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                       IN THE CIRCUIT COURT
                      THIRD JUDICIAL CIRCUIT
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                    MADISON COUNTY, ILLINOIS
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   BRIAN KING, Individually and as )
   Special Administrator for the
                                         NO. 13-L-31
                                      )
   Estate of TOM KING, Deceased,
5
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             Plaintiff,
   VS.
7
   A. W. CHESTERTON COMPANY,
   et al.,
8
9
             Defendants.
10
                            JURY TRIAL
11
                         FEBRUARY 20, 2014
                            VOLUME 4b
12
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         REPORT OF PROCEEDINGS of the Jury Trial before
   ASSOCIATE CIRCUIT JUDGE STEPHEN STOBBS on February 20th,
14
15
   2014.
16
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   APPEARANCES:
   SHRADER & ASSOCIATES, by
18
   Ms. Allyson Romani & Mr. Frank Wathen,
19
   Attorneys at Law,
     for the Plaintiff.
20
   K & L GATES, by
21
   Mr. James A. Lowery,
   and
22
   HEPLERBROOM, by
   Ms. Rebecca Nickelson,
23
   Attorneys at Law,
      for the Defendant Crane Company.
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Christy Streicher, CSR
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                    CSR#84-002682
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                    Official Court Reporter
                    509 Ramey Street
3
                    Edwardsville, Illinois 62025
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6
                          I N D E X
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   WITNESSES: Direct Cross Redirect Recross
                                                 109
8
   Dr. Barry Castleman
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              (Court convened pursuant to lunch recess.)
              (The following proceedings were had in
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              presence of the jury.)
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         THE COURT: We will get started with the cross
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   examination.
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         MR. LOWERY: With the Court's permission, and
7
   allowing Dr. Castleman to sit down.
                            CROSS EXAMINATION
8
                            BY MR. LOWERY:
9
10
         Q.
             Good afternoon, Dr. Castleman.
11
         Α.
              Good afternoon.
              Is it all right if I call you Dr. Castleman?
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         Q.
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   You do have a Ph.D., correct? I want to make sure I am
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   being respectful to you, sir.
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              We have had the pleasure of meeting before,
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   correct, sir?
17
         Α.
             Yes.
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             Good to see you again. Doctor, I would like
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   to talk to you first about -- explore a little bit more
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   about your background if I could. When you came out of
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   college your first job think I was in 1968 for Hercules
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   Chemical, is that correct?
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              Right.
         Α.
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              And you were asked to leave that job a little
         Q.
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bit early, correct, sir?

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- Α. Yes, I was raising concerns about the way they were dumping hazardous waste.
- So you were asked to leave that job a little 4 Q. 5 bit early?
 - A couple days before my scheduled departure.
 - Q. And then from '72 to '73 you worked for the Baltimore County Health Department, correct?
- 9 Α. Right.
- 10 And at one point you were fired from that job 11 but later rehired, correct?
- Right. For naming the names of companies using 12 Α. asbestos filtering gin and beer in Baltimore County at a 13 14 Senate hearing.
 - Gin and beer? Ο.
- Α. And beer, yeah. They were using asbestos in the brewery and in the distillery, and we demonstrated 18 the contamination of the gin through microscopic 19 analysis.
- 2.0 Q. You don't have any evidence of a certain 2.1 brewer in this part of the world doing that kind of 22 thing?
- I don't know, but Cowling had breweries around 23 24 the country and they told me that they stopped using

- asbestos in all their breweries after --
- Q. Hopefully Anheuser Busch doesn't. And in 1974
- 3 and '75 you worked for the Maryland Public Interest
- 4 Research Group, correct, sir?
 - A. Right.
 - Q. And you were fired from that job too, correct?
- 7 A. Right.
- Q. That's when you became an independent
- 9 consultant?

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- 10 A. That's right.
- 11 Q. In 1976 asbestos plaintiffs' lawyers, like
- 12 these fine gentlemen and ladies here, began hiring you
- 13 as a researcher, correct?
- 14 A. Right, started out as a research job.
- 15 Q. Okay. And then asbestos plaintiffs' firm
- 16 decided they want you to start testifying in Court,
- 17 | correct?
- 18 A. In 1978 I was asked to do that, and in 1979 I
- 19 was first deposed and testified in a trial like this.
- 20 Q. Since '78 or '79 you have been testifying
- 21 regularly for law firms representing asbestos plaintiffs
- 22 | in this litigation, correct?
- A. On average about one trial a month, yes, since
- 24 | then.

- Q. You are not an industrial hygienist, correct, sir?
- A. No, I have training in industrial ventilation,
 but I am not a certified industrial hygienist.
 - Q. I think we established that we call you Doctor out of respect; it is because you have a Ph.D., but it is not because you are a medical doctor, correct?
 - A. I am not a medical doctor.
 - Q. You do not testify in asbestos cases as an epidemiologist, fair statement?
- 11 A. I am not a specialist in epidemiology. That is
 12 also part of my training.
- Q. You don't testify about the medical cause of a disease or the diagnosis of the Plaintiff, correct?
- 15 A. Correct.

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- Q. And typically in asbestos cases, Doctor, you testify regarding the historical knowledge of asbestos hazards, is that fair?
 - A. Right.
- Q. You are not an expert on Navy or military specifications, fair?
- 22 A. Correct.
- Q. You are not an expert on gaskets and packing, correct?

- A. Not on the technology, no.
 - Q. You are not an expert on valves, true?
 - A. Same thing, yes, as for gaskets and packing.
 - Q. Since you began, Doctor, testifying in asbestos litigation in 1979 you have testified -- well, have you testified as much as two trials per month on average in certain years?
- A. Yes, the most was I think 30 trials in one year.
- Q. Okay. And in asbestos litigation matters
 would it be fair your work is almost exclusively for
 firms representing plaintiffs in asbestos litigation?
 - A. Yes.

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- Q. For instance, in 2011 you testified in over 20 trials, correct?
- 16 A. I think so.
 - Q. Okay. Gave over 50 depositions, correct?
- A. Yes, the defendants persist in taking my deposition almost at a weekly rate.
 - Q. Well, we have a right to come in and ask for your deposition and get your opinion in a case, right?
 - A. Oh, sure, but with some of these companies there have been no new documents or opinions since my book was published ten years ago, and they are still

deposing me every month.

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- Q. They must enjoy your company.
- A. It is called billing.
- Q. In the 30 years of testifying you have never actually testified in a deposition or trial on behalf of a traditional asbestos defendant such as a product manufacturer, a product supplier or a premise?
- A. Right. The only defendant I testified on behalf of was the United States Government.
- Q. In 2008 you submitted some comments to a panel of a U.S. Environmental Protection Agency, correct?
- 12 A. Yes.
 - Q. And basically in that written statement you summarized what you intended to say orally before the panel, is that correct?
- 16 A. Yes.
- Q. And I believe you said that -- in that
 statement you said that you testify regularly as an
 expert witness on public health and corporate history of
 asbestos, the subject of your doctoral thesis, usually
 at the request of plaintiffs in personal injury cases,
 is that correct?
- 23 A. Right.
- Q. So your letter to the EPA said you testify at

- the request of plaintiffs should say you always testify at the request of plaintiffs, correct?
- A. I said usually at the request of plaintiffs because it is usually at the request of plaintiffs. I have been a defense witness in one proceeding. I have agreed to be a defense witness in other proceedings, but they never called me.
- Q. And while you give expert testimony on behalf
 of plaintiffs in asbestos litigation with some
 frequency, you have never testified as an expert in any
 other type of case, correct?
- 12 A. Correct.

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- Q. Now, you have -- we talked a little bit about what you are getting paid for your time here today. Do you recall that during Direct?
- 16 A. Yes.
 - Q. Would it be fair to say that 90 to 95 percent of your income has come as a result of your work in asbestos litigation?
- 20 A. Probably most of the work I do pays little to 21 nothing.
- Q. And, for instance, in 2007 you earned about \$340,000 from your work testifying for plaintiffs' firms in asbestos litigation, correct?

A. I think so.

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- Q. And in 2008 it was \$315,000?
- A. I think so. I don't remember these numbers perfectly, but they sound like they are in the right range.
 - Q. 2009 about 387, fair statement?
 - A. I think so.
- Q. Is it fair to say that over the years you have brought in or grossed over four million dollars testifying for plaintiffs in asbestos litigation over the years?
 - A. I have never tried to count it up, but the figures are much greater for the past five years or so than they were go back 10 or 15 years before that.
 - Q. We talked about -- Mr. Wathen asked you a question about your rate. I think you said it is still \$400 an hour, correct, sir?
- 18 A. Yes.
 - Q. In addition have you not in the past charged plaintiffs' firms a \$1,000 fee just for the right to list your name as an expert in the case?
- A. The first time I encounter plaintiffs' law firm
 I charge them \$1,000 to list me as an expert witness. If
 they have a hundred plaintiffs they can list me in all

- their cases and charge their clients \$10 apiece. It is a one time charge, and they can go on listing me after that without.
 - Q. Well, to be fair you have charged somewhere between 30 and 50 different law firms that \$1,000 one time charge, correct?
 - A. Well, it wasn't always a thousand but probably 30 to 50 firms over the many years I have been doing this have paid retainers, yeah.
 - Q. Doctor, in all the years that you have testified, in the hundreds of matters you have been involved with you have never testified, have you, sir, that a company that sold an asbestos-containing product acted in a reasonable or prudent manner with respect to asbestos related health risk, correct?
 - A. Correct.

- Q. Now, you would agree that over the decades asbestos was used in literally thousands of products, correct?
 - A. Right.
- Q. You are familiar with a gentleman -- I think
 we talked about it on Direct named Irving Selikoff. The
 jury has heard about Dr. Selikoff?
- 24 A. Yes.

- Q. And Dr. Selikoff, just to refresh everyone's recollection, was associated with the Mt. Sinai School of Medicine in New York City, correct?
- A. Right.

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- Q. And he was -- I have heard various ways to describe him. He was certainly a pioneer in the development and research into asbestos-related health disease?
- A. Yes.
 - Q. One of the things, Doctor, is it not true that one of the things Dr. Selikoff did in his research was to assess the health of a large group of asbestos insulation workers in the greater New York area?
- A. Right.
- Q. And in fact you mentioned you had some association with Dr. Selikoff, correct?
- 17 A. Right.
- 18 Q. This was in the early '70s, correct?
- 19 A. Well, from then until he died in 1992.
- Q. 1992, okay. Did you ever, Doctor, ask Dr.
- 21 | Selikoff to conceal or not disclose any of his research?
- 22 A. Not that I recall.
- 23 Q. Okay.
- 24 MR. LOWERY: May I approach, your Honor?

THE COURT: You may.

Q. (Mr. Lowery) Doctor, I am going to hand you a Memorandum. I can have it marked in a minute.

Do you recognize this Memorandum, sir?

- A. I recognize it as something I was shown on cross examination in 2010 in a trial in Illinois, elsewhere in Illinois.
 - Q. Okay.

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- A. And I don't recognize it other than that.
- Q. All right. And you do recognize that it is entitled Memorandum from Dr. Barry Castleman to Irving Selikoff dated November 5th, 1979, correct?
- A. That's what it says.
 - Q. And the Memorandum, does it not state, sir, that you asked Dr. Selikoff to withhold information with respect to insulation workers and their likelihood of contracting cancer from their work?
- A. The Memorandum indicates that -- this has no signature, has no letterhead which most of my letters to Selikoff did. They were written: Dear Irving, and signed Barry.

But aside from that, this document in the first two paragraphs conveys concerns of a lawyer named Ron Motley. In its text it says that Motley is concerned

about the disclosure of Selikoff's medical questionnaires to the people who was doing these studies on and that -- basically that it expresses concern that these people might because of comments they may have made in answering the questionnaire jeopardize their rights to recover any kind of compensation in Court.

And the document goes on with a third paragraph that says something to the effect that if the people at Selikoff's studies are harmed as a result of his doing the studies and turning over documents that it might make it difficult for him to do epidemiological studies on other workers and other hazards in this country and get cooperation of workers and unions.

 $$\operatorname{But}$ I have no memory of writing this, and I don't recognize the document.

- Q. And just to be clear Ron Motley was a -- he is passed. Sadly he is passed on now. Ron Motley was a very well known plaintiffs' lawyer in representing plaintiffs in asbestos litigation for decades, correct, sir?
- 21 A. Yes.

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- Q. And in fact you have done some work with Mr.

 Motley and his firm over the years?
- A. Well, Motley never asked me to testify as a

- witness in cases he was involved in, but I have done work for his firm over the years.
 - Q. Okay. Thank you, sir.
 - Let's press on if we can. You have written -and I think we discussed this in some detail, but I
 would like to explore it a little further. You have
 written this book -- I have my own copy -- Asbestos
 Medical and Legal Aspects, Fifth Edition, correct, sir?
- 9 A. Right.

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- Q. And the first thing I can take from that is that there were four other previous editions, correct?
- 12 A. Correct.
- Q. And this book -- well, let me ask you this question, sir. Any plans as of February, 2014 to author a Sixth Edition?
- 16 A. No.
- Q. This book, as I understand, sir, grew out of your doctoral thesis, is that correct?
- 19 A. The First Edition was largely identical to my 20 doctoral thesis.
- 21 Q. And that was in 1984?
- 22 A. Yes.
- Q. You would agree that before, during and after the time you were writing the thesis which later became

Volume I or First Edition, I should say, of your

Asbestos Medical and Legal Aspects you were working and
testifying for plaintiffs' attorneys in asbestos
litigation, correct?

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- A. Sure. The jury has heard that I have been involved since 1976 as a researcher and since 1979 as a witness.
- Q. And in fact one of the most valuable sources for your research has been materials provided to you by plaintiffs' lawyers in asbestos litigation, true?
- A. Particularly the corporate documents, the internal corporate documents and trade association minutes which are not available in any public place.

They only emerged and found the light of day because they were produced in litigation, and I have asked defense counsel as well in countless depositions to enlighten me if there are additional documents involving their clients that they would like to share with me so that I would have a full appreciation of what their companies did and knew about the hazards of asbestos.

Q. And we will spend some more time on some of the documents in just a minute.

At the time you were working on your thesis, you billed particular research products to particular

plaintiffs' attorneys who requested that research be done, correct?

A. Yes.

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- Q. And in fact I believe you -- it is your opinion that you stated that you paid for a lot of research which turned up the documentation cited in your doctoral thesis, correct?
- A. Certainly with respect to some of the published literature and also with respect to some of the industry associations whose documents were opened up for examination through litigation. I would -- I went to the Industrial Hygiene Foundation, for example, and saw their documents back in 1980 or so.
 - Q. Okay. Plaintiffs' lawyers in asbestos
 litigation encouraged you in fact to go back to school
 and get your Ph.D. so courts would be more likely to
 accept you as an expert witness?
- A. Well, when I told the plaintiffs' lawyers I was going back to school they certainly encouraged it. They said, sure, good for you.
- Q. And actually another way that you make some income from this work is to sell files of corporate related documents to those that want to obtain them and pay you for that service, correct?

A. No.

2.0

- Q. Who does that?
- A. The files are sold by someone I know named Albert Donnay. He came to me about ten or 12 years ago and said, look, why don't you scan some of these files. You are constantly being asked to produce boxes of documents for depositions. I can scan some of these files, make them available a lot more easily.

And so he started doing this, and so now Albert is able to partly support himself by selling files to plaintiffs' and defense lawyers and relieve me of the burden of having to deal with having my documents photocopied and stapled and destroyed in the process of discovery.

- Q. I just want to be clear --
- A. I don't make any money off of --
 - Q. That was going to be my follow-up question.

