

IN THE UNITED STATES DISTRICT COURT FOR THE
EASTERN DISTRICT OF LOUISIANA

JO ANN BISHOP, ET AL,
Plaintiffs,

vs.

Case No.:07-2832

SHELL OIL CO., ET AL,
Defendants.

VIDEOTAPED DEPOSITION of **KENNETH MUNDT, PH.D.**,
held on June 29, 2009, at 161 Devonshire Street, Boston,
Massachusetts, commencing at 3:00 p.m., before Maryellen
Coughlin, Court Reporter and Notary Public in and for the
State of Massachusetts.

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VIDEOGRAPHER: Patrick Battle

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Federal Register Volume 52 No. 176

K. MUNDT, PH.D.

VIDEOTAPED DEPOSITION OF

KENNETH A. MUNDT, PH.D.

JUNE 29, 2009

THE VIDEOGRAPHER: The videotape recording has commenced, and we are now on the record.

Today is June 29th, 2009. The time is approximately 3:11 p.m. My name is Patrick Battle, and I'm the legal video specialist for Accurate Court Reporting, Inc. whose business address is 24650 Sandhill Boulevard, Suite 401, Punta Gorda, Florida, 33983.

This is the deposition of Kenneth Mundt, M.D. in the matter of Jo Ann Bishop versus Shell Oil Company, et al., Case No. 07-2832 in the United States District Court, Eastern District of Louisiana.

This deposition is being taken at the Club Quarters, 161 Devonshire Street, Boston Massachusetts, 02110. The court reporter is Maryellen Coughlin.

Will counsel please identify yourselves for the record stating your name,

K. MUNDT, PH.D.

address and you who represent.

MR. WILLIAMS: Eric Williams and
Rick Fernandez, 34 35th Street, Suite B,
Metairie, Louisiana 70005 for the plaintiffs.

MR. BEZET: This is Gary Bezet, Post
Office Box 3513, Baton Rouge, Louisiana,
70821 for the defendant Shell Oil Company,
Marathon Oil Company and El Paso.

MR. CHOCHÉLES: Chris Chocheles --

MR. AUBRY: Tom Aubry in Houston,
Texas for Radiator Specialty.

MR. CHOCHÉLES: Chris Chocheles, 909
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MR. PERRY: Stan Perry for Shell
1221 McKinney Street, Suite 2100, Houston,
Texas, 77010.

THE VIDEOGRAPHER: The notary public
and court reporter will stenographically
record the testimony today. At this time
will the reporter please swear in the
witness.

THEREUPON,

KENNETH A. MUNDT, Ph.D.,
having been first duly sworn, was examined

K. MUNDT, PH.D.

and testified as follows:

THE VIDEOGRAPHER: Thank you.

Counsel, please proceed.

MR. WILLIAMS: Are we ready?

THE COURT REPORTER: Yes.

EXAMINATION

BY-MR. WILLIAMS:

Q. Good evening. Dr. Mundt, could you please state your full name and address for the record?

A. Yes, sir, Kenneth Arthur Mundt, 260 Lincoln Avenue, Amherst, Massachusetts.

Q. Okay. And what's your date of birth, sir?

A. December 27, 1959.

Q. And what degrees have you earned thus far?

A. I earned a bachelor's degree from Dartmouth College, a master's degree from University of Virginia, another master's degree from the University of Massachusetts, and a Ph.D. from the University of North Carolina Chapel Hill.

Q. And can you tell me what's the year

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and the major for each degree that you have received?

A. My college degree I majored in English. My first master's degree was in English literature composition; my second master's degree was in epidemiology; and my Ph.D. was in epidemiology.

Q. Doctor, did you receive a notice for this deposition?

A. Yes, sir.

Q. Okay. And do you have that with you?

A. I do.

Q. Okay. I would like to mark that as Exhibit-1.

(Whereupon, Exhibit-1 was marked for identification.)

BY-MR.WILLIAMS:

Q. Doctor, what did you bring in response to the deposition notice?

A. Well, if I may refer to the request. I brought as many of the items that I have available on that list.

Q. Okay, let's go one by one. Tell me

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1
2 for the first item.

3 A. Yes. No. 1, I have a listing of
4 all the documents that were provided to me,
5 which essentially is the log index that my
6 staff uses to track materials as they come
7 into our office.

8 I did not bring copies of those
9 documents, those are quite voluminous, but
10 they all are available should you need any
11 one of them.

12 No. 2, I had no exhibits to my
13 expert report. No. 3, I brought a file
14 containing all of the scientific literature
15 that I've relied upon, as well as other
16 published materials, all of those. In fact,
17 all of the materials that I brought are
18 contained on a DVD that I have here with me.

19 Q. All right.

20 A. I have brought a list of all cases
21 that I've testified in I believe in the last
22 five years, which I have maintained for cases
23 in general.

24 I do not have an itemized statement
25 of the time spent, but I did an inquiry of

1 our accounting system and determined the
2 number of hours and the amount that has been
3 charged against this case as of about 10
4 days.

5
6 I interpret No. 6 as synonymous with
7 No. 3, a listing of all the materials I rely
8 upon.

9 No. 7, my file is essentially all
10 the materials we're discussing, but I have
11 additionally an electronic document which
12 summarizes the numerical results of the
13 epidemiological studies I rely upon.

14 I have also a folder containing
15 communications between me and the attorneys
16 in this case on this DVD.

17 I don't have any college or graduate
18 transcripts. I don't have any documents
19 satisfying No. 10 or 11.

20 I did bring copies of all expert
21 reports provide in multiple myeloma cases,
22 and they are two cases, including this one.

23 And as far as a list of all cases I
24 have served as expert witness involving
25 multiple myeloma, are these same two cases,

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plus one case that I testified in at a trial 10 or 12 years ago that I don't recall the name specifically, but I could research that if it were important, for which there was no report or deposition.

Q. Anything else, Doctor?

A. Oh, yes, sir, I have a volume that I received just the other day which is Dr. Infante's deposition and Exhibits-1 through 27. This is contained in a single three-ring binder.

And I have the volume from the Annals of the New York Academy of Science that contains Dr. Infante's publication entitled, "Benzene Exposure and Multiple Myeloma."

Q. Anything else?

A. That's it.

Q. Okay. If I understood you correctly, you have a list of the documents that came in the office. We'll mark that as No. 2.

A. Everything is on a DVD.

Q. All those items are on a DVD?

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A. Yes, sir.

Q. Are they all on one DVD?

A. Yes, sir.

Q. Oh, fair enough, then. We'll mark that DVD for everything that he's just talked about as No. 2.

(Whereupon, Exhibit-2 was marked for identification.)

BY-MR.WILLIAMS:

Q. Dr. Mundt, where do you work currently?

A. I'm employed full-time by Environ International Corporation. I'm based --

Q. How long have you been at that company?

A. I'm based in the Amherst, Massachusetts office.

Q. And how long have you been with Enviro International?

A. Since November of 2003.

Q. Okay. And where did you work before that?

A. I was employed by Applied Epidemiology, Incorporated in Amherst,

Massachusetts.

Q. Okay. What time period did you work there?

A. Roughly 2000 until -- I'm sorry, I worked there full time roughly from 2000 until, until I joined Environ in 2003. I worked part-time with Applied Epidemiology since 1991, I believe.

Q. Okay. What year did you get your master's in epidemiology?

A. I believe that was in 1986.

Q. Doctor, how old are you?

A. I'm almost 50.

Q. Almost what?

A. 50.

Q. 60, okay.

A. No, 5-0, 50.

Q. 5-0, okay. I don't want to make you older. What year did you get your Ph.D., sir?

A. 1989.

Q. Okay. Where did you work prior to Applied Epidemiology?

A. I was for 10 years on the faculty

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of the School of Public Health, University of
Massachusetts, Amherst.

Q. And were you a full-time professor?

A. Yes, I was.

Q. Okay. And what is your current
title where you're at now?

A. I'm a principal in the firm, and I'm
the director of epidemiology.

Q. Okay. What percentage of your work
involves litigation?

A. It varies from month to month, but I
would say probably 40 percent of my work in
the last half year has been litigation
related.

Q. Okay. And how many cases involve
chemicals with causation issues?

A. Most of them do.

Q. Okay. Have you ever served as an
expert for a plaintiff in a chemical cancer
case?

A. Yes, I have.

Q. Okay. Have you ever found that a
chemical caused a plaintiff's disease?

A. Yes, I have.

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Q. Okay. How about benzene?

A. No, sir. I've not served in a benzene case on behalf of a plaintiff.

Q. You have not?

A. That's correct.

Q. Okay. What case -- what type of case did you serve for the plaintiffs?

A. The specific one I was referring to -- I've served on, on more than that, but the one I was specifically referring to had to do with a skin sensitization agent, a contact exposure resulting in an extreme allergic reaction.

Q. Okay. Did you ever serve a plaintiff where the plaintiff was alleging exposure which caused a cancer?

A. No, sir.

Q. Earlier you brought up the cases of multiple myeloma. In how many cases have you served as an expert regarding multiple myeloma?

A. Three.

Q. And was benzene the substance that was alleged to be the cause for all three?

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A. In two of the three.

Q. Okay. And what was the one that you testified in 10 to 12 years ago, what chemical did that involve?

A. That involved herbicides.

Q. Herbicide. And, Doctor, you're not a medical doctor, correct?

A. That is correct.

Q. And you're not a toxicologist?

A. That's correct.

Q. And you're not board certified in occupational medicine?

A. Correct.

Q. Industrial hygiene?

A. Correct.

Q. But you can offer opinions at trial in any of these fields?

A. Well, as an epidemiologist, I'm well familiar with aspects of industrial hygiene, toxicology and occupational medicine, since epidemiology falls in the middle of these disciplines, but I don't put myself forward as an expert on those. I defer to the actual experts in those areas.

1
2 Q. Okay. Doctor, can benzene cause
3 blood malignancies?

4 A. Yes, I believe so, under certain
5 circumstances.

6 Q. Can benzene cause myelodysplastic
7 syndrome?

8 A. I've not researched that specifically
9 for purposes of causation. I understand that
10 there's evidence supportive of that
11 conclusion.

12 Q. What about AML leukemia?

13 A. Similarly. I think that that,
14 however, has stronger evidence support of a
15 causal association in adequately high doses
16 of exposure.

17 Q. What about CLL leukemia?

18 A. I don't believe that the evidence is
19 sufficient to draw a causal conclusion for
20 CLL.

21 Q. ALL?

22 A. I've not looked at that specifically.

23 Q. Okay. What about non-Hodgkin's
24 lymphoma?

25 A. I believe that the evidence is

insufficient to draw that causal conclusion.

Q. Myelofibrosis?

A. I've not looked at that.

Q. Okay. Would you have an opinion one way or the other with myelofibrosis?

MR. PERRY: Object to form.

A. Not unless I researched it.

Q. Okay. What about CML leukemia?

A. I have not looked at CML that I recall.

Q. Okay. Earlier I asked you if benzene could cause blood malignancies. Are you aware of any other blood malignancies that benzene may cause?

A. I'm aware that there is one that is generally substantiated by the scientific literature, and that was AML.

Q. Okay. Can benzene cause any other type of blood disorder?

A. Yes, there are all sorts of blood dyscrasias that benzene may be able -- capable of inducing.

Q. Can you name some types?

A. Well, I'm thinking of aplastic

1
2 anemias, for example. This is not my area
3 of expertise, and I've not looked into it,
4 but I'm aware that there are concerns
5 associated with benzene poisoning and the
6 affects on the blood system.

7 Q. Okay. Is benzene a known human
8 carcinogen?

9 A. Benzene has been classified as a
10 known human carcinogen, and I'm aware that
11 the literature pertaining to exposures to
12 high-level benzene and AML is reasonable for
13 drawing a causal conclusion.

14 Q. Doctor, what is your definition of
15 association? And when I say association, a
16 chemical associated with a certain disease?

17 A. Yes, it's a term that we use
18 somewhat loosely epidemiologically, but what
19 it essentially means is that there's some
20 correlation statistically between some measured
21 risk factor or exposure and the rate or
22 occurrence of that disease. It's a starting
23 point for a --

24 Q. Would association mean risk factor to
25 you?

1
2 A. There's a good deal of overlap. I
3 think that we use the term risk factor when
4 we see an association because we don't know
5 much more than that, that it's a, let's say
6 it's a possible risk factor, something that
7 correlates with in certain studies an
8 increased occurrence of the disease. It
9 doesn't necessarily imply a causal
10 relationship, but certainly suggests a
11 statistical association.

12 Q. Okay. Doctor, if a study in the
13 peer-reviewed literature shows that there is
14 a 2.0 greater -- or greater relative risk
15 with a confidence interval above a 1, would
16 you call that an association with a disease
17 and a chemical?

18 A. Well, some of that's not necessary
19 to identify an association. The first step
20 is to evaluate what you called correctly the
21 relative risk. And if the relative risk is
22 different from 1, then you could then say
23 there is evidence of an association. It
24 could be above 1 where it's positively
25 associated. It could be less than 1 where

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1
2 it's negatively associated. Whether or not
3 that association is statistically significant
4 is a second level of evaluation.

5 Q. Okay. And my question is, if a
6 chemical we're dealing with has a relative
7 risk above a 2.0 with a greater than a 1.0
8 confidence interval, is that an assoc -- does
9 that rise to the level of an association or
10 a risk factor in your opinion?

