertise and
 [8] responsibility.
 [9] You occupied a very high position, I mean you
 [10] were the head of a large department, correct?

[11] A. Yes.
 [12] Q. So the people who reported directly to you had
 [13] different substantive areas of responsibility, right?
 [14] A. Yes.
 [15] Q. So if there was a pollution issue that touched
 [16] on the Medical Department, would Mr. Garrett be the
 [17] primary source of expertise?
 [18] A. But he might talk to Levinskas. As a
 [19] toxicologist he has got as much involvement or more
 [20] involvement as Garrett.
 [21] Q. As compared to you, would you have more
 [22] expertise or Mr. Garrett have more expertise

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[1] substantively in terms of pollution issues that
 [2] affected the Medical Department?
 [3] A. I could answer your question if you had left
 [4] out the Medical Department.
 [5] Q. Okay.
 [6] A. Medical Department, if you leave out the
 [7] Medical Department it would be Garrett representing
 [8] outside or talking to them because he knew it.
 [9] Q. All right.
 [10] A. The question is where is the expertise. If
 [11] they had been monitoring, if Garrett had been
 [12] monitoring and they - the rest of the company becomes
 [13] interested, involved, they come over here and learn how
 [14] he is doing that.
 [15] Q. Right. I am confused, though.
 [16] MS. WALSH: Can you read back my question.
 [17] (The reporter read as directed.)
 [18] BY MS. WALSH:
 [19] Q. Let me ask the question again. As between you
 [20] and Mr. Garrett, who had more substantive expertise on
 [21] pollution issues?
 [22] A. On health issues related to it or cleanup of

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[1] it or recognizing where it is and where the other
 [2] locations in which it can occur, which one of those
 [3] questions? Those are three different questions.
 [4] Q. All of those questions.
 [5] A. I have told you, they are getting pretty
 [6] complicated for me to say how it was done. Knowing how
 [7] to measure it and knowing the likelihood of that
 [8] contamination taking place, that would be Garrett.
 [9] Q. He would know more than you in that?
 [10] A. He would be involved in it more.
 [11] Q. All right.
 [12] A. But he may not know which one should be,
 [13] because I was sort of getting the overall in terms of
 [14] what the issues are.
 [15] Q. All right.
 [16] A. Now in terms of do we have to clean it up,
 [17] what does it mean? Garrett had been doing it without
 [18] saying we have got to clean up, but if Levinskas had
 [19] gotten involved, the question is does it have to be
 [20] cleaned up, could be involved.
 [21] Q. But as between you and Garrett, was my
 [22] question.

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[1] A. He would be much more involved in the plant
 [2] than me.
 [3] Q. He would have more knowledge about pollution
 [4] issues affecting the plants than you?
 [5] A. Yes.
 [6] Q. He was a section that reported to you,
 [7] correct?
 [8] A. Yes.
 [9] Q. All right.
 [10] A. A good example of how things get complicated
 [11] is Wheeler was responsible for PCB's, worldwide.
 [12] Q. Okay.
 [13] A. You can see, special, you can get special
 [14] assignments. But our goal is to try to keep these
 [15] things from being a hazard wherever they are.
 [16] Q. I understand. Let me ask you just a few more
 [17] questions and then we can go to lunch.

[18] During your time as medical director do you
[19] recall whether you worked on anything that involved
[20] pollution abatement or pollution reduction at the
[21] plants?

[22] A. Offhand, I would say no.

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[1] Q. All right.

[2] A. Not involved.

[3] Q. Okay.

[4] A. Practically not involved. But I could be
[5] asked all kinds of questions about the hazards related
[6] to that. Do we have to worry about that pollution?

[7] Q. So, again, the same Medical Department role
[8] comes up again. You would be asked about information
[9] that affected worker health?

[10] A. That's right.

[11] Q. Is that right?

[12] A. Yes.

[13] Q. During your time as medical director did you
[14] ever have any input on the corporate level to what
[15] environmental policy would be?

[16] A. We participated in writing statements about
[17] the toxicological aspects of a chemical.

[18] Q. All right.

[19] A. On new chemicals, on old chemicals or when new
[20] questions arise on new chemicals. No one else could do
[21] it, they couldn't write anything on toxicology, it was
[22] our job.

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[1] Q. What are those materials safety data sheets -
[2] (Discussion off the record.)

[3] THE WITNESS: She asked what kind of sheets we
[4] were talking about, what kind of method did we have for
[5] deciding how it should be handled and one way would be
[6] a safety data sheet.

[7] Q. So the information about chemicals you would
[8] provide could take other forms besides a material
[9] safety data sheet?

[10] A. That's right. It depends on the state of our
[11] knowledge and understanding that chemical.

[12] Q. Any other input into making corporate
[13] environmental policy that you can recall?

[14] A. Crazy things. Springfield, Massachusetts, the
[15] union there said that they were developing cancer.

[16] Q. Okay.

[17] A. Of course they are developing cancer. Twenty
[18] percent of all people die of cancer. And this was an
[19] environmental problem. I took the plant manager and we
[20] went down to see the people at NIOSH and I told him
[21] that couldn't possibly be. And he said do a study
[22] anyway.

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[1] So we hired an epidemiologist. And half of
[2] those people with cancer didn't even work, hadn't
[3] worked for Monsanto. That's the unions making the
[4] list.

[5] Q. Okay.

[6] A. And that's the continual interplay between
[7] what the plant says, what EPA says, what the health
[8] aspect says. And you can't do any of it without having
[9] all those things under control. If you do, you are
[10] going to miss it.

[11] Q. So would it be correct to say that a majority
[12] of the role of the Medical Department in making
[13] corporate environmental policy decisions was providing
[14] that crucial information about health effects of
[15] various chemicals?

[16] A. Well, we stumbled just like everybody else in
[17] getting there, because if the methodology isn't there,
[18] you have got to develop the methodology first in terms
[19] of whether you move to the next step. So we may ask
[20] the chemical company to supply the chemistry for what
[21] we were trying to do.

[22] Q. But in terms of what the Medical Department

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[1] was providing for corporate environmental policy, it

[2] would either be the information on various chemicals or
[3] obtaining the information on various chemicals, would
[4] that be fair?

[5] A. Say it again.

[6] Q. What I am saying is, I want to make sure I
[7] understand the role of the Medical Department in making
[8] corporate environmental policy. And what I understand
[9] you to be saying is were you either provided that
[10] absolutely crucial information about the health effects
[11] of chemicals or, if we didn't have the information to
[12] provide, we had to go get it?

[13] A. Yes, and it still could be we are talking
[14] about rat studies, that doesn't do it, and how do we
[15] know whether man does or not.

[16] Q. All of that is part of getting information
[17] about chemicals, isn't that right?

[18] A. Yes.

[19] Q. What I want to make sure is that there is not
[20] some other input that the medical department had into
[21] environmental policy that I am missing.

[22] A. The problem with PCB's was so big at Monsanto,

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[1] and that is a chemical problem, it's a plant problem,
[2] have to worry about the workers. Then they found out
[3] that it caused cancer in the rats, then what problem
[4] was it then? Then we had to do epidemiology studies to
[5] decide whether that chemical that caused the rat to
[6] have it doesn't do it in man.

[7] But, you know, it's all little bits of
[8] information that we sort of learn a little bit and we
[9] can't find enough to get an answer and we have to wait.
[10] We go out and what we do, we use different approaches,
[11] we put them in respirators or something to protect
[12] them.

[13] Q. So, again, the Medical Department was
[14] providing information or obtaining information or
[15] interpreting information, would that be fair to say?

[16] A. Yes. You see, that is so complicated in terms
[17] of who was involved, as I can be understating or
[18] overstating. I am giving you a practical way to look
[19] at it.

[20] But it's a big subject, especially if we are
[21] not agreeing on what the results should be. If NIOSH
[22] can't agree with me that the fact that there weren't

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[1] very many people who got cancer, that is a fact. Even
[2] told me, he says go ahead with the study anyway. So
[3] that becomes information that the workers know, too.
[4] Got to communicate that to them.

[5] MS. WALSH: Why don't we break for lunch here.

[6] (Whereupon, the deposition was recessed at
[7] 12:35 p.m., to resume at 1:35 p.m.)

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[1] AFTERNOON SESSION
[2] (1:35 p.m.)

[3] MS. WALSH: Let's go back on the record. We
[4] are back after lunch.

[5] BY MS. WALSH:

[6] Q. Dr. Roush, let me just ask you a few more
[7] general questions in terms of the scope of the medical
[8] director position in the Medical Department. As the

[9] medical director would it be fair to say that the
 [10] Medical Department was concerned with the toxicity of
 [11] chemicals used at the Monsanto plants?
 [12] A. Certainly that.
 [13] Q. All right.
 [14] A. But it also is in products that they sold.
 [15] Q. That is what I was going to ask. Does that
 [16] extend to feed stocks, intermediates and products?
 [17] A. Yes, if that isn't big enough somebody else
 [18] would have to tell me how to get bigger. But it's
 [19] broad.
 [20] Q. So all chemicals whether they are a finished
 [21] product or not?
 [22] A. Yes, but that doesn't mean they sold every

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[1] one.
 [2] Q. Right.
 [3] A. It depends on, we are back to the same place.
 [4] Q. Right.
 [5] A. Monsanto makes acrylic fiber.
 [6] Q. Yes.
 [7] A. Acrylic fiber goes in rugs. It goes into
 [8] sweaters. And they found that it causes cancer in
 [9] rats. The reason, I am not sure of the reason, it
 [10] doesn't, it doesn't to people. And what does it do?
 [11] It apparently doesn't get into man. And, if it does,
 [12] it's not in sufficient quantity to produce an effect.
 [13] But what I am trying to say is, the fact that
 [14] it does something, that doesn't in itself apply to
 [15] utility or whatever, broader than that maybe.
 [16] Q. Was it part of the Medical Department's role
 [17] to make sure the Monsanto workers were not exposed to
 [18] amounts of chemicals that would be dangerous to their
 [19] health?
 [20] A. Or somehow we limit their exposure. Let's
 [21] take back your benzene. You are doing something and
 [22] using benzene as one of the precursors, make it bigger.

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[1] So the people in this room would have exposure unless
 [2] we do something about it. That could be putting up big
 [3] ventilation so that the fumes are carried away, it
 [4] could be putting respirators on them so that they
 [5] aren't getting exposed. So all that becomes a part of
 [6] method of handling.
 [7] Q. All right.
 [8] A. Ideally, of course, would be to use another
 [9] substance. But most often we don't know enough how to
 [10] do that.
 [11] Q. In your view why was it important to have
 [12] toxicity information on the chemicals used at the
 [13] Monsanto plants?
 [14] A. Ask the question again.
 [15] Q. In your view why was it important to have
 [16] toxicity information on the chemicals used at the
 [17] Monsanto plants?
 [18] A. So that we could not have people being exposed
 [19] to something that would be toxic to them.
 [20] Q. So many of the chemicals used at the plants
 [21] would be considered toxic?
 [22] A. You have to go back and define toxic, we

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[1] haven't done that yet.
 [2] Q. Right.
 [3] A. Toxic can include getting on the skin and
 [4] burning it, that is a form of toxicity.
 [5] Q. I guess I would try to use a broad definition
 [6] of toxic, and without getting very technical I think
 [7] just for your understanding, what I mean when I say
 [8] toxic is generally a substance would be toxic if
 [9] exposure to a small amount over a long period of time
 [10] could have adverse health effects, chronic, or if
 [11] exposure to a larger amount over a more concentrated
 [12] period of time could also cause adverse health effects.
 [13] So I am trying to encompass acute and chronic toxicity
 [14] in kind of a general definition. That is what I mean
 [15] when I say it.

[16] A. Most chemicals that produce adverse effects
 [17] are acutely so. Most of them are acutely so. That can
 [18] either be that they breathe it in and get pneumonia, or
 [19] that they get it on their skin or that they ingest it.
 [20] That is acute.
 [21] Now chronic is almost not toxic. But over a
 [22] long period of time there is sufficient of it and it

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[1] accumulates so that it's sufficient to produce an
 [2] effect.
 [3] Q. And there were chemicals of both the types you
 [4] described in use at various Monsanto plants, right?
 [5] A. Yes, I think so. But you see we haven't tried
 [6] to say how serious that effect we are trying to look at
 [7] up until now.
 [8] Q. Right, I understand that and I don't think we
 [9] need to get into a discussion of dosage.
 [10] A. No, I am just trying to make it broad so that
 [11] one understands it. It's a very complicated matter to
 [12] make it work.
 [13] Q. I understand, yes.
 [14] Was it your belief that Monsanto kept up with
 [15] the state of the art in terms of toxicity on chemicals,
 [16] or of chemicals, I should say?
 [17] A. In terms of toxicity?
 [18] Q. Yes.
 [19] A. Levinskas was really - he is now developing a
 [20] laboratory right today in India, he is building a
 [21] toxicology laboratory for them, or putting one in
 [22] place. But so he is directing our toxicology, so he is

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[1] giving us the state of the art.
 [2] Our Biohazards Committee is trying to
 [3] second-guess so that we have that state of the art
 [4] stated beyond the state of the art. In other words
 [5] they are expressly to try to - to either, to establish
 [6] the fact that that was the definition or that it can be
 [7] broadened.
 [8] Q. The Biohazards Committee you said is made up
 [9] of people who don't work for Monsanto?
 [10] A. That's right.
 [11] Q. Is that right?
 [12] A. They are consultants.
 [13] Q. Is that kind of information sharing with
 [14] people outside the company something that is common in
 [15] your experience in the chemical industry?
 [16] A. Well, they are being compensated for what they
 [17] are doing.
 [18] Q. Right.
 [19] A. I can't answer that for other companies.
 [20] Q. So you don't have any knowledge about it?
 [21] A. No, because that is a little bit of this.
 [22] (Indicating.)

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[1] Q. Did you ever visit the Texas City plant?
 [2] A. Oh, yes.
 [3] Q. How many times?
 [4] A. Several times.
 [5] Q. All right.
 [6] A. I can't say how many.
 [7] Q. Let's see if we can get a little more general
 [8] number than several. Was it more than ten?
 [9] A. About ten maybe.
 [10] Q. About ten?
 [11] A. Yes.
 [12] Q. We will say about ten.
 [13] When did you visit, do you recall over what
 [14] time period?
 [15] A. Early, early in my time of being at Monsanto.
 [16] Q. Okay, so -
 [17] A. I put my time where I thought the problems
 [18] were. Acrylonitrile is a perfect example. What you do
 [19] after you have been making this, our world business is
 [20] making acrylic fiber, and then you suddenly find out
 [21] that you have got a chemical you have been using that
 [22] is a carcinogen.

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- [1] Q. Would you consider that, well, let me rephrase
 [2] it.
 [3] You said you would go to where you considered
 [4] there would be problems, is that right?
 [5] A. Yes.
 [6] Q. Did you consider acrylonitrile a problem?
 [7] A. I didn't know it wasn't going to cause -- our
 [8] people working with it in Decatur weren't getting
 [9] cancer.
 [10] Q. Did you consider acrylonitrile a problem at
 [11] Texas City, though?
 [12] A. Not the same way, because the exposure there
 [13] was to the product, as opposed to being a component of
 [14] acrylonitrile.
 [15] (The reporter read as directed.)
 [16] THE WITNESS: But that was where Gaffey came
 [17] in.
 [18] BY MS. WALSH:
 [19] Q. That was his issue?
 [20] A. Responsibility, yes.
 [21] Q. Do you recall the purpose of your visits to
 [22] the Texas City plant?