 You are telling this jury that you don't make any money
 from that service that Mr. Donnay provides?
 - A. Right, I do not.
- Q. Now, let me switch gears a little bit. In
 this particular case you haven't looked at any of the
 documents related specifically to this matter, correct,
 of Mr. King?

- A. No, I am not testifying about anything that is specific to Mr. King's case. I testify about the defendant, not about the plaintiff.
- Q. Okay. You don't have any -- you haven't been asked by the Shrader law firm, for instance, to do any specific investigation related to this case, is that fair?
- 8 A. Right.

- Q. Doctor, let's take some time if we can because I would like to explore in little bit greater detail some of the testimony you gave earlier about the development of knowledge of asbestos-related use and illnesses caused by asbestos, is that okay?
 - A. Sure.
- Q. All right. You would agree with me that no one makes asbestos, correct? It is naturally occurring?
- A. Right.
- Q. And in fact asbestos has been used for centuries in various applications, correct?
- A. Well, it is more of a novelty and rarity up
 until about the 1870's, and then more modern industrial
 uses of asbestos started in earnest.
 - Q. Well, that's a good point because when the industrial revolution came in about that timeframe in

the late 19th Century, the use of asbestos rose along with the industrial revolution, correct?

A. Right.

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- Q. Because of asbestos's physical and chemical properties, asbestos was deemed to be a very useful material in the creation of insulation products, true?
 - A. Yes.
- Q. You mentioned on Direct -- well, you know what, I can skip that. We will save some time. Let's skip right to the -- okay, actually there is one thing I want to ask you.

You will agree with me, Doctor, that it is universally accepted in the medical community that the higher the dose that an individual -- of asbestos that an individual inhales, the greater risk that individual would have of contracting disease?

- A. That's right, I mean up to a point. The people who were wiped out with asbestosis in their early 30's in the early days of the industrial industry didn't live long enough to develop occupational cancers, but generally speaking the greater the dose the greater the risk of developing certainly cancers.
- Q. And that's a widely held concept of industrial hygiene in toxicology that in any substance that could

- be potentially hazardous, the greater the dose, the greater the risk, correct?
 - A. Yes.

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- Q. Let's skip to 1930 if we can. And let me talk to you a little bit about the -- Merewether. Spelling is not my strong suit.
 - There was another researcher that did this work with Merewether named Price, correct?
 - A. Right.
 - Q. All right. And that's the paper you talked about on Direct Examination, correct, sir?
- 12 A. Yes.
 - Q. In 1930 the authors of this report, Merewether and Price, they published a paper where they found there was a high incidence of asbestosis amongst workers who were working in asbestos factories, correct, sir?
- A. That's what their report was about was workers in the factories.
- Q. Now, to be clear the individuals in the
 Merewether study they weren't end users of products,
 were they? They were people working with raw asbestos
 to make products?
- A. Well, they were working with asbestos and whatever materials it was combined with to make other

- 1 products in the factory setting. 2 Well, they started with raw asbestos, correct? Ο. Well, some of the people in the plant opened up 3 Α. sacks of asbestos and dumped them into mixing vessels. 4 5 Other people further downstream weren't exposed to what 6 you call raw asbestos. 7 Q. Got it. Merewether, in this paper, he 8 advocated controlling risks of asbestos through what 9 they call dust suppression measures, correct? 10 Α. Right. 11 He believed -- Merewether did -- that the Q. 12 hazards of asbestos could be limited with the 13 implementation of these dust control measures, true? 14 Α. Yes. And those included -- see if you agree with 15 Ο. 16 this -- wet -- wetting of material? 17 Α. Right. Ventilation? 18 Q. 19 Α. Yes. 2.0 Q. And respiratory protection? 2.1 Among other things, yes. Α. 22 Like segregation of work? Q.
- A. Segregation of the dust process so people don't get bystander exposure who are working in less dusty

activities.

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- Q. Anything else I missed?
- A. Education of the workers, about the nature of the risk, and there were probably some other housekeeping details like keeping asbestos in impermeable containers once it was stored in the factory, and periodic cleaning of the surfaces, floors and machinery so there wouldn't be an accumulation of dust.
- Q. And good housekeeping practices like cleaning of the work area, those are good sound practices whether you are working with asbestos in the 1930's or some other toxin in 2014, correct?
 - A. As long as you don't use a dry broom, yes.
- Q. So these measures that were put forth by Merewether, he wasn't saying that asbestos should be banned in 1930, was he?
- A. No, he didn't even contemplate that until 1933.
 - Q. Okay. He was saying that asbestos could be used safely if these measures were taken, correct?
 - A. I don't think he put it quite like that, but he certainly said that workers need to be protected and that these are ways of making the asbestos industry a less hazardous industry.
- 24 Q. Those safety measures, those industrial

- 1 hygiene protocols, they are just as valid today as they 2 were in 1930?
 - A. That's right. They didn't need to be invented for asbestos. They were used for the lead industry and other industries and recognized before --
 - Q. And they --

2.1

- A. And they are basic standard approaches to dust control in industry.
- Q. My apology. I didn't mean to step on you. They would be just as valid throughout the 1960's for someone serving on a ship, correct?
- A. Right. These are general principles.
- Q. Can you point me, Doctor, to any article that Merewether wrote in which he said gaskets and packing are dangerous?
- A. Well, not aside from the one, the 1932 article which is the British government publication I referred to on Direct that referred to industries that -- industries and products that could give rise to asbestosis and said that the dry scraping or whatever they said of -- are particles composed wholly or partly of asbestos in the dry state, the turning or grinding, whatever it was, including jointings as they called gaskets.
 - Q. Let's visit on that point for a second. Are

you here to tell this jury that the British use of the term jointing and packings in 1930 or '32 is the same as a chrysotile containing gasket used in the 1960's? Do you know that?

A. I don't see any reason to regard it as different.

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- Q. Do you know one way or the other?
- A. Well, we only have one part of one sentence in a report. We don't have any government -- there is no explanation that the government report provides that elaborates any further. They laundry list brake linings and gaskets and other products, if they are turned in the dry state in a way that is going to generate dust it is going to create an asbestosis hazard.
- Q. So is it fair for me to say in this timeframe in the early to mid 1930's researchers like Merewether and others thought that asbestosis, the incidence of asbestosis could be reduced if these safety -- types of safety measures and other regulations were imposed?
- A. Yes, he said in his 1930 report, as a means of dust control are perfected, the time it takes for people to develop this disease should be lengthened and the severity of the disease that the workers get should be reduced.

- Q. Are you and I am asking for some assistance because it involves push buttons. Thank you. And actually I don't know why it is not showing up on that one.
 - A. That looks like the Merewether.
- Q. That is the Merewether we have just been talking about?
- 8 A. That's the title page.
- 9 Q. Technical malfunction. You are familiar, are
 10 you not, sir, with a paper published at the end of the
 11 decade of the '30s, approximately 1938 by a Dr.
- 12 Dreessen, D-R-E-E-S-S-E-N?
- 13 A. Yes.

- Q. Okay. And Dreessen worked for the U.S. Public
 Health Service, is that correct?
- 16 A. He did.
- Q. What's the U.S. Public Health Service?
- A. It is -- it was then a part of the Department of the Treasury, and the Public Health Service would occasionally in the 1930's do surveys of hazards in industry. Two S's.
- Q. Thank you.
- A. They had no power to enter the factories. They
 had to get the permission of the factory owners to even

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   walk into these plants, but they did do some surveys of a
   number of industries, and they did such a survey of the
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   asbestos industry -- well, several asbestos textile
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   plants in North Carolina after the change in the
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   compensation law in the state of North Carolina, and they
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6
   were invited in by the State authorities.
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         Q.
              And, Doctor, is that -- we have our technical
   issues resolved, not by me.
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              That's the title page of the report.
         Α.
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         Q.
              Okay. Title page of the Dreessen article,
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   1938?
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              Right.
         Α.
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              I think you said this; I want to be clear.
         Q.
    The U.S. Public Health Service at that time was an arm
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   of the U.S. Government, correct?
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         Α.
              Yes.
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              And in fact the U.S. -- let me explain that a
         Q.
    little further. There are a number of uniformed
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   services like the Marine Corps, the Army, Navy, Marine
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              Right.
         Α.
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              That I said twice, but this is considered one
         Q.
   of the uniformed services, correct?
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              Right, like the military in that sense.
         Α.
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- wear uniforms, at least they do for some of their official duties.
- Q. And the Dreessen 1938 study for the U.S.

 Public Health Service was basically an attempt to figure out the relationship between dust levels present in an asbestos textile plant and the amount of disease produced, correct?
- A. Right.

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- Q. Now, these textile plants at the time, are you familiar with the conditions that existed in those plants?
 - A. Well, I am familiar with dust counts they reported. They actually monitored the dustiness of a number of the conditions -- the number of the occupations in the plant, and they also demonstrated that most of the airborne dust was not asbestos fiber.
 - Q. The dust levels in these plants, have you heard anecdotally that they were so high that people couldn't see from one side of the plant to the other?
 - A. I haven't heard about these plants that they surveyed there. It may have been true in some cases.
- Q. You would agree the dust levels generally are very high?
- 24 A. Well, in many cases they are well above five

- million particles per cubic foot and they were probably visibly dusty in some parts of these plants.
 - Q. These textile plants were all in North Carolina, correct?
- 5 A. Yes.

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- Q. And the study was done with the cooperation of the State of North Carolina and the U.S. Government, correct?
 - A. Right.
 - Q. The first -- and we heard this term earlier, spell it out. The first threshold limit value, TLV, you heard that acronym TLV for threshold limit value?
- 13 A. Yes.
 - Q. This actually came out of the research that Dreessen did in his 1938 paper, correct?
 - A. Right. That was the report that was referenced as the basis for the 5 million particles per cubic foot guideline, later published by the Industrial Hygiene Professional Association.
- Q. We will get to that in just a second. So that's 5 million particles per cubit foot, correct?
- 22 A. Right.
- Q. That's an acronym you are familiar with 24 mppcf, right?

A. Yes.

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- Q. Have you ever seen anyone try to equate the 5 million particles per cubic foot level to fibers per cc which is the standard that OSHA uses?
- A. I have, but I have also seen studies that say you really can't do that with any scientific basis. It is too much scattering. When you do split sampling using both methods in the same environment and analyze you don't get a single conversion factor you can use to go from one system of measurement to the other. It is much more scattered.
- Q. Have you heard some researchers contend that it is roughly equivalent to 30 fibers per cc?
- A. Well, people who were forcing the issue claiming that they needed to go from the old system to the new did that. You could use the 6 to 1 ratio.
- Q. Now Dreessen said, did he not, Doctor, that it appeared from the data collected in his study that if asbestos dust concentrations in the air were kept below this 5 million particles per cubic foot standard, new cases of asbestosis would not appear, correct?
- A. Well, the statement was somewhat more qualified with words like "it would appear that" and so on, but generally speaking there was a sense to that effect, also

more guarded statements that appeared.

For example, on page 93 where he refers to it as a tentative threshold for the industry to be observed until more data are available. It wasn't presented as a quarantee.

- Q. And as you mentioned later the American Conference of Governmental Industrial Hygienists, ACGIH, adopted this 5 million particles per cubic foot standard as the recommended level for dust control for asbestos, correct?
- 11 A. Right, included that -- they included that in 12 their list of over a hundred exposure limits they 13 recommended for toxic substances.
 - Q. And that was in 1946, correct?
- 15 A. Yes.

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- Q. And at some point in time, Doctor, did the United States Navy also adopt 5 million particles per cubic foot standard?
- A. I think sometime in the mid '50s there was some memo from the Navy that said we would like to see that these exposure limits are honored in our activities and maybe contract activities. I don't remember exactly how it was said.
- Q. You certainly are aware of the fact from your

own research that the Navy was certainly aware that standard was out there, correct?

- A. Certainly some people in the country were.
- Q. Including the Navy?
- A. Well, some people in the Navy were, yes.
- Q. And then later OSHA came into being in the early 1970's and this threshold limit value was called something else, called permissible exposure limit or PEL, correct?
- A. Well, it wasn't the same number, wasn't the same method of measurement but the concept was setting some maximum concentration for the toxic material in the workplace air which would be a legally enforceable limit. That was called a permissible exposure limit under the Occupational Safety and Health.
- Q. That is a fair clarification, appreciate it.

 Now, this 5 million particle per cubic foot standard, it
 was not a legally enforceable standard, correct?
 - A. No.

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- Q. It was a recommendation adopted by the
 American Conference of Governmental Industrial
 Hygienists, but it wasn't necessarily the law of the
 land, correct?
- A. It wasn't the law of the land. It wasn't taken

seriously as far as I can tell by just about everybody.

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- Q. Well, let's just make sure we are on the same page. Many states in fact adopted the 5 million particle per cubic foot standard as their law, correct?
- A. They adopted it as a guideline, as a standard of good practice but it was never enforced as far as I am aware in any state.
- Q. Are you aware that the State of Texas adopted it as a legal standard in 1958?
- A. Different states adopted it with different language. I don't recall the specifics of the Texas law. In California it was listed in a table called Suggested Maximum Allowable Concentrations, and in California and Texas and all the other states nobody got fined for violating a suggestion.
- Q. And you know that from your own research, or are you just assuming no one got fined?
- A. I have yet to see any example, and I have had substantial assistance from plaintiff and defense counsel in looking for such things, and I have not yet seen any case in which any company was cited or fined for overexposing workers to asbestos in this country before OSHA came along in the 1970's.
- 24 Q. So we can add the state regulators to the list

of people that let these workers down, correct?

- A. It is not quite that simple. I think the legislators could include these lists of TLV's in the state code and go to the unions and say, look at what we did for you. As long as they didn't spend the money to empower the State authorities to go into the plants and do unannounced inspections and fine the companies and have laboratories that were capable of doing air sampling analyses for the 300 or 400 chemicals on the list it was an empty gesture. It didn't really mean that industry was going to be any safer in the state. It just looked good somewhere in the code.
- Q. Sounds like there is a hint of conspiracy there; we will get to that.
- Doctor, this standard of 5 million particles per cubic foot remained in effect until OSHA -- was that '71 or '72? I forget.
- A. OSHA began to function in April of 1971.
- 19 Q. Okay.

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- A. So there was no regulation until then.
- 21 Q. 1971 when the PEL came out, correct?
- 22 A. Right.
- Q. And that PEL was 5 fibers per cubic centimeter of air, correct?

- A. Technically it was 12 fibers per cc in April, and then they imposed an emergency temporary standard for asbestos in December of 1971. They lowered the permissible exposure limit to 5 fibers per cubic
 - Q. And I don't want to get too far afield, but you would agree generally that since that standard came out OSHA has over the years continually lowered that standard, and that's a time-weighted average standard, correct, what someone can be exposed to eight hours a day all day long?
- 12 A. Right.

centimeter.

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- Q. And that standard has gone down slowly, as was already shown to the jury today, that the standard today .1 fiber per cc?
 - A. That's the current exposure limit at OSHA.
- Q. Doctor, can you cite me any documents from 1946 until the time OSHA came into existence in '71 where the ACGIH said, well, these limits aren't safe?
- A. No. They were promoting the limits as, you know, safe for -- should be more or less safe for most workers is about the way they put it.
- Q. Can you show me one document from '46 to '71 where they said this limit won't keep you from getting

lung cancer or mesothelioma?

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- A. No, but the documentation they presented in support of the limit they had for asbestos only talked about asbestosis, so I think it is safe to conclude that they weren't representing that it was safe from the standpoint of cancer.
- Q. Well, just to be clear and my question was, can you show me any document, point me to any document and you can't, correct?
- A. Not from the ACGIH. They were criticized by others, but they themselves didn't have any such things to say.
- Q. Okay. Let's move on to the '50s. And actually -- actually let's take a stop in the '40s and deal with this now and not have to worry about it later.

