09:15:11

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COMMONWEALTH OF KENTUCKY
GREENINGS CIRCUIT COURT
Civil Division
C.A. No. 01-C1-00392

DENIZILYE M. DOUGLAS, Individually and as Personal Representative of the ESTATE OF EARL DOUGLAS, Deceased,
Plaintiff,

VS.

ASHLAND INC., U.S.X. CORPORATION, formerly known as UNITED STATES STEEL CORPORATION, and RADIATOR SPECIALITY COMPANY,
Defendant.

ORIGINAL

**DEPOSITION OF RICHARD MONSON**, a witness called on behalf of the Defendant, taken before Lisa W. Starr, a Registered Professional Reporter/Certified Realtime Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Hyatt Regency Cambridge Hotel, Cambridge, Massachusetts, on June 20, 2005, commencing at 9:30 a.m.

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# I N D E X


| Witness | Direct | Cross | Redirect | Recross |
|---|---|---|---|---|
| RICHARD MONSON | | | | |
| (By Mr. Hartley) | 4 | | | |


# E X H I B I T S


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RICHARD MONSON

of lawful age, being first properly identified and duly sworn to tell the truth, the whole truth, and nothing but the truth, deposes and says as follows in answer to direct interrogatories by Attorney Hartley: 09:22:57

Q. Dr. Monson, could you tell us your full name? 09:22:58 09:23:00

A. Richard Redding Monson. 09:23:01

Q. And your present position is what? 09:23:09

A. Professor of Epidemiology at the Harvard School of Public Health and Associate Dean for Professional Education. 09:23:12 09:23:15 09:23:19

Q. You have been retained by, I assume, both Ashland and U.S. Steel in the case of Douglas vs. Ashland and U.S. Steel as an expert witness; is that correct? 09:23:21 09:23:25 09:23:29 09:23:32

A. Yes. 09:23:33

Q. And I have a copy of your reports, and I would assume that you are prepared today to discuss your report and any final opinions that you have reached? 09:23:34 09:23:37 09:23:39 09:23:41

A. Yes. I would only say any current opinions. 09:23:42 09:23:45

Q. Do you have any modifications of your report which I have dated as 4/6/05? 09:23:47 09:23:50

A. Mine is 4/4. I thought I gave up the automatic day change. 09:24:05 09:24:08

Q. In that report you discuss various studies that deal with the development of multiple myeloma and exposure to different substances, correct? 09:24:24 09:24:27 09:24:31 09:24:36

A. Just to be accurate, I would separate it into two types of studies: Those that deal with people with multiple myeloma and those that deal with people exposed to benzene and petroleum products. 09:24:40 09:24:43 09:24:47 09:24:50 09:24:57

Q. Okay. How does epidemiology deal with a cohort such as the Pliofilm cohort? As it ages over time, one would expect to see a development of old age cancers, if you will. 09:24:59 09:25:15 09:25:20 09:25:24

At what point in time do you say we can't follow this cohort any further or the lack of findings is not that important to us anymore? 09:25:28 09:25:31 09:25:35

A. I don't think one ever gets to that point. One can analyze data as long as one can. 09:25:42 09:25:44

Q. What significance does that data have as you get further and further from the first date 09:25:49 09:25:52

of exposure? This cohort was exposed in the early 1940s forward. 09:25:55 09:25:59

A. Well, one wants to look at the pattern of occurrence of disease according to a number of factors. One is length to follow. 09:26:02 09:26:05 09:26:10

Q. What other factors would one look at in addition to follow-up? 09:26:13 09:26:17

A. Age at first exposure, time at first exposure, length of exposure, level of exposure, gender. I think these were all men. Ethnic group, which is usually white or black. 09:26:22 09:26:26 09:26:32 09:26:41

Q. Does the fact that we are now sixty years, more than sixty years from the first exposure in the Pliofilm cohort have any impact on the continuing update of that cohort and the findings therefrom? 09:26:44 09:26:48 09:26:54 09:26:59 09:27:01

A. It doesn't add any impact on the continuing update. As I say, you keep doing that. You would want to look at -- you would want to stratify length of follow-up. 09:27:05 09:27:09 09:27:12 09:27:20

Q. Why? 09:27:25

A. To see if there's a pattern according to length of follow-up. 09:27:26 09:27:29

Q. And what do you mean by stratify? 09:27:31

A. Look at different categories. Just, for example, 0 to 20, 20 to 40, forty plus. 09:27:33 09:27:38

Q. Based upon your knowledge of the benzene literature -- let me rephrase that. 09:27:44 09:27:46

Based upon your knowledge of the benzene literature, would you expect to find increases when you stratify sixty years and above? 09:27:53 09:27:56 09:28:03

A. I don't have any specific knowledge one way or the other. 09:28:10 09:28:11

Q. Do you have an opinion? 09:28:14

A. No. 09:28:19

Q. Would you agree with me that the further removed from the initial exposure one becomes, the less likely the cohort will demonstrate excess risks? 09:28:19 09:28:21 09:28:24 09:28:29

A. An opinion would have to be based on some data, and you're asking a general question. I can't answer a general question like that. 09:28:33 09:28:35 09:28:39

Q. What impact does the fact that the most recent update of the Pliofilm cohort has diminished the excess multiple myeloma found in the studies and the reports of the 1980s? 09:28:41 09:28:43 09:28:49 09:28:55

A. Again, I'd want to look at the data to give you a specific answer. I don't have an 09:29:01 09:29:03

opinion on impact without looking more specifically. 09:29:07 09:29:10

Q. Okay. What do you teach your students with regard to follow-up time and the impact one sees many, many years after first exposure, in particular, sixty-plus years after first exposure, if anything? 09:29:11 09:29:15 09:29:23 09:29:27 09:29:30

A. I haven't taught specifically on that point. I've made the general observation, as I just did to you, that one should stratify in length of exposure, among other things, to look at patterns in these various strata. 09:29:32 09:29:34 09:29:39 09:29:46 09:29:49

Q. Well, when one looks at patterns in the various strata and no longer sees an elevated risk of a particular disease, how does the epidemiologist interpret that? 09:29:55 09:30:02 09:30:06 09:30:09

A. Well, one has to go through the various options. The first question is, -- I'm sorry, I didn't get your question. I don't have your question in my mind. 09:30:12 09:30:14 09:30:23 09:30:25

Q. Okay. When an epidemiologist stratifies the data and does it as you have suggested 0 to 20, 20 to 40, 40 to 60, 60 and above, if the epidemiologist sees a decreasing incidence or 09:30:26 09:30:34 09:30:40 09:30:45

findings of mortality in this study, how does he interpret that as he gets further and further from the initial first date of exposure? 09:30:51 09:30:55 09:30:58

A. Your question talks about incidence. 09:31:07

Q. That was a poor choice of words. An incidence is not intended to be incidence versus mortality; it was simply the frequency of mortality. How's that? 09:31:10 09:31:15 09:31:19 09:31:21

A. Yeah. Again, that, by itself, you have to have some comparison built into your question, and you don't. 09:31:24 09:31:27 09:31:30

Q. Would you look at the general public to see how the disease manifests itself as far as age is concerned? Would that be of significance to you? 09:31:31 09:31:33 09:31:38 09:31:40

A. In some analyses, one compares disease in the group you're studying to disease in the general public, relative to incidence or mortality. 09:31:43 09:31:48 09:31:52 09:31:56

In other situations, one compares people exposed to the substance in which you're interested to other workers at the same facility who do not have the exposure. 09:31:57 09:32:02 09:32:04 09:32:09

Q. As more and more of the workers die off, 09:32:12

would you agree with me that the likelihood of finding an elevated risk in the particular cohort is diminished? 09:32:15 09:32:19 09:32:22

A. No. 09:32:24

Q. Does that mean that we can follow the cohort until the very last individual in the cohort dies and still utilize that data to determine whether there was an increase of mortality from a particular disease? 09:32:28 09:32:30 09:32:35 09:32:38 09:32:39

A. One can follow them until the last person dies and evaluate the data, which I would consider utilizing it. 09:32:43 09:32:46 09:32:50

Q. And what impact does that have if you have but one person left in the cohort in your determination of causality or association for a particular disease process that the cohort had been exposed to, for particular substance that the cohort may have been exposed to? 09:32:52 09:32:55 09:33:01 09:33:07 09:33:09 09:33:13

A. Well, you ordinarily wouldn't have a strata with one person. You would have an open-ended strata. 09:33:16 09:33:18 09:33:22

Q. Does there ever come a time when the data or the age of the cohort makes the significance of any findings not that important in evaluating 09:33:24 09:33:27 09:33:29

association or causation? 09:33:34

A. No. 09:33:38

Q. So, if we follow the cohort completely -- well, let me ask you this. 09:33:41 09:33:44

Myeloma is considered to be a cancer of old age. As your cohort ages and you get to that area where an increase in myeloma is found in the general population, how does the epidemiologist deal with that? 09:33:50 09:33:51 09:34:00 09:34:05 09:34:08

A. You're comparing people of similar ages. So that your comparison population, you look at the age distribution as in your exposed population. 09:34:11 09:34:17 09:34:22 09:34:24

Q. So in 1940, when these folks were first employed, let's assume they came right out of high school, would have been eighteen years old, and the follow-up of 2004 that Rinsky did, it was extended through 1996. So the oldest workers would have been over seventy years old, if we assume that they all were hired in right after high school. 09:34:25 09:34:29 09:34:32 09:34:35 09:34:50 09:35:00 09:35:16 09:35:18

A. Is it 2004 or 2002? 09:35:26

Q. 2002. 09:35:29

A. So, then, please repeat your question. 09:35:30

Q. Sure. In the 2002 update by Rinsky, he followed the work force through 1996. Do you have an appreciation for the age of the work force by 1996? 09:35:33 09:35:38 09:35:43 09:35:47

A. I don't off the top of my head. 09:35:52

Q. In this particular case, did you consider the extent of Mr. Douglas' exposure to benzene? 09:36:03 09:36:07

A. No. 09:36:14

Q. It had no impact on you in reviewing the studies that you have cited for us in your April 2005 report? 09:36:16 09:36:20 09:36:22

A. No. 09:36:23

Q. Did you consider taking the estimated exposure of Mr. Douglas and looking specifically at the studies that you cited to see how the higher level exposed individuals fare as far as an increase in myeloma? 09:36:24 09:36:28 09:36:33 09:36:36 09:36:43

A. No. 09:36:45

Q. Would that be appropriate to do? 09:36:45

A. It would under certain circumstances. I don't know his exposure history, so I can't really comment beyond it. It wouldn't be inappropriate, put it that way. 09:36:55 09:36:58 09:37:00 09:37:04

Q. Did you not see a report by Stephen 09:37:05

Petty? 09:37:09

A. I saw it; I didn't evaluate it. 09:37:10

Q. Would that be one of the more appropriate ways to analyze whether Mr. Douglas' benzene exposure was a contributing cause to his development of myeloma? 09:37:13 09:37:17 09:37:24 09:37:28

A. No. 09:37:30

Q. That is, looking at the particular exposure scenario he has and trying to find articles which deal with those exposure scenarios? 09:37:31 09:37:32 09:37:38 09:37:42

