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.

DEPOSITION of DAVID PYATT, held on June 24, 2009, at 6901 Tower Road, Denver, Colorado, commencing at 9:18 a.m., before Janet Lee Priestley, a Shorthand Reporter and Notary Public in and for the State of Colorado.

APPEARANCES:

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and
RICHARD J. FERNANDEZ, LLC
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Shell Oil Company, Shell Chemical,
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ALSO PRESENT: Roger Stuart, CLVS

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DEPOSITION OF DAVID PYATT

JUNE 24, 2009

THE VIDEOGRAPHER: The videotape recording has commenced and we are now on the record. Today is June 24th, 2009. The time is approximately 9:18 a.m. My name is Roger Stuart, Jr., and I am the certified legal video specialist for Accurate Court Reporting, Incorporated, whose business address is 24650 Sandhill Boulevard, Suite 401, in Punta Gorda, Florida, 33983. This is the deposition of David Pyatt, Ph.D., in the matter of Jo Ann Bishop, plaintiff, vs. Shell Oil Company, et al., defendants, Case No. 07-2832 pending in the U.S. District Court, Eastern District of Louisiana. This deposition is being taken at Courtyard Marriott Denver Airport, address 6901 Tower Road in Denver, Colorado, zip code 80249, taken on behalf of the plaintiff. The court reporter is Janet Priestley. Will counsel please identify yourselves for the record, stating your name, your addresses, and --

MR. WILLIAMS: Eric Williams and

Richard Fernandez for the plaintiffs.

MR. FARNET: Glenn Farnet for Defendants Shell Oil, Shell Chemical, Marathon Oil, and El Paso.

MR. PERRY: Stan Perry for the Shell defendants.

MR. RILEY: Jim Riley, Radiator Special Company.

MR. MADIGAN: T.J. Madigan for Murphy Oil USA, Inc.

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

Thereupon,

DAVID PYATT,

being first duly sworn in the above cause, was examined and testified as follows:

THE VIDEOGRAPHER: Thank you. Counsel, you may now proceed.

EXAMINATION

BY-MR.WILLIAMS:

Q. Yes. Would you please state your

name and address for the record, sir.

A. Sure. David Pyatt, 1944 Cedaridge Circle, Superior, Colorado 80027.

Q. What's your date of birth, sir?

A. June 18, 1958.

Q. And Dr. Pyatt, what degrees have you earned so far?

A. I have an undergraduate bachelor of science in biology/chemistry. I had a science education degree because I taught school for a little while. And then I have a Ph.D. in toxicology.

Q. And you said a science education degree. Is that a --

A. No, science --

Q. -- undergraduate or a master's?

A. I'm sorry; a science education. It's a B.S. degree, but it involves the educational certification so you can teach.

Q. Okay. What year did you receive your Ph.D. in toxicology?

A. '95.

Q. How does one become a toxicologist, Doctor?

A. I think to be a toxicologist, you get an advanced degree in the subject. I think --

Q. Are there also professional certifications for toxicology?

A. There -- yes. Yes. There are some for -- I think there's a medical sort of toxicology, but I'm not quite sure how that one works. And then there's board certification with the American Board of Toxicology.

Q. And are you certified with the American Board of Toxicology?

A. No.

Q. Okay. So is it your testimony that either certification through the American Board of Toxicology or a Ph.D. in toxicology would make one a toxicologist?

A. The American Board of Toxicology set up their certification program where you take the tests with so many years of experience. So with the caveat that in order to take the exam you have to have the appropriate experience and publication record, sure, I

think that's fine.

Q. Okay. Have you ever sat for the toxicology exam?

A. No.

Q. Have you ever applied for it?

A. I applied once in 2000 or maybe 1999 and was accepted, but then -- I don't exactly remember, but something came up and I was unable to take the exam.

Q. Do you have an opinion whether or not that is a rigorous exam?

A. I've heard that it's pretty hard, yes. I think most people that actually have a Ph.D. in the field and have actively been involved in the teaching and the utilization of this science have an okay time taking it. But you don't have to have a Ph.D. in toxicology to take the exam, based on your number of years that they agree you actually have been working in the field. So I think some people who sit for the test have a very hard time with it because they don't really have the didactic training that they would need to be successful at it. So its failure

rate is quite high. That's my understanding.

Q. Would you consider someone to be a toxicologist if they didn't have a Ph.D. in toxicology or were not board certified in toxicology?

A. No.

Q. Thank you. Doctor, where do you work?

A. I work for Summit Toxicology, my consulting company, and then I also work for the university.

Q. Okay. And what is your current title at Summit?

A. I guess my official title would be principal and cofounder. There's only three of us so I probably could give myself any title that I'd like. No, I guess I couldn't be president because one of my partners claimed president when we first started.

Q. And what do you do at the university, Doctor?

A. I teach courses in toxicology. I teach a class in environmental epidemiology. I teach a class in risk assessment. I sit

on committees, curriculum development committees. I sit on graduate student advisory boards; you know, basic academic activities for someone who no longer has an active research lab.

Q. Doctor, have you ever published a study relating to benzene and multiple myeloma?

A. Well, I published a couple papers relating to the metabolites of benzene and effects on B lymphocytes, which I think has some bearing on this issue. But if you're asking about an epidemiology study, the answer is no.

Q. Okay. Have you done any research on benzene and multiple myeloma independent of litigation?

A. Yes.

Q. Tell us what you've done.

A. Well, the context -- at least part of the context in thinking about what metabolites of benzene might do with B lymphocytes, I mean, that was part of the thought, that and non-Hodgkin's lymphoma.

And then I've done other work that wasn't -- that was on benzene involving risk assessments and things like that where this was part of the evaluation, understanding --

Q. Have you specifically done a study, any research, on benzene and multiple myeloma?

A. I think I've answered that. I'm not -- maybe I'm not understandings your question.

Q. Okay. What did you think -- I'm sorry. What was your answer?

A. Well, that within the context of thinking about the metabolites of benzene and B lymphocytes as well as the Giles specific risk assessment on benzene and some of the other risk assessment work that I've done on benzene, multiple myeloma was part of that process, thinking about this disease.

Q. Okay. Doctor have you worked for any federal agencies relating to research on benzene and multiple myeloma?

A. That's pretty specific. I guess the answer to that would be no.

Q. What percentage of your work involves litigation?

A. With pretty wide confidence intervals I'd say the answer is 30, maybe 40 percent. It varies depending on the time frame that you cut off. Sometimes I'm busy doing this. Other times I don't do very much of it at all. But on average, I think that's fair, 30 percent.

Q. And what percentage of the 30 percent deals with chemicals and causation?

A. I would think all of it.

Q. Okay. Do you know how many cases that you have served on as an expert dealing with chemicals?

A. I don't know, no. I've been doing this for five years.

Q. Okay. So you started doing this around 2004?

A. Excuse me. Sorry. That sounds right, yes.

Q. And let's back up for a second. Doctor, did you receive a notice for this deposition?

A. I did.

Q. Okay. Could you please pull out the notice and tell me what you brought with you today in response to our notice.

A. I'll be happy to. Okay. Do you want me to -- how do you want to do this? Do you want me to just tell you what I brought, or would you like for me to go down the list?

Q. Why don't you look at the list and tell me what you brought in response to each item.

A. Okay. "Documents that were produced to you, reviewed, or relied upon in forming your opinions," I brought that. A copy of my expert report, I brought that. The exhibits to my expert report, I'm assuming that's the citations which I burned onto a CD and sent to Stacy Yates so I'm assuming that's out there and you have a copy. "A copy of the scientific literature that you reviewed in preparing your report," yes, I have that. A list of all the cases, I have that. I have the one invoice that I've

submitted in this matter, so a statement itemizing the time. Documents -- No. 6, "documents including all studies or scientific documents that do not support your opinion," of course I have that. "Your file in this case," I think that's what we're talking about, but -- so I'm not exactly sure what that is, but I think I have that. Communications between me and the attorneys, I have that. My college and graduate school transcripts, that was a new one for me, but I do have the graduate school transcripts. I don't have my undergraduate transcripts. I guess they exist somewhere, but not in my possession. I did not bring documentation sufficient to establish income. I was informed that that would not be required. The same with 11, "documentation evidencing the total amount of income earned from litigation regarding Shell." Expert reports that I've provided in other multiple myeloma cases, I did bring that if you'd like them. And a list of cases that I've served as an expert witness involving multiple myeloma,

there haven't been that many. I think I might have them written down; if not, I can give you the list, the names.

Q. Okay. And, Doctor, I had trouble hearing you. You said there was a CD you produced to Stacy Yates?

A. Right. Stacy --

Q. What are you talking about?

A. Stacy -- Ms. Yates asked me if I would take all of the citations from my expert report and put those onto a disk, which I did, and then Fed Ex'd those to her. I was assuming that was going to be distributed around. I also have a disk here today because I brought several binders, which we can go through, you know, whenever it's convenient for you, but so the court reporter doesn't have to take my binders and copy all those and I don't have to let that happen because they never come back the way they left. I put all those studies onto a CD. So I have a CD here that will come to you, I guess, that has all of the scientific studies that I've relied upon on this CD as

well as all the ones that are in these binders that are in the room now.

