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SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF SAN FRANCISCO

DEWAYNE JOHNSON,

Plaintiff,

vs.

Case No. CGC-16-550128

MONSANTO COMPANY, et al.,

Defendants.

-----/

Proceedings held on Wednesday, July 18, 2018,
Volume 12, Afternoon Session, before the Honorable
Suzanne R. Bolanos, at 1:31 p.m.

REPORTED BY:

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Pages 2626 - 2754

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EXHIBITS ADMITTED

(None.)

1 Wednesday, July 18, 2018

2 1:31 p.m.

3 Volume 12

4 Afternoon Session

5 San Francisco, California

6 Department 504

7 Judge Suzanne Ramos Bolanos

8
9 PROCEEDINGS

10 09:01:49

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 13:31:57

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18 [REDACTED]

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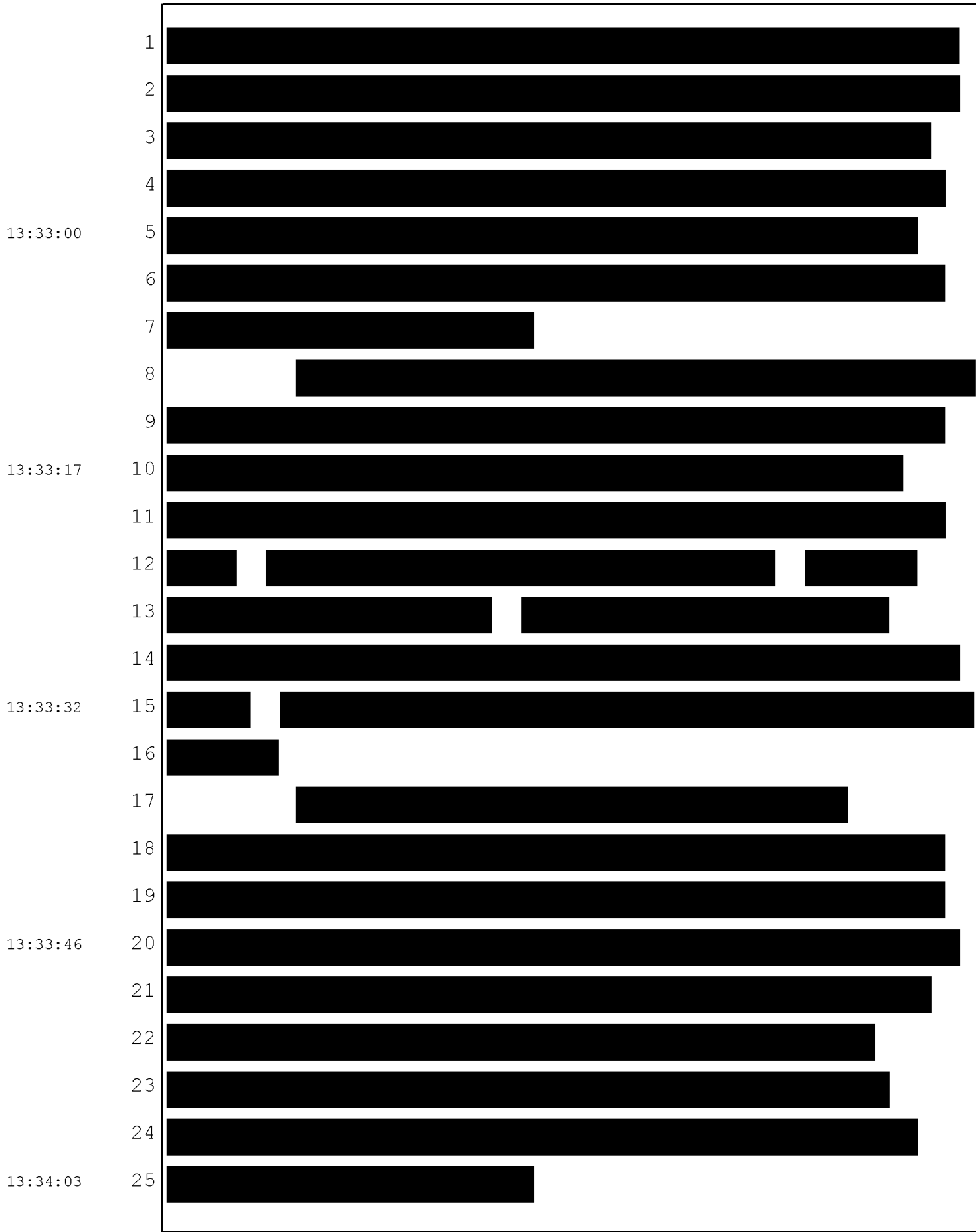
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9 [REDACTED] [REDACTED]

13:35:04

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11 [REDACTED]
12 [REDACTED] [REDACTED] [REDACTED]
13 [REDACTED]
14 [REDACTED] [REDACTED]

13:37:02

15 [REDACTED] [REDACTED]
16 [REDACTED] [REDACTED] [REDACTED]
17 [REDACTED]

18 (Jurors enter courtroom.)

19 THE COURT: Good afternoon.

20 Good afternoon, Ladies and Gentlemen, and
21 welcome back. Good afternoon, Dr. Neugut. Dr. Neugut
22 remains under oath.

23 And, Mr. Wisner, when you're ready, you may
24 proceed.

13:37:11

25 MR. WISNER: Thank you, your Honor.

1 DIRECT EXAMINATION (Continued)

2 BY MR. WISNER:

3 Q. Dr. Neugut, just before we ended off, we were
4 talking about the AHS study specifically related to
13:37:20 5 issues of exposure misclassification and imputation. And
6 the first thing I'd like to do is I'd like to just ask
7 you a question about -- one second. I'm discombobulated
8 here.

9 All right. Doctor, in your binder, if you could
13:37:45 10 please turn to Exhibit 684.

11 A. Okay.

12 Q. This is a journal article specifically about the
13 agricultural health study that you've reviewed.

14 A. Yes.

13:38:05 15 MR. WISNER: Permission to publish, your Honor?

16 THE COURT: Objection?

17 MR. LOMBARDI: No objection.

18 THE COURT: Very well.

19 Q. BY MR. WISNER: All right. This is the document
13:38:11 20 I just showed you, Doctor. It's on the screen. It's
21 titled, "Impact of Pesticide Exposure Misclassification
22 on Estimates of Relative Risks in the Agricultural Health
23 Study." What is this article about?

24 A. This is looking at what we had talked about
13:38:29 25 earlier which is when they measured the -- how the

1 exposure was measured by the people who were filling out
2 the questionnaires when they were recruited into the AHS
3 study. They're looking at how accurate was the amount of
4 exposure that they measured on the questionnaires.

13:38:53

5 Q. And this is published in July of 2011; is that
6 right?

7 A. Uh-huh.

8 Q. And the lead author is Aaron Blair.

9 A. Uh-huh.

13:39:00

10 Q. Do you see that?

11 A. Uh-huh, yes.

12 Q. And then it's a bunch of other scientists mostly
13 from the Division of Cancer Epidemiology and Genetics at
14 the National Cancer Institute?

13:39:11

15 A. Correct. And these mostly are the authors from
16 the AHS study, or many of them are.

17 Q. In fact, many of the authors of this document
18 were also authors in the Andreotti paper or, as Monsanto
19 likes to call it, the JNCI paper; is that right?

13:39:29

20 A. Yes.

21 Q. That's the one that has the most recent data
22 about NHS and glyphosate?

23 A. Correct.

13:39:37

24 Q. Okay. So here they're talking about the
25 potential impact of exposing this classification, one of

1 the issues that we were just discussing a minute ago or
2 before lunch; is that right?

3 A. Correct.

4 Q. Okay. I want to go to the conclusion section
13:39:48 5 here. Starting at the word "second."

6 Do you see that, Doctor?

7 A. Yes.

8 Q. "Second, except in situations where exposure
9 estimation is quite accurate, i.e., correlations of .70
13:40:10 10 or greater with true exposure and true relative risks are
11 3.0 or more, pesticide misclassification may diminish
12 risk estimates to such an extent that no association is
13 obvious which indicates false negative findings might be
14 common."

13:40:29 15 Did I read that right?

16 A. Yes.

17 Q. What does that mean?

18 A. So it's saying that if -- two things: If the
19 exposure estimate is only 70 percent accurate in the
13:40:42 20 first place, then you're going to have a random
21 misclassification error that's going to lead to an error
22 that's going to cause the relative risk estimate to be
23 grossly inaccurate in the first place. But even more
24 importantly, for our purposes, as I had said before, here
13:40:58 25 it's saying that since we're talking in the context with

1 a relative risk estimate is putatively 1.5.

2 So they're saying if the true relative risk is
3 3 -- unless the true relative risk is 3 or more,
4 pesticide -- the misclassification error is going to
13:41:21 5 basically eliminate the observed risk estimate to the
6 degree that basically you're going to miss a risk
7 estimate entirely by the degree of error, that just the
8 way people filled out the questionnaire is going to do
9 it.

13:41:36 10 So basically in the AHS study, the exposure
11 misclassification is basically going to make it
12 impossible to see a relative risk of 1.5 in the first
13 place.

14 Q. And, in fact, with the AHS article in 2017, we
13:41:54 15 actually have a bit of both; right?

16 A. Yeah.

17 Q. We have poor imputation issues, and we have
18 misclassification; is that right?

19 A. Well, I didn't get a chance to talk about the
13:42:04 20 imputation error, but just the first -- we have
21 misclassification error twice. We have the
22 misclassification on the baseline interview which was
23 measured at 10 percent or at least 10 percent, which is
24 probably enough to obviate the risk to underestimate or
13:42:21 25 eliminate the risk of 1.5 in the first place. Then

1 you're interviewing them a second time and getting a
2 second misclassification error, then the point of the
3 imputation, which is another error that we haven't talked
4 about yet, but that's adding a third error.

13:42:38

5 So between all the errors, which are all going
6 to be conservative, as I said, they're all going to
7 reduce the observed risk ratio to 1 or below 1, so you're
8 not going to see anything. That's why I think that the
9 AHS study is really, to a large degree, uninterpretable
10 and really doesn't give us any information with regard to
11 the association between glyphosate and NHL.

13:43:01

12 Q. Now, Doctor, AHS didn't just look at glyphosate;
13 right?

14 A. No.

13:43:14

15 Q. And it didn't just look at NHL?

16 A. No. It looked at the basically multiple,
17 multiple herbicides and fungicides and other things, and
18 it also looked at the basically multiple, multiple,
19 cancers, among them NHL.

13:43:30

20 Q. Just to be clear, would it ever be appropriate
21 to call the AHS study, either the 2005 or the 2017
22 version of it, a "non-exploratory" study?

23 A. I don't know the term in this context. I mean,
24 it's whatever it is. It's a study.

13:43:52

25 Q. I guess the question is: If someone were to say

1 all the case control studies they're exploratory, but the
2 AHS, that's specifically glyphosate, would that be
3 accurate?

13:44:09 4 A. Well, I suppose the last study is specific to
5 glyphosate, because it only analyzes glyphosate as the
6 exposure.

7 Q. But the AHS itself isn't about glyphosate?

8 A. The AHS study itself is not specific to
9 glyphosate.

13:44:19 10 Q. So in all those case control studies that the
11 authors had just published just the glyphosate results,
12 then it would itself be a glyphosate-specific study;
13 right?

14 A. Yes.

13:44:28 15 Q. All right. Now, because there was other
16 pesticides tested in the AHS, wouldn't it be possible to
17 see how the AHS did with other pesticides that we know
18 cause cancer?

19 A. Absolutely.

13:44:42 20 Q. And I believe you prepared a demonstrative for
21 that; is that right?

22 A. Yes.

23 MR. WISNER: Permission to publish, your Honor,
24 Demonstrative 1034?

13:44:51 25 THE COURT: Any objection?

1 MR. LOMBARDI: No objection, your Honor.

2 THE COURT: Very well. You may proceed.

3 Q. BY MR. WISNER: All right. Doctor, we're
4 looking at Exhibit 1034.

13:45:06

5 Do you see this, Doctor?

6 A. Yes.

7 Q. And this is from one of your reports that you
8 prepared in this case; right?

9 A. Yes.

13:45:12

10 Q. Walk us through what we're seeing here.

11 A. Pardon me?

12 Q. Tell us what we see.

13 A. Oh, I'm sorry.

14 Q. What does this show us?

13:45:18

15 A. This is a table which looks at the -- basically,
16 the results from the AHS study, and it's listing five
17 pesticides or herbicides that were evaluated in the AHS
18 study. And you can see the list in the first left-hand
19 column, DDT, et cetera, et cetera, with glyphosate itself

13:45:42

20 on the bottom in bold. And you can see in the second
21 column how they were each classified in the IARC
22 classification, and you can see each of these is either a
23 Class 1 or Class 2A carcinogen according to IARC and all
24 of them being positively associated with NHL. So

13:46:06

25 basically they're all putatively like glyphosate.

1 And now if we look in the last column how the
2 AHS study evaluated them or whether -- they were all
3 evaluated by the AHS study. And while the AHS study did
4 find an association between DDT and NHL and between
13:46:29 5 lindane and NHL, it did not find an association with
6 glyphosate as we know and as we're now saying, but it
7 also missed diazinon and malathion, which are two other
8 known carcinogens, 2A carcinogens, for NHL.

9 So basically, what we can say is that the AHS
13:46:50 10 study -- I'll use the word "screwed up," not just once,
11 but screwed up for several known 2A carcinogens. So it's
12 not singular. It's not the only thing it missed. So we
13 can say that the AHS study is, you know, insensitive or
14 has problems and doesn't always -- it's not a perfect
13:47:17 15 study in terms of being able to pick up 2A carcinogens
16 that were identified previously. So the fact that it
17 missed glyphosate is not remarkable. It goes along with
18 its failures in other instances.

19 Q. All right. Doctor, we got ten minutes left. So
13:47:37 20 let's end with Sir Bradford Hill. Who is Sir Bradford
21 Hill, quickly?

22 A. Sir Bradford Hill was a statistician in the
23 1960s in Great Britain, basically an early
24 epidemiologist, an early cancer epidemiologist involved
13:47:55 25 in tobacco and lung cancer. These are the days of when

1 people were trying to prove that tobacco and lung cancer
2 were associated. And as I said before, it's not easy to
3 prove causal association. So the question is, as I've
4 said, all the studies we've been talking about in terms
13:48:09 5 of case control and Cohort Studies really are to show
6 statistical association, so now we have to go on to the
7 next step. How do you show a causal association, which
8 is really what's at issue, and the answer is what's
9 universally used in epidemiology is what are called the
13:48:26 10 Bradford Hill criteria named after Sir Bradford Hill, who
11 elucidated them or described them in his paper in 1965 in
12 the context of tobacco and lung cancer.

13 Actually, I need a slide or poster or whatever.
14 I don't know what you've got.

13:48:40 15 MR. WISNER: Permission to publish 1033, your
16 Honor?

17 THE COURT: Any objection?

18 MR. LOMBARDI: No objection.

19 THE COURT: Very well.

13:48:45 20 Q. BY MR. WISNER: So let me ask the questions and
21 then -- I don't want to get draw an objection. So we
22 have a chart here. We have the first one that says
23 "Temporality."

24 Do you see that?

13:48:55 25 A. Yes.

1 Q. These are the various factors for Bradford Hill?

2 A. Yes.

3 Q. Okay. Great. And then you have these pluses
4 next to them and minuses.

5 A. Right.

6 Q. Do you see that?

7 A. Right.

8 Q. That's not a minus, that's a range; right?

9 A. Yes.

13:49:06 10 Q. So this is between two and three for --

11 A. Two to three.

12 Q. -- dose response?

13 A. Yeah.

14 Q. Okay. So before you go through this -- and I
13:49:15 15 want you to go through this -- but in case we run out of
16 time -- before we get there, to a reasonable degree of
17 scientific certainty, does glyphosate formulation
18 exposure cause non-Hodgkin's lymphoma?

19 A. Yes.

13:49:27 20 Q. So let's go through this. Walk us through each
21 one, temporality.

22 A. These are the criteria that were established by
23 Bradford Hill for establishing or judging whether --
24 given a statistical -- given an association whether
13:49:41 25 there's, in fact, a causal association as opposed to some

1 other who knows what. It's the same criteria, by the
2 way, that we used in the IARC Monograph and that are used
3 in the IARC Monographs, and they are used across the
4 board by epidemiologists.

13:49:56

5 These are the criteria and they're basically
6 judgments. And these are my -- these pluses, like for a
7 movie, these are my judgments in terms of how powerful
8 each of these criteria are.

9 So the first is what's called temporality.

13:50:11

10 Temporality means that a cause has to come before an
11 outcome, the exposure has to come. Sometimes when you do
12 studies, you can't tell which came first: The chicken or
13 the egg or the egg or the chicken. So -- so do we know
14 that in this instance the glyphosate exposure came before

13:50:28

15 the lymphoma? And the answer is, in this instance, I
16 don't think there's any doubt about it. So I gave it a
17 high score, the temporality applies. We can be confident
18 that the glyphosate exposure precedes the lymphoma
19 outcome.

13:50:45

20 Q. And to be clear, you're talking about in the
21 data as it relates to glyphosate; right?

22 A. From the studies and from everything we know
23 about it, yes.

13:50:54

24 Q. We do know, for example, that before glyphosate
25 hit the market, NHL was on the rise?

1 A. Yes. But that's -- that may or may not have
2 anything to do with the glyphosate, but I'm talking about
3 in the studies and in general.

4 And consistency is something I alluded to
13:51:14 5 earlier, which is basically from the Forest plot, which
6 is across the board in multiple studies, no matter how --
7 the studies that were done in different context,
8 different populations, different countries under
9 different circumstances, some of the studies were what
13:51:29 10 are called a population-based context. Some of them were
11 done with registries. Some of them were done among
12 farmers.

13 But across all the studies, they were
14 consistently positive -- or I say positive results.
13:51:42 15 That's consistency. None of them, as I showed, were
16 across -- were on the other side of the -- of one, so the
17 results are consistent. That's a very important --
18 that's a very important criterion in causal associations.
19 And so again, I gave it a fair high score, not quite four
13:52:02 20 plus.

21 Dose response, you like to see a dose response.
22 The more you're exposed, the higher your risk. Not all
23 the studies assess this, but two or three of the six
24 studies that were on that board did look at it, and they
13:52:16 25 showed dose response relationships that those who were

1 exposed more had a higher risk of getting lymphoma. So I
2 gave it a 2 to 3-plus which, again, is moderate or more
3 than moderate but not super high 5, but I think there is
4 certainly grounds for dose response associations here in
13:52:37 5 relationships.