A. No. 09:37:43

Q. And why is that? 09:37:45

A. You're making a presumption that benzene is the cause of myeloma, which I'm not willing to assume. 09:37:48 09:37:52 09:37:55

Q. Are you going to testify specifically as to Mr. Douglas, or are you just going to generally say benzene doesn't cause myeloma? 09:37:56 09:38:00 09:38:03

A. I don't know the nature of my testimony. It's in the future. 09:38:07 09:38:09

Q. Have you been asked to testify specifically as to Mr. Douglas' development of myeloma? 09:38:11 09:38:13 09:38:17

A. Say that again. 09:38:18
Q. Sure. Look at page 21 of your report. 09:38:19
A. Okay. 09:38:29
Q. Your conclusion is: "The weight of the epidemiologic literature fails to establish an association between the occurrence of benzene and multiple myeloma." Is that your opinion today? 09:38:29 09:38:32 09:38:36 09:38:40
A. Yes. 09:38:43
Q. You have not taken into account -- strike that. 09:38:44 09:38:46
You have not been asked to opine on whether Mr. Douglas' work exposures were a contributing cause of his myeloma, have you? 09:38:47 09:38:50 09:38:53
A. Not that I can recall. 09:38:59
Q. I only want to talk with you about a few of the articles that you have referenced in the report. The Rinsky Pliofilm cohort dealt with pure benzene exposure, did it not? 09:39:16 09:39:18 09:39:22 09:39:41
MR. CARPENTER: Where are you, Dean? 09:39:50
MR. HARTLEY: On page 5. 09:39:55
A. Yeah. I recall that the Pliofilm cohorts and other people were involved. It was an Infante cohort initially, and then it was Rinsky as the senior author. 09:39:58 09:40:02 09:40:06 09:40:11

You say pure benzene. That implies that the only exposure was benzene, and of course it was not. According to the Infante description of the study, natural rubber was mixed with benzene and hydrochloric acid. That's the extent of my understanding of what the exposures were. 09:40:20 09:40:22 09:40:27 09:40:34 09:40:38 09:40:42

Q. Have you seen any literature which would demonstrate that natural rubber increases the likelihood of developing any blood disease? 09:40:46 09:40:49 09:40:51

A. No. 09:40:55

Q. And the same with hydrochloric acid, have you seen any literature which would support a relationship between exposure to hydrochloric acid and the development of blood diseases? 09:40:56 09:41:00 09:41:02 09:41:05

A. No. 09:41:08

Q. If we remove the natural rubber exposure and the hydrochloric acid exposure, could one say that the only exposure this cohort had to substances that may cause blood diseases would be benzene? 09:41:15 09:41:18 09:41:27 09:41:27 09:41:34

A. I would just condition that likely would be benzene because I'm sure that other stuff was added about which we know nothing. 09:41:36 09:41:42 09:41:45

Q. Okay. In the Pliofilm cohort, and in 09:41:49

particular the 1987 study that you cite on page 6, regardless of whether you agree with the inclusion of the particular cases of myeloma, their exposure scenario, their lack of exposure, their length of time of exposure, demonstrated an SMR of 3.3, did it not? 09:41:58 09:42:03 09:42:12 09:42:16 09:42:21 09:42:26

A. I would use the word "reported". 09:42:29

Q. And would you also agree that that was in fact statistically significant? 09:42:34 09:42:37

A. If the authors say it was, I would accept that. I can't tell it from looking at the data. 09:42:46 09:42:49

Q. And the SMR that your report of 3.3 were for the two higher exposure groups, correct? 09:42:52 09:42:55

A. No, it was for the lowest and the highest. It was mainly the lowest. 09:43:01 09:43:03

Q. Look at the sentence right before the comment on page 6: "In the two higher exposure groups, the two expected numbers were 1 to .3." 09:43:06 09:43:09 09:43:13

A. Yes. I'm sorry, the overall SMR -- I'm getting the numbers mixed up. 09:43:20 09:43:23

Q. That's why I asked you that second question. 09:43:25 09:43:27

A. What was your first question now? 09:43:28

Q. The first question was the SMR was 3.3, 09:43:29

but that was only for the higher exposure groups, correct? 09:43:32 09:43:35

A. Yes. I was not answering that question initially. 09:43:36 09:43:38

Q. And the higher exposure groups, those folks would had a level of exposure of 40 to greater than 400 parts per million years, correct? 09:43:39 09:43:42 09:43:45 09:43:49

A. Right. There was one case in .3 expected deaths. 09:43:50 09:43:55

Q. And for the overall cohort, the observed expected deaths from myeloma were 4 to 1, correct? 09:43:55 09:43:59 09:44:03

A. Yes. 09:44:04

Q. I believe the authors reported that that number was in fact statistically significant, correct? 09:44:05 09:44:07 09:44:10

A. If you say so, I'll agree with it. 09:44:11

Q. When it was updated through 1996, these folks who had been exposed to pure benzene had a ratio of 2.5, is that correct, for multiple myeloma development, or death, I guess it would be? 09:44:16 09:44:21 09:44:24 09:44:31 09:44:35

A. I guess if I made that computation, then 09:44:40

it should be 2.0. There was five observed and two and a half expected. So it's a question of which number I computed. 09:44:43 09:44:47 09:44:50

Q. Okay. 09:44:52

A. It's either two or two and a half. 09:44:53

Q. And that number was not statistically significant, correct? 09:44:56 09:45:01

A. Yes. 09:45:02

Q. And as you've testified in other depositions that I have taken of you, the fact that a number is not statistically significant, the importance of its elevation is still considered, correct? 09:45:03 09:45:05 09:45:08 09:45:13 09:45:17

A. I wouldn't use the importance. I would use the fact that it's elevated. 09:45:20 09:45:22

Q. Is still considered, correct? 09:45:25

A. Yes. 09:45:27

Q. So, if your number is 2.0 or your number is 2.5, even following the cohort through 1996, you have a two-fold elevated risk -- strike that. 09:45:27 09:45:30 09:45:35 09:45:40

If you're following the cohort through 1996, one sees reported by the authors at least a twofold elevated risk for those folks in the 09:45:41 09:45:42 09:45:46

cohort for the death from multiple myeloma, correct? 09:45:49 09:45:54

A. I would prefer if you didn't use the word "fold" because it can be misinterpreted. 09:45:55 09:45:57

Q. Okay. What do you mean by fold? What do you think twofold elevated risk means? 09:46:01 09:46:06

A. The question is, is the relative risk two times, is it 2, or is the relative risk 3, which is a twofold increase. And that's an ambiguous use of the words that everyone has some trouble on. 09:46:09 09:46:13 09:46:18 09:46:24 09:46:31

Q. It would be two times the expected risk, correct? 09:46:32 09:46:35

A. Overall, yes. 09:46:36

Q. The fact that it is not significant still is a fact that needs to be considered in determining whether those folks exposed to pure benzene are at an increased risk of death from myeloma, correct? 09:46:40 09:46:42 09:46:44 09:46:47 09:46:51

A. I wouldn't use the word "risk." I would say whether there is the observation that the observed is greater than the expected. 09:46:52 09:46:55 09:46:57

Q. Now, looking at the Yin study, you cite that, beginning on page 7 and the bottom of 7 09:47:00 09:47:08

carrying over to page 8, that cohort represents workers exposed to many different substances, does it not, that may or may not contain benzene? 09:47:12 09:47:20 09:47:26

A. I believe they all have some exposure to benzene. 09:47:35 09:47:37

Q. But it wasn't in the pure form, was it? It was spray paints, was it as solvents, it might be as printing agents. It was a conglomeration of numerous different types of products. Would you agree with that? 09:47:38 09:47:41 09:47:46 09:47:49 09:47:52

A. Yes, although there may have been some who were exposed only to benzene. 09:47:53 09:47:55

Q. And does your recollection permit you to tweak out what number out of 28,000 may have been exposed to pure benzene? 09:47:58 09:48:00 09:48:05

A. No. 09:48:06

Q. If you look at page 8, you reference the Decoufle article from 1983? 09:48:13 09:48:23

A. Yes. 09:48:30

Q. That's a study of the Quantico refinery, is it not, or chemical plant? 09:48:31 09:48:35

A. Looks like chemical workers. 09:48:45

Q. What impact does the fact that the second case of myeloma occurred in a worker who died 09:49:24 09:49:35

from leukemia have, if any, on a causality determination? 09:49:40 09:49:45

A. It's hard to judge because, in essence, what is looked at is being looked at when that case is included as incidence of myeloma as opposed to mortality from, and no comparison is made with incidence of myeloma among the general population. 09:49:48 09:49:52 09:49:55 09:50:00 09:50:06 09:50:11

Q. There's no way of knowing whether the myeloma was the underlying cause of the leukemia, is there? 09:50:16 09:50:18 09:50:22

A. No, although the death certificate sounds like -- if the death certificate were filled out correctly, leukemia would be the primary cause, and myeloma would be the secondary cause. 09:50:23 09:50:28 09:50:34 09:50:41

Q. If myeloma were in fact the cause of the leukemia, you mean? 09:50:44 09:50:47

A. No. If myeloma were the cause of leukemia, it would be a worker who died from myeloma. There is a "due to" in there. Either it's myeloma due to leukemia or leukemia due to myeloma. 09:50:48 09:50:51 09:50:57 09:51:00 09:51:06

The way this is worded it would be myeloma due to leukemia. That's the way the 09:51:07 09:51:10

death certificate would have been filled out. 09:51:12

Q. You cite in the author's note that the data are too scanty for a firm estimate of risk? 09:51:48 09:51:51

A. Yes. 09:51:55

Q. And then you conclude on the next page with, "This very small study provides limited data for an excess in myeloma in any workers exposed to benzene." What did you mean by that? 09:51:55 09:51:57 09:52:01 09:52:05

A. One death observed, I say the expected number likely was less than .5. So that would be limited data. 09:52:09 09:52:12 09:52:20

Q. Would you read the block I have marked there from the Decoufle study? 09:52:45 09:52:47

MR. CARPENTER: Where are you reading from? 09:52:56 09:52:56

MR. HARTLEY: It's the very last page. 09:52:57 09:52:58

A. Do you want me to read it out loud? 09:52:59

Q. You can read it out loud. 09:53:02

A. "In addition, the study augments prior observations of a possible link between benzene and multiple myeloma." 09:53:04 09:53:12 09:53:18

Q. Do you agree with that assertion by the authors in 1983? 09:53:22 09:53:26

A. Yes. 09:53:30

Q. Let's look at the Bond study that you cite on page 9. 09:53:34 09:53:38

A. If I may, you used the word "assertion", which is a bit stronger. I used the word "observation". 09:53:41 09:53:43 09:53:48

Q. All right. You indicate that the Bond study provides no evidence of an excess -- 09:53:49 09:55:18

A. What page are we on? 09:55:26

Q. Page 9. 09:55:28

A. The authors made that statement. 09:55:34

Q. Did the authors indicate what the expected would be for this cohort of 956 employees? 09:55:38 09:55:40 09:55:45

A. Only that it was, the implication was it was greater than one. 09:55:47 09:55:54

Q. Is there any way to verify that? 09:55:57

A. Well, I can look at the paper, but that's a quote from the paper. 09:56:01 09:56:04

Q. Oh, no, I'm not arguing about was that the quote. Was there any way to verify that the expected was implicitly greater than one? 09:56:05 09:56:08 09:56:11

