SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THOMAS WAYNE REESE, Plaintiff, vs. GANS INK & SUPPLY CO., a California corporation, and DOES 1 through 200, inclusive, Defendants.	No. BC332936

DEPOSITION OF

KENNETH A. MUNDT, Ph.D.

LONG BEACH, CALIFORNIA

OCTOBER 13, 2009

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DEPOSITION of KENNETH A. MUNDT, Ph.D., taken on behalf of the PLAINTIFF, at 401 East Ocean Boulevard, Suite 800, Long Beach, California, commencing at 9:05 a.m., on Tuesday, October 13, 2009, before Sheri A. Ply, CSR No. 6507, RPR.

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WITNESS: KENNETH A. MUNDT, PH.D.

EXAMINATION BY: PAGE

MR. METZGER 7

INFORMATION REQUESTED:
(NONE)

QUESTIONS WITNESS INSTRUCTED NOT TO ANSWER:
(NONE)

E X H I B I T S:

E X H I B I T S:

DEPOSITION NUMBER	DESCRIPTION	PAGE
8	Multipage E-mail correspondence	71
9	Multipage Invoices	71

LONG BEACH, CALIFORNIA, TUESDAY, OCTOBER 13, 2009

9:05 A.M.

* * *

KENNETH A. MUNDT, PH.D.,

having been first duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. METZGER:

Q Would you introduce yourself, please.

A Kenneth Mundt. I am an epidemiologist by training and practice.

Q And you are a Ph.D.; correct?

A That is correct.

Q Do you prefer to be called doctor, therefore?

A It is appropriate. I don't have a preference.

Q Okay. Since it is appropriate, I will call you Dr. Mundt.

Dr. Mundt, I don't believe we have met before, have we?

A We have not.

Q Okay. So I never had the pleasure of deposing you before, okay.

So do you have a curriculum vitae with you?

A Yes, it is on the DVD that I provided with my

entire file.

MR. METZGER: That is not going to work, John. Come on. We can recess and have all this stuff printed out, but I mean --

MR. GRANNIS: Can you have your CV E-mailed to us or faxed to us here?

MR. METZGER: That is not the point. I mean that is going to require him to make a call. I want to get this deposition going. At least that is usually produced; not just given on a CD.

So if we need to recess or --

MR. GRANNIS: In the time we have been talking, Dr. Mundt could have called his office and asked to have it faxed here. We would be glad to do that. It is on the disk.

Q BY MR. METZGER: Dr. Mundt, is your curriculum vitae on this disk?

A Yes, sir.

Q Is there a publications list with that curriculum vitae?

A Yes, there is.

Q Is that a separate document or is it incorporated within the CV?

A Part of the same.

Q Is there a list of the cases that you have

testified on this CD?

A There is a list of trial testimony.

Q And deposition testimony?

A Not deposition testimony.

Q Where is that?

A I have -- I have a list of all testimony in the past four years.

Q Where is that?

A That is in my office. I don't have it -- trial testimony on this file.

Q We are going to need that so I will ask you to call for that.

What else is on the CD that you have provided me?

A A listing of all of the case materials that I was provided by counsel, files containing all of the articles in which I rely to form my opinions.

Q Is there a list of those?

A No. They are actual copies of the articles.

Q Is there an index or bibliography?

A No.

Q Okay. What else is on the CD?

A Copies of all correspondence and billings in this matter.

Q What else?

A This statement, summary of opinions.

Q What else?

A I believe that is it.

Q Okay. We are going to go off the record and we will print out this stuff so we can do your deposition.

(Brief recess.)

MR. METZGER: Back on the record.

(Deposition Exhibit 1 was marked for identification.)

Q BY MR. METZGER: Dr. Mundt, is Exhibit 1 your curriculum vitae?

A Yes, sir.

Q Is it current?

A Yes, it is.

Q Is it complete?

A I believe so.

Q Is it accurate?

A Yes, I believe so.

Q When was it prepared, the last updated?

A Within a month.

Q Are there any articles or presentations or abstracts that are not listed on here?

A I believe it is up to date.

Q So is the answer to my question no?

A It is current. I don't recall the wording of

your question.

Q I asked you if there are any publications, articles, abstracts or presentations that you have given or prepared that are not listed on this?

A I am sorry. It is complete. It is up to date. Therefore, there are no other presentations or abstracts that have taken place that are not identified on this.

Q Okay. Have you conducted any epidemiologic studies regarding non-Hodgkin's lymphoma?

A I have conducted several epidemiological studies in which non-Hodgkin's lymphoma was among the diseases of interest.

Q Were these all cancer mortality studies, that type of thing?

A Mostly, yes.

Q Okay.

A I also conducted a review of the literature on perchloroethylene and -- perchloroethylene that looked at various categories of cancers.

Q There is a difference between an epidemiologic study and a review, isn't there?

A Absolutely.

Q I am asking about epidemiologic studies so let's stick with that for the moment, please.

Have you ever conducted a case control study of

non-Hodgkin's lymphoma in patients for deaths?

A No, I have not.

Q Have you ever conducted any epidemiologic study that was specifically designed to investigate risks specifically for non-Hodgkin's lymphoma?

A Specifically and excluding other causes of death or disease?

Q Yes.

A That is correct, I have not.

Q Okay. Have you conducted any epidemiologic studies which investigated disease outcomes amongst benzene-exposed workers?

A Yes, I have.

Q What studies are those?

A There is a series of publications based on a large complex study of river workers in Germany and portions of the cohort workers were presumed to have been exposed to benzene among many other solvents and chemicals.

Q Would you show me on your publications list where those publications are.

Is it more than one?

A Yes. And I can't recall specifically which of the publications address non-Hodgkin's lymphoma specifically.

Q Do you recall that any of them do?

A I believe, yes.

On page 14, the penultimate entry is authored by Straif. This Part 2 of a two-part article covers mortality from non-respiratory cancers.

Q All right. Any others?

A On page 15, the third entry by Weiland is from the same study, as is the sixth, I believe, also by Weiland.

I think those are the three that provide -- I am sorry. There is one more.

On page 14 again, middle of the list, I'm the first author of the study of women in the German rubber industry.

Q You are the first named author on that?

A Correct.

Q Okay. So it is those four studies?

A Those are the most likely to contain results on NHL.

Q Did you review the actual data regarding non-Hodgkin's lymphoma in those publications of yours with respect to your opinions in this case as to whether benzene can cause non-Hodgkin's lymphoma?

A That is a complicated question. If you could clarify what you mean by did I examine the data on

non-Hodgkin's lymphoma.

Q I am asking if you actually looked at the data in your own publications regarding benzene and non-Hodgkin's lymphoma in preparation for your opinions in this case on the causal relationship between benzene and non-Hodgkin's lymphoma.

Did you do that or not?

MR. GRANNIS: It is argumentative. Lacks foundation.

THE WITNESS: I am sorry. The way I view data are the raw materials of a study we gather, so I didn't know if you were asking if I looked at the death certificates that reported NHL.

I think that would have been -- that is how I interpreted your use of the word "data."

Did I review the published results in these publications in preparation for this deposition, no, I did not.

Q BY MR. METZGER: Are you able to tell me what your own studies that you just identified indicate regarding whether there is an increased risk of non-Hodgkin's lymphoma among benzene-exposed rubber workers in any of these studies?

MR. GRANNIS: Argumentative.

THE WITNESS: Not from memory, no.

Q BY MR. METZGER: Okay. Are you more familiar with the epidemiologic studies regarding benzene and non-Hodgkin's lymphoma that have been published by other authors than yourself?

MR. GRANNIS: Argumentative. Lacks foundation.

THE WITNESS: I am very familiar with my study. I don't recall one of hundreds of specific results.

Q BY MR. METZGER: Okay.

A I am also familiar with other's studies of benzene-exposed populations and the range of causes of disease and death they examined.

Q Okay. You are currently a principal of Environ; correct?

A Yes, sir.

Q And that is an environmental consulting firm?

A That is correct.

Q And Environ has as clients major oil companies and chemical companies; is that correct?

MR. GRANNIS: Argumentative.

THE WITNESS: Not exclusively but including oil companies as clients, correct.

Q BY MR. METZGER: Before the deposition began you provided me or counsel provided me an indication that your check for today's testimony should be made payable to Environ International Corp. with its tax

identification number; is that correct?

A I provided Mr. Grannis with that information this morning.

Q So this is your handwriting?

A No, it is not.

Q Okay.

A I read it from an E-mail that I received.

Q And he wrote it down?

A And he wrote it down.

MR. GRANNIS: Poorly, I might add.

MR. METZGER: Off the record.

(Interruption in the proceedings.)

MR. METZGER: Back on the record.

Q Are you employed full time by Environ?

A Yes, sir.

Q And how many hours a week do you work in your work for Environ?

A Between 50 and 60.

Q Do you have any other professional work outside of Environ?

A No, sir.

Q Your curriculum vitae indicates that you have an appointment as an adjunct professor in the department of epidemiology at the University of North Carolina at Chapel Hill; is that correct?

A Yes, sir.

Q Where do you live?

A Amherst, Massachusetts.

Q How frequently do you go to the University of North Carolina to serve as an adjunct professor?

A Rarely.

Q How rarely?

A Once per year.

Q When is the last time you went there?

A Couple years ago, a year ago.

Q And what did you do on that occasion?

A Colleagues in the department of epidemiology and I prepared a large research proposal that was not ultimately funded.

Q What was that proposal for?

A It was for a large study of health of workers in the semiconductor industry.

Q And from whom were you seeking funding for that study?

A I don't recall specifically, but it was from the trade association of semiconductor interests.

Q So when you went there on that one occasion a year or two ago, did you actually do any teaching on that occasion?

A On that occasion, no.

Q When is the last time that you actually taught a course -- strike that.

Have you taught a course as an adjunct professor at UNC?

A I have not, no.

Q Okay. Are you in fact still an adjunct professor at UNC?

A Yes, sir. I think the CV accurately represents that my appointment is from 2007 to 2012.

Q I see.

Are you presently scheduled to teach any courses in the future at UNC?

A No, sir.

Q When you were appointed an adjunct professor for the period 2007 to 2012, did you have any understanding whether you would be expected to teach courses at UNC?

A Yes, sir.

Q What was your understanding?

A That it was not expected because of my location.

Q Do you have an understanding as to why you were appointed an adjunct professor at UNC if you would not be teaching any courses there?

A Yes, sir.

Q What is that?

A Adjunct faculty provide a wide range of service and some include teaching. My appointment at UNC does not include teaching responsibilities.

Q What does it include?

A It includes advising, consulting, preparing exams for doctoral candidates in advanced areas in which I am an expert or at least have something to contribute as a knowledgeable practitioner.

I provide networking of resources and contacts for my clients and my colleagues to a mutual benefit of the university and other professional activities of the department and school.

Q Are you currently advising any doctoral candidates?

A No, I am not.

Q When is the last time that you did?

A Probably in the same time frame of a year or two ago.

Q Are you presently providing any consultation for the university?

A Yes, I am.

Q What is that?

A There is a joint project that Environ is pursuing with the school of public health at UNC that I

helped introduce or arrange. This occurred early part of this year.

Q What is the project?

A It is the further development of some sophisticated models that pertain to, I think, exposure, dispersion of exposure generated from various sources.

Q Is there any particular chemicals that are the subject of that project?

A I don't know the details of that. I was much more participating as a matchmaker than as a practitioner on that project.

Q You mean you were hooking up Environ with the university for this project?

A That is correct.

Q Okay. Any other consultation that you have provided for the university?

MR. GRANNIS: Vague.

THE WITNESS: Not that I can think of right now.

Q BY MR. METZGER: Okay. Are you currently preparing any exams for the university?

A I am not now, no.

Q When is the last time that you did that?

A I believe you asked me that already. It was a year or two ago.

Q And what exam or exams did you prepare?

A My specialty is in occupational epidemiology and the exams that I would prepare are limited to questions on occupational epidemiology for written doctoral exams.

Q I am not asking what you would prepare; I am asking what you did prepare.

Did you actually prepare any exams regarding occupational epidemiology for UNC within the last two years?

A I'm not sure if it was within the last two years, but I certainly have prepared exam questions for that purpose.

Q These were for doctoral candidates?

A Yes.

Q How many?

A I don't recall. Not a large number.

Q Less than five?

A Two or three I would say.

Q And the rest of your activities for the university are networking of resources and contacts and some promotional work; is that correct?