Q. Fair enough, Doctor. Okay. At this point I'd like to mark the notice as Exhibit-1.

A. So what does that mean? I give it to the court reporter?

(Whereupon, Exhibit-1 was marked.)

BY-MR.WILLIAMS:

Q. And the report as Exhibit-2.

A. What report? My report?

Q. Yes, sir.

A. Okay. I brought a copy.

(Whereupon, Exhibit-2 was marked.)

MR. FARNET: Is that an extra copy?

THE DEPONENT: This is the one copy I brought today. I mean, if we're going to talk about it, I'll have to get it back.

BY-MR.WILLIAMS:

Q. I don't think I'll have that many questions from your report. But if you need to, she can hand it back to you.

A. Okay. That's fine. Mr. Williams, do you want --

Q. I'm sorry, Doctor? The CV is Exhibit-3.

A. I was jumping ahead of the court reporter. Do you want the supplemental declaration, which kind of is like the report, or have we not gotten there yet?

Q. Hold that off for right now.

A. Okay. The CV is 3.

(Whereupon, Exhibit-3 was marked.)

MR. WILLIAMS: The bill in this case, Exhibit-4.

(Whereupon, Exhibit-4 was marked.)

MR. WILLIAMS: The communications with counsel in this case will be Exhibit-5.

(Whereupon, Exhibit-5 was marked.)

MR. WILLIAMS: The transcripts, Exhibit-6.

(Whereupon, Exhibit-6 was marked.)

BY-MR.WILLIAMS:

Q. And Doctor, how many reports did you bring from other cases of multiple myeloma?

A. Three.

Q. Okay. The reports will be Exhibit-7.

A. All of them collectively?
Q. Yes, sir.
A. Okay.
(Whereupon, Exhibit-7 was marked.)
BY-MR.WILLIAMS:
Q. The list of cases of multiple myeloma will be Exhibit-8.
A. I'm going to have to make that.
MR. WILLIAMS: Okay. Ms. Court Reporter, maybe if we take a break, he can give that to you before we finish.
THE DEPONENT: So you don't want me to do it now? That's fine.
BY-MR.WILLIAMS:
Q. You can do it now. That's fine.
A. It won't take long.
Q. Okay.
A. Because I think there's these three. Let's see. And I don't need to put this one on there, right? You know that one?
Q. Right.
A. (Deponent complied.)
MR. WILLIAMS: And Ms. Court Reporter, you can mark the disk as Exhibit-9.

THE DEPONENT: Okay. Here's the list. Do you want me to read it or just hand it over?

BY-MR.WILLIAMS:

Q. Well, you can hand it to her, and I'll ask you a question relating to that so we don't have to come back to it.

A. Okay. I'm sorry. Do you want the -- I'm sorry, Mr. Williams. I got -- so does she get the disk?

Q. Yes. The disk is No. 9. When she's finished stickering it, let me know and I'll continue questioning.

A. Okay. So the list is 8.

(Whereupon, Exhibit-8 and Exhibit-9 marked.)

BY-MR.WILLIAMS:

Q. Okay. Doctor, how many cases have you served in that involved multiple myeloma?

A. Four, not counting this one.

Q. Not counting this one?

A. Yeah; five counting this one.

Q. Okay. And can you tell me the names of those cases?

A. One is Ben Brown.
Q. Okay.
A. One is Sundquist; an old one, Trojan vs. People's Gas. And those three all have reports. And then the last one is Behymer, B-e-h-y-m-e-r, vs. BP. And that one did not have a report.
Q. Doctor, did all four of those cases involve allegations of benzene exposure?
A. In the mix. I mean, some had diesel. Some had gasoline. Some had coal tar and polyaromatic hydrocarbons. But yes, to one extent or another, benzene was thrown in the mix.
Q. And did you find that benzene caused multiple myeloma in any of those four cases?
A. Did I find that benzene causes multiple myeloma?
Q. No, sir. Was it your opinion that benzene was the cause of the plaintiff's multiple myeloma in any of those four cases?
A. No, sir.
Q. Okay. Was Shell a defendant in any of those cases?

A. The Ben Brown case, I know that Shell is a defendant. The other ones, I can't honestly say. They might have been somewhere involved. There was always lots of defendants, and they could have been somewhere in the mix, and I honestly don't recall. But I know Ben Brown they are for sure.

Q. And what about Radiator Specialty Company who makes Liquid Wrench? Were they a defendant in any of those four cases?

A. Not to my knowledge, no.

Q. What about Murphy Oil?

A. I don't ever call seeing Murphy Oil in anything other than this one.

Q. Marathon Oil?

A. I've seen Marathon around but not kind of front and center. They've just sort of always been kind of listed in the list of defendants. I'm sorry. That -- as far as the multiple myeloma goes, I don't specifically recall having ever seen them in any of these four cases other than the one that we're in now, Bishop.

Q. What about Tenneco?
A. I never even heard of those guys until this case.
Q. Okay. Fair enough. Doctor, in how many cases have you served as an expert for the defendants?
A. At this point I have never worked for the plaintiffs so all of my litigation would have been on behalf of defendants.
Q. And approximately how many cases have you worked since you started five years ago?
A. It would be a guess; 30. I don't know.
Q. Okay. Do you know how many involved blood malignancies?
A. The vast majority of them. I mean, there were -- I seem to recall a couple of kind of exceptions to that, but almost all of the work that I've done from a litigation point of view has involved blood disorders.
Q. And did you find in any of those cases that the chemical at issue caused the blood malignancy?
A. Well, I've been consulted on several

cases where it was my opinion that I could not -- based on the evidence presented, that I could not rule out that benzene had something to do with that person's disease. And then --

Q. What type of diseases are you talking about, Doctor?

A. Those were all AML cases.

Q. But of the 30 cases that you served as an expert we talked about, how many of them did you find that the chemical caused the plaintiff's disease?

A. Well, let's put quotations around 30 because that's a guess. It may be more. But the ones that I've been retained in, there weren't any. So out of those, the answer would be none.

Q. When you say there "may be more," do you think you may have served on more than 50?

A. I doubt it. I doubt it. I think it probably would be 30 at the low end, 50 at the high end. But I don't -- I don't know. I haven't counted them in the five or

six years I've been doing this.

Q. Okay. Doctor, can benzene cause AML leukemia?

A. Under appropriate exposure conditions.

Q. Okay. And that's my question. Under the worst case scenario, can benzene cause myelodysplastic syndrome?

A. Under the worst case high dose, chronic exposure to benzene is associated -- potentially caused some forms of myelodysplasia. Myelodysplastic syndrome is not a single thing, and I believe the evidence is stronger for some forms of myelodysplasia than others so you've got to be a little more specific with your answer -- with your question. But in general, I would say under the appropriate exposure conditions I would put myelodysplasia in that positive category.

Q. What about ALL leukemia? Can benzene cause ALL leukemia under the worst case scenario?

A. There's no evidence to support that, no.

Q. What about CLL leukemia?
A. No.
Q. Non-Hodgkin's lymphoma?
A. No.
Q. Myelofibrosis?
A. No.
Q. CML leukemia?
A. No.
Q. Are there any other blood disorders that you can think of that benzene can cause?
A. Yes.
Q. Please tell me.
A. I think the historic literature is pretty clear that really high dose exposure to benzene can cause aplastic anemia. And I think the literature, though it's still evolving, is pretty clear that chronic exposure to benzene causes various cytopenias, including pancytopenia, which may or may not be a precursor to aplastic anemia.
Q. Okay. Is benzene classified as a known human carcinogen?
A. Yes.

Q. Do epidemiological studies exist that indicate benzene is a cause of multiple myeloma?

A. Are you asking me are there specific studies? I don't --

Q. Yeah. Are there specifically significant studies for benzene and myeloma?

MR. FARNET: Eric, I don't know -- could you restate that question? The speaker kind of flicked on me, and I don't know that I heard it clearly. Could you restate that, please.

BY-MR.WILLIAMS:

Q. Are there statistically significant studies for benzene and myeloma?

A. Statistically significant studies where they have done an adequate characterization of the exposures and quantified benzene, the only one that I can think of, sitting here, is the original Rinsky study in 1987 of the Pliofilm workers. But then with all of the subsequent follow-ups, Mary Paxton in '94 and then Rinsky himself in 2002, that finding weakened

to nonsignificant levels. In looking at the exposure histories of the four original cases, they don't seem very plausible. So I would say the answer to that is -- well, the answer to your question technically is that one that I'm aware of, but even that one I have trouble with.

Q. Okay. Doctor, if I understand you correctly, is it your testimony that if the exposure assessment is not perfect, then you don't think that study's results are reputable; is that correct?

MR. PERRY: Object to form.