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- [1] A. I didn't have a problem that I was looking at,
 [2] mine was more overview.
 [3] Q. So would you routinely visit just to keep up
 [4] on what was going on?
 [5] A. No, another physician was assigned to do that.
 [6] Q. So why were you going, specifically?
 [7] A. Making sure I -- my goal was to try to
 [8] understand.
 [9] Q. Try to understand the chemicals that were
 [10] being used there?
 [11] A. Yes.
 [12] Q. What kind of things did you do when you went
 [13] to the Texas City plant?
 [14] A. Walked through the plant and talk about
 [15] various parts of it. What is this and why is that and
 [16] can you get that down.
 [17] Q. You were looking at the plant with an eye
 [18] toward things that would affect worker health?
 [19] A. Yes.
 [20] Q. You said you were touring the plants. Were
 [21] you actually doing a formal inspection of the --
 [22] A. No.

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- [1] Q. Of the Texas City plant, no?
 [2] A. A walk-through.
 [3] Q. A walk-through.
 [4] A. Just to see it, let them talk to.
 [5] Q. Did you have a working knowledge of the
 [6] chemicals used at the Texas City plant?
 [7] A. Not really. I knew what the, the chemicals
 [8] that were there, but I didn't know how it got there or
 [9] what it was. You can't be a mathematician and do that
 [10] well.
 [11] Q. I guess my question isn't that complex. I am
 [12] more asking did you have a familiarity with what
 [13] chemicals were involved in the processes at Texas City?
 [14] A. Sort of.
 [15] Q. Sort of?
 [16] A. But not well.
 [17] Q. So you --
 [18] A. That is true of most plants.
 [19] Q. So it would be, an overview knowledge would be
 [20] a good way to characterize it?
 [21] A. Yes, but that may not have been as much as it
 [22] should. You know, every time you do it you make it a

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- [1] little bit better.
 [2] Q. Okay.
 [3] A. You hope.
 [4] Q. Were you familiar with the products of the
 [5] Texas City plant?
 [6] A. I don't recall them.

- [7] Q. Did you participate at all in the process of
 [8] selling the Texas City plant to Sterling Chemicals?
 [9] A. No.
 [10] Q. You didn't have any role in that?
 [11] I am sorry, is that a no?
 [12] MR. JONES: What is the answer?
 [13] THE WITNESS: No.
 [14] (Deposition Exhibit 2 was marked for
 [15] identification.)
 [16] BY MS. WALSH:
 [17] Q. Dr. Roush, in front of you is Exhibit 2. If
 [18] you would just read the first page, I will guide you
 [19] through the rest of it. Actually, you may just want to
 [20] skim the remainder of it.
 [21] (Witness examines document.)
 [22] BY MS. WALSH:

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- [1] Q. Dr. Roush, I gave you too many pages. The
 [2] article that is yours and Dr. Kehoe's actually
 [3] shouldn't be attached.
 [4] A. That was the best part of it.
 [5] Q. I am sure it was and I apologize. I didn't
 [6] realize you were looking at it until I realized yours
 [7] looked thicker than mine.
 [8] MS. WALSH: For the record let me read the
 [9] Bates numbers in just so we are clear. It's MCO
 [10] 9327590 through 605.
 [11] BY MS. WALSH:
 [12] Q. You can certainly have a copy of that article
 [13] if you like.
 [14] With respect to the corrected Exhibit 2 have
 [15] you had a chance to look through it?
 [16] A. Through this?
 [17] Q. Yes.
 [18] A. Yes.
 [19] Q. I will direct you to specific areas. I don't
 [20] have a lot of detailed questions.
 [21] This is a handwritten cover memo from R. L.
 [22] Biggerstaff to Clayton Callis and George Roush.

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- [1] Was Mr. Biggerstaff a Monsanto employee?
 [2] A. I don't know.
 [3] Q. You don't remember him?
 [4] A. No.
 [5] Q. Do you recall these materials that he has
 [6] attached?
 [7] A. No.
 [8] Q. Do you recall receiving them?
 [9] A. No. I knew about this levee.
 [10] Q. All right.
 [11] A. I have walked the levee.
 [12] Q. At North 80?
 [13] A. Yes.
 [14] Q. Do you have any recollection of why you would
 [15] have been copied on this information about the North 80
 [16] site?
 [17] A. No.
 [18] Q. You said you have walked the Levy, so you have
 [19] obviously visited the North 80 site?
 [20] A. Yes.
 [21] Q. Did you visit it as many times as you visited
 [22] the plant?

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- [1] A. No.
 [2] Q. How many times did you visit the North 80
 [3] site?
 [4] A. A couple times.
 [5] Q. Probably twice?
 [6] A. I can't -- you know, I can't be specific, but
 [7] there is a motel up that way, that I walked up to that
 [8] motel.
 [9] Q. All right.
 [10] A. There is a golf course right next to it, there
 [11] was.
 [12] Q. Do you recall why you went to the North 80?
 [13] A. It was a problem of concern when they led me

[14] up that way.
 [15] Q. The people at the plant?
 [16] A. Yes. Maybe this man walked me up, you know.
 [17] Q. Okay.
 [18] A. But to go back, when was this?
 [19] Q. This isn't dated.
 [20] A. This was early in my time.
 [21] Q. All right.
 [22] A. And you could smell some chemical. But you

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[1] can smell chemicals in the plant anyway.
 [2] Q. Right.
 [3] A. A lot has to do with solubility in water.
 [4] Q. Do you recall whether you had to do any work
 [5] involving the North 80 at all?
 [6] A. Dr. Spraul took over that plant when he came
 [7] with me, so last, long before, see, when did we get out
 [8] of this business, when did we sell Texas City?
 [9] Q. Texas City was sold in '86, I believe.
 [10] A. And I believe that was about the time Dr.
 [11] Spraul died.
 [12] Q. And did Dr. Spraul report to you?
 [13] A. Yes.
 [14] Q. Okay, so he was --
 [15] A. Well, sort of. He was working with Dr.
 [16] Coleman.
 [17] Q. That would have been your --
 [18] A. He was our contact with the plant, Dr. Spraul.
 [19] Q. Was he the plant physician?
 [20] A. No, he was with Monsanto.
 [21] Q. So he was from headquarters?
 [22] A. Yes.

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[1] Q. Let me make sure I understand this then. So
 [2] he was in the occupational medicine section?
 [3] A. Yes.
 [4] Q. Of the Medical Department?
 [5] A. And we talked about this, but I couldn't get
 [6] very excited because I couldn't tell what was going on
 [7] and the fact, what they are saying was correct. But
 [8] the problem what to do about it, that is very
 [9] complicated.
 [10] Q. Do you recall what Dr. Spraul, what work Dr.
 [11] Spraul did with respect to the North 80 site?
 [12] A. I am not sure he did anything.
 [13] Q. But he had responsibility for the plant?
 [14] A. Well, he is a physician and he would have been
 [15] interested in what materials were out there.
 [16] Q. In order to provide guidance on how to
 [17] minimize worker exposure?
 [18] A. Or whether they should or whether it was
 [19] necessary.
 [20] Q. Is that your only recollection of the Medical
 [21] Department personnel being --
 [22] A. As related to this?

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[1] Q. Yes.
 [2] A. Yes.
 [3] Q. So in terms, let me make sure I understand, in
 [4] terms of the North 80, Dr. Spraul's work on it is the
 [5] extent of the Medical Department's --
 [6] A. Each time he was there he may have talked to
 [7] them or he may have walked it just like I did.
 [8] Q. But you didn't do any work personally?
 [9] A. No.
 [10] Q. That is it for this exhibit.
 [11] A. But my doing something was really having Dr.
 [12] Spraul go there.
 [13] Q. Just a clarification. Do you consider
 [14] yourself to have substantive expertise in the areas of
 [15] water pollution or chemical waste disposal?
 [16] A. No, not -- I have no expertise.
 [17] Q. All right.
 [18] A. But you see you are asking such a complicated
 [19] question, it has to do with contamination of the
 [20] product, it has something to do with difference in

[21] concentration from one time to the next. At least
 [22] that's the kind of things -- what I am saying to you is

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[1] what bothers me when I go to a plant, when I hear about
 [2] something.
 [3] Q. Right. Did you have any role in waste
 [4] disposal during your time at Monsanto?
 [5] A. Not personally that I recall.
 [6] Q. Were you an expert on state of the art matters
 [7] in waste disposal?
 [8] A. No.
 [9] Q. All right.
 [10] A. That is chemistry.
 [11] Q. That would be outside the Medical Department?
 [12] A. No, it's out of my expertise.
 [13] Q. Did you rely on someone who was an expert in
 [14] state of the art with respect to waste disposal?
 [15] A. Waste disposal was a responsibility of the
 [16] plant.
 [17] Q. In terms of waste disposal were you involved
 [18] in the decisions of how and where a particular plant
 [19] would dispose of its waste materials?
 [20] A. No.
 [21] Q. All right.
 [22] A. Not unless they might ask a question.

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[1] Q. And in that case you would respond to their
 [2] question?
 [3] A. As best I could.
 [4] Q. Did the plants have to report to the Medical
 [5] Department on how they disposed of their waste?
 [6] A. No.
 [7] Q. Do you recall that during your time as medical
 [8] director Monsanto sometimes took a calculated risk in
 [9] allowing pollution at its plant locations?
 [10] MR. JONES: Objection, vague.
 [11] A. That is a very broad question.
 [12] BY MS. WALSH:
 [13] Q. Do you ever recall that you had any
 [14] involvement or knowledge of a plant decision to allow
 [15] pollution after weighing the pros and cons?
 [16] A. Allowing pollution of what?
 [17] Q. Allowing any kind of chemical discharge into
 [18] the environment.
 [19] A. Into the air, into the water or into the
 [20] ground?
 [21] Q. Any of the three.
 [22] A. You see, they can be all, any one of them, and

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[1] I can't go further because it depends on the chemical
 [2] that's there. Or the chemicals that are there.
 [3] Q. I am just asking a yes or no question about
 [4] whether you recall whether there was a decision made to
 [5] go ahead and allow some kind of chemical release into
 [6] the environment that you recall.
 [7] A. No.
 [8] Q. Did the Medical Department have any
 [9] involvement or any input on whether pollution abatement
 [10] was considered in the manufacturing units?
 [11] A. When you say pollution abatement I am back to
 [12] whether we are talking about air, about water or just
 [13] being put in the dump. Every one of them has got that
 [14] and it depends on the chemical. And they could well
 [15] talk to Levinskas about whether that was toxic or not.
 [16] MR. JONES: Also object to the use of the term
 [17] "pollution," which I don't know if counsel is using
 [18] that term to be synonymous with discharge of a waste or
 [19] discharge of a chemical versus pollution, if you are
 [20] distinguishing between pollution and that.
 [21] MS. WALSH: Let me rephrase.
 [22] BY MS. WALSH:

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[1] Q. When manufacturing departments were deciding
 [2] whether to modify a chemical process, and part of that
 [3] calculus would be how much by-product or waste is
 [4] created, would the Medical Department have any input on

[5] what kind of modifications that manufacturing unit
 [6] could or could not make?
 [7] A. Practically it did have something to do with
 [8] it.
 [9] Q. What specifically?
 [10] A. They could ask us how do I evaluate the
 [11] toxicity of this material.
 [12] Q. Any other things you can think of?
 [13] A. It wouldn't be quantity, but primarily it
 [14] would be is to add the dimension of whether this is
 [15] toxic or not.
 [16] Q. So it would be providing toxicity information
 [17] to help make that decision?
 [18] A. Yes.
 [19] Q. After the toxicology lab was built did
 [20] Monsanto conduct all its own toxicology testing?
 [21] A. No, there was a continual change in what they
 [22] wanted that laboratory to do.

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[1] Q. How did it change?
 [2] A. Well, before lunch we were talking that we
 [3] used outside facilities, and we continued to have a
 [4] relationship with the outside laboratories. It had
 [5] something to do with the expertise of the toxicology
 [6] lab, our laboratory, as opposed to one outside in terms
 [7] of even the size of how many studies can you do in a
 [8] facility, because as time went along they have enlarged
 [9] it.
 [10] Q. So some toxicology studies still went to
 [11] outside labs?
 [12] A. Yes.
 [13] Q. During your time as medical director did you
 [14] exchange information with other chemical companies,
 [15] toxicity information?
 [16] A. Levinskis would do that.
 [17] Q. You didn't have any direct interaction?
 [18] A. No, he is a better toxicologist than I am.
 [19] Q. All right.
 [20] A. Experimental toxicologist.
 [21] Q. Was it common to share information with other
 [22] chemical companies?

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[1] A. There are some studies that are done by a
 [2] group of companies, and so there would certainly be a
 [3] part of that group.
 [4] Q. All right.
 [5] A. So it depends on how we got to that.
 [6] Q. What is the Manufacturing Chemists
 [7] Association?
 [8] A. That is a, all the companies that want to be a
 [9] part of that organization.
 [10] Q. Okay.
 [11] A. That they think they can handle the problems
 [12] of their business better by using a common resource.
 [13] Q. That became the Chemical Manufacturers
 [14] Association, is that correct?
 [15] I am sorry, was that a yes?
 [16] A. Yes.
 [17] Q. Did you do any work with CMA or MCA, as it
 [18] later became?
 [19] A. I am sure that I did. But I was not on
 [20] regular assignment to them, I was called in on
 [21] exceptional things.
 [22] Q. Do you remember any specific projects?

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[1] A. No.
 [2] Q. Did CMA or MCA have a program for issuing
 [3] material safety data sheets for various chemicals?
 [4] A. I don't know.
 [5] Q. Okay.
 [6] A. Each company had their own way of getting that
 [7] information out to the customers.
 [8] Q. This case, this lawsuit is very large, as you
 [9] may know, it covers about 80 different sites across the
 [10] country. The part of the suit that is going to be
 [11] tried first is the Texas City plant and then four sites

[12] in Texas. The first one is North 80, which we have
 [13] already discussed.
 [14] The second one is now called the Brio site.
 [15] It's been known by a number of names over the years,
 [16] Hard-Lowe Chemical Company, Lowe Chemical Company,
 [17] Phoenix Chemical, Friendswood Remining. It's located
 [18] on Dixie Farm -
 [19] A. I have been there.
 [20] Q. You have been there. When did you visit the
 [21] Brio site?
 [22] A. When I gave my deposition on the Brio site.