A. Not by me, no. 09:56:16

Q. Okay. 09:56:19

A. When I looked at Bond, because there is a Bloeman study which is later, which I don't believe I included in this review. 09:56:21 09:56:26 09:56:29

Q. You did not. 09:56:31

A. And that's one I would want to add. 09:56:32

Q. Add? 09:56:38

A. I would want to say something about because I think that updated the Bond study. 09:56:46 09:56:46

Q. It did. 09:56:46

A. Okay. So I did not include it in this report. 09:56:46 09:56:49

Q. Is it unusual to report SMRs without reporting the expected number? 09:56:57 09:57:01

A. If one reports the observed number in the SMR, that's standard, because you compute the expected number. 09:57:06 09:57:12 09:57:18

Q. You mention -- how would you pronounce the gentleman's name? 09:57:27 09:57:30

A. Bloeman.

Q. Doctor, we'll flip this back and forth. Looking at the Bloeman study, it appears from the highlight in the abstract as well as in that first introductory section that these were workers who began exposure sometime after 1935 09:57:53 09:58:00 09:58:04 09:58:09 09:58:11

and probably about 1938, correct? 09:58:16

A. Yes. The highlighted section, that's what that says. 09:58:29 09:58:33

Q. And in looking at the article, and it's been awhile since I've looked at this, but it appears to me that the exposures in this particular study were quite low, the exposures to benzene were quite low. Do you recall that? 09:58:34 09:58:37 09:58:41 09:58:57 09:59:02

A. I don't recall it. The highest category they use is 25 PPM with the average being 30, and that's an open-ended category. So it's hard to say how high it went. 09:59:05 09:59:17 09:59:23 09:59:28

So I would not say, I'm trying to think what these -- this is average exposure, time-weighted average. So this is not exposure years; it's point exposure. So, no, I would not say this is low, or very low, whatever word you used. 09:59:34 09:59:39 09:59:44 09:59:49 09:59:54 09:59:59

Q. It appears that the authors have reported that the average estimate of cumulative exposure amounted to 37.7 PPM years, correct? 10:00:26 10:00:29 10:00:32

A. Yes. 10:00:44

Q. Let's talk about the Wong study for a second, Wong 87. Let's go back to Bond just for 10:00:48 10:00:50

a second. 10:01:07

The Bond cohort was a group that would have been at least partially exposed to pure benzene, correct? 10:01:08 10:01:10 10:01:13

A. I don't know that. 10:01:18

Q. Back to Bloeman as well. If you look at what the authors wrote in their methods section, beginning with the sentence "Persons", would you read that? 10:01:44 10:01:48 10:01:56 10:02:01

A. "Persons employed in the chlorobenzol area with jobs in the lowest exposure category are now included in the cohort." 10:02:05 10:02:12 10:02:19

Q. Would it be reasonable to conclude from that sentence that the update included folks who had low-level exposure to benzene? 10:02:29 10:02:32 10:02:35

A. Well, all it says is lowest, and without a description of what's low. 10:02:41 10:02:50

Q. It's a term of art, I understand. 10:02:51

A. So certainly the lowest exposure categories were what they used, and that's correct. 10:02:54 10:02:56 10:02:58

Q. Would you agree with me that by adding folks that have the lowest exposures, one would tend to go toward a null hypothesis? 10:02:59 10:03:01 10:03:04

A. Unless one was already at the null hypothesis. 10:03:08 10:03:10

Q. I understand that. The addition of lower-level exposed workers tends to lead one to the null hypothesis, does it not? 10:03:12 10:03:14 10:03:21

A. That's a hypothetical general statement you're making not related to benzene and myeloma? 10:03:25 10:03:30

Q. It is. Would you agree with that statement? 10:03:34 10:03:36

A. Yes, yes. 10:03:37

Q. Do you understand how benzene is used in the chlorobenzol units? 10:03:41 10:03:44

A. No. 10:03:48

Q. Do you understand how it's used in the alkali benzene? 10:03:49 10:03:51

A. No. 10:03:53

Q. Do you understand how benzene is used in ethyl cellulose? 10:03:53 10:03:55

A. No. 10:03:57

Q. Wong 87. You write: "Three deaths from myeloma were observed in comparison to an expected number of 2.8." Do you see that? 10:03:59 10:04:14 10:04:16

A. Yes. 10:04:19

Q. That 2.8 comes from Wong's more recent 10:04:20

paper, does it not, where he said, I believe in '95, that the expected number for this group of folks was 2.8? 10:04:23 10:04:27 10:04:30

A. Well, just to clarify, the 2.8 relates to this particular cohort. 10:04:33 10:04:36

Q. At least according to Wong. 10:04:39

A. But he reported the 2.8 at a later time. 10:04:41

Q. He did. I believe he reported it in one of his meta analyses, his reviews on myeloma and benzene, or something, did he not? 10:04:45 10:04:47 10:04:52

A. It was another paper. 10:04:56

Q. It was. Did you go back and take a look at the comparison group that he used, the internal comparisons that he suggested in OSHA papers and the testimony were the more pertinent group to see how many myeloma cases were in fact in that group? 10:05:02 10:05:02 10:05:06 10:05:13 10:05:17 10:05:20

A. I didn't go back and look, but I'm aware that there was zero. 10:05:21 10:05:24

Q. Correct. So, in the exposed group, there were three, and in the non-exposed comparison internal group, there was zero, correct? 10:05:26 10:05:29 10:05:33

A. Yes. 10:05:36

Q. How does that impact the assertion that 10:05:37

the expected number is 2.8? 10:05:39

A. Well, this is based on general population 10:05:42
data, use an external comparison as opposed to 10:05:44
use an internal comparison. 10:05:51

Q. Would you agree with me that using 10:05:53
internal comparison groups are a better vehicle 10:05:55
to determine SMRs or relative risks? 10:05:58

A. Not necessarily. 10:06:02

Q. Why would one want to utilize -- strike 10:06:04
that. 10:06:09

What's the benefit of using an internal 10:06:09
group over the general population? 10:06:13

A. In theory, they're more comparable, the 10:06:14
two groups of workers are more comparable in 10:06:17
terms of lifestyles, reason for being employed, 10:06:20
but there may be additional differences between 10:06:32
them, between the two groups, because one type of 10:06:34
person may work in one type of job, and another 10:06:40
in another type of job. And the main limitation 10:06:44
is that the numbers may be small and very 10:06:49
unstable. 10:06:57

Q. What do you mean by unstable? 10:07:05

A. Subject to random variability. 10:07:08

Q. Would that be the case for utilizing the 10:07:16

internal comparison groups in this study? 10:07:19

A. I can't speak specifically because it depends a lot on total expected numbers for the various causes. 10:07:24 10:07:26 10:07:34

Q. Do you recall that in the intermittently exposed group there were two deaths from myeloma and only .56 expected? 10:08:08 10:08:11 10:08:16

A. I don't recall that. 10:08:19

Q. At the bottom of page 9 you cite Hanson? 10:08:38

A. Yes. 10:08:43

Q. And those are, or that is a study of Danish stokers, correct? 10:08:43 10:08:50

A. Yes. 10:08:51

Q. And those folks are exposed to any number of potential carcinogens, correct? 10:08:52 10:08:57

A. Yes. 10:09:02

Q. That group is not a pure benzene-exposed group, is it? 10:09:06 10:09:09

A. I don't see how it could be. 10:09:10

Q. Looking at the top of page 10, you cite the Fu study, which is a follow-up of shoemakers in England and Italy? 10:09:14 10:09:18 10:09:22

A. Yes. 10:09:24

Q. And according to your own writing, it 10:09:24

says shoemakers are exposed to leather dust and solvents from glues, including benzene? 10:09:28 10:09:31

A. Yes. 10:09:34

Q. So those would not be pure benzene-exposed workers, would they? 10:09:34 10:09:36

A. No. 10:09:39

Q. Now, if we look at Ireland, are you aware that the Monsanto workers in Ireland were exposed to pure benzene? 10:09:41 10:09:52 10:09:58

A. No. 10:10:00

Q. Do you know what those, what parts of the plant those workers were employed in? 10:10:01 10:10:04

A. All it says is benzene-using departments. 10:10:10

Q. Looking at Ireland on page 318, the very first sentence under "Exposure Assessment", can you read that into the record? 10:10:30 10:10:35 10:10:42

A. "The benzene-using departments are nitrobenzene, phenol, chlorobenzene, muriatic acid, and alkylbenzene production." 10:10:43 10:10:47 10:10:57

Q. Are you aware that Mr. Douglas worked in a phenol plant? 10:11:04 10:11:08

A. Yes. 10:11:11

Q. Ireland reports three deaths from myeloma among production workers and .9 expected, 10:11:19 10:11:26

correct, according to your -- 10:11:31

A. Yes. 10:11:33

Q. Which according to the author results in an SMR of 2.3. Does that sound about right? 10:11:36 10:11:40

A. No, it wouldn't be 2.3. If they had maintenance in it, it might be. But that wouldn't be correct either, so I don't know where that number comes from. 10:11:50 10:12:01 10:12:04 10:12:07

Q. Nor do I. That's what she reports in her abstract. 10:12:08 10:12:12

Looking at table 1, which is observed versus expected deaths by cumulative benzene exposure, if you go across the myeloma line, it appears that as the exposure increases, the SMR increases for myeloma as well; is that correct? 10:13:09 10:13:13 10:13:17 10:13:38 10:13:43

A. It goes down, up, down, zigzag. So it's not a line; it's a zigzag line. 10:14:04 10:14:06

Q. Does the zigzag line demonstrate a dose response? 10:14:12 10:14:15

A. It's not a monotonic dose response, which would mean no zigzag. 10:14:18 10:14:22

Q. All right. 10:14:27

A. If you want to compare exposed to non-exposed, there would be an increase. 10:14:28 10:14:31

Q. What do you mean by that, there would be an increase? 10:14:37 10:14:39

A. Well, the observed number is greater than -- sorry. The observed over expected ratio is greater among the exposed than among the non-exposed. 10:14:41 10:14:44 10:14:47 10:14:50

Q. Looking at that, can you calculate for me what that ratio would be? 10:14:52 10:14:54

A. Over -- among the exposed, it would be 3 over 1 1/2. 10:14:56 10:15:01

Q. What about the observed in the highest exposure category? 10:15:07 10:15:15

A. That's 1 over .3. 10:15:17

Q. Looking at the last paragraph on page 320, Dr. Monson, could you read into the record the first two sentences? 10:15:51 10:15:53 10:15:59

A. "Our findings are limited by imprecision -- " 10:16:10 10:16:15

Q. Before that. 10:16:15

MR. CARPENTER: "There is debate..." 10:16:19

MR. HARTLEY: Yes. 10:16:23

A. "There is debate about whether low benzene exposure increases the risk of multiple myeloma and all types of leukemia or just ANL. 10:16:24 10:16:27 10:16:31