6 Biological plausibility, so, again, is there a
7 biological reason or basis for assessing that glyphosate
8 causes non-Hodgkin's lymphoma? So you've heard testimony
9 from Dr. Portier -- and I'll leave it at that -- and the
13:52:52 10 IARC Monograph discusses it at great length and gives it
11 a high value, so I gave it a high score, and I won't
12 discuss that at length. But certainly the biological
13 plausibility that there are mechanisms by which this
14 agent can cause malignancy, so that's biological
13:53:11 15 plausibility.

16 Strength of association, strength of association
17 is how strong is the relationship between the two. So
18 here I would say it's modest, we're talking about a 1.5,
19 not a 10 like in tobacco and lung cancer. But that's
13:53:23 20 modest, so I didn't give it a very high score. But it is
21 what it is.

22 Finally, there's a criterion called specificity.
23 Specificity doesn't always come up in causal
24 associations. We often ignore it, but here specificity
13:53:38 25 is a very interesting one which applies in glyphosate and

1 non-Hodgkin's lymphoma, which is that as in the AHS study
2 and in other studies, they looked at the relationship
3 between glyphosate and multiple cancers.

4 There are multiple studies of glyphosate and
13:53:57 5 every other cancer on earth: Prostate cancer, breast
6 cancer, colon cancer, whatever you like. All the other
7 studies are negative. I mean null, clearly null. And if
8 you would do Forest plots for them, they would show up,
9 you know, nicely distributed across 1 the way they should
13:54:17 10 randomly associate across 1. The only one that comes up
11 with a Forest plot that looks like the Forest plot we
12 showed is NHL -- glyphosate and NHL. Very specific, it's
13 NHL. All the time, it's glyphosate and NHL. That's
14 specificity.

13:54:34 15 So it comes up as a powerful marker that
16 whatever you do, it's NHL. So specificity in this
17 particular instance applies, and I think that adds
18 validity to our consideration that causality truly
19 applies in this particular association, and that it's --
13:54:56 20 that there's truly a causal association and that's my
21 ending conclusion and -- with regard to all of this is
22 that there is indeed a causal association between
23 glyphosate and NHL.

24 MR. WISNER: Thank you, sir.

13:55:09 25 No further questions, your Honor.

1 THE COURT: Thank you.

2 MR. LOMBARDI: Your Honor, may I move the
3 podium?

4 THE COURT: Yes.

13:55:38

5 MR. LOMBARDI: Your Honor, I'm not sure how much
6 I'll need the binders, but I figured it would be more
7 efficient to pass some up now, if that's okay?

8 THE COURT: Oh, yes. That's fine.

9

10 CROSS-EXAMINATION

11 BY MR. LOMBARDI:

12 Q. Doctor, we haven't met. My name's George
13 Lombardi, and I'm going to be asking you questions on
14 behalf of Monsanto. How are you today?

13:56:30

15 A. I'm good.

16 Q. Good. Doctor, you were retained by plaintiff's
17 counsel in this matter; is that right?

18 A. Yes.

13:56:41

19 Q. And you've been retained by plaintiff's counsel
20 before; isn't that right?

21 A. Yes.

22 Q. In fact, you -- this is not the first time that
23 you've been retained by the particular lawyers that are
24 involved in this case; is that right?

13:56:55

25 A. I've been retained in one other case by them.

1 Q. One other case, but involved several trials;
2 isn't that right?

3 A. Yes.

4 Q. So when you say one other case, you mean one
13:57:04 5 other big matter that involved several trials that you
6 actually testified at?

7 A. Correct.

8 Q. And the plaintiff's firm that hired you in those
9 cases is Mr. Dickens' firm; isn't that right?

13:57:15 10 A. Yes.

11 Q. Now, you're compensated, is that right, for your
12 time on this matter?

13 A. Yes. By the way, I would say that they
14 requested that I testify in several other matters, which
15 I refused to, just for balance.
13:57:28

16 Q. That's fine. That's fine, Doctor.

17 Now, at the time they called you in this case,
18 you had never reviewed the epidemiological literature on
19 glyphosate; isn't that right?

13:57:41 20 A. Yes.

21 Q. Because glyphosate has really never been one of
22 your interests?

23 A. Not at all.

24 Q. So what they did was you got a phone call from
13:57:51 25 them; right? You got a phone call from them?

1 A. I imagine, yes.

2 Q. And they said, "Will you participate in this
3 case"?

4 A. Yes.

13:58:01 5 Q. And they provided you with the IARC Monograph;
6 isn't that right?

7 A. They didn't provide me with it. I said earlier
8 in my direct testimony that when they called me, I went
9 and looked up the literature on the subject, including
13:58:16 10 looking up the IARC Monograph and perusing it, as well as
11 some related literature.

12 Q. So when you started this case -- or before,
13 right before you started this case, you didn't have any
14 opinion on whether glyphosate caused non-Hodgkin's
15 lymphoma or any other kind of cancer; is that right?
13:58:33

16 A. That's correct. I was a totally unbiased person
17 with regard to the subject.

18 Q. A totally unbiased person retained by
19 Mr. Dickens' firm; correct?

13:58:46 20 A. Not at the time.

21 Q. So when you -- you told us earlier that as an
22 epidemiologist -- by the way, let's step back a second.

23 Epidemiology, one of the really great things
24 about epidemiology is that it deals with the real world;
13:59:05 25 right?

1 A. I guess that's a good thing about it.

2 Q. Well, you agree that it deals with the real
3 world?

4 A. As opposed to?

13:59:12

5 Q. Well, let me ask you this: Have you heard
6 epidemiology referred to as an observational science?

7 A. It's observational and interventional, but if --
8 is that the distinction you're making?

13:59:29

9 Q. You observe people and exposures that occur in
10 the real world; isn't that right?

11 A. Yes.

12 Q. And so when we're talking about the epidemiology
13 of glyphosate and Roundup, what we're talking about is
14 the actual product as it's used in the real world;
15 correct?

13:59:45

16 A. I guess so.

17 Q. Well, you're the epidemiologist, Doctor. I'm
18 just asking the questions. But isn't it true that
19 epidemiologists study the exposure of human beings in the
20 real world to various substances?

14:00:04

21 A. I guess I'm having difficulty understanding what
22 the unreal world is.

23 Q. Real world is giving you trouble?

24 A. Yes.

14:00:15

25 Q. Okay. Not in the laboratory, how about?

1 A. Uh-huh. I mean, I think in terms of making
2 causal associations, one has to take into account
3 laboratory work as well, but, you're right,
4 epidemiologists as a rule don't deal with the laboratory,
14:00:35 5 and I don't particularly partake in the laboratory --

6 Q. You don't like the laboratory, you told us.

7 A. I don't like being in the laboratory. I like
8 the laboratory.

9 Q. All right. You like others to be in the
14:00:46 10 laboratory.

11 A. Uh-huh.

12 Q. So, Doctor, all this stuff about the real world,
13 all I'm trying to say is that when we have a study like
14 AHS, say, what we're looking at is Roundup or whatever
14:00:56 15 products as they exist and are used by people in their
16 ordinary lives.

17 A. Okay.

18 Q. You agree with that?

19 A. Yes, I do.

14:01:08 20 Q. Okay. And so there's not a question that with
21 epidemiology studies you're just looking at glyphosate,
22 you're looking at whatever makes up the whole Roundup
23 formulation; right?

24 A. True.

14:01:25 25 Q. Including if there's surfactants in there, it

1 would be studying a formulation that has surfactants in
2 it; right?

3 A. Yes.

14:01:36 4 Q. It would have glyphosate in it and it would have
5 whatever else is in the Roundup formulation or whatever
6 glyphosate-based products there are; right?

7 A. So that's true. If people are exposed to
8 Roundup and there are other chemicals in the product,
9 then that's certainly true.

14:01:48 10 Q. And you are studying the exposure of human
11 beings like, say, pesticide applicators to products like
12 Roundup?

13 A. Yes.

14:02:06 14 Q. Now, Doctor, you said -- if I understood you
15 right and please tell me if I've got this wrong -- but I
16 think I understood you to say that it is very important
17 for an epidemiologist to review all the literature before
18 making a decision?

19 A. Well, I mean, it's hard to deny that, yes.

14:02:27 20 Q. That's self-evident, isn't it?

21 A. It's logical.

22 Q. But in this case, Doctor, you arrived at an
23 opinion before you had read all of the epidemiological
24 literature; isn't that right?

14:02:40 25 A. I didn't do a totally complete review of every

1 single paper in the literature, that is correct.

2 Q. Well, you did a lot less than that, didn't you,
3 sir?

4 A. Yes.

14:02:49 5 Q. What you did was you reached the opinion in this
6 litigation that glyphosate caused cancer before you had
7 read any of the glyphosate epidemiological studies,
8 didn't you?

9 MR. WISNER: Your Honor --

14:03:01 10 THE WITNESS: No.

11 MR. WISNER: Your Honor, I don't know if this is
12 intentional, but he's standing about four and a half feet
13 away from my witness and shouting at him. I think --

14 MR. LOMBARDI: I do not mean to raise my voice.

14:03:12 15 But if my voice is too loud, your Honor, I'll do
16 everything I can --

17 MR. WISNER: I just want to make sure it doesn't
18 turn into --

19 THE WITNESS: You can yell at me.

14:03:23 20 Q. BY MR. LOMBARDI: Doctor, I have no intention to
21 yell at you.

22 A. And it's not true. I mean, when I read -- I
23 said I read the IARC Monograph. The IARC Monograph
24 contains all the papers that were relevant with summaries
14:03:34 25 of them and I went back and looked at some of them in the

1 original.

2 Q. Okay. So what you did was you read the IARC
3 Monograph which summarized papers?

14:03:48

4 A. Along with going back and looking at some of
5 them. I'll confess I did not read every single one in
6 depth, as I did later.

7 Q. You read a couple of them; right?

8 A. A few of them.

9 Q. Before you came to your conclusion; right?

14:03:57

10 A. That is correct.

11 Q. So if IARC was wrong in the way they summarized
12 the papers, then your opinion could have been wrong
13 because you relied on IARC; right?

14:04:11

14 A. And if I did, then I would have withdrawn from
15 being a witness, because, yes, I do have integrity and I
16 wouldn't have sat up there and lied after swearing.

17 Q. And so --

18 A. But, you're correct, I did not read every paper
19 in depth at that point in time.

14:04:23

20 Q. And so, Doctor, let me just ask you a few points
21 about glyphosate now that you have -- I mean, you've
22 studied -- over the course of this case, you've studied
23 glyphosate and the epidemiology certainly more than you
24 did before this case; right?

14:04:39

25 A. Yes.

1 Q. Because you didn't study it before this case?

2 A. No.

14:04:50

3 Q. But the conclusion that you've come to -- well,
4 non-Hodgkin's lymphoma is the only cancer you're aware
5 of, based on your study, that even arguably has any link
6 to glyphosate; is that right?

7 A. Yes.

14:05:06

8 Q. Non-Hodgkin's lymphoma has -- I'm going to be
9 approximate, Doctor, and if you know exactly, please
10 correct me -- but about 60 different subtypes?

11 A. I would bet it has even more than that,
12 depending on how you want to split or lump it, but every
13 cancer has 60 or more subtypes, I would bet.

14:05:26

14 Q. Okay. Well, I'm just asking about non-Hodgkin's
15 lymphoma, because that's what the jury is here to talk
16 about.

17 A. Sure.

18 Q. Okay. Is that a sure, I know, or --

19 A. I'm sure it does.

14:05:33

20 Q. Now, because non-Hodgkin's lymphoma has
21 different subtypes, you would agree that there are
22 different causes associated with the different subtypes.

23 Do you understand the question?

24 A. Yes.

14:05:45

25 Q. Okay. And can you answer?

1 A. I wouldn't know.

2 Q. Well, wouldn't you say that every disease has a
3 set of causes so that you would say almost perforce one
4 would have to say that every subclass of disease has its
5 set of causes?

14:06:02

6 A. That's a complex question. And my answer is
7 that by the definition that you're using for subtypes,
8 that doesn't necessarily apply, because a subtype --
9 every disease splits into an absolute panoply of
10 multiple, multiple subtypes. There are more than 60
11 types of breast cancer. There are more than 60 types of
12 colon cancer. And if you would split and lump into 60
13 types every disease, you would know absolutely nothing
14 about any disease if you're going to argue that each one
15 has its own spectrum of causes or outcomes. To some
16 degree, it is true that each one has a unique risk factor
17 or a unique prognosis or a unique treatment, and to some
18 degree one can make universal statements or integrated
19 statements across the -- across the integrated group.

14:06:44

20 We talked about non-Hodgkin's lymphoma as a
21 group. We treat them as a group. They all respond to
22 the same -- for the most part, most of them respond to
23 the same treatment, despite the fact that there are, as
24 you say, 60 subtypes. By your definition, there should
25 be 60 different treatments for non-Hodgkin's lymphoma and

14:07:12

14:07:30

1 there are not. So I would say that the statement may or
2 may not be true for any given subtype.

3 Q. Did I ask -- not me, but have you been asked
4 that question under oath and given a different answer,
14:07:49 5 Doctor?

6 A. I haven't got a clue.

7 Q. Well, let me remind you. Doctor, you can look
8 on in your book or I'll put it up on the screen, this is
9 your deposition from June of this year, page 55.

14:08:00 10 MR. WISNER: Please don't play it on the screen
11 until I have a chance to look at it.

12 THE COURT: What tab number is this, Counsel?

13 MR. LOMBARDI: This would be -- it's in the -- I
14 need to hand it up to you, your Honor.

14:08:19 15 MR. WISNER: There's five in here.

16 MR. LOMBARDI: It's the one from June 18th.

17 May I approach the witness, your Honor?

18 THE COURT: Yes.

19 And what is the date?

14:08:32 20 THE WITNESS: It's not in this book?

21 MR. LOMBARDI: It's in that one I just passed
22 you. Your depositions are June 18th -- or June of 2018,
23 I'm sorry.

24 MR. WISNER: Page and line?

14:08:45 25 MR. LOMBARDI: Page and line. Page 55, lines 5

1 through 14.

2 Your Honor, may I ask to put that up on the
3 screen.

4 THE COURT: Just one second.

14:08:55 5 THE WITNESS: I'm sorry. Where am I looking?

6 MR. LOMBARDI: 55, lines 5 to 14. Page 55.

7 MR. WISNER: I object. Improper impeachment.

8 THE COURT: Overruled. You may put it up.

9 MR. LOMBARDI: Let's put that up on the screen.

14:09:21 10 It's Slide 41, please.

11 Q. Doctor, were you asked this -- by the way, at a
12 deposition, Doctor -- Doctor, are you with me -- you
13 raised your hand to take the same oath you took before
14 testifying today; right?

14:09:35 15 A. Yes.

16 Q. And your intention is certainly to tell the
17 truth at the deposition; isn't that right?

18 A. And I believe I intend that then as I do today.
19 Thank you for reminding me of that.

14:09:47 20 Q. I'm sure you do. Let me show you what question
21 you were asked at your deposition.

22 "In your opinion, Dr. Neugut, are there
23 different causes for different subtypes of non-Hodgkin's
24 lymphoma?"

14:09:57 25 Your answer: "Every disease has its set of

1 causes, so I would say that almost perforce one would
2 have to say that every subclass of disease has its set of
3 causes."

14:10:10 4 "And when you are referring to subclass of
5 disease there, you are including subtypes of
6 non-Hodgkin's lymphoma; correct?"

7 Answer: "Yes."

8 Did you give those answers to those questions
9 under oath at your deposition?

14:10:21 10 MR. WISNER: Again, your Honor, object --

11 THE WITNESS: May I see the parts before and
12 after I said that? Can I see it in here?

13 MR. LOMBARDI: You've got it in front of you.

14 MR. WISNER: I have an objection.

14:10:32 15 THE WITNESS: I don't even see it in where you
16 showed in the pages where you presented it to me. Here
17 it says 55 and I don't see the --

18 THE COURT: Do you wish to repeat the page and
19 line?

20 THE WITNESS: Can you show me --

21 Q. BY MR. LOMBARDI: It's page 55. You've got four
22 pages on each sheet of paper, so you'll look for the page
23 number on one of the four pages.

24 A. Oh, I see. I was looking at the bottom page 55.

14:11:04 25 Q. That's happened before.

1 A. I'm sorry.

2 MR. WISNER: Objection. Improper impeachment.
3 Counsel did not ask that question.

4 THE COURT: Okay. Overruled.

14:11:13 5 Q. BY MR. LOMBARDI: Do you have it, Doctor?

6 A. Uh-huh. May I answer or are you just going to
7 get to ask the questions?

8 Q. Well, the way it works is I would love to answer
9 your questions, Doctor, but I have to ask you. So we're
14:11:25 10 going to keep by that format. My only question is, were
11 you asked that question and did you give that answer
12 under oath at your deposition?

13 A. And as I say --

14 Q. Was it a "yes" or "no"?

14:11:34 15 A. When I say that there are different subtypes of
16 cancer that have different causes, as I said before, that
17 may well be that all the different subtypes have the same
18 causes, as I said earlier, so that the different classes
19 of non-Hodgkin's lymphoma may all share the same causes
14:11:52 20 just as they share the same treatments.

21 Q. Okay. Did you finish your answer, Doctor?

22 A. Hmm?

23 Q. Did you finish your answer?

24 A. Yes.

14:12:02 25 Q. Thank you. Now, Doctor, it is the case that

1 glyphosate in your opinion does not cause all
2 non-Hodgkin's lymphoma; correct?

3 A. Of course not.

14:12:19

4 Q. And it's your opinion that not everybody exposed
5 to Roundup gets non-Hodgkin's lymphoma?

6 A. Correct.

7 Q. And, Doctor, you're a medical doctor in addition
8 to being an epidemiologist. I think you told us that;
9 correct?

14:12:34

10 A. Yes. Thank you.

11 Q. And, Doctor, you see no difference in the
12 symptoms of somebody with non-Hodgkin's lymphoma that was
13 exposed to glyphosate as exposed to somebody who wasn't
14 exposed to glyphosate; is that correct?

14:12:52

15 A. I wouldn't be able to answer that question. I
16 don't particularly in my practice treat lymphomas. So
17 you'll have to wait for the expert on lymphoma, whom I
18 gather is come in a day or two.

14:13:08

19 Q. Okay. That's fine. You don't know, just to
20 have it clear for the record; is that right?

21 A. Correct.

22 Q. And, Doctor, you're not aware of any individual
23 case reports published in the literature of
24 glyphosate-induced non-Hodgkin's lymphoma; is that
25 correct?

14:13:21

1 A. I don't read case reports.

2 Q. So you're not aware; is that correct?

3 A. No, I'm not.

4 Q. Doctor, you don't have any opinions about what
14:13:32 5 the minimum threshold dose is that is required for any
6 person exposed to glyphosate to develop non-Hodgkin's
7 lymphoma; isn't that correct?

8 A. Are you talking about rats?

9 Q. No. I'm talking about dose for humans, for a
14:13:51 10 person. Do you want me to redo the question again? I'm
11 happy to if you'd like me to.