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[1] Q. Did you testify in the Slaughter litigation?
 [2] A. Yes.
 [3] Q. What was the purpose of your visit to the Brio
 [4] site?
 [5] A. They called me, asked me to testify.
 [6] Q. Monsanto did?
 [7] A. Yes.
 [8] Q. What did you testify about?
 [9] A. The question related to the people who lived
 [10] on the other side of that ditch.
 [11] Q. The homeowners in the subdivision?
 [12] A. Yes.
 [13] Q. Now did you visit the Brio site once?
 [14] A. Yes.
 [15] Q. Only once?
 [16] A. Yes.
 [17] Q. What did you do on your visit?
 [18] A. Just looked at it.
 [19] Q. Did you do any testing or -
 [20] A. That wasn't my purpose.
 [21] Q. All right.
 [22] A. We were interested in those people on the

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[1] other side, living in that area.
 [2] Q. Were you making a judgment as to whether the
 [3] exposure levels were acceptable?
 [4] A. Yes.
 [5] Q. What was your conclusion?
 [6] A. That I didn't think there was enough there for
 [7] it to be a hazard to the people who lived there.
 [8] Q. Do you recall -
 [9] A. And that examinations were not required.
 [10] Q. Physicals of the people?
 [11] A. Yes.
 [12] Q. How did you make that determination, did you
 [13] take instruments with you, or did you just look around?
 [14] A. Just looked around.
 [15] Q. How can you make that determination without
 [16] measuring the actual chemical levels?
 [17] A. A lot easier than most of the things we do.
 [18] Q. Really?
 [19] A. Sure, there wasn't anything there.
 [20] Q. No open pits?
 [21] A. Oh, yes, no open pit. The question was that
 [22] little ditch that went around there.

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[1] Q. So you examined the ditch?
 [2] A. I didn't do a physical examination, I didn't
 [3] do it with a stethoscope.
 [4] Q. But you looked around the ditch?
 [5] A. Yes, I went down in the ditch, and it was dry.
 [6] Q. During your time as medical director did you
 [7] have any work involving the Brio site?
 [8] A. No.
 [9] Q. So the Slaughter visit was your only exposure
 [10] to the Brio site?
 [11] A. Yes.
 [12] Q. Did you do any research on past practices at
 [13] the site before you made your visit?
 [14] A. No.
 [15] Q. Do you recall what chemicals were of concern
 [16] there?
 [17] A. No.
 [18] Q. Do you have any expertise in geology?

- [19] A. No.
 [20] Q. Did you investigate the soil types at Brio?
 [21] A. No.
 [22] Q. Did you examine the groundwater at Brio?

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- [1] A. No.
 [2] Q. The next of the four sites that's in the first
 [3] trial group is now called Motoo, again it's had a
 [4] number of names, Petroprocessors, the Texas City Wye.
 [5] Are you familiar with that site?
 [6] A. I have heard the names.
 [7] Q. Have you ever visited?
 [8] A. No.
 [9] Q. Did you ever do any work during your time at
 [10] Monsanto that related to Motoo?
 [11] A. No.
 [12] Q. The last site is called the South 20 site,
 [13] south of the plant adjacent to Swan Lake. Are you
 [14] familiar with that site?
 [15] A. I think we talked about it one time.
 [16] Q. Have you ever visited it?
 [17] A. No.
 [18] Q. Do you recall what the discussion that you
 [19] just mentioned -
 [20] A. No.
 [21] Q. You don't recall any specifics?
 [22] A. No.

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- [1] Q. Do you recall any other work you had to do
 [2] involving the South 20 site during your time at
 [3] Monsanto?
 [4] A. No.
 [5] Q. Let me back up a minute, I forgot to ask you
 [6] this. Did you inspect the soil at the North 80 site?
 [7] A. No.
 [8] Q. Did you inspect the groundwater at the North
 [9] 80 site?
 [10] A. I can't answer the one about did I ever, when
 [11] I was walking along.
 [12] Q. Right.
 [13] A. Could I have walked down closer to the water
 [14] to see how high it was, you know, all kinds of sort of
 [15] look around kind of things.
 [16] Q. I guess my question is did you investigate the
 [17] soil type or soil condition at the North 80 site?
 [18] A. No.
 [19] Q. Let's see, Dr. Roush, do you remember some
 [20] time ago you were contacted by an investigator from
 [21] Clarence Kelly Investigation Services?
 [22] A. No.

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- [1] Q. You don't recall. Do you recall at any time
 [2] in the last few years being contacted by an
 [3] investigator regarding this case?
 [4] A. Regarding what?
 [5] Q. Regarding this lawsuit.
 [6] A. No.
 [7] Q. It would have been probably a telephone call,
 [8] does that help you remember at all?
 [9] A. No.
 [10] Q. Okay.
 [11] A. Things like that, I have nothing to relate it
 [12] to, you know, if they don't follow up and that.
 [13] Q. So you don't have any recollection about
 [14] giving any investigator information about Monsanto?
 [15] A. That you can rest assured that I didn't give
 [16] anybody any information about Monsanto.
 [17] Q. If an investigator had asked you for
 [18] information, would you have provided information?
 [19] A. No.
 [20] Q. Did you ever participate in negotiating
 [21] insurance contracts that Monsanto was going to purchase
 [22] or had purchased?

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- [1] A. No.
 [2] Q. Was that the responsibility of the Insurance

- [3] Department?
 [4] A. Pardon?
 [5] Q. Was that the responsibility of the Insurance
 [6] Department?
 [7] A. I don't know.
 [8] Q. All right.
 [9] A. Could well be the company, could well be the
 [10] product.
 [11] Q. Did you ever as medical director have to work
 [12] with Insurance Department personnel?
 [13] A. No.
 [14] Q. Did you have any role at all in obtaining
 [15] insurance coverage for Monsanto?
 [16] A. No.
 [17] Q. Did you ever have to meet with or do any work
 [18] with insurance company personnel?
 [19] A. No.
 [20] Q. Do you recall whether you ever had to have any
 [21] phone calls or correspondence with insurance company
 [22] personnel?

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- [1] A. No.
 [2] Q. Did you have an understanding of who was
 [3] responsible for negotiating with insurance companies to
 [4] get coverage?
 [5] A. No.
 [6] MS. WALSH: Would you mark this, please,
 [7] Exhibit 3.
 [8] (Deposition Exhibit 3 was marked for
 [9] identification.)
 [10] BY MS. WALSH:
 [11] Q. If you could read through Exhibit 3, please,
 [12] Dr. Roush. I don't have a lot of questions about it,
 [13] but I would like you to read the cover memo and then
 [14] skim through the attached materials.
 [15] A. Say that again now.
 [16] Q. If you could read through the cover memo,
 [17] which is the first two pages.
 [18] A. This is the document?
 [19] Q. Exactly.
 [20] A. All right.
 [21] Q. Then just skim through the attached materials,
 [22] which are the last few pages.

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- [1] (Witness examines document.)
 [2] THE WITNESS: This is mighty complicated stuff
 [3] just to read and have a couple of sentences.
 [4] MS. WALSH: Right.
 [5] BY MS. WALSH:
 [6] Q. Have you had a chance to look through Exhibit
 [7] 3?
 [8] A. Yes, I have looked through it.
 [9] Q. This is a memo dated February 1, 1988, and its
 [10] subject is Minutes of DEO/Liaison Committee Meeting.
 [11] Do you remember what the DEO Liaison Committee
 [12] was?
 [13] A. No, I sure do not.
 [14] Q. It indicates under committee members present,
 [15] G. Roush, Jr. That is you, right?
 [16] A. Yes.
 [17] Q. Do you have any recollection of this
 [18] particular meeting that this memo describes?
 [19] A. No.
 [20] Q. On the first page of the memo, item 2 says
 [21] "Insurance," then, "(R. E. Toth)." Then it says, "Key
 [22] points of this presentation (visual aids attached)

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- [1] were:", and then it goes through a number of bullet
 [2] points.
 [3] Do you remember this presentation at all?
 [4] A. No.
 [5] Q. Does this refresh your memory as to whether
 [6] you may have done any work with respect to insurance?
 [7] A. Oh, I am not sure I was there.
 [8] Q. All right.
 [9] A. It says members present. I am not sure there

[10] was, I didn't even know there was a committee of that
 [11] sort.
 [12] Q. Okay.
 [13] A. If you were to go through my file you wouldn't
 [14] find anything like that.
 [15] Q. So this is a presentation that you probably
 [16] heard but you didn't have any involvement or
 [17] responsibility with?
 [18] A. Yes, I am not sure how we became a part of an
 [19] insurance litigation effort.
 [20] Q. Let me ask you this. On the second page item
 [21] three says "Carcinogen Policy" and it's got Dr.
 [22] Levinskas's name and yours following.

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[1] A. It's not in here, is it?
 [2] Q. No, it doesn't appear to be attached, this is
 [3] all we got in the production.
 [4] The first paragraph says, "The Document was
 [5] intended to be consistent with, and a checklist of
 [6] actions to take, with respect to compliance with WWG #5
 [7] when new internal or external health/environmental
 [8] knowledge is obtained."
 [9] Do you remember the carcinogen policy?
 [10] A. No, I do not.
 [11] Q. Do you have any general recollection of
 [12] whether it was a new policy or not?
 [13] A. They are writing a definition and this man was
 [14] never put in charge of anything.
 [15] Q. The author, Mr. Elmer?
 [16] A. Yes.
 [17] Q. Okay.
 [18] A. So just exactly, we need more information to
 [19] make it useful.
 [20] Q. Do you remember worldwide guideline number 5,
 [21] which I believe is the WWG #5?
 [22] A. No, I do not.

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[1] Q. That is it for this exhibit, you can put it
 [2] aside?
 [3] A. What?
 [4] Q. That is it for this exhibit.
 [5] A. Okay. We probably couldn't have finished one
 [6] by the time I retired, anyway.
 [7] Q. A new carcinogen policy?
 [8] A. You would have to get everybody's approval,
 [9] you know.
 [10] Q. It would take too long.
 [11] Are you familiar with vinyl chloride monomer?
 [12] A. Yes.
 [13] Q. That chemical was manufactured at the Texas
 [14] City plant, right?
 [15] A. Yes.
 [16] Q. Was it still being manufactured at the time
 [17] you became medical director?
 [18] A. No.
 [19] Q. So the unit had already shut down?
 [20] A. Yes.
 [21] Q. Vinyl chloride is now known to be a
 [22] carcinogen, is that right?

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[1] A. Yes.
 [2] Q. Do you know what kinds of cancer it can cause?
 [3] A. I was very much involved in this with the
 [4] vinyl chloride industry.
 [5] Q. Okay.
 [6] A. They had their own MCA. So they had a group
 [7] together to handle their common problems of vinyl
 [8] chloride.
 [9] Q. This was the Chemical Manufacturers
 [10] Association?
 [11] A. Yes. Well, it was the equivalent of that, it
 [12] was the vinyl chloride industry people. It was 19,
 [13] just before I left Cincinnati.
 [14] Q. So that would have been just as you started?
 [15] A. 1973, 1975.
 [16] Q. All right.

[17] A. Now they knew that there were problems of
 [18] workers going down inside of reactors, and they then
 [19] found that several of the people who went into reactors
 [20] and had an operation, they found they had
 [21] angiosarcomas.
 [22] Q. What is an -

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[1] A. That is a cancer of the blood vessels but
 [2] involves primarily the liver. So, yes, these people
 [3] who were working with vinyl chloride developed
 [4] angiosarcoma.
 [5] Q. This was in the mid '70s?
 [6] A. Yes.
 [7] Q. Was that the first time that you were aware of
 [8] studies that suggested that vinyl chloride could cause
 [9] cancer in humans?
 [10] A. I knew about it before it became a public
 [11] issue.
 [12] Q. Were there any studies -
 [13] A. It happened at Louisville and the doctor
 [14] operating on several people found this cancer. And
 [15] they looked at it under a microscope and did all kinds,
 [16] found it was an angiosarcoma, which was quite unusual.
 [17] Q. These were workers who would go in and clean
 [18] out a reactor?
 [19] A. Go down inside of reactors, yes. Big, big
 [20] exposure.
 [21] Q. Do you recall whether there were any studies
 [22] before the mid '70s that suggested that vinyl chloride

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[1] could cause cancer in animals?
 [2] A. There was discussion of it, in animals, but I
 [3] don't think they ever showed it in man like they did
 [4] with the angiosarcoma.
 [5] Q. So the angiosarcoma, to your knowledge, was
 [6] the first indication it could cause cancer?
 [7] A. Could cause cancer.
 [8] Q. In humans?
 [9] A. Yes.
 [10] Q. Did you ever on behalf of Monsanto institute
 [11] any kind of monitoring program for workers who might
 [12] have been exposed to vinyl chloride?
 [13] A. We were still making "P B C" up in
 [14] Springfield, and we worked out a procedure for them to
 [15] be looked at.
 [16] Q. All right.
 [17] A. And we also cut down their exposure like mad,
 [18] they didn't go into reactors, and that was the basic
 [19] thing that was good. But the other one, just
 [20] confirmatory type.
 [21] Q. Do you recall whether the studies with the
 [22] angiosarcomas showed that the cancer would appear much

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[1] later than the exposure, or was it a cancer that would
 [2] show up within a relatively short time of the exposure?
 [3] A. Relatively short time.
 [4] Q. Did you ever go back and evaluate whether
 [5] there may have been affected workers at the Texas City
 [6] plant?
 [7] A. No, they were out, we didn't think there was a
 [8] place for doing that.
 [9] Q. Why not?
 [10] A. Because there had been sufficient time that we
 [11] didn't think it could be possible.
 [12] Q. The relatively short time?
 [13] A. Yes.
 [14] Q. For cancer to show up would have passed?
 [15] A. Yes.
 [16] Q. When you say relatively short time, can you
 [17] give me a general idea of what that timeframe is?
 [18] A. No, I don't recall.
 [19] Q. Did Monsanto ever do a carcinogenicity study
 [20] for VCM, besides what you have described at
 [21] Springfield?
 [22] A. No.

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[1] Q. Was the carcinogenicity study inherent with
[2] what you did with the workers at Springfield?
[3] A. We did what the industry was saying to be
[4] done, where these people were actually - Monsanto did
[5] not have people going in the reactors like the place
[6] where they had the angiosarcomas, our exposures were
[7] relatively low.

[8] Q. So you didn't have people cleaning out the
[9] reactors?

[10] A. No.

[11] Q. Do you recall whether you ever did any -

[12] A. Well, we did it, but we did it by washing it
[13] out, as opposed to getting a man down there with a
[14] knife blade and scraping it off.

[15] Q. Okay.

[16] A. Gross difference in terms of level of
[17] exposure.

[18] Q. Do you remember whether Monsanto did any
[19] long-term or short-term health effects studies on vinyl
[20] chloride?

[21] A. No. They were examined yearly, that is the
[22] way our system works.

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[1] Q. So in the routine monitoring the answer is no?

[2] A. And, not routine monitoring, it was examining
[3] them.

[4] Q. The actual annual physical exams?

[5] A. Right, and the fact that we didn't go into
[6] reactors.

[7] MS. WALSH: Let me just show you one document.

[8] (Deposition Exhibit 4 was marked for

[9] identification.)
[10] BY MS. WALSH:

[11] Q. This is Exhibit 4, Dr. Roush, an April 17,
[12] 1974 memo with an attachment questionnaire. Could you
[13] read through it.

[14] (Witness examines document.)

[15] THE WITNESS: That is the general vinyl
[16] chloride examination program.