Our study provides some support for both sides of the debate." 10:16:40 10:16:43

Q. Now, when the study was updated through 1997, you report in a table-like format the SMRs increasing from less than .1 part per million years at .14 to 1.1 to 6 part per million years -- strike that. 10:16:53 10:16:55 10:17:07 10:17:10 10:17:43

You have in table format, Dr. Monson, an indication of the exposures and the development of myeloma based on the SMR, correct? 10:17:45 10:17:55 10:18:01

A. Yes. 10:18:06

Q. At no exposure the SMR would be 1.1? 10:18:07

A. Yes. 10:18:12

Q. At less than 1 part per million years, the SMR would be 1.4? 10:18:12 10:18:16

A. Yes. 10:18:18

Q. At 1 to 6 part per million years, the SMR would be 1.5? 10:18:19 10:18:24

A. Yes. 10:18:25

Q. And at greater than 6 part per million years, the SMR is 2.6? 10:18:26 10:18:28

A. Yes. 10:18:31

Q. Did you attempt to determine whether that increase was statistically significant; in other 10:18:31 10:18:33

words, the trend itself was statistically significant? 10:18:36 10:18:39

A. No. 10:18:40

Q. Do you have any way of doing that? 10:18:40

A. There is a way to do it. I don't have it. 10:18:44 10:18:46

Q. Okay. Can we at least say that as one experiences greater exposure to benzene in this cohort, the SMR for myeloma increases? 10:18:47 10:18:53 10:18:57

A. Yes. 10:19:01

Q. What do you mean when you have calculated at the bottom a total? 10:19:11 10:19:15

A. That's those with more than no exposure. 10:19:18

Q. So in your total, you have included the folks who were not exposed, correct? 10:19:29 10:19:33

A. No. 10:19:35

Q. You've got 13 over 8.9? 10:19:36

A. But the association -- I'm sorry, we're talking about two different things here. The overall association is 13 over 8.9. If you include the no exposure, it's 8 over .2. 10:19:39 10:19:41 10:19:43 10:19:51

Q. We wouldn't expect to expose folks in order to determine whether benzene causes or is associated with myeloma, would we? 10:19:56 10:20:00 10:20:03

A. Don't use the word "cause" at the moment, please. 10:20:06 10:20:08

Q. I won't. That's why I added "associated" afterwards. Let me strike that, and I'll do it again. 10:20:09 10:20:13 10:20:15

We wouldn't expect to include non-exposed individuals in this cohort if we were attempting to determine an association between myeloma and benzene, correct? 10:20:16 10:20:19 10:20:22 10:20:25

A. Well, yes and no. If we're looking only at those exposed, then you would not include them. If you were making a comparison between exposed and non-exposed, then you would compare them. 10:20:28 10:20:31 10:20:34 10:20:37 10:20:41

Q. You concluded that this study provides some data consistent with a non-significant excess of myeloma among workers exposed to benzene, did you not? 10:20:42 10:20:45 10:20:48 10:20:51

A. Yes. 10:20:52

Q. Do you know whether the authors themselves determined whether the trend was significant? 10:20:54 10:20:56 10:21:00

A. No. 10:21:01

Q. What importance would that have if in 10:21:21

fact the trend was significant? 10:21:23

A. There would be another piece of 10:21:26

information to be considered. 10:21:29

Q. In our determination of what? 10:21:32

A. Association. 10:21:34

Q. Look at the abstract, the last three 10:23:10

sentences beginning with "However." 10:23:12

A. Do you want me to read it? 10:23:39

Q. Sure. Would you agree with me that the 10:23:44

authors have reported that when peak exposures 10:23:57

over a hundred parts per million for 40 or more 10:24:00

days are considered, the SMR for myeloma was 4.0? 10:24:04

A. Yes, and the confidence level was .8 to 10:24:09

11.7. 10:24:14

Q. Do the authors also state in that 10:24:21

abstract that a high number of peak exposures to 10:24:23

benzene is a better predictor of risk than 10:24:27

cumulative exposure for myeloma? 10:24:31

A. Can you point that out? 10:24:37

Q. Don't know that it's in there. I know 10:24:39

that it's in the article, but I don't know if 10:24:40

it's in that abstract. 10:24:42

A. I don't see it in the abstract. 10:24:44

MR. CARPENTER: Look at the very 10:24:50

last paragraph, if that will help. 10:24:51

MR. HARTLEY: Thanks. 10:25:04

Q. The very last paragraph, I think it's sentence 2 and 3. 10:25:04 10:25:06

A. "Our study found increased rates of ANL and multiple myeloma at benzene concentrations greater than 100 PPM, high and intermittent benzene exposure was related to the highest risk." 10:25:16 10:25:25 10:25:31 10:25:40 10:25:43

Q. Looking at Glass on page 11, these folks were refinery workers, I believe, were they not, or else distribution workers? 10:26:01 10:26:05 10:26:08

A. All I have written down here is petroleum industry. So whatever you say they were, I'll accept. 10:26:12 10:26:16 10:26:19

Q. In your third paragraph, you say: "It is noted that men in this cohort based on 15 exposed cases have an increased relative risk for myeloma of 1.9." 10:26:21 10:26:23 10:26:29 10:26:33

A. Yes. 10:26:35

Q. Was that statistically significant? 10:26:35

A. Yes. 10:26:38

Q. Now, the authors, you write, conclude that the excess noted is not related to benzene 10:26:45 10:26:49

exposure, correct? 10:26:53

A. Well, I'll read: "No association was found between benzene and non-Hodgkin lymphoma or a multiple myeloma." 10:26:55 10:26:59 10:27:07

Q. Do you have an appreciation for how the 15 exposed workers would have an increased risk of myeloma and it not provide some information on the association? 10:27:11 10:27:14 10:27:18 10:27:21

A. Well, the 15 is the entire cohort, and presumably they then separated the cohort into those with varying levels of benzene exposure and looked at the various categories of benzene exposure. 10:27:25 10:27:32 10:27:35 10:27:44 10:27:48

Q. If these men and women were distribution workers as well as refuelers of various types of equipment, they wouldn't be exposed to pure benzene, would they? 10:27:49 10:27:53 10:28:00 10:28:03

A. No. 10:28:05

Q. They would have gasoline exposure and other refinery stream exposures in addition to pure benzene, correct? 10:28:06 10:28:09 10:28:12

A. To the best of my knowledge, yes. 10:28:14

Q. The one study that you didn't refer in addition to the Bloeman study we talked about 10:28:21 10:28:23

earlier was the Dement study in 1998. Do you recall that study? 10:28:26 10:28:31

A. No. 10:28:32

Q. I believe that was the update of Thomas. 10:28:34

A. I don't recall having seen that study. Yes, it's an update of Thomas, 1982. 10:28:41 10:29:16

Q. In that update, does Dr. Dement and others report excess myeloma for these three refineries, this cohort of three refineries? 10:29:20 10:29:24 10:29:28

A. I guess it would help if you pointed it out. 10:30:02 10:30:04

Q. Well, I think he breaks it down by different exposure scenarios, different latency periods. If you would like, I could go through it with you. 10:30:05 10:30:07 10:30:15 10:30:22

A. Well, he seems to combine -- here's one myeloma. Most of the time, myeloma was included with other. On table 11 he lists multiple myeloma. And overall, there were ten cases observed in a proportional PMR ratio of 124. That's the one place I see it. 10:30:23 10:30:31 10:30:35 10:30:43 10:30:54 10:31:06

Q. If we look at the PMR for workers who were white, the PMR would be 160 for myeloma, is it not? 10:31:29 10:31:34 10:31:41

A. Yes. 10:31:44

Q. What would cancers of other lymphatic tissue be? 10:31:59 10:32:02

A. I was trying to figure that out myself. 202 is malignant lymphoma and 203 is multiple myeloma. 10:32:12 10:32:41 10:32:47

Q. When he combines the categories of 202 and 203, or they combine the categories, would you agree that they report an SMR of 233? 10:32:58 10:33:01 10:33:07

A. I'll just read what they say. They say, "Cancers of other lymphatic tissue, SMR 233", and I'll extend that by saying usually 205 is included in that group, and it depends on what NIOSH did in its program at that time. When they use the word "other", they say 202 and 203. 205 may or may not be included. I'm sorry, it would be 208 at this time. 10:33:29 10:33:32 10:33:40 10:33:49 10:33:56 10:34:04 10:34:10 10:34:14

Q. So we don't know from that concluding remark whether it's 202 and 203 or -- 10:34:16 10:34:19

A. 202 and 203 or 208. 10:34:23

Q. One final area. You talked about, and I always butcher this guy's name, is it, it's T-S-A-I? 10:34:31 10:34:36 10:34:40

A. Tsai. 10:34:43

Q. The Tsai study from 1983. Looking at what you indicated, that is that the study provides evidence of no excess of myeloma in a group of workers exposed to benzene, correct? That's on page 6, I think it is -- 8, I'm sorry. 10:34:43 10:34:56 10:35:02 10:35:05 10:35:08

MR. CARPENTER: His report? 10:35:16

MR. HARTLEY: Of his report, that's right. 10:35:18 10:35:20

Q. On page 8 of your report, you indicate that Tsai, et al, is a very small study and provides evidence of no excess of myeloma in a group of workers exposed to benzene, correct? 10:35:20 10:35:22 10:35:27 10:35:30

A. Yes. 10:35:33

Q. If you would look for me at page 687 in the highlighted area that I have in the left-hand column beginning with "for 89 percent." And would you read into the record the exposure of this group of workers according to the authors, had experienced? 10:35:34 10:35:36 10:35:40 10:35:47 10:35:50 10:35:53

A. Two sentences or one? 10:35:54

Q. I believe it runs down. 10:35:57

A. "For 89 percent of the full samples and 79 percent of the partial samples, exposures were less than 1 part per million (PPM) benzene. For 10:36:01 10:36:05 10:36:11

10 percent of the full samples and 17 percent of the partial samples, exposures were between 1 and 10 PPM. In addition, for 4 percent of the partial samples, exposures exceeded 10 PPM." 10:36:22 10:36:29 10:36:32 10:36:40

Q. So, according to the authors, 89 percent of the full samples and 79 percent of the partial samples, the exposures were less than 1 part per million? 10:36:52 10:36:54 10:36:59 10:37:03

A. Yes. 10:37:04

Q. What significance is it to you in reviewing the association between benzene and myeloma that arteriosclerotic heart disease had a deficit whereby the SMR was .46? 10:37:12 10:37:16 10:37:20 10:37:27

A. Please repeat the question. 10:37:38

Q. Sure. Does the fact that the healthy worker effect demonstrated by the low SMR of .46, 0.46 for arteriosclerotic heart disease have any association between benzene and myeloma in this study? 10:37:39 10:37:41 10:37:47 10:38:02 10:38:06

A. The answer is it has no impact. 10:38:07

Q. What about the fact that cancer deaths demonstrated an SMR of .87, would that have an impact on a lower SMR for myeloma overall? 10:38:09 10:38:11 10:38:16