12 A. Yes, I would.

13 Q. I'll just ask you this way. Do you have any
14 opinions about what the minimum threshold dose that is
14:14:05 15 that is required for any person exposed to glyphosate to
16 develop non-Hodgkin's lymphoma?

17 A. I would have to say that it would depend on how
18 much exposure was included in the patients or the people
19 who were included in the studies. If they're included in
14:14:27 20 the studies and the group as a whole has an elevated
21 risk, then I can't distinguish them from the people who
22 are in the study.

23 Q. Doctor, did you give a different answer to that
24 question under oath at your deposition?

14:14:39 25 A. Again, I don't have a recollection of it, but

1 I'm sure I'm going to find out.

2 Q. Well, Doctor, it's the same deposition. It's
3 the June of 2018 deposition that I think you have open in
4 front of you. I assume -- if you don't want to follow
14:14:54 5 along, that's fine.

6 A. No, no. But you're going to have to tell me the
7 page.

8 Q. I'm going to. Page 56, lines 3 to 7.

9 A. 56 where?

14:15:03 10 Q. Lines 3 to 7.

11 Do you have that?

12 A. Yes.

13 MR. WISNER: Objection. Improper impeachment.
14 And actually now this is beyond the scope. I don't think
14:15:11 15 the word "dose" was even used on direct.

16 THE COURT: Just a moment.

17 THE WITNESS: Okay.

18 THE COURT: Overruled.

19 MR. LOMBARDI: May I put --

14:15:32 20 MR. WISNER: Both objections, including the
21 beyond the scope objection?

22 THE COURT: Yes.

23 MR. LOMBARDI: Your Honor, may I put that up on
24 the screen?

14:15:45 25 THE COURT: Yes.

1 MR. LOMBARDI: Thank you, Your Honor.

2 Slide 42, please.

14:15:54

3 Q. BY MR. LOMBARDI: Doctor, this is the question I
4 just asked you. This is the answer you gave under oath
5 about a month ago in a deposition.

6 "Do you have any opinions about what the maximum
7 threshold dose is that is required for any person exposed
8 to glyphosate to develop non-Hodgkin's lymphoma?"

9 Answer: "No."

14:16:05

10 MR. WISNER: Objection. The quote is minimum
11 threshold dose from the deposition. I don't know what
12 that slide is saying.

13 MR. LOMBARDI: Okay. Error on the slide. I'll
14 accept your correction.

14:16:17

15 Q. Doctor, I'm going to read it, but I'm going to
16 make the correction that Counsel has said.

17 "Do you have any opinions about what the minimum
18 threshold dose is that is required for any person exposed
19 to glyphosate to develop non-Hodgkin's lymphoma?"

14:16:30

20 Answer: "No."

21 Did you give that answer to that question?

22 A. Yes.

23 Q. I'm sorry?

24 A. Yes.

14:16:35

25 Q. Thank you, Doctor.

1 So, Doctor, non-Hodgkin's lymphoma is not
2 something that you typically work on, as I understand it;
3 is that right?

4 A. That's correct.

14:16:44

5 Q. But in your work in this case, you've gotten to
6 learn some things about non-Hodgkin's lymphoma; right?

7 A. I suppose.

8 Q. Yes?

9 A. I suppose I have.

14:17:00

10 Q. Okay. Well, here's something that you know now
11 about non-Hodgkin's lymphoma, right, is that rates of
12 non-Hodgkin's lymphoma seem to be higher with farmers
13 than with others; isn't that right?

14 A. I knew that before.

14:17:18

15 Q. You knew that before being involved in this
16 case?

17 A. Yes.

18 Q. Okay. And actually that's something that's been
19 known for a long period of time; isn't that right?

14:17:29

20 A. Yes.

21 Q. And actually it's been observed even before
22 glyphosate was on the market, that farmers had a higher
23 risk level for non-Hodgkin's lymphoma than others; isn't
24 that right?

14:17:40

25 A. Yes.

1 Q. So the conclusion we can draw from that is that
2 something is causing non-Hodgkin's lymphoma in farmers
3 that is not glyphosate; isn't that true?

4 A. I imagine, yes.

14:17:58

5 Q. And I take it, as you sit there right now, you
6 don't know what it is other than glyphosate that's
7 causing non-Hodgkin's lymphoma to be greater in farmers
8 than in others?

9 A. I don't think anyone knows.

14:18:12

10 Q. It could be farm practices; correct? That's one
11 example.

12 A. It could be other herbicides.

13 Q. It could be other herbicides. It could be
14 animals, exposure to farm animals, couldn't it?

14:18:31

15 A. Yes.

16 Q. These are things that -- I'm not just making --
17 these are things that epidemiologists are actively
18 considering; isn't that true?

19 A. Yes.

14:18:40

20 Q. And you mentioned that there are other
21 herbicides out there that could be causing farmers to get
22 non-Hodgkin's lymphoma before glyphosate even went on the
23 market; right?

24 A. Yes.

14:18:53

25 Q. And so one of the things that's really important

1 about these studies is you have to separate out the
2 effect of those other pesticides from glyphosate if
3 you're going to have a true picture in the epidemiology;
4 isn't that right?

14:19:08

5 A. I think it's important to take that into
6 consideration, yes.

7 Q. And that's what we call adjusting for other
8 pesticides; right?

9 A. Yes.

14:19:17

10 Q. And adjustment for other pesticides means that
11 you've got -- say you've got, I don't know, I'm just
12 going to make something up, Doctor, just for an example.
13 You've got five pesticides that a farmer is exposed to
14 and then you have glyphosate, and you're trying to
15 separate out, tease out, what is actually responsible for
16 the non-Hodgkin's lymphoma; right?

14:19:34

17 A. Yes.

18 Q. Adjustment for other pesticides is something
19 that you look for when you look at the studies; isn't
20 that right?

14:19:48

21 A. Yes.

22 Q. It would be extremely desirable to adjust for
23 other pesticides in studies; right?

24 A. Yes.

14:19:59

25 Q. All right. Doctor, let me ask you a little bit

1 about IARC, because you spent some time on IARC this
2 morning. Do you remember doing that?

3 A. Was that a question?

4 Q. I'm just trying to orient you. I just asked you
14:20:19 5 if you remembered talking about IARC this morning. I
6 assume the answer is yes.

7 A. Yes.

8 Q. Okay. Thank you, Doctor.

9 And you yourself have never been on an IARC
14:20:29 10 Working Group; is that right?

11 A. No.

12 Q. And you recognize that you talked a lot about
13 what IARC does; right? And how you consider it -- I
14 can't remember your exact word, but the premier
14:20:45 15 determiner of carcinogenicity or something like that;
16 right?

17 A. Yes.

18 Q. So you, Doctor, when you look at IARC, it's
19 really important to understand exactly what role IARC is
14:20:59 20 playing; right?

21 A. What role IARC is playing in what?

22 Q. In the determination of carcinogenicity.

23 A. Yes.

24 Q. Because you want to know exactly what they mean
14:21:15 25 when they see probable carcinogen; right?

1 A. Yes.

2 Q. You don't want to just say, oh, it says probable
3 carcinogen, and I, Dr. Neugut, am going to apply my
4 meaning of probable carcinogen in this case, you want to
14:21:29 5 use IARC's meaning; right?

6 A. Okay.

7 Q. Well, do you agree?

8 A. Yes.

9 Q. Okay. Well, because you know from your
14:21:37 10 experience reading IARC stuff that what IARC does is very
11 different than, for instance, what regulators do; isn't
12 that right?

13 A. Yes.

14 Q. And what IARC does is something called a hazard
14:21:52 15 assessment; right?

16 A. Yes.

17 Q. So I would like to put up -- and I think this is
18 already in evidence. I want to put up IARC preamble,
19 which is in your binder, DTX 2635.

14:22:09 20 MR. WISNER: I don't believe that is in
21 evidence. I mean, our exhibit is in evidence.

22 MR. LOMBARDI: It's the same thing. I'll let
23 you look at it to confirm. 2635, and I'm going to go to
24 page 4.

14:22:23 25 Q. Doctor, it's Exhibit 2635 and I'm going to turn

1 you to page 4.

2 MR. WISNER: No objection.

3 MR. LOMBARDI: Thank you.

4 Q. And, Doctor, if it's easier for you, I'm going
14:22:34 5 to put something up on the screen with the Court's
6 permission that might be easier for you to look at.

7 A. That's all right.

8 What page?

9 Q. 2635. And then these are the numbers at the
14:22:56 10 bottom, have 004 at the end of it.

11 Do you have that, Doctor?

12 A. I have 004, yes.

13 Q. And maybe, Armando, can you just go back to the
14 first page just so we show the jury exactly what we're
14:23:16 15 looking at here.

16 This is the preamble for IARC Monographs; is
17 that right?

18 A. Yes.

19 Q. And what it does is it sets forth terms that
14:23:25 20 IARC uses; correct?

21 A. Yes.

22 Q. And this gets appended to all the Monographs
23 that come out; isn't that right?

24 A. Yes.

14:23:32 25 Q. We'll go back to page 4, if we could, Armando.

1 And let's take a look right here. And, Doctor,
2 do you see what I've blown up on the screen there?

3 A. Yes.

14:23:57

4 Q. And this is where IARC defines what it means by
5 hazard versus risk; correct?

6 A. Yes.

7 Q. And let's just highlight that first sentence,
8 Armando.

14:24:09

9 It says: "A cancer hazard is an agent that is
10 capable of causing cancer under some circumstances, while
11 a cancer risk is an estimate of the carcinogenic effects
12 expected from exposure to a cancer hazard."

13 Do you see that?

14 A. Yes.

14:24:21

15 Q. So what IARC's goal here is what they're doing
16 when they arrive at their categorization of an agent is
17 they're just trying to see if that agent is capable of
18 causing cancer under some circumstances; right?

19 A. Yes.

14:24:38

20 Q. And they go on -- if we could go to line 21,
21 Armando, and highlight from "The distinction."

22 "The distinction between hazard and risk is
23 important and the Monographs identify cancer hazards even
24 when risks are very low at current exposure levels."

14:24:59

25 Do you see that?

1 A. Yes.

2 Q. And you understand that's what IARC is doing;
3 right?

4 A. Yes.

14:25:06

5 Q. That is part of the way they go about their
6 Monographs and, in particular, the Monograph on
7 glyphosate; is that right?

14:25:26

8 A. Their role is to identify whether something can
9 cause cancer or it does cause cancer. They don't give an
10 estimate of how -- or they don't purposely or they don't
11 as a primary part of their assessment make an assessment
12 of how strong the risk assessment or how strong the
13 relative risk is.

14:25:42

14 Q. Okay. And so it actually -- what it literally
15 says is a hazard is an agent capable of causing cancer
16 under some circumstances; right? Right?

17 A. Well, again, some circumstances meaning, as you
18 said earlier, I'll say real world circumstances.

19 Q. You're going to real world. All right.

14:26:02

20 So, Doctor, then it goes on -- but what's
21 important here is IARC will find something to be a cancer
22 hazard and categorize it as such even when the risks are
23 very low; correct?

24 A. Even when the risks can be low, yes.

14:26:22

25 Q. Okay. And that's what IARC was doing with

1 respect to the work of Working Group 112 on glyphosate,
2 they were doing this kind of hazard assessment; isn't
3 that right?

4 A. That's what they're always doing, yes.

14:26:37

5 Q. Okay. And IARC reached no conclusion about a
6 dose of glyphosate that could cause cancer in humans;
7 right?

8 A. I don't think they typically do that.

14:26:55

9 Q. Right. So, Doctor, let's go to the next page,
10 if we could, page 5, and the first full paragraph on page
11 5, and this talks a little bit about what IARC expects or
12 understands is done with its Monographs; right?

13 A. I guess.

14:27:17

14 Q. And the Monographs are used by national and
15 international authorities to make risk assessments.

16 Now, that's different than a hazard assessment,
17 as IARC said; right?

18 A. Yes.

14:27:28

19 Q. And we're talking about national and
20 international authorities, we're talking about things
21 like the EPA; right?

22 A. Yes.

14:27:38

23 Q. And what IARC does is it helps them make risk
24 assessments, formulate decisions concerning preventative
25 measures, provide effective cancer control programs, and

1 decide among alternative options for public health
2 decisions.

3 Do you see that?

4 A. Yes.

14:27:47

5 Q. If we could just skip one sentence where it says
6 "These evaluations."

7 "These evaluations" -- that means the IARC
8 evaluation; right, Doctor?

9 A. Yes.

14:28:10

10 Q. The IARC evaluations.

11 "These evaluations represent only one part of
12 the body of information on which public health decisions
13 may be based."

14 Do you see that?

14:28:22

15 A. Yes.

16 Q. And then the last sentence in this paragraph
17 says: "Therefore, no recommendation is given with regard
18 to regulation or legislation which are the responsibility
19 of individual governments or other international
20 organizations."

14:28:37

21 A. Absolutely. I mean, IARC tells you that
22 something can cause cancer and what you want to do with
23 that information is totally up to you. I don't have any
24 opinions as to whether glyphosate should be taken off the
25 market or whether it should have a warning label or not.

14:28:52

1 I couldn't care less. It's simply a matter of
2 glyphosate -- the knowledge that glyphosate can cause
3 cancer.

4 Q. Under some circumstances; right?

14:29:05

5 A. Under some circumstances, true.

6 Q. And IARC -- IARC, the fact that they have a
7 Monograph that classifies glyphosate doesn't mean that
8 IARC is recommending a warning; is that right?

14:29:26

9 A. I don't know what IARC thinks about it, but
10 you're right. I assume that they're saying that that's a
11 public policy decision that's up to public policy or
12 governmental organizations to do.

14:29:45

13 I mean, you know, everything in life has a
14 potential downside, and we don't say it should be banned.
15 We have cars and they cause death and we don't say we
16 shouldn't be driving cars. The same way, you know,
17 glyphosate causes cancer, okay. That's okay with me.

14:30:00

18 Q. Okay, Doctor. And I want to go to another
19 section now. You've testified here as an epidemiologist,
20 so I want to focus on the epidemiology analysis that was
21 done by IARC. Do you understand -- I'm trying to be
22 transparent about where I'm going, Doctor.

23 Do you understand that?

24 A. Yes.

14:30:10

25 Q. Okay. Let's go to the same exhibit, page 21 to

1 22.

2 A. We're now in the preamble still?

3 Q. Still in the preamble, same exhibit. Just go
4 back to 21 to 22.

14:30:32

5 I'll leave it the way it is for right now. Wait
6 until you find your place, Doctor. Tell me when you're
7 ready.

8 A. I have it.

9 Q. Okay. You've got it.

14:30:41

10 And this is where it talks about the
11 categorization of carcinogenicity in humans; right?

12 A. Yes.

13 Q. And this is talking about the epidemiology
14 studies; right?

14:31:02

15 A. Yes.

16 Q. And so the top category says "Sufficient
17 evidence of carcinogenicity" and it says the Working --
18 that happens when the Working Group considers that a
19 causal relationship has been established between exposure
20 to the agent and human cancer; right?

14:31:17

21 A. Yes.

22 Q. And that is not what Working Group 112 concluded
23 about glyphosate; correct?

24 A. That is correct.

14:31:30

25 Q. What they concluded about glyphosate was that it

1 was limited evidence of carcinogenicity; correct?

2 A. Yes.

3 Q. Let's look at that. That says: "A positive
4 association has been observed between exposure to the
14:31:42 5 agent and cancer for which a causal interpretation is
6 considered by the Working Group to be credible, but
7 chance, bias, or confounding could not be ruled out with
8 reasonable confidence."

9 Is that right?

14:31:58 10 A. Yes.

11 Q. And chance, bias, and confounding, those are
12 terms that have meaning for any epidemiologist; is that
13 right?

14 A. Yes.

14:32:07 15 Q. Chance has to do with -- you made reference I
16 think this morning -- statistical significance, size of
17 the study, things like that?

18 A. Well -- okay. Yes.

19 Q. Okay. And bias, you made some reference to
14:32:25 20 bias, but different kinds of studies are prone to
21 different kinds of bias and you have to look at the
22 specific study, but that's something that any
23 epidemiologist is looking into; right?

24 A. Yes.

14:32:35 25 Q. There are biases that are associated with case

1 control studies, for instance; right?

2 A. Yes.

3 Q. Might have something called recall bias; right?

4 A. Yes.

14:32:47 5 Q. You might have -- well, I think sometimes people
6 call it misclassification bias; is that right? Or --

7 A. Misclassification isn't necessarily bias, but --
8 unless it occurs with bias.

9 Q. Okay. And then "or confounding" --

14:33:02 10 A. Yes.

11 Q. -- is the third one. And that relates to we
12 were talking about -- what we were talking about earlier,
13 where you can do adjustments to take care of confounding;
14 is that right?

14:33:16 15 A. Yes.

16 Q. So IARC with respect to glyphosate, you know
17 concluded that chance, bias, and confounding is a problem
18 with many of the studies; isn't that right?

19 A. Yes.

14:33:27 20 Q. Now, the IARC Working Group on glyphosate,
21 Doctor, determined that the epidemiological evidence did
22 not reach the level where they could find it was
23 sufficient to show a causal relationship between
24 glyphosate and non-Hodgkin's lymphoma?

14:33:47 25 A. That's correct.

1 Q. And, Doctor, actually, you agree with them that
2 the epidemiology alone is not sufficient to show a causal
3 relationship between glyphosate and non-Hodgkin's
4 lymphoma; correct?

14:34:02

5 A. Yes.

6 Q. Thank you, Doctor.

7 So let me talk a little bit, Doctor, about the
8 epidemiology of glyphosate more specifically, not just
9 what it said in IARC.

14:34:30

10 You understand where I'm going now?

11 A. Not yet.

12 Q. All right. Fair enough. That's fair enough.

13 Let's talk for a minute about a couple of just
14 concepts from epidemiology so the jury understand what
15 we're talking about. One concept is statistical
16 significance. You obviously are aware of that term;
17 right?

14:34:45

18 A. Yes.

19 Q. And statistical significance really in the

14:34:56

20 studies we're looking at, the way you check on
21 statistical significance is to look at what are called
22 confidence intervals; right?

23 A. Yes.

24 Q. And if your counsel will allow me, I'll hold up
25 one of your demonstratives.

14:35:10

1 MR. WISNER: Sure.

2 Q. BY MR. LOMBARDI: So the confidence intervals,
3 Doctor, are the bars; right?

4 A. Yes.

14:35:20

5 Q. I'm going to call them bars. Sometimes
6 epidemiologists call them whiskers; right?

7 A. I've never heard that.

8 Q. All right. I'm talking to the wrong
9 epidemiologist, I guess.

14:35:29

10 So it's got bars and the end points of the bars
11 represent the confidence interval; right?

12 A. Correct.

14:35:46

13 Q. And what you're doing with the confidence
14 interval is you're giving an estimate -- you're giving an
15 estimate of the precision of your point estimate; right?