Let's move forward to 1946. Are you aware of any significant studies that came out in 1946 that dealt with whether or not insulators were at increased risk for asbestos-related disease in shipyard operations?

- A. I don't know how significant it is, but there was a study published in 1946.
 - Q. And that was the Fleischer --
- A. Fleischer was the first article. Fleischer,
 Vile, Gade --

- Q. Is that the first page of that article?
- A. Yes, it is.

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- Q. I will just put Fleischer, et al. Is that generally referred to as the Fleischer-Drinker study?
 - A. That's what lawyers call it.
- Q. So if I call it that you know we are talking about the same thing. That study came out in 1946, correct?
 - A. Yes.
- Q. And as I recall -- please correct me if I am wrong -- this study, well, first of all, let me back up.

 One of the authors was Phillip Drinker?
- A. Phillip Drinker was a chemical engineer who was on the faculty at the Harvard School of Public Health and taught industrial hygiene.
- Q. Okay. And is it your understanding, Doctor, that this study was contracted by the Government to have the researchers go into U.S. Naval contract shippards where they were building U.S. Navy vessels during the buildup of World War II and determine whether or not individuals working with pipe covering that contained asbestos were at increased risk of disease?
- A. It wasn't contracted by the Navy. If you blow up that lower left hand corner you will see that's a

- 1 disclaimer by the Navy saying the Navy takes no responsibility for this, but the people that did the work 2 3 Okay, fair enough. 4 Q. -- the people that did the work were listed as 5 6 consultants to the Navy. 7 Q. Okay. The opinions -- I will read it. The opinions and the assertions contained herein are private 8 9 ones of the writers and are not to be construed as 10 official or reflect the views of the Navy Department or 11 the Navy Service at large. 12 Did I read that correct?
- 13 I think so. Α.

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- Okay. So this study was done of shipyards where large amounts of Naval ship construction were being done, correct?
- New ship construction, yes. There was no ship repair going on in this.
- Okay. And during this timeframe these were Naval vessels of various sizes, but thermal insulation -- you know from your research was commonly used on these Naval ships built during that time?
- 23 Α. Sure.
- 24 What were the conclusions reached by the Ο.

- authors in this study with respect to whether or not people working day in and day out with thermal pipe insulation during the mid 1940's were at increased risk for disease?
- A. Well, the conclusion number 4 which made it into my book because of its abundant use in the courtroom reads in its entirety: Since each of the three cases of asbestosis that worked at asbestos pipe covering in shipyards for more than 20 years, it may be concluded that such pipe covering is not a dangerous occupation.
 - Q. Did they get that right?

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- A. I find the sentence internally inconsistent.

 The three cases are elsewhere described in the report as moderate and advanced asbestosis, but that's what they wrote.
- Q. That's what they wrote. I am particularly interested in the part where they said it is not a dangerous occupation. Did they get that right?
- A. Well, aside from the three guys that, you know, might have been wiped out by asbestos they didn't find any problems. There were only 51 people in the study who had ten or more years of exposure. Most of these people had just been brought into the shipyards during the war and wouldn't have been expected to develop

asbestosis in two or fewer years. Some of them had -hundreds of them had less than two years. Hundreds more
had two to five years.

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- Q. Well, isn't it certainly fair to say that one of the things is that Fleischer, et al., didn't take into account is the latency period involved?
- A. That's right. They missed the business of the maturation period Merewether had spoken of 16 years earlier.
- Q. So this at the time 1946 was a widely available, widely disseminated paper that people could go to and for all it's worth read it and learn lessons provided by Fleischer, et al., true?
- A. I would say it was widely available in the sense that it was probably carried in many libraries in this country. It was not widely cited. It was in fact cited by only one study within the ten years after the period, one study written by other people and that was an Italian study that credited these guys for identifying the asbestosis hazard in the shipyard --
- Q. And Drinker was actually a very well known researcher at the time?
- A. Yes, he was on the faculty at Harvard. He was a corporate consultant to the oil industry in the '40s.

- He was on the original Threshold Limits Committee of the ACGIH in 1946 and 1947.
- Q. Let's move on to the '50s. You mentioned this on Direct. That is an article that you are familiar with by Sir Richard Doll?
- A. Yes.

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- Q. I refer to it as Sir Richard. He is not called Sir Richard there because I don't think he had been knighted by the Queen yet, correct?
- A. Well, even after he was knighted I don't think in medical articles they identify you with those kinds of terms, but he was honored for his epidemiological studies establishing the risk of lung cancer from tobacco smoking in 1950's and --
 - Q. Would it be fair to say, Doctor, that even through the 1950's there were medical and scientific publications disputing the contention that asbestos causes lung cancer?
- A. There were a few studies that questioned it usually without having any data, but they raised the question.
- Q. Now, Doll -- and I don't want to belabor too
 much because we just talked about it, but Doll found in
 his research published in 1955 a linkage between

asbestos -- people with asbestosis and lung cancer in British factory workers, fair?

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- A. Virtually all the people that died with lung cancer had asbestosis because many of them started their work in the years before there were any regulations in the asbestos industry in England which he points out.
- Q. And this is viewed as the first peer-reviewed epidemiological study in the world linking asbestos and lung cancer, correct?
- A. No, I mentioned the study of Breslow in California with the interviews of the two, 500 lung cancer patients and the comparison with their occupations with the control group and the identification of the group of asbestos workers, boilermakers and steamfitters as being at increased risk --
 - Q. Epidemiological study?
 - A. It was an epidemiological study, sure.
- Q. This one certainly was well widely read and well accepted during this time?
 - A. This was also widely cited, yes.
 - Q. One of the things Doll noted in this paper, isn't is true, Doctor, is that the causes of lung cancer he observed were among people who worked in textile factories, asbestos textile factories prior to factory

regulations that were put in place later in the 1930's?

- A. Yeah, the cohort, the population of people studied, were people working in an asbestos textile factory. As I said some of their exposures predated the British regulations introduced in 1933. They were followed up through about 1952 in this study.
- Q. My fault. In fact Doll was hopeful that the controls that had been put in place in asbestos textile factories in the '30s would reduce or eliminate the risk of lung cancer in the factory workers, correct?
- 11 A. I think so.

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- Q. All right. Now, let's move on to 1960, and you mentioned a study by -- well, we Americans would pronounce it Wagner, but he was a South African, correct, and I think his name was pronounced Vogner, correct?
 - A. Actually it was Welsh. He pronounced his name Vogner.
- Q. Who are we to argue with that? This Welshman actually published his study in 1960 in South Africa?
- A. He did.
- Q. His study, I think I have a picture of that as well. J.C. Wagner discussed the incidence of mesothelioma in and around a mine in South Africa,

correct?

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- A. Not only that but most of the people in this study were people whose exposure came from the asbestos mine, a bunch of asbestos mines, not just one.
- Q. And you are aware, of course, that the mine in question was actually mining crocidolite asbestos, correct?
 - A. Yes.
 - Q. And I assume through your research through the years have seen studies, articles and publications that indicate that crocidolite is generally going to be far more potent of causing mesothelioma than amosite and, certain chrysotile, correct?
 - A. Some people believe that to be true.

 Experimental animal studies didn't confirm that.

 Chrysotile was just as lethal as the other types of asbestos when you expose by inhalation rats to chrysotile with breathing different types of asbestos they all produced lung cancers and mesotheliomas, and chrysotile as much as any of the others.
 - Q. We certainly heard about rats so I won't belabor that, but, Doctor, in this study you believe that this study -- well, first let me ask you this. Is this in your mind the first peer-reviewed

epidemiological study that links exposure to asbestos and mesothelioma?

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- A. Well, I don't know technically whether you can call it an epidemiological study or a big case report, but it really established -- it put mesothelioma on the map in terms of having a lot more people around the world concerned about mesothelioma, particularly low dose asbestos exposures and causing it than previously had been the case.
- Q. And isn't it in fact true, however, that even after the publication of Dr. Wagner's study in 1960 there was still debate in the medical and scientific community about whether mesothelioma was linked to asbestos?
- A. Very little of that. I mean there was -- the literature is remarkably consistent on that question.
- Q. Is it true, Doctor, that by 1968 the ACGIH was actually considering recommending a stricter set of requirements for the control of dust when crocidolite asbestos was involved?
 - A. That's also true.
- Q. The -- and in 1968, for instance, the British
 Government began treating crocidolite as especially
 dangerous and began issuing regulations for crocidolite

which were stricter than regulations for chrysotile?

- A. They did.
- Q. All right. Dr. Selikoff you talked about his publication and his work in the early to mid '60s. I think it was '64, is that correct?
 - A. Right.

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- Q. I think you referred to him as a towering figure in the development of asbestos knowledge -- knowledge of asbestos diseases?
- A. He was a leading figure in this country partly because he didn't just publish in medical journals. He was willing to do media interviews and try to raise public understanding and awareness about asbestos and other things in ways a lot of other doctors were unwilling to do.
- Q. One of the things -- well, let me back up. I don't want to belabor this too much on Selikoff. We have heard quite a bit about it, but obviously the group, the cohort as they call it that Selikoff was looking at, were insulation workers in the greater New York area, correct?
- A. Initially that's right.
- Q. And these people were applying thermal insulation like pipe covering and block and other

1 material -- similar material and also tearing them out,
2 correct?

- A. Right.
- Q. You are familiar with studies that demonstrate that tear out of asbestos insulation -- pipe insulation can generate fiber levels of 100 fibers per cc or higher, correct?
- A. Yes.

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- Q. And to be fair these workers, these insulators in Selikoff's study, they would have received these doses routinely because that was their job as insulators, correct?
- A. Yeah, there were periodic -- depending on what
 they were doing from day-to-day. Sometimes they didn't
 work with asbestos-containing materials at all. Other
 times they would be doing rip out of old dry asbestos
 insulation.
- Q. And in fact Selikoff found in '64, in the '64

 study that there was in fact a terrible degree of

 coccupational cancer among asbestos insulation workers,

 correct?
- 22 A. Right.
- Q. Are you familiar with a gentleman by the name of -- well, did Selikoff have a gentleman that published

his -- or did work with by the name of Dr. Hammond?

A. Yes.

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- Q. And you know that in the mid 1960's Dr. Hammond was discussing Dr. Selikoff's studies and he had held the position that prior to those studies there was hardly anyone who would have suspected that there was a risk of lung cancer among asbestos insulation workers, correct?
- A. There is a part of the transcript of the conference includes a discussion that took place after the papers were presented in different groups, and one part of one of the discussions includes this where Hammond where -- that is attributed to Hammond which is kind of inconsistent with his own writing in which he cites 18 studies of lung cancer and asbestosis and mesothelioma in insulators published prior to 1964, going back to the 1930's.
- Q. I am sorry. My question was, did Hammond actually say that?
- A. I don't recall word for word, but he said something to that effect during one of his discussion sections or at least that is what appears in the Annals of the New York Academy.
- 24 Q. You would agree with me that Dr. Selikoff

- 1 published a lot of material on the issue of asbestos and asbestos-related health?
 - Α. He did.

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- And in none of those materials did he ever say Q. that asbestos needed to be banned, did he?
- I don't think he did, although he certainly supported our work when we were trying to get it banned in the '80s.
- All right. Let's switch gears again if we can. You are aware of the fact that throughout the years many different companies sold a variety of asbestos-containing products, correct? 12
 - Α. Yes.
 - You have heard the estimate I think that asbestos ultimately found its way to over 3000 different products over the years, fair statement?
 - I have seen that figure in one text about Α. asbestos in its industrial application, yes.
 - At one time even the U.S. Government sold raw Ο. asbestos in brown burlap bags, true?
- 2.1 I don't know about the bags - probably. Α. 22 Government would occasionally stockpile what they thought were strategically important materials, and asbestos is 23 one of those. So it would have been handled in that 24

- manner along with whatever else the military and Government considered strategically important.
- Q. You would agree with me that health risk posed by a given asbestos containing product are largely a function of its ability to release fibers in the air?
- A. Yes.

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- Q. And different products can have different levels of exposure, correct?
- A. Right.
 - Q. Some products create less exposures than others based upon their chemical makeup or their structural makeup or other factors?
- A. Right.
 - Q. And you believe a manufacturer has a duty to anticipate the types of exposures products can create, right?
- A. Yes.
- Q. Are you aware -- but yet you are unaware -
 19 start over. You are unaware of one industrial hygiene

 20 article recommending that a warning be placed on an

 21 asbestos-containing product before the 1970's, correct?
 - A. I think that's right. I mean industrial hygienists generally didn't address the question of warning labeling for asbestos when they were writing

prior to that time. They would measure levels of exposure associated with the products, but they wouldn't think to throw in, oh, by the way people should be warned about this.

- Q. So I am correct?
- A. I think you are.
- Q. You are not aware of any article in the peer reviewed literature prior to 1970 that indicated that working with chrysotile-containing gaskets and packing increased a person's risk of mesothelioma, correct?
- 11 A. Correct.

- Q. You are not aware of any article in the peer reviewed literature prior to 1970 that indicated that exposure to chrysotile asbestos only put an individual at increased risk of contracting mesothelioma, fair statement?
- A. Well, there were studies that suggested that. There were reports of mesothelioma in chrysotile miners in 1952.
- Q. A study in peer reviewed literature prior to
 1970 that chrysotile in products that contained
 chrysotile asbestos put individuals at increased risk of
 mesothelioma?
- A. I can't think of any end product that contained

- only chrysotile. The insulation that contained chrysotile and amosite, at least some of the insulation did, so you wouldn't be able to say that chrysotile was causing all the death and disease that it did, that it was all from chrysotile because there was amosite mixed in some of those rods.
- Q. Fair enough. That actually raises a good point. Throughout this time period throughout the 1960's the focus certainly was on insulation, wasn't it?
- A. Well, the focus of whom? There wasn't much of a focus except for a few people like Selikoff who would go to the trouble to make friends with the union of insulators, get their cooperation and do an epidemiological study somehow coming up with a federal funding to carry on research, but for the most part there was no focus.
- Q. Well, to the extent there was it was on insulators. That's certainly the cohort that Dr. Selikoff --
- 20 A. Thanks to Selikoff there was a focus on 21 insulators, yes.
- Q. One of the reasons that's true is because insulation was an extremely dusty product, correct?
- 24 A. Yes.

Q. In fact it was so dusty that in the 1970s it was finally banned by the EPA, true?

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- A. It was banned in 1975 as an air pollution hazard by the EPA, yeah.
- Q. All right. Let's talk a little bit about gaskets and packing if we can. You testified in the past and I would like to know if it is still your opinion today that it would be difficult for you to fault manufacturer of valves for not applying a warning regarding asbestos-containing components in the valve in 1946, correct?
 - A. I think I said in the early '40s because the cancer-causing aspects -- cancer-causing potential of asbestos was not abundantly demonstrated until the late 1940's.
- Q. So until that was demonstrated in the late 17 1940's that is your answer?
 - A. I was giving the industry a bit of a break in answering the question, but that's why.
 - Q. Fair enough. I appreciate that.

I would like to move on to some of the other literature that we didn't cover earlier in either my Cross Examination or on Direct Examination. Are you familiar, sir, with a publication that came out in 1971

- by a gentleman named P. G. Harries?
- A. The name -- I recognize the name, and I know there are a couple publications he wrote.
 - Q. Do you recall this: Asbestos Dust

 Concentrations in Ship Repairing: A Practical Approach
 to Improving Asbestos Hygiene in Naval Dockyards?
 - Are you familiar with that?
- 8 A. Yes.