A. No. 10:38:20

Q. What about the fact that there were no leukemias found in this cohort, would that impact the lack of a finding of myelomas in this cohort? 10:38:22 10:38:23 10:38:35

A. The only impact in general is that this is a very small study. 10:38:41 10:38:43

Q. Would you agree with me that if you don't have enough benzene exposure to demonstrate an elevated risk of leukemia, the lack of a finding of myeloma in the cohort is not as important when determining an association between benzene and myeloma? 10:38:47 10:38:49 10:38:53 10:38:56 10:39:02 10:39:05

A. I would say it's relevant to the issue. 10:39:09

Q. In what way? 10:39:11

A. One accepts that under certain exposure scenarios benzene will cause ANL. Not having seen that suggests that the exposure to benzene was low. 10:39:15 10:39:23 10:39:32 10:39:39

Q. Have you attempted to update the chart that we discussed in LeBron which was the various studies that were grouped together of potential exposures and the development of myeloma? 10:40:38 10:40:43 10:40:48 10:40:57

A. I'm trying to think because it was updated at the time of the deposition. 10:41:01 10:41:02

Q. It was. I'm just wondering if you've 10:41:06

worked on that since then. 10:41:08

A. I know Bloeman is floating around 10:41:14
somewhere. Whether I actually put it in the cart 10:41:14
or not, I'm not sure. See, I noticed this is 10:41:14
through 2003, and I have looked at the literature 10:41:18
through 2005 for another disease. I'm just not 10:41:24
sure where I am on myeloma, but I will update 10:41:36
this through 2005, so you both know that, so 10:41:41
you'll have the same. 10:41:44

Q. You will update the chart? 10:41:46

A. I'm going to update the report. 10:41:49

Q. Okay. 10:41:51

A. The chart was in response to 10:41:52
Dr. Infante's chart. 10:41:54

Q. It was. I'm wondering if you've updated 10:41:56
that chart since then? 10:41:59

A. As I said, I don't remember what was 10:42:01
updated and when. 10:42:03

Q. All right. 10:42:07

A. It was updated after the deposition in 10:42:08
January. That's when I remember. 10:42:11

Q. Did you provide it to Mr. Woolf? 10:42:17

A. He's the one who updated it. 10:42:20

Q. He's the one who updated it? 10:42:22

A. Based on your conversation with him during the deposition. 10:42:25 10:42:26

Q. Are you going to print out a new report that would have up through 2005 articles? 10:42:31 10:42:37

A. Yes. 10:42:42

MR. HARTLEY: Might I get a copy of that, I assume, before trial? 10:42:46 10:42:47

MR. CARPENTER: Absolutely. 10:42:49

Q. I may or may not want to ask you some questions about what you include in that report, so that we can do that by telephone, I'm sure, before trial. 10:42:50 10:42:52 10:42:54 10:42:57

A. Yeah. Well, Bloeman is the one I remember, and there may be more. 10:42:58 10:43:02

Q. You probably might want to consider Dement if you're going to include Thomas in it. 10:43:03 10:43:06

A. I'll use the word "consider", if you would give me a cite or a copy of the paper. 10:43:17 10:43:22

Q. Doctor, I'll be happy to give you my copy of Dement because I have an extra copy of it back home. 10:45:03 10:45:06 10:45:10

What did you bring with you today other than your report and your CV? 10:45:17 10:45:19

(Document handed to 10:45:25

counsel). 10:45:25

A. A piece of paper that said when I'm going 10:45:31
to meet with Mr. Carpenter and you. 10:45:33

Q. When did you last publish? If you need 10:45:38
to look at your CV, that's fine. It's not a 10:45:45
memory quiz. 10:45:48

A. Well, 2004 is here and there, two studies 10:46:00
submitted for publication that were in January, 10:46:04
and one may have been published. I'm not quite 10:46:12
sure. 10:46:17

Q. What were they on? 10:46:17

A. Psychiatric epidemiology. 10:46:19

MR. HARTLEY: Let's mark that as 10:46:21
Exhibit 1. 10:46:22

(Curriculum vitae was 10:46:48
marked as Exhibit No. 1 for identification). 10:46:50

Q. Did you bring an extra copy of your 10:46:53
report? 10:46:55

A. No. 10:46:56

Q. Can I use your copy as an exhibit? 10:46:57

A. I'm only hesitating because I want to 10:46:59
make sure that yours said 4/6? 10:47:01

Q. It did. 10:47:10

A. I was using, when we talked last time, 10:47:12

this automatic update when I found the typo. As long as it's agreed that 4/4 and 4/6 don't differ substantively. 10:47:14 10:47:19 10:47:24

MR. CARPENTER: I don't think they do. 10:47:26 10:47:26

A. I quit doing that because it drove me crazy. 10:47:29 10:47:31

Q. I would bet that you simply printed it out and sent it to him. 10:47:31 10:47:33

MR. CARPENTER: I know that's what happened, and I don't think there's any difference because we went over it. 10:47:36 10:47:37 10:47:39

Exactly the same. 10:49:52

MR. HARTLEY: Okay. 10:49:54

(Monson report was marked as Exhibit No. 2 for identification). 10:50:23 10:50:25

Q. Let me show you what's been marked as Monson Exhibit No. 2. Can you identify that for me? 10:50:27 10:50:30 10:50:32

A. It's a report titled "Epidemiologic Evaluation of the Possible Association Between Workplace Exposure to Benzene or Petroleum Products and the Occurrence of Multiple Myeloma" dated 4/4/05. 10:50:33 10:50:36 10:50:42 10:50:46 10:50:51

Q. And how many pages does that consist of? 10:50:53
A. Twenty-one. 10:50:58
Q. Let me show you what's been marked as 10:51:00
Monson No. 1. Can you identify that for me? 10:51:02
A. It's my curriculum vitae dated January 10:51:05
2005. 10:51:10
Q. How many pages does that involve? 10:51:11
A. Seventeen. 10:51:14
Q. How many hours do you have in this case? 10:51:18
A. Fewer than ten is the best I can say. 10:51:31
Q. If I would ask you -- strike that. 10:51:34
You and I have had depositions before 10:51:36
where I read to you segments from your treatise 10:51:39
on epidemiology. Do you recall that? 10:51:45
A. Yes. 10:51:49
Q. If I were to ask you those same 10:51:50
questions, would you give me those same answers 10:51:52
today? 10:52:00
A. It's likely, but I would want to listen 10:52:00
carefully to the same question. 10:52:00
Q. I understand. 10:52:00
MR. HARTLEY: I have nothing 10:52:00
further. 10:52:01
MR. CARPENTER: I have no questions 10:52:02

at this time. 10:52:04

(Whereupon the deposition concluded at 10:52:06

10:52 a.m.) 10:52:08

COMMONWEALTH OF MASSACHUSETTS )
SUFFOLK COUNTY, ss. )

I, ROBERT MONSON, the witness herein, having read the foregoing testimony of the pages of this deposition, do hereby certify it to be a true and correct transcript, subject to the corrections, if any, shown on the attached page.

oOo

_____

ROBERT MONSON

Subscribed and sworn to before me
this_____day of_____, 20 __
_____.

COMMONWEALTH OF MASSACHUSETTS )

SUFFOLK COUNTY, ss. )

I wish to make the following changes, for the following reasons:

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CERTIFICATE

COMMONWEALTH OF MASSACHUSETTS )
SUFFOLK COUNTY, ss. )

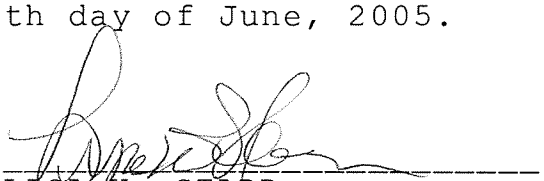
I, LISA W. STARR, a Registered Professional Reporter and Notary Public within the Commonwealth of Massachusetts, do hereby certify:

That ROBERT MONSON, the witness whose testimony is hereinbefore set forth, was properly identified and duly sworn by me.

That the foregoing proceedings were taken down by me stenographically and thereafter transcribed under my direction and supervision, and that the within transcript is a true record of such proceedings.

I further certify that I am not related to any of the parties to this action by blood or marriage, and that I am in no way interested in the cause or outcome of this action.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of June, 2005.



LISA W. STARR
Registered Professional Reporter
Certified Realtime Reporter

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VOLUME: 1
PAGES: 1 through 53

COMMONWEALTH OF KENTUCKY
GREENINGS CIRCUIT COURT
Civil Division
C.A. No. 01-C1-00392

DENIZILYE M. DOUGLAS, Individually and as Personal Representative of the ESTATE OF EARL DOUGLAS, Deceased, Plaintiff,

VS.

ASHLAND INC., U.S.X. CORPORATION, formerly known as UNITED STATES STEEL CORPORATION, and RADIATOR SPECIALITY COMPANY, Defendant.

DEPOSITION OF RICHARD MONSON, a witness called on behalf of the Defendant, taken before Lisa W. Starr, a Registered Professional Reporter/Certified Realtime Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Hyatt Regency Cambridge Hotel, Cambridge, Massachusetts, on June 20, 2005, commencing at 9:30 a.m.

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EXHIBITS


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| 1 | 47 | Curriculum Vitae |
| 2 | 48 | Monson Report |




RICHARD MONSON

of lawful age, being first properly identified and duly sworn to tell the truth, the whole truth, and nothing but the truth, deposes and says as follows in answer to direct interrogatories by Attorney Hartley:

Q. Dr. Monson, could you tell us your full name?

A. Richard Redding Monson.

Q. And your present position is what?

A. Professor of Epidemiology at the Harvard School of Public Health and Associate Dean for Professional Education.

Q. You have been retained by, I assume, both Ashland and U.S. Steel in the case of Douglas vs. Ashland and U.S. Steel as an expert witness; is that correct?

A. Yes.

Q. And I have a copy of your reports, and I would assume that you are prepared today to discuss your report and any final opinions that you have reached?

A. Yes. I would only say any current opinions.

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Q. Do you have any modifications of your report which I have dated as 4/6/05?
A. Mine is 4/4. I thought I gave up the automatic day change.
Q. In that report you discuss various studies that deal with the development of multiple myeloma and exposure to different substances, correct?
A. Just to be accurate, I would separate it into two types of studies: Those that deal with people with multiple myeloma and those that deal with people exposed to benzene and petroleum products.
Q. Okay. How does epidemiology deal with a cohort such as the Pliofilm cohort? As it ages over time, one would expect to see a development of old age cancers, if you will.
At what point in time do you say we can't follow this cohort any further or the lack of findings is not that important to us anymore?
A. I don't think one ever gets to that point. One can analyze data as long as one can.
Q. What significance does that data have as you get further and further from the first date

Page 6

of exposure? This cohort was exposed in the early 1940s forward.
A. Well, one wants to look at the pattern of occurrence of disease according to a number of factors. One is length to follow.
Q. What other factors would one look at in addition to follow-up?
A. Age at first exposure, time at first exposure, length of exposure, level of exposure, gender. I think these were all men. Ethnic group, which is usually white or black.
Q. Does the fact that we are now sixty years, more than sixty years from the first exposure in the Pliofilm cohort have any impact on the continuing update of that cohort and the findings therefrom?
A. It doesn't add any impact on the continuing update. As I say, you keep doing that. You would want to look at -- you would want to stratify length of follow-up.
Q. Why?
A. To see if there's a pattern according to length of follow-up.
Q. And what do you mean by stratify?