A. Yeah. That's not even close, really, to what I said.

Q. Okay. What did you say about the exposure assessment in other studies?

A. Well, in other studies or in the Rinsky study?

Q. No. I believe you said in other studies the exposure assessment wasn't proper so therefore --

A. No, no, no, sir. What I said was that the studies where they have adequately

characterized the benzene exposure quantified what that exposure was and then conducted an analysis of the multiple myeloma rates in those exposed people. There are a lot of studies where it's a refinery study. Ostensibly there is some benzene there, but they haven't been -- those exposures have not been quantified.

Q. So if I understand you correctly, if the exposure to benzene has not been quantified, then you would not rely on that study?

A. No, sir. That's not what I said. I've relied on every study that I could find that was even peripherally related to this issue.

Q. Okay, Doctor. We'll move on. I'll get back to that. Is benzene associated with multiple myeloma?

A. Not in my opinion.

Q. Okay. Have you ever opined that a chemical caused an individual to contract a blood malignancy?

A. Well, I think I answered that

question. I mean, that was my opinion in several cases, that it was at least probable or possible, and I wouldn't be able to rule that out. But at that point I was not retained in those cases so it never reached the point where I was putting something down on paper. But yes, it has certainly been my opinion that benzene has caused certain blood disorders.

Q. How many cases have you worked on as an expert for Shell that involved blood malignancies and benzene exposure?

A. The only -- as I discussed earlier, they may be in the mix somewhere that I'm not -- well, I might have been familiar with it at one point when I worked on the case, but I can't recall whether they were in there now. The only two that I know of are this one and the Ben Brown.

Q. Okay. What's your hourly rate, Doctor?

A. It's 300 an hour.

Q. How many hours have you put in through completion of your report?

A. Can I go to my invoice?
Q. Absolutely.
A. So when I submitted the invoice, which was after the report, that was 24, 25 hours.
Q. Okay. And how many hours have you put in this case up until your deposition today?
A. Probably that again, maybe more. I mean, I spent some time --
Q. I didn't hear how many hours you said.
A. Probably 25, perhaps more, as many as 40. I mean, I put some time into responding to the motion to exclude my testimony, and then I always spend quite a bit of time prepping for deposition. So this weekend and some last week and this week, I mean, this was my primary focus.
Q. Okay. Speaking of that, Doctor, have you ever been excluded as an expert witness?
A. No, sir.
Q. Have you ever been limited by a

Court in your testimony?

A. No.

Q. Has anyone ever filed a Daubert challenge against you in litigation?

A. Isn't that what you did?

Q. Well, besides me.

A. Oh.

Q. I'm sorry. I didn't hear you, Doctor.

A. I'm pondering the question.

Q. Okay. Take your time.

A. I think they have. I think there's been one or two, maybe more.

Q. Okay. Do you remember the names of those cases?

A. One was Baker. And Chevron, I think, is the primary defendant, but I'm not positive because it's been a while. And they filed a motion, but I never responded to it. The judge dismissed it out of hand. And then there was another one. Boy, it was a long time ago, and I don't -- I don't honestly remember the name. So there's two plus the one you did, so there's three that

I'm aware of. There might have been others.
Q. Okay. Baker, what state was that?
A. California. Well, my client was in California, but the actual case was in Cincinnati.
Q. Do you know if it was federal court or state court?
A. I don't know. It was a really big courtroom.
Q. Do you remember which year it was?
A. Last year so --
Q. Okay.
A. -- '08, early '08.
Q. And I assume that the Baker case would be listed on your case experience that we attached?
A. Yes. Yeah.
Q. And did the court reporter --
A. We haven't --
(Whereupon, a Discussion was held off the record.)
MR. WILLIAMS: I'm sorry. Did we attach a list of his entire case work in the last five years?

THE REPORTER: No.

MR. WILLIAMS: Okay. Let's attach that as Exhibit-10.

(Whereupon, Exhibit-10 was marked.)

BY-MR.WILLIAMS:

Q. Okay. Doctor, how are cancer-causing chemicals identified by IARC?

A. I think IARC does a weight of the evidence evaluation, and they look at all of the scientific data that they can find. I know for the IARC it has to be published. So they look at all of the peer reviewed, published data on a given chemical, and then they meet and discuss the relative weight of all that evidence and then decide upon their classification.

Q. And what type of studies does IARC use?

A. I would assume they use all of them. I've never been part of an IARC panel. But my understanding is that they would certainly put the most weight on quantitative epidemiology, and also they would look at as far as just can it cause human cancer,

probable, possible, whatever their classifications are. They would also rely on the long-term animal bioassays. I think mechanistic studies and plausibility studies are probably in the mix somewhere but certainly do not -- and genotoxicity studies, they certainly will not carry the day, but they're probably on the table.

Q. Doctor, did you have the opportunity to look at the 1977 Shell study that had eight cases of multiple myeloma?

A. I did because you attached it to the motion to exclude my testimony.

Q. Okay. Did you have an opportunity to look at Dr. Infante's calculations for multiple myeloma based on that study?

A. No.

Q. Did you read his report?

A. I read his report.

Q. Dr. Infante calculated a 2.67, I think it was, PCMR for the eight cases. Do you disagree with his findings there?

A. Well, I can't disagree or agree because I don't know what he did to come up

with those numbers.

Q. Do you recall seeing that information in his report?

A. I have his report. I can look at it if you'd like, but --

Q. Yeah, let's do.

A. Even if it's in his report, you know, until those calculations -- they have to be transparent, and they have to go through the peer review process before I would consider that valid.

Q. We're not talking about peer review. I'm just asking, do you disagree with the calculations that he performed?

A. What I'm telling you is I can't agree or disagree because I don't know anything about how he did it.

Q. Is that outside of your field of expertise?

A. Well, I can do it, but yes, that is outside of my field.

Q. Fair enough. Did you review any Shell documents that showed employees with abnormal blood results that developed multiple

myeloma while they were in the benzene monitoring program?

A. No.

Q. Would that have been a factor one way or the other in whether or not benzene can cause multiple myeloma to you?

A. Well, I would factor it into my overall determination, but I would have to see that information and evaluate what you're talking about before I could say whether I would consider that a positive or a negative study.

Q. Okay. And again, I'm not talking about study. I'm talking about internal documents that indicated Shell employees that were in the benzene blood monitoring program with abnormal blood results developed multiple myeloma.

MR. PERRY: Objection to form.

Q. Does that matter to you one way or the other whether or not benzene can cause multiple myeloma?

A. Well, the way you worded it, no, because in order to understand whether there

is a real effect going on, you've got to have comparison populations and do statistic analysis. People get multiple myeloma all the time. They're exposed to all kinds of things, and they're exposed to nothing. They're in all works of -- walks of life. So simply saying, Look, here's a bunch of plumbers, and one them got multiple myeloma or even two of them got multiple myeloma; therefore, being a plumber gives you multiple myeloma, that's inappropriate. That's just not how epidemiology works. So without doing the appropriate epidemiological analysis of the data that you're talking about, which I haven't seen, I don't know whether that says anything about benzene or not.

Q. All right. What about toxicology, Doctor? If we give rats benzene and they develop diseases, is that how we determine whether or not diseases are capable of causing certain cancers?

MR. FARNET: Object to form.

A. All right. I'll try to answer that, Mr. Williams. That's kind of a fuzzy

question. But I think in the overall weight of evidence that something is carcinogenic, then, sure, animal data, of, course would be considered. Whether or not something is going to be classified as a human carcinogen, animal data will not get you there. And even then, in order to discuss a specific form of cancer like we are here, that's a whole different evaluation where you need quantitative epi studies that are looking at the specific disease of interest. Benzene causes zymbal gland tumors in mice and rats. We don't even have a zymbal gland. So clearly the animal data does not tell us that much about what benzene can do in humans.

Q. Well, let me ask you this, Doctor. If we can create a cancer in rats through benzene exposure, is it possible that that cancer could occur in humans?

A. Well, I think it's possible. And if you didn't have any other information, that's probably what the determination would be, that it's possible or it's probable unless

you have mechanistic and additional information that would lead you to believe that the tumor type that you saw in the animals was not appropriate or relevant to humans. And there are certainly examples of that. Inbred species of experimental animals all have genetic instabilities that predisposes them to various tumors. Some are relevant to humans, and some are not.

Q. Thank you, Doctor. Are you familiar with the ATSDR minimum risk levels for benzene?

A. Peripherally.

Q. Do you know what the purpose of those levels are?

A. I think these mineral -- minimum risk levels are a screening level, sort of a baseline risk assessment that would allow you to say if you're below this, really there's no additional study needed, and you can pretty much forget about it. If you're above this, that certainly is not an indication that someone is going to be harmed, but it would probably indicate from

the ATSDR's point of view that they would want to do a more sophisticated risk assessment exposure analysis to understand what those individuals were exposed to.

Q. Doctor is, multiple myeloma a blood cancer?

A. Sure.

Q. Do animal studies indicate that benzene can cause cancer of the blood?

MR. PERRY: Object to form.