11 MR. PERRY: Object to the form.

12 A. Well, it's a bit vague because
13 chemicals don't have relative risks. It's a
14 constructive and epidemiological study where
15 risks of persons with a certain exposure
16 group are compared with risks of persons in
17 another exposure group, and it describes the
18 relationship between those.

19 Q. Correct, Doctor. I'm aware that
20 chemicals don't have risks. I'm trying to
21 give you an example to see if you can answer
22 my question. Let me try a little, a little
23 different approach.

24 There are studies that show a 2.0 or
25 greater relative risk with a higher than a 1

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confidence interval for benzene exposure in multiple myeloma. Does that rise to the level of association for you, Doctor?

A. Well, I guess I don't understand the terminology you're using "rising to the level of association" when I in my earlier answer described to you that a departure from a relative risk of 1 suggests an association.

Q. Okay. So does the Infante meta analysis demonstrate an association for benzene and multiple myeloma to you, Doctor?

A. Well, I think all of these questions prior to this point were abstract. We're talking about epidemiological methods. Something that you've jumped over is what is the validity of the study that generated that result.

We can have a statistically significant finding in any number of studies that might have resulted from errors in study design or execution, so perhaps you could make it a hypothetical that I could answer.

Q. Well, I gave you a question. Does that -- do the results of the Infante 2006

1 meta analysis demonstrate an association with
2 benzene in most myeloma to you, Doctor?

3 A. Well, again, I don't know what you
4 mean in the terminology "demonstrating an
5 association." He derives based on the
6 selected studies he chose and the data he
7 selects from those studies to combine, they
8 demonstrate that, that there is a statistical
9 correlation that one could describe as an
10 association. Not to say --

11 Q. Okay. Thank you, Doctor.

12 A. -- whether it's valid or not. That's
13 a separate question.

14 Q. Okay. Doctor, was that study done
15 by Mr. -- Dr. Infante in 2006 peer reviewed?

16 A. First of all, it's not a primary
17 study. It is a pooling of some results from
18 several other studies. So I just want to
19 make sure that we differentiate a primary
20 epidemiologically study from let's say a
21 review or some other combination of existing
22 data from other studies.

23 Q. Is that your definition of meta
24 analysis, a review?
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A. I didn't say that.

Q. Okay. And I didn't say primary study, so. I asked you if the meta analysis done by Dr. Infante was peer reviewed, Doctor.

A. My understanding is that it had been reviewed by others. I don't know the mechanism that was used for that peer review. In other words, I don't know that it was blindly sent to experts in the field for their evaluation as one would do typically for a peer-reviewed medical journal.

Q. Do you know what journal that article was published in, Doctor?

A. It was published as a volume, as a conference proceedings by the Annals of the New York Academy of Science.

Q. Is that a reputable journal, Doctor?

A. Well, it's a reputable organization. The organization is highly regarded. I myself have been a member for years.

Q. Have you ever tried to contact that organization to see whether or not the article was peer reviewed?

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1
2 A. Actually, no. I think that's a
3 great idea, however. It would be informative
4 to know who in fact reviewed it and what
5 their criticisms might have been.

6 Q. Well, we actually did that, Doctor.
7 We verified it through an affidavit from the
8 editor but in any event.

9 How many cases have you worked on
10 dealing with blood malignancies, Doctor?

11 MR. BEZET: Excuse me, Gary Bezet,
12 object to the form of the question. Go
13 ahead.

14 A. I've probably worked on somewhere
15 between 8 and 12.

16 Q. I'm listening, Doctor. I didn't
17 quite hear you.

18 A. I'm sorry, I'll repeat my answer.
19 I've worked on somewhere between 8 and 12.

20 Q. Okay. And what was your first
21 benzene blood malignancy case that you worked
22 on, Doctor?

23 A. You know, I don't recall offhand.

24 Q. Well, let me ask you this. When
25 did you start serving as an expert witness?

1
2 A. The first case I served as an expert
3 witness in was that Rhode Island case 10 or
4 12 years ago.

5 Q. So somewhere around 1997?

6 A. You know, I don't really recall the
7 year. It was a number of years after that
8 that I worked on my next case as an expert.

9 Q. Okay. Doctor, how many blood
10 malignancy cases did you find that the
11 benzene exposure was because of the
12 individual's disease?

13 A. Well, I don't recall any cases in
14 which I found that the epidemiological
15 evidence was supportive of a causal
16 conclusion.

17 Q. Okay. How many cases have you
18 served as an expert witness in your entire
19 career?

20 A. I don't know. I've got my list
21 from the last five years, and it looks like
22 about 30.

23 Q. 30 for the last five years? Is
24 that correct, Doctor.

25 A. It looks like 26 or 7, yes. I

1
2 tried to quickly count. There's not quite
3 30, yes.

4 Q. In any of those cases did you find
5 that the chemical at issue was the cause of
6 the plaintiff's disease?

7 MR. CHOCHULES: Objection, asked and
8 answered.

9 Q. Go ahead, Doctor.

10 A. These are cases that I have
11 testified in, and the specific conclusions in
12 these cases in which I have testified I have
13 not testified that the alleged exposure
14 indeed caused the disease.

15 Q. Okay. Doctor, how many hours did
16 you put in the Bishop case to do your
17 general causation analysis?

18 A. I'm not sure that I could break it
19 out that specifically. I can tell you
20 overall I've invested about 60 hours of my
21 time as of about 10 days ago.

22 Q. Okay. And how many hours did you
23 spend prior to or up until the completion of
24 your expert report?

25 A. I don't have it broken out that way.

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Q. Okay. Do you know how many hours it took you to do your report?

A. No, sir.

Q. Are you familiar with the Ben Brown case, Doctor?

A. Yes, I am.

Q. Do you know how many hours it took you to complete your expert report in that case?

MR. PERRY: Object to form.

A. I didn't look that up, no, sir.

Q. Okay. Okay. Have you ever been limited or excluded by a court of law?

A. Not that I'm aware of.

Q. Has anyone filed a Dolbear motion against you besides this case?

A. No that I'm aware of.

Q. Have you ever published a study on benzene and multiple myeloma?

A. No, sir.

Q. Have you ever published a study -- and when I say study, I mean epidemiological study -- on benzene or any other blood malignancy?

1
2 A. I wouldn't consider benzene a blood
3 malignancy but. Maybe you could rephrase
4 that.

5 Q. Yes, have you ever published a study
6 involving benzene and a blood malignancy?

7 A. I see. Not specifically, no.

8 Q. Doctor, do you know the criteria,
9 IARC uses to classify chemicals as
10 carcinogens?

11 A. Yes, I do.

12 Q. Can you tell me what criteria they
13 look at?

14 A. Sure. First of all, it's based
15 entirely on published peer-reviewed scientific
16 evidence divided into three committees.
17 There's the epidemiology committee. There's
18 an animal studies committee. There's a
19 mechanism committee. There's also often an
20 exposure committee that helps the other
21 committees understand the relationship between
22 the exposures and the cancers at issue.

23 These committees review their
24 respective areas of expertise and as
25 comprehensively as possible the available

1 literature and formulate a preliminary opinion
2 as to whether that evidence is sufficient in
3 terms of quantity and quality and in terms
4 of strength of finding and consistency of
5 finding in order to render an opinion on
6 causation.
7

8 This then is folded together in a
9 plenary session where each committee offers
10 their perspectives, and an overall evaluation
11 is derived at that time.

12 Q. Doctor, have you ever served on any
13 of those panels for IARC?

14 A. Yes, sir.

15 Q. What chemicals are we talking about?

16 A. Titanium dioxide, carbon black, talc,
17 painting, firefighting and shift work. I
18 understand those are not chemicals, but those
19 were the topics for the IARC evaluations.

20 Q. And did the evaluation conclude that
21 any of those chemicals or substances were
22 carcinogenic to man?

23 A. Yes, sir. Of those I believe
24 painting was the only one that received a
25 Group 1 classification that is known human

1
2 carcinogen.

3 Q. And which one did you say? You're
4 fading in and out sometimes.

5 A. Painting.

6 Q. Painting?

7 A. Yes, sir.

8 Q. Okay.

9 MR. AUBRY: Eric, let me interrupt
10 for a second. Is it possible to move the
11 phone closer to Dr. Mundt, 'cause you're
12 having trouble hearing him, and he's a little
13 faint for me as well.

14 Doctor, can you do that?

15 THE WITNESS: We can try.

16 **(Whereupon, Discussion off the**
17 **record.)**

18 **BY-MR. WILLIAMS:**

19 Q. Doctor, are you there?

20 A. I'm still here.

21 Q. Okay, great. Earlier we were
22 talking about the procedure IARC uses. Do
23 you know if there are any epidemiological
24 studies that show an association between
25 benzene and multiple myeloma?

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A. Yes, there are.

Q. Okay. Do you know if there are any animal studies that show a relationship between lymphomas and benzene?

A. I've not looked at the toxicology. I'm an epidemiologist.

Q. Okay. And what about mechanism studies, are there any mechanism studies that would show a relationship between benzene and the blood, such as lymphocytes?

A. I've not looked at that either, and that's not my area of expertise.

Q. Fair enough. Doctor, did you look at the material safety data sheets in this case?

A. I'm not aware of any, no.

Q. Okay. Can you tell me how many studies you need to form an opinion? And let me rephrase. How many statistically significant studies one needs to form an opinion that a substance is capable of causing a disease?

A. I think that that's not answerable. I think that determining causation is much

more complicated than adding up numbers of statistically significant studies.

Statistically significant studies can be invalid, and it doesn't matter how many you have. So I think that we would have to describe more completely what that process is and how causation is determined.

Q. Well, Doctor, as an epidemiologist, can you tell me if a negative study proves that a chemical cannot cause a disease?

A. My opinion is that a single study is not adequate for making a causal determination one way or the other.

Q. But does a negative study disprove a causal relationship between a chemical and a disease?

A. It doesn't boil down to a single study proving or disproving but rather a critical evaluation of the entire body of literature and a weighting of the evidence, including positive and negative studies, looking at the relative weights and quality weights -- by weight I mean size -- quality of methods used and whether that body of

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literature consistently supports the association under different circumstances and in different populations.

Q. Doctor, are you familiar with the reference done on epidemiology out of the Judicial Reference Manual?

A. Yes, I've seen it sometime ago.

Q. Do you know how many studies that reference says that one needs to conclude that an agent is more likely the cause of a disease?

A. I don't, but I also don't consider that a scientific document. It's a judicial document. It's a guidance for non-scientists.

Q. You don't consider the methodology in the reference guide on epidemiology adequate for this type of work?

MR. PERRY: Object to form.

A. I wouldn't teach a course on epidemiological evaluation of causation using it as a textbook.

Q. Okay. Do you know who authored the reference guide on epidemiology?

1
2 A. I do believe I know one or more of
3 the authors. I can't recall them right now.

4 Q. Okay. Do you agree or disagree with
5 the methodology contained in that reference?

6 A. If depends on which methodology. I
7 think some of it's pretty good for a lay
8 accessible document. Some of it I think is
9 -- has been oversimplified, probably
10 necessarily, for its intended use.

11 Q. Does an expert need epidemiological
12 studies to render an opinion as to causation?

13 MR. PERRY: Object to form.

14 A. Well, certainly the preferred body of
15 evidence would derive from human studies
16 because human studies are by far the most
17 relevant.

18 There are examples where human
19 evidence is lacking and where a causal
20 determination was made because of the, I
21 think good understanding of the mechanism in
22 humans. It may be more experimentally than
23 epidemiologically or observationally. But I
24 think that most of the organizations, bodies,
25 authoritative bodies that determine causation

1
2 rely heavily upon and prefer human evidence
3 primarily.

4 Q. Did you review -- let me rephrase
5 it.

6 Are you aware of the mechanism
7 studies relating to benzene exposure?

8 A. I think earlier I indicated that was
9 not my area of expertise. I'm not --

10 Q. I thought that's what you said. I
11 was just curious why you were bringing that
12 up.

13 So is it your opinion that sometimes
14 mechanism studies can be substituted for
15 epidemiological studies?

16 A. Well, if you understand the process
17 that IARC uses, there can be, on the basis
18 of animal studies combined with good
19 mechanistic understanding, a promotion of a
20 substance, a chemical to a Group 1 carcinogen
21 absent good epidemiologic studies. It is
22 possible.

23 Q. Okay. Doctor, what's general
24 causation?

25 A. In my opinion, general causation is

1 the ability of a substance, say, it doesn't
2 have to be a chemical in order to determine
3 causation or risk, but let's say stick to a
4 chemical agent. It's the ability of that
5 chemical to cause a specific disease, let's
6 say a cancer or any cancer, under any
7 circumstances.
8

9 Q. And can you define specific
10 causation, Doctor?

11 A. Yes, in my opinion, specific
12 causation pertains to an individual and
13 whether an individual's disease can
14 specifically be attributed to a specific
15 exposure.

16 Q. Okay. Doctor, did you disagree with
17 the results of the studies that Dr. Infante
18 relied on in his report?

19 A. Well, just to be clear, there are
20 the results of the studies that Dr. Infante
21 relied on in his expert report --

22 Q. Yes, sir.

23 A. -- there are the results of the
24 studies Dr. Infante relied upon in his meta
25 analyst, and there are the results of the

1 studies that he derived from those studies
2 for his meta analysis, so we've got three
3 universes of results. Which one are you
4 referring to?

5 Q. His expert report?

6 A. And the question is, do I disagree
7 with the results of these studies?

8 Q. Yes.

9 A. Well, I think that's -- we'd have to
10 take those individually. First of all,
11 results are results, and if the studies are
12 well conducted, then they're open to
13 interpretation and discussion, and
14 epidemiologically that's what we spend a lot
15 of our time doing, is understanding whether
16 results that we generate or someone else
17 generates has use or meaning in understanding
18 causes of disease.