Page 7

A. Look at different categories. Just, for example, 0 to 20, 20 to 40, forty plus.
Q. Based upon your knowledge of the benzene literature -- let me rephrase that.
Based upon your knowledge of the benzene literature, would you expect to find increases when you stratify sixty years and above?
A. I don't have any specific knowledge one way or the other.
Q. Do you have an opinion?
A. No.
Q. Would you agree with me that the further removed from the initial exposure one becomes, the less likely the cohort will demonstrate excess risks?
A. An opinion would have to be based on some data, and you're asking a general question. I can't answer a general question like that.
Q. What impact does the fact that the most recent update of the Pliofilm cohort has diminished the excess multiple myeloma found in the studies and the reports of the 1980s?
A. Again, I'd want to look at the data to give you a specific answer. I don't have an

Page 8

opinion on impact without looking more specifically.
Q. Okay. What do you teach your students with regard to follow-up time and the impact one sees many, many years after first exposure, in particular, sixty-plus years after first exposure, if anything?
A. I haven't taught specifically on that point. I've made the general observation, as I just did to you, that one should stratify in length of exposure, among other things, to look at patterns in these various strata.
Q. Well, when one looks at patterns in the various strata and no longer sees an elevated risk of a particular disease, how does the epidemiologist interpret that?
A. Well, one has to go through the various options. The first question is, -- I'm sorry, I didn't get your question. I don't have your question in my mind.
Q. Okay. When an epidemiologist stratifies the data and does it as you have suggested 0 to 20, 20 to 40, 40 to 60, 60 and above, if the epidemiologist sees a decreasing incidence or

Page 9

findings of mortality in this study, how does he interpret that as he gets further and further from the initial first date of exposure?
A. Your question talks about incidence.
Q. That was a poor choice of words. An incidence is not intended to be incidence versus mortality; it was simply the frequency of mortality. How's that?
A. Yeah. Again, that, by itself, you have to have some comparison built into your question, and you don't.
Q. Would you look at the general public to see how the disease manifests itself as far as age is concerned? Would that be of significance to you?
A. In some analyses, one compares disease in the group you're studying to disease in the general public, relative to incidence or mortality.
In other situations, one compares people exposed to the substance in which you're interested to other workers at the same facility who do not have the exposure.
Q. As more and more of the workers die off,

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would you agree with me that the likelihood of finding an elevated risk in the particular cohort is diminished?
A. No.
Q. Does that mean that we can follow the cohort until the very last individual in the cohort dies and still utilize that data to determine whether there was an increase of mortality from a particular disease?
A. One can follow them until the last person dies and evaluate the data, which I would consider utilizing it.
Q. And what impact does that have if you have but one person left in the cohort in your determination of causality or association for a particular disease process that the cohort had been exposed to, for particular substance that the cohort may have been exposed to?
A. Well, you ordinarily wouldn't have a strata with one person. You would have an open-ended strata.
Q. Does there ever come a time when the data or the age of the cohort makes the significance of any findings not that important in evaluating

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association or causation?
A. No.
Q. So, if we follow the cohort completely -- well, let me ask you this.
Myeloma is considered to be a cancer of old age. As your cohort ages and you get to that area where an increase in myeloma is found in the general population, how does the epidemiologist deal with that?
A. You're comparing people of similar ages. So that your comparison population, you look at the age distribution as in your exposed population.
Q. So in 1940, when these folks were first employed, let's assume they came right out of high school, would have been eighteen years old, and the follow-up of 2004 that Rinsky did, it was extended through 1996. So the oldest workers would have been over seventy years old, if we assume that they all were hired in right after high school.
A. Is it 2004 or 2002?
Q. 2002.
A. So, then, please repeat your question.

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Q. Sure. In the 2002 update by Rinsky, he followed the work force through 1996. Do you have an appreciation for the age of the work force by 1996?
A. I don't off the top of my head.
Q. In this particular case, did you consider the extent of Mr. Douglas' exposure to benzene?
A. No.
Q. It had no impact on you in reviewing the studies that you have cited for us in your April 2005 report?
A. No.
Q. Did you consider taking the estimated exposure of Mr. Douglas and looking specifically at the studies that you cited to see how the higher level exposed individuals fare as far as an increase in myeloma?
A. No.
Q. Would that be appropriate to do?
A. It would under certain circumstances. I don't know his exposure history, so I can't really comment beyond it. It wouldn't be inappropriate, put it that way.
Q. Did you not see a report by Stephen

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Petty?
A. I saw it; I didn't evaluate it.
Q. Would that be one of the more appropriate ways to analyze whether Mr. Douglas' benzene exposure was a contributing cause to his development of myeloma?
A. No.
Q. That is, looking at the particular exposure scenario he has and trying to find articles which deal with those exposure scenarios?
A. No.
Q. And why is that?
A. You're making a presumption that benzene is the cause of myeloma, which I'm not willing to assume.
Q. Are you going to testify specifically as to Mr. Douglas, or are you just going to generally say benzene doesn't cause myeloma?
A. I don't know the nature of my testimony. It's in the future.
Q. Have you been asked to testify specifically as to Mr. Douglas' development of myeloma?

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A. Say that again.
Q. Sure. Look at page 21 of your report.
A. Okay.
Q. Your conclusion is: "The weight of the epidemiologic literature fails to establish an association between the occurrence of benzene and multiple myeloma." Is that your opinion today?
A. Yes.
Q. You have not taken into account -- strike that.
You have not been asked to opine on whether Mr. Douglas' work exposures were a contributing cause of his myeloma, have you?
A. Not that I can recall.
Q. I only want to talk with you about a few of the articles that you have referenced in the report. The Rinsky Pliofilm cohort dealt with pure benzene exposure, did it not?
MR. CARPENTER: Where are you, Dean?
MR. HARTLEY: On page 5.
A. Yeah. I recall that the Pliofilm cohorts and other people were involved. It was an Infante cohort initially, and then it was Rinsky as the senior author.

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You say pure benzene. That implies that the only exposure was benzene, and of course it was not. According to the Infante description of the study, natural rubber was mixed with benzene and hydrochloric acid. That's the extent of my understanding of what the exposures were.
Q. Have you seen any literature which would demonstrate that natural rubber increases the likelihood of developing any blood disease?
A. No.
Q. And the same with hydrochloric acid, have you seen any literature which would support a relationship between exposure to hydrochloric acid and the development of blood diseases?
A. No.
Q. If we remove the natural rubber exposure and the hydrochloric acid exposure, could one say that the only exposure this cohort had to substances that may cause blood diseases would be benzene?
A. I would just condition that likely would be benzene because I'm sure that other stuff was added about which we know nothing.
Q. Okay. In the Pliofilm cohort, and in

Page 16

particular the 1987 study that you cite on page 6, regardless of whether you agree with the inclusion of the particular cases of myeloma, their exposure scenario, their lack of exposure, their length of time of exposure, demonstrated an SMR of 3.3, did it not?
A. I would use the word "reported".
Q. And would you also agree that that was in fact statistically significant?
A. If the authors say it was, I would accept that. I can't tell it from looking at the data.
Q. And the SMR that your report of 3.3 were for the two higher exposure groups, correct?
A. No, it was for the lowest and the highest. It was mainly the lowest.
Q. Look at the sentence right before the comment on page 6: "In the two higher exposure groups, the two expected numbers were 1 to .3."
A. Yes. I'm sorry, the overall SMR -- I'm getting the numbers mixed up.
Q. That's why I asked you that second question.
A. What was your first question now?
Q. The first question was the SMR was 3.3,

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but that was only for the higher exposure groups, correct?
A. Yes. I was not answering that question initially.
Q. And the higher exposure groups, those folks would had a level of exposure of 40 to greater than 400 parts per million years, correct?
A. Right. There was one case in .3 expected deaths.
Q. And for the overall cohort, the observed expected deaths from myeloma were 4 to 1, correct?
A. Yes.
Q. I believe the authors reported that that number was in fact statistically significant, correct?
A. If you say so, I'll agree with it.
Q. When it was updated through 1996, these folks who had been exposed to pure benzene had a ratio of 2.5, is that correct, for multiple myeloma development, or death, I guess it would be?
A. I guess if I made that computation, then

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it should be 2.0. There was five observed and two and a half expected. So it's a question of which number I computed.
Q. Okay.
A. It's either two or two and a half.
Q. And that number was not statistically significant, correct?
A. Yes.
Q. And as you've testified in other depositions that I have taken of you, the fact that a number is not statistically significant, the importance of its elevation is still considered, correct?
A. I wouldn't use the importance. I would use the fact that it's elevated.
Q. Is still considered, correct?
A. Yes.
Q. So, if your number is 2.0 or your number is 2.5, even following the cohort through 1996, you have a two-fold elevated risk -- strike that.
If you're following the cohort through 1996, one sees reported by the authors at least a twofold elevated risk for those folks in the

Page 19

cohort for the death from multiple myeloma, correct?
A. I would prefer if you didn't use the word "fold" because it can be misinterpreted.
Q. Okay. What do you mean by fold? What do you think twofold elevated risk means?
A. The question is, is the relative risk two times, is it 2, or is the relative risk 3, which is a twofold increase. And that's an ambiguous use of the words that everyone has some trouble on.
Q. It would be two times the expected risk, correct?
A. Overall, yes.
Q. The fact that it is not significant still is a fact that needs to be considered in determining whether those folks exposed to pure benzene are at an increased risk of death from myeloma, correct?
A. I wouldn't use the word "risk." I would say whether there is the observation that the observed is greater than the expected.
Q. Now, looking at the Yin study, you cite that, beginning on page 7 and the bottom of 7

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carrying over to page 8, that cohort represents workers exposed to many different substances, does it not, that may or may not contain benzene?
A. I believe they all have some exposure to benzene.
Q. But it wasn't in the pure form, was it? It was spray paints, was it as solvents, it might be as printing agents. It was a conglomeration of numerous different types of products. Would you agree with that?
A. Yes, although there may have been some who were exposed only to benzene.
Q. And does your recollection permit you to tweak out what number out of 28,000 may have been exposed to pure benzene?
A. No.
Q. If you look at page 8, you reference the Decoufle article from 1983?
A. Yes.
Q. That's a study of the Quantico refinery, is it not, or chemical plant?
A. Looks like chemical workers.
Q. What impact does the fact that the second case of myeloma occurred in a worker who died

Page 21

from leukemia have, if any, on a causality determination?
A. It's hard to judge because, in essence, what is looked at is being looked at when that case is included as incidence of myeloma as opposed to mortality from, and no comparison is made with incidence of myeloma among the general population.
Q. There's no way of knowing whether the myeloma was the underlying cause of the leukemia, is there?
A. No, although the death certificate sounds like -- if the death certificate were filled out correctly, leukemia would be the primary cause, and myeloma would be the secondary cause.
Q. If myeloma were in fact the cause of the leukemia, you mean?
A. No. If myeloma were the cause of leukemia, it would be a worker who died from myeloma. There is a "due to" in there. Either it's myeloma due to leukemia or leukemia due to myeloma.
The way this is worded it would be myeloma due to leukemia. That's the way the

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death certificate would have been filled out.
Q. You cite in the author's note that the data are too scanty for a firm estimate of risk?
A. Yes.
Q. And then you conclude on the next page with, "This very small study provides limited data for an excess in myeloma in any workers exposed to benzene." What did you mean by that?
A. One death observed, I say the expected number likely was less than .5. So that would be limited data.
Q. Would you read the block I have marked there from the Decoufle study?
MR. CARPENTER: Where are you reading from?
MR. HARTLEY: It's the very last page.
A. Do you want me to read it out loud?
Q. You can read it out loud.
A. "In addition, the study augments prior observations of a possible link between benzene and multiple myeloma."
Q. Do you agree with that assertion by the authors in 1983?