A That is my primary role.

Q You also on your curriculum vitae list being an adjunct associate professor in the department of

epidemiology at the University of Massachusetts at Amherst from 2005 to the present.

Is that accurate?

A Yes, sir.

Q Are you currently teaching any courses at University of Massachusetts, Amherst?

A Not this semester.

Q When is the last time that you taught courses there?

A Last academic year.

Q That would be the year 2008 to 2009?

A Correct.

Q Why are you not teaching a course this year?

A I will teach a course in the next semester. This semester I am very busy and this is a voluntary activity.

Q I see.

Has it been your practice to teach one course per year at UMASS?

A No, sir.

Q How many courses per year in the last three years have you taught?

A I have only taught two courses in the last three years.

Q Okay. What were those classes?

A They were essentially the same class, different years on the use of epidemiology in decision making.

Q Was that a graduate level course?

A Yes.

Q Was that an independent study or a regular course listed?

A It was a classroom class, met once a week for three hours.

Q For how many weeks?

A I believe total of 15.

Q Did you teach each of those sessions or were you an invited speaker at one or a few of them?

A I was one of the organizers of the course.

Q How many organizers were there?

A There were two others.

Q Who were they?

A Dr. Sulski and Dr. Silverberg, also both adjunct faculty members.

Q What are their specialties?

A Dr. Silverberg is a physician whose specialty is outcomes research, a branch of epidemiology that attempts to match what is known scientifically with what is practiced clinically.

Dr. Sulski is a colleague of mine at Environ at my office in Amherst. Her specialty is in epidemiology

concepts and methods mainly as applied to research in musculoskeletal injury disorders.

Q Okay. 15 sessions that this course comprise, how many of those sessions did you actually teach yourself?

A Keep in mind this was a shared course. I think I had full responsibility for one session and partial responsibility for two others.

Q Okay.

A As well as participation in the seminar portion of the class, which is more discussion oriented.

Q Other than the three organizers, were there other people who actually taught the course?

A I believe there were one or two. I don't know exactly how many, a few, and other invited speakers.

Q Okay. For the one session for which you have full responsibility, what was the subject of that session that you taught?

A It was either of the following two: The IARC evaluation process or the emerging use of epidemiology in European legislation known as REACH.

It is an acronym for Registration Authorization --

Q Okay.

A -- et cetera, as it compares to regulation and

use of epidemiologic evidence under EPA in the U.S.

Q Have you ever sat on an IARC committee other than as an observer?

A No, I have not.

Q Have you sat on any of the implementing committees for REACH?

A No.

Q In the courses which we have just been discussing, did you in any way discuss benzene or non-Hodgkin's lymphoma?

A No.

Q Okay. Other than the rubber worker epidemiologic studies which you have done and which you have identified on your curriculum vitae, do you have any other publications which in any way relate to benzene?

MR. GRANNIS: Overbroad. Vague.

THE WITNESS: Not exclusively or directly. There probably are a number where indirectly benzene may be relevant; for example, meta-analyses of occupational exposure as a painter, to the extent that painters may have been exposed to products containing some quantity of benzene.

Q BY MR. METZGER: Where -- oh, the second --

A That is the second one. I am citing this as an

example, if this is what you would like me to identify for you.

Q Okay. So let me see.

You are referring to what is the second article on your publications list on page 12; is that correct?

A That is correct.

Q As I look at the title of that it appears to be concerning a meta-analyses of occupational exposure as a painter for the specific outcomes of lung and bladder cancer; is that correct?

A That is correct.

Q So in that study do you specifically address non-Hodgkin's lymphoma or not?

A No.

Q Is this study one in which you have compiled data and performed a meta-analysis of exposure data for painters?

MR. GRANNIS: Vague.

THE WITNESS: No. Unfortunately there are very poor exposure data for painters.

Q BY MR. METZGER: Okay. Have you read the recently published article regarding painter's exposure to benzene that was published in OEM, I think, within the last few weeks?

A I can't recall that I have.

Q Okay. It is Chinese workers, does that ring --

A Oh, yes, I have seen it.

Q Have you read that article?

A I haven't had time to, no.

Q Okay. Other than the second article on your publications list that you have identified, are there any other articles that you have which relate to benzene?

A Indirectly.

Q Directly or indirectly, sure.

A I don't believe there are any that directly do so. I will look to see if there are others that indirectly address it.

MR. GRANNIS: While the doctor is doing that, Raphael, where could I get a glass of water?

Thanks.

THE WITNESS: I believe that is it.

Q BY MR. METZGER: Okay. Is all of your professional income currently derived from your work at Environ?

A Yes, sir.

Q Would you describe for me the work that you do for Environ.

A It divides roughly into three areas, one of which is litigation support; another which is primary

epidemiologic research studies as well as reviews and syntheses of the epidemiologic engineering literature.

And the third is a bit more of a mix. It has to do with advising, consulting, opinion giving to clients and operating an epidemiology practice within Environ, so some administrative responsibilities.

Q Okay. What percentage of the time that you spend for your work for Environ is on litigation support?

A It varies depending on the timing of the cases that we are working on and the demands of those cases, but it probably doesn't drop below 25 percent and it probably doesn't go over 50 percent, somewhere in that range.

Q And what percentage of your time at Environ is spent advising clients?

A That is really the first priority so it depends what the demand is at the time, but I would say it is roughly a third on average.

Q And that is advising and consulting for clients?

A For that piece that I identified, and that includes some administrative. Do you want me to further divide that?

Q Yes. I'd like a breakdown.

How much time do you spend in administrative work at Environ, what percentage of your time?

A That is probably 10 to 15 percent.

Q And how much time do you spend operating an epidemiologic practice at Environ?

A I consider that part administrative activities.

Q Okay. And what percentage of your time do you spend advising and consulting for clients outside of litigation support?

A That is probably 20, 25 percent.

Q And what percentage of your time do you spend reviewing and synthesizing the epidemiologic literature at Environ?

A That is a fair amount of what I do because that is a large part of what I do in the litigation area as well as in the research area as well as in the client advising area.

So I would say more than half of my time is spent in that type of activity.

Q How much more than half?

A I don't know. These are all rough estimates. I have never really split it out for that kind of analysis.

Q Okay. What percentage of your time at Environ is actually spent conducting primary epidemiologic

research studies?

A Well, that is what varies the most. During phases of start-up and protocol development I could be spending three, four days per week, and then there will be long stretches where I don't do anything. So it is very difficult to average.

Q Okay. In the year 2009 have you spent time at Environ reviewing and synthesizing epidemiologic literature apart from litigation?

A Yes, I have.

Q What have you done there this year in that regard?

A These first two publications that are -- I think you have the CV. The first two publications that are in press are very large reviews that consumed a fair amount of time this year.

Q Let's talk about those briefly then -- well, we will get to them in just a minute.

A There are other areas, but yes, I spent a lot of time reviewing and critiquing literature.

Q And in 2009 have you conducted any primary epidemiologic research studies?

A Yes.

Q Which ones?

A The largest and most time consuming is based in

Germany. It is a study of 18,000 men and women employed in the porcelain manufacturing industry.

Q All right. Who is sponsoring that study?

A That is jointly sponsored by the European silica trade group called Eurosil and the German Government.

Q Okay. Regarding the first publication listed on your CV, "Epidemiologic studies of formaldehyde exposure and risk of leukemia and nasopharyngeal cancer: A Meta-analysis," who sponsored that?

A That is sponsored by the formaldehyde council.

Q The second one, "Meta-analyses of occupational exposure as a painter and lung and bladder cancer morbidity and mortality," who sponsored that?

A That is sponsored by the National Paints and Coatings Association.

Q Okay. And have you testified in cases for the defense where the claimed exposure was formaldehyde?

A I have not.

Q Have you testified in cases where the claimed exposure was paint?

A I did give a deposition in a case where the exposure included use of a paint product. I don't quite believe that is a good fit but paint was mentioned.

Q Okay. All right.

They are gradually bringing in things from your CV that they have been printing out.

So we have here this document which we will mark as Exhibit 2.

(Deposition Exhibit 2 was marked for identification.)

Q BY MR. METZGER: I will ask you, is this the list of testimony that you had faxed over?

A Yes.

MR. GRANNIS: And this is a document entitled -- three-page document entitled, "Testimony and Fees"; correct?

THE WITNESS: Yes. The fourth page is a fax cover.

Q BY MR. METZGER: Why don't we just remove that last page so it doesn't clutter up the exhibit, okay.

A Yes. It is three pages.

Q All right. And is this a list both of deposition and trial testimony?

A Yes.

Q Okay. Now, the first case listed here is O'Neill versus The Sherwin-Williams Company.

And you apparently gave a deposition in July of this year; is that correct?

A Yes, sir.

Q What was that case about?

A Mr. O'Neill was diagnosed with a bladder cancer which he alleged to have been caused by his recent use of a product manufactured by Sherwin-Williams.

Q A paint product?

A Which?

Q A paint product?

A A paint product, yes. I believe an epoxy system, something I don't fully understand.

Q On whose behalf did you testify?

A I believe Sherwin-Williams.

Q What was the thrust of your testimony?

A Essentially that the alleged painting exposure which consisted of I think half a dozen applications of this material, within 10 years, maybe less of the diagnosis of bladder cancer was incompatible with the epidemiology of bladder cancers.

My understanding was also that there is no chemical in that product that could cause bladder cancer and it was on that basis the case was dismissed.

Q Who is the attorney who took your deposition?

A I don't know. I mean I don't remember.

Q When you say the case was dismissed, was there a summary judgment brought that you are aware of?

A Yes, sir.

Q Did you provide a declaration in support of the dismissal of that case by summary judgment?

A I don't recall. I believe that my testimony at deposition was cited in that motion, but I just don't recall so ...

Q And the next case, Willis versus R.J. Reynolds Tobacco Company, what was that about?

A This is a case in which I was asked to comment on what level of reduction or avoidance of risk occurs among smokers who quit smoking, various stages of their smoking histories.

Q What was the case about?

A This is one of complex series of cases that I don't fully understand from a legal perspective, but it's one of the so-called angle progeny cases, individuals that had filed claims earlier, years and years ago and that are coming back now.

Q These are claims where smokers were suing R.J. Reynolds and perhaps other tobacco companies claiming that tobacco had caused their lung cancers.

Is that it?

A Essentially. I don't want to represent that it is as simple as that because I don't know, but that is essentially my limited understanding of those cases.

Q And on whose behalf were you testifying in that

case?

A The tobacco companies.

Q Does smoking cause lung cancer?

A Absolutely. And of course in all of these situations where chemicals are -- exposures cause disease, it has to be an adequately high level to cause that.

Q What is the carcinogenic constituent of cigarette smoke that causes lung cancer?

MR. GRANNIS: Irrelevant.

THE WITNESS: I don't know that it is known. There may be many of them. And I think that that's -- there are many people working on that trying to disentangle that.

Q BY MR. METZGER: How do you know if smoking causes lung cancer if you don't know which constituent does cause lung cancer?

MR. GRANNIS: Irrelevant. Argumentative.

THE WITNESS: Well, I know this from various approaches, not the least of which is that this has been demonstrated epidemiologically, so many times it can't be counted, in that removing that exposure has been demonstrated to have parallel reductions in risk.

So without knowing what the mechanism is, we can test it experimentally at the population level.

Q BY MR. METZGER: So without knowing what the mechanism is and without knowing what the carcinogenic constituent -- causative carcinogenic constituents are, you can still determine that cigarette smoking causes lung cancer; correct?

MR. GRANNIS: Argumentative. Irrelevant.

THE WITNESS: In this situation that can be held because of the strength of the association between those -- between the exposures and the occurrence of lung cancers.

Q BY MR. METZGER: What is the strength of the association?

A It depends how carefully you have measured the exposure.

Q I am asking for cigarette smoking and lung cancer, what is the strength of that association?

MR. GRANNIS: Irrelevant. Vague.

THE WITNESS: I would say that is not answerable as simply as that because it is an oversimplification.

Q BY MR. METZGER: Okay.

A Epidemiologically you have to specify a quantity of exposure and you have to specify a specific disease. If you asked me about adenocarcinomas --

Q I am asking about lung cancers.

A Lung cancers are --

MR. GRANNIS: Excuse me, the witness has not finished answering your previous question. He is entitled to do so. I appreciate if you give him that courtesy.

Go ahead, doctor.