16 A. I don't know if I like the word "precision," but
17 again -- actually "confidence" isn't a bad word.

18 Q. Go ahead. I didn't mean to interrupt you.

14:36:11

19 A. Confidence is a pretty good word. I mean,
20 basically it says that 95 percent of the time if you did
21 the study again and again and again, you would get an
22 answer within the bars.

23 Q. Right.

14:36:26

24 A. Within the risk estimate, the relative risk
25 would come out somewhere between the end of the bars.

1 Q. Okay. So it means 95 percent of the time the
2 true answer would be between the ends of the bars; right?

3 A. Correct. Uh-huh.

14:36:43

4 Q. And confidence intervals are something that
5 every epidemiologist, including yourself, takes into
6 account when you're looking at the results from a study;
7 right?

8 A. Yes.

14:36:55

9 Q. No epidemiologist would say that that little --
10 the box -- those boxes are precise risks; right? You
11 have to look at the confidence interval.

14:37:24

12 A. So, again, I don't know what the word "precise"
13 in this context means, or how you're using it. No one
14 would say that -- again, if you're using the word
15 "precise" to mean that that's an absolute correct number,
16 then I don't know if that's true or not. But that's --
17 that the answer is somewhere -- that the mean answer is
18 somewhere near that bar -- near the box.

14:37:44

19 Q. Well, the better answer is that 95 percent of
20 the time the answer is somewhere between the ends of the
21 confidence interval; right, Doctor?

22 A. Correct.

14:38:03

23 Q. Now, so in all the epidemiology studies you've
24 looked at about glyphosate, there is always an indication
25 of the confidence interval; right?

1 A. The confidence interval is a standard part of
2 how you assess the risk estimate and it's always given
3 together or it should be always given together with the
4 risk estimate so that someone can assess the confidence
14:38:17 5 with which they can look at that estimate.

6 Q. Okay. And when you're dealing with confidence
7 intervals, you say that a result is not statistically
8 significant if the bar overlaps 1.0; correct?

9 A. Yes.

14:38:33 10 Q. So, Doctor, in the Forest plot that you put up
11 here, every single bar crosses 1.0; correct?

12 A. Yes.

13 Q. They are not statistically significant results;
14 correct?

14:38:48 15 A. Yes.

16 Q. And, Doctor, from your point of view, you, you,
17 Dr. Neugut, would not label an exposure as being
18 associated with an outcome unless there is a finding of
19 an increased risk that is statistically significant;
14:39:06 20 correct?

21 A. Why do you say I, I, I, Dr. Neugut?

22 Q. Because I'm asking you the question.

23 A. Oh. Again, if we're talking about one single
24 study and only one study had ever been done on glyphosate
14:39:27 25 and non-Hodgkin's lymphoma, then you would probably be

1 correct. But if we're looking at a multiplicity of
2 studies, as we are here, and they are all positive and
3 some of them are pretty close to one, then I would say
4 that that statement is not necessarily accurate.

14:39:49

5 And I would also say that, at least in more
6 recent epidemiologic methodology, that the concept of
7 statistical significance is becoming more flexible and
8 not relying on P -- in .05 as a rigid tool for assessing
9 statistical significance.

14:40:14

10 Q. Okay. Doctor, let me -- I'm going to ask you
11 the question very precisely here.

12 A. Uh-huh.

14:40:26

13 Q. You would not label an exposure as being
14 associated with an outcome unless there is a finding of
15 an increased risk that is statistically significant,
16 correct?

17 MR. WISNER: Objection. Asked and answered.
18 Improper hypothetical.

19 THE COURT: Overruled. You may answer.

14:40:37

20 THE WITNESS: It would depend on the
21 circumstances.

22 Q. BY MR. LOMBARDI: Okay. Did you get asked that
23 question under oath and give a different answer?

24 A. Again, I would have to say I don't recall.

14:40:50

25 Q. Okay. Let's look this time at a deposition from

1 August of 2017.

2 A. Am I supposed to be looking this up?

3 Q. Yes, if you would, please. It's back in that
4 same binder where --

14:41:15 5 A. This one?

6 Q. Yes, it should be there. It's August 7th of
7 2017, so almost a year ago now.

8 A. And the page?

9 Q. Page 45. Let me know when you're there and I'll
14:41:31 10 give you the lines.

11 A. Uh-huh.

12 Q. Are you there, Doctor?

13 A. Yes.

14 Q. Okay. So look at lines 14 to 18.

14:41:48 15 And, your Honor, I'd ask to put this on the
16 screen so the jury can see it.

17 MR. WISNER: Sorry. Lines?

18 MR. LOMBARDI: 14 to 18. Page 45.

19 MR. WISNER: I actually don't think it's
14:42:10 20 appropriate. I think you have to read the question
21 beforehand. It's the same subject matter.

22 THE COURT: Overruled.

23 You can put it on the screen.

24 Q. BY MR. LOMBARDI: Let's put it up on the screen,
14:42:21 25 Doctor, so the jury can see.

1 You were asked this question and gave this
2 answer under oath at your deposition; correct, Doctor?

3 A. Yes.

4 Q. "You would not label an exposure as being
14:42:31 5 associated with an outcome unless there is a finding of
6 an increased risk that is statistically significant;
7 correct?"

8 Your answer was: "That's correct."

9 MR. WISNER: Again, objection. This isn't a --
14:42:42 10 hold on, Doctor.

11 THE WITNESS: And if that's the question, then
12 my answer is twofold. One is, first of all, you have the
13 metaanalysis, which is statistically significant. And,
14 secondly, as I said before, if we're talking about a
14:42:57 15 single study, that's accurate, but over the course of
16 multiple studies, I would not say that that is -- that
17 that would be my feeling. And if you're talking about it
18 in the context of these studies, there are statistically
19 significant findings in these studies as well aside from
14:43:22 20 the overall findings.

21 Q. BY MR. LOMBARDI: Okay. Is that the answer you
22 gave under oath, Doctor?

23 A. That is the answer I gave under oath.

24 Q. Thank you, Doctor.

14:43:31 25 Another area that epidemiologists consider when

1 they look at studies is called power; right? The power
2 of the study?

3 A. Yes.

14:43:46 4 Q. And the power of the study, you want to have a
5 study that's as powerful as possible. Power is a good
6 thing, I guess is what I'm saying; is that true?

7 A. Yes.

8 Q. And power has to do with the size of the study;
9 is that right?

14:43:58 10 A. Yes.

11 Q. And when we say the size of the study, we just
12 don't mean the number of people total that are in the
13 study, do we?

14 A. Not at all.

14:44:08 15 Q. What we mean is -- what we're talking about is
16 the -- and we'll explain this, but in epidemiological
17 terms, the exposed cases; is that right?

18 A. Well, I would say it's actually dependent on a
19 number of things, but I would say mostly it's -- in most
14:44:38 20 instances it's based on the number of end points.

21 Q. Okay. Doctor, the key number for power is the
22 number of individuals who are both exposed and had the
23 outcome of interest; correct?

24 A. That's probably the most important single
14:45:15 25 number, yes.

1 Q. Okay. Thank you, Doctor.

2 And insufficient power in a study limits your
3 ability to get a correct answer from the study; isn't
4 that right?

14:45:27

5 A. Limits your ability to get a statistically
6 significant answer from the study.

7 Q. Does it also limit your ability -- limit the
8 ability of the study to be able to give you a correct
9 answer?

14:45:40

10 A. Not necessarily.

11 Q. Let me ask you precisely, Doctor, so there's no
12 confusion. Do you believe if a study has insufficient
13 power, that this is a significant limitation in your
14 ability to use that study to reach a causation opinion?

14:46:00

15 A. Again, to get a statistically significant
16 result, if you don't have enough power, you're going to
17 have difficulty getting a statistically significant
18 outcome if you don't have enough power.

14:46:17

19 Q. Will you have difficulty getting a correct
20 answer, Doctor?

21 A. Maybe yes, maybe no. Again, what does correct
22 mean?

23 Q. Does it limit your ability to get a correct
24 answer, Doctor?

14:46:25

25 A. So if you're talking about the precision of the

1 relative risk estimate, not necessarily.

2 Q. Okay. Doctor, would you -- in the same
3 deposition -- you were asked that question under oath in
4 a deposition before, weren't you, Doctor?

14:46:39

5 A. I have no recollection.

6 Q. Let's go to the August 7th deposition at page
7 203. Tell me when you have it, Doctor.

8 A. Uh-huh. I have it.

9 Q. And I'm looking at lines 15 to 23.

10 A. Uh-huh.

11 Q. Do you have that?

12 A. Yes.

13 MR. WISNER: Your Honor, sidebar. Please.

14 THE COURT: Yes. Please approach.

14:47:37

15 (Sidebar.)

16 [REDACTED] [REDACTED]
17 [REDACTED] [REDACTED]
18 [REDACTED] [REDACTED] [REDACTED]

19 [REDACTED]

14:47:53

20 [REDACTED] [REDACTED]

21 [REDACTED]

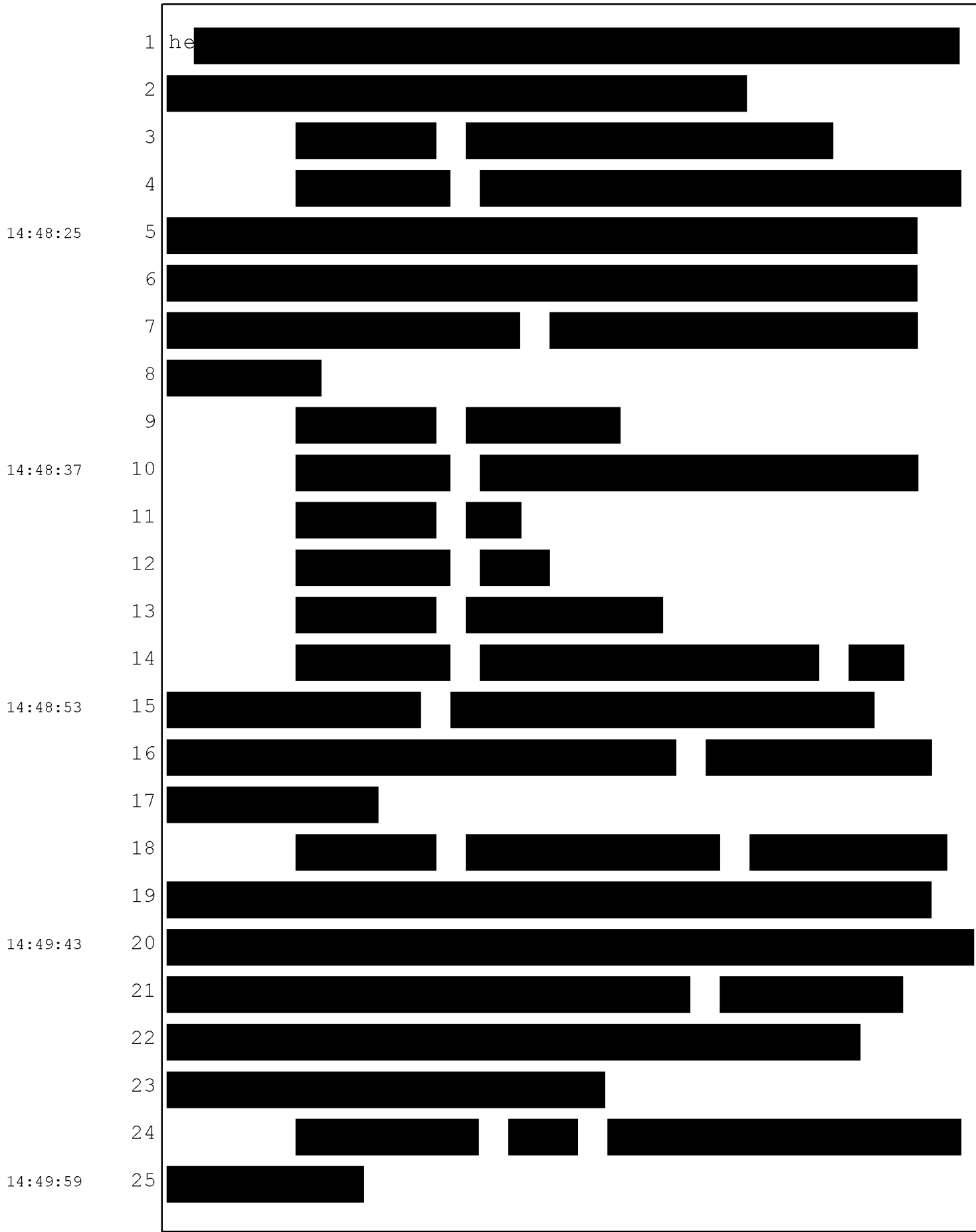
22 [REDACTED] [REDACTED]

23 [REDACTED]

24 [REDACTED] [REDACTED]

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(End sidebar.)

14:50:14

THE COURT: All right, Ladies and Gentlemen,
we're going to take the afternoon recess now. So we'll
be in recess for 15 minutes and resume again at five
after 3:00. All right? You may step down. Thank you.

(Recess.)

15:05:51

(Jurors enter the courtroom)

THE COURT: Welcome back, Ladies and Gentlemen.
Dr. Neugut. Dr. Neugut remains under oath. And, Mr.
Lombardi, you may continue.

MR. LOMBARDI: Thank you, your Honor.

15:07:59

Q. Dr. Neugut, I want to turn to the Forest plot
that you had. It's this chart. And I'm going to put it
up on the video screen if I can.

You had said that you had taken the Forest
plot from the article; right, Doctor?

15:08:34

A. Yes.

Q. And this looks like the Forest plot that you
had; is that right?

A. Yes.

15:08:46

Q. And so I don't want the take a huge amount of
time with this, but you're the epidemiologist; right?

1 A. Yes.

2 Q. And you didn't show the jury any of these
3 studies; correct?

4 A. I figured we'd do them with you.

15:09:04 5 Q. And so, Doctor, you just kind of generally
6 referred to, oh, studies have problems; right?

7 A. I don't know that I said that. Did I?

8 Q. Well, again, I'm not allowed to answer
9 questions, Doctor, but your testimony was essentially
10 that all of these studies have their problems.

11 A. Every epidemiologic study and every experiment
12 that's done in humans is -- so every study perforce has
13 issues with it. My point was that its consistency that
14 really is what carries the day, because each of the
15 studies is done under different circumstances --
16 Scandinavia, Canada, the US. Some of them have controls
17 for -- as you said earlier and as we said earlier,
18 herbicide, other herbicides. Some have not. Some have
19 done dust response relationships. Some have not.

15:10:12 20 But across the board, as I said, to a greater or
21 lesser degree, they all are positive by being to the
22 right of one and thus I considered them on a whole
23 positive with showing risk ratios greater than one. And
24 the metaanalysis shows a cumulative risk ratio that's
15:10:35 25 greater than one as well.

1 Q. So let me ask you about just a couple of
2 specifics just so that we get a feel for things.

3 A. Sure.

4 Q. The top study here is De Roos 2003. You made
15:10:47 5 reference to that one specifically.

6 Do you remember that?

7 A. No.

8 Q. During your direct? You don't remember?

9 A. It was a long time ago.

10 Q. Okay. All right. Doctor -- Doctor?
15:10:56

11 A. Yes.

12 Q. De Roos 2003 is a pooled study; isn't it?

13 A. Yes.

14 Q. It pools how many other studies?

15 A. Three.
15:11:09

16 Q. And you pool studies together in order to help
17 create greater power; is that right?

18 A. You pool studies for -- well, first of all, its

19 metaanalysis is pooled studies, so you pool a study to
15:11:28 20 your right for -- primarily for achieving increased

21 numbers so you can get statistical power, as you say.

22 And, in addition, by pooling studies you also achieve

23 what's called generalized ability because you also have

24 pooled together different populations. So one might

15:11:57 25 criticize a study by saying that it only alludes to one

1 population, one state or whatever, but by pooling
2 together three studies, you now have -- De Roos now
3 represents different populations together so it
4 actually -- and you still get a statistically significant
15:12:14 5 risk ratio and a positive result, but it's across several
6 populations now so you can have more confidence that the
7 result really represents a more dramatic population than
8 would be the case with any of the single studies.

9 Q. For the De Roos 2003 study, actually what you
15:12:32 10 put up on the board has a confidence interval that
11 crosses one, doesn't it?

12 A. I alluded to that in the thing and said the
13 actual risk ratio, if you look, is 2.1.

14 Q. Well, you chose to put 1.6 up, Doctor; right?
15:12:53 15 That's what you put on the board?

16 A. Right. But that's the --

17 Q. Because you wanted to be conservative; right?

18 A. Yes.

19 Q. And that's what good epidemiologists do; right?

15:13:03 20 A. But I think the --

21 Q. Is that right, Doctor?

22 A. Yes. That is right.

23 Q. And, Dr. De Roos, tell the jury, isn't it
24 relevant to consider when the data is gathered for an
15:13:19 25 epidemiological study?

1 MR. WISNER: Objection. This is Dr. Neugut.
2 Not Dr. De Roos.

3 Q. BY MR. LOMBARDI: I'm sorry. I didn't mean to
4 call you Dr. De Roos. My apologies.

15:13:30 5 A. I'm sure Dr. De Roos would be thrilled that you
6 called me that. Or maybe not.

7 Q. I apologize.

8 It's important to know, the three pooled studies
9 in De Roos, you actually -- you know when those
15:13:43 10 studies -- when the cases for those studies were
11 diagnosed; right?

12 A. Not off the top of my head, but I could look it
13 up.

14 Q. Well, I don't want to take all that time, but
15:13:54 15 you know, does it sound right to you that the case
16 control studies, the cases in the De Roos study were
17 gathered in the late '70s or early '80s? Do you recall
18 that?

19 A. Not offhand, but if you show me the De Roos
15:14:08 20 paper, I'm willing to take a look and see.

21 Q. I've got limited time, Doctor, so if you don't
22 know, just tell me and we'll move on.

23 A. Then let's move on.

24 Q. Okay. But, Doctor, it is important to an
15:14:21 25 epidemiologist's analysis to know how close in time those

1 diagnosed cases were to the time glyphosate first went on
2 the market; right?

3 A. Yes.

4 Q. Because you want to make sure there's enough
15:14:39 5 time and enough prevalence of glyphosate for there to be
6 non-Hodgkin's lymphoma actually caused, don't you?

7 A. Yes.

8 Q. And you can't correct that problem with the
9 underlying three pooled studies by pooling them together;
15:14:55 10 correct?

11 A. Yes.

12 Q. Now, I want to go back to that PowerPoint we
13 were talking about. Not a slide. I want to go back to
14 the point about statistical power we were talking about
15:15:09 15 right before the break.