Page 23

A. Yes.
Q. Let's look at the Bond study that you cite on page 9.
A. If I may, you used the word "assertion", which is a bit stronger. I used the word "observation".
Q. All right. You indicate that the Bond study provides no evidence of an excess --
A. What page are we on?
Q. Page 9.
A. The authors made that statement.
Q. Did the authors indicate what the expected would be for this cohort of 956 employees?
A. Only that it was, the implication was it was greater than one.
Q. Is there any way to verify that?
A. Well, I can look at the paper, but that's a quote from the paper.
Q. Oh, no, I'm not arguing about was that the quote. Was there any way to verify that the expected was implicitly greater than one?
A. Not by me, no.
Q. Okay.

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A. When I looked at Bond, because there is a Bloeman study which is later, which I don't believe I included in this review.
Q. You did not.
A. And that's one I would want to add.
Q. Add?
A. I would want to say something about because I think that updated the Bond study.
Q. It did.
A. Okay. So I did not include it in this report.
Q. Is it unusual to report SMRs without reporting the expected number?
A. If one reports the observed number in the SMR, that's standard, because you compute the expected number.
Q. You mention -- how would you pronounce the gentleman's name?
A. Bloeman.
Q. Doctor, we'll flip this back and forth. Looking at the Bloeman study, it appears from the highlight in the abstract as well as in that first introductory section that these were workers who began exposure sometime after 1935

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and probably about 1938, correct?
A. Yes. The highlighted section, that's what that says.
Q. And in looking at the article, and it's been awhile since I've looked at this, but it appears to me that the exposures in this particular study were quite low, the exposures to benzene were quite low. Do you recall that?
A. I don't recall it. The highest category they use is 25 PPM with the average being 30, and that's an open-ended category. So it's hard to say how high it went.
So I would not say, I'm trying to think what these -- this is average exposure, time-weighted average. So this is not exposure years; it's point exposure. So, no, I would not say this is low, or very low, whatever word you used.
Q. It appears that the authors have reported that the average estimate of cumulative exposure amounted to 37.7 PPM years, correct?
A. Yes.
Q. Let's talk about the Wong study for a second, Wong 87. Let's go back to Bond just for

Page 26

a second.
The Bond cohort was a group that would have been at least partially exposed to pure benzene, correct?
A. I don't know that.
Q. Back to Bloeman as well. If you look at what the authors wrote in their methods section, beginning with the sentence "Persons", would you read that?
A. "Persons employed in the chlorobenzol area with jobs in the lowest exposure category are now included in the cohort."
Q. Would it be reasonable to conclude from that sentence that the update included folks who had low-level exposure to benzene?
A. Well, all it says is lowest, and without a description of what's low.
Q. It's a term of art, I understand.
A. So certainly the lowest exposure categories were what they used, and that's correct.
Q. Would you agree with me that by adding folks that have the lowest exposures, one would tend to go toward a null hypothesis?

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A. Unless one was already at the null hypothesis.
Q. I understand that. The addition of lower-level exposed workers tends to lead one to the null hypothesis, does it not?
A. That's a hypothetical general statement you're making not related to benzene and myeloma?
Q. It is. Would you agree with that statement?
A. Yes, yes.
Q. Do you understand how benzene is used in the chlorobenzol units?
A. No.
Q. Do you understand how it's used in the alkali benzene?
A. No.
Q. Do you understand how benzene is used in ethyl cellulose?
A. No.
Q. Wong 87. You write: "Three deaths from myeloma were observed in comparison to an expected number of 2.8." Do you see that?
A. Yes.
Q. That 2.8 comes from Wong's more recent

Page 28

paper, does it not, where he said, I believe in '95, that the expected number for this group of folks was 2.8?
A. Well, just to clarify, the 2.8 relates to this particular cohort.
Q. At least according to Wong.
A. But he reported the 2.8 at a later time.
Q. He did. I believe he reported it in one of his meta analyses, his reviews on myeloma and benzene, or something, did he not?
A. It was another paper.
Q. It was. Did you go back and take a look at the comparison group that he used, the internal comparisons that he suggested in OSHA papers and the testimony were the more pertinent group to see how many myeloma cases were in fact in that group?
A. I didn't go back and look, but I'm aware that there was zero.
Q. Correct. So, in the exposed group, there were three, and in the non-exposed comparison internal group, there was zero, correct?
A. Yes.
Q. How does that impact the assertion that

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the expected number is 2.8?
A. Well, this is based on general population data, use an external comparison as opposed to use an internal comparison.
Q. Would you agree with me that using internal comparison groups are a better vehicle to determine SMRs or relative risks?
A. Not necessarily.
Q. Why would one want to utilize -- strike that.
What's the benefit of using an internal group over the general population?
A. In theory, they're more comparable, the two groups of workers are more comparable in terms of lifestyles, reason for being employed, but there may be additional differences between them, between the two groups, because one type of person may work in one type of job, and another in another type of job. And the main limitation is that the numbers may be small and very unstable.
Q. What do you mean by unstable?
A. Subject to random variability.
Q. Would that be the case for utilizing the

Page 30

internal comparison groups in this study?
A. I can't speak specifically because it depends a lot on total expected numbers for the various causes.
Q. Do you recall that in the intermittently exposed group there were two deaths from myeloma and only .56 expected?
A. I don't recall that.
Q. At the bottom of page 9 you cite Hanson?
A. Yes.
Q. And those are, or that is a study of Danish stokers, correct?
A. Yes.
Q. And those folks are exposed to any number of potential carcinogens, correct?
A. Yes.
Q. That group is not a pure benzene-exposed group, is it?
A. I don't see how it could be.
Q. Looking at the top of page 10, you cite the Fu study, which is a follow-up of shoemakers in England and Italy?
A. Yes.
Q. And according to your own writing, it

Page 31

says shoemakers are exposed to leather dust and solvents from glues, including benzene?
A. Yes.
Q. So those would not be pure benzene-exposed workers, would they?
A. No.
Q. Now, if we look at Ireland, are you aware that the Monsanto workers in Ireland were exposed to pure benzene?
A. No.
Q. Do you know what those, what parts of the plant those workers were employed in?
A. All it says is benzene-using departments.
Q. Looking at Ireland on page 318, the very first sentence under "Exposure Assessment", can you read that into the record?
A. "The benzene-using departments are nitrobenzene, phenol, chlorobenzene, muriatic acid, and alkylbenzene production."
Q. Are you aware that Mr. Douglas worked in a phenol plant?
A. Yes.
Q. Ireland reports three deaths from myeloma among production workers and .9 expected,

Page 32

correct, according to your --
A. Yes.
Q. Which according to the author results in an SMR of 2.3. Does that sound about right?
A. No, it wouldn't be 2.3. If they had maintenance in it, it might be. But that wouldn't be correct either, so I don't know where that number comes from.
Q. Nor do I. That's what she reports in her abstract.
Looking at table 1, which is observed versus expected deaths by cumulative benzene exposure, if you go across the myeloma line, it appears that as the exposure increases, the SMR increases for myeloma as well; is that correct?
A. It goes down, up, down, zigzag. So it's not a line; it's a zigzag line.
Q. Does the zigzag line demonstrate a dose response?
A. It's not a monotonic dose response, which would mean no zigzag.
Q. All right.
A. If you want to compare exposed to non-exposed, there would be an increase.

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Q. What do you mean by that, there would be an increase?
A. Well, the observed number is greater than -- sorry. The observed over expected ratio is greater among the exposed than among the non-exposed.
Q. Looking at that, can you calculate for me what that ratio would be?
A. Over -- among the exposed, it would be 3 over 1 1/2.
Q. What about the observed in the highest exposure category?
A. That's 1 over .3.
Q. Looking at the last paragraph on page 320, Dr. Monson, could you read into the record the first two sentences?
A. "Our findings are limited by imprecision -- "
Q. Before that.
MR. CARPENTER: "There is debate..."
MR. HARTLEY: Yes.
A. "There is debate about whether low benzene exposure increases the risk of multiple myeloma and all types of leukemia or just ANL.

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Our study provides some support for both sides of the debate."
Q. Now, when the study was updated through 1997, you report in a table-like format the SMRs increasing from less than .1 part per million years at .14 to 1.1 to 6 part per million years -- strike that.
You have in table format, Dr. Monson, an indication of the exposures and the development of myeloma based on the SMR, correct?
A. Yes.
Q. At no exposure the SMR would be 1.1?
A. Yes.
Q. At less than 1 part per million years, the SMR would be 1.4?
A. Yes.
Q. At 1 to 6 part per million years, the SMR would be 1.5?
A. Yes.
Q. And at greater than 6 part per million years, the SMR is 2.6?
A. Yes.
Q. Did you attempt to determine whether that increase was statistically significant; in other

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words, the trend itself was statistically significant?
A. No.
Q. Do you have any way of doing that?
A. There is a way to do it. I don't have it.
Q. Okay. Can we at least say that as one experiences greater exposure to benzene in this cohort, the SMR for myeloma increases?
A. Yes.
Q. What do you mean when you have calculated at the bottom a total?
A. That's those with more than no exposure.
Q. So in your total, you have included the folks who were not exposed, correct?
A. No.
Q. You've got 13 over 8.9?
A. But the association -- I'm sorry, we're talking about two different things here. The overall association is 13 over 8.9. If you include the no exposure, it's 8 over .2.
Q. We wouldn't expect to expose folks in order to determine whether benzene causes or is associated with myeloma, would we?