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- Q. Okay. And Harries was a British industrial hygienist if I recall correctly, correct?
- 11 A. I think so. I don't really know for sure.
 - Q. And he did a survey of British shipyards and reached certain conclusions about whether or not certain types of asbestos-containing products posed a risk while others did not, correct?
 - A. Well, he mentioned dust concentrations associated with some aspects of asbestos product used and published them in that paper.
 - Q. You would agree with me that Harries in this publication concluded that high temperature gaskets and packing containing asbestos do not pose a health risk in normal shipyard operation, correct?
- A. I think he said something to that effect based upon the study he did, whatever it was, of packings.

Q. In fact --

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- A. He was looking at the full range of asbestos products, was no doubt distracted by sprayed asbestos and asbestos pipe covering and some of the other --
- Q. You knew Mr. Harries at the time? You knew he was distracted?
- A. Well, those products were more well known in the literature as potentially hazardous asbestos products. The British Government published about that in its annual report to the chief inspector prior to the time this appeared.
- Q. You don't dispute the fact that Harries reached a conclusion that high temperature gaskets and packing don't pose a health risk in normal shipyard operations, correct?
- A. I think he put that -- the line appears in the article. I don't have the article in front of me, but I think that line appears in there.
- Q. Tell me if you do recall that in an earlier Harries publication again in the same subject matter, asbestos hazards in a Naval dockyard in 1968 concluded that gasket and packing were -- working with them were among the shipyard tasks that were non-dusty, correct?
- A. I believe he designated it that way. He didn't

- include any dust counts for things like wire brushing of pipe flanges or adhering gasket material.
 - Q. One second, Doctor. Let's go right to my beloved book that you looked at earlier.
- 5 MR. LOWERY: May I approach the witness, your 6 Honor?
- 7 THE COURT: You may.
- Q. Did you recall this from earlier this morning, right, Asbestos and Disease by Selikoff and Lee? I am not going to belabor about who edited it and who wrote what. You do acknowledge that there is a table in Chapter 20, correct, sir?
- 13 A. Right.

- Q. Are you familiar with it?
- A. Sure.
- Q. And when it talks about high temperature
 jointing and packing materials you said that you believe
 that's gaskets, correct?
- 19 A. Right.
- Q. It says: No substitute heat resistant
 material, no health hazard in forms used in shipyard
 applications, correct?
- A. You read that correctly.
- 24 O. Is that not the same conclusion reached in

Harries' 1971 paper?

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- A. It sounds similar.
- Q. And this is certainly a well-regarded and reliable textbook in the field of asbestos and related health issues, correct?
- A. Certainly for the medical information that it contains.
 - Q. And that was in 1978, correct?
 - A. That's when the book was published, yes.
- Q. Isn't it true even today you can't cite to us one epidemiological study showing an increased risk of mesothelioma arising from working with gaskets and packing?
 - A. That's right. There are no studies of workers whose only asbestos exposure were gaskets and packing and no other type of asbestos product.
- Q. All right. In all of the editions of your book, there is a chapter that's called Asbestos Product Use, correct?
 - A. Yes.
- Q. And in that chapter you detail some of the asbestos products that have been shown to pose health hazards, correct?
- 24 A. Yes.

- Q. The first version of your book, First Edition

 -- well, let me back up. The first edition in fact

 where you did mention either gaskets or packing was the
- A. I don't recall but it wasn't in the initial edition. It takes an awful lot to put something like this together, and I neglected a few things in the earlier editions.
- 9 Q. I understand. That Fourth Edition came out in 10 1996, isn't that right?
- 11 A. That's right.

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Fourth Edition, is that true?

- Q. The Third Edition that you published in 1990 in fact doesn't talk about gaskets and packing in the Asbestos Product Use section, correct?
- 15 A. I think that's correct. I don't really 16 remember.
 - Q. And that's because in 1990 there wasn't anything published about gaskets and packing that actually tried to measure the levels of exposure associated with it, true?
 - A. There was little if anything in print where people had actually measured the exposures associated with the use of packings and gaskets in the various ways that the products were used.