[17] BY MS. WALSH:

[18] Q. All right.

[19] A. And it became a part of the OSHA regulation
[20] now.

[21] Q. At the time it was not part of OSHA?

[22] A. I don't recall.

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[1] Q. Is that your signature - I am sorry, have you
[2] read through it?

[3] A. No.

[4] Q. Take your time.

[5] (Pause.)

[6] THE WITNESS: All these questions that are
[7] asked are related to liver effect.

[8] BY MS. WALSH:

[9] Q. You are referring to questions on the
[10] questionnaire?

[11] A. The questionnaire, right.

[12] It doesn't say where this thing went, does it?

[13] Q. No, it doesn't.

[14] Have you read through Exhibit 4?

[15] A. Yes.

[16] Q. That was my next question, do you recall who
[17] you distributed this to?

[18] A. No.

[19] Q. Is that your signature at the bottom of page
[20] 1, the very faint copying?

[21] A. Not the one - I can surmise it's mine, but I
[22] sure can't see it.

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[1] Q. The copying is not good, I apologize. This is
[2] on Monsanto letterhead, is that right?

[3] A. Yes.

[4] Q. Do you remember preparing this?

[5] A. No, I do not.

[6] Q. You don't have a specific recollection?

[7] A. No, but it was, it's a reasonable one.

[8] Q. From reading through the memo, the subject of
[9] which is Medical Surveillance of Workers Exposed to
[10] Vinyl Chloride, is this procedure that is laid out
[11] something that was instituted as a result of VCM
[12] producing cancer in the workers you described?

[13] A. I am sure it is.

[14] Q. Okay.

[15] A. They had a peculiar disease in those workers
[16] who went down in reactors while I was - before I came.

[17] Q. On the first item, item 1, it says, "A

[18] physical examination should be done on all workers at
[19] least once a year."

[20] Did -

[21] A. All those exposed to vinyl chloride.

[22] Q. "If a worker has been exposed to vinyl chloride

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[1] for ten years or longer, examinations should be done
[2] every six months. The examination should include
[3] evaluation of the liver and spleen for possible
[4] enlargement."

[5] Those steps, instructions for physical
[6] examination part of the annual examination as a
[7] routine, or were they added just for the vinyl
[8] chloride?

[9] A. They were part of the routine.

[10] Q. So item 1 was always part of the routine?

[11] A. Well, I suppose the logical thing, we could
[12] have done more, or were doing was to twist the arms of
[13] those involved more without forcing them.

[14] Q. In other words, encourage participation?

[15] A. Yes.

[16] Q. The liver function testing that is outlined in
[17] item 2, was that routinely done as part of the annual
[18] physical exams?

[19] A. Yes.

[20] Q. The questionnaire that you added, that was
[21] specific to vinyl chloride workers, is that right?

[22] A. Yes, and it almost reads like OSHA just wrote

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[1] it.

[2] Q. I don't know whether that is good or bad.

[3] A. It's too close to being the same to be by
[4] accident.

[5] Q. So you may have used some OSHA -

[6] A. I would think I copied it from somebody.

[7] Q. Okay.

[8] A. And take full credit for it.

[9] Q. The last item, number 3, just says copies of
[10] the test scores as well as the completed questionnaires
[11] should go to St. Louis Medical Department. An
[12] evaluation of the testing will be returned to the
[13] plant.

[14] Did St. Louis actually do the analysis on
[15] those physicals?

[16] A. Well, all we would do was find out if it was
[17] abnormal and call them and say did you do so and so.
[18] It was really a means of making sure that the work was
[19] done.

[20] Q. Do you recall -

[21] A. Where did we get the protected order 1989 on
[22] that.

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[1] Q. That is part of this litigation.

[2] A. Oh, it's not a part -

[3] Q. Not a part of the document, no. There are
[4] protective orders in the case that protect some of the
[5] trade secret material in the documents.

[6] A. Sure.

[7] Q. Let me ask you one more thing, and that is
[8] were there any additional steps that you remember that
[9] you took in the Medical Department in response to the
[10] knowledge about VCM causing these angiosarcomas?

[11] A. I went up to Springfield and walked through
[12] the plant.

[13] Q. All right.

[14] A. And found out that they didn't go into the

[15] reactors, so their exposures were relatively minor.
 [16] Q. Do you recall whether any of the Springfield
 [17] workers had abnormal tests following this procedure?
 [18] A. No.
 [19] Q. None did?
 [20] A. No.
 [21] Q. I am sorry, I am not clear.
 [22] A. No, they were not. They did not have

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[1] abnormal.
 [2] MS. WALSH: That is it for Exhibit 4. Why
 [3] don't we take a five-minute break, we have gone about
 [4] an hour.
 [5] (Recess.)
 [6] MS. WALSH: Mark this.
 [7] (Deposition Exhibit 5 was marked for
 [8] identification.)
 [9] BY MS. WALSH:
 [10] Q. This is Exhibit 5, Dr. Roush. It's a November
 [11] 12, 1975 memo. If you could please read through that.
 [12] (Witness examines document.)
 [13] THE WITNESS: There's my boss.
 [14] BY MS. WALSH:
 [15] Q. Mr. Throdahl?
 [16] A. Yes, Mr. Throdahl.
 [17] (Pause.)
 [18] BY MS. WALSH:
 [19] Q. Have you read through Exhibit 5?
 [20] A. Yes.
 [21] Q. All right.
 [22] A. My boss had me all nervous.

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[1] Q. So this was written by Mr. Reese and Mr.
 [2] Throdahl?
 [3] A. Yes.
 [4] Q. Mr. Throdahl was your boss?
 [5] A. Yes.
 [6] Q. What was your relationship to Mr. Reese?
 [7] A. Good with both of them.
 [8] Q. I am sorry?
 [9] A. My relationship was good with Reese and
 [10] Throdahl, both.
 [11] Q. Did you report to Reese?
 [12] A. No.
 [13] Q. What was his position?
 [14] A. I know he was at a very high level in the
 [15] company.
 [16] Q. But you reported to Throdahl?
 [17] A. Yes.
 [18] Q. You obviously received a copy of this?
 [19] A. I am sure I did.
 [20] Q. You don't have a specific recollection?
 [21] A. No.
 [22] Q. Do you have any idea why you would have been

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[1] copied on a memo that discusses chlorinated
 [2] by-products?
 [3] A. So that when they get around to defining what
 [4] products were of concern that they were going to
 [5] incinerate, that if it came to my mind, no, or yes, I
 [6] could respond in an appropriate manner if in fact we
 [7] had some chemical that I recognized that we said we
 [8] wanted to get rid of.
 [9] Q. But did you -
 [10] A. The real issue is if someone got chlorine on
 [11] them, and the question is, is that bad or good, or how
 [12] are we going to get rid of it.
 [13] Q. Did you have any involvement in determining
 [14] which chemicals, which chlorinated by-products were
 [15] incinerated?
 [16] A. No.
 [17] Q. No, okay.
 [18] A. I would have the responsibility of saying what
 [19] would happen if they did or didn't.
 [20] Q. Do you recall specifically any chlorinated
 [21] by-products that you said were not proper for

[22] incineration, not proper candidates for incineration, I
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[1] should say?
 [2] A. No.
 [3] Q. Do you recall having any response to this
 [4] memo?
 [5] A. No, I wouldn't be, it wouldn't be appropriate
 [6] for me to respond yet.
 [7] Q. Okay.
 [8] A. If I were real smart and had some good points
 [9] on what hydrochlorine compounds that should be
 [10] controlled, if I had said we have got to do so and so,
 [11] if it came to mind, then I would get it back.
 [12] Q. Did you ever work with Dr. Fair, Dr. J. R.
 [13] Fair, who is mentioned on the second page?
 [14] A. No.
 [15] MS. WALSH: That is it for this. This is
 [16] Exhibit 6.
 [17] (Deposition Exhibit 6 was marked for
 [18] identification.)
 [19] MS. WALSH: I would also like to mark 7 and 8
 [20] at the same time.
 [21] (Deposition Exhibits 7 and 8 were marked
 [22] for identification.)

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[1] MS. WALSH: Dr. Roush, could you please read
 [2] through Exhibit 6. Take as much time as you need.
 [3] THE WITNESS: All right.
 [4] MS. WALSH: Just for your information my
 [5] questions are going to be directed to the first two
 [6] pages of Exhibit 6.
 [7] (Witness examines document.)
 [8] BY MS. WALSH:
 [9] Q. You have read through Exhibit 6?
 [10] A. Yes. I always try to understand it as I go.
 [11] Q. Take as much time as you need.
 [12] This is dated July 22, 1977. Do you remember
 [13] being appointed to the Corporate Environmental Policy
 [14] Staff?
 [15] A. No.
 [16] Q. You don't, okay. Do you recall the name of
 [17] the Corporate Environmental Policy Staff?
 [18] A. Pardon?
 [19] Q. Do you recall that there was a committee
 [20] called the Corporate Environmental Policy Staff?
 [21] A. Yes.
 [22] Q. Let me direct you to Exhibits 7 and 8, the two

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[1] charts. Does that refresh your memory?
 [2] If you could look over those and see if by
 [3] looking at them they might refresh your memory as to
 [4] who was on the committee and if it refreshes your
 [5] memory on your role.
 [6] (Witness examines documents.)
 [7] A. Yes. Lots of changes have been made from this
 [8] to this.
 [9] Q. I believe Exhibit 7 has a date at the bottom
 [10] that says April 1, 1980. And Exhibit 8 has a date at
 [11] the very bottom right that says 1984. So that was
 [12] 1984?
 [13] A. What was the first one?
 [14] Q. The first chart, Exhibit 7, is dated 1980.
 [15] The memo is '77. The first chart, Exhibit 7, is 1980.
 [16] A. Mine says - oh, yes.
 [17] Q. At the very bottom.
 [18] A. Right, right.
 [19] Q. The second chart, Exhibit 8, says 1984, and
 [20] that is little tiny numbers down at the bottom.
 [21] A. Yes. And the first one was '77.
 [22] Q. The memo, which is Exhibit 6, is dated 1977.

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[1] Does looking at the charts help you remember
 [2] anything about this committee?
 [3] A. Well, this was just something you put into
 [4] your - this man here was the company executive
 [5] officer.

[6] Q. Mr. Hanley?
 [7] A. Yes.
 [8] Q. Who wrote Exhibit 6?
 [9] A. Oh, my, yes.
 [10] Q. He was the chief -
 [11] A. Chief bottle washer.
 [12] Q. All right.
 [13] A. All these other people reported to him.
 [14] Q. Okay.
 [15] A. So my reporting to him was only there so that
 [16] he has got that area covered.
 [17] Q. Do you remember whether in 1977 you took on
 [18] additional responsibilities?
 [19] A. No, my additional responsibilities would have
 [20] been assigned to me by Throdahl.
 [21] Q. Okay.
 [22] A. Just as simple as that, do you see? And when

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[1] Throdahl, the assignment would be that some of these
 [2] things are moving and we would provide the backup so
 [3] that he didn't get into any trouble doing it.
 [4] Q. Do you remember whether Mr. Throdahl at this
 [5] time changed or added any responsibilities of you or
 [6] the Medical Department?
 [7] A. No, it wouldn't.
 [8] Q. It wouldn't?
 [9] A. No.
 [10] Q. So this was more a formal reporting function?
 [11] A. No, no. It's a way of stating what way we
 [12] think and what we want to get done.
 [13] Q. Okay.
 [14] A. And I was sort of the batter that is behind,
 [15] ready to bat if they want me to bat, that is all.
 [16] Q. Would it be fair to say, then, that this was
 [17] defining Monsanto's resource network?
 [18] A. No, this defines direction.
 [19] Q. Exhibit 6 is redefining direction?
 [20] A. That's right. We were only there to, in mine,
 [21] would be to report to Throdahl and Throdahl would say,
 [22] George, we have got to do so and so for so and so.

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[1] Q. On Exhibit 6 at the very bottom of the first
 [2] page, that is the memo.
 [3] A. Yes.
 [4] Q. There is a paragraph that talks about what the
 [5] Corporate Environmental Policy Staff is going to do,
 [6] and I will read it. It says starting on the second
 [7] sentence, "This group, headed by Mr. Throdahl, will
 [8] become a central resource for developing corporate
 [9] policies and translating regulations, laws and various
 [10] pressures from public groups into corporate-wide
 [11] action, hence it will provide corporate initiative in
 [12] managing Monsanto's impact on the total environment."
 [13] Were there any responsibilities that you took
 [14] on after this that were part of the Corporate
 [15] Environmental Policy Staff's purpose?
 [16] A. No, what would happen, if they wanted me, Mr.
 [17] Throdahl would call and say, can you come over?
 [18] Q. Okay.
 [19] A. We would sit down and we would talk about it.
 [20] I would say I don't know.
 [21] Q. So let me just make sure I understand this,
 [22] then. You don't have any specific recollection of any

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[1] particular projects.
 [2] A. Right.
 [3] Q. You did for this Corporate Environmental
 [4] Policy Staff?
 [5] A. Yes, but you see my position has not changed.
 [6] Q. Right.
 [7] A. Since I was put there.
 [8] Q. Right, the second page of Exhibit 6.
 [9] A. Right.
 [10] Q. It says George Roush will continue as director
 [11] DMEH.
 [12] A. And will continue to report to Throdahl doing

[13] the same thing as I did before, unless Mr. Throdahl had
 [14] some question that he wanted to have answered right
 [15] away.
 [16] Q. When did the Medical Department become
 [17] Department of Medicine and Environmental Health?
 [18] A. Very soon after I became medical director.
 [19] Q. All right.
 [20] A. Throdahl wanted it that way because my
 [21] responsibility was environmental.
 [22] Q. In terms of the workplace environment?

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[1] A. That's right.
 [2] Q. Was that supposed to better define what you
 [3] were doing, or did that change the responsibilities of
 [4] the Medical Department?
 [5] A. It would be that I am available to help on
 [6] anything that they, was related to this Environmental
 [7] Policy Staff.
 [8] Q. How about when the Medical Department became
 [9] DMEH, was that a change in responsibility?
 [10] A. No, that was just defining it.
 [11] Q. Exhibit 6 on the second page toward the bottom
 [12] refers to the Dayton laboratory.
 [13] A. Yes.
 [14] Q. Was that part of your responsibility in the
 [15] Medical Department?
 [16] A. We had a doctor from the area who came in and
 [17] did physicals for us.
 [18] Q. At Dayton?
 [19] A. At the Dayton lab, he will go into the lab and
 [20] do it.
 [21] Q. Did the Dayton lab do any toxicology work?
 [22] A. No.

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[1] Q. No?
 [2] A. They were not in our business. We supplied
 [3] what they needed in the area.
 [4] MS. WALSH: That is it for this exhibit and
 [5] for the two charts, as well.
 [6] (Deposition Exhibit 9 was marked for
 [7] identification.)
 [8] MS. WALSH: Dr. Roush, could you read through
 [9] Exhibit 9, please.
 [10] (Witness examines document.)
 [11] BY MS. WALSH:
 [12] Q. Have you read through Exhibit 9?
 [13] A. Yes.
 [14] Q. This is a list of names and phone numbers that
 [15] is headed Emergency Notification, Phone Numbers for
 [16] Reporting Accidents. The date, which is on the bottom
 [17] of the second page is 9-15-77. Also on the second page
 [18] under the heading medical is your name, do you see
 [19] that?
 [20] A. Yes.
 [21] Q. Do you recall what kind of emergencies you
 [22] would have been notified of?