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A. Don't use the word "cause" at the moment, please.
Q. I won't. That's why I added "associated" afterwards. Let me strike that, and I'll do it again.
We wouldn't expect to include non-exposed individuals in this cohort if we were attempting to determine an association between myeloma and benzene, correct?
A. Well, yes and no. If we're looking only at those exposed, then you would not include them. If you were making a comparison between exposed and non-exposed, then you would compare them.
Q. You concluded that this study provides some data consistent with a non-significant excess of myeloma among workers exposed to benzene, did you not?
A. Yes.
Q. Do you know whether the authors themselves determined whether the trend was significant?
A. No.
Q. What importance would that have if in

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fact the trend was significant?
A. There would be another piece of information to be considered.
Q. In our determination of what?
A. Association.
Q. Look at the abstract, the last three sentences beginning with "However."
A. Do you want me to read it?
Q. Sure. Would you agree with me that the authors have reported that when peak exposures over a hundred parts per million for 40 or more days are considered, the SMR for myeloma was 4.0?
A. Yes, and the confidence level was .8 to 11.7.
Q. Do the authors also state in that abstract that a high number of peak exposures to benzene is a better predictor of risk than cumulative exposure for myeloma?
A. Can you point that out?
Q. Don't know that it's in there. I know that it's in the article, but I don't know if it's in that abstract.
A. I don't see it in the abstract.
MR. CARPENTER: Look at the very

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last paragraph, if that will help.
MR. HARTLEY: Thanks.
Q. The very last paragraph, I think it's sentence 2 and 3.
A. "Our study found increased rates of ANL and multiple myeloma at benzene concentrations greater than 100 PPM, high and intermittent benzene exposure was related to the highest risk."
Q. Looking at Glass on page 11, these folks were refinery workers, I believe, were they not, or else distribution workers?
A. All I have written down here is petroleum industry. So whatever you say they were, I'll accept.
Q. In your third paragraph, you say: "It is noted that men in this cohort based on 15 exposed cases have an increased relative risk for myeloma of 1.9."
A. Yes.
Q. Was that statistically significant?
A. Yes.
Q. Now, the authors, you write, conclude that the excess noted is not related to benzene

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exposure, correct?
A. Well, I'll read: "No association was found between benzene and non-Hodgkin lymphoma or a multiple myeloma."
Q. Do you have an appreciation for how the 15 exposed workers would have an increased risk of myeloma and it not provide some information on the association?
A. Well, the 15 is the entire cohort, and presumably they then separated the cohort into those with varying levels of benzene exposure and looked at the various categories of benzene exposure.
Q. If these men and women were distribution workers as well as refuelers of various types of equipment, they wouldn't be exposed to pure benzene, would they?
A. No.
Q. They would have gasoline exposure and other refinery stream exposures in addition to pure benzene, correct?
A. To the best of my knowledge, yes.
Q. The one study that you didn't refer in addition to the Bloeman study we talked about

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earlier was the Dement study in 1998. Do you recall that study?
A. No.
Q. I believe that was the update of Thomas.
A. I don't recall having seen that study. Yes, it's an update of Thomas, 1982.
Q. In that update, does Dr. Dement and others report excess myeloma for these three refineries, this cohort of three refineries?
A. I guess it would help if you pointed it out.
Q. Well, I think he breaks it down by different exposure scenarios, different latency periods. If you would like, I could go through it with you.
A. Well, he seems to combine -- here's one myeloma. Most of the time, myeloma was included with other. On table 11 he lists multiple myeloma. And overall, there were ten cases observed in a proportional PMR ratio of 124. That's the one place I see it.
Q. If we look at the PMR for workers who were white, the PMR would be 160 for myeloma, is it not?

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A. Yes.
Q. What would cancers of other lymphatic tissue be?
A. I was trying to figure that out myself. 202 is malignant lymphoma and 203 is multiple myeloma.
Q. When he combines the categories of 202 and 203, or they combine the categories, would you agree that they report an SMR of 233?
A. I'll just read what they say. They say, "Cancers of other lymphatic tissue, SMR 233", and I'll extend that by saying usually 205 is included in that group, and it depends on what NIOSH did in its program at that time. When they use the word "other", they say 202 and 203. 205 may or may not be included. I'm sorry, it would be 208 at this time.
Q. So we don't know from that concluding remark whether it's 202 and 203 or --
A. 202 and 203 or 208.
Q. One final area. You talked about, and I always butcher this guy's name, is it, it's T-S-A-I?
A. Tsai.

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Q. The Tsai study from 1983. Looking at what you indicated, that is that the study provides evidence of no excess of myeloma in a group of workers exposed to benzene, correct? That's on page 6, I think it is -- 8, I'm sorry.
MR. CARPENTER: His report?
MR. HARTLEY: Of his report, that's right.
Q. On page 8 of your report, you indicate that Tsai, et al, is a very small study and provides evidence of no excess of myeloma in a group of workers exposed to benzene, correct?
A. Yes.
Q. If you would look for me at page 687 in the highlighted area that I have in the left-hand column beginning with "for 89 percent." And would you read into the record the exposure of this group of workers according to the authors, had experienced?
A. Two sentences or one?
Q. I believe it runs down.
A. "For 89 percent of the full samples and 79 percent of the partial samples, exposures were less than 1 part per million (PPM) benzene. For

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10 percent of the full samples and 17 percent of the partial samples, exposures were between 1 and 10 PPM. In addition, for 4 percent of the partial samples, exposures exceeded 10 PPM."
Q. So, according to the authors, 89 percent of the full samples and 79 percent of the partial samples, the exposures were less than 1 part per million?
A. Yes.
Q. What significance is it to you in reviewing the association between benzene and myeloma that arteriosclerotic heart disease had a deficit whereby the SMR was .46?
A. Please repeat the question.
Q. Sure. Does the fact that the healthy worker effect demonstrated by the low SMR of .46, 0.46 for arteriosclerotic heart disease have any association between benzene and myeloma in this study?
A. The answer is it has no impact.
Q. What about the fact that cancer deaths demonstrated an SMR of .87, would that have an impact on a lower SMR for myeloma overall?
A. No.

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Q. What about the fact that there were no leukemias found in this cohort, would that impact the lack of a finding of myelomas in this cohort?
A. The only impact in general is that this is a very small study.
Q. Would you agree with me that if you don't have enough benzene exposure to demonstrate an elevated risk of leukemia, the lack of a finding of myeloma in the cohort is not as important when determining an association between benzene and myeloma?
A. I would say it's relevant to the issue.
Q. In what way?
A. One accepts that under certain exposure scenarios benzene will cause ANL. Not having seen that suggests that the exposure to benzene was low.
Q. Have you attempted to update the chart that we discussed in LeBron which was the various studies that were grouped together of potential exposures and the development of myeloma?
A. I'm trying to think because it was updated at the time of the deposition.
Q. It was. I'm just wondering if you've

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worked on that since then.
A. I know Bloeman is floating around somewhere. Whether I actually put it in the cart or not, I'm not sure. See, I noticed this is through 2003, and I have looked at the literature through 2005 for another disease. I'm just not sure where I am on myeloma, but I will update this through 2005, so you both know that, so you'll have the same.
Q. You will update the chart?
A. I'm going to update the report.
Q. Okay.
A. The chart was in response to Dr. Infante's chart.
Q. It was. I'm wondering if you've updated that chart since then?
A. As I said, I don't remember what was updated and when.
Q. All right.
A. It was updated after the deposition in January. That's when I remember.
Q. Did you provide it to Mr. Woolf?
A. He's the one who updated it.
Q. He's the one who updated it?

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A. Based on your conversation with him during the deposition.
Q. Are you going to print out a new report that would have up through 2005 articles?
A. Yes.
MR. HARTLEY: Might I get a copy of that, I assume, before trial?
MR. CARPENTER: Absolutely.
Q. I may or may not want to ask you some questions about what you include in that report, so that we can do that by telephone, I'm sure, before trial.
A. Yeah. Well, Bloeman is the one I remember, and there may be more.
Q. You probably might want to consider Dement if you're going to include Thomas in it.
A. I'll use the word "consider", if you would give me a cite or a copy of the paper.
Q. Doctor, I'll be happy to give you my copy of Dement because I have an extra copy of it back home.
What did you bring with you today other than your report and your CV?
(Document handed to

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counsel).
A. A piece of paper that said when I'm going to meet with Mr. Carpenter and you.
Q. When did you last publish? If you need to look at your CV, that's fine. It's not a memory quiz.
A. Well, 2004 is here and there, two studies submitted for publication that were in January, and one may have been published. I'm not quite sure.
Q. What were they on?
A. Psychiatric epidemiology.
MR. HARTLEY: Let's mark that as Exhibit 1.
(Curriculum vitae was marked as Exhibit No. 1 for identification).
Q. Did you bring an extra copy of your report?
A. No.
Q. Can I use your copy as an exhibit?
A. I'm only hesitating because I want to make sure that yours said 4/6?
Q. It did.
A. I was using, when we talked last time,

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this automatic update when I found the typo. As long as it's agreed that 4/4 and 4/6 don't differ substantively.
MR. CARPENTER: I don't think they do.
A. I quit doing that because it drove me crazy.
Q. I would bet that you simply printed it out and sent it to him.
MR. CARPENTER: I know that's what happened, and I don't think there's any difference because we went over it.
Exactly the same.
MR. HARTLEY: Okay.
(Monson report was marked as Exhibit No. 2 for identification).
Q. Let me show you what's been marked as Monson Exhibit No. 2. Can you identify that for me?
A. It's a report titled "Epidemiologic Evaluation of the Possible Association Between Workplace Exposure to Benzene or Petroleum Products and the Occurrence of Multiple Myeloma" dated 4/4/05.

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Q. And how many pages does that consist of?
A. Twenty-one.
Q. Let me show you what's been marked as Monson No. 1. Can you identify that for me?
A. It's my curriculum vitae dated January 2005.
Q. How many pages does that involve?
A. Seventeen.
Q. How many hours do you have in this case?
A. Fewer than ten is the best I can say.
Q. If I would ask you -- strike that.
You and I have had depositions before where I read to you segments from your treatise on epidemiology. Do you recall that?
A. Yes.
Q. If I were to ask you those same questions, would you give me those same answers today?
A. It's likely, but I would want to listen carefully to the same question.
Q. I understand.
MR. HARTLEY: I have nothing further.
MR. CARPENTER: I have no questions

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at this time.
(Whereupon the deposition concluded at 10:52 a.m.)

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COMMONWEALTH OF MASSACHUSETTS )
SUFFOLK COUNTY, ss. )

I, ROBERT MONSON, the witness herein, having read the foregoing testimony of the pages of this deposition, do hereby certify it to be a true and correct transcript, subject to the corrections, if any, shown on the attached page.
oOo

_____
ROBERT MONSON

Subscribed and sworn to before me this_____day of_____, 20 __
_____.

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COMMONWEALTH OF MASSACHUSETTS )
SUFFOLK COUNTY, ss. )
I wish to make the following changes, for the following reasons:
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CERTIFICATE

COMMONWEALTH OF MASSACHUSETTS )
SUFFOLK COUNTY, ss. )

I, LISA W. STARR, a Registered Professional Reporter and Notary Public within the Commonwealth of Massachusetts, do hereby certify:

That ROBERT MONSON, the witness whose testimony is hereinbefore set forth, was properly identified and duly sworn by me.

That the foregoing proceedings were taken down by me stenographically and thereafter transcribed under my direction and supervision, and that the within transcript is a true record of such proceedings.

I further certify that I am not related to any of the parties to this action by blood or marriage, and that I am in no way interested in the cause or outcome of this action.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of June, 2005.

LISA W. STARR
Registered Professional Reporter
Certified Realtime Reporter

My Commission Expires: May 9, 2008

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