THE WITNESS: Lung cancers are many, many different diseases with slightly different etiologies, meaning they have different constellation of causes.

If you ask me a more specific question about adenocarcinoma of the lung, I'd give you a different answer than if you asked me about small cell or squamous cell. All of them are, in lay terms, considered lung cancer. They're very different diseases.

On the exposure side I'd have to ask you whether you are talking about a casual smoker of a cigarette or two a day or a half a pack a day or a serious smoker, 20 or 30 packs per day.

If you looked at squamous or small cell --

Q BY MR. METZGER: 20 or 30 packs a day?

A I'm sorry. 20 or 30 cigarettes per day. Thank you for correcting.

Q That is a real serious smoker.

A I think most I have seen is five but not 25 or 30.

But if you looked at a squamous cell carcinoma risk among smokers of two to three packs a day, relative risk might be 100 or 200.

Q I see.

A It is highly specific to both the specific exposure and the specific disease.

Q How many types of lung cancer are there?

MR. GRANNIS: Irrelevant. Overbroad.

THE WITNESS: I'd have to look at the ICD coding. It changes, you know. There are more added over time as we understand that many of these cancers actually are multiple diseases, but there are four main groups.

Q BY MR. METZGER: And those are?

A Large cell, small cell, squamous cell and adeno, and there are many subtypes. I know there are certain subtypes of adeno that are not associated with smoking.

So it is more complicated than what is the relative risk of cigarette smoking.

Q Does cigarette smoking cause all of the four major types of lung cancer that you just identified?

MR. GRANNIS: Argumentative. Irrelevant.

THE WITNESS: To some degree. It varies, as I previously explained, by the amount of exposure and by

the specific subtype of the disease.

Q BY MR. METZGER: Does cigarette smoking cause the various subtypes, the four main types of lung cancer?

MR. GRANNIS: Vague. Irrelevant. Overbroad. Argumentative.

THE WITNESS: Again, it depends. There are subtypes that either are shown to be weakly or non-associated with smoking, or where there is inadequate evidence available to conclude that a specific subtype is reasonably represented by the larger family.

Q BY MR. METZGER: Is there any subtype of lung cancer that has been shown to not be caused by cigarette smoking?

MR. GRANNIS: Vague. Irrelevant. Overbroad. Argumentative.

THE WITNESS: Yes. There is a subtype called B.A.C, bronchioalveolar carcinoma that I believe has been looked at adequately to demonstrate epidemiologically the evidence is mixed, so it is not strong enough to conclude that it is causal relationship.

Q BY MR. METZGER: But I wasn't quite asking you that. What I was asking you is, is there any subtype of

lung cancer which has been proven to be not caused by cigarette smoking?

MR. GRANNIS: Vague. Overbroad. Irrelevant. Argumentative.

Q BY MR. METZGER: I am not asking about sufficiency of evidence.

A I understand. I also understand it is not an epidemiologic question. I think that proving something doesn't cause something is not compatible with the basic approach we use to scientific method generally, but specifically epidemiologically.

Q I understand you to be saying that epidemiology doesn't do that. Epidemiology does not prove that something does not cause something.

MR. GRANNIS: Vague. Overbroad. Mischaracterizes testimony.

THE WITNESS: I didn't understand the question as you phrased it, but I believe that you are asking epidemiology doesn't or is not able, as is are other sciences, unable to prove this negative. And that is the way that it is summarized in lay terms.

Q BY MR. METZGER: I see.

A The scientific method establishes a testable hypothesis that there is an observable difference between two groups.

Failing to see an observable difference doesn't prove a negative; it disproves the hypothetical. We build our understanding from this basic scientific method and I believe it is not limited to epidemiologic.

Q So in layman's terms so that an average person can understand this, are you saying that epidemiology does not prove that a particular chemical does not cause a particular disease?

MR. GRANNIS: Overbroad. Vague. Mischaracterizes testimony. Argumentative.

THE WITNESS: The way we describe that in lay terms is that there is inadequate evidence to reject the hypothesis.

It may lend support for the null hypothesis, that is that it doesn't cause the disease, but it doesn't provide proof for that.

Q BY MR. METZGER: And you say that that is lay terminology?

A It is. It doesn't get any better.

Q Okay. Well, then let me ask you the flip side of this. Does epidemiology actually prove that a chemical does cause a disease?

A I think that I have found --

MR. GRANNIS: Vague and overbroad.

THE WITNESS: I found a more commonly used lay

explanation for your previous question. That is that this is the white swan, black swan analogy. You can repeatedly hypothesize that all swans are white and be paraded in front of an endless stream of white swans but still not be able to prove that there aren't black swans. But as soon as you have identified a black swan, you can disprove that hypothesis.

I think that is an analogy that's frequently used in lay settings so you can understand the difference between affirming epidemiologically or observationally or scientifically versus disproving.

Q BY MR. METZGER: Is it true that epidemiologic textbooks state that epidemiology does not prove causes of disease?

MR. GRANNIS: Vague. Overbroad. Argumentative.

THE WITNESS: Yes, epidemiology texts appropriately identify that, but should also accurately add that causality cannot be proven by any means except some ridiculously obvious things like a gunshot wound fatally injured someone.

As you move into chronic disease complex epidemiology, then I think it is reasonable that proof of causation cannot be determined.

Q BY MR. METZGER: Okay. All right. We were

looking at this case list. The next case down Bishop versus Shell Oil, what was that case about?

A This is an oil -- excuse me, oil production or oil worker -- I don't recall the details. And I believe it is a multiple myeloma case.

Q Was the claim that benzene from petroleum products caused the worker's multiple lymphoma?

A That is what I think it is, yes.

Q And you gave a deposition in that case this year?

A That is correct.

Q What was the thrust of your testimony?

A The epidemiologic literature on multiple myeloma and benzene is very weak and not sufficient to draw causal determination.

Q And you testified on behalf of Shell Oil Company?

A And/or one of the other defendants.

Q Who took your deposition in that case?

A I don't recall.

Q Is that case still pending, to your knowledge?

A Yes, it is.

Q Okay. The next case, Davis versus BNSF Railway Company, what was that about?

A I am sorry. I shouldn't say so definitively

that it is still pending. I just believe so. I don't recall.

Q Sure.

A The Davis case, Mr. Davis had a biliary tract tumor and alleged that that was caused by his exposures while employed at BNSF.

Q He was a railroad worker?

A He was a tie plant worker.

Q What was the claimed exposure?

A It was a mix and it included most of the chemicals or all of the chemicals that were used at that facility.

I haven't finished. You were eager for my words and I am getting there. The creosote was one. Chromium, pentachlorophenol, in this category, mostly wood preservatives.

Q What was the thrust of your testimony?

A I looked fairly comprehensively at each of those exposures in the epidemiologic literature as well as at that specific type of cancer and demonstrated that there was no epidemiologic support for that hypothesis.

Q Who took your deposition?

A I am sorry. I don't recall. I will do a better job and try to remember you in this deposition for future reference, but I don't retain the names of

the attorneys taking my depositions.

Q That case went to trial?

A It did.

Q Did you testify at trial?

A I did.

Q What was the result?

A Defense verdict.

Q The next case, Valdez versus A.W. Chesterton Company, what was that about?

A I don't recall the specifics of that.

Q Do you recall generally that that was regarding asbestos?

A That may be. I have given depositions in a number of asbestos cases.

Q Have you testified for A.W. Chesterton?

A Not that I recall. The name is not familiar to me.

Q In that case did you testify for the defense?

A Yes, sir.

Q You seem quite definitive.

In all of these cases have you testified for the defense?

A No, sir.

Q All right. The next case, Kaplan versus R.J. Reynolds, is that another one of the angle cases?

A Yes, it is.
Q You testified for the defense?
A I don't even remember.
Q For R.J. Reynolds; is that correct?
A I believe it was for all of the defendants.
Q All of the tobacco companies?
A Yes.
Q Is same true with the Grossman case?
A Yes.
Q The Gersten versus Asbestos Corporation, I would assume that was some asbestos case; is that correct?
A That is correct.
Q And whose behalf did you testify?
A I believe it was Plant Insulation.
Q That was one of the asbestos companies?
A Yes.
Q One of the defendants?
A Yes.
Q Who took your deposition in that case?
A I don't know.
Q The next case, Clayton -- sorry, Thompson versus Asbestos Defendants, another similar case?
A Yes.
Q Collins versus A.W. Chesterton Company, another

asbestos case?

A Yes.

Q And you gave both deposition and trial testimony in that case?

A Yes.

Q Barr versus Aladdin Heating Corporation, what was that about?

A I think that was similar. These cases --

Q Also asbestos --

A -- cases in Alameda are all on behalf of a plant which I provided testimony on state of the art.

Q I see.

And essentially that meant that the hazards of asbestos were not knowable or known at a certain point in time.

Is that what you mean?

A The question put to me is what would a scientist at a particular point throughout history have available and possibly understand as to what was knowable. Did not come into what a company might know. It really was a scientific question.

Q I understand.

Was it one law firm that was representing the plaintiffs in these cases?

A I was retained by one law firm in these cases

and it was Burn & Brown, Oakland.

Q But was there one law firm who was representing the plaintiffs?

A I don't know.

Q Do you recall the name of any law firm that was associated with the plaintiffs?

A No. These were mainly phone depositions, some of them 10 or 20 minutes and some never discussing the science of the case, so I had fairly little interaction with any parties in these.

Q Okay. Trombella versus Advocate Mines Limited, what was that case about?

A It must have been similar because the deposition was in the same day and there was a cluster of cases in the same --

Q You testified for the defendant asbestos company?

A That would have been plants, yes.

Q Okay. Village of Bensenville, Illinois versus City of Chicago, what was that about?

A Bensenville is the village adjacent to O'Hara.

Q Airport, right.

A And I was representing Bensenville as a plaintiff concerned about the way the City of Chicago was demolishing properties in their neighborhood while

people were still living next to the demolition site --

Q The next case --

A -- which included a hazardous waste site.

Q The next case, Marshall versus AC&S, another asbestos case and you testified for the defense?

A That's correct.

Q City of St. Louis versus American Tobacco Company, what was that about?

A This is a large and very complicated matter that I don't understand entirely. To simplify it, I will describe it probably in a simplistic way.

The hospitals in and around throughout Missouri have jointly filed this case in an attempt to recoup moneys that they expended on behalf of patients that were either charity cases or non-paying, non-charity cases --

Q Lung cancer case --

A -- alleging that their care caused damages, financial damages to the hospitals in treating them.

Q Were these lung cancer patients suffering from tobacco-related disease?

A That is where it is very complicated.

Q Is that what the claim was?

A No. It has to do with a long list of diseases and --

Q Was the claim that the tobacco companies had caused these diseases thereby resulting in this treatment for which the hospitals were not compensated and the hospitals wanted the tobacco companies to compensate the hospitals for treating these patients?

A Something like that. When I try to reiterate this way, they say, "No, no, it's much more complicated."

So I don't want to --

Q What was the thrust of your testimony in this case?

A That is ongoing and it is still unclear to me all of the areas that I will be addressing. And I understand this has been underway for 10 or eight more years.

MR. GRANNIS: Have you testified in that case?

THE WITNESS: I gave a deposition. And at the deposition I identified a large number of diseases that I believe are caused by smoking.

Q BY MR. METZGER: So cigarette smoking doesn't just cause lung cancer?

A That's right.

Q Oh, how do you know that?

A General causation, you know, is a judgment largely based on available evidence and often -- and

with cigarette smoking there is substantial scientific evidence that is specific to these diseases and from which causation can be reasonably inferred.

Q So a chemical can actually cause more than one disease?

MR. GRANNIS: Argumentative. Overbroad. Vague.

THE WITNESS: And doesn't at all reflect what I said in my previous answer.

Q BY MR. METZGER: I am just asking.

A Could you ask it as a new question.

Q I'm asking a new question.

A Maybe by tone you implied that's what I had suggested.

MR. GRANNIS: Same objections, and mischaracterizes previous testimony.

Q BY MR. METZGER: I will ask a new question.

A Thank you.

Q Can a chemical cause more than one disease? Is that possible?

MR. GRANNIS: Vague. Overbroad. Argumentative.

THE WITNESS: A specific chemical I believe could cause more than one disease. I think that there are chemicals such as vinyl chloride that causes

angiosarcoma of the liver but can also cause another host of -- a host of other diseases, including acroosteolysis so...

Q BY MR. METZGER: Brain cancer?