A. Well, you know, let's be specific. The animal studies indicate that benzene causes an aggressive T cell lymphoma/leukemia that arises in the thymus and does not really have a precise analogy to humans. So that is actually a pretty good example of where the tumor type does not really correlate with what humans develop. Multiple myeloma is not seen in animals, nor is it seen in humans, but the way you connected those two things I would disagree with.

Q. Are there animal studies that indicate that benzene can cause lymphomas in animals?

A. Yes, just what I told you. It's an aggressive T cell lymphoma/leukemia that arises in the thymus, doesn't really have a precise analogy in humans.

Q. Are there mechanism studies that show benzene can cause damage to the blood cells?

A. There are. In fact, some of my own work would show that.

Q. Thank you. Doctor, did you review the material safety data sheets for the defendants in this case?

A. No.

Q. Doctor, what does a 2.0 or greater relative risk mean to you?

A. By itself? Just that?

Q. Well, what does it mean in the scientific community?

A. I mean, that's all I have, is that relative risk equals 2.0? I don't have anything else?

Q. And confidence intervals above a 1.0.

A. Okay. Well, that's different. A relative risk of 2.0 with no confidence intervals really doesn't tell me much at all.

What you just said, if the 95 percent confidence interval does not include the value of 1, then you would say that finding represents a doubling of the risk, and it is statistically significant.

Q. Doctor, what is general causation?

A. General causation is the analytical process whereby scientists, a group of individuals, a group of scientists would try to determine whether or not a chemical, really at any dose under any circumstances, is capable of causing a specific disease.

Q. What is specific causation, Doctor?

A. If the general causation has been satisfied, whatever your guidelines or criteria or process that you use, you're satisfied that the chemical can cause the disease in question, then specific causation would be what do we know about the individual in question, and do we think that that chemical -- that there was sufficient exposure for sufficient duration, are the characteristics of the disease consistent with our understanding of what it should look

like. But basically did the chemical in question cause that person's disease.

Q. And Doctor, you did not offer a specific causation in your report, did you?

A. Well, you mentioned that in the motion to exclude, and I disagree with that characterization. I mean, I think by definition if you say that the literature does not support an association between benzene and multiple myeloma, then that is offering an opinion, an implied, explicit, or implicit opinion, that Mr. Bishop's multiple myeloma was not caused by benzene.

Q. Doctor, what are the known causes of multiple myeloma?

A. I think the only one that has achieved a level of certainty that I would agree with is ionizing radiation.

Q. Was MR. Bishop exposed to ionizing radiation?

A. I don't -- I don't know.

Q. Do you know what caused Mr. Bishop's multiple myeloma?

A. I do not.

Q. Doctor, how many 2.0 statistically significant studies do you need to reach an opinion on general causation?

A. I can't answer that question the way you worded it.

Q. Okay. How many statistically significant studies do you need, does Dr. Pyatt need, to reach an opinion that a chemical caused a person's disease?

A. Well, again, I mean, that's really the same question. Let me tell you what my problem with it is. You're not -- how many studies are there? Is there only one study? If there's only one study and that's all there is out there, there's no reproducibility, then you think, okay, here's a statistically significant finding, but it's never been reproduced. Maybe, all right. This is suggestive, and perhaps we've got an issue here. If there are two studies that are out there and they're both statistically significant and they're both elevated, then I would start to think, yeah, this is probably a real phenomenon. With regard to benzene

and multiple myeloma, there's 50 studies, 60 studies, looking at various aspects of occupational exposure, benzene, et cetera. And that collectively doesn't reach the level of general causation so it's hard to answer the question the way you've asked it.

Q. Okay. Doctor, are you familiar with The Reference Guide on Toxicology?

A. The Reference Guide on Toxicology?

Q. Yes, sir.

A. I don't know what that is.

Q. Are you familiar with The Reference Guide on Epidemiology?

A. I don't know what that is.

Q. Are you familiar with The Reference Guide on Medical Testimony?

MR. FARNET: I just want to object. Are you referring to the federal judicial reference manual for --

MR. WILLIAMS: Yes, I am.

MR. FARNET: The Federal Judicial Center publications? Is that what you're talking about?

MR. WILLIAMS: Yes.

MR. FARNET: Okay.

A. That helps clarify it, but the answer is still no, I haven't read those.

BY-MR.WILLIAMS:

Q. So it would be fair to say you didn't utilize the methodology outlined in those publications?

MR. FARNET: Object to form.

A. I would disagree with that because I'm -- without having read them, I'm sure what I did is what they would require any thoughtful scientist to do when they're trying to establish a link between a chemical and disease.

THE REPORTER: Excuse me, gentlemen. Excuse me, MR. Williams.

(Whereupon, a Discussion was held off the record.)

MR. FARNET: Let me just make a clarification here. We have -- Eric, correct me if I'm wrong. But I believe we have an understanding here that one objection will serve for all so you don't necessarily have to get everybody's name, as long as you get

one objection. Is that agreeable, Eric?

MR. WILLIAMS: Yeah. That's fair for this deposition, Glenn.

THE REPORTER: Thank you.

MR. RILEY: I was the one that objected for Radiator.

THE REPORTER: Thank you.

THE VIDEOGRAPHER: Gentlemen, this is Roger, the videographer. We have approximately 5 minutes left on the tape. I'll let you know when we have two.

MR. WILLIAMS: Thank you.

BY-MR.WILLIAMS:

Q. Doctor, can you tell me as you sit here today how many studies The Reference Guide on Toxicology, Epidemiology, or Medical Testimony -- let me rephrase the question -- how many statistically significant studies you need to reach an opinion on general causation?

MR. FARNET: I'll object. I think it was asked and answered, but subject to that.

MR. WILLIAMS: No, it wasn't.

A. I haven't reviewed those documents.

BY-MR.WILLIAMS:

Q. Doctor, can you tell me how many statistically significant studies Dr. Infante relied on that show benzene can cause multiple myeloma?

A. Well, I'd have to go through his report and count them up. But as far as -- we've already talked about this. As far as benzene and multiple myeloma directly linked, the only statistically significant finding is Rinsky, 1987. So that's the only one that he possibly could have relied on.

Q. Well, let me ask you this, Doctor. Did you read Dr. Infante's meta-analysis?

A. I've read Dr. Infante's meta-analysis several times.

Q. Okay. Did he find statistically significant results for benzene and myeloma?

A. You mean in his meta-analysis?

Q. Yes, sir.

A. That was extremely flawed methodology, but yes. Based on what he decided to put into his equation, he was able to manufacture

a statistically significant finding.

Q. And Doctor, was that a peer reviewed publication?

A. That, I do not know.

Q. Is it published in a journal?

A. It was published in a journal. But when I saw it, it came with a whole lot of papers like that. And I think it was part of a symposium, which means that it may not have undergone peer review. Maybe it underwent an abbreviated form of peer review. I don't know.

Q. Where are you getting that information from, Doctor?

A. Where am I getting what information from?

Q. That it may have gone through an abbreviated peer review process.

A. Well, when you publish, sometimes journals will put out a special issue for a given topic. Or sometimes journals will cover a specific symposium, and people that come and present in that symposium will also -- in addition to their presentation, they

will submit a manuscript. I've been on some of these groups. When you do that, it is a different process, review or process than when you just submit a journal to -- excuse me -- submit a manuscript to a journal and they send it out to, you know, blinded, editorial folks that are going to offer a review. So I don't know whether that happened or not. But it did appear to me, because it all came across together, that it was part of a symposium. If that's true, then it is possible, perhaps likely, that it was a slightly different or very different review process, from none at all, they just put it in, to the editor, the conference chairperson took a look at it and said fine. But they usually do not have to go through a standard, formalized peer review.

Q. Doctor, as you sit here today under oath, is it your testimony that that publication was not peer reviewed?

A. No, sir. I said when you first asked me that question that I didn't know whether it was or not.

THE VIDEOGRAPHER: And this is Roger the videographer. We have less than two minutes left on the videotape.

BY-MR.WILLIAMS:

Q. Okay. Doctor, are you going to give an opinion as to the level of exposures Mr. Bishop encountered at trial?

A. I haven't been asked to do that.

Q. Is that your field of expertise?

A. No, sir. Well --

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

MR. PERRY: Hey, Glenn, can we -- I mean, Eric, can we take a break, just because we're about to run out of tape?

MR. WILLIAMS: As soon as he answers that question, we can take a break.

MR. PERRY: Okay.

A. I actually wasn't finished answering the question before. So the question before was whether or not it's my field of expertise. It's not my field of expertise to actually quantitate what a person's

cumulative exposure was. But toxicologists are and have always been keenly interested in what the quantitative exposures are and relating that to the scientific data for a given link or disease or chemical. So that is part of what toxicology does. Now, the last part of your question -- I'm sorry -- something about pipe fitters, but you're going to have to repeat it.

BY-MR.WILLIAMS:

Q. Were pipe fitters exposed to high levels of benzene in the 70s?

MR. PERRY: Object to form.