16 Do you remember that?

17 A. Yes.

18 Q. Now, just to give the jury a feel here, that
19 pooled study with De Roos, how many exposed cases were
15:15:19 20 there in that study?

21 A. Again, without looking at the paper, I don't
22 know.

23 Q. Well, let me ask, and this is just my
24 representation, but does 36 sound about right?

15:15:29 25 A. I don't know. But you can actually get a feel

1 for the power of the study by looking at the box. The
2 jury can get a feel for the power of the study or for the
3 size of the study by looking at the box.

15:15:45 4 Q. Well, I want to put down the number of exposed
5 cases, if that's okay with you, Doctor. Is that all
6 right?

7 A. Sure.

8 Q. Let's skip De Roos 2005, because that's a cohort
9 study; right?

15:15:54 10 MR. WISNER: Objection.

11 Q. MR. LOMBARDI: I'm going to come back to it,
12 Doctor.

13 A. Yes.

14 Q. Okay?

15:15:58 15 MR. WISNER: Objection. The 36 on there hasn't
16 been confirmed. He needs to look at the study.

17 MR. LOMBARDI: I said that's my representation,
18 Judge? If I'm wrong, then he can --

19 Q. Do you know that that's wrong?

20 A. No.

21 Q. I mean, does that sound ballpark to you, Doctor?

22 A. Again, off the top of my head, I don't know the
23 answer.

24 Q. Okay. Doctor, do you know how many exposed
15:16:26 25 cases there are in the Eriksson study?

1 A. No.

2 Q. You don't know?

3 A. No.

4 Q. So if I go down here to Hardell, you don't know
15:17:41 5 what the exposed cases are for that?

6 A. No, I don't have the numbers.

7 Q. McDuffie, you don't know?

8 A. Not off the top of my head. I'd have to look in
9 the papers.

15:17:49 10 Q. Orsi, you don't know?

11 A. I don't have the papers in front of me.

12 Q. All right. I'm just going to ask you. You tell
13 me if that refreshes your recollection. Does Eriksson
14 have 29 exposed cases?

15:18:01 15 A. Again, I have no way of knowing without --

16 Q. Hardell, we've heard a lot about Hardell. I
17 don't think the jury has heard. Isn't Hardell eight
18 exposed cases?

19 A. I would not know.

15:18:11 20 Q. Eight would be really small, though, wouldn't
21 it?

22 A. The size is really not that important after
23 you've done the study and gotten the results.
24 Statistical power is important before you do the study,
15:18:28 25 not so much after.

1 Q. Eight is small?

2 A. Eight is a small number.

3 Q. Yep. And McDuffie was 51, does that sound about
4 right?

15:18:36 5 A. Again, I have no way of knowing.

6 Q. Orsi, 12, does that sound about right?

7 A. I don't know.

8 Q. Now --

9 MR. WISNER: Your Honor, I actually have his
15:18:46 10 notes. Maybe we should just give it to him.

11 MR. LOMBARDI: I'm ready to move on.

12 THE COURT: All right. You may proceed.

13 Q. BY MR. LOMBARDI: So, Doctor, now, De Roos is a
14 pooled study. You know that De Roos actually got pooled
15:19:01 15 into another larger study; right?

16 A. I don't know what you're referring to.

17 Q. Well, you've heard of the North American Pooled
18 Project; right?

19 A. Yes.

15:19:09 20 Q. And the North American pooled product pools De
21 Roos and the three studies that are part of De Roos with
22 McDuffie, doesn't it?

23 A. I did not consider the NAPP study in my review.

24 Q. Understood. And I'm not going to ask you
15:19:27 25 substantive questions about it. I just want to know, do

1 you know that NAPP includes De Roos and McDuffie in the
2 pool?

3 A. How would I know if I didn't look at it?

4 Q. You don't know?

15:19:38

5 A. No.

6 Q. But you chose not to look at the NAPP study?

7 A. When you say -- use the word "choose," you're

8 making it sound like I made some kind of arbitrary,

9 idiotic decision to exclude some important study and, you

15:20:02

10 know, tried to make some judgement that was dumb. But

11 the reality is I chose not to look at it for good

12 reasons.

13 Q. Well, that's actually all I asked you. I didn't

14 ask you all that other stuff. I just asked you --

15:20:16

15 A. No. But when you said choose, it sounded like I

16 chose not to include it. I decided not to include it.

17 Q. You decided not to include it?

18 A. Yes.

19 Q. That's better than chose? Because I'll ask you

15:20:30

20 the question again. I want to get it right.

21 You decided not to include the NAPP study?

22 A. Because it's not a peer-reviewed study. It's

23 never been included -- it's never had the same number of

24 cases in it. It's never been published.

15:20:46

25 Q. And you also decided not to include the Journal

1 of the National Cancer Institute article from 2018. You
2 decided not to use that one as well; correct?

3 A. I explained that in my direct testimony this
4 morning, so -- because I think that it's not up to the
15:21:08 5 standards of being included.

6 Q. And we'll talk about that study in just a
7 minute, Doctor. But as you look at this Forest plot and
8 as you consider what you've seen in your review of the
9 epidemiological literature related to glyphosate, it's
15:21:28 10 true, isn't it, that there is no odds ratio anywhere in
11 the epidemiological literature that reports for
12 glyphosate and non-Hodgkin's lymphoma and adjusted odds
13 ratio positive association that is statistically
14 significant? That's true; isn't it?

15:21:51 15 A. First of all, I did not make up this
16 metaanalysis. This is from a published study. So --

17 Q. I'm actually just asking about your knowledge.
18 We can take this off the screen so it won't be a
19 distraction. I'm asking your knowledge based on the
15:22:07 20 epidemiology you've looked at.

21 A. De Roos.

22 Q. Okay. Let me ask you the question again just so
23 we've got it clear.

24 Doctor, there is no odds ratio anywhere in the
15:22:17 25 epidemiological literature that reports for glyphosate

1 and non-Hodgkin's lymphoma an adjusted odds ratio
2 positive association that is statistically significant;
3 correct?

4 A. That's not true.

15:22:32

5 Q. Okay. Could you refer to -- you were asked that
6 question under oath, weren't you? Let's go to your
7 deposition, your August 7th deposition at page 150.

8 MR. WISNER: Objection, your Honor. Sidebar.

9 (Sidebar.)

15:23:00

10 [REDACTED] [REDACTED]
11 [REDACTED] [REDACTED]
12 [REDACTED] [REDACTED]
13 [REDACTED] [REDACTED] [REDACTED] [REDACTED]
14 [REDACTED]

15:23:22

15 [REDACTED] [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED] [REDACTED]
19 [REDACTED]

15:23:38

20 [REDACTED] [REDACTED]
21 [REDACTED] [REDACTED]
22 [REDACTED] [REDACTED] [REDACTED]
23 [REDACTED] [REDACTED]
24 [REDACTED]

15:23:51

25 [REDACTED] [REDACTED]

15:24:10

1 [REDACTED]

2 [REDACTED]

3 [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

15:24:22

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15:24:35

15 [REDACTED]

16 [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED]

15:24:49

20 [REDACTED]

21 [REDACTED]

22 [REDACTED]

23 [REDACTED]

24 (End sidebar.)

15:25:05

25 Q. BY MR. LOMBARDI: Okay. On the Forest plot that

1 you presented to the jury, there was no statistically
2 significant result?

3 A. Correct.

4 Q. Thank you.

15:25:27

5 Let me ask you -- we'll change the subject here,
6 Doctor, to JNCI. And by that I mean the Journal of the
7 National Cancer Institute 2018 article which you talked
8 about this morning; right?

9 A. Yes.

15:25:45

10 Q. You didn't actually show that to the jury;
11 right? You gave your critique of it; is that correct?

12 A. Yes.

13 Q. And so let me -- I'd like to publish 2052. It's
14 in evidence.

15:26:02

15 THE COURT: Any objection?

16 MR. WISNER: No objection, your Honor. It's
17 actually not in evidence.

18 MR. LOMBARDI: My mistake, but I think we have
19 agreement we can publish.

15:26:09

20 THE COURT: That's fine.

21 MR. LOMBARDI: Let's put it up on the screen. I
22 think this will be a clearer way for the jury to see it.

23 Q. And so you see this is right there, Journal of
24 the National Cancer Institute; is that right?

15:26:34

25 A. Yes.

1 Q. That's a well regarded journal?

2 A. Yes.

3 Q. And you've been published in it yourself; is
4 that right?

15:26:40 5 A. I have 20 papers in it.

6 Q. Let's go down to -- it says, "Glyphosate Use and
7 Cancer Incidence in the Agricultural Health Study." I
8 think you made reference to this before. It specifically
9 is a study about glyphosate; right?

15:26:54 10 A. Yes.

11 Q. Okay. And then it lists the authors. And there
12 are a number of them.

13 Do you see that there?

14 A. Yes.

15:27:00 15 Q. And these authors are either associated with the
16 government or with universities; is that right?

17 A. If they're associated with the government, then
18 I suppose we're going to have to be a bit suspicious, but
19 aside from that, yes.

15:27:19 20 Q. Okay. You don't mean to impugn the integrity of
21 Gabriella Andreotti, do you, Doctor?

22 A. No.

23 Q. Okay. Thank you.

24 And so Andreotti -- you look here it says the
15:27:33 25 affiliations of the authors. If you look at that, you

1 see that they are with the National -- I'm not going to
2 read all of the language. Doctor? Are you with me,
3 Doctor?

4 A. Yes.

15:27:43

5 Q. They're with the National Cancer Institute.
6 Do you see that?

7 A. Yes.

8 Q. Of the National Institutes of Health?

9 A. Yes.

15:27:51

10 Q. They are with the National Institute of
11 Environmental Health Sciences of the National Institute
12 of Health.

13 Do you see that?

14 A. Yes.

15:28:09

15 Q. They are with -- right below that, the
16 Department of Epidemiology at the University of Iowa?

17 A. Yes.

18 Q. They are with Drexel University right below
19 that.

15:28:21

20 Do you see that?

21 A. Yes.

22 Q. They are not with Monsanto; correct?

23 A. Yes.

15:28:33

24 Q. They are not with any industry entity; is that
25 right?

1 A. Yes.

2 Q. And you understand that the agricultural health
3 study was a study that was created and put together by
4 government entities; correct?

15:28:44 5 A. Yes.

6 Q. Funded by those entities; right?

7 A. Yes.

8 Q. All right. Now, this is a cohort study -- you
9 talked about cohort studies this morning; is that right?

15:28:56 10 A. Yes.

11 Q. All right. Let's go to the next page and let's
12 look under "Study Design."

13 Do you see that section, Doctor?

14 A. Yes.

15:29:14 15 Q. Okay. And under "Study Design," it says that --
16 right there -- tells us how many people were enrolled in
17 the study initially; right?

18 A. Yes.

19 Q. 57,000 some-odd; correct?

15:29:29 20 A. Yes.

21 Q. And we're going to come back to the followup in
22 just a few minutes, but it starts with 57,000. Let's go
23 to the statistical -- excuse me. Let's go to the next
24 page under "Results" and they actually -- these

15:29:48 25 scientists did a number of different analyses, didn't

1 they?

2 A. Sure.

3 Q. And they tried to look at this data in a number
4 of different ways to see if they could see any effect of
15:30:00 5 glyphosate on the risk level for non-Hodgkin's lymphoma;
6 correct?

7 A. Yes.

8 Q. And so what you're seeing here is -- and here,
9 if you could just go a little bit above that, Armando --
15:30:21 10 yeah. "Risk ratios for unlagged intensity-weighted
11 lifetime days."

12 Do you see that? That's one of the analyses
13 they did; right?

14 A. Yes.

15:30:29 15 Q. And then if you go further down to right about
16 here, here's another analysis they did, the rate ratio in
17 the top exposure quartile.

18 Do you see that?

19 A. Yes.

15:30:43 20 Q. They had quartiles that they kind of ranked
21 people by the extent of their exposure; is that right?

22 A. Yes.

23 Q. And then if you go down a little bit further,
24 you can go -- if you can scroll up a little bit, Armando,
15:30:59 25 that would be great. Right there. They did results

1 based on lifetime days of glyphosate use and cancer risk.

2 Do you see that?

3 A. Yes.

4 Q. They evaluated the impact of lagging exposure.

15:31:21 5 Do you see that?

6 A. Yes.

7 Q. And they conducted several sensitivity analyses.

8 Do you remember that?

9 A. Yes.

15:31:32 10 Q. And a sensitivity analysis is something that is
11 designed to basically check the results you got?

12 A. Yes.

13 Q. By performing tests to make sure that the
14 tests -- the result you got is accurate?

15:31:48 15 A. Yes.

16 Q. Okay. And they did -- do you remember how many
17 sensitivity analyses they did?

18 A. No. But I'm sure they did a lot.

19 Q. And did they do -- were there any sensitivity
15:31:59 20 analyses in the case control studies that you referred
21 to?

22 A. I'm sure there were.

23 Q. Okay. Let's go to page 5 and let's just read
24 what they say in conclusion.

15:32:16 25 "In this updated evaluation of glyphosate use

1 and cancer risk in a large prospective study of pesticide
2 applicators, we observed no associations between
3 glyphosate use and overall cancer risk or with total
4 lymphohematopoietic cancers."

15:32:40

5 Do you see that?

6 A. Yes.

7 Q. And that's the results that they came to; right?

8 A. Yes.

9 Q. And if we just go to page 7 down here under

15:32:53

10 "Funding," just to confirm, Doctor, this work was
11 supported by the Intramural Research Program of the
12 National Institutes of Health, National Cancer Institute,
13 Division of Cancer Epidemiology and Genetics; right?

14 A. Yes.

15:33:09

15 Q. The National Institute of Environmental Health
16 Science.

17 Do you see that?

18 A. Yes.

19 Q. The Iowa Cancer Registry; right?

15:33:18

20 A. Okay.

21 Q. Iowa's Holden Comprehensive Cancer Center;
22 correct?

23 A. Yes.

24 Q. And as well as the NIEHS-funded Environmental
25 Health Sciences Research Center.

1 Do you know what NIEHS is?

2 A. Yes.

3 Q. What is it?

15:33:43

4 A. National Institute of Environmental Health
5 Sciences.

6 Q. Another government entity?

7 A. Well, referred to earlier. But that's part of
8 the NIH.

15:33:49

9 Q. Okay. And actually in this, one of the things
10 you think was well done in this study is they had access
11 to good cancer registries to track the disease in the
12 cohort; is that right?

13 A. Like I said before, cancer outcomes are usually
14 well measured.

15:34:05

15 Q. And you agreed that in this particular case the
16 cancer outcome was well measured?

17 A. Yes.

18 Q. Now, one thing that you talked about as being
19 problematic, in your view, with the JNCI study was

15:34:29

20 imputation; right?

21 A. No.

22 Q. Well, you talked about their use of imputation.

23 A. Imputation was appropriate. You use imputation
24 when you've got a screwed-up study with poor followup.

15:34:44

25 And since they had poor followup, they had to use

1 imputation. And so the use of imputation was totally
2 appropriate and they did it correctly and appropriately.
3 Turned out it didn't work well, so -- as we're saying
4 here, you know, I have no problem with the investigators
15:35:05 5 here. I think they're all, as you say, noble government
6 employees and excellent scientists, and they did a noble
7 job of trying to work with the study where there were
8 many problems. And unfortunately this is a case of
9 measuring shit with a gold scale where it turns out the
15:35:29 10 results just didn't turn out to be what they should be
11 because there were so many problems, as I pointed out in
12 my direct testimony this morning.

13 So you got those misclassification in the
14 exposure, poor followup, and then the imputation didn't
15:35:48 15 work -- it didn't work. I didn't say the imputation was
16 inappropriate. I said the imputation didn't work well.
17 And in particular it didn't work well or it didn't work
18 as it could have because the risk ratio that we're
19 looking for is small so that the errors that are here or
15:36:06 20 the problems that are here with a risk ratio -- a
21 putative risk ratio of 1.5 just obviates and attenuates a
22 risk ratio that's that small. If the risk ratio was 3 or
23 4, everything would be fine and good. But with a risk
24 ratio of 1.5, they're not going to catch it. And they
15:36:27 25 didn't.

1 Q. Did you finish your answer, sir?

2 A. Yes, I did.

3 Q. You know, I think we're probably going to bleep
4 you in the transcript.

15:36:36 5 A. I'm going to be very offended by that.

6 Q. Doctor, the fact is that you have used
7 imputation yourself in studies?

8 A. Yes. As I say, I have no problem with
9 imputation. It's a good statistical tool and should be
10 used.

15:36:52

11 Q. Let's take a look in your binder at
12 Exhibit 3153.

13 A. 31 --

14 Q. 53. 3153.

15:37:16 15 And let me know when you have it, Doctor.

16 A. I'm honored.

17 Q. That is -- for the record, that is an article
18 that you were a coauthor on; is that right?

19 A. Yes.

15:37:30 20 Q. And it was an article that was published just
21 last year in the Journal of the National Cancer
22 Institute, I believe; is that right?

23 A. Yes.

24 MR. LOMBARDI: And I'd ask permission to publish
15:37:45 25 it.

1 THE COURT: Any objection?

2 MR. WISNER: No objection. It just has nothing
3 to do with glyphosate or NHL. But I assume it has some
4 relevance. So no objection at this time, your Honor.

5 MR. LOMBARDI: So let's put it up on the screen
6 so the jury can see it.

7 Q. Doctor, it says, "Post-Diagnosis Changes in
8 Cigarette Smoking and Survival Following Breast Cancer."

9 That was the title; is that right?

15:38:05

10 A. Yes.

11 Q. And there you are, Dr. Neugut --

12 A. Yes.

13 Q. -- as one of the authors.

15:38:16

14 And what happened with this study was you were
15 tracking a group of people; is that right?

16 A. Breast cancer patients.

17 Q. Right. So let's go to page 4 of the study.

18 A. Uh-huh.

15:38:44

19 Q. And let's look down here and more specifically
20 right there, and here you note the sample that you had;
21 right?

22 After excluding an additional seven women for
23 various reasons, the analytic sample consisted of 1332
24 women; is that right?

15:39:00

25 A. Yes.

1 Q. And then you lost some to followup; right?

2 A. 28 percent.

3 Q. In a similar way -- I mean, that's what you
4 talked about, lost to followup with the JNCI 2018 study
15:39:12 5 we've been looking at; right?

6 A. Yes.

7 Q. And so you lost 28 percent of followup. And the
8 way you solved that problem was to do imputation; is that
9 right?

15:39:23 10 A. That's correct.

11 Q. So if we just go down a little bit. Right
12 there. Missing values were imputed using -- and I assume
13 that these are complicated computer software type of
14 things?

15:39:39 15 A. It's the typical software.

16 Q. Okay. Great. And you talk about Markov Chain
17 Monte Carlo procedure. We don't need to know about that,
18 sir, but that is part of the imputation process; isn't
19 that right?