19 Q. All right. And, Doctor, my question
20 is, did Dr. Infante rely on epidemiological
21 studies that show a statistical significant
22 result for benzene and multiple myeloma?

23 A. Actually, no, there aren't so many
24 of those available.
25

1
2 Q. There aren't so many. I said did
3 he rely on any.

4 A. Yes, I believe he relied on Rinsky
5 87 that shows statistically significant
6 association.

7 Q. Did Kirkeleit show a statistically
8 significant association?

9 A. Yes. I didn't mean to say Rinsky
10 was the only one. I was just giving you an
11 example of one.

12 Q. Right.

13 A. Kirkeleit is another, yes.

14 Q. That's why I asked you generically
15 did he rely on studies that show a
16 statistically significant relationship between
17 benzene and multiple myeloma.

18 A. Well, yeah, that was your original
19 question, but let's take Kirkeleit. For
20 example, he relies on one of the many
21 results from that study, but he appears not
22 to rely on the rest of the study. What he
23 relies on specifically is the statistically
24 significant association they report.

25 Q. All right. Doctor, what are the

known causes of multiple myeloma?

A. I'm not sure that there are known causes. There are certainly some risk factors that are suspected. For instance, ionizing radiation.

Q. Anything else?

A. I think that there -- excuse me, there's been a interruption.

(Interruption.)

A. Okay. Sorry. There are other characteristics, attributes of individuals that appear to place them at increased risk for multiple myeloma. Age, of course, is clearly one, being of white race another, possibly other individual characteristics, but as far as environmental or what we consider preventable risk factors, I don't think that any rise to the level of known causes.

Q. Doctor, what caused Mr. Bishop's multiple myeloma?

A. I don't know. I don't know that it can be known at this point in our understanding of the disease.

Q. Doctor, you're not going to try to

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1
2 give any opinions at trial as to the levels
3 of exposure Mr. Bishop sustained from
4 benzene?

5 A. I will not be speculating on his
6 exposure levels to benzene.

7 Q. Do you know if pipe fitters were
8 exposed to high level of benzene in the
9 '70s?

10 MR. PERRY: Object to form.

11 A. This is a very broad category of
12 occupation, and so I would expect that some
13 proportion of pipe fitters might be. I
14 would expect others never were.

15 Q. Do you know the exposure pathways a
16 pipe fitter would encounter?

17 A. Yeah, I presume, as with any
18 chemical exposure that is volatile, it could
19 be ingested, it could be inhaled, it could
20 be contacted with the skin.

21 Q. Okay. Doctor, if a chemical can
22 cause one cancer, is it capable of causing
23 others?

24 MR. PERRY: Object to form.

25 A. No, not necessarily. There appears

1 to be a great specificity in the
2 relationships between exposures and -- or
3 carcinogens and the cancers they cause.

4 Q. Is benzene contained in gasoline,
5 Doctor?

6 A. I believe there are small quantities
7 of benzene in gasoline products.

8 Q. What about crude oil?

9 A. I believe there's some, again, small
10 quantities in crude oil and --

11 Q. Is it contained in Pyrolysis Gas?

12 A. I'm sorry, I didn't hear the
13 beginning of your question.

14 Q. Is benzene contained in Pyrolysis
15 Gas?

16 A. I'm not sure.

17 Q. Do you know if Pyrolysis Gas is an
18 issue in this case?

19 A. I don't frankly know what that is.

20 Q. Do peak exposures play a role in
21 development of blood disorders, Doctor?

22 MR. PERRY: Object to form.

23 A. You need to define peak exposures,
24 but if you rely on how I would describe a
25

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peak exposure, as some unusually high exposure sustained over hopefully a short period of time, I think there is some evidence that those may be more harmful than, say, that same quantity of exposure stretched out over long periods of time.

Q. Okay. Doctor, would you say all studies contain some type of flaw or imperfection?

A. Well, in ours, observational science is -- you're talking about epidemiological studies I presume.

Q. Yes, sir.

A. Because they're observational studies, they are inherently subject to various forms of error, and that the real art of epidemiology is to anticipate and prevent those from occurring thereby increasing the quality and the validity of the results of the study.

Q. Okay. Doctor, do you know the minimum benzene exposure level that is required to cause a blood malignancy or blood disorder?

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A. I do not, no.

Q. Okay. Would that be something that epidemiologists keep up with?

A. Well, I'm sure there are epidemiologists who specialize in that area that would know that area well.

Q. Okay. Doctor, do any of the studies Dr. Infante rely on contain a dose response for benzene and multiple myeloma?

A. Is your question do any of the studies demonstrate a dose response.

Q. Yes.

A. I don't think there are any that clearly do so, no.

Q. Are there any that show any type of dose response relationship?

A. Well, there's some, you know, irregular dose response. For example, Collins has a study where he looks at different levels of exposure, and it turns out that the category with the highest exposure also has the highest SMR. It's not statistically significant, but I'm sure there are people who would look at that and say

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1 this appears to be a, a dose response
2 relationship, that is an increasing strength
3 of association with increasing exposure level,
4 but that's fairly weak.

5
6 Q. Does the 1987 Rinsky study show a
7 dose response for benzene in multiple
8 myeloma?

9 A. It can't. There's only four cases,
10 and you really need to have decent -- I
11 don't even think that the Collins had enough.
12 It wasn't much bigger than that. But you
13 need a good estimate of the risk at each of
14 the exposure levels in order to have any
15 confidence in the relationship between those
16 or across those categories of exposure.

17 Q. Doctor, are you familiar with the
18 1987 OSHA final benzene standard?

19 A. Yes, I am.

20 Q. Okay. And do you know if they used
21 the Rinsky study in that final benzene
22 standard?

23 A. Yeah, I think that actually must
24 have been the impetus for that. It came out
25 around the same time.

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Q. All right. And was the dose response relationship between benzene and multiple myeloma discussed in that OSHA final rule?

A. I really don't know. I doubt it. I don't think there was a dose response relationship demonstrated in Rinsky.

Q. Do you know if OSHA states in that rule whether or not there is sufficient epidemiological evidence to demonstrate a causal relationship between benzene and multiple myeloma?

A. I'd have to look at the specific document to see if it used those terms, but I do understand that at that time they believed that benzene causes multiple myeloma.

Q. And do you know which studies OSHA used as a basis for that opinion?

A. Well, they do, they do list the studies including, you know, Decoufle and even Aksoy, which wasn't an epidemiologic study, so I'm not sure that that's an accurate representation, but they are listed in the document.

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1
2 Q. Okay. Do you know any other studies
3 that they listed as references for their
4 opinion?

5 A. Ah --

6 Q. No, okay.

7 A. It's just a matter of looking at
8 that document. I don't --

9 Q. Do you have that document handy,
10 Doctor?

11 A. I think there were -- I do. I do
12 have it here.

13 Q. Why don't you pull it out, Doctor.
14 Turn to page 34779.

15 A. I actually recall it was an exhibit
16 to Dr. Infante's deposition which is in front
17 of me. Okay, 34489.

18 Q. 34779.

19 A. 3479. I have it, yes.

20 Q. Okay.

21 A. Okay, I see the studies here, the
22 middle of the, the bottom of the middle
23 column.

24 Q. Why don't you read what OSHA says.
25 "Epidemiological studies demonstrate," start

there.

A. "Epidemiologic studies demonstrate that benzene can cause leukemia, multiple myeloma and perhaps other hemopoietic and lymphatic cancers. Aplastic anemia and several other blood diseases are also known to be caused by benzene exposure. Observations related to the above findings have been demonstrated by a number of high quality epidemiologic studies and case reports, such as those by Rinsky, Wong, Ott, Decoufle, Infante, Aksoy, Vigliani and others."

Q. Okay. My question is, do you disagree with OSHA's statement that those were high quality studies?

A. Well, there are a couple problems with this. I do disagree specifically with these being necessarily good epidemiological studies, although that's not exactly what it says. It lumps a lot of things together, so the language is not really scientifically specific.

It's talking about many disease

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entities, and it's talking about many studies, so we'd have to talk about each one individually for me to decide whether that was a high quality epidemiologic study, whether or not OSHA believed that it was a high quality study of any sort.

Q. All right. Doctor, do you believe benzene can cause multiple myeloma under any circumstances?

A. I don't think that the epidemiological evidence available to us to date can support that conclusion.

Q. Okay. Doctor, do you believe that concealment of data would under report the incidence of myeloma in the public domain?

MR. PERRY: Object to form.

A. That's pretty vague. I don't know what you're asking.

Q. Okay. If certain industries fail to produce cases of employees with let's say multiple myeloma, would there be a lack of studies in the peer-review literature?

MR. PERRY: Object to form.

A. I think you're referring to two

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different things. There are cases of diseases that will occur, and there are epidemiological studies that seek to determine the rates at which those occur.

If studies, epidemiologic studies, that ascertain the rates of those diseases among employees exposed and non-exposed showing associations, then you have something close to an epidemiologic study, and my belief is that those epidemiologic findings should be published in peer-reviewed scientific journals for the scientific community to evaluate.

Q. Okay. Doctor, if I owned a oil company and I had 150 cases of multiple myeloma from 1960 to 2009 and I didn't report that or publish a study on that, would you have an interest or an opinion on whether or not that could be statistically significant?

MR. PERRY: Object to form.

A. Well, not as you described it. I think it suggests that there might be a large enough sample size around which a

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proper epidemiologic study could be constructed where the actual rates of occurrence of those diseases or those cases occur could be quantified. I think having a number of cases doesn't itself suggest whether it's large or small without knowing the denominator of the population that actually gave rise to those case. Maybe --

Q. What if the denominator was 30,000 for my oil company and I had 150 cases of multiple myeloma from 1960 to 2009, would that, would that be of interest to you?

MR. PERRY: Eric, you mean 30,000 employees per year from 1960 until 2009 or you mean 30,000 employees total from 1960 until 2009?

MR. WILLIAMS: 30,000 employees with work, work lives of 20 to 40 years.

MR. PERRY: The same 30,000 employees for 49 years, is that the question?

MR. WILLIAMS: I'm asking the Doctor.

Doctor, do 150 cases -- let me rephrase my question.

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Doctor, tell me one study in the public domain that shows 150 cases of multiple myeloma from one company.

MR. PERRY: Object to form.

A. I don't know about a single study. There are many com -- many studies from among the petroleum companies where there are hundreds of cases total.

Q. And how many employees are we talking? Hundreds of thousands of employees?

A. Well, the studies don't just take number of cases out of number of employees. All the studies you see with SMRs we calculate person time. So we need to know every person who worked in that facility and the duration of time they worked in that facility and every year that they're followed until they die and we determine what the cause of death was in those cases. So we typically have hundreds of thousands of person years that are necessary, then, to calculate the rates at which the diseases are occurring, and we then can more properly compare those rates of diseases between

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exposed subgroups and non-exposed subgroups or even to the general population. But if we only have counts of people and diseases, we can't construct a valid epidemiological measure of association.

Q. Okay. And, Doctor, I don't recall what you said. Have you seen a -- one company with 150 cases internally?

MR. PERRY: Object to form.

A. Not that I recall, no.

Q. Okay. Can you name a study sponsored or conducted by Shell Oil that show a statistically significant result for benzene and multiple myeloma?

A. Not that I recall, no.

Q. How about Exxon, sir?

A. I'd have to refer to my summary. There's so many studies. Let me -- if you don't mind, I'll look at --

Q. Absolutely.

A. -- the summary that I have and provided you on this DVD. I believe not, but there might be some here or there. You know, you always have some positive and

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potentially statistically significant findings out of the majority that show no such association. I don't believe that there was, no.

Q. How about Chevron?

A. I believe not.

Q. Any other oil company?

MR. PERRY: Object to form.

A. I believe that, yes, Dr. Satin 2002 reports in refinery workers, I believe this is a Canadian company --

Q. And what were the results from that study?

A. He had a total of 29 multiple myelomas.

Q. Okay.

A. And the SMR was 1.56 -- I'm sorry, 1.59, and the confidence interval was 1.07 to 2.89.

Q. Okay. Have any other oil companies shown a statistically significant result that was greater than a 2.0?

A. Greater than a 2.0. I don't know of one offhand.

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Q. Okay.

A. There is the Kirkeleit, has relative risks based on --

Q. That was sponsored by an oil company, you said?

A. I don't know what the sponsorship was, but it was in oil employees.

Q. Doctor, in your report you say that there are 19,920 new cases of multiple myeloma diagnosed each year, paragraph 27. Do you know what the U.S. incidence rate for myeloma is?

A. As an aggregate, no. You really should look at the incidence rate by age. It depends strongly on age.

Q. Well, if I told you Dr. Nilsson testified that it was 4.3 per hundred thousand, would you agree with that?

A. I think that I've seen estimates around 4 or a little bit more than 4 for the overall population which would be a weighted average of all the age specific rates. They do vary considerably across age groups.

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Q. Doctor, in your report, paragraph 31, you talk about the Institute of Medicine. Is that a governmental agency, Doctor?

A. Well, the Institute of Medicine is part of our natural academies of science, and its -- while it's important to our government and it often deals with matters of science for our Congress, it is intentionally independent of government and industry and all specific interests in order to render high quality valid and unbiased scientific opinions.