A. That is outside of my expertise.

MR. WILLIAMS: Fair enough. We can change the tape now.

MR. PERRY: I'm going to put the phone on mute. We'll be back in about three minutes or more.

THE VIDEOGRAPHER: We are off the record at approximately 10:16. This is the end of Tape No. 1 in the deposition of David Pyatt.

(Whereupon a Recess was taken from

10:16 a.m. to 10:25 a.m.)

THE VIDEOGRAPHER: We are back on the record at approximately 10:25. This is the beginning of Tape No. 2.

BY-MR.WILLIAMS:

Q. Are you there, Dr. Pyatt?

A. Yes, I'm here. Thanks.

Q. Okay. What type of exposure pathways would a pipe fitter encounter to benzene?

A. Well, I mean, I don't know that much about what pipe fitters do. I'm not an industrial hygienist so you are getting a little outside of my area. I mean, I can tell you generally that inhalation is by far and away the most important exposure for benzene but that it is possible for there to be some dermal exposure and a small percentage of absorption through the skin. So those, too, I would assume, would be relevant.

Q. Ingestion, would that be a possibility?

A. It seems a little far-fetched, but I

guess it's possible if you didn't wash your hands or -- I don't know. That seems a little out there.

Q. Dr. Pyatt, are you familiar with a toxicologist named Dennis Paustenbach?

A. Yes, sir.

Q. Okay. Are you familiar with his study that he published on dermal calculations?

A. Who were the other authors?

Q. I believe this one was Paustenbach -- Dennis Paustenbach published a study on benzene dermal exposures.

A. I read a book chapter that Dr. Paustenbach authored on dermal -- the dermal pathway in risk assessment and various variables, considerations, factors that someone needs to consider if they're going to try to quantitate that pathway for risk assessment. And I'm pretty sure that benzene was one of the examples that he used. But as far as a peer reviewed publication on dermal absorption of benzene per se, I'm not familiar with the one you're talking about unless it is that

book chapter.

Q. Okay. Do you agree with Dr. Paustenbach's publication on dermal calculations for benzene?

A. I would have to see those.

Q. Okay. Do you know Dr. Paustenbach?

A. Yes.

Q. How do you know Dr. Paustenbach?

A. Well, several ways. Dr. Paustenbach is petty famous as far as toxicologists go so I knew of him and had met him quite a while ago. He came and gave a presentation at my department a long time ago. But then I actually worked with Dennis, Dr. Paustenbach, for almost a year with his new -- at that point it was the newly formed ChemRisk. I, along with Dr. Pamela Williams, started the Boulder ChemRisk office. And I did that for about eight months, I think, or nine months.

Q. And why did you leave ChemRisk?

A. I have a pretty strong independent streak. It just really wasn't working for me to be in a highly structured company like

that. Plus, I had gotten a grant funded so I was splitting my time with the university, and that became more and more difficult, to juggle all of my responsibilities. So I was at the university enough to where it really just didn't make sense to stay on as an employee of ChemRisk. So I retired in September, I think, of maybe '04.

Q. Have you ever seen any studies that Dr. Paustenbach published that were -- that used the wrong methodology?

A. Not -- no, not that I can recall sitting here today, no.

Q. Okay. I know I asked you earlier if you have ever published a study involving benzene and multiple myeloma. My specific question is, have you ever published a study that resulted in an epidemiological risk, relative risk, for multiple myeloma and benzene?

A. No.

Q. What references of Dr. Infante's did you read?

A. I'd have to go through and -- I've

read them all.

Q. Okay. Doctor, did you have the opportunity to look at a document that is Environmental Health, Inc. on the front page of a section of it where it says, "Chronic benzene exposure can cause multiple myeloma"?

A. Sorry. No, I haven't seen that.

Q. Okay. Would that be of interest to you?

A. Sure. I'd be interested in it.

Q. Okay. If I told you I received a document from Shell that had that information in it, would that change your opinion that benzene could cause multiple myeloma?

A. Well, you know, I'd first of all have to read -- I mean, is it a study? I don't even know what it is you're talking about. It has a title that I think would make me believe that it had some relevance to this issue, but I don't know what's in it or what they've done. For all I know they find that it doesn't cause it. I mean, I just don't know. I don't know what's in that document, whether it --

Q. You didn't read it in this case, correct?

A. No. I haven't seen it, no.

Q. Fair enough. Doctor, earlier I asked you if you reviewed the material safety data sheets for the chemicals at issue in this case. Would it be fair to say that you do not know the benzene content in the chemicals at issue in this case?

A. Well, I think it would be fair to say I don't know what Shell listed on their MSDS sheets or any of the other defendants on their MSDS sheets. I mean, I've been doing this quite some time, and I am interested in the content of benzene in various solvents and in various petroleum products. So if you told me what product you were referring to, I would have a generally good idea as to how much benzene would likely be in there. But specifically what they listed on their MSDS sheets, no, I would have to look at it.

Q. Okay. What's the benzene content of pyrolysis gas?

A. That's a good question. I don't know the answer to that.

Q. Fair enough. Doctor, do peak benzene exposures play a role in the development of blood disorders?

A. Well, can you specify what blood disorders you're referring to?

Q. Any one that you think benzene can cause.

A. Fair enough. There are some studies, and there has always been some debate and discussion around the most appropriate exposure metric with regard to AML risk. I think, in general, the scientific literature supports the notion of using cumulative exposures. But there are studies and evaluations within studies where AML risk was also correlated with peak exposures. So there are both. Both exist in the literature. Certainly from an occupational, regulatory point of view, cumulative exposure makes the most sense, and it's definitely going to be the easiest one to deal with scientifically. There are

certainly some biologically plausible reasons why high dose, intense exposures would have a different response than low dose, chronic exposures even if they equaled the same cumulative dose. So, you know, the answer is, we don't fully have that completely worked out. Cumulative exposure still is the one that is the most commonly calculated.

Q. And Doctor, does the EPA use cumulative benzene exposure figures in regulatory purposes?

A. Well, it depends on which -- what are you talking about with EPA? Are you talking about their noncancer reference concentration, or are you talking about their cancer potency slope factor? Because they're very different.

Q. I'm referring to cancers, and I'm referring to any type of risk assessment the EOA would do. Do they use a cumulative benzene dose?

A. Yes.

Q. Okay.

A. Yes. They --

Q. What about the slope factor that you were talking about?

MR. FARNET: I just want -- you cut off the witness with his answer so I just want to make sure the witness has finished his answer.

THE DEPONENT: That's okay. He followed up with the next question. That's where I was going anyway.

A. The cancer slope factor, their cancer risk assessment, as described in IRIS and with their carcinogenic data supporting their IRIS value is based on the Pliofilm cohort. It's based on Postenbach's analysis, Crump and Allen's analysis and Rinsky's analysis. They express it as a range. And all three of those are -- the risks for AML are derived by looking at cumulative exposure. So yes, their cancer potency factor is based on cumulative exposure. Their noncancer value, the reference concentration is different.

BY-MR.WILLIAMS:

Q. Okay. Doctor, does the EPA or any

other federal agency use dermal calculations for benzene exposure?

A. I don't think they use it in terms of actually quantitating it and putting it into their calculations because their cancer risk assessment is based on what I just told you, these three exposure assessments done for Pliofilm, the Pliofilm cohort. I'm sure there is language in there about dermal, but it is not part of their quantitative assessment of risk.

Q. Do you know if the National Cancer Institute uses dermal calculations for benzene for any purpose?

MR. PERRY: Object to form.

A. The NCI, I don't -- I don't know where they would -- under what -- I don't know how they would. I don't know what the NCI would ever do that would fit in -- that would answer your question.

Q. Okay. Doctor, do all studies contain flaws or imperfections?

MR. PERRY: Object to form.

A. All scientific studies?

BY-MR.WILLIAMS:

Q. Yes, sir.

A. I would say if you really were critical and you looked hard enough, you could probably take issue with just about every study that's been published. Some of those things might be quibbles, and some are, you know, true methodological flaws. But the peer reviewed process is not perfect, and science is an iterative process. And we all do the best we can, but I would say the answer to that is, in my opinion, probably yes.

Q. Okay. Doctor, do you know if the material safety data sheets for gasoline, crude oil, and other products in this litigation contain warnings that benzene can cause leukemia or blood disorders?

A. That is my understanding, but I would need to see the MSDS sheets that you're referring to to know. I mean, there's a labeling requirement, and crude oil doesn't exceed that labeling requirement. There's just not enough benzene in there.

So I don't know whether it would have it on every MSDS sheet or not. I just wouldn't know without looking at the sheet itself.

Q. Doctor, what is the threshold for benzene exposure in AML?

A. In my opinion, based on the existing scientific literature and the existing scientific data, that is going to be somewhere between 40 and maybe even 500 part per million years, with the best estimate at this point probably being 200 PPM years. But I would say the low end of that range would be 40 or 50.