A I don't agree at all with that, unless you have found a new battery of epidemiologic studies. And I have looked very closely at that.

Q If you want to agree with Rinkis, what about hepatocele carcinoma?

A I think that is a great question.

Q How about answering it?

A I would love to answer it. Would you like to sponsor my research? I have access to very good data.

Q I can't afford you. No, thanks.

Let's move on.

A I thought we were almost close to coming to a deal.

Q No.

A See, that is one of those good hypotheses for which there are epidemiological -- or data that could be used in epidemiological study to answer it.

Q Carter versus A.W. Chesterton Company, another asbestos case you testified for the defense?

A Yes, just like the others above.

Q Okay. Johnese versus Ameron, what is that

about?

I assume it is some paint-related case.

A I think so. I think it was a pancreatic cancer case with non-specific exposure.

Q You testified for the paint company, Ameron?

A It is possible. I --

Q For the defense, for some paint company in the case?

A Correct, correct, or a defendant. I don't know if they were necessarily a paint company.

Q All right. And you testified that the exposure didn't cause the pancreatic cancer?

A I don't recall specifically my testimony, but it would have been more likely something like that but more along the lines that the epidemiologic evidence doesn't support that claim.

Q Clark versus Kellogg Brown & Root, what was that about?

You don't recall?

A This is a benzene case.

Q Okay.

A I don't recall the disease that Mr. Clark had.

Q Did you testify that benzene did not cause that disease?

A I don't recall.

Q If I told you that the disease he had was acute lymphocytic leukemia, would that have been your testimony in the case?

MR. GRANNIS: Incomplete hypothetical.

THE WITNESS: I would say that the epidemiologic data was insufficient to draw that conclusion.

Q BY MR. METZGER: Okay. Cairns versus American Optical, what was that about?

A This is an asbestos case.

Q You testified for the defense?

A Yes.

Q Hamman versus American Oil, what was that about?

A I think this is a benzene case. I don't recall the disease.

Q Did you testify for the defense?

A Yes.

Q Do you recall generally what your testimony was?

A No.

Q Do you recall the plaintiff's attorney?

A No.

Q Weir versus ArvinMeritor, what was that about?

A I actually think that was the pancreatic cancer

case.

Q The one that you mentioned earlier?

A Yes. We are getting back too far for me to remember these things.

Q In re: Tobacco Litigation, West Virginia, what was that about?

A That is another long time ongoing case where I believe my testimony was similar to that in the St. Louis identifying the lists of diseases that I concluded or caused by tobacco smoke.

Q You testified for the tobacco industry in this case?

A Yes.

Q Okay. Cantu versus Refining & Marketing, is that a benzene case?

A Yes.

Q What was the disease?

A Actually I think that was an NHL case. This -- that's right. I did not give a deposition in this case. That was a Daubert hearing that I participated in.

Q When you say a Daubert hearing, was this actually a hearing that took place in court or just a Daubert hearing where you submitted an affidavit or declaration?

A I thought you were going to catch my error. It

was a Havner hearing in Texas.

Q Life testimony or declaration?

A It was life testimony before the judge.

Q Okay. You testified for the defense?

A Yes.

Q Mountney versus 84 Lumber Company, what was that about?

A It is an asbestos case.

Q You testified for the defense?

A I testified on behalf of 84 Lumber.

Q What was the thrust of your testimony?

A The asbestos, if any, in joint compound, if it had been sold by 84 Lumber was not capable of causing Mr. Mountney's disease.

Q Why was that?

A I am sorry?

Q Why was that?

A Why was?

Q Why was it not capable of causing the disease?

MR. GRANNIS: Vague. Overbroad.

THE WITNESS: Two basic reasons. One is that I believe this was a mesothelioma and chrysotile was not clearly a cause of mesothelioma, especially -- if there is any doubt at all, it is -- it disappears at levels which might be exposed from joint compound.

Q BY MR. METZGER: What disappears?

A The risk.

Q Oh, okay.

A In other words, there is no evidence whatever that low level exposures to chrysotile, if they occurred at all in this case, could have contributed to a mesothelioma.

Q Do you mean on an epidemiologic basis?

A Based on epidemiologic evidence, that conclusion was derived.

Q Is epidemiology as a science capable of making those assessments for extremely low dose exposures?

MR. GRANNIS: Argumentative. Vague. Overbroad.

Q BY MR. METZGER: Do you understand the question?

A I do understand the question. I think that it is -- it is very broad and it is complicated to answer what epidemiology is capable of and what you mean by low exposures because, for example --

Q Let me rephrase the question then.

A -- the insulators in Sulakoff's work were considered low exposed.

Q Let me rephrase the question.

A All right.

Q In this case the exposure was to chrysotile in what, joint compound?

A Alleged chrysotile. It was years and years where the joint compound did not contain chrysotile. So if you make it hypothetical, then we can get past the specifics of this case.

Q Sure, sure.

A If this guy used joint compound yesterday, nobody would say that anything in it contributed to his disease.

Q So here is my question: Is epidemiology a sufficiently precise and sensitive analytical device to detect statistically significant increases in the rates of occurrence of mesothelioma amongst workers who are exposed to chrysotile asbestos from joint compound?

MR. GRANNIS: Vague. Overbroad. Argumentative. Irrelevant.

THE WITNESS: It is still quite broad. You are asking me about epidemiology. Epidemiology is a world of practitioners and methods.

So you could say could -- could epidemiology using state of the art techniques detect these things. And I think that, well, if you look at quality of studies and the numbers of individuals that have been exposed to chrysotile fibers at low levels all their

lives, then in fact we can set those individuals apart epidemiologically from those that have been exposed to much, much higher levels and to moderate to high level of anthropoles.

Q BY MR. METZGER: So the answer to my question is yes?

A Partly. It is not a "Yes" or "No" obviously.

Q All right. Coulter versus Parks, that was a benzene lymphoma case; correct?

A Yes, I believe so.

Q And do you recall the name of the attorney who took your deposition in that case?

A No.

Q I believe it was Phil Harley.

Does that ring a bell?

A I think it does, yes. Very nice guy.

Q He was a very nice guy. He recently died.

A Did he really?

Q Yeah. Melanoma, unfortunately.

A Oh, I'm very sorry to hear that.

Q Did he take your deposition in other of the asbestos cases that we have discussed?

A This was not an asbestos case.

Q I know.

A Oh, do I recall whether he had taken my

deposition in an asbestos case, I don't recall.

Q Okay. Were you deposed by attorneys from the Braden Purcell firm?

A I don't know. I am sorry.

Q You don't know, okay.

Next case, Lattin versus Borden, what was that about?

A That is a vinyl chloride and brain cancer case.

Q I thought you said there was no such thing?

A There are cases. That is not what is lacking.

MR. GRANNIS: Mischaracterizes prior testimony.

Q BY MR. METZGER: Go ahead.

A That is not what we are short on. It is the science. I can't say much about this, not because I don't want to. I was a fact witness.

Q Really?

A I was in the court for five minutes.

Q What were you testifying about?

A I published the study on vinyl chloride workers in the U.S. and counsel believed that I could comment on my study without being identified as an expert.

Q I see.

Erroneously believed that?

A And the judge didn't agree with that so I was excused after 10 minutes.

Q Without testifying?

A A side bar.

MR. GRANNIS: So this case was one of failure to designate you as an expert.

Is that it?

THE WITNESS: I can't say I know what happened there.

MR. GRANNIS: Okay.

THE WITNESS: But I would say that I will be very careful if ever asked again to testify as a fact witness.

Q BY MR. METZGER: You were called by counsel to testify by counsel for Borden, the defendant?

A By one of the defendants.

Q Ringstaff versus AMOCO, what is that about?

A That is a benzene case.

Q Disease?

A Maybe a CLL, CML maybe. I don't know.

Q Okay. What was the outcome of that case? I see there was a trial.

A I don't recall.

Q Do you know who took your deposition?

A No.

Q Taylor versus AIRCO, what was that about?

A This is a vinyl chloride case.

Q On whose behalf did you testify?

A One of the defendants.

Q Okay. Can you recall the name of any plaintiff's attorney who ever took your deposition?

MR. GRANNIS: Other than the deceased gentleman that you referred to?

MR. METZGER: He didn't recall that one so I am asking other than that, yes.

THE WITNESS: And other than yours.

Q BY MR. METZGER: I am not done yet.

Other than Phil Harley and me.

A I remember the first.

Q Who was that?

A It was a gentleman by the name of Withey.

Q Mike Withey?

A Do you know him?

Q Sure.

A Okay.

Q Have you been deposed by Dean Heartly?

A I am sorry. My --

Q West Virginia, tall guy occasionally with a beard.

A I don't -- I don't recall.

Q Hershall Hockson?

A Oh, I do remember Mr. Baggett. I believe that

was June Taylor. So I think that I had only given depositions a few times before this list. This is five years. And so I think those first had an impression on me. No offense to any of your fine colleagues --

Q Billy Baggett?

A -- since then. I don't recall their names, but it was Mr. Baggett.

Q Jr. or Sr.?

A Jr.

Q Any others that you can recall?

A Not without prompting. I just don't remember.

MR. GRANNIS: Is this a good time to take a break?

MR. METZGER: Just going to ask a few more names.

Q What about Al Stewart?

A Doesn't ring a bell.

Q Steve Jansen?

A (No audible response.)

MR. GRANNIS: Is that a no?

THE WITNESS: Sorry, I am waiting for something that rings a bell. I am sorry. I don't remember that.

MR. METZGER: Let me just wrap up on the cases and we will take a break.

MR. GRANNIS: Sure.

Q BY MR. METZGER: So summing this all up, is it correct that in the past five years, wherever there was a claim of an occupational cancer or disease, in all of the cases in which you testified, you testified on behalf of the defense?

A That's right. If you are only talking about testimony, that is correct.

Q Have you --

A And the other caveat that it was an individual rather than a town.

Q Right, right.

A Yes.

Q Have you ever testified on behalf of a worker claiming to have suffered an occupational disease?

A Testified, no.

Q Okay. Let's take a break.

MR. GRANNIS: Okay.

(Brief recess.)

MR. METZGER: Back on the record.

(Deposition Exhibit 3 was marked for identification.)

Q BY MR. METZGER: Dr. Mundt, is the document that I'm providing you, which has been marked as Exhibit 3, a list of trial testimony which you provided on the CD this morning?

A Yes, sir.

Q Okay. So this lists all of the trials that you have testified in?

A I believe that there are trials and -- for instance, I noticed there was hearing, so I think this is testimony in court in front of a judge.

Q I understand. Okay.

Looks like we have addressed most of these cases. The only one I don't think we did is the one at the bottom, which is from 1996, the DiPetrillo versus Narragansett Electric, what was that about?

A That was a multiple myeloma case and alleged exposure was herbicide.

Q And you testified for the defendant?

A On behalf of Narragansett Electric, yes.

Q All right. We will mark as Exhibit 4 this document from the CD.

(Deposition Exhibit 4 was marked for identification.)

Q BY MR. METZGER: Is this a list of materials that you have received from counsel for this case?

A Yes, sir, that -- I recognize it.

Q Did you read all of the materials on this list?

A No, I didn't.

Q Go through it and tell me which of the

materials you have actually read and which you haven't.

A May I mark it?

Q Sure. Let's do it that way.

How do you want to mark it just so we know what --

A Just put a checkmark next to the number.

Q That you have read?

A Yes.

Q Okay.

A All right. The third amended complaint, Dr. Harrison's deposition and all of the exhibits, depositions of Dr. Whysner, Garabrant, Sarna, more deposition of Dr. Harrison, those are the ones that I have read.

The rest of the materials I have scanned, leafed through, but because there is so much in the medical record, I can't tell you that I have looked at a particular one.

Q Okay.

A And the same with the materials from the defendants listed here, excerpts from depositions 36 through 53. I don't know what that last entry is. I have not looked at it.

Q Okay.

A I don't -- I am actually going to put an "X" on

those numbers. I don't think that I have looked at these, and these are also scanned.

Q Okay.

A And I am familiar with and in order to identify it to you, have this portion from the medical record which I find to be important though my research in this case.

MR. GRANNIS: You are referring to Exhibit 3 to Dr. Sarna's deposition?

THE WITNESS: Correct.

Q BY MR. METZGER: Okay. All right. We will get to that later.

My staff has printed out a file listing from the CD that you provided and this appears to be regarding non-Hodgkin's lymphoma epidemiology articles. We will mark that as 5.