Q. Doctor, when you say "our," who are you referring to?

A. U.S. citizens.

Q. Okay. Is it a nonprofit organization?

A. I don't know their legal construct.

Q. Okay. Do they classify chemicals as carcinogens?

A. They do do critical reviews of epidemiologic and toxicologic literature and often provide opinions as to carcinogenicity, yes.

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1
2 Q. Kind of like the American Cancer
3 Society, something similar to that?

4 A. I wouldn't use that specifically. I
5 think the American Cancer Society has another
6 purpose, but let's say they use a similar
7 approach as IARC or NTP would in evaluating
8 the epidemiological literature.

9 Q. But, again, they're not a
10 governmental agency, correct?

11 A. Well, I don't know their exact
12 classification, but they intend to be
13 independent of the government so that they
14 can render objective opinions to the
15 government for litigation and decision making.

16 MR. PERRY: Wait. Eric, let him
17 finish.

18 THE COURT REPORTER: We didn't get
19 that question. There was an interruption.

20 MR. PERRY: Eric, let him --

21 **BY-MR. WILLIAMS:**

22 Q. Do you know if they rendered any
23 peer-review opinions as relates to benzene
24 and multiple myeloma?

25 A. I'm not sure what you mean by a

1 peer-review opinion. They have in fact
2 published language in review documents that
3 were the products of the large and diverse
4 committee of experts that underwent additional
5 peer-review drawing the conclusion that the
6 evidence was insufficient for such a
7 conclusion.
8

9 Q. What journal was that published in,
10 Doctor?

11 A. I'm sorry, I don't understand that I
12 ever indicated it was published in a journal.
13 It was published in an official report of
14 the IOM.

15 Q. Mm-hmm. Doctor, if you look at your
16 reference list in your report, can you tell
17 me what studies are benzene cohort studies?

18 A. Well, I don't have a specific
19 notation of that, but I believe that the
20 Ireland and Collins, Sorahan, Rinsky, Wong.
21 The Australian study series there are several
22 reports on some, various over time.
23 Schnatter --

24 Q. Anything else, Doctor?

25 A. I'm still going. Schnatter, Lewis,

1
2 Satin, Huebner, Tsai, Divine, Thomas, Dement,
3 Rushton, Kirkeleit. I think those are most
4 of the cohort studies.

5 Q. Doctor, can you define benzene cohort
6 for us?

7 A. Well, I assume you're referring to
8 cohorts exposed to benzene.

9 Q. Yes, I'm asking your definition of a
10 benzene cohort.

11 A. Well, I'm not sure that that's a
12 standard term, but I take it as meaning a
13 defined group of people, which is simply the
14 definition of a cohort, where exposure is
15 either known or presumed, and that depends on
16 what kinds of records might be available.

17 Q. And what would make the study that
18 you just listed different from other benzene
19 epidemiological studies as it relates to
20 being called a benzene cohort?

21 A. I really don't understand your
22 question.

23 Q. Well, how do we -- how does one
24 know if we're looking at a benzene cohort
25 study or just an epidemiological study

1
2 involving benzene and blood malignancies?

3 A. I'm sorry, I still don't understand
4 what your question is.

5 Q. Okay. Well, if you don't understand
6 the question, I don't know how else to ask
7 it.

8 Do you know what type of studies Dr.
9 Infante used in his meta analysis?

10 A. He claims to have selected 7 of the
11 8 available cohort studies on benzene
12 exposure and multiple myeloma.

13 Q. Okay. Now, let's go to that word
14 claims. Why don't you define that for us.

15 A. That's what he says in his report.

16 Q. Okay. And what is he saying about
17 7 of 8 benzene cohorts?

18 A. He, again, claims, meaning he
19 describes in his report that these are
20 studies where he has a high level of
21 certainty that the cases were exposed.

22 Q. Does he state that there are other
23 known benzene cohorts?

24 A. I think he does.

25 Q. Besides the 8 studies that you just

1
2 referred to?

3 A. I'd have to -- you know, I don't
4 know what he would define a benzene cohort
5 as, and I don't recall specifically if he
6 mentions others. I believe he mentions a
7 larger number of studies but then ends up
8 not incorporating them in his analysis.

9 Q. Okay. And is there a standard
10 epidemiological definition for benzene cohort
11 that you know of?

12 A. Well, as I said earlier, I don't
13 think that that's a standard term to begin
14 with. I think loosely you're referring to
15 groups of people where there's some
16 probability that benzene exposure occurred.
17 Sometimes it's a subset of a larger cohort,
18 so I don't know that it has inherent meaning
19 as a technical term.

20 Q. Okay, I understand. Doctor, did you
21 look at the 1977 Joyner/Stallone study?

22 MR. PERRY: Object to form.

23 A. Yes, I -- I'm sorry, I --

24 Q. Did you review Dr. Infante's expert
25 report in this case?

1
2 A. Excuse me, I didn't finish my
3 previous answer.

4 Q. I apologize.

5 A. I looked at reports from Stallone.
6 You're referring to the unpublished reports
7 of the surveillance system? Not the
8 surveillance system; of the death
9 certificates?

10 Q. For the 77 Stallone study?

11 A. Yes, I'm just trying to clarify that
12 we're talking about the same document.

13 Q. Yeah, the one with the 8 cases of
14 multiple myeloma in it, that one.

15 A. Okay. Yes, I've seen that report.

16 Q. Okay. And did you look at Dr.
17 Infante's calculation for those 8 cases of
18 myeloma?

19 A. I believe I did, but on the other
20 hand, this is not a peer-reviewed, published
21 epidemiologic study. And, secondly, it uses
22 a kind of a quick and dirty analytic
23 methodology that is not of the caliber of
24 what one does in conducting a cohort study.

25 Q. Did you say quick and dirty?

1
2 A. Yeah, that's what I would refer to a
3 PMR analysis.

4 Q. Okay. Why is it quick and dirty?

5 A. Well, typically it's done when you
6 have a bunch of death certificates and you
7 want to make some sense out of them or
8 generate some hypotheses. It's done, you
9 know, for that purpose often, and it's very
10 inexpensive to do. It might lead one to
11 conclude that a cohort study might be
12 worthwhile. It might also suggest that there
13 aren't enough, you know, cases to actually
14 pursue a cohort study which can be quite
15 time-consuming and expensive. So it has its
16 purpose, but its purpose is -- among these
17 purposes is not determining causation.

18 Q. Do the results indicate that they
19 are statistically significant?

20 MR. PERRY: Object to form.

21 A. Statistically significant what?

22 Q. For benzene and myeloma.

23 A. Well, first of all, I'm not sure
24 there was any measure of exposures, including
25 benzene in that report. I think that this

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was a collection of death certificates from a company which included people who might have been exposed to benzene and others who might not have.

Q. Okay. Do you know if those results were ever reported to OSHA, Doctor?

A. The results on multiple myeloma?

Q. Yeah, the 8 cases of myeloma.

A. I don't, I don't know that those were sought by OSHA. I think that OSHA was looking for studies on leukemias.

Q. Is blood dyscrasia also -- is multiple myeloma also referred to as blood dyscrasia?

MR. PERRY: Object to form.

A. I don't know if that's what -- if that's the right terminology, so I just don't know.

Q. Have you ever referred to multiple myeloma as blood dyscrasia?

MR. PERRY: Object to form.

A. Not that I know of.

Q. Okay. One second, Doctor. Do you think 150 cases in a company is enough to

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perform an epidemiological study to determine if there's an excess of multiple myeloma?

MR. PERRY: Object to form.

A. Well, epidemiologically 150 cases is certainly much more attractive than studies with 8 or 10 or 22 or 50.

Q. I agree with you on that, Doctor. I don't think I have any other questions at this time. Do you have any Stan?

MR. PERRY: No, sir.

MR. WILLIAMS: Anybody else?

MR. CHOCHULES: No.

MR. WILLIAMS: Okay, I don't think I heard anybody else, Ms. Court Reporter.

I want to mark the OSHA document as the next exhibit. I don't think he had that in his CD-ROM.

(Whereupon, Exhibit-3 was marked for identification.)

THE VIDEOGRAPHER: The deposition is now concluded, and the time is approximately 4:27. This concludes tape No. 1 of 1 of the deposition of Kenneth Mundt, M.D. and we are off the record.

K. MUNDT, PH.D.

(Whereupon, the Deposition of KENNETH
MUNDT, M.D. concluded at 4:30 p.m.)

CERTIFICATE

I, Maryellen Coughlin, a RPR/CRR and Notary Public of the Commonwealth of Massachusetts, do hereby certify that the foregoing is a true and accurate transcript of my stenographic notes of the deposition of KENNETH A. MUNDT, Ph.D., who appeared before me, satisfactorily identified themselves, and was by me duly sworn, taken at the place and on the date hereinbefore set forth.

I further certify that I am neither attorney nor counsel for, nor related to or employed by any of the parties to the action in which this deposition was taken, and further that I am not a relative or employee of any attorney or counsel employed in this case, nor am I financially interested in this action.



MARYELLEN COUGHLIN, RPR/CRR

Dated: July 3, 2009

CAPTION

The Deposition of **KENNETH MUNDT,**
PH.D., taken in the matter, on the date, and
at the time and place set out on the title
page hereof.

It was requested that the deposition
be taken by the reporter and that same be
reduced to typewritten form.

It was agreed by and between counsel
and the parties that the Deponent will read
and sign the transcript of said deposition.

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K. MUNDT, PH.D.

CERTIFICATE

STATE OF _____:

COUNTY/CITY OF _____:

Before me, this day, personally appeared, **KENNETH MUNDT, PH.D.**, who, being duly sworn, states that the foregoing transcript of his/her Deposition, taken in the matter, on the date, and at the time and place set out on the title page hereof, constitutes a true and accurate transcript of said deposition.

KENNETH MUNDT, PH.D.

SUBSCRIBED and SWORN to before me this _____ day of _____, 2009 in the jurisdiction aforesaid.

My Commission Expires _____ Notary Public

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VIDEOTAPED DEPOSITION OF KENNETH MUNDT, M.D., JUNE 29, 2009

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1
2 IN THE UNITED STATES DISTRICT COURT FOR THE
3 EASTERN DISTRICT OF LOUISIANA

4 -----

5 JO ANN BISHOP, ET AL,

6 Plaintiffs,

7 vs. Case No.:07-2832

8 SHELL OIL CO., ET AL,

9 Defendants.
10 -----/

11

12 VIDEOTAPED DEPOSITION of KENNETH MUNDT, PH.D.,

13 held on June 29, 2009, at 161 Devonshire Street, Boston,

14 Massachusetts, commencing at 3:00 p.m., before Maryellen

15 Coughlin, Court Reporter and Notary Public in and for the

16 State of Massachusetts.

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VIDEOTAPED DEPOSITION OF KENNETH MUNDT, M.D., JUNE 29, 2009

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1 2 INDEX TO EXHIBITS 3 4 DESCRIPTION MARKED 5 6 EXHIBIT-1 9 7 Notice of deposition 8 9 EXHIBIT-2 13 10 DVD 11 12 EXHIBIT-3 66 13 Federal Register Volume 52 No. 176 14 15 16 17 18 19 20 21 22 23 24 25	1 2 address and you who represent. 3 MR. WILLIAMS: Eric Williams and 4 Rick Fernandez, 34 35th Street, Suite B, 5 Metairie, Louisiana 70005 for the plaintiffs. 6 MR. BEZET: This is Gary Bezet, Post 7 Office Box 3513, Baton Rouge, Louisiana, 8 70821 for the defendant Shell Oil Company, 9 Marathon Oil Company and El Paso. 10 MR. CHOCHÉLES: Chris Chocheles -- 11 MR. AUBRY: Tom Aubry in Houston, 12 Texas for Radiator Specialty. 13 MR. CHOCHÉLES: Chris Chocheles, 909 14 Poydras, Suite 28, New Orleans, Louisiana. 15 MR. PERRY: Stan Perry for Shell 16 1221 McKinney Street, Suite 2100, Houston, 17 Texas, 77010. 18 THE VIDEOGRAPHER: The notary public 19 and court reporter will stenographically 20 record the testimony today. At this time 21 will the reporter please swear in the 22 witness. 23 THEREUPON, 24 KENNETH A. MUNDT, Ph.D., 25 having been first duly sworn, was examined
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1 2 VIDEOTAPED DEPOSITION OF 3 KENNETH A. MUNDT, PH.D. 4 JUNE 29, 2009 5 THE VIDEOGRAPHER: The videotape 6 recording has commenced, and we are now on 7 the record. 8 Today is June 29th, 2009. The time 9 is approximately 3:11 p.m. My name is 10 Patrick Battle, and I'm the legal video 11 specialist for Accurate Court Reporting, Inc. 12 whose business address is 24650 Sandhill 13 Boulevard, Suite 401, Punta Gorda, Florida, 14 33983. 15 This is the deposition of Kenneth 16 Mundt, M.D. in the matter of Jo Ann Bishop 17 versus Shell Oil Company, et al., Case No. 18 07-2832 in the United States District Court, 19 Eastern District of Louisiana. 20 This deposition is being taken at 21 the Club Quarters, 161 Devonshire Street, 22 Boston Massachusetts, 02110. The court 23 reporter is Maryellen Coughlin. 24 Will counsel please identify 25 yourselves for the record stating your name,	1 2 and testified as follows: 3 THE VIDEOGRAPHER: Thank you. 4 Counsel, please proceed. 5 MR. WILLIAMS: Are we ready? 6 THE COURT REPORTER: Yes. 7 EXAMINATION 8 BY-MR.WILLIAMS: 9 Q. Good evening. Dr. Mundt, could you 10 please state your full name and address for 11 the record? 12 A. Yes, sir, Kenneth Arthur Mundt, 260 13 Lincoln Avenue, Amherst, Massachusetts. 14 Q. Okay. And what's your date of 15 birth, sir? 16 A. December 27, 1959. 17 Q. And what degrees have you earned 18 thus far? 19 A. I earned a bachelor's degree from 20 Dartmouth College, a master's degree from 21 University of Virginia, another master's 22 degree from the University of Massachusetts, 23 and a Ph.D. from the University of North 24 Carolina Chapel Hill. 25 Q. And can you tell me what's the year