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MR. LOWERY: Your Honor, I am at a place where I am
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   going to branch out into something totally different.
   Do you want to do it now or wait?
3
         THE COURT:
                     Take our afternoon break?
 4
5
         MR. LOWERY: Yes, sir.
 6
         THE COURT: Let's do that and be back here at 2:30.
7
                   (Brief recess taken.)
                   (The following proceedings were had in
8
9
                   presence of the jury.)
10
         MR. LOWERY: Dr. Castleman, are you okay to
11
   continue, sir?
             Sure. Go ahead.
12
         Α.
13
              (Mr. Lowery) I want to switch into some of
         Q.
   the Crane documents you talked about on Direct. Before
14
15
   I do that, I just want to cover one addition, Doctor.
16
             With regard to asbestos and the United States
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   Government's use of it, you would agree that the U.S.
18
   Government was one of the largest suppliers of asbestos
19
   fibers to various companies during the 1940's, correct?
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         Α.
              I don't know about that. I mean the suppliers
2.1
   were companies like Johns-Manville and other companies
2.2
   that had mines in Canada.
                               They were the large suppliers.
23
   The Government was directing things during the war,
   something called the War Production Board which totally
24
```

- controlled the U.S. economy, but they weren't the supplier of the material.
- Q. Let me ask it a slightly different way.

 That's a fair point you make.

Was the United States -- you would agree with me that the United States Government was one of the largest procurers or obtainers of asbestos-containing materials particularly during this time?

- A. Sure, during the war.
- Q. In fact they stored those asbestos-containing materials at Government facilities, correct, sir?
 - A. I presume so, sure.

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Q. Doctor, as I said I would like to switch gears and talk a little bit about the Crane Co. documents that -- or documents related to Crane Co. is a better way to put it that were shown earlier.

Let me just preface with a couple things. In the Fifth Edition of your book Crane Co. is not mentioned, correct?

- A. I believe that's right.
- Q. In fact you testified that as recently as July of 2004 that you had not paid any attention to Crane Co. in the past and you had no opinions regarding Crane Co., correct?

A. I hadn't seen any Crane Co. documents. That's certainly true, and it is true today. I don't think I have seen any internal documents from Crane Co., maybe a few but I don't recall.

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- Q. Okay. Crane Co. eventually got your attention not because you had independent interest in research in Crane Co. but because an attorney representing plaintiffs in asbestos litigation in Mississippi was in the process of taking a case against Crane Co. to trial in 2004 and requested your help, correct?
- 11 A. That is probably right. I don't recall the 12 details.
 - Q. Mr. Pendleton do you recall that name?
 - A. I don't even remember the guy. Some of these lawyers just came and went with one letter or phone call.
 - Q. Got it. The attorney -- this attorney mailed you a number of documents and later became a part of the basis of your opinions regarding Crane Co., correct?
 - A. Well, I don't recall what I got from the attorney so I am kind of at a disadvantage trying to answer your question about the usefulness of whatever it was he sent me.
 - Q. You don't have any idea what trade associations Crane Co. is a member of, fair statement?

A. That's right.

2.0

- Q. You obviously talked about a lot of documents that either mentioned Crane Co. personnel or you believe Crane Co. had access to on Direct Examination, but you have no evidence that Crane Co. received any of these documents, correct?
- A. You mean like the documents that they had advertisements in the magazines?
- Q. That -- we are going to get to that in a minute. Do you know whether they received them or not?
- A. I don't know if they received the magazines that they paid for one or two page ads in or not.
- Q. We will get to that. Let's take a look at some specific documents. One of the ones you mentioned was 1935 document which referenced Dr. Andrew Harvey, do you recall that?
 - A. Right.
- Q. Dr. Harvey was a medical person -- I am not sure exactly what his title was. He was associated with the medical department at Crane Co., correct?
- A. Right. He was medical director or the equivalent, whatever they called it.
- Q. The page referencing Dr. Harvey that was shown to you on Direct Examination does not discuss asbestos,

correct?

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- A. The page in which Harvey's name appeared, that exact page doesn't have the word "asbestos" on that page, no.
- Q. According to the journal Harvey was in an association called the American Association of Industrial Physicians and Surgeons, correct, sir?
 - A. He was, yes.
- Q. You testified that that association published that journal, correct?
- 11 A. They do.
- Q. But according to the front page of the journal a company called Industrial Medicine, Inc. was the publisher, correct?
 - A. Well, the people that actually printed the magazine may have had a different name, but it was the journal of the professional association. I didn't mean to imply that the professional association ran the printing press.
 - Q. Not a big deal. Let's move on. You had no idea whether Crane Co. ever published any material in that journal, correct?
 - A. Correct. I didn't know.
- 24 O. You don't know if Crane Co. received or

- reviewed any of the material in that journal, true?
- A. I would be amazed if Dr. Harvey didn't read it,
- 3 but I don't really know for sure.
- Q. Your testimony is the journal included
- 5 articles on dust diseases, right?
- A. Right.
- 7 Q. And these articles are not limited to just
- 8 asbestos, are they? They talk about all kinds of
- 9 things?

- 10 A. They do.
- 11 Q. In fact silica is the primary focus of the
- 12 | article, isn't it?
- A. I haven't done a count but silica was a very
- 14 | serious concern among the dust diseases in the American
- 15 industry.
- Q. Certainly in the 1935 timeframe silica was a
- 17 | very big concern, correct?
- 18 A. It was.
- 19 Q. Let's talk a little bit about Dr. Harvey. You
- 20 | have seen references to him in publications other than
- 21 | this journal, true?
- 22 A. I have.
- Q. Based on what you reviewed you believe Dr.
- 24 Harvey was a leader in the early industrial medicine at

- 1 | this time, correct?
- A. He was one of the early industrial physicians,
- 3 yes, in industry.
- 4 Q. You are not here trying to tell this jury that
- 5 Dr. Harvey was out to hurt workers, are you?
- 6 A. No.
- 7 Q. You are not here saying he was anything other
- 8 than a good, upstanding physician, right?
- 9 A. Well, I don't know anything about him
- 10 personally, but I don't have any reason to say anything
- 11 | bad about him certainly. He seems to have been a
- 12 knowledgeable industrial physician who was a leader in
- 13 | the company doctors group.
- Q. He was actually a practicing professional
- 15 doctor in the late 1890's, did you know that, sir?
- 16 A. Yes.
- Q. Do you know whether Dr. Harvey was even alive
- 18 | when, say, Richard Doll published his 1955 article?
- 19 A. No, I don't.
- Q. Or the Wagner article in 1960?
- 21 A. No, I don't. He would have had to have been
- 22 quite old and probably would have been retired by the
- 23 | time those things came out.
- 24 Q. I promised that we would get to some of those

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   advertisements in the trade publications. Let's talk
   about that now if we can. You mentioned Crane Co. put
2
   an ad in a magazine called Heating and Ventilating in
3
   1944, correct?
4
5
         Α.
              Yes.
 6
         Q.
              You have that in front of you?
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         Α.
              Yes.
              And in that magazine there is an article that
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         Q.
9
   discusses industrial dust hazards, correct?
10
         Α.
              That's right.
11
              The article does not discuss mesothelioma,
         Q.
12
   right?
13
              It doesn't talk about cancer at all as a
14
   consequence of dust exposure.
15
              It doesn't discuss valves?
         Ο.
16
         Α.
              No.
17
              It doesn't discuss gaskets and packing?
         Q.
18
         Α.
              No.
19
              And it doesn't say asbestos should be banned,
         Q.
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   correct?
2.1
         Α.
              That's correct.
22
              And it is not limited to asbestos as I think
23
   we may have mentioned. It is discussing asbestos and of
24
   other potential dust hazards, correct?
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- A. Well, the headings are silicosis, asbestosis and then it has miscellaneous dust in another heading.
 - Q. You mentioned Crane also had an advertisement in a magazine called *Southern Power and Industry* in 1946, correct, sir?
 - A. Yes.

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- Q. And that -- in that issue I should say, the 1946 issue of *Southern Power* it also had an article that dealt with dust control, correct?
- A. Yes.
- 11 Q. That article actually references asbestos
 12 quite minimally, correct?
 - A. Talks about lots of different dust hazards but talks about asbestos as well, doesn't go on and on about asbestos.
- Q. Again like the other article doesn't discuss mesothelioma or valves or gaskets and packing?
 - A. Doesn't talk about cancer and asbestos.
 - Q. Now, I just want to make sure I understand what you were telling the jury earlier today. It is your position that a company that had an advertisement in a publication should be fully aware of the substance of the articles in that publication, correct?
- 24 A. Not necessarily. I am just saying that quite

- likely somebody at the company would have checked the
 company to make sure that their ad appeared in the form
 that it should have, and since it was kind of a

 publication that was used as a vehicle for advertising
 and commerce by companies in the business of making
 boilers and piping systems and insulation and so on that
 they very likely would have seen the article.
 - Q. Let me ask it this way. I think you answered the question. So your position is, if a company placed an ad in a publication they should at least be aware that the subject, the title of the article or the topic that's being discussed was in that publication?
- A. I would say somebody in the company probably would, yes.
- Q. Do you have your curriculum vitae handy? In think it is your Exhibit 1.
- 17 A. Yes.

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- Q. You wrote an article entitled: Asbestos
 19 Product Hazards and Regulations, correct?
 - A. Yes.
- Q. Actually got published in the *International*22 Journal of Health Services in 2006?
 - A. Right.
- 24 Q. Listed on your curriculum vitae, correct?

A. Right.

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- Q. Please tell the jury one of the other articles that appeared in that journal besides yours?
- A. I don't remember now, but I probably looked through the journal when I received that issue of the journal and looked to see what else was published in it.
- Q. Just to be clear you can't tell the jury one other article that appeared in that journal?
 - A. No, not now. I don't remember.
- Q. Maybe that was a bad one. Let me pick
 another. You published an article on vinyl chloride
 that appeared in the *Environmental Health Perspective* in
 2005, correct?
- 14 A. Yes.
- Q. That's on your CV also, true, isn't it?
- 16 A. Yes.
- Q. Tell us one of the other articles that appeared in that journal?
- A. Well, I looked through the journal when the
 journal came out, but again I don't recall what the other
 articles were at the time.
- Q. You subscribe to magazines, don't you?
- A. Pardon?
- Q. You subscribe to magazines?

1 A. Sure. Well, a few.

2

- Q. Mother Earth -- Mother Jones?
- A. Yeah. My goodness, they even know what magazines I subscribe to.
 - Q. I asked you this question before.
- 6 MR. WATHEN: Your Honor, I will object to the 7 relevance of the random magazines he subscribes to.
- 8 MR. LOWERY: I think when you accuse someone of 9 knowing everything that's in a publication you put an ad 10 in it.
- 11 MR. WATHEN: I object to the speaking objection.
- MR. LOWERY: You raised the issue.
- 13 THE COURT: I am going to overrule it.
- 14 MR. LOWERY: I am done. I will move on.
- Q. So as far as Crane Co.'s advertisements in the '40s you don't know if Crane Co. used an ad agency to
- 17 place that ad, correct?
- 18 A. Correct.
- 19 Q. You don't know if Crane Co. subscribed to the 20 magazine?
- 21 A. Right.
- Q. You don't know if anyone at Crane Co. ever read the magazine or publication?
- A. No, this was 70 years ago.

- Q. Let's move on to the symposium in 1935. That was discussed earlier today, correct?
 - A. Right.
- Q. That was a symposium or meeting I should say held in Pittsburgh, Pennsylvania, correct?
 - A. Right.

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- Q. And it is your testimony that from your review of that document that two people from Crane Co. attended the meeting?
- 10 A. They are listed by the doctor at Metropolitan
 11 Life as having been there, yes.
- 12 Q. You really don't know if anyone gave a speech at this meeting, correct?
 - A. Well, I know from the Johns-Manville memo about some of the people that gave speeches, but I don't know everything that went on at the meeting.
 - Q. The meeting lasted one day?
- 18 A. I think so, yes.
- Q. Can you tell me which meetings of the 1935 one day symposium that the Crane Co. people went to?
- A. No, I don't know whether there were different sessions or anything like that. There is no program of that meeting that I have ever seen.
- Q. You don't know whether they went to a meeting

on silica or asbestos or benzene?

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- A. Well, it was about industrial dust.
- Q. Fair enough. We will scratch benzine. How about silica or asbestos?
- A. I don't know. Mainly they were talking about how this is a big problem for industry. All these lawsuits and comp claims and what could industry do to deal with this problem, and they decided to set up an organization that would provide them with technical expertise, medical and industrial hygiene expertise that would provide them with publications that would provide them with like the Industrial Hygiene Digest that would provide them with research and consulting capacity to hire people at the IHF to go and do surveys at the oil refineries and chemical plants and power plants and whatever else they had, and give them confidential reports on the hazards they found.

This is basically what they decided to do and what they did, and by the late 1940's the annual meeting of the Industrial Hygiene Foundation were noted in the Wall Street Journal and the New York Times and they had hundreds of industrial companies as members.

Q. Certainly the two gentlemen from Crane Co. were not the only ones to attend the meeting, correct?

- 1 A. Right.
- Q. There is a list of attendees about eight pages
- 3 long, fair statement?
- 4 A. Eight pages.
- 5 Q. Eight I said, yes.
- 6 A. I wanted to make sure the jury heard.
- 7 Q. Between -- the number between seven and nine,
- 8 | right. There were people attending from a lot of
- 9 different companies, correct, sir?
- 10 A. Right.
- 11 Q. People attended from academia like University
- 12 of Pittsburgh, correct?
- A. Well, there were one or two professors there
- 14 but mostly was people in the business community that were
- 15 | concerned about this problem.
- Q. People attended from trade associations like
- 17 | the American Refractory Institute, correct?
- 18 A. Right.
- 19 Q. And the gentleman we looked at earlier who was
- 20 | involved in that shipyard study Dr. Drinker was in
- 21 | attendance?
- 22 A. I think he was.
- Q. Along with other people from the U.S. Public
- 24 | Health Service?

- A. I think one guy name Sayers (ph.) from the Public Health Service who also attended.
 - Q. So there were representatives there from the United States Government as well?
 - A. Well, if Sayers was there you could say that.
 - Q. All right. Let's move on to the Illinois
 Manufacturers Association document, 1936, if you have
 that?
 - A. Yes, I do.

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- Q. You mentioned earlier some people associated with Crane were involved in commenting on workers' compensation laws that were being considered at that time in the State of Illinois, correct?
- A. Well, they were involved in the medical side of the industry, a lobbying presence in negotiating that -- the language of that law.
- Q. I know you are familiar with the Constitution
 of the United States and Article 1 of the Constitution,
 and everyone has a right to petition the Government,
 correct, sir?
- 21 A. That's right.
- 22 Q. You don't disagree with that, do you?
- A. No, I don't. People with more money generally petition the Government with more --

- Q. I got two kids in college, and I don't have any money. I can petition the Government, so can you, right, Doctor?
 - A. We can.

- Q. And you also agree it's a good things to try to compensate workers who are injured on the job, right?
- A. Well, that's one of the public health protections that workers are supposed to enjoy mainly to discourage them from being over exposed and getting occupational diseases, but at least secondarily to compensate them for their lost earnings.
- Q. It is a fair statement, isn't it, sir, that before the turn of the 20th Century, 1900, there was really no system of workers' compensation in this country?
- A. Right. And companies were being sued in Court on some occasions and so they needed workers' compensation in order to better manage that cost.
- Q. You don't dispute to try and compensate workers who are injured on the job --
- 21 A. I am sorry. You are speaking a little fast and 22 low.
- Q. My apologies. You don't contend that there is anything wrong with trying to compensate workers who are

injured on the job?

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- A. There is nothing wrong with trying to compensate workers fairly for their losses.
- Q. So in toto these documents, Doctor, in looking at all of them that we just discussed, not one of them references a hazard associated with valves, correct?
 - A. I am sorry. Not one of them has --
- Q. I will speak up. I am sorry. All the documents we just talked about that were shown to you on Direct, none of them reference a hazard associated with valves specifically, correct?
- 12 A. Right.
- Q. And same is true with gaskets and packing.

 14 They don't specifically --
- A. Besides the British document that's talks about jointings, I think that is right.
- Q. None of them are actually created by Crane Co.

 18 other than the advertisement of themselves?
 - A. Right. I have never seen any internal Crane
 Co. documents, at least I can't recall having seen any.
 - Q. Let's switch gears again. I want to talk to you about some other industries. For instance, you expect as an expert in your field that premises owners should be responsible for what goes on in their work

sites regardless of whether anyone else brings a hazardous material to that work site?

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- A. Well, if you control an industrial premise and you bring people on to do work for you, you have some responsibility to try to assure that they don't unnecessarily create hazardous conditions, sure.
- Q. In fact you have testified in the past I think that you believe industrial employers have complete control over what happens on their industrial premises, correct?
- A. Well, certainly nobody walks into an oil refinery without being allowed onto the premises by the guards, and that's true for all kinds of industries as far back as I can remember.
- Q. By the 1950's industrial hygiene techniques like the ones we talked about there were referenced in the Merewether study and others which help keep dust levels down were available and well known to employers, correct?
- A. Well, they were to employers that had some sophistication in the field of industrial hygiene and industrial medicine certainly.
- Q. These controls and techniques in the '50s and '60s included engineering controls to help reduce the

amount of dust, correct?

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- A. All the things we already talked about.
- Q. You have mentioned education of workers, housekeeping methods, right?
 - A. Right.
 - Q. All those were available in the '50s and '60s?
- 7 A. They were.
 - Q. All the precautionary measures were published in the medical and industrial literature and Governmental reports through the years too, weren't they?
 - A. These are things that have repeatedly been noted as general good practices in writing on industrial hygiene and occupational medicine, dust control, education of the worker, warnings on products that say what's in it and not some GX42 trade name that doesn't tell you the stuff is 95 percent benzene, absolutely.
 - Q. An employer has a responsibility to warn its workers of dangers posed by products used at the work site?
- A. To the extent that the employer knows about that, yes.
- Q. So it is your testimony if it is shown that an employer is aware of the hazards of using a particular

1 toxin or substance they should be in a position to warn 2 those employees, correct? Α. Yes. 3 You believe that employer has a duty to 4 Q. 5 determine what is hazardous in the workplace, and 6 educate the worker, true? 7 Α. Yes. An employer is well-positioned to warn its 8 employees about occupational hazards which the employer 9 knows about, correct? 10 11 Α. Right. 12 An employer is in the best position to Q. 13 implement safety measures to reduce occupational hazards 14 and to protect workers from hazards the employer is 15 aware of? 16 Α. Yes. 17 And that includes training and holding safety Q. 18 meetings, and employer is in the best position to do 19 that as well? 2.0 Α. Yes. 2.1 You would include the Navy in the category of Q. 22 employers, correct, sir? 23 Α. Sure.

Q. You would agree that employers were obligated

- to protect their employees from hazards about the -- I

 am sorry, strike that. Since 1971 in fact that

 obligation to protect workers in the workplace has been

 a legal obligation, correct?
- A. Well, yes, to the extent that the OSHA regulations address it.
 - Q. And you -- I think you testified earlier, you have always been involved and given the opinion that it is always an ethical obligation?
 - A. I am sorry?

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- Q. You have always thought that's been an ethical obligation whether it is legally imposed duty or not?
- A. Sure. Employers should try to keep their employees from getting occupational diseases.
 - Q. I want to drill down a little bit more on the Navy if we can. You would agree with me, Doctor, by 1930 at the latest the U.S. Navy was putting asbestos material on ships, correct?
- A. I don't know for sure but probably that's true, probably used in some of the insulation products they were using.
 - Q. Well, we know for instance that the Navy uses asbestos insulation extensively from the '30s up through the 1970's, fair statement?

A. Certainly sometime in the '30s they were using it and probably they were using insulation containing asbestos well before that.

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- Q. Well, let's -- I want to be clear. As part of your research and I believe it is discussed in your certainly well documented book you looked at what the Navy used with respect to asbestos and what they knew about asbestos hazards, correct?
- A. I didn't look at all of the usage of asbestos that they did. I certainly was interested in their documentation of any awareness about the hazards of asbestos which they started publishing in the early 1940's.
- Q. You are aware from your own research that by 1918 the United States Government was clearly aware that asbestos was a health hazard, correct?
- A. Well, the Bureau of Labor Statistics recorded by Hoffman that I mentioned on Direct talked about that the life insurance companies not wanting to sell life insurance to asbestos workers. That was a government publication.
- Q. In 1932 a man named Dr. Albert Russell who worked for the U.S. Public Health Service issued a report about insulation work causing asbestosis,

correct?

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- A. Well, he presented a case of asbestosis in a government worker who had worked as maintenance worker in government hospital and had been identified as having disability from asbestosis and was compensated for that by the Government. That was reported in 1932.
- Q. Well, let me ask you this question. Do you understand that the United States Navy published documents relating to the health risks associated with asbestos as early as the 1940's, correct?
- 11 A. That's what I said.
- Q. I am sorry. I wanted to make sure we agree.

 The Navy was using asbestos certainly by the 1930's?
- 14 A. Yes.
- Q. And they were publishing documents on hazards by the 1940's, is that fair?
- 17 A. Early 1940's.
- Q. Early 1940's. In fact -- skip back. Let me
 go back to 1939 for a second. In 1939 there was
 something called the Annual Report of the Surgeon
 General of the U.S. Navy. In that document the Surgeon
 General expressed concern over asbestos exposure of
 insulation workers, correct?
- 24 A. Yeah, it was called the Annual Report for the

Year 1939 and it was published in 1941.

- Q. Okay. We will keep it the way it is.
- 3 Are you familiar with that document?
- 4 A. Yes.

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- Q. You would agree in that document the Surgeon General concluded that asbestosis is an industrial disease of the lungs incident to the inhalation of asbestos dust over long periods and is distinct from silica. The development of the disease depends upon the concentration of the dust, size of dust particles and the length of exposure, correct?
- A. I really don't recall the exact text, but I know that they acknowledged the hazard of asbestos in that report.
 - Q. That's good enough. Thank you.
 - Certainly from reviewing that publication as part of your research you were able to conclude that by -- when it was published early 1940's Navy was aware that asbestos can cause disease, correct?
 - A. Yes.
 - Q. Are you familiar with another document at that time period, a handbook called The Handbook of the Hospital Corps of the United States Navy?
- 24 A. I may have seen it. I don't remember that.

- Q. I will warn you it is actually referenced in your book?
 - A. Okay. I haven't looked at it in a long time.
 - Q. Don't drop the book on your foot.
- 5 A. There were a couple of documents from the early 6 '40s that I reference in the book.
 - Q. Do you recall a document in the early 1940's in which Navy for lack of a term, the brass or higher ups were discussing the idea that the Navy is not adequately protecting its members from asbestos hazards?
- 11 A. That's an internal memo. I think that was from 12 1941.
- Q. That was a Navy document?
- 14 A. Yes.

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- Q. So the Navy in an internal document is concerned that they weren't protecting workers and sailors well enough in 1941, right?
- A. I think they were mainly talking about people that worked on the docks, yes, but certainly people in the Navy yards, Navy shipyards that I think were the subject of that.
- Q. Let's skip to 1943 memo from the Chief of Bureau of Ships entitled Insulation Water Repellant Amosite For Cold Water Piping.

Do you recall that?

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- Yes, I recall that. Α.
- In that memo the Chief of the Bureau of Ships Q. discusses the possibility of using mineral wool as a safer alternative to amosite asbestos for insulation, correct?
- I am referring to my book to refresh my recollection.
- Please do. 9 Ο.
 - Yes, that's right. They talk about the use of mineral wool instead of amosite. They say they were doing some testing.
 - And just so we all have the same understanding Ο. the Chief of Bureau of Ships recommended that medical and hygiene makers be observed for workers handling amosite asbestos, correct?
- 17 Α. Yes.
- 18 1943. The Chief of the Bureau of Ships of the 19 U.S. Navy, that's a fairly high ranking officer in the 20 Navy, correct?
 - Α. Sounds like it.
- In fact aren't you aware that that's the highest ranking individual in the Navy that is directly 23 responsible for procuring materials in building Navy 24

ships?

- A. I didn't know about that.
- Q. So there is no doubt in your mind that by 1943 the Navy was aware of asbestos as a hazard, and they were looking at ways to minimize those hazards, correct?
- A. Certainly some people in the Navy were aware of that and were trying to do something about it. That's right.
- Q. You are also aware that amosite asbestos was commonly used on military vessels throughout the mid 20th Century, correct?
- A. Probably. I mean it was common components of insulation materials. I think they were mostly chrysotile, but some of them also contained amosite.
- Q. And in thermal insulation materials like pipe covering, like block insulation are used extensively on U.S. Navy warships during that time period, correct?
- A. Yes.
- Q. There are many reasons for that. It was lighter. It could stop the spread of fire. Do you agree with that?
- A. Well, that was one reason. They wanted an insulation material, pipe insulation that wouldn't catch fire so mineral wool would have worked just as well.

- Q. Also help with containing the heat?
- A. Well, that was the purpose of the heat insulation, yes.
- Q. Amosite, thermal insulation was lighter weight than other types of insulation, correct?
- A. I think so but again the technical details are limited in the articles that talk about that.
- Q. Well, are you aware from your research that ship weight was a concern because of certain trees that were in effect that limited the tonnage of Naval warships though to enable to carry more armaments and weaponry, weight had to be sacrificed in other areas?
- A. Right.

2.1

- Q. World War II airships, those that were contracted for, laid down and commissioned in and around the time of World War II, those typically had miles of asbestos-containing pipe insulation aboard them, correct?
 - A. Probably. I don't really know, but based on what I have read about oil refineries and other industrial facilities there is a lot of length of pipe covering and piping that's present from ships.
- Q. Okay. Now between 1946 and the year after the end of World War II when the Fleischer-Drinker article

- we talked about was published and '64 when Dr. Selikoff
 held his conference are you aware of anyone, anyone
 anywhere in the world criticizing the conclusions in
 that Fleischer-Drinker paper?
 - A. No, they were mostly ignored, not criticized.
- Q. So you are not aware of anyone criticizing those?
- A. No, not until Selikoff's conference in 1964 and then they took a look and this study obviously didn't consider latency.
- Q. Did you also discuss in your book an article entitled Asbestos Dust in a Safety -- volume of the Safety Review published by the U.S. Navy in January, 1947. Do you recall that?
 - A. Yes.

15

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2.0

- Q. Would you agree that that article states that exposure to asbestos dust is a health hazard which cannot be overlooked in maintaining an effective industrial occupational hygiene program?
 - A. Yes.
- Q. You are familiar also, Doctor, with an article
 by a Navy captain Earnest Brown published in the early
 1940's entitled: Industrial Hygiene in the Navy and
 National Defense?

A. That was published in 1940.

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- Q. 1940. Captain Brown listed asbestosis as suspected occupational hazard of shipyard work in that article, correct?
- A. Right. They had not identified any cases of asbestosis at the time he wrote that.
 - Q. But he was suspecting that might be a problem?
 - A. They were looking for them. They were starting to do periodic medical surveys of people in shipyards.
- Q. Speaking of Philip Drinker you are aware of a letter he sent to the Bureau of Medicine and Surgery,
 U.S. Navy Department to the attention of a Captain
 Thomas Carter dated January, 1945, correct, sir?

 If it helps you at all I will represent it
 - If it helps you at all I will represent it dealt with bath iron works.
- A. I just don't happen to remember that or see it.

 17 Do you have a reference to it in my book?
- 18 Q. Let me see.
- A. I know there was something in 1944, but it is not about bath iron works.
- Q. The reference I had to it is to some prior testimony. You know what, in the interest of time we can move along.
- By the mid '50s, Doctor, the Navy was

recommending an internal memo that Navy personnel implement the threshold limit value of five million 2 particles per cubic foot of air, correct? 3

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- I think they referred generally to the list of Α. the threshold limit value saying that it would be to try and comply with those throughout Navy operations. wasn't about asbestos.
 - And did they adopt that for asbestos?
- Well, the indication is somebody sent out a memo saying this is what we should do. I don't know exactly what happened after that.
- And that would be of that 5 million particles 0. per cubic foot, correct?
- That was the asbestos exposure limit in the 14 15 list.
- Okay. You seen a letter from Murray Brown, Chief Occupational Health Program of the Public Health 18 Service to Vice Admiral R.B. Brown, Chief, Bureau of 19 Medicine of the Navy dated July 30, 1968?
- 2.0 Yes, I think so. The name is certainly 2.1 familiar.
- 22 Do you recall whether in that document the 23 Navy is organizing meetings to coordinate efforts to deal with the asbestos problem? 24

- 1 A. That sounds -- I think that's correct.
 - Q. And do you remember -- are you familiar with a document that same year authored -- a Naval memorandum 1968, entitled Hazards of Asbestos, author by W.R.
- 5 Ribleit, R-I-B-L-E-I-T?
 - A. I vaguely remember that.
 - Q. Do you recall that document concluded the U.S. Navy is well aware of the hazards of asbestos to its employees engaged in ship construction and ship repair at Naval shipyards?
- 11 A. No.

2.1

- 12 Q. You don't remember that?
 - A. I don't remember the exact language in the document. We are doing -- you are making a legal record here. I am not disputing that. I just don't have the document in front of me.
 - Q. Do you recall whether or not in that Ribleit memorandum that Mr. Ribleit concluded that asbestos-containing gaskets and packing are not friable when cut and do not cause dust in shipboard applications and are not considered to be a significant health hazard; do you recall that?
- A. I really don't recall the detailed text, and I
 have never heard of this Naval bureaucrat other than

- 1 seeing his name on that document. 2 MR. LOWERY: May I approach, your Honor? 3 THE COURT: You may. I will approach, Doctor, and hand you the 4 memorandum and see if that refreshes your recollection. 5 6 Α. Thank you. 7 Q. Thank you. Okay. I see the part that you read about 8 9 packings and gaskets. It says considered to be -- not 10 considered to be a significant health hazard. 11 This is an internal Navy Memorandum in Q. Okay. 12 1968, correct? 13 Α. Yes. 14 The idea -- skip that. Let me ask you this question. Certainly by 1968 the Navy should have taken 15 16 precautions to protect persons working on ships from the 17 hazards of asbestos, fair statement? 18 Α. Yes. 19 By 1968 the Navy was definitely aware of the Q. 20 hazards posed by asbestos aboard ships and persons in 2.1 the Navy were actually publishing on that topic, 2.2 correct?
 - A. Well, there was one publication in 1964, yes.
 - Q. You understand that the Navy has complete

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1
   control over of what goes on aboard its vessels,
2
   correct, sir?
             Aboard its vessels?
3
         Α.
             Aboard its vessels.
         Q.
 4
5
         Α.
              I would think so, sure.
 6
              By 1962 the Navy already knew there were risks
         Q.
7
   associated with working around asbestos-containing
   products, correct?
8
9
         A. Certainly some people in the Navy were aware of
   that.
10
11
              And the Navy was also aware of safety
         Q.
   precautions that could be used to minimize that risk,
12
13
   fair statement?
14
              Certainly some people in the Navy were aware of
   the safety precautions that could be used.
15
16
         Q.
              That was true in the '50s and throughout the
17
    1960's, fair statement?
18
         Α.
              Right.
19
              You would agree with me, sir, that there is
         Q.
20
   nothing that Crane Co. knew in the 1950's that the Navy
2.1
   did not already know with respect to the hazards --
2.2
   potential hazards of asbestos, correct?
23
             Will, as far as I am aware, that's correct.
         Α.
```