Q. And when you say "40 or 50," are you talking about multiple exposures to 40 to 50 parts per million?

A. No, no. All of those values that I just expressed are in part per million year so it is a cumulative dose metric.

Q. Okay.

A. With regard to air concentrations and a threshold for air concentrations, if you're using the same study that the cumulative exposure came from -- and that is the

Pliofilm cohort and Rinsky and Crump and Allen, et al., and Williams and all the other exposure assessments that have been done. Rob Schnatter did a very nice analysis that he published in 1996 of what the air concentrations had to be within the Pliofilm facility, the Goodyear facility there, to result in an increased risk of AML, and that was about 20 part per million, less than 20 part per million air concentrations. And there was no real elevation of AML risk.

Q. Doctor, would a relative risk of 2.0 indicate that there is an increase of 100 percent in the exposed population?

A. A relative risk of 2.0? By definition, that's what that would mean.

Q. In your opinion does a 3.0 relative risk provide strong evidence of a causal relationship?

A. Well, 3.0 is bigger than 2.0 so I would consider that to be stronger than 2.0. You could have 50. But without looking at the other considerations -- what's the

confidence interval, how many studies, how many cases -- there's a lot of things that go into it other than just that number before you can say that you think that's even real. If that's a real finding and it is statistically significant, it was based on a sufficient number of cases, then that's a reasonable -- that's a reasonable effect.

Q. What's a sufficient number of cases?

A. Well, certainly more than one. It would depend on what the disease is and the power analysis and other considerations for calculating the relative risks. So you can't --

Q. How many cases of multiple myeloma would it take for you to think that there is a sufficient number of cases in a study?

MR. PERRY: Object to form. How many cases of multiple myeloma or how many multiple myeloma studies?

MR. WILLIAMS: Cases in a study.

A. Well, I know there's a couple that are out there where there was one or maybe two. And I look at those, and I still

consider those, but those are more like case reports to me. If you have an n of 1, one single case, to then calculate a SMR, a standardized mortality ratio, and put confidence intervals around it, that's ridiculous. So that's wrong. That is inappropriate from an epidemiological point of view. You probably could do it with two, but most don't. Most epidemiologists would not attempt to do that because it's too unstable. When you get an n of 3, I think then from at least a statistical point of view, you could calculate a reasonably stable SMR. The higher that number, the better the answer is going to be and the more reliable. But, you know, those -- this is a topic that is directly in the wheelhouse of an epidemiologist.

BY-MR.WILLIAMS:

Q. And that's not something that you feel is in your field of expertise?

A. Well, I certainly wouldn't look at a study and say that only has two cases, I'm not going to pay any attention to it. So I

looked at all of the scientific data, whether it had one case or whether it had eight and didn't really say this one is more important than that one and do this kind of relative strength of the individual studies.

Q. Doctor, what is a dose response?

A. Dose response is what the words mean, is that there is a biologically rational response at what you're looking at, the endpoint that you're measuring, with increasing exposures or increasing or decreasing doses. So if the dose changes, then you see a biologically meaningful response in what you're looking at. If the dose goes up and the response goes up, then you would consider that a dose response. If the dose is changing and the response is not changing or changing in a way that just doesn't make any sense from a biological point of view, then you don't have a dose response, and you have to really question whether you've set up your experiment right or whether the endpoint that you're looking at is really connected to the dose at all.

Q. Doctor, do you know if Dr. Infante relied on any studies that show a dose response for benzene and multiple myeloma?

A. Well, Dr. Infante had most of the studies in his report. Assuming that he relied on all of those, then that would be my assumption.

Q. Well, did any of those studies show a dose response for benzene and multiple myeloma?

A. The only one that I can think of is Jim Collins' work with the Dow Chemical worker studies, Collins and Ireland. And there was an increasing response with benzene exposure.

Q. Okay, Doctor. We're going to talk about those. Do you disagree with the findings of the 1987 Rinsky study?

A. I don't disagree with them. I mean, why would I -- he published what -- you know, he published what he found.

Q. And did he find a SMR of 409?

A. For multiple myeloma, yes. I mean, I disagree with some of the interpretations

I've heard of that data based on looking at what those workers were exposed to. I also think it's inappropriate to not consider the updates that have gone into that cohort and follow that cohort through time because that gives you the appropriate information to evaluate those original cases of multiple myeloma.

Q. And we'll get to that study in a little bit. I'm asking you about the study that he relied on. Doctor, do you know the results of the Wong 1987 study of multiple myeloma?

A. Yes. And by "he" in your earlier question --

THE REPORTER: I'm sorry. Repeat your question.

THE DEPONENT: My fault.

BY-MR.WILLIAMS:

Q. What was the relative risk for multiple myeloma in that study?

A. As I recall there were two cases in the intermediate exposure category, and the relative risk was 350, but it was not

statistically significant. That's --

Q. Referring --

A. -- my recollection.

THE REPORTER: I'm sorry. Repeat your question.

Q. I'm referring to the three cases, Doctor.

A. The three-case one -- I mean, okay. I'll answer one more question, and then I probably should pull it out. There was not a quantitative risk assessment done or quantitative risk ratio calculated for those. The only one that he calculated -- that Dr. Wong calculated was in the intermediate dose range, and there were only two cases.

Q. What was the relative risk for the three cases, Doctor?

A. I just answered that. He did not do that.

Q. Decoufle, do you recall that study?

A. Which one?

Q. Decoufle, if I'm saying it correct.

A. Decoufle (pronouncing)?

Q. Yes. There you go.

A. I'm with you.
Q. What were the findings on that study?
MR. FARNET: Hold on. Doctor, would you like to pull the studies out?
THE DEPONENT: Yeah. I'm going to.
A. Can you wait just one second, Mr. Williams, and let me get out my binder?
Q. Sure.
MR. PERRY: Off the record.
THE VIDEOGRAPHER: I have to have counsel agree to go off the record.
THE DEPONENT: We don't have to go off the record. It will just take me two seconds.
A. Okay. I'm back. Now, I remember the Decoufle study pretty well. The authors did not quantitate a risk ratio for multiple myeloma in their study.
BY-MR.WILLIAMS:
Q. There was no SMR; is that your testimony?
A. That is my testimony.
Q. Doctor, let's go to Kirkeleit.

A. Okay.
Q. Were there any findings that were statistically significant for multiple myeloma in crude oil?
A. Yes.
Q. What were they, Doctor?
A. What were the numbers?
Q. Yes, sir.
A. I think it was 2 point something -- I can look and tell you -- in one group of upstream workers. Upstream operators offshore, multiple myeloma was 2.85, the relative risk, with a 95 confidence interval of 1.37 to 5.93.
Q. Are you familiar with the Bradford Hill postulates?
A. I don't think I've ever heard them called postulates before, but yes, I'm familiar with Bradford Hill.
Q. Okay. In the original Bradford Hill article, what did he call them?
A. I don't know. Let's look. He may have called them postulates. I don't remember. I thought he called them

considerations or -- I know people use "criteria," and other people don't like that.

Q. Did Bradford Hill himself say that all or none of his -- let's call them considerations are required to offer an opinion as to causation?

A. Did he say all or none?

Q. Yes.

A. Well, I'm pretty sure he did not say all of them were. But it's illogical for him to say that none of them are required? Why would he even have them?

Q. Well, I'm asking you, do you know if there's a statement in his article that says that?

A. That none are required? I can't imagine that that -- I mean, I haven't memorized the paper, but that just doesn't make any sense. Temporality -- how can you not have temporality and expect there to be causation? So that one is absolutely required by everyone's -- everyone's definition.

Q. Doctor, let's go to your references,

your reference list on your report.
A. Okay.
Q. Okay. I noticed that you have approximately -- you have 79 studies on here; is that correct?
A. Hold on just a second. My original one or the rebuttal declaration?
Q. We're talking about the one attached to your report.
A. Yes. Okay. Right, 79.
Q. Okay. Doctor, how many of these studies -- let me rephrase that. Earlier you testified that there were 60 studies that addressed multiple myeloma and benzene; is that correct?
A. I don't recall saying that. I mean, I don't have an exact number. We could probably get --
Q. How many of these studies on your reference list address benzene exposure and multiple myeloma?
A. Well, we'll have to go through them.
Q. Just call out the number, and we can go from there.

A. 14.
Q. No. 14?
A. Correct.
Q. Okay.
A. 15.
Q. Okay.
A. 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 -- let's take 54 back off -- 55, 56, 57 -- maybe not 57, probably something that's peripherally related -- 58, 59. These are kind of occupational studies, surveys of multiple myeloma where you could speculate that there are some occupations that would have benzene exposure, but they didn't actually quantitate it, the same with 60, so there's a lot of those; 61, 62. 63 is a review paper so that's probably not worth listing. 65 is my review paper. 66 is a review paper. It looks likes the rest of these deal with the biology of multiple myeloma; maybe 79. I don't remember whether Dr. Kyle specifically addressed occupational

risk factors. So that would be an off-the-cuff list.