15:39:54 20 A. Yes.

21 Q. All right. And what you concluded in the end
22 was that imputation was a good thing; right?

23 A. Yes.

24 Q. And let's go to page 7. And I think it's right
15:40:15 25 about there. This is where -- and, Doctor, if you need

1 me to go back up, but this is where you're talking about
2 some of the limitations of your study?

3 A. Yes.

4 Q. All right. So here it says: "Last, while our
15:40:29 5 prospective study design allowed us to assess changes in
6 smoking status several years after breast cancer, a
7 proportion of women were lost to followup and thus did
8 not complete the followup assessment. However, we
9 addressed the missing data using multiple imputation" --
15:40:49 10 and then here's what you say about that -- "resulting in
11 valid statistical inferences that properly reflect the
12 uncertainty due to missing values."

13 Do you see that?

14 A. Yes. But there are vast differences between
15:41:05 15 this study and the AHS study, which I can address, which
16 are, number one, that, first of all, we had a strong
17 positive association as opposed to a null finding. And
18 when you have a strong positive association, as I said
19 this morning, you can put a lot more reliance on the
15:41:29 20 findings than when you have a null finding. Because when
21 you have a null finding, you don't know if it's due to
22 the errors, their results, or not.

23 Secondly, the smoking assessment is assessed
24 with a great deal of validity. While it's certainly
15:41:51 25 unclear if the exposure misclassification that results

1 from the glyphosate study, that can eliminate a risk
2 ratio of 1.5 in and of itself. So that's a point.

3 Thirdly, we actually put the problem here, which
4 is to say in a paper you're supposed to put down the
15:42:16 5 problems with the paper, which is the fact that we had
6 lost the followup and used imputation to correct the loss
7 to followup. If you go back to the AHS study, the
8 authors in the discussion section don't mention that they
9 had loss to followup and used imputation. It's not in
15:42:37 10 the discussion section for the peer reviewer to address.

11 Q. Wait. Are you suggesting that it's not clear
12 from the AHS -- from the JNCI study 2018 that imputation
13 was done?

14 A. No. Of course it's clear that imputation was
15:42:51 15 done, but it's a standard part of the discussion section
16 to put the strengths and limitations into the discussion
17 section so the peer reviewer can properly do peer review.

18 Q. One other way that JNCI 2018 is different from
19 your study is they did three sensitivity analyses to
15:43:10 20 check their imputation, didn't they, Doctor?

21 A. And they were off by 17 percent. So that error
22 alone would be enough to obviate a 1.5 risk ratio, and
23 therefore the absence of a risk ratio of 1.5 in your
24 findings can be totally due to the use of the imputation.
15:43:31 25 They themselves found an error of 17 percent in their own

1 thing and that's without even looking at the bias.

2 Q. Sir, do you remember my question?

3 A. What's -- no, I don't.

4 Q. So my question, Doctor, was, they did three
15:43:45 5 sensitivity analyses to check their imputation, didn't
6 they?

7 A. I don't recall offhand, but possibly. And?

8 Q. Okay. So let's go to back to Andreotti, 2052,
9 and let's go to page 3. And it's that paragraph towards
15:44:11 10 the top that says, "In addition." And here's what they
11 said, these folks that I guess were not properly
12 disclosing imputation, they said, "In addition, we
13 conducted sensitivity analyses to evaluate the impact
14 of" --

15:44:29 15 A. I did not say they did not disclose imputation.
16 Don't misquote me.

17 Q. Doctor, can you just answer my question? It
18 says --

19 A. Just properly quote me.

15:44:39 20 Q. Doctor, I'll do the best I can, but can you just
21 answer my question?

22 A. Uh-huh.

23 Q. "In addition, we conducted sensitivity analyses
24 to evaluate the impact of including additional exposure
15:44:49 25 information."

1 Do you see that?

2 A. Yes.

3 Q. That refers to the imputation; right?

4 A. I don't know.

15:45:01 5 Q. Well, if you need to, Doctor, you can go back to
6 the prior page. If you need to. Do you need to?

7 A. Oh, no. They go on to say that. Okay. Uh-huh.

8 Q. Do you agree with me now that they're
9 specifically talking about imputation in here, Doctor?

15:45:25 10 A. Give me a moment to read through the paragraph.

11 Q. Sure.

12 A. Okay.

13 Q. All right. And do you see they talk about three
14 different sensitivity analyses they did; right?

15:45:48 15 A. Yes.

16 Q. The first one was they calculated risk estimates
17 including cancer incidence data for the complete followup
18 period with only exposure information collected at
19 enrollment. That was one method they used; right?

15:46:03 20 A. Yes.

21 Q. The second method they used was we examined
22 associations excluding imputed exposure data, thereby
23 limiting analyses to participants who completed both the
24 enrollment and the followup questionnaires; right?

15:46:20 25 A. Correct.

1 Q. And the last one was because the last exposure
2 information was collected between 1999 and 2005, we
3 truncated followup at 2005 to coincide with this exposure
4 period; right? Correct?

15:46:35 5 A. Do I get to answer now?

6 Q. Yes. Did they do that?

7 A. Yes, they did that. And --

8 Q. Okay. Now let's look at the results. Let's go
9 to page 4. And it's down here. "We conducted" -- right
10 there. "We conducted several sensitivity analyses
11 evaluating the impact of including exposure data obtained
12 at the two time points." And then continuing: "When
13 restricted to exposure reported at enrollment, the
14 patterns of risk were the same as analyses that
15 considered glyphosate use reported at enrollment and
16 followup."

17 Do you see that?

18 A. Yes.

19 Q. That was one of the sensitivity tests that came
15:47:26 20 out with the same result; is that right?

21 A. Yes.

22 Q. Let's look at the last one. It says:
23 "Finally" -- down there -- "when we truncated the
24 followup period to 2005 to be concurrent with the latest
15:47:41 25 exposure information, we had even fewer total cancer

1 cases."

2 Do you see that?

3 A. Yes.

4 Q. For NHL -- I'm going -- I'm trying to find an
15:47:52 5 easy way to read this, Doctor -- the reasonable risk
6 quartile four was, again, no effect; is that right?

7 A. Yes.

8 Q. And that was the third sensitivity test that
9 they did that showed that they got -- that their
15:48:08 10 imputed results were accurate. That's why they did it;
11 right? They got the same result in the sensitivity
12 analysis.

13 A. That doesn't mean they were accurate. That
14 means they were the same.

15:48:22 15 Q. Okay. Good.

16 Now, the other imputation method that they did
17 or sensitivity analysis they did was -- just so it's
18 clear to everybody, there's something like 54,000 people
19 that filled out the first questionnaire; right?

15:48:35 20 A. Yes.

21 Q. And then you had a follow-up period; right?

22 A. Yes.

23 Q. And you followed up with people. And your point
24 is that they didn't get everybody to follow up, people
15:48:45 25 hung up, people refused, whatever it was; right?

1 A. Yes.

2 Q. And with that you ended up with -- I think you
3 said 36 or 37, something in that ballpark of people did
4 not do the followup; is that right?

15:49:01 5 A. Yes.

6 Q. And those people -- so that leaves you with a
7 total of, what is it, 34,000 or so that did do the
8 followup and the initial questionnaire; right?

9 A. Yes.

15:49:12 10 Q. And what happened when you did the -- this
11 particular sensitivity analysis was -- this sensitivity
12 analysis said let's just not impute at all and see what
13 result we get with the 34,000 who did do both? That's
14 what this particular sensitivity analysis said.

15:49:35 15 A. Yes.

16 Q. Okay. And then let's see what the result was.
17 Right there. "To evaluate the impact of using imputed
18 exposure data for participants who did not complete the
19 followup questionnaire, we limited the analysis to 34,000
20 some-odd participants" --

21 I've got that right so far, Doctor?

22 A. Yes.

23 Q. -- "who completed both questionnaires, reducing
24 the total number of cancer cases to 4,699."

15:50:13 25 And, again, when they don't even impute, they

1 again find that glyphosate use was not associated with
2 NHL; right?

3 A. So that's introducing almost as big a bias as is
4 possible to introduce because you're now excluding
15:50:30 5 40 percent of your sample, and who are the 40 percent
6 you're excluding? The losers who are not answering the
7 phone or for whatever reason. So you've introduced a
8 huge bias in your sample. There are studies conducted by
9 these same investigators that show that there's a big
15:50:51 10 difference between the 60 percent who did answer -- who
11 did answer the questionnaire and the 40 percent who did
12 not, but you've excluded the 40 percent. And for all you
13 know, the 60 percent is totally different than the other
14 40 percent and it's difficult to make any conclusions
15:51:11 15 then. And indeed the risk ratio that they mention here
16 goes up when they do their sensitivity analysis. So,
17 again, maybe if you included the 40 percent who were not
18 interviewed, you would have had an EPA higher risk ratio.
19 Again, to get rid of the 1.5 risk ratio, you don't need
15:51:38 20 much bias, you don't need much non-response, you don't
21 need much error altogether.

22 Q. Sir, this was a sensitivity analysis run as a
23 check on the imputation that they did.

24 A. I'm not criticizing them for doing a sensitivity
15:51:50 25 analysis and I'm not blaming them for having lost the

1 followup, and in no way did I ever say they shouldn't
2 have done imputation. I think imputation was absolutely
3 the correct method to use. Imputation is precisely what
4 you should use when you have lost a followup. So it's
15:52:09 5 unfortunate when they did their own check on the
6 amputation, which you didn't allude to, but when they
7 checked the 20,000 against the 10,000, when they did a
8 validity bias, the imputation showed a 17 percent
9 discrepancy, which also would have caused an elevated
15:52:26 10 risk ratio to disappear.

11 So there are many errors in this study and -- or
12 potential errors, and I think a risk ratio or finding a
13 null risk ratio is no surprise whatsoever and is really
14 uninterpretable in the context of this study. And I'm
15:52:45 15 not criticizing the AHS study overall, but for the
16 particular analysis of glyphosate versus NHL, I think
17 there's a lot of problems in being able to rely on it in
18 any meaningful way. And if you're going -- I mean, I
19 just think it's not appropriate.

15:53:04 20 MR. LOMBARDI: Your Honor, I don't think we ever
21 answered the question.

22 THE COURT: All right. Dr. Neugut, if you could
23 please just listen carefully to Mr. Lombardi's question,
24 answer the question only, and then he'll ask you another
15:53:15 25 question.

1 THE WITNESS: I believe I am answering his
2 questions, your Honor.

3 THE COURT: Mr. Lombardi, do you wish to repeat
4 your last question or do you have another question?

15:53:24 5 MR. LOMBARDI: Well, I'll try.

6 Q. So, Doctor, you're okay with the fact that they
7 did sensitivity analysis?

8 A. Of course.

9 Q. That's a good thing to do for an analysis;
15:53:34 10 right?

11 A. Absolutely.

12 Q. And what they found out was when they did
13 imputation, they got a relative risk that was very
14 similar to when they didn't do imputations. That's what
15:53:45 15 they found, Doctor.

16 A. Yes.

17 Q. Thank you.

18 Now, Doctor, you've talked about the problem
19 with imputation was misclassification bias in part;
20 right?

21 A. I don't understand the question.

22 Q. Well, part of the problem, you said, this is
23 what I understood you to say, was that when imputation
24 was done here, there was an issue with potential
15:54:17 25 misclassification bias; correct?

1 A. Misclassification bias is a different --
2 misclassification error is a different problem than the
3 problems that arose from the imputation.

4 Q. Okay. Am I right that you raised
15:54:35 5 misclassification bias as a problem with the imputation?

6 A. Misclassification, yes, uh-huh.

7 Q. Now, with respect to the 34,000 participants who
8 did both the initial questionnaire and the second
9 questionnaire, isn't it true that there is no concern
15:55:03 10 about misclassification bias with that group?

11 A. There's a concern with misclassification error,
12 random misclassification error, that they're not filling
13 -- that they have the initial misclassification error
14 from when they originally filled out the questionnaire in
15:55:21 15 1993 to 1997, and then when they filled it out again the
16 second time, they're going to have the same error a
17 second time. So that's going to introduce two
18 misclassification errors right off the bat. And again in
19 the context of a low relative risk, that's a problem to
15:55:40 20 start with.

21 Q. Sir, you agree that you don't have any concerns
22 of exposure misclassification with that 63 percent of the
23 cohort; correct?

24 A. I don't have any concerns with?

15:56:00 25 Q. Exposure misclassification with respect to that

1 63 percent of the cohort; correct?

2 A. No, I don't agree.

3 Q. Okay. Let's look at your deposition from
4 January of 2018, pages 86 to 87.

15:56:18 5 A. I'm sorry. Give me the --

6 Q. It will be January of 2018.

7 A. What page?

8 Q. Page 87, line 4.

9 Do you see that?

15:57:01 10 A. Yes.

11 MR. LOMBARDI: Your Honor, I ask to publish it.

12 THE COURT: All right. You can publish.

13 Q. BY MR. LOMBARDI: And I'll just put it over
14 here.

15:57:22 15 These are the answers you gave under oath,
16 Dr. Neugut, at your deposition; is that correct?

17 A. Yes.

18 Q. Starting at line 4, "You agree that you don't
19 have any concerns of exposure misclassification with
20 respect to that 63 percent of the Cohort; correct?"

15:57:36

21 Your answer, under oath, was "correct"; isn't
22 that right, Doctor?

23 A. So --

24 Q. Did you give that answer to that question?

15:57:48 25 A. Yes. I gave that answer, but --

1 Q. Thank you, Doctor.

2 MR. WISNER: Objection, your Honor. He should
3 be allowed to respond. This is improper impeachment.

15:57:59

4 THE COURT: Mr. Lombardi, do you have any
5 further questions?

6 MR. LOMBARDI: I think I do.

7 THE COURT: All right. Well, you can address it
8 on redirect, Mr. Wisner.

15:58:14

9 Q. BY MR. LOMBARDI: Doctor, you put up this chart
10 at the very end of your testimony, and for the record
11 it's Plaintiff's Exhibit 1034. Do you remember seeing
12 that?

13 A. Yes.

15:58:35

14 Q. And you put together a chart that showed things
15 that were classified under IARC as 2A?

16 A. Yes.

15:58:52

17 Q. And then things from the AHS study -- and this
18 is actually -- 2014 was actually -- not the 2018
19 publication, but there was a 2014. I think it was just a
20 draft, wasn't it, Doctor?

21 A. I'll confess, I'm not sure.

22 Q. I'm not trying to --

23 A. No, no. I'm just --

24 Q. There was at least a draft in 2014; right?

15:59:06

25 A. Uh-huh, yes.

1 Q. Okay. And what this shows is it shows that IARC
2 was doing something different, doesn't it?

3 A. That IARC was doing something different?

4 Q. Right.

15:59:22 5 A. In what context or sense?

6 Q. Well, we know that IARC is only considering a
7 hazard assessment, right, not a risk assessment?

8 A. Yes.

9 Q. And AHS is actually doing a study to determine
15:59:39 10 what happens, I'm going to say, in the real world,
11 Doctor, see if you're with me on that?

12 A. I'm sorry, you'll have to repeat that one. That
13 went over my head.

14 Q. That's fine. That's fine. IARC is doing a
15:59:53 15 hazard assessment; right?

16 A. Determining whether it's a carcinogen.

17 Q. Right. And what we see from your chart is that
18 there is not necessarily a correlation between an IARC
19 hazard assessment and what the epidemiology actually
16:00:10 20 finds; right?

21 A. So that the AHS study did not necessarily find
22 an association between an IARC defined carcinogen and
23 NHL.

24 Q. Actually, IARC defined probable carcinogens one
16:00:33 25 as a carcinogen; right?

1 A. You can differ on what we can call a carcinogen,
2 but yes.

3 Q. Thank you, Doctor.

16:00:40

4 MR. LOMBARDI: May I have one second just to
5 make sure --

6 THE COURT: Yes.

7 MR. LOMBARDI: But I think I'm finished, Doctor.
8 No further questions, your Honor.

9 Thank you very much for your time, Doctor.

16:00:54

10 THE WITNESS: Thank you.

11 THE COURT: All right. Mr. Wisner, you may
12 proceed.

13 MR. WISNER: Thank you, your Honor.

16:01:28

14 permission to publish Plaintiff's Exhibit 669, the
15 Andreotti study.

16 THE COURT: No objection?

17 MR. LOMBARDI: I'm sorry?

18 MR. WISNER: Andreotti.

16:01:37

19 MR. LOMBARDI: No problem, yes. No objection, I
20 mean, your Honor.

21

22 REDIRECT EXAMINATION

23 BY MR. WISNER:

16:01:40

24 Q. All right. Doctor, we're looking at the
25 Andreotti study, the one that Mr. Lombardi asked you

1 quite a few questions about towards the end of your
2 cross-examination.

3 I actually just want to ask you a
4 straightforward question. Do you think it's important to
16:01:55 5 be honest in your publications?

6 A. Do I think it's important to be what?

7 Q. Honest in your publications?

8 A. Yeah.

9 Q. Okay. Let's look at the abstract here. In the
16:02:06 10 conclusion it states -- and Doctor, I'm not asking if you
11 agree with this conclusion. I'm just asking what it
12 actually states in this paper, okay?

13 It says, "In this large prospective Cohort study
14 no association was apparent between glyphosate and any
16:02:22 15 solid tumors or lymphoid malignancies overall including
16 NHL and its subtypes." Do you see that?

17 A. Yes.

18 Q. Is that a true statement? I understand you
19 don't agree with it or not. Is that a true statement
16:02:39 20 based on what the study showed itself?

21 A. Depends on how you read the paper, but not
22 fully, no.

23 Q. Was there a statistical significance association
24 between glyphosate exposure and an NHL subtype?

16:02:53 25 A. So again, I wouldn't want to count the AHS study

1 towards our discussion today because as I said I think it
2 has so many problems with it that I don't want to
3 integrate it or include it with the case control studies,
4 but it did find a significant association with one type
16:03:16 5 of non-Hodgkin's lymphoma.

6 Q. And what was that?

7 A. T-cell lymphomas.

8 Q. And are you aware whether or not mycosis
9 fungoides is a type of T-cell lymphoma?

16:03:31 10 A. One thing it did find statistically a
11 significant association with was mycosis T-cell
12 lymphomas.

13 Q. Thank you, your Honor -- thank you, Doctor.

14 Now, you raised the criticism about the
16:03:43 15 sensitivity -- sorry, about the imputation limitations
16 not being disclosed in the article. Do you recall that?