Page 9 1 2 and the major for each degree that you have 3 received? 4 A. My college degree I majored in 5 English. My first master's degree was in 6 English literature composition; my second 7 master's degree was in epidemiology; and my 8 Ph.D. was in epidemiology. 9 Q. Doctor, did you receive a notice for 10 this deposition? 11 A. Yes, sir. 12 Q. Okay. And do you have that with 13 you? 14 A. I do. 15 Q. Okay. I would like to mark that as 16 Exhibit-1. 17 (Whereupon, Exhibit-1 was marked for 18 identification.) 19 BY-MR.WILLIAMS: 20 Q. Doctor, what did you bring in 21 response to the deposition notice? 22 A. Well, if I may refer to the request. 23 I brought as many of the items that I have 24 available on that list. 25 Q. Okay, let's go one by one. Tell me	Page 11 1 2 our accounting system and determined the 3 number of hours and the amount that has been 4 charged against this case as of about 10 5 days. 6 I interpret No. 6 as synonymous with 7 No. 3, a listing of all the materials I rely 8 upon. 9 No. 7, my file is essentially all 10 the materials we're discussing, but I have 11 additionally an electronic document which 12 summarizes the numerical results of the 13 epidemiological studies I rely upon. 14 I have also a folder containing 15 communications between me and the attorneys 16 in this case on this DVD. 17 I don't have any college or graduate 18 transcripts. I don't have any documents 19 satisfying No. 10 or 11. 20 I did bring copies of all expert 21 reports provide in multiple myeloma cases, 22 and they are two cases, including this one. 23 And as far as a list of all cases I 24 have served as expert witness involving 25 multiple myeloma, are these same two cases,
Page 10 1 2 for the first item. 3 A. Yes. No. 1, I have a listing of 4 all the documents that were provided to me, 5 which essentially is the log index that my 6 staff uses to track materials as they come 7 into our office. 8 I did not bring copies of those 9 documents, those are quite voluminous, but 10 they all are available should you need any 11 one of them. 12 No. 2, I had no exhibits to my 13 expert report. No. 3, I brought a file 14 containing all of the scientific literature 15 that I've relied upon, as well as other 16 published materials, all of those. In fact, 17 all of the materials that I brought are 18 contained on a DVD that I have here with me. 19 Q. All right. 20 A. I have brought a list of all cases 21 that I've testified in I believe in the last 22 five years, which I have maintained for cases 23 in general. 24 I do not have an itemized statement 25 of the time spent, but I did an inquiry of	Page 12 1 2 plus one case that I testified in at a trial 3 10 or 12 years ago that I don't recall the 4 name specifically, but I could research that 5 if it were important, for which there was no 6 report or deposition. 7 Q. Anything else, Doctor? 8 A. Oh, yes, sir, I have a volume that 9 I received just the other day which is Dr. 10 Infante's deposition and Exhibits-1 through 11 27. This is contained in a single 12 three-ring binder. 13 And I have the volume from the 14 Annals of the New York Academy of Science 15 that contains Dr. Infante's publication 16 entitled, "Benzene Exposure and Multiple 17 Myeloma." 18 Q. Anything else? 19 A. That's it. 20 Q. Okay. If I understood you 21 correctly, you have a list of the documents 22 that came in the office. We'll mark that as 23 No. 2. 24 A. Everything is on a DVD. 25 Q. All those items are on a DVD?

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2 A. Yes, sir.

3 Q. Are they all on one DVD?

4 A. Yes, sir.

5 Q. Oh, fair enough, then. We'll mark

6 that DVD for everything that he's just talked

7 about as No. 2.

8 (Whereupon, Exhibit-2 was marked for

9 identification.)

10 BY-MR.WILLIAMS:

11 Q. Dr. Mundt, where do you work

12 currently?

13 A. I'm employed full-time by Environ

14 International Corporation. I'm based --

15 Q. How long have you been at that

16 company?

17 A. I'm based in the Amherst,

18 Massachusetts office.

19 Q. And how long have you been with

20 Enviro International?

21 A. Since November of 2003.

22 Q. Okay. And where did you work before

23 that?

24 A. I was employed by Applied

25 Epidemiology, Incorporated in Amherst,

Page 14

1

2 Massachusetts.

3 Q. Okay. What time period did you work

4 there?

5 A. Roughly 2000 until -- I'm sorry, I

6 worked there full time roughly from 2000

7 until, until I joined Environ in 2003. I

8 worked part-time with Applied Epidemiology

9 since 1991, I believe.

10 Q. Okay. What year did you get your

11 master's in epidemiology?

12 A. I believe that was in 1986.

13 Q. Doctor, how old are you?

14 A. I'm almost 50.

15 Q. Almost what?

16 A. 50.

17 Q. 60, okay.

18 A. No, 5-0, 50.

19 Q. 5-0, okay. I don't want to make

20 you older. What year did you get your

21 Ph.D., sir?

22 A. 1989.

23 Q. Okay. Where did you work prior to

24 Applied Epidemiology?

25 A. I was for 10 years on the faculty

Page 15

1

2 of the School of Public Health, University of

3 Massachusetts, Amherst.

4 Q. And were you a full-time professor?

5 A. Yes, I was.

6 Q. Okay. And what is your current

7 title where you're at now?

8 A. I'm a principal in the firm, and I'm

9 the director of epidemiology.

10 Q. Okay. What percentage of your work

11 involves litigation?

12 A. It varies from month to month, but I

13 would say probably 40 percent of my work in

14 the last half year has been litigation

15 related.

16 Q. Okay. And how many cases involve

17 chemicals with causation issues?

18 A. Most of them do.

19 Q. Okay. Have you ever served as an

20 expert for a plaintiff in a chemical cancer

21 case?

22 A. Yes, I have.

23 Q. Okay. Have you ever found that a

24 chemical caused a plaintiff's disease?

25 A. Yes, I have.

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1

2 Q. Okay. How about benzene?

3 A. No, sir. I've not served in a

4 benzene case on behalf of a plaintiff.

5 Q. You have not?

6 A. That's correct.

7 Q. Okay. What case -- what type of

8 case did you serve for the plaintiffs?

9 A. The specific one I was referring to

10 -- I've served on, on more than that, but

11 the one I was specifically referring to had

12 to do with a skin sensitization agent, a

13 contact exposure resulting in an extreme

14 allergic reaction.

15 Q. Okay. Did you ever serve a

16 plaintiff where the plaintiff was alleging

17 exposure which caused a cancer?

18 A. No, sir.

19 Q. Earlier you brought up the cases of

20 multiple myeloma. In how many cases have

21 you served as an expert regarding multiple

22 myeloma?

23 A. Three.

24 Q. And was benzene the substance that

25 was alleged to be the cause for all three?

Page 17

1
2 A. In two of the three.
3 Q. Okay. And what was the one that
4 you testified in 10 to 12 years ago, what
5 chemical did that involve?
6 A. That involved herbicides.
7 Q. Herbicide. And, Doctor, you're not
8 a medical doctor, correct?
9 A. That is correct.
10 Q. And you're not a toxicologist?
11 A. That's correct.
12 Q. And you're not board certified in
13 occupational medicine?
14 A. Correct.
15 Q. Industrial hygiene?
16 A. Correct.
17 Q. But you can offer opinions at trial
18 in any of these fields?
19 A. Well, as an epidemiologist, I'm well
20 familiar with aspects of industrial hygiene,
21 toxicology and occupational medicine, since
22 epidemiology falls in the middle of these
23 disciplines, but I don't put myself forward
24 as an expert on those. I defer to the
25 actual experts in those areas.

Page 18

1
2 Q. Okay. Doctor, can benzene cause
3 blood malignancies?
4 A. Yes, I believe so, under certain
5 circumstances.
6 Q. Can benzene cause myelodysplastic
7 syndrome?
8 A. I've not researched that specifically
9 for purposes of causation. I understand that
10 there's evidence supportive of that
11 conclusion.
12 Q. What about AML leukemia?
13 A. Similarly. I think that that,
14 however, has stronger evidence support of a
15 causal association in adequately high doses
16 of exposure.
17 Q. What about CLL leukemia?
18 A. I don't believe that the evidence is
19 sufficient to draw a causal conclusion for
20 CLL.
21 Q. ALL?
22 A. I've not looked at that specifically.
23 Q. Okay. What about non-Hodgkin's
24 lymphoma?
25 A. I believe that the evidence is

Page 19

1
2 insufficient to draw that causal conclusion.
3 Q. Myelofibrosis?
4 A. I've not looked at that.
5 Q. Okay. Would you have an opinion one
6 way or the other with myelofibrosis?
7 MR. PERRY: Object to form.
8 A. Not unless I researched it.
9 Q. Okay. What about CML leukemia?
10 A. I have not looked at CML that I
11 recall.
12 Q. Okay. Earlier I asked you if
13 benzene could cause blood malignancies. Are
14 you aware of any other blood malignancies
15 that benzene may cause?
16 A. I'm aware that there is one that is
17 generally substantiated by the scientific
18 literature, and that was AML.
19 Q. Okay. Can benzene cause any other
20 type of blood disorder?
21 A. Yes, there are all sorts of blood
22 dyscrasias that benzene may be able --
23 capable of inducing.
24 Q. Can you name some types?
25 A. Well, I'm thinking of aplastic

Page 20

1
2 anemias, for example. This is not my area
3 of expertise, and I've not looked into it,
4 but I'm aware that there are concerns
5 associated with benzene poisoning and the
6 affects on the blood system.
7 Q. Okay. Is benzene a known human
8 carcinogen?
9 A. Benzene has been classified as a
10 known human carcinogen, and I'm aware that
11 the literature pertaining to exposures to
12 high-level benzene and AML is reasonable for
13 drawing a causal conclusion.
14 Q. Doctor, what is your definition of
15 association? And when I say association, a
16 chemical associated with a certain disease?
17 A. Yes, it's a term that we use
18 somewhat loosely epidemiologically, but what
19 it essentially means is that there's some
20 correlation statistically between some measured
21 risk factor or exposure and the rate or
22 occurrence of that disease. It's a starting
23 point for a --
24 Q. Would association mean risk factor to
25 you?

Page 21 1 2 A. There's a good deal of overlap. I 3 think that we use the term risk factor when 4 we see an association because we don't know 5 much more than that, that it's a, let's say 6 it's a possible risk factor, something that 7 correlates with in certain studies an 8 increased occurrence of the disease. It 9 doesn't necessarily imply a causal 10 relationship, but certainly suggests a 11 statistical association. 12 Q. Okay. Doctor, if a study in the 13 peer-reviewed literature shows that there is 14 a 2.0 greater -- or greater relative risk 15 with a confidence interval above a 1, would 16 you call that an association with a disease 17 and a chemical? 18 A. Well, some of that's not necessary 19 to identify an association. The first step 20 is to evaluate what you called correctly the 21 relative risk. And if the relative risk is 22 different from 1, then you could then say 23 there is evidence of an association. It 24 could be above 1 where it's positively 25 associated. It could be less than 1 where	Page 23 1 2 confidence interval for benzene exposure in 3 multiple myeloma. Does that rise to the 4 level of association for you, Doctor? 5 A. Well, I guess I don't understand the 6 terminology you're using "rising to the level 7 of association" when I in my earlier answer 8 described to you that a departure from a 9 relative risk of 1 suggests an association. 10 Q. Okay. So does the Infante meta 11 analysis demonstrate an association for 12 benzene and multiple myeloma to you, Doctor? 13 A. Well, I think all of these questions 14 prior to this point were abstract. We're 15 talking about epidemiological methods. 16 Something that you've jumped over is what is 17 the validity of the study that generated that 18 result. 19 We can have a statistically 20 significant finding in any number of studies 21 that might have resulted from errors in study 22 design or execution, so perhaps you could 23 make it a hypothetical that I could answer. 24 Q. Well, I gave you a question. Does 25 that -- do the results of the Infante 2006
Page 22 1 2 it's negatively associated. Whether or not 3 that association is statistically significant 4 is a second level of evaluation. 5 Q. Okay. And my question is, if a 6 chemical we're dealing with has a relative 7 risk above a 2.0 with a greater than a 1.0 8 confidence interval, is that an assoc -- does 9 that rise to the level of an association or 10 a risk factor in your opinion? 11 MR. PERRY: Object to the form. 12 A. Well, it's a bit vague because 13 chemicals don't have relative risks. It's a 14 constructive and epidemiological study where 15 risks of persons with a certain exposure 16 group are compared with risks of persons in 17 another exposure group, and it describes the 18 relationship between those. 19 Q. Correct, Doctor. I'm aware that 20 chemicals don't have risks. I'm trying to 21 give you an example to see if you can answer 22 my question. Let me try a little, a little 23 different approach. 24 There are studies that show a 2.0 or 25 greater relative risk with a higher than a 1	Page 24 1 2 meta analysis demonstrate an association with 3 benzene in most myeloma to you, Doctor? 4 A. Well, again, I don't know what you 5 mean in the terminology "demonstrating an 6 association." He derives based on the 7 selected studies he chose and the data he 8 selects from those studies to combine, they 9 demonstrate that, that there is a statistical 10 correlation that one could describe as an 11 association. Not to say -- 12 Q. Okay. Thank you, Doctor. 13 A. -- whether it's valid or not. That's 14 a separate question. 15 Q. Okay. Doctor, was that study done 16 by Mr. -- Dr. Infante in 2006 peer reviewed? 17 A. First of all, it's not a primary 18 study. It is a pooling of some results from 19 several other studies. So I just want to 20 make sure that we differentiate a primary 21 epidemiologically study from let's say a 22 review or some other combination of existing 23 data from other studies. 24 Q. Is that your definition of meta 25 analysis, a review?