Q. Okay. Doctor, which studies that you just identified provide epidemiological results for benzene and multiple myeloma?

A. For benzene?

Q. Yes, sir.

A. Not for crude oil?

Q. No. We're talking benzene right now.

A. And what do you mean? Where they have quantitated the benzene exposure?

Q. Yes.

A. Well, 14 and 15 are case reports that have to do with benzene, but it was not quantitated so I guess those don't count. 20 we talked about. 21 or 22, 23, follow-ups of that one. 24 is quantification of benzene and multiple myeloma. So is 25. 26, 27, 28, I don't know. I'd have to look at it. He's certainly talking about benzene, but I don't know if he's quantitated it or not. 31 for sure has. 32, NCI, China --

Q. Let me stop you there, Doctor. I

think you misunderstood my question. I said benzene and multiple myeloma. Multiple myeloma is not addressed in the Hayes study so maybe we need to start over because I'm asking you specifically for benzene with a quantified exposure, as you described, and a result, a statistical result, for myeloma. It seems like you're pulling studies that don't address myeloma.

A. I disagree.

Q. Tell me where they say myeloma in the '97 Hayes study.

A. Well, there weren't any multiple myeloma cases, which you can get out of the Travis '94 and the Yin '96. So there's no reason to do a statistical analysis on one or no cases, but that doesn't mean that that study does not have relevance because it is profoundly relevant to this issue. Because they looked at a very large cohort of workers that had very high exposures to benzene, and they did not see an excess in multiple myeloma. In fact, they didn't see any. So I think that study is clearly

relevant to what we're discussing.

Q. And Doctor, that's not my question. My question was, I wanted you to identify every study that shows a statistical result, whether it be statistically significant or not, for benzene and myeloma.

A. And I think I've done that. And I will not take Hayes off that list.

Q. Okay. We'll go back to that. Keep going, Doctor.

A. 34; probably 39, but that's related to Bond. Let's see. Schnatter for sure.

MR. FARNET: What number is that?

BY-MR.WILLIAMS:

Q. What number?

A. 49. I'm just doing this from memory. I mean, I'd really need to go through and look at all these, where they've quantitated the benzene exposure. Well, I think that might be all.

Q. Okay. Doctor, what was the result, the statistical result, for No. 21, the Crump study for myeloma?

A. There wasn't. That was a risk

estimate so that was part of the understanding of what the exposures were in the Pliofilm cohort.

Q. So there was no result calculated for myeloma in that study?

A. No.

Q. Okay. Doctor, No. 22, Silver, what was the statistical result for Silver for myeloma?

A. I'd have to look and see.

Q. Go ahead.

A. Do you want it for males and females or white males, or what do you want?

Q. Give me the overall.

A. The overall multiple myeloma was 2.04, and the 95 percent confidence interval was 0.66 to 4.76. That was for males and females, all races combined.

Q. What about No. 24, Doctor?

A. The total was 2.01, 95 percent confidence interval 0.79 to 7.45.

Q. I'm sorry. Did you say .01 was the relative risk?

A. 2.01.

Q. Okay.
A. I think that's what it is. It's hard to read it.
Q. What about No. 25?
A. So you know these are all the same cohort, right?
Q. I'm just asking you to identify the number.
A. Right. I'm looking. I know it's in here. Sorry it's taking so long. It's somewhere in the text, and I'm not seeing it.
Q. Okay. No. 26, Bond, do you know the number for that study?
A. Bond, there weren't any multiple myeloma cases.
Q. All right. For Collins, No. 27, Infante identified a 4.0 but with a confidence interval below -- 1.0 or below. Does that provide any evidence of an association between benzene and multiple myeloma to you?
A. The Collins study?
Q. Yes.

A. I would put the Collins study on the positive side of the column.

Q. What about the Constantini with a 1.9 odds ratio but the confidence interval is below 1.0?

A. I would have to look at it. No, no.

Q. No? Okay. What about the Ireland study, No. 34, with 2.3 SMR?

A. That's the same -- that's the same as Collins. It's the same cohort.

Q. But it's a 1997 study. Would you put that on the positive side?

A. I would put it in the same place that I would put Collins, Jim's analysis of that cohort.

Q. What about No. 39? Do you know the results from the Ott study?

A. Ott is an update of Bond, and there were no multiple myelomas in that cohort.

Q. Okay. I believe you said 49, Schnatter?

A. Schnatter (pronouncing).

Q. Schnatter.

A. There's lots.

Q. I'm sorry, Doctor. I couldn't hear you.

A. There are lots of analyses between benzene exposure and multiple myeloma risk. The highest PPM category, the multiple myeloma risk, the highest benzene cumulative exposure PPM year category, the multiple myeloma risk is 1.22 with a 95 percent confidence interval of 0.7, 0.07 to 20.

Q. Did you rely on this study?

A. Sure.

Q. And Doctor, can you tell me who sponsored this study?

A. Who sponsored the Schnatter study?

Q. Yes, sir.

A. Well, Dr. Schnatter works for Exxon/Mobil so I would assume that it was part of his job as an epidemiologist for Exxon.

Q. Okay. Doctor, let's go to the Otto Wong 1999 study.

A. Okay.

Q. Did they find a relationship for

benzene and multiple myeloma?

A. No, sir.

Q. Doctor, who sponsored this study?

A. I don't know the answer to that.

Q. Turn to Page 221, the last paragraph.

MR. FARNET: Excuse me. What study are we on?

THE DEPONENT: Wong, 1999.

MR. FARNET: Thank you.

A. The "We thank" -- let's see.

BY-MR.WILLIAMS:

Q. Yes, sir.

A. Thanking people --

Q. American --

A. -- at various universities --

Q. -- Institute --

THE REPORTER: Excuse me.

(Whereupon, a Discussion was held off the record.)

A. I'm looking. So he's thanking lots of people, reviews, thanks API for valuable support and assistance, thanks some companies for data, thanks NC -- National Center for

Health Statistics for information and the API, the American Petroleum Institute for sponsoring the project; there you go.

BY-MR.WILLIAMS:

Q. What are the names of those companies, Doctor?

A. The name of the four participating companies? Chevron --

Q. Yes, sir.

A. Chevron, Exxon, Mobil, and Shell.

Q. Okay. Doctor, could you go to the Wong 2001 study, No. 51.

A. You know, apparently I can't. I don't have a hard copy with me. Sorry. That one slipped through the cracks.

Q. Do you know what the results were for multiple myeloma in this study?

A. You know, hold on. I might have it in one other binder. Okay. I'm getting there. Okay. The abstract reads, "No increase was detected for other leukemia cell types, non-Hodgkin's lymphoma, or multiple myeloma." You want the actual number?

Q. Actually, I'm looking at the

acknowledgments on the last page, and I'm asking you to tell me, do you know who sponsored this study?

A. Oh. You don't care about the number? You just want to know who sponsored it?

Q. I think you said there was no increase in multiple myeloma.

A. Right.

Q. Just give me the number, too.

A. I'm looking. Well, he kind of lumps them in, cancer of other lymphatic tissue. And there's lots of ways of slicing it, but, yeah, there's no -- maintenance, multiple myeloma. So he's got the total cohort. That's probably what you want. Total cohort for multiple myeloma, 14 cases, expected 14.54. SMR of 96.3. 95 percent confidence interval of 52.7 to 161.6. And who sponsored --

Q. What did you say the relative risk was, Doctor? I couldn't hear you.

A. Yeah. For the overall cohort -- this is on Page 395. I mean, there's lots

of ways of looking at it. But the total cohort, the SMR was 96.3. 95 percent confidence interval was 52.7 to 161.6.

Q. And again, my question is who sponsored that study, Doctor?

A. I haven't gotten to the end yet so that's where I was going; "and to Mobil Corporation, now Exxon/Mobil, for sponsoring the project."

Q. Thank you, Doctor. If you'd turn to the Raabe study from 1998.

A. Raabe (pronouncing)?

Q. Raabe.

A. That's okay. He won't hear this. 1998, yes.

Q. And what were the results for multiple myeloma in this case?

A. It looks like the overall results were, the SMR was 121. 95 percent confidence interval, 55 to 230.

Q. And Doctor, can you tell me who sponsored this study?

A. He used to work for Mobil so I would assume that that had something to do

with it. Yes, it --

Q. Does it say "Mobil Business Resource Corporation" on the first page of the study?

A. Yeah. It doesn't say anything in the acknowledgments. That's where he worked. Yes. That's where --

Q. Fair enough. I'd like to direct you to the Otto Wong study of 1997, and if you could turn to Page 191.

A. Which number is that on my citations?

MR. PERRY: You said '87 or '97?

THE DEPONENT: '97.