Same was true in the 1960's?

24

Ο.

A. Yes.

2.0

- Q. You also agree that the Navy had knowledge of the potential hazards of asbestos, that because they had knowledge of that potential hazard it was within the Navy's power to implement the variety of dust control measures, train their sailors and warn of the hazards of asbestos?
- MR. WATHEN: Your Honor, I am going to object at this point. This is again cumulative of all this Navy testimony. They are going to have experts and calls for speculation.
- 12 THE COURT: Overruled.
- Q. (Mr. Lowery) Correct?
- 14 A. I am sorry. The Navy had what?
 - Q. I will read it. You would agree that because the Navy had knowledge of the potential hazards of asbestos it is within the Navy's power to implement the various dust control measure, train their sailors and warn of the hazards of asbestos, correct?
 - A. True.
- Q. And the Navy could have done more to protect its sailors from the asbestos hazards over the years, true?
- 24 A. Yes.

- Q. They had an ethical obligation to do so, didn't they?
 - A. Yes.

13

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- Q. The Navy was in the best position to educate its sailors of the dangers of asbestos in the '40s, '50s, and '60s, correct, sir?
- 7 MR. WATHEN: Your Honor, I object. This is again 8 cumulative.
- 9 THE COURT: I don't know that -- I am going to 10 sustain that objection.
- MR. LOWERY: I am done, your Honor. I will move on to something else.
 - Q. (Mr. Lowery) Let's move on to warnings very briefly. You would agree with me, Doctor, that there isn't anything on equipment, a company could have put on a warning on its equipment that the Navy wasn't already aware of, correct, sir?
 - A. Well, there was some people in the Navy that were aware of the medical and scientific literature on the hazards of asbestos. Warning labels wouldn't have informed those people anything that they didn't know, but the people that actually did the work on the ships maybe didn't know nearly as much about what was in the medical literature.

- Q. Certainly there were elements of the Navy that were well aware of those issues, correct?
- A. There were people in the Navy that were presumably well aware of the hazards of asbestos.
- Q. OSHA was actually the first governmental agency that required a warning on asbestos-containing products, true?
 - A. Right.

2.1

2.2

- Q. That was '72?
- A. Right.
- Q. That OSHA warning requirement only applied to products with exposures could exceed the then permissible exposure limit of 5 fibers per cc, correct?
- A. That or the short time ceiling limit of 10 fibers per cc for a 15 minute period of time.
 - Q. The language that was contained in the OSHA warning label would not have conveyed any information to the Navy that it did not already know, correct?
 - A. Well, again there were people in the Navy that knew plenty about the hazards of asbestos, but not all the people that worked on the ships and handled the products that were coming in to the shipyards knew anything about asbestos.
- Q. Let's talk about something a little bit

1 different. You certainly in researching and putting together your book looked at a question of companies 2 that made asbestos thermal insulation like those that 3 the workers in Dr. Selikoff's study worked with, 4 5 correct? 6 Α. Right. 7 Q. It is your position that those companies that made those types of products either knew or should have 8 known the products were extremely dangerous, correct? 9 Yes. 10 Α. 11 You are familiar with manufacturers of various Ο. 12 insulation materials used in both the Navy and the 13 industry like Johns-Manville, correct? 14 Α. Yes. 15 Pittsburgh Corning? Q. 16 Α. Yes. 17 Q. Mundet? 18 Α. Yes. 19 You know that some of those were very large 0. 20 suppliers of insulation, correct? 2.1 Α. Yes. 22 And in particular Johns-Manville was a massive asbestos company that made all sorts of asbestos-23 24 containing products including various types of

1 insulation material, correct? 2 They were the industry leaders. And many of these products contained amphibole 3 Q. asbestos like amosite, correct? 4 5 Your Honor, I am going to object to MR. WATHEN: 6 that as vague. There are numerous products that were 7 made. If he wants to ask about a specific one, otherwise it is very confusing and a global question and 8 9 vague. 10 MR. LOWERY: Sure. I am happy to. 11 Thermobestos, a pipe covering made by Q. 12 Johns-Manville contained amosite? 13 Contained chrysotile and amosite I believe. Α. Unibestos made by both Unarco and Pittsburgh 14 Corning pipe covering contained amosite, didn't it? 15 16 Α. Yes. 17 Mundet pipe covering? Q. I don't know. 18 Α. MR. WATHEN: Your Honor -- I am sorry. 19 2.0 Α. I don't know about Mundet's product 2.1 composition. 2.2 Doctor, if the record in this case is that Q.

these companies made asbestos-containing thermal

insulation products and supplied them to the Navy that

23

- were used on vessels in which Mr. King worked, is it
 your opinion these companies either had actual knowledge
 or should have known of the hazards of those products?

 A. Are you talking during the 1960's?
 - Q. Yes, sir.

6

7

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- A. And the companies are Mundet, Johns-Manville and --
- Q. Pittsburgh Corning.
- A. -- Pittsburgh Corning. Pittsburgh Corning didn't make these products --
- Q. Or Unarco.
 - A. Unarco all those companies had experiences that should have informed them, did inform them of the dangers of asbestos prior to 1960.
- Q. Do you believe, sir, isn't it true you believe by the 1940's at the latest makers of thermal insulation should have known that their products were dangerous?
- 18 A. Yes.
- Q. And it is your opinion that these insulation companies were negligent in failing to warn about the harms of asbestos?
- MR. WATHEN: Your Honor, I am going to object. He has made objections to my questions which were remotely like that. Since this is a general expert I am going to

make the same objection to strike that question.

THE COURT: He asked him whether they were negligent. That calls for a legal conclusion. I will sustain the objection.

- Q. Now, certainly by 1960, Doctor, it is your position that companies that made a product that contained asbestos should have known that there were risks associated with those products, correct?
 - A. Any product that contained asbestos?
- Q. That's a fair point. Let's talk about thermal insulation products by 1960.
- A. Well, those companies should have known. Any company that was using asbestos as a raw material in the manufacture of products should have known that asbestos was harmful any time since the 1930's based on what was publicly available in the medical and industrial circuits.
- Q. Okay. And that would include companies that used asbestos as a raw material in their products that supplied equipment or components or insulation to the Navy, correct?
- 22 A. Yes.

2.1

Q. Those companies should have known the risk and should have warned, correct?

```
1
         Α.
              Yes.
              If they didn't warn it is your belief that
2
         Q.
   those companies were creating an unreasonable risk from
3
   a public health perspective, correct?
 4
5
         MR. WATHEN:
                       Your Honor, same objection.
 6
         THE COURT: Overruled.
7
         Α.
             Yes.
             And if they didn't warn it is your opinion
8
   their conduct was unreasonably dangerous, correct?
9
10
         Α.
              Yes.
11
              Would you agree, Doctor, that companies that
         Q.
   manufactured boilers such as Foster Wheeler and Babcock
12
13
   & Wilcox had this information available to them --
14
         MR. WATHEN:
                       Your Honor -- I am sorry. Go ahead
15
   and finish your question. I am sorry.
16
         MR. LOWERY: -- had this information available to
17
   them and knew or should have known about that asbestos
18
   was hazardous?
19
         MR. WATHEN: Your Honor, I object. Can we
20
   approach for just one moment?
2.1
                   (An off the Record discussion was held
2.2
                   at the Bench outside the hearing of the
23
                    jury.)
24
              (Mr. Lowery) Doctor, I have heard you testify
         Q.
```

in the past that floating dust in the air does not respect a job classification, correct?

A. Yes.

2.1

- Q. A worker -- a worker is at risk when asbestos materials are disturbed and other people around the insulation are at risk as a bystander exposure, correct?
 - A. That's true with any asbestos product, yes.
- Q. In fact you believe that if asbestos is being disturbed anywhere in a room, everyone in the room will be exposed, correct, sir?
- A. Well, maybe -- it depends how long they stay in the room but, yeah, the stuff tends to get disbursed and diffused throughout the room.
- Q. Now, one of the things you talk about in your book, Doctor, is the fact that some companies that manufacture thermal insulation actually work to conceal, to withhold the knowledge of the hazards of asbestos from other entities and individuals, correct?
- MR. WATHEN: Your Honor, we object for relevance on the whole point of his being allowed these questions, goes to causation, has nothing to do with other type of legal claims like conspiracy that he is trying to inject. It's completely irrelevant.
- MR. LOWERY: Can we approach on that?

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1
              (A discussion was held at the bench out of the
2
              hearing of the jury and was not reported.)
              Doctor, thanks to that very nice side bar we
3
         Q.
   had from the Judge I am done. Thank you so much for
4
5
   your time.
6
         THE COURT:
                     Thank you, Mr. Lowery. We will go on
7
   with Redirect.
         MR. WATHEN: Yes, your Honor.
                                          Thank you.
8
9
                            REDIRECT EXAMINATION
10
                            BY MR. WATHEN:
11
              Dr. Castleman, you were asked a lot of
         Q.
   questions about the Navy and what they were doing and
12
13
   what they were not doing and whether they were in the
14
   best position to do some things, do you recall that?
15
         Α.
              Yes.
16
         Q.
              I would like to ask similar questions to
17
    follow up on that. Now, Dr. Castleman, was Crane using
    asbestos since at least the 1930's?
18
19
         Α.
              Yes.
2.0
         Q.
              If not before?
2.1
              Probably before.
         Α.
22
              Selling Crane products since the 1920's, does
         Q.
   that sound familiar?
23
24
              I believe they were selling asbestos products
         Α.
```

```
as well as using asbestos in their own pipes.
1
2
             Sorry. My handwriting it not very good there.
         Ο.
   It is getting worse if that's possible. Judge, do you
3
   have a crayon I could use? Might be more appropriate.
 4
5
   That's okay, your Honor. Thank you.
 6
             Dr. Castleman, they talk about Navy publishing
7
   hazards. Was Crane ever publishing or issuing warnings
   about asbestos hazards in the 1940's or any other time
8
   to your knowledge?
9
         MR. LOWERY: Objection, asked and answered.
10
11
         THE COURT: I will overrule it.
12
             No.
         Α.
13
         THE COURT: Let's try to stick to new material.
14
                       He opened the door just on these
         MR. WATHEN:
15
   items.
         THE COURT: I will give you some latitude.
16
17
              (Mr. Wathen) Dr. Castleman, was Crane doing
         Q.
18
   anything to protect users of its products with regard to
19
   the hazards of asbestos to your knowledge since the
   1940's or before or since?
2.0
2.1
         Α.
             No.
22
             Dr. Castleman, did Crane in the mid 1950's
23
   before or any time since ever discuss or inform users of
24
   its products to keep dust levels low when using those
```

products?

2.0

2.1

2.2

- A. No.
- Q. You were asked a lot of questions again about the Navy and was the Navy aware. And I just want to make sure we are clear about what this Navy is that they are talking about as far as knowledge of asbestos hazards.

During all your research have you ever seen anything that individual sailors as a group working in the engineering spaces on ships from the 1920's to the 1960's were aware of the hazards of the asbestos products like those that Crane sold at any time?

- A. No.
- Q. Dr. Castleman, who is in a better position than a company that manufactures and sells asbestos products to understand the hazards of its products? Is anyone in a better position than that company?
- A. I don't think so. I mean the seller of the products -- once they know asbestos dust is dangerous the seller of the products knows better than, you know, some industrial hygienist that works for the Navy or some doctor who walks through some Navy yards all the ways in which their product is used that might create dust.

24 The seller of the product knows that because it

is integral to the marketing and the sale of their products is to know that in extraordinary detail.

2.1

2.2

And so if they have the knowledge that the dust is lethal then they know all the ways in which the use of the product can generate dust including those that some of which may not have been obvious to people doing surveys and writing tables and Navy reports and things like that.

- Q. Is the manufacturer or seller of the asbestos products in the best position to research the hazards -- potential hazards of its products?
- A. Sure, because they know the ways in which the product is used. They know what kinds of activities to do air sampling and testing on in order to see the extent of the dangers that the individual tests in which their product is ordinarily or foreseeably used, what those tests might give rise to in terms of exposures and risks.
- Q. If a company has a known toxin such as asbestos in its products that it is selling and that company during the 1950's, 1940's, the 1960's fails to research the potential health hazards of that asbestos, is that failure to do so unreasonable on the part of the company?

MR. LOWERY: Objection, calls for a legal

conclusion.

2.1

THE COURT: Overruled.

- A. Well, if they know that asbestos is lethal, if they know about the scientific literature on asbestos and disease then they are in the best position to determine the extent of the hazards associated with all the ways the product is used and of course to provide warnings to people who are going to be using their product.
- Q. And failure to do so, would that be unreasonable?
- 11 A. I think so.
 - Q. Now, counsel has mentioned or asked you about whether there were any studies prior to 1990 concerning disease specifically from gaskets. Do you recall that question?
- 16 A. Yes.
 - Q. So -- and you weren't aware of any?
 - A. I wasn't even aware of any exposure

 measurements that had been published prior to the 1990's,

 let alone studies of disease associated with the

 products.
- Q. So, Dr. Castleman, does that mean that Crane
 Co. never conducted gasket studies over the decades
 concerning either exposure levels or disease pertaining