17 A. Yes.

18 Q. And you took issue with the way Mr. Lombardi was
19 characterizing your opinion, do you remember?

16:03:59 20 A. Well, again, I did not criticize in any way that
21 that they used imputation. Imputation is used when you
22 have lost a follow-up and it's the proper methodology to
23 use as I used -- or as we used in our study in breast
24 cancer. It's a methodology that's used when there's a
16:04:22 25 loss to follow up and you have to use it. In their

1 particular study it didn't -- it didn't work well, which
2 is not anyone's fault. They did everything right. They
3 did everything correctly, and it just didn't pan out
4 properly, which happens. There is a paper by
16:04:40 5 Heltsche, et al., which shows that when they used
6 imputation, it introduced -- and they studied it that it
7 introduced a 17-percent error rate -- a potential
8 17-percent error rate and thus a 15-percent error rate on
9 top of the exposed misclassification in the first place
16:05:02 10 is certainly a big error in the context of a risk ratio
11 of 1.5 and was taken away or attenuated a 1.5 error rate
12 and thus the fact that we find a null finding for
13 non-Hodgkin's lymphoma as a whole is no surprise at all.

14 MR. WISNER: Permission to publish demonstrative
16:05:33 15 1032.

16 THE COURT: No objection?

17 MR. LOMBARDI: No objection, your Honor.

18 Q. BY MR. WISNER: All right. Doctor, this is that
19 graph about glyphosate or Roundup use.

16:05:40 20 Do you see that, Doctor?

21 A. Yes.

22 Q. And my understanding is the second follow-up on
23 the AHS for exposure assessment, that was completed by
24 2005; right?

16:05:54 25 A. Yes.

1 Q. So after 2005, I mean we almost have an
2 additional doubling of the use of Roundup, don't we?

3 A. Yes.

4 Q. Was there any accounting for that?

16:06:05

5 A. No.

6 Q. So if there was any issues with the follow-up
7 between '93 and '97 and then 2001, 2005, we'd have a
8 similar problem in 2005 to the present, wouldn't we?

9 A. I suppose we would, yes.

16:06:21

10 Q. And the cancers that are being counted as part
11 of the AHS study, they're counting cancers in registries;
12 right?

13 A. So I think the cancer follow-up went through --
14 I don't know the exact year. I'd have to see again in
15 the Andreotti paper, but I think it went through 2015 or
16 2016. So I guess if you were exposed between 2005 and
17 2013, 14, '15, they would have missed that. If your
18 exposure changed over that time interval, it would have
19 it would be missed.

16:07:00

20 Q. So people could have started using it in 2005
21 and had been using it for one, two, three, four, five,
22 six, seven, eight, nine -- ten years and gotten NHL and
23 they would have been considered -- by the Andreotti
24 paper's own standards, they would have been considered

16:07:19

25 unexposed in having cancer?

1 A. If they started in 2005 for sure, yes.

2 Q. And that's assuming they filled it out, it was
3 arranged between 2001 and 2005 so those people who
4 started using it in 2002 but completed their follow-up in
5 2001, that could be even 13 years; right?

16:07:38

6 A. Yes.

7 Q. Now, you've done Cohort studies before; right?

8 A. Yes.

9 Q. And you agree with me that an important aspect
10 of the Cohort study is repeated follow-up to make sure
11 your exposure is correct; right?

16:07:48

12 A. It's a difficult thing to keep following up
13 50,000 people. The problem is most exposures don't
14 change so dramatically over time. As I said if you're a
15 smoker, you tend to stay a smoker and you don't change so
16 dramatically over time. This is an unusual circumstance
17 where the exposure over time is really dramatically
18 changing, so it does become more important to have an
19 ongoing follow-up to try to reassess it but, of course,
20 it's difficult to go back and do another 50,000

16:08:06

21 questionnaire. Who's going to pay for it? Now you're
22 going to have to find -- you've already lost 20,000 out
23 of the 50,000 in the first follow-up, then you go back to
24 the 30,000 that you got the second time around and God
25 knows how many of them are going to answer the phone the

16:08:30

16:08:46

1 second time you call. So you're going to have one loss
2 to follow up on top of the second loss to follow up, and
3 I'll be sitting up here telling about, you know, another
4 30 percent loss to follow up and one screw up on top of
16:09:05 5 another. Again, it's not a screw up. It's just that's
6 the nature of the beast and that's the way life goes.

7 MR. WISNER: Permission to publish Exhibit 1034.

8 THE COURT: No objection?

9 MR. LOMBARDI: No objection.

16:09:17 10 THE COURT: Very well.

11 Q. BY MR. WISNER: This is one where the AHS and
12 IARC agree; right? DDT, 2A seen in the AHS?

13 A. DDT and what was the other one you said.

14 Q. Well, DDT that was seen in IARC and the AHS;
15 right?

16 A. Yes.

17 Q. Now, DDT didn't have an explosion of use during
18 the time of the AHS, did it?

19 A. DDT was banned in the early '70s, I believe.

16:09:45 20 Q. So essentially it's static starting from the
21 1970s on. So there's no change of use after that point?

22 A. No.

23 MR. WISNER: Mr. Lombardi, permission to publish
24 the block?

16:10:01 25 THE COURT: Any objection?

1 MR. LOMBARDI: No objection.

2 Q. BY MR. WISNER: Mr. Lombardi raised an issue
3 about how this De Roos study in 2003 was looking at
4 studies in the 1980s. Do you remember that issue?

16:10:12

5 A. Yes.

6 Q. The 1980s, that doesn't have the problem change
7 of Roundup use, does it?

8 A. No.

16:10:23

9 Q. So by actually focusing on earlier exposures
10 where it's more constant, you're actually able to parse
11 out a difference?

12 A. It's easier.

16:10:41

13 Q. And that De Roos 2003 study, the one that has a
14 2.1, if this was the proper 2.1 this would be
15 statistically significant; right?

16 A. Yes.

17 Q. And that adjusted for like 69 pesticides, didn't
18 it?

19 A. Yes.

16:10:46

20 Q. So even after adjusting for pesticides, studying
21 a population that have consistent exposure, what did the
22 results show?

23 A. Significant increase in glyphosate association
24 with NHL.

16:10:58

25 Q. Now, Doctor, no one has said, not Dr. Portier

1 nor you, that the epi in this case is sufficient to show
2 causation; correct?

3 A. That's correct.

4 Q. Would it be even remotely scientifically correct
16:11:16 5 to just look at the policy?

6 A. No. I mean, not to make a causal link based
7 solely on the epidemiology.

8 Q. You have to look at the totality of the
9 evidence; right?

16:11:27 10 A. That's what I showed in the Bradford-Hill
11 criteria at the end of my direct testimony, that you have
12 to incorporate the dose-response relationship, the
13 biological evidence like the toxicology that Dr. Portier
14 spoke about. You have to think about it, you have to
16:11:49 15 look at things, like I said, the specificity and the
16 other factors, consistency the strength of association,
17 et cetera.

18 Q. Now, you recall Mr. Lombardi raised some issues
19 that IARC isn't doing a risk assessment; it's doing a
16:12:07 20 hazard assessment. Do you recall that?

21 A. Yes.

22 Q. Now, a hazard assessment that's trying to answer
23 the question that something causes cancer; right?

24 A. Yes. Sure.

16:12:16 25 Q. And after you decide that yes, sure, that can

1 cause cancer, the next step is sort of see how much of it
2 do you need to cause cancer; right?

3 A. How much of it and how much risk does it really
4 confer on you or on the population, how seriously do you
16:12:32 5 want to take it, what do you want to do about it, how
6 high is the risk, are you going to put a label on it, are
7 you going to ban it, are you going to -- but that's a
8 public policy decision. That's, you know, for an agency
9 or for a governmental agency.

16:12:49 10 Q. And you'd agree that when we talk about
11 exposure, it's a lot different if someone sprays it in
12 their yard twice or three times in their life and they're
13 doing it everyday for their job and getting drenched in
14 it? Those are different types of exposures; right?

16:13:03 15 A. Of course. That's where the dose response issue
16 comes into play.

17 Q. Before once you establish, okay, it can cause
18 cancer, then you have to look at a specific person and
19 their experiences and exposure before you can say whether
16:13:17 20 it causes that person's cancer; right?

21 A. Of course.

22 Q. And IARC nor yourself are offering any opinions
23 about a specific person here; right?

24 A. I'm not.

16:13:26 25 Q. We have someone else for that; right?

1 A. Yes. I hope so, yes.

2 Q. And so, Doctor, on the question that really is
3 before you, the question that kind of goes to the first
4 thing that we have to figure out here in this courtroom:
16:13:41 5 Does Roundup exposure, as we see it in the world and as
6 we see it in the data, does it actually cause
7 non-Hodgkin's lymphoma?

8 A. That's my expert opinion, yes.

9 MR. WISNER: Thank you. No further questions.

16:13:54 10 THE COURT: Mr. Lombardi.

11 MR. LOMBARDI: Just a couple, your Honor.

12

13 RE-CROSS-EXAMINATION

14 BY MR. LOMBARDI:

16:14:01 15 Q. Doctor, you talked a couple times about the
16 Heltsche article.

17 Do you recall that?

18 A. Yes.

19 Q. And the Heltsche article is the one you say
16:14:08 20 shows that there's a 17-percent error in the Journal of
21 the National Cancer Institute 2018 article; is that
22 right?

23 A. Seventeen-percent error with the imputation,
24 yes.

16:14:21 25 Q. And, sir, I just want to show you here, let's

1 look quickly at the --

2 MR. WISNER: Do we have a copy?

3 MR. LOMBARDI: My apologies.

4 Q. -- Defendant's Exhibit 2598.

16:14:36

5 MR. LOMBARDI: My apologies, your Honor.

6 Q. I'm not going to run you through the whole
7 article, Doctor. I think you'll be okay with just what
8 I'm going to show you. Why don't we give that a shot.

9 MR. LOMBARDI: Am I okay to publish?

16:14:47

10 MR. WISNER: Yes.

11 MR. LOMBARDI: Thank you.

12 Q. And so, Doctor, you're not suggesting that the
13 folks that did the JNCI 2018 article weren't aware of the
14 Heltsche article, are you?

16:15:05

15 A. No.

16 Q. Because actually the people who did the Heltsche
17 article, a lot of them were involved in the JNCI article,
18 weren't they?

16:15:16

19 A. That's correct, but they didn't mention it in
20 their JNCI paper.

21 Q. Well, they cited it, didn't they?

22 A. They didn't put the figure into the JNCI.
23 That's why I think the JNCI is a rather sloppy, poorly
24 written, misleading in some ways, paper but...

16:15:30

25 Q. Heltsche is good?

1 A. Heltsche is good --

2 Q. A good paper?

3 A. I didn't -- I'm not --

4 Q. You're citing it, Doctor.

16:15:42 5 A. Okay. Then it's a good paper.

6 Q. Heltsche good. JNCI's bad, sloppy, dishonest, I
7 think you said; right?

8 MR. WISNER: Objection. Let him answer the
9 question.

16:15:53 10 THE WITNESS: I didn't use the word "dishonest."
11 "Misleading" is the word I used.

12 Q. BY MR. LOMBARDI: Misleading. JNCI is
13 misleading?

14 A. Yes, and sloppily written.

16:16:01 15 Q. So Heltsche -- when she wrote the Heltsche
16 paper, that's a good paper. Let's just go through. You
17 know that Heltsche was on the JNCI paper; right?

18 A. Yes.

19 Q. Lubin was on the JNCI paper; right?

16:16:18 20 A. Yes.

21 Q. Andreotti was on the JNCI paper; right?

22 A. Yes.

23 Q. Sandler was on the JNCI paper; right?

24 A. Yes.

16:16:27 25 Q. Freeman was on the JNCI paper; right? Isn't

1 that right?

2 A. These are all the same authors, yes, same
3 investigators.

16:16:38

4 Q. And isn't it possible, sir, that the person who
5 has it wrong here is not those authors, but you?

6 A. Possible, yes.

16:16:55

7 Q. Now, Doctor, one other thing and I -- I may have
8 misheard you, so I apologize if I did. Did you just say
9 that there was a statistically significant result for
10 T-cell lymphoma in mycosis fungoides in the JNCI study?
11 Is that what you said?

12 A. I'm not saying we should count it at all, but
13 yes.

14 Q. You say it's a statistically significant result?

16:17:14

15 A. Yes.

16 Q. Okay. Let's look at what JNCI actually says.
17 Defendant's Exhibit 2052, permission to publish?

18 THE COURT: No objection? Very well.

16:17:28

19 Q. BY MR. LOMBARDI: Let's look at page 5 at the
20 bottom.

21 MR. WISNER: Objection. Completeness. He has
22 to show the page after it as well.

23 MR. LOMBARDI: I think I'm entitled to examine
24 the witness, your Honor.

16:17:42

25 THE COURT: He may ask the question. This is

1 the Andreotti article?

2 MR. LOMBARDI: Yes.

3 THE COURT: You may proceed.

16:17:53

4 Q. BY MR. LOMBARDI: This is the NHL T-cell
5 results; right, sir?

6 A. Which table is that?

7 Q. This is Table 2. Do you see it says T-cell?

8 A. Yes. And did I misspeak? Can I see the paper?

16:18:19

9 Q. You've got it. It's 2052. But, sir, can we
10 make the point here while we're here?

11 MR. WISNER: Objection. He needs to see the
12 paper. He's hiding Table 3.

13 THE COURT: Counsel --

16:18:28

14 THE WITNESS: I don't recall if it's Table 2 or
15 Table 3, but, again, I'm just asking for the paper.

16 Q. BY MR. LOMBARDI: You've got it there. 2052.

17 A. Which folder? I think it's that one, the three
18 ring binder that you've got.

19 Q. Do you have it, Doctor?

16:19:26

20 A. You're right. It's not statistically
21 significant.

22 Q. And that's because it's .73 to 24.6. That's a
23 huge confidence interval; right?

16:19:49

24 A. Yes. It's also a very large risk ratio. It's a
25 very large risk ratio. But I misspoke.

1 Q. Okay. And so, sir, in fairness to you, I'm
2 going to show you Table 3, okay?

3 A. Uh-huh.

4 Q. You've said you misspoke but let's go to table 3
16:20:06 5 non-Hodgkin's lymphoma T-cell down towards the bottom, I
6 believe, and let's look at that. And this is an even
7 smaller group right, sir? It's 12 in M1 and 6 in M2,
8 that's very small; right?

9 A. Right.

16:20:24 10 Q. That again is a non statistically significant
11 result; right?

12 A. Right.

13 Q. Over here it's nine, even smaller?

14 A. Uh-huh.

16:20:34 15 Q. For that one it's 2.97 and the confidence
16 interval is above 1; right?

17 A. Yes.

18 Q. Okay. Let's go up and see what that's referring
19 to, sir. You know that this is a 20-year lag study;
16:20:47 20 right?

21 A. Yes.

22 Q. So that's saying that the only time that they
23 saw any effect at all with those nine people was after
24 20 years had passed; right.

16:20:57 25 A. Uh-huh.

1 Q. Right?

2 A. Yes.

16:21:07

3 Q. That means it took 20 years for them to get the
4 disease, to have the symptoms and the disease show up;
5 right?

6 A. Yes.

7 Q. Thank you. And let me just to finish this off.

8 Doctor, let's just go to page 7 in our study.

16:21:20

9 This is what the authors actually conclude just the very
10 top. "In our study we observed no associations between
11 glyphosate use and NHL overall or any of its subtypes";
12 correct?

13 A. Yes.

14 Q. That includes T-cell; right?

16:21:33

15 A. Yes.

16 MR. LOMBARDI: Thank you, Doctor. No further
17 questions.

18 MR. WISNER: Redirect, your Honor?

19 THE COURT: Redirect on the recross?

16:21:41

20 MR. WISNER: Just that, yeah.

21 THE COURT: Very well.

22 RE-REDIRECT EXAMINATION

23 BY MR. WISNER:

16:21:49

24 Q. Doctor, we looked at Table 3 and there was
25 statistically significant result for the lag 20 year

1 analysis. That doesn't mean it took 20 years to develop
2 the T-cell. That means it took 20 years to see it in
3 this the study; right?

4 A. To tell the truth, I'm not sure what it means in
16:22:07 5 the context of this. But again, I'm not arguing we
6 should be taking this result and making anything out of
7 it. I've been arguing we shouldn't be using the AHS
8 study at all. I'm just saying, I guess as a throw away,
9 if you use the AHS study, here's the potential T-cell
16:22:31 10 mind. But I think the AHS study is not -- it has so many
11 potential flaws in it, that it shouldn't be utilized for
12 consideration in the epidemiologic thing, and that goes
13 for B-cells or T-cells.

14 Q. Fair enough. Doctor, would it be fair to say,
16:22:54 15 though, that every one of those T-cell lymphoma in the
16 Andreotti paper, every single one of them is elevated
17 above one; right?

18 A. That's true.

19 MR. WISNER: No further questions.

16:23:06 20 THE COURT: All right. Anything further?

21 All right. Thank you, Dr. Neugut. You may be
22 excused.

23 THE WITNESS: Thank you, your Honor.

24 THE COURT: All right. Ladies and Gentlemen --
16:23:20 25 You can leave your exhibits there. Thank you.

1 (Dr. Neugut leaves courtroom.)

2 THE COURT: All right. Ladies and Gentlemen,
3 we're going to adjourn now for today. We will not in
4 session tomorrow. We will not be meeting tomorrow.

16:23:46

5 Please do not do any research about the case or discuss
6 the case or any interesting issues. We will resume again
7 on Friday at 9:30.

8 And, Counsel, can you please remain? I'll be
9 right back.

16:24:01

10 (Jury leaves courtroom.)