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[1] A. The best one I have got is the Sturgeon spill.
 [2] Q. They notified you of the Sturgeon spill?
 [3] A. Sure did.
 [4] Q. What kind of emergencies would it be necessary
 [5] to notify you, the head of the Medical Department, or
 [6] the head of DMEH at this point?
 [7] A. In this case it was a major spill.
 [8] Q. Would you get notified in the case of any
 [9] major spill?
 [10] A. Depends on who above them wanted to call.
 [11] Q. All right.
 [12] A. That decision was made by somebody up here.
 [13] Q. Now the Sturgeon spill was a spill of a
 [14] railroad car that had some dioxin in it, right?
 [15] A. One teaspoonful.
 [16] Q. Then there was, and it was in Sturgeon,
 [17] Missouri?
 [18] A. Yes.
 [19] Q. And you are saying it would depend, whether

[20] you got notified would depend on whether someone higher
 [21] up decided you should be notified?
 [22] A. Sure. Somebody from safety most likely would

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[1] call and tell us.
 [2] Q. So on the first page under the Monsanto
 [3] category where it says Safety and Property Protection,
 [4] would it have been one of those people who decided
 [5] whether to notify you?
 [6] A. Yes.
 [7] Q. Do you know who notified you about the
 [8] Sturgeon spill?
 [9] A. No.
 [10] Q. Okay.
 [11] A. I don't recall that anymore.
 [12] Q. What did you do when you found out about the
 [13] Sturgeon spill when you were notified?
 [14] A. One of my group went out there and looked at
 [15] it right there, decided what they should do.
 [16] Q. So it wasn't necessarily any environmental
 [17] emergency or any large spill that you would get
 [18] notified of, right, it would be whatever safety deemed
 [19] you should be notified of?
 [20] A. That's right.
 [21] Q. Were you, in the case of Sturgeon, expected to
 [22] take any specific action once you were notified?

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[1] A. If I thought it was appropriate. It could
 [2] just be bringing it to our attention.
 [3] Q. Is the Sturgeon spill the only emergency that
 [4] you recall being notified of during your time in the
 [5] Medical Department?
 [6] A. Well, that was by far the biggest.
 [7] Q. But are there any others that you remember?
 [8] A. That's the only accident that I can recall, at
 [9] least offhand.
 [10] Q. All right.
 [11] A. If we did find some more it would be much
 [12] smaller.
 [13] Q. Which you may have been notified of?
 [14] A. Yes.
 [15] Q. You don't recall?
 [16] A. No.
 [17] Q. Did you have any responsibility to notify
 [18] people in the Insurance Department if you were told
 [19] about an emergency under these notification procedures?
 [20] A. Somebody at higher level, or even at my level
 [21] would think to call me and say what took place at
 [22] Sturgeon.

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[1] Q. But in terms of what you had to do next if you
 [2] were notified, did you have responsibility to call
 [3] someone in the Insurance Department?
 [4] A. No, I would call somebody above the Insurance
 [5] Department, let it come down.
 [6] Q. So there was no formal requirement that you
 [7] call the Insurance Department?
 [8] A. No.
 [9] Q. Under these emergency procedures?
 [10] A. No, as long as it got done.
 [11] Q. Do you recall whether you had any
 [12] responsibility to notify the Insurance Department with
 [13] respect to your opinion on whether a certain emergency
 [14] was covered by insurance or not?
 [15] A. No.
 [16] Q. You didn't make any determinations?
 [17] A. No. And I would have to go there in order to
 [18] do it.
 [19] Q. Okay.
 [20] A. And I wouldn't go there unless it was a
 [21] medical type, somebody else would be doing that.
 [22] Q. So it was someone else's responsibility to

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[1] decide whether or not to make a coverage claim?
 [2] A. Yes, unless it came to me. And then I would
 [3] go back and put it into what I thought was the normal

[4] chain.
 [5] Q. Okay, so -
 [6] A. If it wasn't medical I would get it out of the
 [7] medical responsibility. If it was medical plus safety
 [8] then I would call safety, someone from safety.
 [9] Q. If it was an emergency that was medical in
 [10] nature, did you have any responsibility for determining
 [11] whether Monsanto should make a claim on their policies?
 [12] A. No.
 [13] Q. No. Do you have an idea of where that
 [14] responsibility would have rested?
 [15] A. No, I would just go back and I would go to the
 [16] safety route.
 [17] Q. So you would convey it to -
 [18] A. Mine is of doing, rather than informing.
 [19] Q. You are saying you weren't part of the formal
 [20] chain of informing the Insurance Department on the
 [21] issues we have been talking about?
 [22] A. No, I would tell one in the Insurance

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[1] Department.
 [2] Q. Do you recall any emergencies that you did
 [3] inform the Insurance Department about?
 [4] A. No, that one came to us from safety.
 [5] Q. Did you ever have any responsibility to notify
 [6] the actual insurance companies of an incident?
 [7] A. No, that wouldn't be my responsibility.
 [8] Q. Again, would that be the same answer, in other
 [9] words it would either rest with safety or you would
 [10] notify someone else?
 [11] A. If it was big enough I would probably call my
 [12] boss.
 [13] Q. Okay.
 [14] A. You know?
 [15] Q. This is it for this exhibit.
 [16] Wait, let me ask you one more question. On
 [17] the first page it says "Travelers," then, "(auto and
 [18] general liability and Workers' Compensation)."
 [19] Did you ever have to contact Travelers?
 [20] A. No.
 [21] Q. Did anybody from Travelers ever contact you?
 [22] A. Not that I recall.

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[1] Q. Did you ever, just to clarify, I know we have
 [2] discussed this in more general terms, the people listed
 [3] under Insurance on page 1.
 [4] A. Yes.
 [5] Q. Did you ever have to work with any of those
 [6] people? Their names would be Chapman, Caldwell, Grimm,
 [7] Stryker and Rasmussen.
 [8] A. I am quite sure with some time come up with
 [9] something with Chapman and maybe with Stryker.
 [10] Q. Do you have any recollection of what kind of
 [11] things you would have -
 [12] A. No, I would have to work to find it, if I
 [13] found something.
 [14] Q. So there is nothing you specifically recall?
 [15] A. Nothing of consequence.
 [16] Q. That is it.
 [17] A. The time you get in trouble is if you want to
 [18] call somebody and you can't get them. And if I
 [19] couldn't get them, then I would go to their boss.
 [20] MS. WALSH: This is Exhibit 10.
 [21] (Deposition Exhibit 10 was marked for
 [22] identification.)

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[1] BY MS. WALSH:
 [2] Q. Dr. Roush, feel free to scan through it if you
 [3] like, this is Exhibit 10. I will tell you ahead of
 [4] time, my question on it is why were you copied on this
 [5] waste management study, which is dated January 3rd,
 [6] 1979.
 [7] So take as much time as you need to scan
 [8] through it. Other than that I will direct you to
 [9] specific sections that I may have questions on.
 [10] (Witness examines document.)

[11] THE WITNESS: All right.
 [12] BY MS. WALSH:
 [13] Q. You have looked through Exhibit 10?
 [14] A. Yes. There's lots of words in here.
 [15] Q. Do you have any recollection of why you would
 [16] be copied on a waste management study?
 [17] A. No. It's just for information.
 [18] Q. Purely for information?
 [19] A. Yes.
 [20] Q. You have read through the document. Was there
 [21] anything that you saw that you did any work on
 [22] personally?

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[1] A. No. And I wouldn't do it, it wouldn't be my
 [2] responsibility to do it.
 [3] Q. Okay.
 [4] A. My responsibility would be to read through
 [5] what they have done and see whether I agree with what
 [6] they have done.
 [7] Q. And then inform them if you disagreed?
 [8] A. That's right.
 [9] Q. Let me direct you to -
 [10] A. But this is still Jesse's, early in their
 [11] getting this in form
 [12] Q. Okay.
 [13] A. As I read it.
 [14] Q. Let me turn your attention to the third page,
 [15] under, it has introduction at the top, under summary.
 [16] I will read part of the introduction. "Corporate-wide
 [17] study of Monsanto's waste management condition was made
 [18] in December, 1978. Its purpose was to establish the
 [19] integrity and any potential problems related to present
 [20] and past disposal of wastes from our manufacturing and
 [21] laboratory operations."
 [22] Under summary it says, "78 manufacturing

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[1] sites, 20 animal product centers and three research
 [2] laboratories were included in the study. Each location
 [3] supplied information for the following:"
 [4] The first is active owned and operated
 [5] disposal systems. Would the Medical Department have
 [6] any involvement with that?
 [7] A. No.
 [8] Q. No?
 [9] A. No.
 [10] Q. The next one -
 [11] A. It wouldn't have involvement with any of these
 [12] things until we got someplace where we had a chance to
 [13] look through for conclusions.
 [14] Q. What about the item that says potentially
 [15] toxic contents of systems, would medical be involved in
 [16] that?
 [17] A. If they were to ask us to.
 [18] Q. They would provide information if requested?
 [19] A. They would help us to do it, we would have to
 [20] have more information than that.
 [21] Q. How about existing monitoring programs, would
 [22] medical be involved in that?

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[1] A. They really don't define monitoring programs
 [2] enough.
 [3] Q. So if it's health monitoring of workers?
 [4] A. That wouldn't be this.
 [5] Q. It wouldn't be, because this is waste
 [6] management?
 [7] A. Yes.
 [8] Q. Monitoring programs being developed, would
 [9] that be the same thing?
 [10] A. Yes.
 [11] Q. It's probably not worker monitoring?
 [12] A. That's right.
 [13] Q. All right.
 [14] A. When they got done with it they may ask us
 [15] where they stand on toxic.
 [16] Q. Okay.
 [17] A. But not without some background information.

[18] Q. So this study that was done at the plants and
 [19] manufacturing sites would not have had medical's
 [20] involvement up front?
 [21] A. Unless they asked specifically for some
 [22] question on some specific as expected.

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[1] Q. On the next page that is headed Decisions and
 [2] Actions, paragraph 2 begins, "Quantifying a complete
 [3] Monsanto waste disposal history is impossible due to
 [4] absence of records."
 [5] Did you or anybody in the Medical Department
 [6] have to do any work in compiling a waste disposal
 [7] history for any plant?
 [8] A. No.
 [9] Q. The last page, which is a chart, over on the
 [10] left it says Anniston.
 [11] A. Yes.
 [12] Q. Did you ever do any work with respect to the
 [13] Anniston plant?
 [14] A. Yes.
 [15] Q. Do you remember what that work was?
 [16] A. PCB's.
 [17] Q. Okay.
 [18] A. Which would include parathion in some form.
 [19] Q. Was that assessing the exposure risks?
 [20] A. I can't tell you because it's too early.
 [21] Q. When you say too early, you mean too early
 [22] to -

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[1] A. For me to evaluate what information has been
 [2] given to us.
 [3] Q. I see. I am just asking your general
 [4] recollection of -
 [5] A. Of this?
 [6] Q. No, of projects you may have worked on at
 [7] Anniston.
 [8] A. The one we were involved with most often was
 [9] PCB's.
 [10] Q. Do you remember the specifics?
 [11] A. And parathion.
 [12] Q. What were you doing with respect to those
 [13] chemicals?
 [14] A. Parathion, it's a fact that that is toxic, or
 [15] can be toxic.
 [16] Q. So you were doing toxicology testing?
 [17] A. No, this is human testing.
 [18] Q. Is toxicology testing different than human
 [19] testing?
 [20] A. Toxicology can - a parathion effect would be
 [21] a toxic effect.
 [22] Q. I am not quite clear on that. Generally what

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[1] work did you do that involved PCB's and parathion and
 [2] Anniston?
 [3] A. I just had a long time before this become
 [4] alert and aware of PCB's.
 [5] Q. When you were assistant director and after
 [6] that?
 [7] A. Well, when we had the concern from the fact
 [8] that it was in the environment and stayed in the
 [9] environment.
 [10] Q. At Anniston, I understand that you identified
 [11] the PCB's and parathion as an issue, but at Anniston
 [12] were you doing some specific projects that related to
 [13] those two chemicals?
 [14] A. Yes, I was asked about PCB's from someone, I
 [15] don't remember what it was about, that was involved.
 [16] Q. You were providing information to the plant?
 [17] A. No, it was outside the plant.
 [18] Q. What do you mean when you say outside the
 [19] plant?
 [20] A. I am back in the same place, I can't recall.
 [21] All I am saying is I was involved in an evaluation of
 [22] parathion.

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[1] Q. When you say "I was outside," does that mean

[2] that you weren't at Monsanto? I don't understand what
 [3] that means.
 [4] A. I was involved in parathion in some operation
 [5] outside of Monsanto on PCB's.
 [6] Q. Okay.
 [7] A. On parathion. I keep saying it.
 [8] Q. So would -
 [9] A. If we were to find it, it would be to find it
 [10] in the documents someplace where - it was not a big
 [11] involvement.
 [12] Q. Was it, did you even do any work specific to
 [13] Armiston on PCB's or parathion?
 [14] A. No.
 [15] MS. WALSH: That answers my question. That is
 [16] it for this exhibit, Dr. Roush. You can put that
 [17] aside.
 [18] (Pause.)
 [19] BY MS. WALSH:
 [20] Q. Dr. Roush, do you know what polynuclear
 [21] aromatics are?
 [22] A. Usually cancer agents.

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[1] Q. All right.
 [2] A. It means nucleus, it's got more than one
 [3] nucleus.
 [4] Q. Is that a generic group?
 [5] A. We say PNA's.
 [6] Q. PNA's are a generic group of chemicals?
 [7] A. If they have more than one nucleus, that is
 [8] one of the ways you get, a certain percentage of them
 [9] will be carcinogenic.
 [10] Q. So there are a lot of different compounds that
 [11] are PNA's? PNA isn't like oxygen?
 [12] A. No, no.
 [13] Q. It's more like aromatics, it's more like
 [14] organics, it's not a specific term, is it?
 [15] A. No, but it talks about those chemicals that
 [16] have more than one nucleus.
 [17] Q. All right.
 [18] A. And of those things that have more than one
 [19] nucleus, a number of them will be carcinogenic.
 [20] Q. Do you have a recollection of the early years
 [21] point that you were aware of that fact?
 [22] A. Of what, what PNA's are?

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[1] Q. That PNA's can be carcinogenic.
 [2] A. One way of finding are they carcinogens is to
 [3] look for the PNA's.
 [4] Q. Is that something that was known relatively
 [5] early on in your career?
 [6] A. In what?
 [7] Q. Was that something that you knew early on?
 [8] A. It was in literature, it's a literature thing.
 [9] It's a very common thing.
 [10] Q. Okay. Do you -
 [11] A. It's animal studies is where they have first
 [12] talked about PNA's.
 [13] Q. Did you do any studies in the Medical
 [14] Department on PNA's?
 [15] A. No, we did studies that showed they were
 [16] carcinogenic, then they might have been called PNA's.
 [17] Q. So the Monsanto Medical Department did some
 [18] studies -
 [19] A. No. We did experimental studies.
 [20] Q. What did those experimental studies focus on?
 [21] A. We were doing lifetime feeding studies and it
 [22] was found to be carcinogenic.