Page 25 1 2 A. I didn't say that. 3 Q. Okay. And I didn't say primary 4 study, so. I asked you if the meta analysis 5 done by Dr. Infante was peer reviewed, 6 Doctor. 7 A. My understanding is that it had been 8 reviewed by others. I don't know the 9 mechanism that was used for that peer review. 10 In other words, I don't know that it was 11 blindly sent to experts in the field for 12 their evaluation as one would do typically 13 for a peer-reviewed medical journal. 14 Q. Do you know what journal that 15 article was published in, Doctor? 16 A. It was published as a volume, as a 17 conference proceedings by the Annals of the 18 New York Academy of Science. 19 Q. Is that a reputable journal, Doctor? 20 A. Well, it's a reputable organization. 21 The organization is highly regarded. I 22 myself have been a member for years. 23 Q. Have you ever tried to contact that 24 organization to see whether or not the 25 article was peer reviewed?	Page 27 1 2 A. The first case I served as an expert 3 witness in was that Rhode Island case 10 or 4 12 years ago. 5 Q. So somewhere around 1997? 6 A. You know, I don't really recall the 7 year. It was a number of years after that 8 that I worked on my next case as an expert. 9 Q. Okay. Doctor, how many blood 10 malignancy cases did you find that the 11 benzene exposure was because of the 12 individual's disease? 13 A. Well, I don't recall any cases in 14 which I found that the epidemiological 15 evidence was supportive of a causal 16 conclusion. 17 Q. Okay. How many cases have you 18 served as an expert witness in your entire 19 career? 20 A. I don't know. I've got my list 21 from the last five years, and it looks like 22 about 30. 23 Q. 30 for the last five years? Is 24 that correct, Doctor. 25 A. It looks like 26 or 7, yes. I
Page 26 1 2 A. Actually, no. I think that's a 3 great idea, however. It would be informative 4 to know who in fact reviewed it and what 5 their criticisms might have been. 6 Q. Well, we actually did that, Doctor. 7 We verified it through an affidavit from the 8 editor but in any event. 9 How many cases have you worked on 10 dealing with blood malignancies, Doctor? 11 MR. BEZET: Excuse me, Gary Bezet, 12 object to the form of the question. Go 13 ahead. 14 A. I've probably worked on somewhere 15 between 8 and 12. 16 Q. I'm listening, Doctor. I didn't 17 quite hear you. 18 A. I'm sorry, I'll repeat my answer. 19 I've worked on somewhere between 8 and 12. 20 Q. Okay. And what was your first 21 benzene blood malignancy case that you worked 22 on, Doctor? 23 A. You know, I don't recall offhand. 24 Q. Well, let me ask you this. When 25 did you start serving as an expert witness?	Page 28 1 2 tried to quickly count. There's not quite 3 30, yes. 4 Q. In any of those cases did you find 5 that the chemical at issue was the cause of 6 the plaintiff's disease? 7 MR. CHOCHULES: Objection, asked and 8 answered. 9 Q. Go ahead, Doctor. 10 A. These are cases that I have 11 testified in, and the specific conclusions in 12 these cases in which I have testified I have 13 not testified that the alleged exposure 14 indeed caused the disease. 15 Q. Okay. Doctor, how many hours did 16 you put in the Bishop case to do your 17 general causation analysis? 18 A. I'm not sure that I could break it 19 out that specifically. I can tell you 20 overall I've invested about 60 hours of my 21 time as of about 10 days ago. 22 Q. Okay. And how many hours did you 23 spend prior to or up until the completion of 24 your expert report? 25 A. I don't have it broken out that way.

Page 29 1 2 Q. Okay. Do you know how many hours 3 it took you to do your report? 4 A. No, sir. 5 Q. Are you familiar with the Ben Brown 6 case, Doctor? 7 A. Yes, I am. 8 Q. Do you know how many hours it took 9 you to complete your expert report in that 10 case? 11 MR. PERRY: Object to form. 12 A. I didn't look that up, no, sir. 13 Q. Okay. Okay. Have you ever been 14 limited or excluded by a court of law? 15 A. Not that I'm aware of. 16 Q. Has anyone filed a Dolbear motion 17 against you besides this case? 18 A. No that I'm aware of. 19 Q. Have you ever published a study on 20 benzene and multiple myeloma? 21 A. No, sir. 22 Q. Have you ever published a study -- 23 and when I say study, I mean epidemiological 24 study -- on benzene or any other blood 25 malignancy?	Page 31 1 2 literature and formulate a preliminary opinion 3 as to whether that evidence is sufficient in 4 terms of quantity and quality and in terms 5 of strength of finding and consistency of 6 finding in order to render an opinion on 7 causation. 8 This then is folded together in a 9 plenary session where each committee offers 10 their perspectives, and an overall evaluation 11 is derived at that time. 12 Q. Doctor, have you ever served on any 13 of those panels for IARC? 14 A. Yes, sir. 15 Q. What chemicals are we talking about? 16 A. Titanium dioxide, carbon black, talc, 17 painting, firefighting and shift work. I 18 understand those are not chemicals, but those 19 were the topics for the IARC evaluations. 20 Q. And did the evaluation conclude that 21 any of those chemicals or substances were 22 carcinogenic to man? 23 A. Yes, sir. Of those I believe 24 painting was the only one that received a 25 Group 1 classification that is known human
Page 30 1 2 A. I wouldn't consider benzene a blood 3 malignancy but. Maybe you could rephrase 4 that. 5 Q. Yes, have you ever published a study 6 involving benzene and a blood malignancy? 7 A. I see. Not specifically, no. 8 Q. Doctor, do you know the criteria, 9 IARC uses to classify chemicals as 10 carcinogens? 11 A. Yes, I do. 12 Q. Can you tell me what criteria they 13 look at? 14 A. Sure. First of all, it's based 15 entirely on published peer-reviewed scientific 16 evidence divided into three committees. 17 There's the epidemiology committee. There's 18 an animal studies committee. There's a 19 mechanism committee. There's also often an 20 exposure committee that helps the other 21 committees understand the relationship between 22 the exposures and the cancers at issue. 23 These committees review their 24 respective areas of expertise and as 25 comprehensively as possible the available	Page 32 1 2 carcinogen. 3 Q. And which one did you say? You're 4 fading in and out sometimes. 5 A. Painting. 6 Q. Painting? 7 A. Yes, sir. 8 Q. Okay. 9 MR. AUBRY: Eric, let me interrupt 10 for a second. Is it possible to move the 11 phone closer to Dr. Mundt, 'cause you're 12 having trouble hearing him, and he's a little 13 faint for me as well. 14 Doctor, can you do that? 15 THE WITNESS: We can try. 16 (Whereupon, Discussion off the 17 record.) 18 BY-MR.WILLIAMS: 19 Q. Doctor, are you there? 20 A. I'm still here. 21 Q. Okay, great. Earlier we were 22 talking about the procedure IARC uses. Do 23 you know if there are any epidemiological 24 studies that show an association between 25 benzene and multiple myeloma?

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2 A. Yes, there are.

3 Q. Okay. Do you know if there are any

4 animal studies that show a relationship

5 between lymphomas and benzene?

6 A. I've not looked at the toxicology.

7 I'm an epidemiologist.

8 Q. Okay. And what about mechanism

9 studies, are there any mechanism studies that

10 would show a relationship between benzene and

11 the blood, such as lymphocytes?

12 A. I've not looked at that either, and

13 that's not my area of expertise.

14 Q. Fair enough. Doctor, did you look

15 at the material safety data sheets in this

16 case?

17 A. I'm not aware of any, no.

18 Q. Okay. Can you tell me how many

19 studies you need to form an opinion? And

20 let me rephrase. How many statistically

21 significant studies one needs to form an

22 opinion that a substance is capable of

23 causing a disease?

24 A. I think that that's not answerable.

25 I think that determining causation is much

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2 more complicated than adding up numbers of

3 statistically significant studies.

4 Statistically significant studies can be

5 invalid, and it doesn't matter how many you

6 have. So I think that we would have to

7 describe more completely what that process is

8 and how causation is determined.

9 Q. Well, Doctor, as an epidemiologist,

10 can you tell me if a negative study proves

11 that a chemical cannot cause a disease?

12 A. My opinion is that a single study is

13 not adequate for making a causal

14 determination one way or the other.

15 Q. But does a negative study disprove a

16 causal relationship between a chemical and a

17 disease?

18 A. It doesn't boil down to a single

19 study proving or disproving but rather a

20 critical evaluation of the entire body of

21 literature and a weighting of the evidence,

22 including positive and negative studies,

23 looking at the relative weights and quality

24 weights -- by weight I mean size -- quality

25 of methods used and whether that body of

Page 35

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2 literature consistently supports the

3 association under different circumstances and

4 in different populations.

5 Q. Doctor, are you familiar with the

6 reference done on epidemiology out of the

7 Judicial Reference Manual?

8 A. Yes, I've seen it sometime ago.

9 Q. Do you know how many studies that

10 reference says that one needs to conclude

11 that an agent is more likely the cause of a

12 disease?

13 A. I don't, but I also don't consider

14 that a scientific document. It's a judicial

15 document. It's a guidance for

16 non-scientists.

17 Q. You don't consider the methodology in

18 the reference guide on epidemiology adequate

19 for this type of work?

20 MR. PERRY: Object to form.

21 A. I wouldn't teach a course on

22 epidemiological evaluation of causation using

23 it as a textbook.

24 Q. Okay. Do you know who authored the

25 reference guide on epidemiology?

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2 A. I do believe I know one or more of

3 the authors. I can't recall them right now.

4 Q. Okay. Do you agree or disagree with

5 the methodology contained in that reference?

6 A. If depends on which methodology. I

7 think some of it's pretty good for a lay

8 accessible document. Some of it I think is

9 -- has been oversimplified, probably

10 necessarily, for its intended use.

11 Q. Does an expert need epidemiological

12 studies to render an opinion as to causation?

13 MR. PERRY: Object to form.

14 A. Well, certainly the preferred body of

15 evidence would derive from human studies

16 because human studies are by far the most

17 relevant.

18 There are examples where human

19 evidence is lacking and where a causal

20 determination was made because of the, I

21 think good understanding of the mechanism in

22 humans. It may be more experimentally than

23 epidemiologically or observationally. But I

24 think that most of the organizations, bodies,

25 authoritative bodies that determine causation

Page 37 1 2 rely heavily upon and prefer human evidence 3 primarily. 4 Q. Did you review -- let me rephrase 5 it. 6 Are you aware of the mechanism 7 studies relating to benzene exposure? 8 A. I think earlier I indicated that was 9 not my area of expertise. I'm not -- 10 Q. I thought that's what you said. I 11 was just curious why you were bringing that 12 up. 13 So is it your opinion that sometimes 14 mechanism studies can be substituted for 15 epidemiological studies? 16 A. Well, if you understand the process 17 that IARC uses, there can be, on the basis 18 of animal studies combined with good 19 mechanistic understanding, a promotion of a 20 substance, a chemical to a Group 1 carcinogen 21 absent good epidemiologic studies. It is 22 possible. 23 Q. Okay. Doctor, what's general 24 causation? 25 A. In my opinion, general causation is	Page 39 1 2 studies that he derived from those studies 3 for his meta analysis, so we've got three 4 universes of results. Which one are you 5 referring to? 6 Q. His expert report? 7 A. And the question is, do I disagree 8 with the results of these studies? 9 Q. Yes. 10 A. Well, I think that's -- we'd have to 11 take those individually. First of all, 12 results are results, and if the studies are 13 well conducted, then they're open to 14 interpretation and discussion, and 15 epidemiologically that's what we spend a lot 16 of our time doing, is understanding whether 17 results that we generate or someone else 18 generates has use or meaning in understanding 19 causes of disease. 20 Q. All right. And, Doctor, my question 21 is, did Dr. Infante rely on epidemiological 22 studies that show a statistical significant 23 result for benzene and multiple myeloma? 24 A. Actually, no, there aren't so many 25 of those available.
Page 38 1 2 the ability of a substance, say, it doesn't 3 have to be a chemical in order to determine 4 causation or risk, but let's say stick to a 5 chemical agent. It's the ability of that 6 chemical to cause a specific disease, let's 7 say a cancer or any cancer, under any 8 circumstances. 9 Q. And can you define specific 10 causation, Doctor? 11 A. Yes, in my opinion, specific 12 causation pertains to an individual and 13 whether an individual's disease can 14 specifically be attributed to a specific 15 exposure. 16 Q. Okay. Doctor, did you disagree with 17 the results of the studies that Dr. Infante 18 relied on in his report? 19 A. Well, just to be clear, there are 20 the results of the studies that Dr. Infante 21 relied on in his expert report -- 22 Q. Yes, sir. 23 A. -- there are the results of the 24 studies Dr. Infante relied upon in his meta 25 analyst, and there are the results of the	Page 40 1 2 Q. There aren't so many. I said did 3 he rely on any. 4 A. Yes, I believe he relied on Rinsky 5 87 that shows statistically significant 6 association. 7 Q. Did Kirkeleit show a statistically 8 significant association? 9 A. Yes. I didn't mean to say Rinsky 10 was the only one. I was just giving you an 11 example of one. 12 Q. Right. 13 A. Kirkeleit is another, yes. 14 Q. That's why I asked you generically 15 did he rely on studies that show a 16 statistically significant relationship between 17 benzene and multiple myeloma. 18 A. Well, yeah, that was your original 19 question, but let's take Kirkeleit. For 20 example, he relies on one of the many 21 results from that study, but he appears not 22 to rely on the rest of the study. What he 23 relies on specifically is the statistically 24 significant association they report. 25 Q. All right. Doctor, what are the