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

16:35:16

15 [REDACTED]

16 [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED]

16:35:29

20 [REDACTED]

21 [REDACTED]

22 [REDACTED]

23 [REDACTED]

24 [REDACTED]

16:35:49

25 [REDACTED]

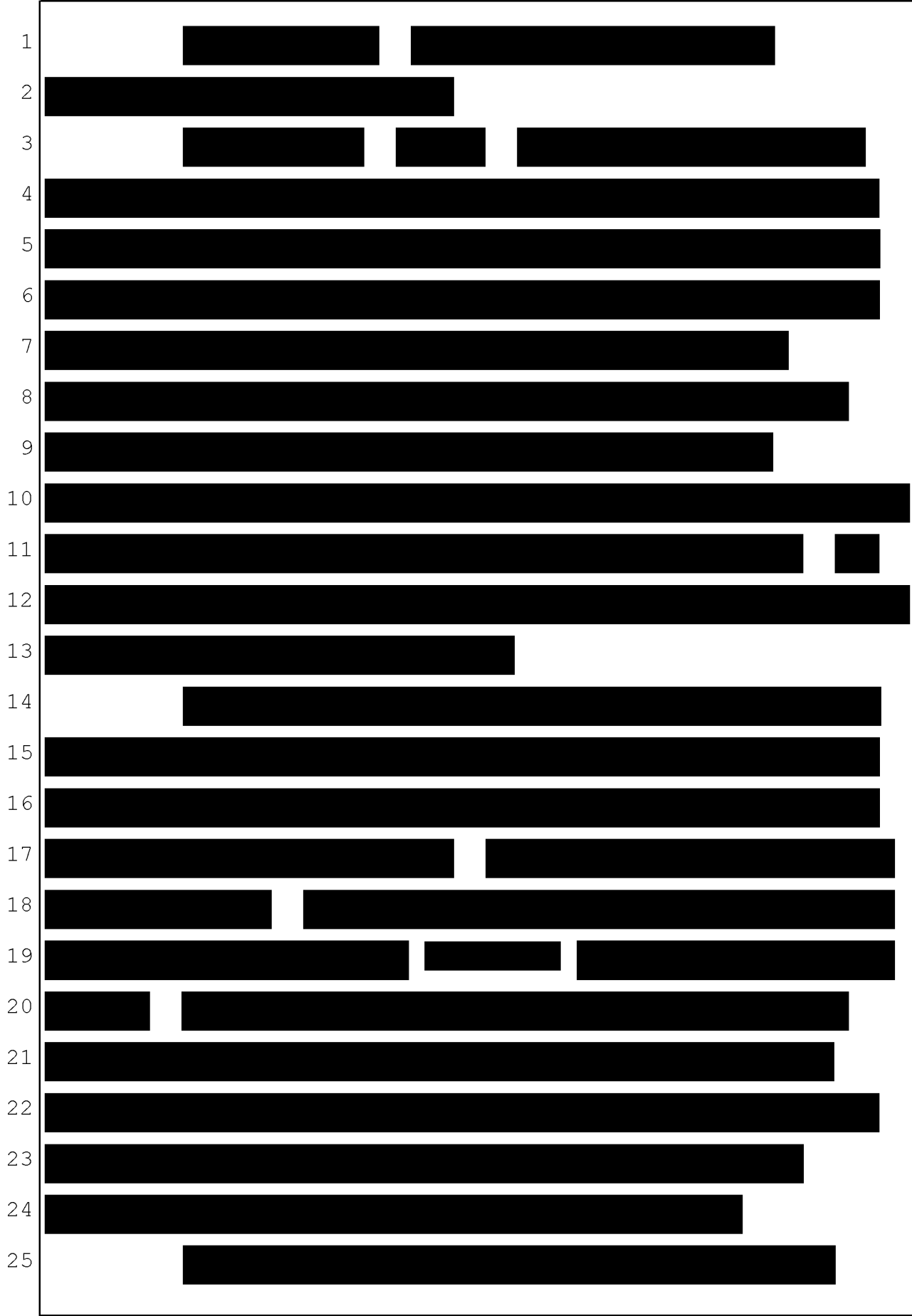
16:35:59

16:36:16

16:36:32

16:36:50

16:37:06



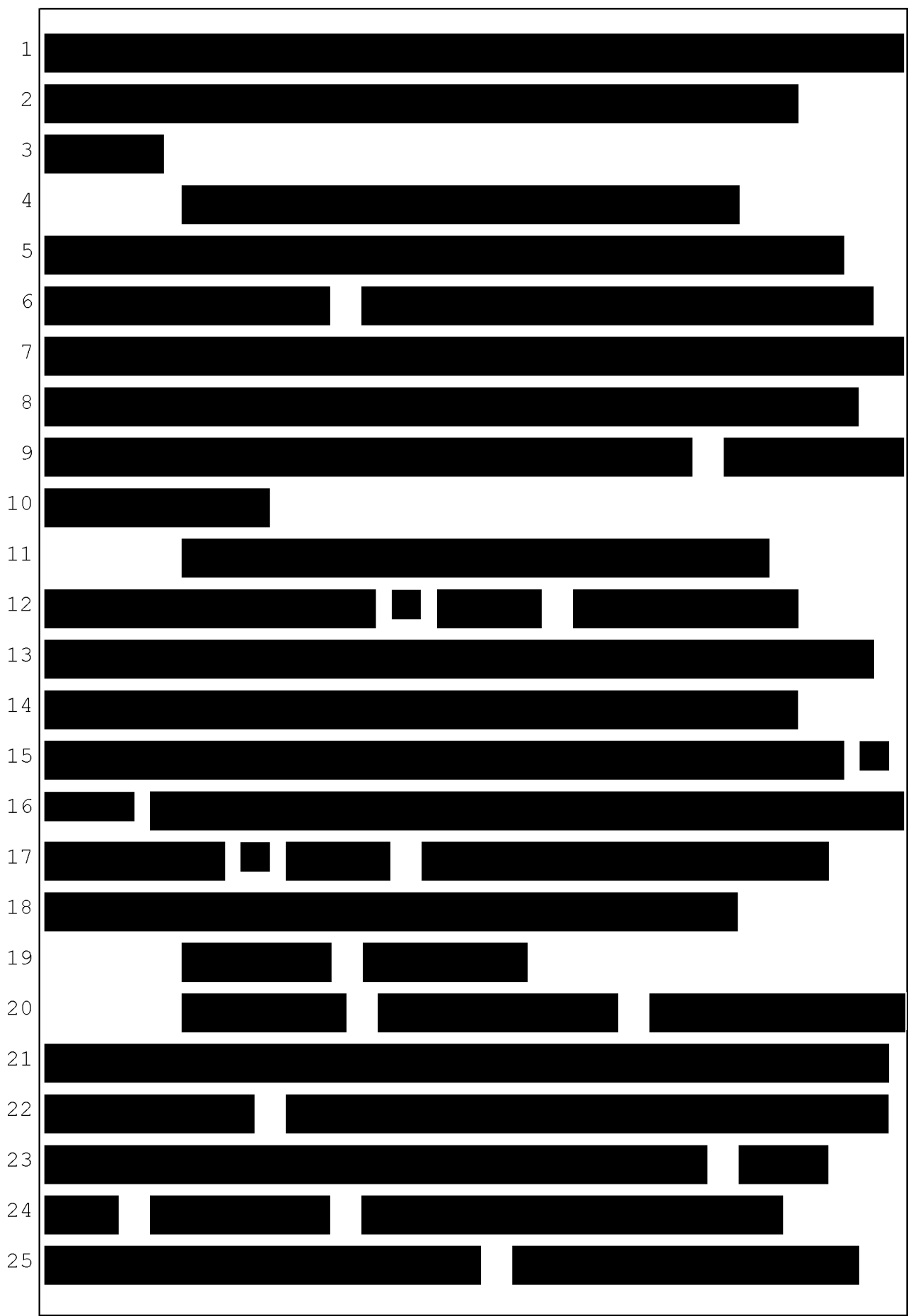
16:37:18

16:37:40

16:37:53

16:38:08

16:38:29



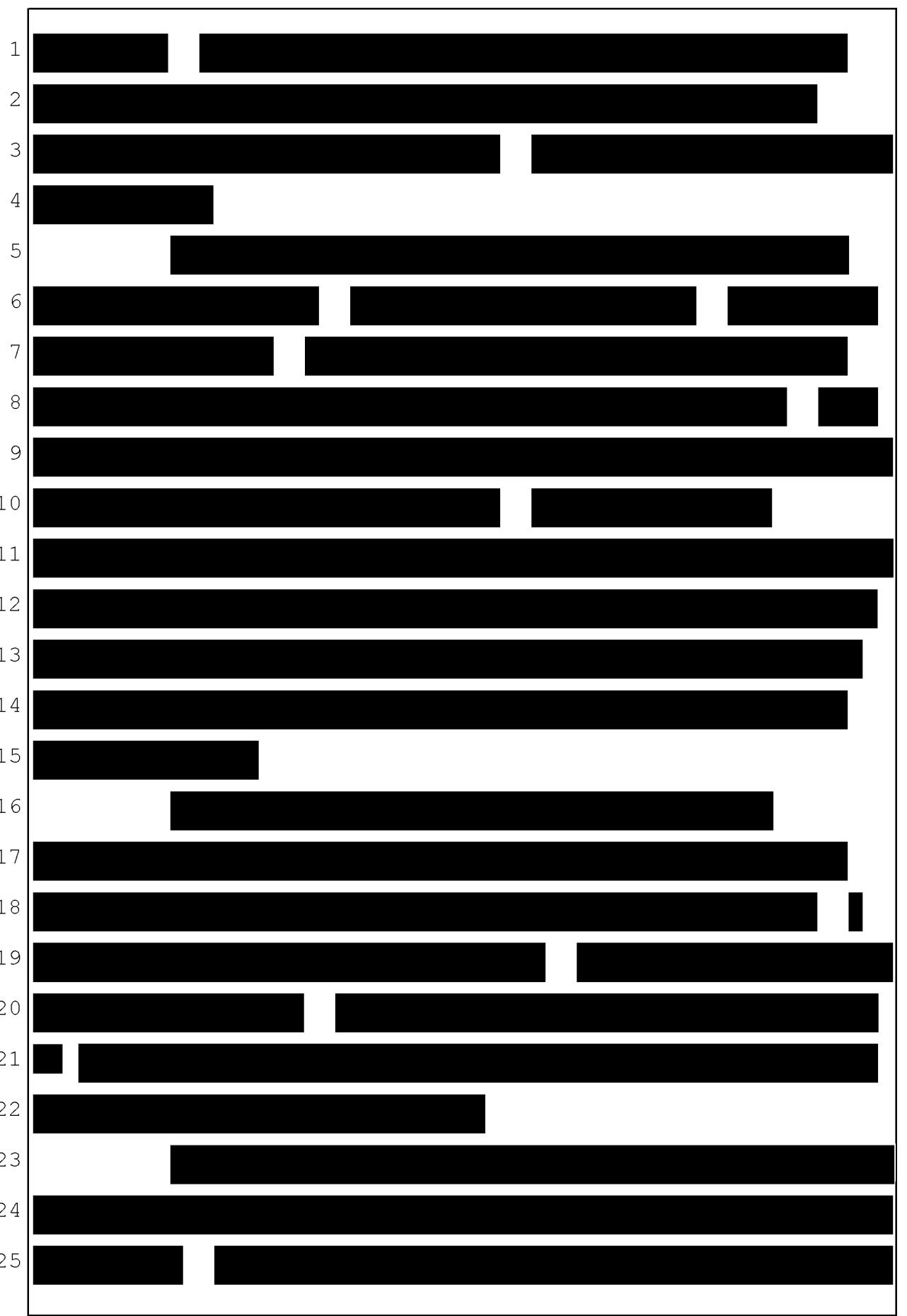
16:38:46

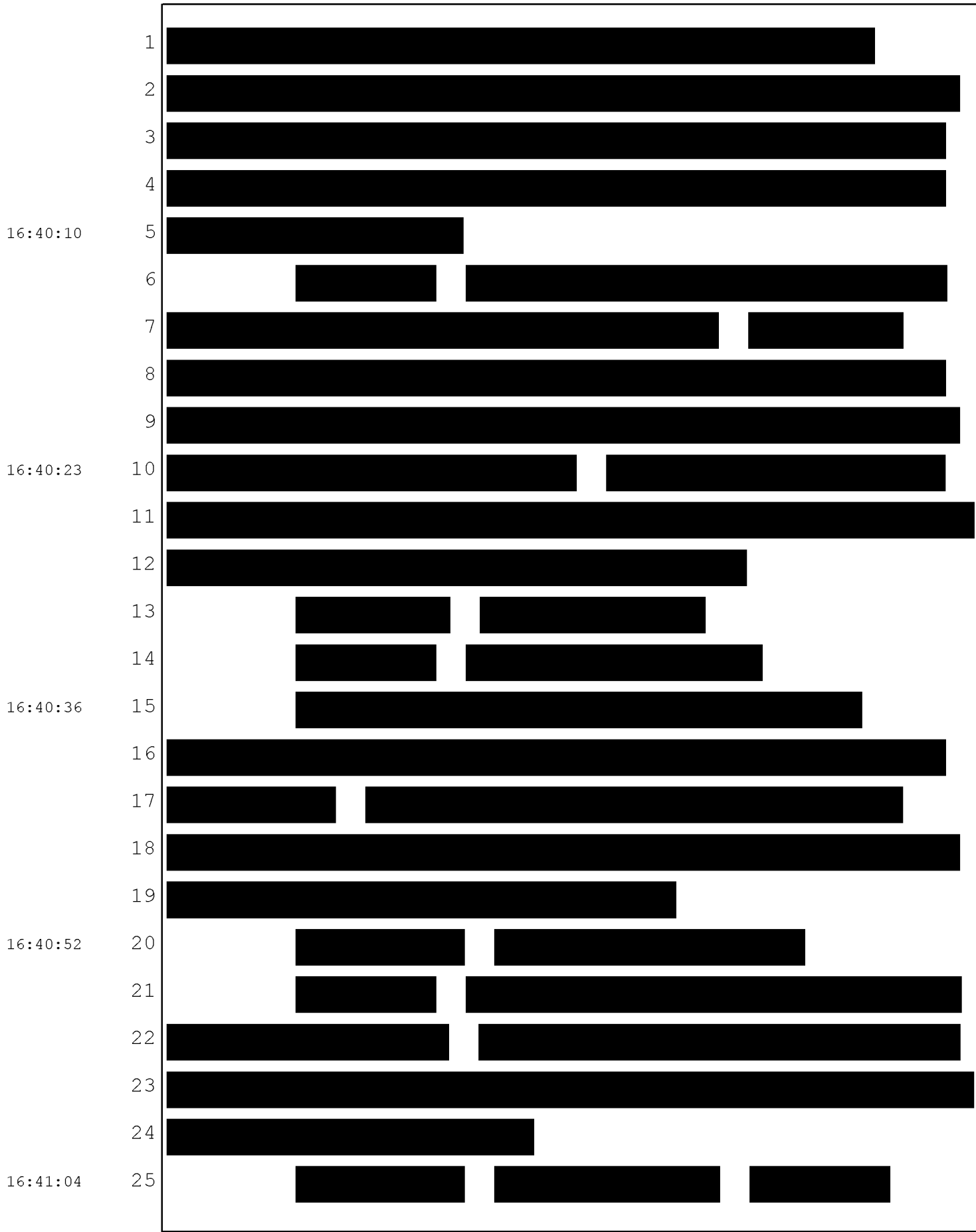
16:39:03

16:39:20

16:39:33

16:39:51





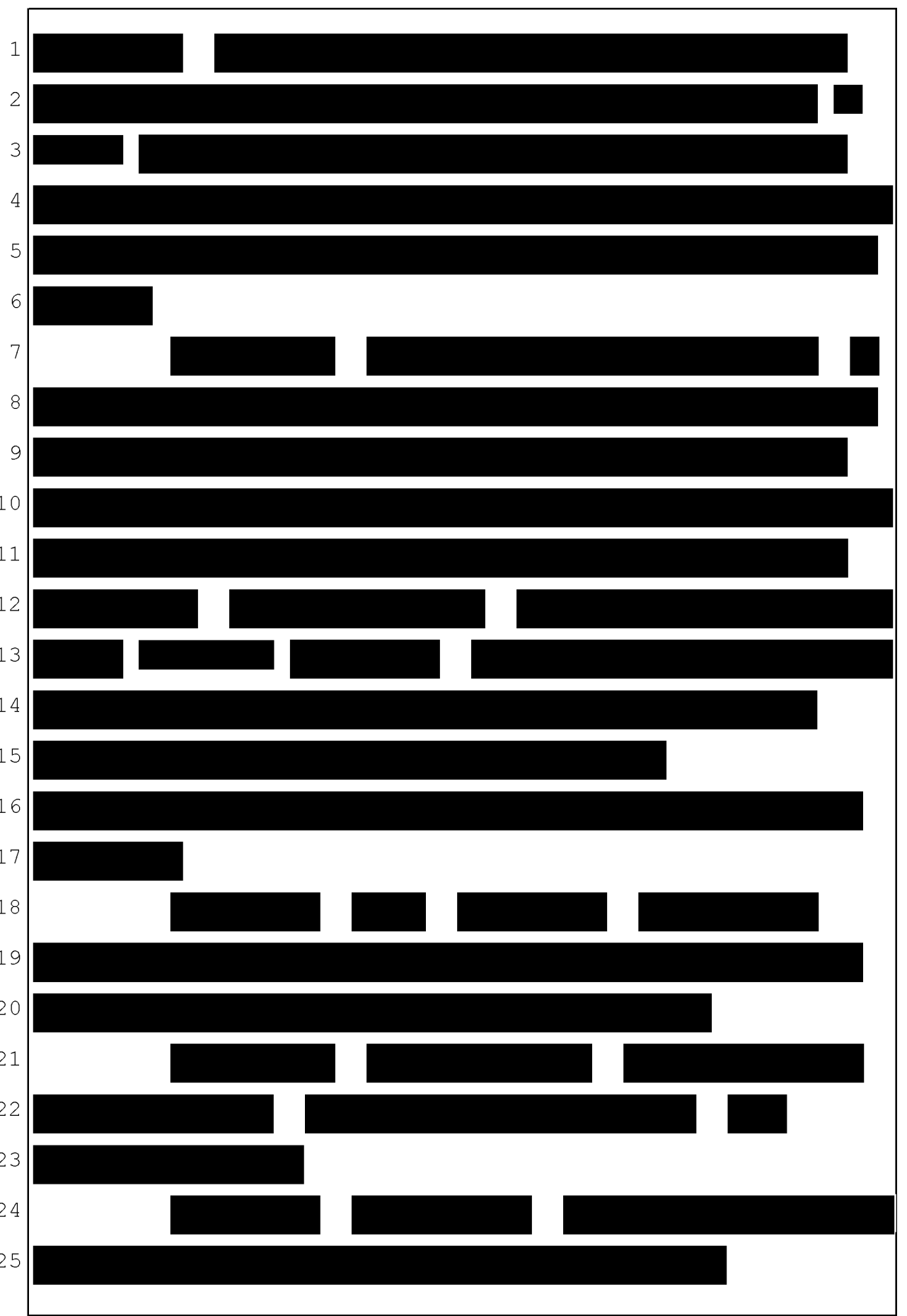
16:41:19

16:41:30

16:41:45

16:41:59

16:42:12



1	[REDACTED]
2	[REDACTED]
3	[REDACTED] [REDACTED]
4	[REDACTED] [REDACTED]
5	(Time Noted: 4:42 p.m.)
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1 REPORTER'S CERTIFICATE

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I certify that the proceedings in the within-titled cause were taken at the time and place herein named; that the proceedings were reported by me, a duly Certified Shorthand Reporter of the State of California authorized to administer oaths and affirmations, and said proceedings were thereafter transcribed into typewriting.

I further certify that I am not of counsel or Attorney for either or any of the parties to said Proceedings, not in any way interested in the outcome of the cause named in said proceedings.

IN WITNESS WHEREOF, I have hereunto set my hand:
July 18th, 2018.

<%signature%>
Leslie Rockwood Rosas
Certified Shorthand Reporter
State of California
Certificate No. 3462