```
to the asbestos gaskets they sold?
2
         MR. LOWERY: Objection, calls for speculation, lack
   of foundation.
3
         THE COURT: Overruled.
 4
             As far as I know that's right.
5
 6
             Last question, Dr. Castleman. You were asked
         Q.
   about questions again about the Navy, a lot of questions
7
   about the Navy and asbestos.
8
9
              Dr. Castleman, in your book is there a
10
   reference to a colloquial expression of the tendency of
11
   companies that supplied asbestos containing products to
   the Navy to say they insisted upon those products
12
13
   pursuant to their specifications?
         Α.
14
             Yes.
15
         MR. LOWERY: Objection, vague, calls for
16
   speculation.
17
                       What is that called?
         MR. WATHEN:
18
         THE COURT: I will allow you Recross on that.
19
   Overruled.
2.0
             I think you are referring to the claim by some
2.1
   manufacturers that they had to use asbestos in their
22
   products because it was required by military
23
   specifications under which the products were purchased by
24
   the Government. I don't think that the military
```

```
1
   specifications really bear that out, but that line of
   reasoning has been referred to as "the devil made me do
2
   it" defense.
3
                       Thank you, Doctor.
 4
         MR. WATHEN:
5
         THE COURT: You may recross on that point.
 6
                            RECROSS EXAMINATION
7
                            BY MR. LOWERY:
              Do you recall, sir, one of the first questions
8
         Q.
   I asked you in cross examination was: You don't
9
10
   consider yourself an expert in military and Navy
11
   specifications. Do you recall that question?
              That's right.
12
         Α.
13
         Ο.
             And the answer was?
14
              I am not an expert on it.
         Α.
15
         MR. LOWERY: Right. Thank you.
16
         THE COURT: Okay. The jurors are going to be given
17
   an opportunity to ask Dr. Castleman any questions they
18
   might have. This will be our last witness for the day.
19
   We are about quarter till 4 here so we have a little
2.0
   time to do this. If you want to formulate any questions
2.1
   we have plenty of time to do that. If you do we will
2.2
   have them handed down to Dana and take a minute to
23
   consider the questions and have him address them.
24
              (Pause.)
```

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THE COURT: Raise your hand if you are working on a
1
2
   question. No questions, okay. Thank you, Dr.
   Castleman.
3
         MR. LOWERY: Your Honor, he has to stick around.
 4
5
         THE COURT:
                     We are going to go ahead and have you
6
   jurors go out for just a short break. Probably you will
7
   be finished here. We will call you back in to give you
   the schedule for tomorrow. Okay.
8
9
                   (Jurors exit courtroom.)
10
                   (The following proceedings were had out
11
                   of the presence of the jury.)
         MR. LOWERY: Your Honor, very brief.
12
13
                   (The following is an offer of proof
                   held in this cause.)
14
              (Mr. Lowery) Doctor, would you agree with me
15
         Q.
16
   that companies that manufactured boilers such as Foster
17
   Wheeler and Babcock & Wilcox had this information with
   respect to the hazards of thermal insulation that
18
19
   contained asbestos available to them and knew or should
2.0
   have known that asbestos was hazardous?
2.1
         MR. WATHEN:
                       Excuse me. For the record you are
22
   asking about those two specific companies? I think you
23
   said "companies like" and I think the nature of this is
24
   it has to be very specific.
```

```
1
         MR. LOWERY: You want me to rephrase?
2
   rephrase.
         MR. WATHEN: If you don't mind. I don't want to
3
   drag this out.
 4
5
         MR. LOWERY: I literally had three questions.
6
         MR. WATHEN: If we are going through this exercise
7
   I want it to be accurate.
         MR. LOWERY: The term might be a problem I think
8
   with "such as".
9
10
         MR. WATHEN: Yeah.
11
              (Mr. Lowery) Would you agree with me, Doctor,
         Q.
   that companies that manufactured boilers, particularly
12
   Foster Wheeler and Babcock & Wilcox had information
13
14
   available to them regarding the use of
15
   asbestos-containing thermal insulation and knew or
16
   should have known that that asbestos material was
17
   hazardous?
18
         MR. WATHEN: Your Honor, and I apologize to
19
   interrupt, but I think it has to be amosite asbestos.
2.0
   will withdraw it please. I am sorry.
2.1
         THE COURT: Okay.
2.2
              May I answer?
         Α.
23
             Answer it, sir.
         Q.
24
         Α.
                     I think I have seen documentation on
```

- Foster Wheeler from the '40s; Babcock & Wilcox I don't remember how far back it goes, but certainly with Foster Wheeler there was knowledge in the late '40s, early to late '40s that there were hazards associated with asbestos that was available to Foster Wheeler.
 - Q. And to clarify Mr. Wathen's issue, would your answer be the same if this was thermal insulation that contained amosite asbestos?

2.0

2.1

2.2

- A. Well, I wouldn't think that the literature distinguishes between chrysotile and amosite insulation.

 It is all called asbestos.
 - Q. Okay. Same question with respect to turbines manufactured by General Electric and Westinghouse would you agree with me that those companies had information available to them that amosite containing thermal insulation would have been hazardous and they knew or should have known that fact?
- A. Well, if you just call it asbestos-containing thermal insulation I would say yes.
- Q. Fair enough. Would you agree with me that by the 1940's the following companies had information about asbestos available to them and knew or should have known about the -- that asbestos was hazardous. Those companies like Babcock & Wilcox, Mundet, Westinghouse,

```
1
   General Electric, Pittsburgh Corning and Johns-Manville?
2
              Westinghouse and Johns-Manville only.
   Pittsburgh Corning didn't make asbestos products until
3
   1962.
 4
5
              I will add Unarco. Would you include Unarco
6
   on that list?
7
         Α.
              Unarco knew something in the 1940's; this is in
             Everything in my book is totally reliable.
8
   has been thoroughly fact checked by the best lawyers and
9
10
   scientists money can buy.
11
              Just so we have a clear record, Unarco,
         Ο.
12
   Johns-Manville and who was the third one, sir?
13
   Westinghouse.
14
              Westinghouse.
         Α.
15
         MR. LOWERY: Thank you, sir.
16
         THE COURT: And then the nature of the objection
17
   just for the record at the side bar was not on the
   record.
18
19
         MR. LOWERY: Okay. You made the objection.
2.0
         MR. WATHEN: We didn't have it on the record.
2.1
                     He did object.
         THE COURT:
2.2
         MR. WATHEN: I did object.
23
         MR. LOWERY: That's why we are doing the offer.
24
         MR. WATHEN: No, the side bar wasn't on the
```

record, that's right. I am sorry.

2.0

2.1

The objection, your Honor, was that counsel's questions are going beyond the *Nolan* ruling made by this Court. The Court made a ruling that there would be — the evidence that could be admitted with the understanding that it would be supported by expert testimony later on in the case, but Defendant's experts in particular concerning amphibole—containing insulation products, specifically named and identified by the Plaintiff in his deposition thermal insulation which he identified. What counsel —

THE COURT: Which was what?

MR. WATHEN: Johns-Manville and Mundet, and what counsel is attempting to do by adding in their terminology para metal equipment companies to the list of other culprits in this amosite group is improper and goes beyond your Honor's ruling because it is that same insulation that Johns-Manville insulation that is put on those pieces of metal.

Those are not distinct exposures. They put Johns-Manville insulation on pipes. They put it on boilers. Those do not all comprise additional parties because the nature of the -- the whole basis of this Nolan Motion being granted is the amosite asbestos and

so -- and that is the sole proximate cause.

2.0

It has nothing to do with causation the fact that that amosite -- doesn't matter whether it was put on a pipe by ABC brand company, doesn't matter if it was put on a Babcock & Wilcox boiler or a Westinghouse turbine, and by the way I think the turbine testimony I think he was unable to identify the insulation put on there.

well, but even if you identify this thermal insulation which they contend they can prove contained amphibole or amosite which I don't think they have done yet, specifically not for these ships, but if they are going to be allowed to do it, it has just got to be for the insulation products that contain amosite, not adding to the list of culprits to build their mountain of sole proximate cause to include just other pieces of metal that had some name on it like Babcock & Wilcox. Well, that has nothing to do with causation.

That is not probative of the causation opinions that they are going to try to get, whether sitting on a boiler or sitting on a pipe or used for anything else.

The basis of my objection again was their

1 attempt to inject these brand names of these other 2 companies who have had been defendants in asbestos litigation for various reasons, but their burden is 3 completely different. They have to prove amphibole by 4 5 sole proximate cause, and so that's why I object, your 6 Honor. 7 MR. LOWERY: May I be heard? THE COURT: 8 Yes. MR. LOWERY: First off, it is our contention, your 9 10 Honor, that those products, the boilers and the turbines 11 that are identified manufactured by Babcock & Wilcox, Foster Wheeler, General Electric, and Westinghouse all 12 13 incorporated thermal insulation products in both their 14 design specification, and that Mr. King testified to 15 working with and around those products which had that 16 thermal insulation in place that generated dust to which 17 he was exposed, and therefore all of those products 18 would be contributing factors, which by the way Dr. 19 Bedrossian agreed with me yesterday without objection on 20 that point that all of those products would also be 2.1 substantially contributing factors to the creation of 22 his mesothelioma, whether it be sole cause. 23 I think he indicated if that was the only 24 exposure that would be sufficient sole cause, their own

causation expert.

2.0

2.1

Also, your Honor, I would like to add and I forgot to mention at side bar we opened on these very companies, and there was no objection made on that basis. I would contend the Plaintiffs have waived that argument, and we should be allowed to go into that in toto because they waived any objection.

MR. WATHEN: Your Honor, it is our recollection

Miss Romani did in fact object to it, and the burden -
they are conflating the burden of what we have and what

Plaintiff's causation expert will say with regard to

substantial contributing factor.

They have the burden of sole proximate -unusual burden and very high burden, one that we have
never had in an asbestos case. Theirs is sole proximate
cause by amosite or amphibole only. That's it.

THE COURT: So I tend to agree, and as I said earlier I do agree that there is a burden of proof with respect to sole proximate cause.

It is true *Nolan* says you don't have any burden of proof, but it doesn't say that if you undertake to prove anything you then have no standard of proof required. That would be illogical.

So the Defendant doesn't have the burden of

proof. If it however assumes a burden, if it then wants to introduce that something was a sole proximate cause it certainly has some burden of proof to prove that. I mean, it can't just be no burden.

2.0

2.1

Now, the question will be, which Nolan doesn't discuss which I think is an interesting question, I think the answer is it can't be that the Defendant's burden of proving something caused the injury is a lesser burden than the Plaintiff's burden of proving that something caused the injury.

I mean it wouldn't make sense that I could give the jury two instructions, pick A or pick B, and they are equal instructions. One of the causes will be selected as the cause, yet the burdens of proof are different. That wouldn't make any sense.

Now, whether or not something -- whether or not that issue gets to the jury I think, you know, we are kind of talking about the *Thacker* analysis I think. It has to sort of meet that threshold to get there.

In the Bolls (sp.) opinion the Court decided the facts were insufficient to meet that threshold requirement. I tend to disagree with that opinion, not in the analysis that was correct. I think there were enough facts that it should have gotten by summary

judgment but certainly in the Fifth District, but that goes both ways.

2.1

So the Defendant -- I think that the parties have an equal burden to meet if they are going to try to prove something in their case. If they are going to try to prove proximate cause I think you have the same level or burden of proof required as the Plaintiff would have.

Getting those issues to the jury will also be considered similar and not differently. Okay. Now, having said that I think that Nolan allows you to prove that something was the sole proximate cause. You mentioned in your argument, Mr. Lowery, that these other companies were substantial contributing factors. I don't think that's what Nolan says you get to do because that in my opinion gets into the area of confusing the jury with other causes in a joint and several liability state, that is, that is not relevant.

MR. LOWERY: I understand. Just for clarification of the record the questions I asked Dr. Bedrossian were all qualified. I wanted him to assume that those exposures, each one of them asked separately were the only exposures the gentleman had. If that was true would that be sufficient to cause his disease? That in of itself is the sole proximate cause, and he agreed.

THE COURT: As I understand the initial presentation and what you are going to do as your sole proximate cause and you gave me some material I still haven't seen the actual evidence, haven't really had a chance to listen to your experts. Obviously I haven't heard the Plaintiff's whole case to see whether or not he was exposed to the material you say he was exposed to, but there seems to be some indication which is why I allowed you to proceed on that.

2.0

2.1

Again those are going to be questions that need to be addressed at the close of the Plaintiffs' case, the close of all the evidence and eventually we talked about the jury instructions and maybe even after the case is over, but I understand that the sole proximate cause defense is based on his exposure to Johns-Manville and Mundet pipe insulation.

And so for that reason I found the nature of the question injecting the other companies was irrelevant, not probative and likely prejudicial.