(Deposition Exhibit 5 was marked for identification.)

Q BY MR. METZGER: Could you tell me if I have correctly identified what that is?

A Yes, you have. The heading from the CD printed accurately.

Q Okay. So this is a list of the articles regarding non-Hodgkin's lymphoma epidemiology that are actually on the CD that you have provided me?

A They are.

Q And is this the collection of articles regarding non-Hodgkin's lymphoma epidemiology that you have reviewed and considered for this case?

A Yes, sir.

Q Are there any other articles regarding the epidemiology of non-Hodgkin's lymphoma that you have read, reviewed or considered for this case?

A So far this is what I have accumulated. I believe that this accurately reflects the literature on this NHL epidemiology.

Q So is the answer to my question no?

MR. GRANNIS: Hang on. I think he is still answering.

THE WITNESS: I also recall that this was a separate folder that also supports my opinions and that I reviewed in this case. So maybe we just need to be more specific on the --

Q BY MR. METZGER: We will come back to this question then.

Let me mark as Exhibit 6 then a document which is a printout of a file listing entitled, "Miscellaneous Articles" from your CV.

(Deposition Exhibit 6 was marked for identification.)

Q BY MR. METZGER: Is that what you were referring to?

A Yes, it is. Thank you.

And these don't fall neatly into a single category. And since there aren't so many of them, they are combined on this.

And between these two, these do represent the published scientific literature which I relied in formulating my opinions.

Q Between Exhibits 5 and 6?

A Yes.

Q Okay. Are there any epidemiology articles regarding benzene, organic solvents or non-Hodgkin's lymphoma that you are relying on for your opinions in this case which are not listed on Exhibits 5 and/or 6?

A The only exception to this list would be articles on which Dr. Harrison relies that I may not have incorporated on my list and addressing his testimony and what he might put forward might also review and critique those articles if they are not on this list.

Q How can I know which articles you are referring to?

A When he identifies them, then I can identify them.

Q Well, did you receive a CD-ROM which contained all of the articles which Dr. Harrison produced?

A Yes. As I understand it is a very large collection of articles that he provided.

Q Have you read all of those?

A I have not, no.

Q Have you read any of the articles that Dr. Harrison provided which are not on your lists Exhibit 5 and 6?

A I have not had a chance to compare. I have done my evaluation based on articles that I have identified and there is a good chance there is something that he had identified that I was either unable to identify or find a copy, but I have not made that comparison.

Q Well, I am not really asking you to make a comparison. What I want to know is, are there any articles on the CD-ROM that Dr. Harrison produced that you actually read other than those which are on your lists Exhibits 5 and 6?

A I have not read all of the articles on his list. It seems I think you are asking slightly different question.

Given that I haven't read the articles on his list, unless they are on my list --

Q You haven't read them?

A I haven't read them.

Q Fair enough. That is all I was asking.

A Okay. Good. I am glad you understood that one. I am sorry.

Q You did. Tried to make it simple. Okay. All right.

Let's see. I guess we have several copies of this. We will mark this as Exhibit 7 the single page entitled, "Summary of Opinions in Reese."

(Deposition Exhibit 7 was marked for identification.)

Q BY MR. METZGER: Is this a list or summary of the opinions that you have prepared for this case?

A Yes.

(Deposition Exhibit 8 was marked for identification.)

Q BY MR. METZGER: Is Exhibit 8 a collection of E-mails transmitting various materials to you that you received for this case?

A Yes.

Q Okay.

(Deposition Exhibit 9 was marked for identification.)

THE WITNESS: Excuse me, I just recall there

might be an older E-mail because we were first retained in this case a year ago and there was a long inactive period and then restarted in August I believe or September.

Q BY MR. METZGER: So it might be missing --

A There might have been an E-mail from an attorney, I believe Mr. Yang at Poole & Shaffery, contacting me initially on the case.

Q Okay. If you could just send that to me so we could have that, I would appreciate it.

MR. GRANNIS: If it exists.

Q BY MR. METZGER: If you have it. If you don't have it, you don't have it.

Okay. Is Exhibit 9 the billings in this case which Environ submitted to the Poole & Shaffery firm which retained you for this case?

A Yes, through September -- or through August, sorry.

Q Are there any more recent billings that have been prepared?

A There will be. It hasn't been prepared yet. That will be for the month of September and we are into October now. That will be forthcoming.

Q When does Environ send out bills?

A It is usually between the third and fourth week

after a month ends. It runs through its process, so it hadn't come out. The one for September hadn't come out yet. Otherwise, I would have provided it.

Q Do you have an estimate as to how many hours you have spent during the month of September and October on this case?

A Not precisely, but a lot more than in any previous months.

Q Give me your best estimate, if you could, recognizing it's an estimate.

A I have probably spent a week to 10 days plus staff time. I have no idea how much time.

Q How many hours per day?

A I was referring to day equivalents so ...

Q So --

A 40 to 60 hours.

Q And eight to 10 weeks of those, is that what you said?

A Days.

Q I am not understanding.

A That's right, we are not communicating.

I have probably spent a week.

Q Or 10 days?

A Or 10 days. So it is --

Q Eight to 10 hours per day?

A Right.

Q I got it. Thank you.

And I would like the bill when it does come out. If you could send me that too, please.

All right. And you have here some medical records which were Exhibit 3 to Dr. Sarna's deposition. And does this concern the thyroiditis?

A Yes, the thyroiditis as well as the site of the lymphoma.

Q Okay. I am not going to need to attach that.

I believe now we did not -- I have not had my staff yet print out the actual articles on the CD that you provided us, but is it correct that all of the articles that are on this CD are listed on Exhibits 5 and 6?

A I believe so, yes.

Q And --

A You represented that was a screen listing of those?

Q Yes.

A Right.

Q Recognizing that we have not printed out those articles but that we have them on the CD, have you actually now provided me either in paper form or electronic form all of your files for this case?

A Yes, I have.

Q All right.

A Understanding that I have only provided you a list of materials that were sent to me. They are not on the CD.

Q Right.

A They are identifiable and voluminous but ...

Q Right. I understand.

So now let's take a look at your opinions, which are Exhibit --

A 7.

MR. GRANNIS: Yes.

Q BY MR. METZGER: There they are, correct.

Let's go over this if we could.

You first write, "I understand that Mr. Reese was diagnosed with lymphocytic thyroiditis and diffuse large B-cell thyroid lymphoma."

What is lymphocytic thyroiditis?

A It is inflammation of the thyroid in which lymphocytes are present at some notable level. I am not a pathologist. I am relying on the medical report record for that information.

Q Is that type of pathological observation consistent with non-Hodgkin's lymphoma?

MR. GRANNIS: Vague. Overbroad.

THE WITNESS: I do address this more specifically in my opinions here, but the epidemiological literature on groups of individuals with non-Hodgkin's lymphoma specifically in the thyroid have also, concurrently or prior to the diagnosis, evidence of thyroiditis.

Q BY MR. METZGER: Are you saying that all lymphomas that occur in the thyroid either concurrently or previously have lymphocytic thyroiditis?

A No.

MR. GRANNIS: Argumentative. Misstates prior testimony.

THE WITNESS: No, I didn't say that.

Q BY MR. METZGER: Okay. Here is what I want to know: Is the pathological description of inflammation of the thyroid gland consistent with the diagnosis of a non-Hodgkin's lymphoma occurring in the thyroid gland?

MR. GRANNIS: It's vague. Overbroad. Misstates prior testimony. It is argumentative.

THE WITNESS: I find that to be a pathology question. I am not an expert in that area. Epidemiologically it is --

Q BY MR. METZGER: I understand epidemiologically, but --

A Then I can't answer your pathology question.

MR. GRANNIS: Dr. Mundt is here as an expert in epidemiology. And if he wishes to answer your question from an epidemiologic standpoint, I'd appreciate if you would give him the opportunity to do so.

MR. METZGER: I thought he gave me his answer to the prior question.

MR. GRANNIS: You cut him off, Raphael.

Q BY MR. METZGER: Well, I thought you had told me that among patients --

MR. GRANNIS: You still cut him off. I'd appreciate if you would let him finish his answers.

Q BY MR. METZGER: Go ahead.

A Thank you.

The epidemiological perspective, the thyroiditis is clearly a strong risk factor for certain NHL's of the thyroid.

Q Okay. Incidentally, have you produced any literature regarding that?

A Yes. I believe those articles that pertain to this are in the miscellaneous.

Q Okay. All right.

MR. GRANNIS: That is Exhibit 6.

THE WITNESS: That is correct.

Q BY MR. METZGER: Let's just take a quick look at that.

Tell me which of the articles on Exhibit 6 pertain to the epidemiology or the epidemiologic association between chronic lymphocytic thyroiditis and non-Hodgkin's lymphoma or B-cell lymphoma.

A I can't recall these just off the top of my head, but there are -- there are probably four or five among them. I believe Pedersen, Hyjek, Holm and others.

Q Okay. Now, you indicate in your opinions that you have evaluated the epidemiologic literature evaluating the association, if any, between exposure to benzene and other organic solvents, as well as working in printing and related occupations, and increased risk of NHL's including subtypes such as DLBCL and DLBTL; correct?

A More or less. I am not sure that you read the word "benzene," but --

Q Okay. In any event, you know where I am referring to in your statement?

A Yes, in my preamble, yes.

Q In the preamble, okay.

Is it correct that there are a number of epidemiologic studies which have shown statistically significantly increased risks or rates of NHL among benzene-exposed workers?

MR. GRANNIS: Vague. Overbroad. Incomplete

hypothetical. Argumentative.

THE WITNESS: There are epidemiological studies that among their reports include statistically significant measures of association in which the cohorts were attempting to associate occupational exposures, including benzene and NHL's as a class or as subsets, subtypes of NHL's.

The only cohort I recall that is widely viewed as limiting exposures to benzene is the pliofilm cohort in which NHL's are in fact evaluated.

Q BY MR. METZGER: Okay. And there were NHL's identified in the pliofilm cohort, were there not?

A There are NHL's identified in any cohort because it is not an uncommon disease. They were not identified in excess in the pliofilm cohort.

Q Isn't that because some of the NHL's were left out; they were excluded?

MR. GRANNIS: Argumentative.

THE WITNESS: I have no reason to believe that the reports as published and updated through at least 2002 have not had an opportunity to identify to show NHL's in excess. As of the record that I have, there is no excess.

Q BY MR. METZGER: So you are not aware that there was in fact an NHL worker in the pliofilm cohort

who committed suicide due to severe itching from his NHL which was not counted in the pliofilm cohort because the cause of death was suicide?

MR. GRANNIS: Argumentative.

THE WITNESS: I have seen this reported, but you have to keep in mind if you want to count it you would have to do the same thing in a reference populations and make sure that it is a level of inaccuracy that I think would be applied to across the board.

Q BY MR. METZGER: So you are aware of that situation?

A Yes.

Q I see.

And what is the incidence of mortality from suicide due to severe itching from non-Hodgkin's lymphoma in the general population?

MR. GRANNIS: Vague and ambiguous. Overbroad. Argumentative. Incomplete hypothetical.

THE WITNESS: It is not a research question that has ever been posed to me before so I haven't looked at it.

Q BY MR. METZGER: You don't know what the incidence is?

A I don't know that anyone knows what the

incidence is.

Q Is that incidence rate ascertainable from existing literature?

A I doubt it.

MR. GRANNIS: Vague and ambiguous. Overbroad. Calls for speculation. Incomplete hypothetical.

Q BY MR. METZGER: So how would you control for that since it can't be ascertained?

MR. GRANNIS: Vague and ambiguous. Argumentative. Misstates prior testimony.

THE WITNESS: Epidemiologically you have to evaluate whether or not that would lead to a bias. One could add one more NHL to that in a very conservative way and ignore those that might occur in a referent population to determine what the sensitivity of the result was to a single case.

Q BY MR. METZGER: Okay. Now, have you read the most recent meta-analysis regarding benzene and non-Hodgkin's lymphoma?

A There have been three. Let me clarify which you are referring to.

Q Let me ask you please identify for me those meta-analyses regarding benzene and non-Hodgkin's lymphoma that you are aware of that you have read, reviewed and considered for this case.

MR. GRANNIS: Well, that may be two different questions; what's he aware of, what has he read, reviewed and considered, you know. I'd prefer you ask him one question and then another.

Q BY MR. METZGER: Let's start with those that you are aware of.