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1
2 known causes of multiple myeloma?
3 A. I'm not sure that there are known
4 causes. There are certainly some risk
5 factors that are suspected. For instance,
6 ionizing radiation.
7 Q. Anything else?
8 A. I think that there -- excuse me,
9 there's been a interruption.
10 (Interruption.)
11 A. Okay. Sorry. There are other
12 characteristics, attributes of individuals that
13 appear to place them at increased risk for
14 multiple myeloma. Age, of course, is clearly
15 one, being of white race another, possibly
16 other individual characteristics, but as far
17 as environmental or what we consider
18 preventable risk factors, I don't think that
19 any rise to the level of known causes.
20 Q. Doctor, what caused Mr. Bishop's
21 multiple myeloma?
22 A. I don't know. I don't know that it
23 can be known at this point in our
24 understanding of the disease.
25 Q. Doctor, you're not going to try to

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1
2 give any opinions at trial as to the levels
3 of exposure Mr. Bishop sustained from
4 benzene?
5 A. I will not be speculating on his
6 exposure levels to benzene.
7 Q. Do you know if pipe fitters were
8 exposed to high level of benzene in the
9 '70s?
10 MR. PERRY: Object to form.
11 A. This is a very broad category of
12 occupation, and so I would expect that some
13 proportion of pipe fitters might be. I
14 would expect others never were.
15 Q. Do you know the exposure pathways a
16 pipe fitter would encounter?
17 A. Yeah, I presume, as with any
18 chemical exposure that is volatile, it could
19 be ingested, it could be inhaled, it could
20 be contacted with the skin.
21 Q. Okay. Doctor, if a chemical can
22 cause one cancer, is it capable of causing
23 others?
24 MR. PERRY: Object to form.
25 A. No, not necessarily. There appears

Page 43

1
2 to be a great specificity in the
3 relationships between exposures and -- or
4 carcinogens and the cancers they cause.
5 Q. Is benzene contained in gasoline,
6 Doctor?
7 A. I believe there are small quantities
8 of benzene in gasoline products.
9 Q. What about crude oil?
10 A. I believe there's some, again, small
11 quantities in crude oil and --
12 Q. Is it contained in Pyrolysis Gas?
13 A. I'm sorry, I didn't hear the
14 beginning of your question.
15 Q. Is benzene contained in Pyrolysis
16 Gas?
17 A. I'm not sure.
18 Q. Do you know if Pyrolysis Gas is an
19 issue in this case?
20 A. I don't frankly know what that is.
21 Q. Do peak exposures play a role in
22 development of blood disorders, Doctor?
23 MR. PERRY: Object to form.
24 A. You need to define peak exposures,
25 but if you rely on how I would describe a

Page 44

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2 peak exposure, as some unusually high
3 exposure sustained over hopefully a short
4 period of time, I think there is some
5 evidence that those may be more harmful than,
6 say, that same quantity of exposure stretched
7 out over long periods of time.
8 Q. Okay. Doctor, would you say all
9 studies contain some type of flaw or
10 imperfection?
11 A. Well, in ours, observational science
12 is -- you're talking about epidemiological
13 studies I presume.
14 Q. Yes, sir.
15 A. Because they're observational studies,
16 they are inherently subject to various forms
17 of error, and that the real art of
18 epidemiology is to anticipate and prevent
19 those from occurring thereby increasing the
20 quality and the validity of the results of
21 the study.
22 Q. Okay. Doctor, do you know the
23 minimum benzene exposure level that is
24 required to cause a blood malignancy or blood
25 disorder?

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2 A. I do not, no.

3 Q. Okay. Would that be something that

4 epidemiologists keep up with?

5 A. Well, I'm sure there are

6 epidemiologists who specialize in that area

7 that would know that area well.

8 Q. Okay. Doctor, do any of the studies

9 Dr. Infante rely on contain a dose response

10 for benzene and multiple myeloma?

11 A. Is your question do any of the

12 studies demonstrate a dose response.

13 Q. Yes.

14 A. I don't think there are any that

15 clearly do so, no.

16 Q. Are there any that show any type of

17 dose response relationship?

18 A. Well, there's some, you know,

19 irregular dose response. For example,

20 Collins has a study where he looks at

21 different levels of exposure, and it turns

22 out that the category with the highest

23 exposure also has the highest SMR. It's not

24 statistically significant, but I'm sure there

25 are people who would look at that and say

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2 this appears to be a, a dose response

3 relationship, that is an increasing strength

4 of association with increasing exposure level,

5 but that's fairly weak.

6 Q. Does the 1987 Rinsky study show a

7 dose response for benzene in multiple

8 myeloma?

9 A. It can't. There's only four cases,

10 and you really need to have decent -- I

11 don't even think that the Collins had enough.

12 It wasn't much bigger than that. But you

13 need a good estimate of the risk at each of

14 the exposure levels in order to have any

15 confidence in the relationship between those

16 or across those categories of exposure.

17 Q. Doctor, are you familiar with the

18 1987 OSHA final benzene standard?

19 A. Yes, I am.

20 Q. Okay. And do you know if they used

21 the Rinsky study in that final benzene

22 standard?

23 A. Yeah, I think that actually must

24 have been the impetus for that. It came out

25 around the same time.

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2 Q. All right. And was the dose

3 response relationship between benzene and

4 multiple myeloma discussed in that OSHA final

5 rule?

6 A. I really don't know. I doubt it. I

7 don't think there was a dose response

8 relationship demonstrated in Rinsky.

9 Q. Do you know if OSHA states in that

10 rule whether or not there is sufficient

11 epidemiological evidence to demonstrate a

12 causal relationship between benzene and

13 multiple myeloma?

14 A. I'd have to look at the specific

15 document to see if it used those terms, but

16 I do understand that at that time they

17 believed that benzene causes multiple myeloma.

18 Q. And do you know which studies OSHA

19 used as a basis for that opinion?

20 A. Well, they do, they do list the

21 studies including, you know, Decoufle and

22 even Aksoy, which wasn't an epidemiologic

23 study, so I'm not sure that that's an

24 accurate representation, but they are listed

25 in the document.

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1

2 Q. Okay. Do you know any other studies

3 that they listed as references for their

4 opinion?

5 A. Ah --

6 Q. No, okay.

7 A. It's just a matter of looking at

8 that document. I don't --

9 Q. Do you have that document handy,

10 Doctor?

11 A. I think there were -- I do. I do

12 have it here.

13 Q. Why don't you pull it out, Doctor.

14 Turn to page 34779.

15 A. I actually recall it was an exhibit

16 to Dr. Infante's deposition which is in front

17 of me. Okay, 34489.

18 Q. 34779.

19 A. 3479. I have it, yes.

20 Q. Okay.

21 A. Okay, I see the studies here, the

22 middle of the, the bottom of the middle

23 column.

24 Q. Why don't you read what OSHA says.

25 "Epidemiological studies demonstrate," start

Page 49 1 2 there. 3 A. "Epidemiologic studies demonstrate 4 that benzene can cause leukemia, multiple 5 myeloma and perhaps other hemopoietic and 6 lymphatic cancers. Aplastic anemia and 7 several other blood diseases are also known 8 to be caused by benzene exposure. 9 Observations related to the above findings 10 have been demonstrated by a number of high 11 quality epidemiologic studies and case 12 reports, such as those by Rinsky, Wong, Ott, 13 Decoufle, Infante, Aksoy, Vigliani and 14 others." 15 Q. Okay. My question is, do you 16 disagree with OSHA's statement that those 17 were high quality studies? 18 A. Well, there are a couple problems 19 with this. I do disagree specifically with 20 these being necessarily good epidemiological 21 studies, although that's not exactly what it 22 says. It lumps a lot of things together, so 23 the language is not really scientifically 24 specific. 25 It's talking about many disease	Page 51 1 2 different things. There are cases of 3 diseases that will occur, and there are 4 epidemiological studies that seek to determine 5 the rates at which those occur. 6 If studies, epidemiologic studies, 7 that ascertain the rates of those diseases 8 among employees exposed and non-exposed 9 showing associations, then you have something 10 close to an epidemiologic study, and my 11 belief is that those epidemiologic findings 12 should be published in peer-reviewed 13 scientific journals for the scientific 14 community to evaluate. 15 Q. Okay. Doctor, if I owned a oil 16 company and I had 150 cases of multiple 17 myeloma from 1960 to 2009 and I didn't 18 report that or publish a study on that, 19 would you have an interest or an opinion on 20 whether or not that could be statistically 21 significant? 22 MR. PERRY: Object to form. 23 A. Well, not as you described it. I 24 think it suggests that there might be a 25 large enough sample size around which a
Page 50 1 2 entities, and it's talking about many 3 studies, so we'd have to talk about each one 4 individually for me to decide whether that 5 was a high quality epidemiologic study, 6 whether or not OSHA believed that it was a 7 high quality study of any sort. 8 Q. All right. Doctor, do you believe 9 benzene can cause multiple myeloma under any 10 circumstances? 11 A. I don't think that the 12 epidemiological evidence available to us to 13 date can support that conclusion. 14 Q. Okay. Doctor, do you believe that 15 concealment of data would under report the 16 incidence of myeloma in the public domain? 17 MR. PERRY: Object to form. 18 A. That's pretty vague. I don't know 19 what you're asking. 20 Q. Okay. If certain industries fail to 21 produce cases of employees with let's say 22 multiple myeloma, would there be a lack of 23 studies in the peer-review literature? 24 MR. PERRY: Object to form. 25 A. I think you're referring to two	Page 52 1 2 proper epidemiologic study could be 3 constructed where the actual rates of 4 occurrence of those diseases or those cases 5 occur could be quantified. I think having a 6 number of cases doesn't itself suggest 7 whether it's large or small without knowing 8 the denominator of the population that 9 actually gave rise to those case. Maybe -- 10 Q. What if the denominator was 30,000 11 for my oil company and I had 150 cases of 12 multiple myeloma from 1960 to 2009, would 13 that, would that be of interest to you? 14 MR. PERRY: Eric, you mean 30,000 15 employees per year from 1960 until 2009 or 16 you mean 30,000 employees total from 1960 17 until 2009? 18 MR. WILLIAMS: 30,000 employees with 19 work, work lives of 20 to 40 years. 20 MR. PERRY: The same 30,000 21 employees for 49 years, is that the question? 22 MR. WILLIAMS: I'm asking the 23 Doctor. 24 Doctor, do 150 cases -- let me 25 rephrase my question.

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2 Doctor, tell me one study in the
3 public domain that shows 150 cases of
4 multiple myeloma from one company.
5 MR. PERRY: Object to form.
6 A. I don't know about a single study.
7 There are many com -- many studies from
8 among the petroleum companies where there are
9 hundreds of cases total.
10 Q. And how many employees are we
11 talking? Hundreds of thousands of employees?
12 A. Well, the studies don't just take
13 number of cases out of number of employees.
14 All the studies you see with SMRs we
15 calculate person time. So we need to know
16 every person who worked in that facility and
17 the duration of time they worked in that
18 facility and every year that they're followed
19 until they die and we determine what the
20 cause of death was in those cases. So we
21 typically have hundreds of thousands of
22 person years that are necessary, then, to
23 calculate the rates at which the diseases are
24 occurring, and we then can more properly
25 compare those rates of diseases between

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1
2 exposed subgroups and non-exposed subgroups or
3 even to the general population. But if we
4 only have counts of people and diseases, we
5 can't construct a valid epidemiological
6 measure of association.
7 Q. Okay. And, Doctor, I don't recall
8 what you said. Have you seen a -- one
9 company with 150 cases internally?
10 MR. PERRY: Object to form.
11 A. Not that I recall, no.
12 Q. Okay. Can you name a study
13 sponsored or conducted by Shell Oil that show
14 a statistically significant result for benzene
15 and multiple myeloma?
16 A. Not that I recall, no.
17 Q. How about Exxon, sir?
18 A. I'd have to refer to my summary.
19 There's so many studies. Let me -- if you
20 don't mind, I'll look at --
21 Q. Absolutely.
22 A. -- the summary that I have and
23 provided you on this DVD. I believe not,
24 but there might be some here or there. You
25 know, you always have some positive and

Page 55

1
2 potentially statistically significant findings
3 out of the majority that show no such
4 association. I don't believe that there was,
5 no.
6 Q. How about Chevron?
7 A. I believe not.
8 Q. Any other oil company?
9 MR. PERRY: Object to form.
10 A. I believe that, yes, Dr. Satin 2002
11 reports in refinery workers, I believe this
12 is a Canadian company --
13 Q. And what were the results from that
14 study?
15 A. He had a total of 29 multiple
16 myelomas.
17 Q. Okay.
18 A. And the SMR was 1.56 -- I'm sorry,
19 1.59, and the confidence interval was 1.07 to
20 2.89.
21 Q. Okay. Have any other oil companies
22 shown a statistically significant result that
23 was greater than a 2.0?
24 A. Greater than a 2.0. I don't know
25 of one offhand.