Prejudicial effect I think outweighed any probative value in that it would mislead -- or not mislead, but definitely might confuse the jury, go beyond the Nolan ruling and go beyond I think what Nolan allows you to do on that point. For that reason I sustained the

1 objection. Okay. 2 MS. ROMANI: Your Honor, real quick just for scheduling and trying to expedite things, I reviewed the 3 brief on the Longo issue. I think I can address a 4 number of the issues. 5 6 THE COURT: I wanted to talk about that here. 7 Before you do that, not to interrupt you, I don't want to do it that but there is a couple of questions I had 8 about that I am going to have after you done. 9 10 ATTORNEY: The jury is still outside. 11 THE COURT: Have Dana release them to have them come back tomorrow at 9 a.m. instead of 8:30 in case we 12 13 need a little extra time in the morning. Tomorrow morning at 9. Give us a little extra 14 15 time. 16 Real quick, Allyson, before you get into that 17 what I want to sort of question I had about this issue 18 with Dr. Longo is when was he noticed as a potential 19 witness? I assume in December when this case first came 2.0 around. 2.1 MS. ROMANI: Well, he has been on our general 22 witness list for sometime and per the Standing Order

once you disclosed he was a general expert you are

allowed to call them as long as they have been deposed

23

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1
   this case.
         THE COURT: Then specifically with this case?
2
         MS. ROMANI: We discussed this with Miss Behnen
3
   back before December, that there was --
4
5
         THE COURT: Why wasn't the deposition taken?
6
   are we talking about this now?
7
        MS. NICKELSON: Your Honor, they want a video
   preservation --
8
9
         THE COURT: What I want to know is why you
10
   didn't -- I mean Garlock was -- when did that come out?
   2012?
11
12
         MR. LOWERY: No, about a month ago.
13
         MS. ROMANI: His testimony was in July of 2013.
14
         MR. LOWERY: About a month ago.
         THE COURT: His testimony. I thought somebody said
15
16
   that was in 2012.
17
         MR. LOWERY: Are you talking about the Garlock
   opinion?
18
19
         THE COURT: Not the opinion. Somebody said there
20
   was testimony in that case.
         MR. LOWERY: That would have been --
2.1
22
         MS. ROMANI: It was July 7, '13 per what they
23
   attached to their Brief.
24
         THE COURT: Okay. I guess what I am trying to get
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at is why are we bringing this up now, why you didn't do
2
   it sooner? You want to take his deposition based on
   some inaccuracies or discrepancies. Why didn't you do
3
 4
   you that assuming --
         MS. NICKELSON: Your Honor, given that we had 25
5
6
   cases on this docket, and it was in December and there
7
   were also multiple cases. We didn't find out they were
   picking this case as you know until last Thursday or
8
   Friday. We didn't know they were going to call Longo
9
10
   until they said so.
11
         THE COURT: This wasn't Crane's only case.
                                                      Wasn't
   he listed -- I am just trying --
12
13
         MS. NICKELSON: He is listed generally.
14
         THE COURT: But didn't anybody --
15
         MS. NICKELSON:
                         If we went and took everybody's
16
   deposition who they list generally, that is hundreds of
17
   experts, your Honor.
18
         THE COURT: That's the reason for the rule.
                                                       Ιf
19
   they already had their deposition taken it can be
2.0
   utilized. That way you don't have to do that each time.
2.1
         MS. NICKELSON: Which is why we need in this
2.2
   situation to take the deposition because something has
23
   changed.
24
         THE COURT: But then why not when Mrs. -- what was
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her name -- Behnen was apprised of his doing that list
2
   for this particular case --
         MS. NICKELSON: I have no knowledge of that, your
 3
   Honor.
 4
5
         THE COURT: I believe the representation.
6
   kind of gets back to what we talked about in terms of
7
   case management. I really don't like this idea of being
   in the middle of the case and doing deposition issues
8
   and pre-trial issues. I know some of this you have to
9
10
   do in terms of going through objections on video
11
   depositions and things.
         MS. NICKELSON: Right, your Honor, and we have an
12
13
   agreement that experts will be deposed 48 hours prior to
   their testimony, so next week for instance we are
14
15
   putting up Dr. Taylor before he testifies.
16
   discussed that and worked out the timing so that it
17
   doesn't interfere with Court. So we know to do that.
18
   So when we requested Dr. Longo we were then told he is
19
   unavailable.
2.0
         MS. ROMANI:
                       That agreement was made, your Honor,
2.1
   with regard to case specific expert witnesses. It is
2.2
   under the Standing Order that if they decide that they
23
   want to take a general expert that has already been
24
   taken they are supposed to let us know.
```

We haven't filed a supplemental designation 1 2 for him. He hasn't changed his opinion. There is nothing new about his opinions at any time after his 3 testimony in July of 2013. If any defendant in Madison 4 5 County wanted to cross him on that all they had to do is 6 ask any one of the plaintiff's attorneys that have him 7 listed. We want to take his deposition In Re All so we can cross him on this issue. Nobody has done that. 8 9 That's what I was asking. THE COURT: 10 MS. ROMANI: Of note, there have been 24 11 depositions of Dr. Longo since his testimony in Garlock 12 including at least three that I am now aware of where 13 Crane has extensively crossed him. 14 They have had an opportunity to cross him on these issues. I think they posited in their Motion that 15 16 should your Honor allow him in based on other arguments, 17 not based on the inopportunity to cross him they just 18 want to have the opportunity to present potentially the 19 2.0 THE COURT: Impeaching material. 2.1 Exactly, which they certainly have --MS. ROMANI: 22 What else were you going to say on it? THE COURT: 23 MS. ROMANI: Well, I just wanted to point out, your 24 Honor, I have already covered it with the Rule 212 and

```
Standing Order, you know, I read through his testimony
1
2
   and the things they crossed him on are things he gets
   crossed on all the time.
3
              There are a few issues with some of the early
 4
5
   gasket studies. He has published subsequent gasket
 6
   studies. They have gone over all that with him.
7
   has been extensive cross examination by numerous
   defendants, and like I said they are certainly entitled
8
   to present prior depo testimony, prior trial testimony.
9
10
              The Order that they attach that this Judge
11
   issued is merely a finding of fact by that Judge.
12
   was a Daubert hearing. He was not excluded based on
13
   Daubert. He was allowed to testify in those
14
   proceedings. The opinions that are in that Order are
15
   simply the opinions of that Judge. That doesn't
16
   necessarily mean that his studies are now
17
   unscientifically sound because a Judge in a bankruptcy
18
   hearing decided that they didn't think that they were
19
   relevant and --
2.0
         THE COURT: But you are saying they would be
2.1
   allowed if they choose to bring in his testimony in that
22
   hearing or that case or other deposition testimony that
   might where he may --
23
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MS. ROMANI: Yeah, I mean he was extensively

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crossed on these issue in the Seaborne deposition.
2
         THE COURT: But they can do that you are saying in
   this case?
3
                       Well, they can certainly present what
 4
         MS. ROMANI:
   they would like to --
5
         THE COURT: Have the jury hear.
7
         MS. ROMANI: -- have as evidence, yeah, and if
   your Honor decides that it is admissible which I mean it
8
   is prior deposition testimony. I don't know how it
9
   could not be.
10
11
         MS. NICKELSON: Your Honor, I think we are mixing
12
   up discovery depositions and evidence depositions.
13
   can -- yes, we could have noticed and taken the
14
   discovery deposition of Dr. Longo whenever we wanted,
15
   but they are wanting to use this as evidence in front of
16
   the jury. Therefore they, you know, they didn't
17
   schedule him properly so now we are being punished
18
   because he can't come testify live.
19
         THE COURT: How is he not scheduled?
2.0
         MS. NICKELSON: He is not available for this trial
2.1
   even though they listed him as a witness.
2.2
         THE COURT: It sounds like they have done
23
   everything that's required under the Standing Order to
24
   present his deposition.
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MS. NICKELSON: I think that applies to discovery
1
2
   depositions, your Honor, not evidence depositions.
   Using an evidence deposition in another unrelated case
3
   that has no Navy, that had nothing to do with Navy
 4
   exposures, had multiple differences which we outlined in
5
6
   our Brief and trying to sub that in here --
7
         THE COURT: Can't you bring in other deposition
   testimony of his?
8
9
         MS. NICKELSON: We can certainly impeach him, your
10
   Honor, but he should be here live to testify or there
11
   should be an evidence deposition in this case, and I
   think that's what the Standing Order says.
12
13
         MS. ROMANI:
                       That's not what Rule 212 says
14
   actually, your Honor. Any deposition which is properly
15
   taken and filed in any Illinois action may be used at
16
   trial in an Illinois court. The fact that this case
17
   involves exposure to Crane valves on a Navy ship versus
18
   Seaborne where they involved Crane valves in industrial
19
   and commercial setting is totally irrelevant. He wasn't
20
   deposed as a case specific expert in Seaborne. It
2.1
   doesn't matter where the valves were at.
22
         THE COURT: We do rely on Rule 212 in the Supreme
23
   Court Rules.
24
         MS. ROMANI: I agree. I don't think the Standing
```

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1
   Order differentiates between an evidence and a discovery
2
   deposition. The reason behind that rule was so that we
   didn't have in every single case the general experts
3
   going up and being deposed on the exact same issue.
4
5
         MS. NICKELSON:
                          You are saying we should have
6
   noticed the deposition. We would have only noticed the
7
   discovery deposition. We would not notice an evidence
   deposition.
8
9
         THE COURT: Unless you want to subpoena him and
10
   bring him in for your case. Nothing precludes you from
11
   doing that.
         MS. NICKELSON: We keep talking about this is what
12
13
   is done like they list it and we know this is coming.
14
   That is not how evidence depositions work. They notice
15
16
         THE COURT: It is unusual, but I am saying that
17
   there is nothing that would preclude you from doing
18
   that.
19
         MS. NICKELSON: I think in this case it is highly
20
   prejudicial of the way it is being handled. I am going
2.1
   to look at -- I did read the Brief. I flipped through
22
   it. It wasn't that long.
23
         THE COURT: I will look at it and make a ruling.
24
   It sounds like -- just tell you, unless I see something
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really drastic, sounds like that they have met the
1
   requirements of the Standing Order and Rule 212.
2
   think if it were me I would probably start planning on
3
   bringing in whatever other deposition testimony you
 4
5
   think you need.
 6
         MS. NICKELSON: We will be able to play that right
7
   after theirs and not wait until our case in chief?
         THE COURT: I think we have to keep it all
8
   together. I think we should do that. So I will look at
9
10
   it though in case there is something --
11
         MS. ROMANI: And, your Honor, I would urge you to
   reference the exhibits because there are a number of
12
13
   statements made in the Brief that don't necessarily
14
   coincide with what exactly is in the testimony.
15
         THE COURT: I will probably look at it. I will
16
   look at the testimony.
17
         MR. LOWERY: May I raise just a general question
18
   where we stand on everything. Are we -- do you have a
19
   sense of how close we are to getting ready to proceed?
2.0
              I don't know how close we are to an agreement
2.1
   on King objections.
2.2
         MR. SHUTTLESWORTH: Real quick, your Honor, on
23
   King I am working with defense. We will have -- which
24
   goes tomorrow. The jury is going to come at 9. We will
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1
   be here at 8:30. I think it takes maybe ten minutes.
2
         THE COURT: You can be here at 8:30. If you are
   here a little before that I will probably be here before
3
   that.
 4
                              I think it will take ten
5
         MR. SHUTTLESWORTH:
6
   minutes of just general page line and be anything too
7
   difficult to knock out, just a couple basic evidentiary
   objections at which point it will be a finalized
8
   product. I will give it to my paralegal and we will
9
10
   have a video ready to play certainly by lunch.
11
         THE COURT: Go through it. I noticed there was
   some hearsay and relevancy objection. Relevancies are
12
13
   pretty low threshold to get it in, but hearsay I mean --
         MS. NICKELSON:
14
                         It is my understanding we will have
15
   a couple issues.
16
         MR. LOWERY: We are much closer on that one. May I
17
   approach?
18
         THE COURT: Yeah.
         MR. LOWERY: This is the objections and counters
19
20
   designations that we have been given to the plaintiffs
2.1
   on the Pantaleoni, P-A-N-T-A-L-E-O-N-I, transcript.
22
   transcript itself is actually not that long, your Honor,
23
   and the counters are -- somewhat depend upon your ruling
24
   but they are even short. But my understanding is our
```

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counsel and their counsel tried to work out an agreement
1
2
   on of that and they --
         THE COURT: When is Pantaleoni going to be offered?
3
         MR. LOWERY: He wants to play that tomorrow as
 4
5
   well. That is the gentleman I am bringing live on
6
   Wednesday.
7
         MR. WATHEN: It is a 15 minute clip. I haven't
   been part of the negotiations, but I think it is pretty
8
9
   much a disagreement --
10
         MR. LOWERY: I think we are at loggerheads.
11
         THE COURT: Pantaleoni is -- what type of expert is
12
   he?
13
         MR. LOWERY: He is not an expert. He is a corporate
14
   representative.
15
         MS. ROMANI: And like Robert said I am working on
16
   addressing their objections. I think we can probably
17
   knock those out pretty quickly tomorrow morning.
18
         THE COURT: We are going to bring them in as
19
   admissions against interest or something?
2.0
         MS. ROMANI: Correct.
2.1
         THE COURT: So what are you saying? They are not
22
   all admissions against interest?
23
         MR. LOWERY: Well, we have some other objections
24
   there, your Honor.
```

```
MS. ROMANI:
                       There is some relevancy objections
1
2
   and --
         MR. LOWERY: I can highlight for you the three main
3
   issues I have are: One, relevancy; two, the fact that
 4
   he was shown a number of documents that he didn't know
5
6
   anything about; and, relevancy, basically for the most
7
   part which would deal with products that aren't an issue
   in this case. I think based on the agreement that we
   had we are not going to get into the insulation sold
9
10
   out, right? That's our agreement?
11
         MR. WATHEN:
                       Right.
12
         MR. LOWERY: So that can go. What was the other
   area I had mentioned?
13
         MS. NICKELSON: Documents, the items not at issue
14
15
   in this case and the third, post sale action.
         MR. LOWERY: Post sale, right. Those are the three
16
17
   main issues. The rest of it I don't have a problem.
18
   Those are my three main issues. Thank you.
19
         THE COURT: So we will be here tomorrow morning.
20
   Anything else?
2.1
         MR. WATHEN: No, your Honor.
2.2
         THE COURT:
                      See you folks in the morning.
         MR. LOWERY: Thank you, Judge.
23
24
              (Trial adjourned to Friday, February 21,
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2014 at 9 a.m.)
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1	IN THE CIRCUIT COURT
2	THIRD JUDICIAL CIRCUIT MADISON COUNTY, ILLINOIS
3	
4	I, Christy Streicher, CSR# 084-002682, an Official
5	Court Reporter for the Circuit Court of Madison County,
6	Third Judicial Circuit of Illinois, reported in machine
7	shorthand the proceedings had on the trial in the
8	above-entitled cause and transcribed the same by
9	Computer Aided Transcription, which I hereby certify to
10	be a true and accurate transcript of the proceedings had
11	before Associate Judge Steve Stobbs.
12	
13	
14	GL
15	Christy Struchn Official Court Reporter
16	Official Court Reporter
17	
18	DATED thisday
19	of February , 20_ <u>14</u> .
20	
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\$	1918 [1] - 81:15 1920's [2] - 103:22,	1970 [3] - 51:8, 51:13, 51:21	387 [1] - 10:6	53:14 academia [1] - 73:11
\$1,000 [3] - 10:20,	105:10	1970's [4] - 32:7,	4	Academy [1] - 48:23
10:23, 11:5	1930 [7] - 21:4,	33:23, 50:21, 80:24		accept [1] - 17:17
\$10 [1] - 11:1	21:13, 23:16, 24:2,	1970s [1] - 53:1	4 [2] - 39:5, 109:19	accepted [2] - 20:13,
\$315,000 [1] - 10:2	25:2, 25:20, 80:17	1971 [6] - 34:18,	400 [1] - 34:9	42:19
\$340,000 [1] - 9:23	1930's [8] - 23:11,	34:21, 35:3, 53:24,	48 [1] - 124:13	access [1] - 62:4
\$400 [1] - 10:17	25:16, 26:20, 43:1,	57:1, 80:2	4b [1] - 1:11	according [2] - 63:5,
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•	103:18	1975 [1] - 53:3	5	account [1] - 40:6
'13 [1] - 122:22	1932 [3] - 24:16,	1976 [2] - 5:11, 16:6	5 [13] - 29:17, 29:21,	accumulation [1] -
'30s [4] - 26:11, 43:9,	81:22, 82:6	1978 [2] - 5:18, 57:8	30:2, 30:20, 31:8,	23:8
80:23, 81:1	1933 [2] - 23:17, 43:5	1979 [4] - 5:18, 7:5,	31:17, 32:17, 33:3,	accurate [2] - 111:7,
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'40s [9] - 36:14,	64:16, 71:1, 71:19	1980 [1] - 17:13	90:12, 96:13	accuse [1] - 70:8
40:24, 53:12, 70:16,	1936 [1] - 74:7	1984 [1] - 15:21	50 [3] - 7:17, 11:5,	ACGIH [5] - 31:7,
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