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[1] Q. Were you doing the lifetime feeding studies on
 [2] a number of different chemicals?
 [3] A. Well, we talked about them. We did one on
 [4] PCB's, we did one on acrylonitrile. I don't remember
 [5] whether we did any others or not.
 [6] But they are so big and so complicated, that's
 [7] about where I am.
 [8] Q. So there was a specific lifetime feeding study

[9] that looked at polynuclear aromatics?
 [10] A. No.
 [11] Q. There was not?
 [12] A. Were found to be polynuclear aromatic after we
 [13] did them.
 [14] Q. Oh, okay.
 [15] A. And those that are carcinogenic may well be
 [16] PNA's as well.
 [17] Q. So your studies were not focusing on
 [18] polynuclear aromatics?
 [19] A. No, no.
 [20] Q. They were focusing on -
 [21] A. It was finding, rather than direction.
 [22] Q. I want to make sure I understand this. You

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[1] don't have a recollection of when there was an
 [2] awareness in the industry that polynuclear aromatics
 [3] were carcinogenic?
 [4] A. No.
 [5] Q. Do you recall after the finding from the
 [6] lifetime feeding studies, whether you did any
 [7] additional studies on polynuclear aromatics,
 [8] specifically?
 [9] A. On the ones that we have talked about earlier?
 [10] Q. Well, tell me which ones we talked about
 [11] earlier, because I am not -
 [12] A. I just said there are two of them, PCB's and
 [13] acrylonitrile.
 [14] Q. Those are both polynuclear aromatics?
 [15] A. No, I didn't say that.
 [16] Q. What did you say?
 [17] A. I think that if we had a hundred of them, 50
 [18] or more of them may well be PNA's. But there are
 [19] different ways of getting to be cancer besides going
 [20] through the PNA route. There are somewhere they would
 [21] become carcinogens without going through a stage where
 [22] there are additional nuclei.

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[1] Q. I don't mean -
 [2] A. PNA is still an experimental statement, way of
 [3] looking at carcinogenesis. If I had a good expert, if
 [4] we had one of the men from the - Pitot here, he would
 [5] say, yes, some of these are PNA's, not all of them are.
 [6] Q. I am not trying to torture you, I am having a
 [7] little built of a disconnect on this, though. How do
 [8] your lifetime feeding studies on PCB's and AN relate to
 [9] polynuclear aromatics?
 [10] A. We have a lifetime feeding study. And we cut
 [11] them apart and put them under a microscope. All of
 [12] those cells in that microscope, all those cells of
 [13] nuclei. Some of them will have two nuclei.
 [14] I am not sure whether these two I talked about
 [15] have them, but if they do have, then they are called
 [16] PNA's.
 [17] Q. Okay.
 [18] A. Polynuclear aromatics.
 [19] Q. When you say we cut them apart, you are
 [20] talking about the animal test subject?
 [21] A. Yes.
 [22] Q. So the cells of some of the animal test

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[1] subjects that fed on AN or PCB's had polynuclear -
 [2] A. Sure. Some of them will have cancers that was
 [3] not from that because they get their cancers normally,
 [4] too.
 [5] Q. But does that study where you fed an animal
 [6] PCB's or AN and then the animal's cells show
 [7] polynuclear compounds -
 [8] A. Not compounds, nuclei.
 [9] Q. Okay, they show, but does that tell you
 [10] anything about the carcinogenicity of polynuclear
 [11] aromatics?
 [12] A. Rather, the PNA's may help us to find which
 [13] ones are carcinogenic. You are going back instead of
 [14] forward.
 [15] Q. You are looking at which polynuclear -

- [16] A. Each cell has got a nucleus.
 [17] Q. Right.
 [18] A. When they have more than one, it's more likely
 [19] that that will become a carcinogen, or carcinogenic
 [20] response, I should say.
 [21] Q. So you are looking at the cells that have -
 [22] A. What is the hangup on PNA's? I am not sure

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- [1] what, where we are going.
 [2] Q. All I want to know is if you did studies on
 [3] the carcinogenic effects of PNA's. What I don't
 [4] understand -
 [5] A. You don't do carcinogenic studies of PNA's,
 [6] you do studies on chemicals. Some of them will end up
 [7] with more than one nucleus in that cell.
 [8] Q. Okay.
 [9] A. That is all I can say. Some of those PNA's
 [10] will go on and become cancerous.
 [11] Q. Did the Medical Department provide information
 [12] about these feeding studies to the plants if they
 [13] requested it?
 [14] A. Would we give them to the plants?
 [15] Q. Yes.
 [16] A. What we would probably do is talk about
 [17] something as complicated as that, we would talk to the
 [18] management of that plant, it's a bigger subject than
 [19] just that plant.
 [20] MS. WALSH: I want to mark the next two
 [21] exhibits together.
 [22] (Deposition Exhibits 11 and 12 were

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- [1] marked for identification.)
 [2] (Witness examines documents.)
 [3] THE WITNESS: Did you notice he says again
 [4] recommending?
 [5] (Pause.)
 [6] THE WITNESS: Did you see "George demands?"
 [7] That shows that I was in there fighting from time to
 [8] time.
 [9] Is there another one?
 [10] MS. WALSH: 11 And 12.
 [11] (Witness examines document.)
 [12] THE WITNESS: Crosson's on my side.
 [13] BY MS. WALSH:
 [14] Q. You have read through 11 and 12?
 [15] A. Yes.
 [16] Q. Let's look at Exhibit 11, first. This is a
 [17] March 2nd, 1981 memo.
 [18] A. Yes.
 [19] Q. From C. A. Sweets to D. R. Bishop and G. C.
 [20] Rankey.
 [21] Who is C. A. Sweets?
 [22] A. He is in personnel.

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- [1] Q. You said his first name is Clarence, is that
 [2] right?
 [3] A. Yes.
 [4] Q. Who are Mr. Bishop and Mr. Rankey, do you
 [5] know?
 [6] A. Bishop is a public relations fellow who does
 [7] writings.
 [8] Q. All right.
 [9] A. He is a writing type.
 [10] Q. Do you know who Mr. Rankey is?
 [11] A. No.
 [12] Q. Mr. Sweets' memo begins "I am not sure what
 [13] the approach should be as to the employee
 [14] communications George Roush is (again) recommending."
 [15] He continues further.
 [16] Do you recall what employees communication
 [17] approach you were recommending?
 [18] A. I would suspect that I was telling them if
 [19] they have a concern or not.
 [20] Q. Telling who?
 [21] A. That the worker has a reason for a concern or
 [22] not.

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- [1] Q. You were telling the people in public
 [2] relations?
 [3] A. No, employees, not the public relations.
 [4] Q. So the approach you advocated was what?
 [5] A. Telling them, telling the workers.
 [6] Q. Telling them specifically everything that
 [7] Monsanto knows about a chemical?
 [8] A. No.
 [9] Q. Okay.
 [10] A. Things that are of concern to them.
 [11] Q. Things of concern to the worker?
 [12] A. Yes.
 [13] Q. Was it the Medical Department's responsibility
 [14] to inform workers about things of concern to them?
 [15] A. We would say to the plant, the plant would be
 [16] the one that tells them what they should be telling
 [17] them.
 [18] Q. You would tell the plant management and they
 [19] would disseminate the information?
 [20] A. Yes. He may have a fight with personnel.
 [21] Q. Do you recall whether the approach you were
 [22] advocating represented a change?

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- [1] A. I would think it was not.
 [2] Q. Do you have any -
 [3] A. What we are really saying is something that
 [4] personnel would want to keep on doing something or
 [5] something new has been found, we have got something
 [6] that causes a rash or causes skin - and we want to get
 [7] that information to them before they get their rash,
 [8] that is the most likely problem.
 [9] Q. What's personnel's role in communicating with
 [10] the workers?
 [11] A. The personnel manager at that plant reports to
 [12] Sweets.
 [13] Q. How does personnel play into the communication
 [14] of information of concern to the workers?
 [15] A. They are the ones who do it.
 [16] Q. They do it?
 [17] A. They communicate to the workers.
 [18] Q. All right.
 [19] A. If they don't, they lose their position.
 [20] Q. So if medical had information about a
 [21] previously unknown rash that a chemical could cause,
 [22] medical would tell the plant, is that right?

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- [1] A. Yes.
 [2] Q. Then the plant management would tell personnel
 [3] at the plant?
 [4] A. No, they are part of management.
 [5] Q. So you would be communicating to the plant
 [6] management which includes personnel, is that right?
 [7] A. Yes.
 [8] Q. Then personnel would communicate it to
 [9] individual workers?
 [10] A. Either put it up on the bulletin board or have
 [11] a meeting with all the people from that one unit or
 [12] something.
 [13] Q. All right.
 [14] A. In some way they would communicate it to them.
 [15] Q. Do you recall talking to Mr. Sweets about this
 [16] at all?
 [17] A. No.
 [18] Q. The second paragraph of Exhibit 11 says,
 [19] "Personally, I feel there is a balance point somewhere
 [20] between telling employees all we know about all
 [21] substances and keeping them attuned to specific
 [22] concerns of which we (Monsanto management) decide they

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- [1] should be aware. I have no argument against a fully
 [2] explanation of PCB's and employee exposure to them
 [3] within Monsanto. As a matter of fact I am such an
 [4] employee. On the other hand, Roy 'Red' Hall was/is
 [5] exposed to hundreds of substances as an employee and
 [6] union safety committeeman at Crumrich. Giving him all

[7] we know about all of them is going to be
 [8] self-defeating."
 [9] Was the --
 [10] A. I have no qualms with telling people things
 [11] that they don't need to know.
 [12] MR. JONES: Doctor, you should just make sure
 [13] you allow Ms. Walsh to finish asking the question, and
 [14] then answer.
 [15] BY MS. WALSH:
 [16] Q. Mr. Sweets ends, "George prefers (demands) a
 [17] broad effort. I support a more specific (narrow)
 [18] approach. I would like you experts to conciliate, so
 [19] we can sort out a proper (or at least an approved)
 [20] corporate effort."
 [21] To your knowledge, was there a corporate
 [22] policy on what to communicate to workers at this time?

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[1] A. No.
 [2] Q. Would Mr. Sweets have been the one in charge
 [3] of formulating it?
 [4] A. Yes.
 [5] Q. Do you remember in what context you advocated
 [6] your broad approach, as Mr. Sweets calls it?
 [7] A. No.
 [8] Q. No. Did you advocate telling employees, as
 [9] Mr. Sweets' memo puts it, "all we know about all
 [10] substances"?
 [11] A. No.
 [12] Q. I am not sure I am clear on this. You
 [13] advocated telling employees those things that were of
 [14] concern to them?
 [15] A. Yes.
 [16] Q. Would that include any physical effects of a
 [17] chemical they worked with?
 [18] A. Sure.
 [19] Q. To your knowledge, was that information always
 [20] communicated?
 [21] A. We are saying it should be.
 [22] Q. But did you have any knowledge about whether

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[1] the plants actually communicated the information?
 [2] A. No one communicated to me that it was not
 [3] followed through.
 [4] Q. So you don't know one way or the other?
 [5] A. I would suspect they were being told.
 [6] Q. So your impression was most of the things that
 [7] you passed along from the Medical Department were
 [8] passed on to workers?
 [9] A. I would say it's a problem of what is a
 [10] hundred percent?
 [11] Q. Right.
 [12] A. You know, or whatever. They are at the plant
 [13] and we are not.
 [14] Q. Looking at Exhibit 12, and this is a memo from
 [15] W. D. Crosson back to Mr. Sweets. Do you know who Mr.
 [16] Crosson was?
 [17] A. He was in public relations as I recall.
 [18] Q. Were you aware of the survey results that Mr.
 [19] Crosson passes on in this memo?
 [20] A. I don't recall now.
 [21] Q. On the second page the paragraph begins, "On a
 [22] more positive note, however, both the corporate issues

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[1] study and the environmental network study showed
 [2] employees have a great deal of faith in the company's
 [3] communications efforts. This favorable opinion was
 [4] also reflected in the finding in the recent Sirota and
 [5] Alper Associates, Inc., study, that communications
 [6] within Monsanto concerning safety are rated highly.
 [7] (Concerning the Sirota study, it should be noted that
 [8] restricting information flow, 'the need to know'
 [9] approach, was identified as a communications problem
 [10] area.) Making a direct comparison of 'health' vs.
 [11] 'safety' is subject to some error due to differing
 [12] perceptions of terms, yet the responses in the research
 [13] I have reviewed are so similar that I feel I can safely

[14] draw conclusions."
 [15] Was it your belief that if you passed
 [16] information on to the Public Relations Department that
 [17] they would make some determination as to whether it was
 [18] a health or safety issue?
 [19] A. I don't know what they would do.
 [20] Q. You don't have any knowledge?
 [21] A. I don't know whether I did back then or not.
 [22] I might have called them on the phone and asked them

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[1] what they thought they were saying.
 [2] Q. It refers to the need to know approach was
 [3] identified as a communications problem area.
 [4] Would you characterize your, the employee
 [5] communications approach that you advocated a need to
 [6] know approach?
 [7] A. Say that again.
 [8] Q. The approach you advocated in terms of what
 [9] should be communicated to employees, would it be fair
 [10] to call that a need to know approach?
 [11] A. Yes.
 [12] Q. Do you know whether the environmental
 [13] communications group which Mr. Crosson refers to in the
 [14] last paragraph of Exhibit 12, did they adopt your
 [15] suggestion in terms of how communications should be
 [16] passed on to workers or what communications should be
 [17] passed on?
 [18] A. I don't recall.
 [19] Q. Do you recall having any conversations with
 [20] anyone regarding the subject matter of Exhibits 11 and
 [21] 12, these two memos?
 [22] A. No, I don't, I would have to speculate.

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[1] Q. Do you have any recollection of whether you
 [2] did any work in terms of making recommendations on what
 [3] should be communicated to employees?
 [4] A. Well, I say I think there should be, it says
 [5] there, a candid, frank disclosure.
 [6] Q. Right, but do you have any specific
 [7] recollection of communicating that to certain people or
 [8] advocating that approach in meetings or that kind of
 [9] thing?
 [10] A. No, I think what I did here is where I would
 [11] go and as far as I would go because I would then go to
 [12] the plant and see whether they were or not. It's
 [13] supposed to be part of a team.
 [14] Q. What was your recollection of how PR fit into
 [15] this whole communications chain, because --
 [16] A. They sort of feel that their responsibility is
 [17] employees as well.
 [18] Q. If you had information about some effect of a
 [19] chemical you wanted to pass on, would you tell PR and
 [20] the plant management?
 [21] A. A lot depends on the timing. If I would say,
 [22] can you write this, put this in a better form and send

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[1] it down, you know.
 [2] Q. Okay.
 [3] A. I know I have got employee relations on my
 [4] side when they say an effort in line with the corporate
 [5] employees relations objective is the way to go.
 [6] Q. Exhibit 12 refers to Monte Throdahl's
 [7] Environmental Policy Staff. That is in the second
 [8] paragraph on page 1.
 [9] A. All right.
 [10] Q. Do you recall any discussions of
 [11] communications with workers in connection with the
 [12] Environmental Policy Staff?
 [13] A. We didn't care how it got to the employees as
 [14] long as it got there. We usually tried to work through
 [15] a group that is regularly in communications and let
 [16] this be another one, rather than saying we will tell
 [17] them the bad news kind.
 [18] Q. So this appears to be memos largely between
 [19] public relations employees, would that be accurate?
 [20] A. It's a means of getting communication to

[21] employees.