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1
2 Q. Okay.
3 A. There is the Kirkeleit, has relative
4 risks based on --
5 Q. That was sponsored by an oil
6 company, you said?
7 A. I don't know what the sponsorship
8 was, but it was in oil employees.
9 Q. Doctor, in your report you say that
10 there are 19,920 new cases of multiple
11 myeloma diagnosed each year, paragraph 27.
12 Do you know what the U.S. incidence rate for
13 myeloma is?
14 A. As an aggregate, no. You really
15 should look at the incidence rate by age.
16 It depends strongly on age.
17 Q. Well, if I told you Dr. Nilsson
18 lesson testified that it was 4.3 per hundred
19 thousand, would you agree with that?
20 A. I think that I've seen estimates
21 around 4 or a little bit more than 4 for
22 the overall population which would be a
23 weighted average of all the age specific
24 rates. They do vary considerably across age
25 groups.

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2 Q. Doctor, in your report, paragraph 31,

3 you talk about the Institute of Medicine.

4 Is that a governmental agency, Doctor?

5 A. Well, the Institute of Medicine is

6 part of our natural academies of science, and

7 its -- while it's important to our government

8 and it often deals with matters of science

9 for our Congress, it is intentionally

10 independent of government and industry and

11 all specific interests in order to render

12 high quality valid and unbiased scientific

13 opinions.

14 Q. Doctor, when you say "our," who are

15 you referring to?

16 A. U.S. citizens.

17 Q. Okay. Is it a nonprofit

18 organization?

19 A. I don't know their legal construct.

20 Q. Okay. Do they classify chemicals as

21 carcinogens?

22 A. They do do critical reviews of

23 epidemiologic and toxicologic literature and

24 often provide opinions as to carcinogenicity,

25 yes.

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2 Q. Kind of like the American Cancer

3 Society, something similar to that?

4 A. I wouldn't use that specifically. I

5 think the American Cancer Society has another

6 purpose, but let's say they use a similar

7 approach as IARC or NTP would in evaluating

8 the epidemiological literature.

9 Q. But, again, they're not a

10 governmental agency, correct?

11 A. Well, I don't know their exact

12 classification, but they intend to be

13 independent of the government so that they

14 can render objective opinions to the

15 government for litigation and decision making.

16 MR. PERRY: Wait. Eric, let him

17 finish.

18 THE COURT REPORTER: We didn't get

19 that question. There was an interruption.

20 MR. PERRY: Eric, let him --

21 BY-MR.WILLIAMS:

22 Q. Do you know if they rendered any

23 peer-review opinions as relates to benzene

24 and multiple myeloma?

25 A. I'm not sure what you mean by a

Page 59

1

2 peer-review opinion. They have in fact

3 published language in review documents that

4 were the products of the large and diverse

5 committee of experts that underwent additional

6 peer-review drawing the conclusion that the

7 evidence was insufficient for such a

8 conclusion.

9 Q. What journal was that published in,

10 Doctor?

11 A. I'm sorry, I don't understand that I

12 ever indicated it was published in a journal.

13 It was published in an official report of

14 the IOM.

15 Q. Mm-hmm. Doctor, if you look at your

16 reference list in your report, can you tell

17 me what studies are benzene cohort studies?

18 A. Well, I don't have a specific

19 notation of that, but I believe that the

20 Ireland and Collins, Sorahan, Rinsky, Wong.

21 The Australian study series there are several

22 reports on some, various over time.

23 Schnatter --

24 Q. Anything else, Doctor?

25 A. I'm still going. Schnatter, Lewis,

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1

2 Satin, Huebner, Tsai, Divine, Thomas, Dement,

3 Rushton, Kirkeleit. I think those are most

4 of the cohort studies.

5 Q. Doctor, can you define benzene cohort

6 for us?

7 A. Well, I assume you're referring to

8 cohorts exposed to benzene.

9 Q. Yes, I'm asking your definition of a

10 benzene cohort.

11 A. Well, I'm not sure that that's a

12 standard term, but I take it as meaning a

13 defined group of people, which is simply the

14 definition of a cohort, where exposure is

15 either known or presumed, and that depends on

16 what kinds of records might be available.

17 Q. And what would make the study that

18 you just listed different from other benzene

19 epidemiological studies as it relates to

20 being called a benzene cohort?

21 A. I really don't understand your

22 question.

23 Q. Well, how do we -- how does one

24 know if we're looking at a benzene cohort

25 study or just an epidemiological study

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1
2 involving benzene and blood malignancies?
3 A. I'm sorry, I still don't understand
4 what your question is.
5 Q. Okay. Well, if you don't understand
6 the question, I don't know how else to ask
7 it.
8 Do you know what type of studies Dr.
9 Infante used in his meta analysis?
10 A. He claims to have selected 7 of the
11 8 available cohort studies on benzene
12 exposure and multiple myeloma.
13 Q. Okay. Now, let's go to that word
14 claims. Why don't you define that for us.
15 A. That's what he says in his report.
16 Q. Okay. And what is he saying about
17 7 of 8 benzene cohorts?
18 A. He, again, claims, meaning he
19 describes in his report that these are
20 studies where he has a high level of
21 certainty that the cases were exposed.
22 Q. Does he state that there are other
23 known benzene cohorts?
24 A. I think he does.
25 Q. Besides the 8 studies that you just

Page 62

1
2 referred to?
3 A. I'd have to -- you know, I don't
4 know what he would define a benzene cohort
5 as, and I don't recall specifically if he
6 mentions others. I believe he mentions a
7 larger number of studies but then ends up
8 not incorporating them in his analysis.
9 Q. Okay. And is there a standard
10 epidemiological definition for benzene cohort
11 that you know of?
12 A. Well, as I said earlier, I don't
13 think that that's a standard term to begin
14 with. I think loosely you're referring to
15 groups of people where there's some
16 probability that benzene exposure occurred.
17 Sometimes it's a subset of a larger cohort,
18 so I don't know that it has inherent meaning
19 as a technical term.
20 Q. Okay, I understand. Doctor, did you
21 look at the 1977 Joyner/Stallone study?
22 MR. PERRY: Object to form.
23 A. Yes, I -- I'm sorry, I --
24 Q. Did you review Dr. Infante's expert
25 report in this case?

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1
2 A. Excuse me, I didn't finish my
3 previous answer.
4 Q. I apologize.
5 A. I looked at reports from Stallone.
6 You're referring to the unpublished reports
7 of the surveillance system? Not the
8 surveillance system; of the death
9 certificates?
10 Q. For the 77 Stallone study?
11 A. Yes, I'm just trying to clarify that
12 we're talking about the same document.
13 Q. Yeah, the one with the 8 cases of
14 multiple myeloma in it, that one.
15 A. Okay. Yes, I've seen that report.
16 Q. Okay. And did you look at Dr.
17 Infante's calculation for those 8 cases of
18 myeloma?
19 A. I believe I did, but on the other
20 hand, this is not a peer-reviewed, published
21 epidemiologic study. And, secondly, it uses
22 a kind of a quick and dirty analytic
23 methodology that is not of the caliber of
24 what one does in conducting a cohort study.
25 Q. Did you say quick and dirty?

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1
2 A. Yeah, that's what I would refer to a
3 PMR analysis.
4 Q. Okay. Why is it quick and dirty?
5 A. Well, typically it's done when you
6 have a bunch of death certificates and you
7 want to make some sense out of them or
8 generate some hypotheses. It's done, you
9 know, for that purpose often, and it's very
10 inexpensive to do. It might lead one to
11 conclude that a cohort study might be
12 worthwhile. It might also suggest that there
13 aren't enough, you know, cases to actually
14 pursue a cohort study which can be quite
15 time-consuming and expensive. So it has its
16 purpose, but its purpose is -- among these
17 purposes is not determining causation.
18 Q. Do the results indicate that they
19 are statistically significant?
20 MR. PERRY: Object to form.
21 A. Statistically significant what?
22 Q. For benzene and myeloma.
23 A. Well, first of all, I'm not sure
24 there was any measure of exposures, including
25 benzene in that report. I think that this

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Page 65

1
2 was a collection of death certificates from a
3 company which included people who might have
4 been exposed to benzene and others who might
5 not have.
6 Q. Okay. Do you know if those results
7 were ever reported to OSHA, Doctor?
8 A. The results on multiple myeloma?
9 Q. Yeah, the 8 cases of myeloma.
10 A. I don't, I don't know that those
11 were sought by OSHA. I think that OSHA was
12 looking for studies on leukemias.
13 Q. Is blood dyscrasia also -- is
14 multiple myeloma also referred to as blood
15 dyscrasia?
16 MR. PERRY: Object to form.
17 A. I don't know if that's what -- if
18 that's the right terminology, so I just don't
19 know.
20 Q. Have you ever referred to multiple
21 myeloma as blood dyscrasia?
22 MR. PERRY: Object to form.
23 A. Not that I know of.
24 Q. Okay. One second, Doctor. Do you
25 think 150 cases in a company is enough to

Page 66

1
2 perform an epidemiological study to determine
3 if there's an excess of multiple myeloma?
4 MR. PERRY: Object to form.
5 A. Well, epidemiologically 150 cases is
6 certainly much more attractive than studies
7 with 8 or 10 or 22 or 50.
8 Q. I agree with you on that, Doctor. I
9 don't think I have any other questions at
10 this time. Do you have any Stan?
11 MR. PERRY: No, sir.
12 MR. WILLIAMS: Anybody else?
13 MR. CHOCHULES: No.
14 MR. WILLIAMS: Okay, I don't think I
15 heard anybody else, Ms. Court Reporter.
16 I want to mark the OSHA document as
17 the next exhibit. I don't think he had that
18 in his CD-ROM.
19 (Whereupon, Exhibit-3 was marked for
20 identification.)
21 THE VIDEOGRAPHER: The deposition is
22 now concluded, and the time is approximately
23 4:27. This concludes tape No. 1 of 1 of
24 the deposition of Kenneth Mundt, M.D. and we
25 are off the record.

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2 (Whereupon, the Deposition of KENNETH
3 MUNDT, M.D. concluded at 4:30 p.m.)
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Page 68

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2 CERTIFICATE
3
4 I, Maryellen Coughlin, a RPR/CRR and
5 Notary Public of the Commonwealth of
6 Massachusetts, do hereby certify that the
7 foregoing is a true and accurate transcript
8 of my stenographic notes of the deposition of
9 KENNETH A. MUNDT, Ph.D., who appeared before
10 me, satisfactorily identified himself, and
11 was by me duly sworn, taken at the place and
12 on the date hereinbefore set forth.
13 I further certify that I am neither
14 attorney nor counsel for, nor related to or
15 employed by any of the parties to the action
16 in which this deposition was taken, and
17 further that I am not a relative or employee
18 of any attorney or counsel employed in this
19 case, nor am I financially interested in this
20 action.
21
22
23 MARYELLEN COUGHLIN, RPR/CRR
24
25 Dated: July 3, 2009

VIDEOTAPED DEPOSITION OF KENNETH MUNDT, M.D., JUNE 29, 2009

Page 69 1 2 CAPTION 3 The Deposition of KENNETH MUNDT, 4 PH.D., taken in the matter, on the date, and 5 at the time and place set out on the title 6 page hereof. 7 It was requested that the deposition 8 be taken by the reporter and that same be 9 reduced to typewritten form. 10 It was agreed by and between counsel 11 and the parties that the Deponent will read 12 and sign the transcript of said deposition. 13 . 14 . 15 . 16 . 17 . 18 . 19 . 20 . 21 . 22 . 23 . 24 . 25	Page 71 1 2 DEPOSITION ERRATA SHEET 3 . 4 RE: Accurate Court Reporting, Inc. 5 Case Caption: JOANN BISHOP, ET AL. 6 VS. SHELL OIL COMPANY, ET AL. 7 . 8 DEPONENT: KENNETH MUNDT, PH.D. 9 DEPOSITION DATE: June 29, 2009 10 . 11 To the Reporter: 12 I have read the entire transcript of my 13 Deposition taken in the captioned matter or the 14 same has been read to me. I request that the 15 following changes be entered upon the record for 16 the reasons indicated. I have signed my name 17 to the Errata Sheet and the appropriate 18 Certificate and authorize you to attach both to 19 the original transcript. 20 . 21 _____ 22 _____ 23 _____ 24 _____ 25 _____
Page 70 1 2 CERTIFICATE 3 STATE OF : 4 COUNTY/CITY OF : 5 Before me, this day, personally 6 appeared, KENNETH MUNDT, PH.D., who, being duly 7 sworn, states that the foregoing transcript 8 of his/her Deposition, taken in the matter, 9 on the date, and at the time and place set 10 out on the title page hereof, constitutes a 11 true and accurate transcript of said 12 deposition. 13 14 KENNETH MUNDT, PH.D. 15 . 16 SUBSCRIBED and SWORN to before me this 17 day of , 2009 in the 18 jurisdiction aforesaid. 19 20 My Commission Expires Notary Public 21 . 22 . 23 . 24 . 25 .	Page 72 1 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 _____ 21 _____ 22 . 23 SIGNATURE: _____ DATE: _____ 24 KENNETH MUNDT, PH.D. 25