BY-MR.WILLIAMS:

Q. It's No. 42 in your reference list.

A. Oh, right, right, his meta-analysis. Okay. Hang on.

Q. And I'm on Page 191, Table 1.

A. Okay. I'm getting there. Okay.

Q. Yes, sir. I believe this study includes studies of refineries from Amoco, Chevron, Exxon/Mobil, Shell, Texaco, Institute of Petroleum UK, American Petroleum Institute, and Australian Institute of Petroleum,

Imperial Oil. Does that sound right to you?
A. That's Canadian, yeah. He looked at UK refineries, Canadian refineries, and U.S. refineries.
Q. Okay. And the studies he looked at were studies prepared by these refineries, correct?
A. I don't know that that's always the case. I mean, it would be -- there could be other investigators that were looking into that refinery so I don't know what you mean by "prepared by" the refinery.
Q. Studies sponsored or paid for by the refineries.
A. I don't know. We would have to go to each one of them. I'm sure some of them are.
Q. Okay. Were any of these studies -- did they find a statistically significant relationship or result for multiple myeloma and benzene?
A. Were there any?
Q. Yes, sir, in Table 2.
A. No.

Q. Okay. Fair enough. Doctor, can you point to one study in your references that was published by any of the refineries -- well, let's say Shell -- that shows a statistically significant result for benzene and multiple myeloma?

A. The only statistically significant result -- and by that I'm assuming you mean positive -- for benzene and multiple myeloma was the Goodyear facility published by Rinsky in '87. So Shell didn't --

Q. That's not my question.

A. Shell didn't have --

Q. Can you point to a study that was pertaining to a Shell facility with benzene exposure where there is a statistically significant result for benzene and multiple myeloma?

A. No.

Q. What about Exxon?

A. No.

Q. What about Mobil?

A. No, sir.

Q. What about Chevron?

A. I think the answer is no.
Q. What about the American Petroleum Institute?
A. Well, the American Petroleum Institute sponsors studies, but that's not a refinery. So they may have had something to do with many of these studies.
THE VIDEOGRAPHER: Mr. Williams, this is Roger, the videographer. We have approximately five minutes left on this tape.
MR. WILLIAMS: Thank you, sir.
BY-MR.WILLIAMS:
Q. Can you point to an American Petroleum Institute study that shows a statistically significant positive result for multiple myeloma and benzene?
A. I don't know whether API had anything to do with Rinsky's work or not. That's the only statistically significant study on multiple myeloma and benzene, the first Rinsky paper, so that's it. Everything else is going to be no. All of the other studies that looked at benzene and multiple myeloma, the answer is going to be no, there

aren't any.

Q. Doctor, let's go back to the 1977 Shell study authored by Dr. Joiner and Dr. Stallone.

MR. PERRY: Object to form.

BY-MR.WILLIAMS:

Q. There were four cases of multiple myeloma in 1976 alone. Dr. Joiner's testified at the OSHA benzene emergency standard hearings that there were 30,000 employees. Would that give a relative risk above 2.0 for that study?

A. I couldn't answer that, sitting here. That's a question that an epidemiologist could do relatively straightforward based on demographics of the population of 30,000, race and age and other things. But I can't do it just sitting here.

Q. Well, would that produce an increased number of cases of myeloma, in your opinion?

A. There's no way to know that.

Q. Okay. Let me ask you one final question, Doctor. I'm going to give you a worst case scenario. A guy swims in a pool

full of benzene for 30 years, eight hours a day. Could he under any circumstances contract multiple myeloma?

A. I think the scientific literature that we've been discussing and much of it that we didn't discuss would say the answer to that is no.

Q. I'm asking you for your opinion.

A. That is my opinion.

Q. Okay.

A. My opinion is based on the scientific literature that we discussed and much of it that we didn't, and that supported opinion is no.

Q. Doctor, how many studies do you think there are that analyze or provide a statistical result for benzene and multiple myeloma?

A. I think we kind of went through that list, but I don't know off the top of my head. I'd have to go through and look at them; maybe 10.

Q. Certainly not 60; would you agree with that?

A. Not that -- not that you would be able to say, This is just a benzene study. But the refinery studies where they've quantitated benzene exposures in their workers and then calculated relative risk or SMRs for multiple myeloma, that counts. I think that is a legitimate piece of data that is relevant to this question. So the bracket that you're putting around the counting I'm not totally clear on. But no, I don't think it would be 60.

Q. Would it be 30?

A. Well, you know, 32, 64? I'd have to go through and count them. I don't know the exact number, but there's a lot. This is not --

MR. WILLIAMS: Okay. Thank you, Doctor. I don't have any other questions at this time.

MR. PERRY: Let's take a quick break.

MR. WILLIAMS: Okay.

MR. FARNET: Let's take a break, Eric. We'll be back in about --

THE VIDEOGRAPHER: We are off the record at approximately 11:22. This is the end of Tape No. 2 in the deposition of David Pyatt.

(Whereupon, a Recess from 11:22 a.m. to 11:33 a.m.)

THE VIDEOGRAPHER: We are back on the record at approximately 11:33. This is the beginning of Tape No. 3 in the deposition of David Pyatt.

EXAMINATION

BY-MR.FARNET:

Q. Dr. Pyatt, this is Glenn Farnet. I just have two questions to clarify some terminology. You were asked about Study No. 51 in your report, which is the Wong 2001 study, and you were asked what the SMR was reported for multiple myeloma. Do you recall that?

A. Yes.

Q. And I believe you said that there was an SMR of 96.3 with a 95 percent confidence interval of 52.7 to 161.6, correct?

A. Correct.

Q. Could you explain whether or not that is an elevated risk or a statistically significant result?

A. No, it's not. I mean, the issue is with an SMR you take the risk ratio, which is the observed over the expected, and you multiply it by a hundred. So an SMR of 96 is the same as a risk ratio or a relative risk of 0.96. So it's a little confusing if you don't understand what the epidemiologists do to report it as a standardized mortality ratio. But it's not 96. It's .96. So the confidence interval would be 0.52 to 1.61, and that is not an elevated risk, and it is not statistically significant.

Q. And would the same be true for the results you discussed regarding Raabe, 1998, where you listed an SMR of 121 with a confidence interval of 55 through 230?

A. Sure. I mean, with an SMR of 121, that's a relative risk or a risk ratio of 1.21. So again, that is not meaningfully elevated. And the 95 percent confidence

interval is .0.55 to 2.30, based on -- you divide these by a hundred to get it back to a risk ratio.

MR. FARNET: Thank you, Dr. Pyatt. All right. That's all the questions we have.

MR. WILLIAMS: Anybody else?

MR. RILEY: Yes. This is Jim Riley.

(Whereupon, a Discussion was held off the record.)

EXAMINATION

BY-MR.RILEY:

Q. Dr. Pyatt, you mentioned earlier a supplemental declaration. Is that the supplemental declaration that you authored in response to a plaintiffs' motion?

A. Correct.

Q. And are the statements contained in the supplemental declaration truthful, and do they accurately express your views?

A. Yes, sir.

Q. I'd like that attached as an Exhibit to the deposition, and that's all the

questions I have. Thank you, sir.

A. You're welcome.

(Whereupon, Exhibit-11 was marked.)

MR. WILLIAMS: Okay.

THE VIDEOGRAPHER: This concludes the videotape deposition. We are off the record at approximately 11:37. This is the end of Tape No. 3 in the deposition of David Pyatt.

(Whereupon, The following proceedings were not on the video record.)

MR. RILEY: I just want the record to note that I advised Mr. Williams and also Dr. Pyatt, who did not know, that Radiator was a co-defendant in the Brown case. I just didn't want counsel to be misled or the doctor to be misled.

(Whereupon, a Discussion was held off the record.)

THE DEPONENT: I'll read and sign.

(Whereupon, the deposition concluded at 11:39 a.m., June 24, 2009.)

REPORTER'S CERTIFICATE

STATE OF COLORADO)

COUNTY OF DENVER)

I, Janet Lee Priestley, do hereby certify that I am a Registered Professional Reporter and Notary Public within the State of Colorado; that previous to the commencement of the examination, the deponent was duly sworn to testify to the truth.

I further certify that this deposition was taken in shorthand by me at the time and place herein set forth, that it was thereafter reduced to typewritten form, and that the foregoing constitutes a true and correct transcript.

I further certify that I am not related to, employed by, nor of counsel for any of the parties or attorneys herein, nor otherwise interested in the result of the within action.

Janet Lee Priestley

CAPTION

The Deposition of DAVID PYATT, 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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. CERTIFICATE

STATE OF :

COUNTY/CITY OF :

Before me, this day, personally appeared, DAVID PYATT, 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.

DAVID PYATT

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

My Commission Expires Notary Public

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. DEPOSITION ERRATA SHEET

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RE: Accurate Court Reporting, Inc.

Case Caption: JO ANN BISHOP, ET AL

VS. SHELL OIL CO., ET AL

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DEPONENT: DAVID PYATT

DEPOSITION DATE: June 24, 2009

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To the Reporter:

I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me. I request that the following changes be entered upon the record for the reasons indicated. I have signed my name to the Errata Sheet and the appropriate Certificate and authorize you to attach both to the original transcript.

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SIGNATURE:_____DATE:_____

DAVID PYATT