[22] Q. No, I mean just these two memos, Exhibits 11

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[1] and 12, this is something that is internally passing--

[2] A. Yes.

[3] Q. -- within PR people's hands, right?

[4] A. It's still dealing with the same subject we

[5] have been talking about.

[6] Q. Right. But it seems the way these memos

[7] characterize it, it appears you at some time made some

[8] type of disclosure recommendation, would that be

[9] accurate?

[10] A. Yes.

[11] Q. My question is, just to be clear, did you make

[12] that recommendation because you wanted to clarify the

[13] policy or change the policy, or set a policy?

[14] A. I don't recall.

[15] Q. You don't remember?

[16] A. No.

[17] Q. That is it.

[18] A. But I think the statement stands by itself,

[19] trying to make it work and after we wrote it, then

[20] Crosson agreed with it.

[21] MS. WALSH: That is it for these exhibits.

[22] Do you want to take a break? We have been

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[1] going about an hour.

[2] MR. JONES: Yes, I think so.

[3] (Recess.)

[4] MS. WALSH: We can go back on.

[5] BY MS. WALSH:

[6] Q. I know you mentioned at some point that the

[7] toxicology lab that you built became the domain of

[8] another department, is that right?

[9] A. No. The, Jim Senger's name is in this. And
[10] Jim Senger was an associate or working for one of the
[11] people in the top of Monsanto. And his boss changed
[12] assignments so he didn't need Jim any longer. So Jim
[13] started to report to me.

[14] Along about two or three years later, four

[15] years later, I got a call from one of the chief

[16] officers. He said, "You remember Jim Senger?"

[17] I said, "I sure do."

[18] He said, "He has been reporting to you for the

[19] last four or five years?"

[20] I said, "Yes."

[21] He says, "Do you know what?"

[22] I said, "What?"

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[1] He said, "You are going to start reporting to

[2] him."

[3] Q. He replaced Mr. Throdahl?

[4] A. Yes, and I started reporting to him.

[5] Q. Okay.

[6] A. That's what happened to Throdahl and what
[7] happened to Senger. So Senger moved up, became vice
[8] president as well. I don't know whether it's in there
[9] or not.

[10] Q. How did that affect the toxicology lab?

[11] A. The toxicology laboratory was, while he was
[12] working with me he was given assignment to be
[13] responsible for the toxicology laboratory.

[14] Q. All right.

[15] A. What things they were studying and how they
[16] studied them.

[17] Q. And then when did the toxicology lab cease to
[18] be your responsibility?

[19] A. When Senger became my boss.

[20] Q. Did the responsibility go to another

[21] department or did it remain with Mr. Senger?

[22] A. Sometime along in there it moved over and

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[1] became a responsibility of our Ag' Division.

[2] Q. MAC?

[3] A. Agriculture.

[4] Q. Monsanto Agricultural Chemicals, or Company?

[5] A. Yes.

[6] Q. Do you recall what year that switch happened?

[7] A. No.

[8] Q. When the toxicology lab became the Ag'

[9] Company's responsibility did the whole toxicology

[10] program go with it?

[11] A. No, we had divided up the toxicologists, we

[12] had about ten of them.

[13] Q. Okay.

[14] A. We had divided the toxicologists up into those

[15] who worked for ag' and those who did not. So when Tom

[16] Fuhreman, who was head of the toxicologists, moved over

[17] to ag' he took with him the toxicologists who were ag'

[18] toxicologists.

[19] Q. Did you have a toxicologist working for you

[20] named S. V. Becker?

[21] A. No.

[22] Q. Are you familiar with that name at all?

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[1] A. No. Maybe I should, but it's not one I am
[2] familiar with at all.

[3] Q. Did you commonly have toxicologists who were

[4] veterinarians?

[5] A. They were largely or all of them were down at

[6] the tox' lab.

[7] Q. The veterinarian toxicologists?

[8] A. Yes.

[9] Q. That would not have been your responsibility

[10] MS. WALSH: This is the next exhibit.

[11] (Deposition Exhibit 13 was marked for

[12] identification.)

[13] BY MS. WALSH:

[14] Q. Dr. Roush, you have Exhibit 13 in front of

[15] you. Could you please skim through Exhibit 13.

[16] A. Okay.

[17] (Witness examines document.)

[18] THE WITNESS: Okay.

[19] BY MS. WALSH:

[20] Q. You have read through Exhibit 13?

[21] A. Well, no, I have looked through it and tried

[22] to study it as I went.

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[1] Q. All right.

[2] A. But it's hard to even identify them by their
[3] way of identifying sites.

[4] Q. This is an August 29, 1983 memo that says as

[5] the subject line, Outline of September 1, 1983 Texas

[6] City Plant Groundwater Assessment, and G. Roush is

[7] under the list of recipients. That is you, is that

[8] right?

[9] A. Yes.

[10] Q. So you received a copy of this?

[11] A. Yes.

[12] Q. Do you have a specific recollection of

[13] receiving a copy of this?

[14] A. No.

[15] Q. Do you remember working with Mr. Hancock at

[16] all?

[17] A. No, I think Spraul was the one who was working
[18] with the plant.

[19] Q. So Spraul who is in your department reported

[20] to you?

[21] A. Right. And the one, his surveillance was

[22] Texas City.

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[1] Q. All right.

[2] A. He would come back and we would talk about
[3] their groundwater.

[4] Q. Do you recall any work that you or your

[5] department did with respect to this Texas City plant

[6] groundwater assessment?

[7] A. It doesn't even suggest in here that we did

[8] it.

[9] Q. Is it --

[10] A. The problem of handling water was not ours.

[11] Q. Okay.

- [12] A. Ours was people.
 [13] Q. So if there was an issue with handling
 [14] groundwater that affected worker health, you would be
 [15] involved?
 [16] A. Yes. We would also be involved if they told
 [17] us something about the chemistry.
 [18] Q. You would give feedback on the toxicology of a
 [19] certain chemical?
 [20] A. We would decide what should be done next if we
 [21] got a definition of what the chemicals were.
 [22] Q. All right.

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- [1] A. What was going on.
 [2] Q. When you say you would decide what would be
 [3] done next, are you talking about how the workers would
 [4] have to deal with that chemical?
 [5] A. No, we are talking about whether anything had
 [6] to be done in the way of protection.
 [7] Q. Protection from the chemicals for the workers?
 [8] A. Right, or, that definition, what do you do
 [9] after that? It could be that we were talking about the
 [10] city as well, because it really was just on the other
 [11] side of that embankment, embankment.
 [12] Q. So your concern in the Medical Department
 [13] would also have included people who were not workers
 [14] that were in the city that would have been affected by
 [15] the chemicals?
 [16] A. No, we would think about them.
 [17] Q. Okay.
 [18] A. We wouldn't say until we saw that there was a
 [19] problem. It could well be we say, well, you have got
 [20] to do this, because again, what they did was their
 [21] responsibility, not ours.
 [22] Q. So you don't have any specific recollection of

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- [1] advice you gave the Texas City plant on this
 [2] groundwater assessment?
 [3] A. We wouldn't have given advice at this stage.
 [4] Q. Too early?
 [5] A. Yes.
 [6] Q. I am going to direct you to the fifth page of
 [7] the document which is headed Current Waste Disposal
 [8] Systems.
 [9] A. Yes, all right.
 [10] Q. Did you have any involvement with any of these
 [11] waste disposal systems that are mentioned?
 [12] A. See, whether it got primary treatment or
 [13] secondary treatment depends what it is. And we don't
 [14] have a definition of what it is. Once you have got
 [15] that, then you can talk about it.
 [16] This could well be that by knowing where this
 [17] thing came from they may have been able to do this
 [18] without our input.
 [19] Q. Would you in the Medical Department have input
 [20] if the plant requested it?
 [21] A. If they requested it we would go down and
 [22] discuss it with them, which could include either that's

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- [1] your problem, that would be one response. Another one
 [2] is, if you do this, then we can tell what should be
 [3] done.
 [4] Or, thirdly, we could say, we will go back and
 [5] talk to our toxicologists and decide what we think
 [6] should be done.
 [7] Q. Okay. Would there -
 [8] A. There is a lot of probability, but it's based
 [9] on a further step than we have here.
 [10] Q. Which is further information, right?
 [11] A. No, this isn't even much information, we talk
 [12] about primary versus secondary. I have got to know
 [13] what the primary was, first.
 [14] Q. Did you personally do any work that involved
 [15] injection wells or incineration or boilers or
 [16] landfills?
 [17] A. That wouldn't be our responsibility, that
 [18] would be going into their plant and doing their work

- [19] for them, because if they did they wouldn't like
 [20] anything that we did, since it was their plant.
 [21] Q. So this kind of decision -
 [22] A. You see, it's really theirs.

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- [1] Q. So those kind of decisions really rested with
 [2] the plant, itself?
 [3] A. If it's in the plant.
 [4] Q. And the Medical Department was there to lend
 [5] resources?
 [6] A. But also to be involved if we thought we
 [7] should be.
 [8] Q. Okay.
 [9] A. But more information would be required. And
 [10] they weren't far enough along.
 [11] Q. Let me take you back two more pages, the page
 [12] headed North Ditch.
 [13] A. Yes.
 [14] Q. Were you familiar with the North Ditch at the
 [15] Texas City plant?
 [16] A. Pardon.
 [17] Q. Were you familiar with the North Ditch at the
 [18] Texas City plant?
 [19] A. Not by name of the ditch, North Ditch.
 [20] Q. Do you recall during your visits at the plant
 [21] an earthen ditch that went through the site from east
 [22] to west that bounded Monsanto's property?

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- [1] A. I think so.
 [2] Q. Did you ever have to do, did you or any of
 [3] your department people do any work that involved the
 [4] North Ditch?
 [5] A. No. There is an estuary right there, and what
 [6] was put into that estuary and under what circumstances
 [7] I didn't know. When I went down there, we walked
 [8] through the plant with the manager and he would point
 [9] like this. Right adjacent to us was a big refinery,
 [10] and Amoco refinery.
 [11] Q. Okay.
 [12] A. They were into the same area, so there was
 [13] lots of contamination into that plant. Now how much?
 [14] We weren't involved in that.
 [15] Q. If you go back, well actually I don't need to
 [16] direct you back.
 [17] Did you or any of your people in your
 [18] department have to do any migration studies?
 [19] A. No.
 [20] Q. The second-to-last page of this document,
 [21] which is headed Technical Approach.
 [22] A. Yes.

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- [1] Q. Sets out Phase I, Trench drain network in
 [2] settling pond.
 [3] Clay Cap Over West Side.
 [4] Phase II. Substitute conduit culvert for
 [5] borrow ditch.
 [6] Backfill borrow ditch.
 [7] Concrete slurry wall along south property
 [8] line.
 [9] Phase III. Soil - bentonite slurry walls
 [10] along north and west property lines.
 [11] Assuming this applies to the North 80 site,
 [12] would the Medical Department or you have had any
 [13] involvement with working on these phases?
 [14] A. Not at this stage.
 [15] MS. WALSH: That is it for this document.
 [16] Please mark this document as Exhibit 14.
 [17] (Deposition Exhibit 14 was marked for
 [18] identification.)
 [19] BY MS. WALSH:
 [20] Q. Dr. Roush, Exhibit 14 is dated January 9,
 [21] 1984, and it's headed Status of Environmental
 [22] Practices. I believe it's a presentation that was

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- [1] given by Monte Throdahl, as the name indicates up in
 [2] the upper left corner.

[3] I would like you to read pages 1 through 5,
 [4] and I will direct my pages only to those. Feel free to
 [5] skim the rest of the document if you like. I am not
 [6] going to ask any questions about it.
 [7] (Witness examines document.)
 [8] THE WITNESS: Do you see what it says on page
 [9] 2, in 1977? Have to advertise a little bit. Has a
 [10] long record of responsible decisions.
 [11] (Pause.)
 [12] THE WITNESS: Just the first five pages?
 [13] BY MS. WALSH:
 [14] Q. Just the first five pages.
 [15] A. Makes good reading.
 [16] Q. So you have read through at least the first
 [17] five pages of Exhibit 14?
 [18] A. Yes.
 [19] Q. I want to direct you to the paragraphs that
 [20] are on page 4.
 [21] A. Page 4. All right.
 [22] Q. Looking down, after the list of six items it

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[1] says, "Let me give an example of an important job where
 [2] establishing good communications has proved to be
 [3] critical to success, yet has not proved easy to do."
 [4] The next paragraph reads, "I am thinking of
 [5] toxicology. In the early 1970s it became clear that
 [6] Monsanto's program of animal testing was not meeting
 [7] our needs for consistency or uniformly high quality.
 [8] Dr. George Roush also was convinced that such testing
 [9] would become increasingly important to our efforts to
 [10] determine the human health effects to Monsanto's
 [11] chemicals and that new regulations would demand an
 [12] increasing volume of such testing."
 [13] I will read you the rest of it, if it will
 [14] make it clear. "The need for better monitoring and
 [15] control became painfully obvious soon, as the
 [16] Industrial BioTest scandal unfolded. We obviously did
 [17] not know in early 1977 that an IBT was going to happen,
 [18] and we weren't prepared for it then. But I can say
 [19] that our present system of placement and audits will
 [20] prevent any recurrence."
 [21] Let me stop here. Did you revamp the program
 [22] of animal testing when you started as the medical

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[1] director?
 [2] A. When I came to Monsanto all of our toxicology
 [3] was being done at Industrial BioTest, that is what it
 [4] says.
 [5] Q. What is the Industrial BioTest scandal?
 [6] A. It was shortly thereafter that EPA came in and
 [7] found that they thought Industrial BioTest was not
 [8] doing an adequate job.
 [9] Q. All right.
 [10] A. For EPA.
 [11] Q. Okay.
 [12] A. And Monsanto was doing all of their testing at
 [13] Industrial BioTest.
 [14] Q. Did that in essence render their toxicology
 [15] studies for you ineffective in EPA's eyes?
 [16] A. No.
 [17] Q. No?
 [18] A. No. It required us to reevaluate them
 [19] ourselves, and so a rewritten statement was given to
 [20] the EPA. They were done by Levinskas.
 [21] Q. All right.
 [22] A. And he had a couple of other outstanding

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[1] people who helped him to review them.
 [2] Q. Was that the only effect on Monsanto?
 [3] A. There were lots of studies that we didn't even
 [4] try to get reevaluated. But it was a terrible burden
 [5] on the operating companies that were dependent on this
 [6] testing.
 [7] Q. Was that part of the emphasis for building the
 [8] new toxicology lab?
 [9] A. Yes.