A I am aware of Wong's, and I am blanking on the next, and the third is Steinmaus.

Q Okay.

A If I could take a quick look at Exhibit 5, I could provide it.

Q Okay.

A Thank you.

It is Lamm, the third author.

Q So you are familiar with the meta-analyses by Wong, Lamm and Steinmaus; is that correct?

A Yes.

Q Any others?

A Not that I consider or self-identify as meta-analysis.

Q I am just asking are you aware of any other meta-analyses regarding benzene and non-Hodgkin's lymphoma?

MR. GRANNIS: Overbroad. Vague.

THE WITNESS: I identify those as the

meta-analyses distinct from other reviews where results are --

Q BY MR. METZGER: I am not talking about reviews; I am talking about meta-analysis.

A Okay. Thank you.

I wanted to make sure we were talking about meta-analyses as either the authors describe it or as I would consider it.

Q So what I'm asking you is, setting aside reviews and any other type of study, are you aware of any meta-analysis regarding benzene and non-Hodgkin's lymphoma other than those published by Wong, Lamm and Steinmaus?

MR. GRANNIS: Vague and ambiguous. Overbroad.

THE WITNESS: I am aware of earlier ones which I did not look at closely and factor in.

Q BY MR. METZGER: Can you identify it?

A Not offhand.

Q Can you tell me the results?

A No. I didn't examine older materials. I favor newer materials.

Q Have you -- well, are you aware of any newer meta-analyses regarding benzene and non-Hodgkin's lymphoma than the three that you identified?

A No.

Q What reviews regarding benzene and non-Hodgkin's lymphoma have you read, reviewed and considered for this case that you rely on for your opinions in this case?

A My reliance is on the primary studies, so I am aware of and have read and reviewed not only the meta-analyses but several reviews on non-Hodgkin's lymphoma and on benzene and non-Hodgkin's lymphoma.

Q Which reviews regarding benzene and non-Hodgkin's lymphoma have you read, reviewed or considered for this case?

MR. GRANNIS: Vague.

THE WITNESS: The ones that I have are on the disk. I can't tell you off the top of my head.

Q BY MR. METZGER: Take a look at the listing, please.

A Unfortunately without the titles printed I can't reliably identify these, but I know that that Boffetta is a review, Alexander is a review, Morton. I guess there is two Mortons. One in 2008 comes to mind as a particularly relevant review of NHL.

I am afraid unless I look at the titles it is difficult.

Q Okay. I want to go back to your CV. You mentioned that you have been doing some studies with

this group in Germany, and I think you identified an article here by an author by the name of Straif or Straif?

A Yes. Straif is an IARC employee.

Q Is that Kurt Straif?

A Kurt Straif, yes. We have worked together for years.

Q Okay. Do you respect his work?

MR. GRANNIS: Vague. Overbroad.

THE WITNESS: I respect him as a colleague. And I would have to look at a particular piece of work because I think everyone is capable of producing something that is not great.

I wouldn't label him -- I have no reason to say that I disrespect him in any way. But with respect to his work as a scientist and as an objective evaluator, I would have to review, as I would a peer, submitted publication to one of the journals I review for for the quality of that work.

Q BY MR. METZGER: How many years have you worked with Kurt Straif?

A I worked with Kurt directly for probably five years surrounding the German rubber study, that constellation of studies.

Q And during that time did you form an opinion

regarding the scientific integrity?

MR. GRANNIS: Vague and overbroad.

THE WITNESS: Well, generally I respect Kurt and his scientific integrity. I would have to reserve the right to comment on a particular piece of work just not because he is a friend or colleague or any other category of person, but as a fellow scientist, we tend to review and critique each other's work.

Q BY MR. METZGER: Have you ever discussed with him the relationship between benzene and non-Hodgkin's lymphoma?

MR. GRANNIS: Vague and overbroad.

THE WITNESS: It is possible in the years we worked together in the German rubber cohorts that may have been discussed. I just don't have any specific recall of it.

Q BY MR. METZGER: Okay. Have you prepared any criticism of either the Steinmaus meta-analysis or -- well, let me leave the question at that.

Have you done so?

A I have not. I have not been asked. Again, this is --

MR. GRANNIS: By your question, you mean like a written critique?

MR. METZGER: Yes.

THE WITNESS: I am certainly aware of what he has done and I think it deserves some more in-depth evaluation. But in the time that I have had available to come up to speed on this case, it has not been a priority.

Again, I rely on the primary studies, some of which Steinmaus selects and cites, but that is not the universe. And the end of the day I think that there are serious questions raised by that paper that could be addressed, but it's not a priority scientifically for me to do that.

Q BY MR. METZGER: Have you done any statistical compilation of the studies regarding organic solvents and NHL?

A No.

Q Have you done any statistical compilation regarding the studies of benzene and NHL?

MR. GRANNIS: Vague. Overbroad.

THE WITNESS: Statistical compilation may not be a valid exercise so --

Q BY MR. METZGER: I am just asking if you did one or not.

A I just want to make sure that the reason I wouldn't have done something like that is why would be my question. Why would you statistically compile

results from a wide array of studies and exposures.

Q Have you ever done a meta-analysis regarding either benzene or organic solvents and NHL?

MR. GRANNIS: Vague. Overbroad.

THE WITNESS: No, I have not specifically done that.

Q BY MR. METZGER: Okay. Let's go back to your opinions.

In your first opinion you write that "Valid interpretation of epidemiological evidence must consider study strengths and weaknesses, most importantly the avoidance of bias, or systematic error stemming from study design and conduct, data availability, specificity of exposure, specificity of disease, and random error, among others."

Did I read that correctly?

A Yes.

Q Have you --

MR. GRANNIS: Except for the last sentence.

MR. METZGER: I will get to that.

MR. GRANNIS: Okay.

Q BY MR. METZGER: Well, I will read the last sentence for Mr. Grannis. "Failure to avoid or account for such biases can result in invalid results and interpretations."

That is the last sentence that you wrote in that paragraph; is that correct?

A And you read it correctly.

Q So here is my question: Have you written out, either for this case or to submit to any journal for publication, an analysis of the strength and weaknesses of the epidemiologic studies regarding benzene or organic solvents and NHL?

MR. GRANNIS: Argumentative. Vague and ambiguous.

THE WITNESS: I have not produced such a document.

Q BY MR. METZGER: Okay. Have you produced such a document regarding bias in those studies?

A No.

Q Or systematic error in those studies?

MR. GRANNIS: Same objections.

THE WITNESS: No, I have not produced written documents of the qualities of or lack of qualities of these various articles.

Q BY MR. METZGER: Or data availability?

MR. GRANNIS: Same objections.

THE WITNESS: Same answer.

Q BY MR. METZGER: Specificity of exposure?

MR. GRANNIS: Same objections.

THE WITNESS: That's right, I have not written a report on this topic covering these dimensions of my opinion.

Q BY MR. METZGER: Okay. Have you in any way compiled a list of the studies that you think suffer from such biases versus those that don't?

MR. GRANNIS: Same objections.

THE WITNESS: No. I think that it is an oversimplification. If I were to critically assess the individual studies, they would not fall into one or another.

It really requires a critical assessment of how those results might have come about and whether that is a valid representation of the study.

Q BY MR. METZGER: In your second opinion you write that "There is insufficient/inadequate evidence to validly support a conclusion that these chemicals cause NHL's, including diffuse large B-cell lymphoma."

What evidence are you looking to for you conclude that the evidence would be sufficient or adequate?

A Fair question. The method and process that I use is pretty similar to what is used by the epidemiology group at the IARC reviews where the better studies are identified based on their methodology,

typically case control, cohort studies. Not to say the others are discarded, but they certainly carry less weight.

And then of those that are on point, I would identify studies looking at specific exposures and -- for example, the diffuse B-cell lymphomas, there are a few studies that look specifically at subtype NHL.

And among those that have reasonable quality, that is large enough sample size, consideration of confounding, consideration for potential for selection bias, reporting bias; then look at among that subset how strong and how consistently is that association important.

Q Okay. Did you do that for this case?

MR. GRANNIS: Vague. Overbroad. Argumentative.

THE WITNESS: In some ways I certainly have.

Q BY MR. METZGER: Okay.

A Not to the extent of -- well, let's say enough of the review of these papers to note that they have not been sufficiently critiqued by Dr. Harrison to justify his conclusions.

Q Well, which are the pertinent studies that you identified for this case?

A For example --

Q No. I want a complete listing; not an example.

A Well, I told you three minutes ago that I didn't do that evaluation specifically for this case in a way that I could represent that these are the 12 best articles for this purpose.

But, for example, Rinsky, which I don't think we see in Steinmaus, Sorahan, large study NHL's in some of the most highly exposed workers in the U.K., not included.

So my criticism is of what has been done and that it fails to achieve a level adequate to draw the conclusions that Dr. Harrison has drawn.

Q Well, I am not asking about Dr. Harrison's conclusion; I am asking about your conclusion.

What I want to know is what quantum of evidence do you need for you to conclude that the association between benzene and NHL is causal, what is that level of sufficient and adequate evidence for you?

MR. GRANNIS: Compound. Vague and ambiguous. Overbroad.

Q BY MR. METZGER: Can you quantify it for me, please?

A I don't think it can be quantified. I did qualify it earlier by saying that you would need among this group, however defined, of better studies, strong

and consistent associations that are not otherwise explained by study bias or error.

Q How strong?

A I don't know that it needs to be specifically quantified. If you have 20 studies and 15 of them show positive associations ranging from, you know, 1. something to 34 or higher, you would clearly in that situation more readily embrace a conclusion, again, assuming that the individual studies aren't flawed.

You might be more willing to conclude epidemiologically that there is something going on than in the literature that we have at hand where the results range from appearing to be protective against NHL to positive studies showing a statistically significant association.

Q How consistent do the studies have to be?

A Again, I don't know that consistency is ever quantified. It is I think part of the practice of evaluating epidemiologic literature that one identifies enough consistent evidence and a lack of opposing evidence to lean toward a judgment of causation.

Q When you refer to studies showing a protective evidence against NHL, are you referring to studies that report statistically significant negative correlations between benzene and NHL?

A It is interesting wording because it seems that statistically significant negative associations are usually described that way, but statistically significant positive findings typically described as causal.

I think epidemiologically we view them as statistically significant positive or negative, and that the big picture is some objective understanding of their entirety.

Q I don't know that you answered my question, but probably because I didn't understand your answer.

Let me ask you this: From all of the studies that you have reviewed that are set forth on Exhibits 5 and 6, were there any studies that reported statistically significantly negative correlations between benzene exposure and NHL?

MR. GRANNIS: Vague and ambiguous. Overbroad. Argumentative.

THE WITNESS: I would expect so.

Q BY MR. METZGER: I am not asking what you expect.

Could you identify any studies?

A Not off the top of my head.

MR. GRANNIS: Same objection.

Q BY MR. METZGER: And during the course of your

review of the study on Exhibits 5 and 6, which you reviewed for this case, did you identify any statistically significantly negative studies with a correlation between organic solvent exposure and NHL?

MR. GRANNIS: Same objections.

THE WITNESS: I can't recall specifically.

Q BY MR. METZGER: Have you identified any studies which demonstrate that exposure to solvents or benzene produces a protective effect against the development of non-Hodgkin's lymphoma?

MR. GRANNIS: Same objections.

THE WITNESS: And by protective you mean a negative correlation. I am resistent to using the word "protective" as much as I am resistent to using the word "causal" for a positive study.

Q BY MR. METZGER: I only asked because you referred to a protective study that showed a protective effect against NHL.

Are there any?

MR. GRANNIS: Same objections.

THE WITNESS: Well, I don't know what your question is. Are you asking whether there are studies that find statistically significant deficits of NHL in exposed populations?

Q BY MR. METZGER: Populations exposed to benzene

in organic solvents.

A Yes, there certainly are.

Q What are they?

A They are in there.

Q Which are they?

A Well, we could go through it, but they are --

Q I am asking you to identify any.

MR. GRANNIS: This is not a memory test. If the witness would like to refer to a document or to his CD-ROM, let him do so.

Q BY MR. METZGER: Can you identify any by looking at the listing of the studies on Exhibits 5 or 6?

A Well, it is also not a meaningful exercise for me because I am not putting forward that any of these exposures are protective.

Q Okay. Fair enough.

A I am pointing out that the results are randomly distributed about the null; some positive, some negative, some significant, both in each direction.