[10] Q. Ways it the only reason for building it?
 [11] A. No, they weren't adequate. But when we
 [12] dropped IBT we, Levinskas got us involved with
 [13] Biodynamics, that does the same thing.
 [14] Q. Okay.
 [15] A. And their studies have been quite adequate.
 [16] Q. When he refers to in the early '70s, it became
 [17] clear that Monsanto's program of animal testing was not
 [18] meeting our needs for consistency or uniformly high
 [19] quality, to your knowledge, was that referring to just
 [20] the fact that you were using IBT?
 [21] A. Yes. I am not saying a hundred percent.
 [22] Practically that was correct.

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[1] Q. The last full paragraph on page 4 says, "The
 [2] results from toxicology testing are useful to help
 [3] identify possible human health risks from Monsanto
 [4] chemicals. It's DMEH's job to interpret all the
 [5] relevant data. But it is the operating units' job to
 [6] manage the plants and businesses. And we can't make
 [7] good decisions on testing priorities without the
 [8] operating units' input.
 [9] "We struggled for a few years to establish
 [10] workable interfaces and communications, between DMEH
 [11] and operating units, especially the old MIC. With the
 [12] new corporate organization, and persistent effort, good
 [13] communications links, through the DEO now exist. Now
 [14] all the operating units have in place plans to fill
 [15] those important gaps in the data base that remain
 [16] open."
 [17] How did DMEH ultimately communicate with the
 [18] operating units?
 [19] A. Sent them reports of the results of the
 [20] studies.
 [21] Q. Were testing priorities established by the
 [22] Medical Department?

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[1] A. We would do that as the requests came from the
 [2] operating companies.
 [3] Q. So in conjunction with the operating units the
 [4] testing priorities were set?
 [5] A. Sure. And if we couldn't do them all we would
 [6] go back and negotiate which ones we would do next.
 [7] Q. Do you recall any issues that you had to work
 [8] out with the operating company to get workable
 [9] interfaces and communications?
 [10] A. No, it just took time.
 [11] Q. It was more establishing what needed to be
 [12] there?
 [13] A. Sure, having them understand what has to be
 [14] done.
 [15] Q. Okay.
 [16] A. And why we have got to do it differently and
 [17] that sort of thing.
 [18] Q. Were the interests of DMEH in terms of testing
 [19] priorities different from the interests of the
 [20] operating plants?
 [21] A. By and large, it has something to do with
 [22] acceptability. When they found out what we did was

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[1] almost invariably right, they didn't quarrel. When
 [2] they found it was easier than doing it themselves, we
 [3] monitored what was being done and assured them it was
 [4] being well done, then they were very happy to have us
 [5] do it.
 [6] Q. When you say to have us do it, was the idea
 [7] that the plants had the option to -
 [8] A. Not the plants.
 [9] Q. Who are you talking about then?
 [10] A. Talking about the operating companies.
 [11] Q. The operating companies, okay.
 [12] A. Yes.
 [13] Q. Was the idea that the operating companies
 [14] could do testing outside of DMEH?
 [15] A. Could operating companies?
 [16] Q. Yes.

[17] A. No.
 [18] Q. Okay.
 [19] A. We had to do it. We were recognized as being
 [20] the ones, we knew what the laboratories could provide
 [21] to us, and we learned if they didn't meet schedules and
 [22] all that kind of business.

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[1] So we did it and made them meet the schedules
 [2] of the operating companies.
 [3] Q. Did DMEH have a method for deciding to test,
 [4] and when I say test, I mean toxicology testing, on
 [5] chemicals even if the plant involved didn't request
 [6] testing?
 [7] A. Not plants, operating companies.
 [8] Q. The operating companies?
 [9] A. Yes.
 [10] Q. Let me make sure I understand this then. If
 [11] you had MIC down at Texas City -
 [12] A. MIC wasn't in Texas City, one of MIC's plants
 [13] was in Texas City.
 [14] Q. Okay.
 [15] A. The headquarters was in St. Louis.
 [16] Q. Would it be MIC's headquarters that would
 [17] request toxicology testing on a particular chemical?
 [18] A. No, they would tell us what they had to do,
 [19] and we would tell them what tests they need.
 [20] Q. They would be communicating the regulatory
 [21] demands and that kind of thing?
 [22] A. We knew the demands. It was their recognition

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[1] what they needed and they communicating to us and we
 [2] tell them that they are out of line on what terms,
 [3] needs to be done. We were the experts.
 [4] Q. Was it the operating company that was
 [5] communicating with the plant on this?
 [6] A. Yes.
 [7] Q. Or did the DMEH also work with the plants?
 [8] A. The plants weren't much interested in these
 [9] studies. These studies were being done to meet
 [10] requirements of EPA and whoever else.
 [11] Q. So it was much more of a headquarters concern?
 [12] A. Yes.
 [13] Q. Okay.
 [14] A. But we had no problem if Texas City called us
 [15] and asked about it, a study. We would tell them if we
 [16] knew it, we weren't trying to withhold it.
 [17] Q. Okay.
 [18] A. But they were too busy doing what they had to
 [19] do.
 [20] MS. WALSH: That is it for this exhibit.
 [21] Let's mark this as the next exhibit
 [22] (Deposition Exhibit 15 was marked for

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[1] identification.)
 [2] BY MS. WALSH:
 [3] Q. This is Exhibit 15, Dr. Roush. If you could
 [4] read through it.
 [5] My question is basically what was your
 [6] involvement in the issues that are described here, if
 [7] that helps you read it with an eye toward that.
 [8] (Witness examines document.)
 [9] THE WITNESS: CMA.
 [10] That's quite a statement.
 [11] BY MS. WALSH:
 [12] Q. You have read through Exhibit 15?
 [13] A. Yes.
 [14] Q. This is a June 30th, 1986 memo. The subject
 [15] is Monsanto Position Statement and Overview. One of
 [16] the recipients is listed as G. Roush. That is you,
 [17] right?
 [18] A. Yes.
 [19] Q. So you received a copy of this?
 [20] A. It says I did.
 [21] Q. Do you have any reason to think you didn't
 [22] receive it?

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[1] A. What?
 [2] Q. Do you have any reason to think you did not
 [3] receive a copy?
 [4] A. I have no reason, you know, I would assume I
 [5] got it.
 [6] Q. Do you recall -
 [7] MR. JONES: Off the record.
 [8] (Off-the-record discussion.)
 [9] BY MS. WALSH:
 [10] Q. Do you remember what the ECC Groundwater
 [11] Steering Committee is?
 [12] A. That was not a medical group.
 [13] Q. You weren't involved?
 [14] A. No.
 [15] Q. Do you remember having any involvement in
 [16] formulating this Monsanto Company groundwater position
 [17] statement?
 [18] A. No, I did not.
 [19] Q. You did not?
 [20] A. No.
 [21] Q. Do you recall whether you had any input on the
 [22] information that went into this groundwater overview

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[1] that is dated June, 1986, which is the third page of
 [2] the document?
 [3] A. No, I did not.
 [4] Q. Did you have any input in making the
 [5] determination of the impact on Monsanto of public and
 [6] governmental concern about groundwater quality?
 [7] A. No, I did not.
 [8] Q. Did you ever do any work that had to do with
 [9] legislation or regulation that related to groundwater?
 [10] A. No, I did not.
 [11] Q. On what is numbered page 4 of the memo there
 [12] is a heading that says Advocacy Groups. The first is
 [13] the National Groundwater Policy Forum. Did you ever do
 [14] any work for them?
 [15] A. No.
 [16] Q. Did you ever do any work that involved the
 [17] National Groundwater Policy Forum?
 [18] A. No. It says who it was, it was Fernandez and
 [19] Fierle.
 [20] Q. Did you ever do any work with the second group
 [21] listed, the National Environmental Development
 [22] Association?

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[1] A. No.
 [2] Q. We have discussed the next advocacy group,
 [3] which is Chemical Manufacturers Association. You
 [4] belong to CMA, right?
 [5] A. I didn't.
 [6] Q. Monsanto was a member?
 [7] A. Yes.
 [8] Q. You personally did some work with them, is
 [9] that correct?
 [10] A. No, some of our department did, toxicologists
 [11] did.
 [12] Q. Did you or anybody in your department do any
 [13] work with CMA that had to do with groundwater?
 [14] A. No, it wasn't our department.
 [15] Q. Okay.
 [16] A. It was someone else, but they were involved.
 [17] Q. So even your toxicologists wouldn't have done
 [18] any work with groundwater?
 [19] A. Unless they were asked to.
 [20] Q. Did you ever do any work with the National
 [21] Water Alliance?
 [22] A. No.

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[1] Q. How about the National Agricultural Chemists
 [2] Association?
 [3] I am still on page 5. At the last bullet,
 [4] paragraph.
 [5] A. Yes.
 [6] Q. Did you ever do any work with the National
 [7] Agricultural Chemists?

[8] A. We weren't members, our Ag' Company was
[9] involved.

[10] Q. So the Medical Department didn't have any
[11] involvement?

[12] A. No.

[13] Q. How about the Synthetic Organic Chemicals
[14] Manufacturers Association?

[15] A. No.

[16] Q. How about the National Wildlife Federation?

[17] A. No.

[18] Q. The Chemical Specialties Manufacturers
[19] Association?

[20] A. No.

[21] Q. So, and when I ask, I mean did you or anyone
[22] in your department?

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[1] A. That's right. That doesn't mean we didn't, we
[2] could have been involved by virtue of Ag' Company
[3] asking us to be, for instance.

[4] Q. I see. There is, the last page of the memo it
[5] talks about future plans. It says, "First we will
[6] continue to protect groundwater by adhering to our
[7] environmental guidelines for current operations and by
[8] responding to instances of serious past contamination
[9] through the ongoing groundwater assessment program."

[10] Did you or anybody in your department work on
[11] the ongoing groundwater assessment program?

[12] A. No.

[13] Q. "Secondly we will continue to try to steer
[14] this policy development along the lines of reason and
[15] effectiveness." And it talks about working on
[16] legislation that will affect groundwater policy.

[17] Did you or anybody in your department do any
[18] work with respect to that type of legislation?

[19] A. No.

[20] Q. Finally at the very bottom of the page it
[21] says, "The Corporate Environmental Policy Staff will
[22] continue to coordinate these efforts, but will solicit

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[1] the involvement of the various expertise resident
[2] throughout Monsanto as noted above."

[3] I know you said you don't have a recollection
[4] of being involved on the Corporate Environmental Policy
[5] Staff. Does this refresh your recollection about why
[6] you may have received this memo?

[7] A. No.

[8] Q. Do you know why you would have been copied on
[9] this memo?

[10] A. Because they weren't sure I shouldn't be.

[11] Q. Okay.

[12] A. This all could have changed since '88, of
[13] course.

[14] Q. In terms of the Medical Department's
[15] involvement?

[16] A. Work participation or other organizations may
[17] have gotten involved with it, you know, to improve it.

[18] Q. Okay.

[19] A. Obviously, their commitment to getting control
[20] over groundwater was there, and how they did it, I
[21] can't imagine them going four years without finding
[22] something they could have done better.

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[1] Q. Right.

[2] A. But I don't know.

[3] Q. Is your thought that, in saying that are you
[4] saying that perhaps the Medical Department -

[5] A. Not the Medical Department.

[6] Q. Just the company in general?

[7] A. Monsanto would.

[8] MS. WALSH: That is all I have. If you don't
[9] mind, why don't we take a five-minute break and I will
[10] go back through my notes and make sure I didn't leave
[11] anything out and get you out of here sooner.

[12] (Recess.)

[13] BY MS. WALSH:

[14] Q. I just have one more short series of questions

[15] for you, Dr. Roush. Before we talked about the
[16] education and training you received I want to make sure
[17] that I understand.

[18] And my question is, during your time at

[19] Monsanto did you develop any substantive expertise in
[20] environmental pollution cleanup?

[21] A. Did I?

[22] Q. Yes.

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[1] A. No.

[2] Q. Same time period. Did you develop any
[3] substantive expertise in waste incineration?

[4] A. No.

[5] Q. Same question with respect to landfills?

[6] A. No.

[7] Q. Same question with respect to soil and
[8] groundwater?

[9] A. No.

[10] Q. Same question with respect to pit
[11] construction?

[12] A. No.

[13] Q. Did you develop any substantive expertise with
[14] respect to the specifics of waste disposal methods?

[15] A. No.

[16] Q. Did you develop any substantive expertise with
[17] respect to how to deal with groundwater pollution?

[18] A. No.

[19] Q. Did you develop any substantive expertise with
[20] respect to how to deal with soil pollution?

[21] A. No.

[22] Q. Or soil contamination?

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[1] A. No.

[2] Q. Did you develop any substantive expertise in
[3] terms of the prevention of chemical releases?

[4] A. No.

[5] Q. Did you develop any substantive expertise with
[6] respect to the detection of chemical releases?

[7] A. No.

[8] Q. Did you develop any substantive expertise with
[9] respect to methods of pollution abatement or reduction?

[10] A. No.

[11] MS. WALSH: Those are all the questions I
[12] have. Thank you for your time. Mr. Jones may have
[13] some questions for you.

[14] MR. JONES: I have no questions.

[15] (Whereupon, the deposition was concluded at
[16] 5:50 p.m.).

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[1] ACKNOWLEDGMENT OF DEPONENT

[2] I, George Roush, Jr., M.D., hereby acknowledge that
[3] I have read and examined the foregoing pages of my
[4] deposition and that:

[5] (Check appropriate box.)

[6] () the same is a true, correct and complete
[7] transcription of the answers given by me to
[8] the questions therein recorded.

[9] () except for the changes noted in the attached

[10] Errata Sheet, the same is a true, correct and
[11] complete transcription of the answers given
[12] by me to the questions therein recorded.

[13] Date

[14] Signature of Witness

[15] Subscribed to and sworn before me.

[16] this day of , 19

[17]

[18] Notary public in and for the

[19] My commission expires:

[20]

[21]

[22]

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[1] Certificate of Reporter)

[2] United States of America) ss.

[3] District of Columbia)

[4] I, CRAIG L. KNOWLES, the officer before whom

[5] the foregoing deposition was taken, do hereby certify

[6] that the witness whose testimony appears in the

[7] foregoing deposition was duly sworn by me; that the

[8] testimony of said witness was taken by me to the best

[9] of my ability and thereafter reduced to print under my

[10] direction; that I am neither counsel for, related to,

[11] nor employed by any of the parties to the action in

[12] which this deposition was taken and, further, that I am

[13] neither a relative nor an employee of any attorney or

[14] counsel employed by the parties thereto nor financially

[15] or otherwise interested in the outcome of this action.

[16] Witness my hand this 19th day of February, 1993.

[17]

[18] Notary Public in and for

[19] the District of Columbia.

[20] My Commission Expires October 31, 1994:

[21]

[22]

Look-See Concordance
Report

2,383 UNIQUE WORDS
386 NOISE WORDS
35,774 TOTAL WORDS

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JUL 08 1993

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