Q What methodology did you employ in reaching your conclusion regarding general causation?

MR. GRANNIS: Vague and ambiguous. Overbroad.

THE WITNESS: I would say the methodology is described by the process that IARC uses, which is a

critical review and synthesis.

Q BY MR. METZGER: Is that based upon the Bradford Hill factors?

A Certainly Bradford Hill in the '60s brought occupational medicine or helped focus occupational medicine on applying a little bit more reasoning in drawing causal conclusions.

And I believe most epidemiologists are well aware of Bradford Hill's guidelines and incorporate them in their thinking.

Q Did you --

A But I think that what Bradford Hill doesn't go into adequately as would be, you know, embraced today is a fuller critical assessment of the findings rather than let's say a summation of the findings and applying arbitrarily these guidelines.

I certainly do embrace those as seminal developments as with the Surgeon General 64 parallel set of scientific considerations that help focus scientific evidence and epidemiologists on how to synthesize and conclude based on that evidence.

Q In reaching your conclusion for general causation in this case, did you evaluate the studies using the Bradford Hill factors?

MR. GRANNIS: Argumentative.

THE WITNESS: I am not sure that is an appropriate exercise. I think it is unusual for an epidemiologist to sit down and use something, a guideline like that.

On the other hand, the critical points that we do use in evaluating individual studies are compatible with those general principles.

But, for instance, to determine whether exposure preceded the disease is not a particularly -- although it is the most necessary, perhaps the only one that's necessary in determining causation, not usually the focus of any attention in a critical review or assessment.

Q BY MR. METZGER: I appreciate your statement. But I just want to know in reaching your conclusion in this case did you or did you not attempt to faithfully apply the Bradford Hill factors?

MR. GRANNIS: Excuse me. Vague. Ambiguous. Overbroad. Argumentative.

THE WITNESS: And I don't want to be argumentative because I know Bradford Hill and they are mistakenly referred to as criteria often are well respected, but that reduces what epidemiologists today do to fairly intuitive concepts.

That doesn't mean that they necessarily apply

directly to a study. They really were intended to apply to the occupational medical community who in its day was finding many, many associations and reporting them.

Bradford Hill was cautioning that you really need to think through before you draw these conclusions. So he says given an association, does it fit these things.

Q BY MR. METZGER: I understand.

My question is, did you or did you not apply it and consider the Bradford Hill factors in reaching your causal opinion in this case?

MR. GRANNIS: Same objections. And asked and answered.

THE WITNESS: I absolutely applied the principles embraced by those.

Q BY MR. METZGER: Okay.

A But I do not go through a checklist of those things, which is incompatible with their intended use.

Q When you say that you absolutely do that, did you do that in this case?

A With what?

Q For in assessing the studies between -- regarding benzene or organic solvent and NHL.

MR. GRANNIS: Vague. Overbroad.

THE WITNESS: Again, yes, absolutely.

Q BY MR. METZGER: Okay.

A But not in a mechanical way. I don't want to imply it is appropriate to take these nine guideposts, guide points and that epidemiological critical review can be reduced to ticking off nine boxes.

Q You did mention that the approach that you followed was that in which you believe IARC employs; is that correct?

A Yes, in the epidemiology section of IARC.

Q Okay. It is true, is it not, that IARC classifies chemicals as to their carcinogenicity?

A That is I believe the purpose of the monograph series and the associated meetings is to identify carcinogens.

It has not been limited to chemicals per say. It has included things like shift work and fire fighting.

Q And occupations like painting?

A And painting, which are not chemicals or exposures.

Q Right. Okay.

But it is also true, is it not, that IARC does not classify chemicals as lymphomagens?

MR. GRANNIS: Overbroad. Vague.

THE WITNESS: That is not true. Technically I

understand what you are getting at. IARC traditionally had identified chemicals as carcinogenic.

As of about 2006 they have required the committees to identify the sites that are supportive of that conclusion.

Of course that can't be exhaustively known. It is a function of how much and how -- what the quality of the epidemiology literature is on that particular relationship.

Q BY MR. METZGER: But even since 2006 IARC does not have a classification system for the classification of lymphomagins. True?

A Well, if you narrow it to that, nor for any other specific site. It is covered by their more recent procedures for identifying the sites for which the -- let's say Group I designation applies in their opinion.

Q Okay. In your second opinion, the last sentence, the one that Mr. Grannis wanted -- I am sorry.

The last sentence of your second opinion says, "Furthermore, there is substantially evidence detracting from this hypothesis," namely that benzene or organic solvents cause NHL.

What is that substantial evidence that you are referring to?

A It comes in various forms. Let's simplify it

and say that is two forms.

One is the large number of studies that don't find any association. I believe many of those resulted in the findings in Lamm and Wong's meta-analyses.

The other is if you look at the range of exposures; not just chemicals, but range of risk factors say for NHL there is hundreds of them.

And though you can tease benzene or solvent out of some of these studies, there is many, many other exposures that have produced excess risk estimates, including being a clergyman or involved in the transportation industry or working with meat or working on a farm.

So to isolate the benzene in chemicals from this kind of cacophony of noise from these studies, I think is not a balanced approach.

We really only have to look at say a state of the art review like Morton 2008 to see that, despite all of these findings across the studies, that these -- this very qualified group doesn't identify any of them as particularly compelling risk factors associated with NHL.

Q Are there any primary studies that you consider to provide substantial evidence detracting from the hypothesis that benzene or organic solvents causes NHL?

MR. GRANNIS: Vague. Overbroad. Argumentative.

THE WITNESS: I think you are asking for specific references.

Q BY MR. METZGER: Yes.

A I think that a look at the literature that I have provided you there are numerous studies that fail to show a positive association. And that those, though they cannot prove a lack of association, certainly detract from that hypothesis.

Q Can you identify those studies for me.

A I believe I did indirectly by citing the studies identified in the meta-analyses of Wong and Lamm.

Their arriving at a conclusion of no association is driven by studies, some positive, some negative, but on average showing no association.

Q Can you identify any other studies other than those in Wong and Lamm?

A I am not representing Wong and Lamm as those studies. I am representing that among their studies reviewed will be ample studies that in sum provide no evidence of increased risk in those populations.

Q Did any of those studies -- what you are referring to as the studies in the Lamm review which did

not report a positive association, did any of them have sufficient statistical power to detect a doubling of the risk at low concentrations, around one part per million?

MR. GRANNIS: Argumentative. Vague and ambiguous. Incomplete hypothetical.

THE WITNESS: I would think so.

Q BY MR. METZGER: Do you know so?

A I wasn't finished. I am sorry. If you want to --

MR. GRANNIS: Go ahead.

Q BY MR. METZGER: Are you speculating when you say "I would think so"?

MR. GRANNIS: That is another question. Let him finish the last question.

MR. METZGER: I thought that was an answer.

MR. GRANNIS: He just said he wasn't finished.

Q BY MR. METZGER: Give me your explanation and then we will go on.

A Sorry, I have lost track of the question now. Could we have a read back.

MR. GRANNIS: Thank you.

(Record read as follows:

"Q Did any of those studies -- what you are referring to as the studies in the Lamm review which did not report a

positive association, did any of them have sufficient statistical power to detect a doubling of the risk at low concentrations, around part per million?")

THE WITNESS: And I began to answer that I would think so, but not having done a power calculation can't sit here and say yes.

But, for example, Sorahan. Sorahan is one of the largest studies that both of those reviews I believe consider that would have found an increase as large as a doubling had there been one and there probably are others but...

Q BY MR. METZGER: Are you referring to the recent Sorahan study published around, what was it, 2005?

A Yes.

Q Well, that post dates both the Lamm and the Wong reviews, doesn't it?

A Sorahan 2002, it might. You are right so ...

Q Okay.

A But I believe it answers your question, a paper that has adequate power to detect a doubling.

Q Have you read any criticisms of the Sorahan study?

A I recall an exchange or a criticism that was appropriately addressed and dispensed with. I don't recall what the criticism was.

Q Do you recall who authored the criticism?

A No.

Q Do you recall who authored the explanation or the justification --

A No.

Q -- addressing the criticism?

A No, I don't recall.

Q Okay. Now, I didn't -- in looking through the lists of the literature on Exhibits 5 and 6, I didn't see any animal studies.

Were there any?

A I am sorry. I am an epidemiologist.

Q So you didn't consider any animal studies for your --

A Epidemiology --

MR. GRANNIS: Excuse me. Argumentative. Vague and ambiguous. Overbroad.

THE WITNESS: -- has the pesky root of -demos in it which pertains to people.

Q BY MR. METZGER: Well, my question though is did you consider any animal studies regarding benzene and lymphoma or organic solvent and lymphoma in reaching

your causal opinion in this case?

MR. GRANNIS: Compound. Vague and ambiguous. Overbroad. Argumentative.

THE WITNESS: And outside of my area of expertise.

Q BY MR. METZGER: So you did consider those; is that correct?

MR. GRANNIS: Same objection.

THE WITNESS: I am an epidemiologist.

Q BY MR. METZGER: I just want to know if you considered those, "Yes" or "No." I am not asking what you are.

MR. GRANNIS: You are interrupting him again. I believe he has given you his answer and explained the reason for it.

MR. METZGER: I didn't get a clear answer.

Q Have you considered any animal studies regarding benzene or solvent exposed animals and the development of non-Hodgkin's lymphoma in reaching your opinion as to whether solvents and benzene causes NHL?

MR. GRANNIS: Same objections.

THE WITNESS: My research and therefore my opinions are based on my evaluation of the epidemiological literature only.

Q BY MR. METZGER: So you did not consider any

animal studies; correct?

MR. GRANNIS: Same objections.

THE WITNESS: I did not review any animal tox studies.

Q BY MR. METZGER: Did you review any experimental studies regarding the ability of the benzene or organic solvents to cause hematotoxicity, lymphopoietic toxicity, altercations of immune function, did you consider any of those studies?

MR. GRANNIS: Vague and ambiguous. Overbroad. Argumentative.

THE WITNESS: In humans or in animals?

Q BY MR. METZGER: In either, in reaching your opinions in this case.

A No.

MR. GRANNIS: Same objections.

Q BY MR. METZGER: Did you consider any studies evaluating the clastogenic potential -- strike that.

Did you consider any studies evaluating clastogenicity of benzene and/or organic solvents in reaching your opinions in this case?

MR. GRANNIS: Vague and ambiguous. Overbroad. Argumentative.

THE WITNESS: Yeah. I think I made it clear that I reviewed the epidemiologic literature and I don't

think that the epidemiological studies address toxicology or pathology directly.

I'm certainly dependent on them for understanding what we are studying and how we might design a study, but I did not review that literature. It is outside of my area of expertise.

Q BY MR. METZGER: Okay. Do you believe that it is appropriate to make a causal assessment without considering animal studies and experimental studies? Do you?

MR. GRANNIS: Argumentative. Vague and ambiguous. Overbroad. Incomplete hypothetical.

THE WITNESS: It also depends on what is available. Unfortunately, much research that we would like to have on humans, the relevant species, in actual doses that are encountered in whatever workplace settings, but we don't.

So to some extent we have to factor in evidence from other sciences to supplement what is seen epidemiologically.

Q BY MR. METZGER: My question is, do you consider it to be a valid scientific methodology not to consider animal studies and other experimental studies in reaching a determination on the issue of general causation?

MR. GRANNIS: Vague and ambiguous. Overbroad. Argumentative. Incomplete hypothetical.

THE WITNESS: I think that if one is conducting this review epidemiologically, as the epidemiology section would at IARC, they come to a conclusion despite what others are discussing in the other rooms on animal studies or on mechanism.

So they do come to a conclusion as to whether the evidence epidemiologically is sufficient to support a causal determination.

So the methodology --

Q BY MR. METZGER: So you consider it a valid --

A And I am not sure if you are referring to it in any setting, but certainly an epidemiological evaluation can be done exclusively of the evaluation of these other. Ultimately I think they combine.

Q BY MR. METZGER: When you say they combine, do you mean that in reaching a causal determination it is both necessary and appropriate to consider all of the available scientific evidence that bears on the question, not just the epidemiology but also toxicology and experimental studies?

MR. GRANNIS: Compound. Vague and ambiguous. Argumentative. Overbroad. Incomplete hypothetical.

THE WITNESS: That is a different question. I

do believe that to make a causal judgment we want to factor in all available evidence from these other fields.

I think you had worded it quite differently before so I had a hard time answering it.

Q BY MR. METZGER: And in fact when IARC makes its determinations, IARC reviews and assesses the strength of the animal evidence and also the other experimental studies, including DNA studies and other types of studies. True?

MR. GRANNIS: Vague and ambiguous. Overbroad.

THE WITNESS: Generally true, and as available. For instance, for painting there were no animal studies and I presume there are no animals that are painting.

Q BY MR. METZGER: Okay. Are all of the opinions that you have formed for this case set forth in Exhibit 7?

A Certainly these are my central opinions. There are probably variations on these that supplement these opinions.

For example, to the extent that evidence put forward by let's say Dr. Harrison relies on epidemiological studies, I would expect to critique, as we discussed earlier, on these criteria, those studies that he relies upon.

Q Which studies?

A I am not -- I can't say that he has identified specifically a set of studies in which he relies.

Q Did you read the 200 odd page declaration that he prepared regarding benzene/organic solvents and non-Hodgkin's lymphoma?

A I did.

Q Okay. And there were a lot of studies identified in that, were there not?

A There is a huge number of studies identified --

Q Which of those studies do you have --

A -- some of which I expect he will specifically identify as key in relying upon. I believe there was one, Hayes. I expect that if he advances his opinions based on Hayes, that I would critique Hayes because I don't think he has.

Q All right. What are your critiques of the Hayes study?

MR. GRANNIS: Which Hayes study?

MR. METZGER: The one that he is referring to.

MR. GRANNIS: Well, okay. Vague and ambiguous. Overbroad. Incomplete hypothetical. Argumentative. He did not say "the Hayes study."

The witness did not say "the Hayes study." The witness said, "Hayes."

Q BY MR. METZGER: I assume that you are referring to the 1997 study by Hayes published in JNCI; is that correct, doctor?

MR. GRANNIS: That's not what Dr. Harrison limited himself to.

THE WITNESS: Well, in fact that is one of several from the group that includes Yin. I think the same results were published many times.

Q BY MR. METZGER: Actually the results regarding lymphoma were published in the Hayes 1997; correct, not in the other --

A I don't think that is accurate, but we could check.

Q What are your criticisms of the Hayes 1997 study?

A Well, for one, with respect to NHL there is certain question regarding the actual diagnosis of NHL.

Q Really?

A In the article --

MR. GRANNIS: Excuse me, counsel.

Q BY MR. METZGER: Are you serious?

MR. GRANNIS: Excuse me, counsel. The witness has not finished his answer. He is entitled to answer your question.

Q BY MR. METZGER: I am sorry. I do apologize for interrupting. I was just flabbergasted by the first statement.

MR. GRANNIS: Okay. Flabbergasted --

Q BY MR. METZGER: Finish your answer and we will go ahead and talk about that.

MR. GRANNIS: One thing at a time, exactly.

Go ahead.

THE WITNESS: For example, you will read in many of the NCI publications that there were panels of reviewers verifying diagnosis and that they looked at pathological specimens for these cases.

Do you know how many they had for NHL? Four. So three of which were confirmed, two of which were follicular, one of which was diffuse B. The rest we don't know.

I raise the question. I am not saying that I know that those are undiagnosed, but I think there is that sense that the quality of the diagnosis is better than it actually is if you read deeply into the Hayes family of publications.

Q BY MR. METZGER: And where do you -- in which Hayes study do you find what you just stated, that there were four that were pathologically reviewed?

A I believe it is Travis. May I refer to Exhibit

5?

MR. GRANNIS: 5.

THE WITNESS: 5 or 6.

Q BY MR. METZGER: I know the Travis study. That is fine.

MR. GRANNIS: But if he wants to refer to it --

Q BY MR. METZGER: You could refer to whatever you want. Look at whatever you want. I know what you are referring to.

MR. GRANNIS: This is 5 here or there?

MR. METZGER: I think this is my set.

MR. GRANNIS: Well, I see.

All right. Go ahead.

THE WITNESS: Travis is there, Travis '94.

Q BY MR. METZGER: All right. In fact, regarding the pathology review, the pathology specimens that were the subject of the Hayes study were reviewed by pathologists at the Mayo Clinic, were they not?

MR. GRANNIS: Vague. Overbroad. Ambiguous.

THE WITNESS: I understand that all four of them.

Q BY MR. METZGER: And do you consider -- isn't that a very positive feature of the study, that the specimens were in fact reviewed by pathologists from the Mayo Clinic?

MR. GRANNIS: Argumentative. Vague and ambiguous. Overbroad.

THE WITNESS: I think the intent was good. The reality of any of these studies is not the intent, however. It is what is in the data.

Q BY MR. METZGER: Let's talk about --

A Noteworthy, since you point out that the Mayo Clinic diagnosed these cases, that the one that -- of the four that is questionably NHL has always been included in the analyses as if it were confirmed, as were the other, what were there, 12 or maybe 20 total. I don't recall the number.

But the rest that were not confirmed are all included. And that harkens to your comment on the Rinsky, that there are always cases that might have been in and out.

You will find that in the Hayes study that you don't have to remove one or two or more or add one or two more to the referent group that whole statistically significant finding comes apart.

Q Can you identify for me any other epidemiology study in which the investigators went to the trouble of attempting to confirm pathological diagnosis on the reports by sending the specimens themselves to the Mayo Clinic for pathological analysis?

MR. GRANNIS: Argumentative. Vague and ambiguous. Overbroad.

THE WITNESS: I think that the pathological confirmation is much more prevalent in the U.S. and that registry based studies and just the degree of accurate diagnosis is going to be greater in the U.S.

I think there were fundamental concerns about the quality of the diagnoses and the data in China and therefore this was implemented to try to address that.

I think -- I am not questioning their intent. Again, the reality was that they could not obtain path verification on the vast majority of the cases.

Q BY MR. METZGER: And the epidemiologic studies that you have conducted, have you ever sent or arranged for the pathology specimens to be sent to the Mayo Clinic for pathological confirmation of the diagnosis?

MR. GRANNIS: Argumentative. Vague and ambiguous. Overbroad.

THE WITNESS: I say analogously in my German silica worker study, we sent every single x-ray to the German B-readers to be re-read so that we would have a high quality of diagnosis before we tried to published any paper on the risks -- quantitative risks of silicosis and myelo Class I,I x-ray interpretation.

Q BY MR. METZGER: In any of the epidemiologic

studies that you have done, did you ever send pathology specimens of patients diagnosed with cancer to the Mayo Clinic to have the Mayo Clinic's expert pathologists confirm the diagnosis?

MR. GRANNIS: Argumentative. Vague and ambiguous. Overbroad.

THE WITNESS: No, I have not. I have not had the opportunity to do comparable research in a place where I had seriously questions about a diagnostic capability locally.

Q BY MR. METZGER: You mentioned that there were some variation on a theme for these opinions.

What other opinions do you have for this case that are not set forth on Exhibit 7?

MR. GRANNIS: Mischaracterizes his prior testimony.

THE WITNESS: These in fact are the main themes and anything that I would testify to as far as I know right now at this moment, given other, you know, usual caveats that things may change or another paper may be published that somehow changes things, my opinions will largely be based on these.

They could be -- this is only a few paragraphs. I didn't write a 300-page report, so obviously these could be expanded in detail, but they would be

encompassed under these.

Q BY MR. METZGER: Are there any opinions that you have formed in this case that are not encompassed in the opinions set forth in Exhibit 7?

A No, sir. I did my best to write these as carefully as I could to cover those bases.

Q Have you completed your work in this case?

A I don't think so.

Q What else do you need to do that you haven't done?

A I think when it becomes clearer what specifically Dr. Harrison might rely upon -- I have described this before -- I will take a closer, more critical look at it to see whether his conclusions can be substantiated when the quality of the study and the, you know, evaluation of these -- these are things that he did not consider that I could tell for any one of the hundreds of papers that he identified.

I would --

MR. GRANNIS: "These" being the issues addressed in your summary of opinions?

THE WITNESS: Paragraph 1 of my opinions, I would expect to apply that to each and every paper that he puts forward.

Q BY MR. METZGER: I'd like to represent to you

that the matters on which Dr. Harrison is relying for his assessment of the general causation issue are those papers identified in his 200 odd page declaration, plus the additional papers which supplement that that were published after he prepared that declaration.

So with that understanding, are there any opinions that you have for this case that are not set forth in Exhibit 7?

A No.

Q Okay. And have you -- is there any particular work that you have been asked to perform for this case that you have not yet done?

A No. I have not been asked to do anything more than what I have described here.

Q Were there any materials or publications that you wanted to read for this case but which were not available to you so you could not consider them in reaching your opinions?

A That is a very good question. I appreciate that. I believe that I to date have been able to find and consider any of those materials that arose in the course of my review.

Q Okay. Is your opinion in this case limited to opinions on the subject of general causation or are you also opining regarding specific causation?

A Well, that construct is -- translates into epidemiologically causation determination because epidemiology we tend to focus on determining general causation.

Q Right.

A Where general causation is substantiated and a conclusion can reasonably be determined, there are epidemiological approaches to addressing specific causation.

Q Have you done that in this case or have you not because you do not believe that general causation is satisfied?

A Well, I am confident that general causation is not met with respect to the B -- diffuse-B, whether it is in the thyroid or not, that has not been determined.

There is additionally evidence that risk factors that Mr. Reese has evidence of do cause that disease or are strongly associated with it in epidemiologic terms.

Q Well, I guess my question is, are you going to be testifying at trial that Mr. Reese's exposure to benzene was insufficient to cause hematologic disease?

A I am not aware that that is the question in this case. I think that Mr. Reese has a specific disease and I think that the epidemiological evidence is

insufficient to conclude that those exposures caused that disease.

So I will specifically address that causation at that level.

Q General causation but not --

A I will apply the general causation to the specific facts in this case that because -- and I think it is captured here.

Because it does not support a general causation conclusion, the claim that these alleged exposures actually caused or substantially contributed to his diffuse large cell B -- B-cell thyroid lymphoma cannot be supported. That is that specific causal conclusion.

Q I understand what you are saying, but it's not a specific causal assessment in the sense that you are basing it on a specific dose assessment or a specific latency or anything of that sort which usually goes into specific causation because you don't even believe that there is general causation; right?

MR. GRANNIS: Argumentative. Vague and ambiguous. Overbroad.

THE WITNESS: It is my turn to gasp. That is illogical. Of course I am talking about specific causation.

Q BY MR. METZGER: Have you -- all right. It

doesn't matter.

We are done. I will get you a check.

I will propose that the court reporter can forward the original transcript to Mr. Grannis; that he will make it available to you; you can read and sign it under penalty of perjury so you don't have to have it notarized.

I would ask you to make any corrections or changes that you have on the pages where the testimony occurs and then to list them on the correction sheet at the end of it so we may know where they are.

If you would then forward the original transcript -- you could have 30 days to do this. If you would then forward the original transcript to Mr. Grannis, he will notify all counsel of changes, if any; and then forward the original transcript on to me; we will preserve it and lodge it with the court in advance of trial; if the original is lost or not signed, a certified copy may be used with full force and effect.

So stipulated?

MR. GRANNIS: I would just simply suggest cutting out the middleman on one of those transmittals and having the reporter transmit the original directly to Dr. Mundt in Amherst with a pre-addressed pre-stamped return envelope to my office so that I accomplish the

things that you have suggested in your proposed stip.

MR. METZGER: That is fine.

So stipulated?

ALL DEFENSE COUNSEL: So stipulated.

(ENDING TIME: 12:10 P.M.)

STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

I, the undersigned, declare under penalty of perjury that I have read the foregoing transcript, and I have made any corrections, additions or deletions that was desirous of making; that the foregoing is a true and correct transcript of my testimony contained therein.

EXECUTED this _____ day of _____, 20___, at _____, _____
(City) (State)

_____
KENNETH A. MUNDT, Ph.D.

REPORTER'S CERTIFICATION

I, SHERI A. PLY, CSR No. 6507, a Certified Shorthand Reporter in and for the State of California do hereby certify:

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was placed under oath by me;

That the testimony of the witness and all objections made at the time of the examination were recorded stenographically by me and were thereafter transcribed;

That the foregoing transcript is a true and correct record of the testimony so taken.

I further certify that I am not a relative or employee of any attorney or of any of the parties, nor financially interested in the action.

I declare under the penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated this 21st day of October, 2009.

_____

SHERI A. PLY, CSR No. 6507