SUPERIOR COURT OF CALIFORNIA

COUNTY OF ALAMEDA

BEFORE THE HONORABLE WINIFRED Y. SMITH, JUDGE PRESIDING

DEPARTMENT NUMBER 21

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COORDINATION PROCEEDING SPECIAL TITLE (RULE 3.550) ROUNDUP PRODUCTS CASE	**JCCP No. 4953**
THIS TRANSCRIPT RELATES TO: Pilliod, et al. vs. Monsanto Company, et al.	**Case No. RG17862702** **Pages 1834 - 2073** **Volume 13**

Reporter's Transcript of Proceedings

Wednesday, April 3, 2019

Reported by: Lori Stokes, CSR No. 12732, RPR
Court Reporter

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I N D E X

Wednesday, April 3, 2019

Wednesday, April 3, 2019 9:01 a.m.

(Proceedings commenced in chambers out of the presence of the jury.)

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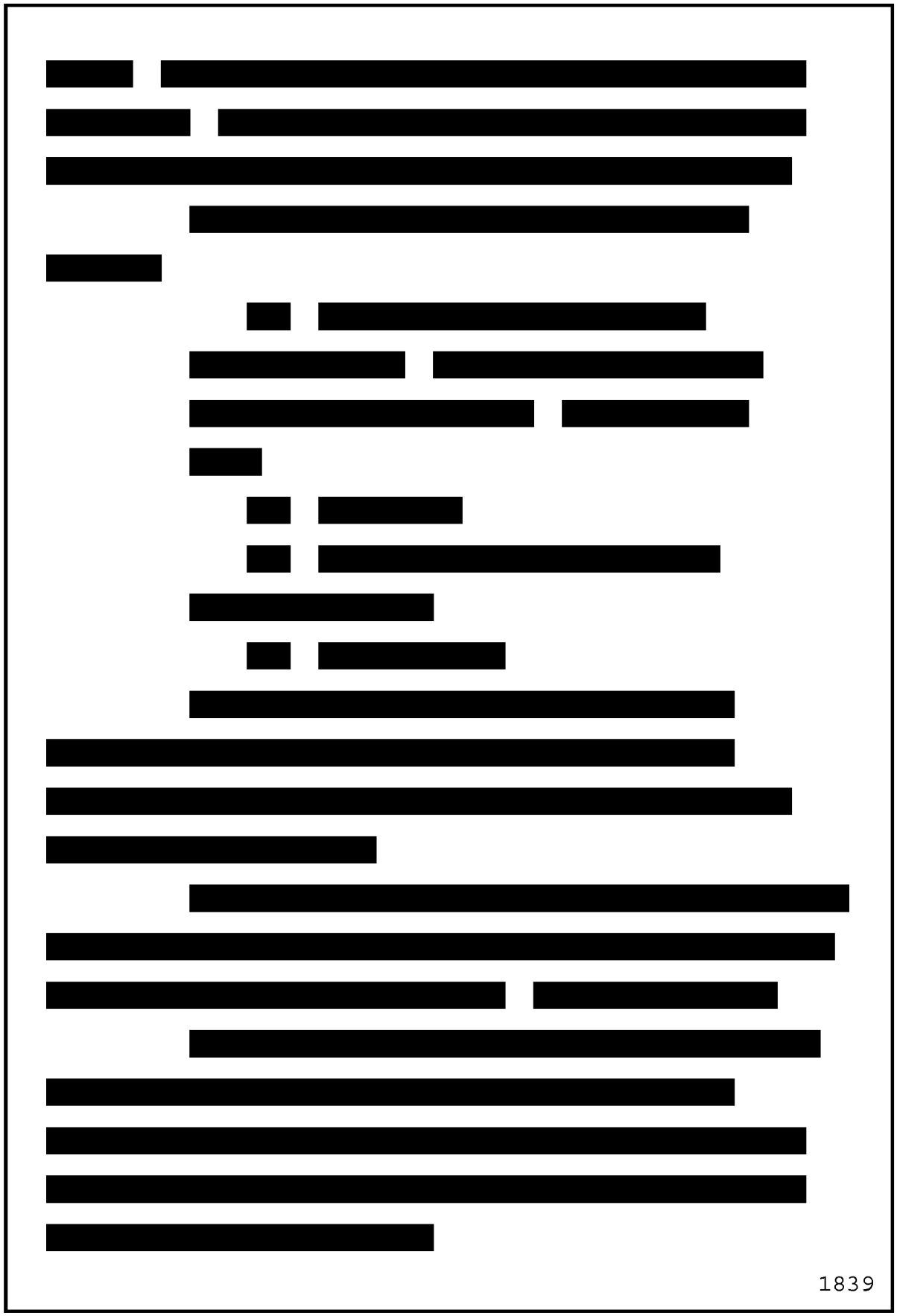
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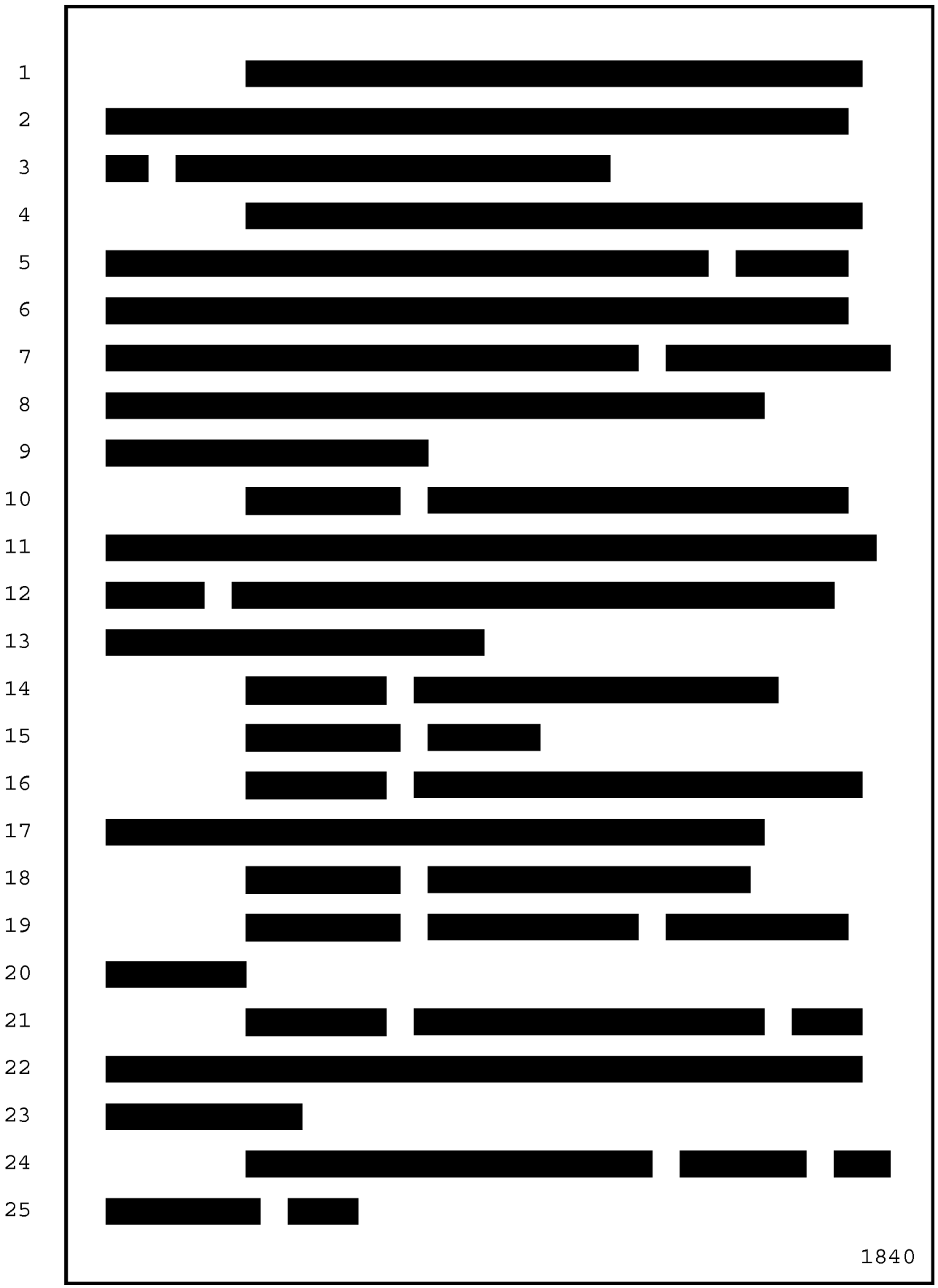
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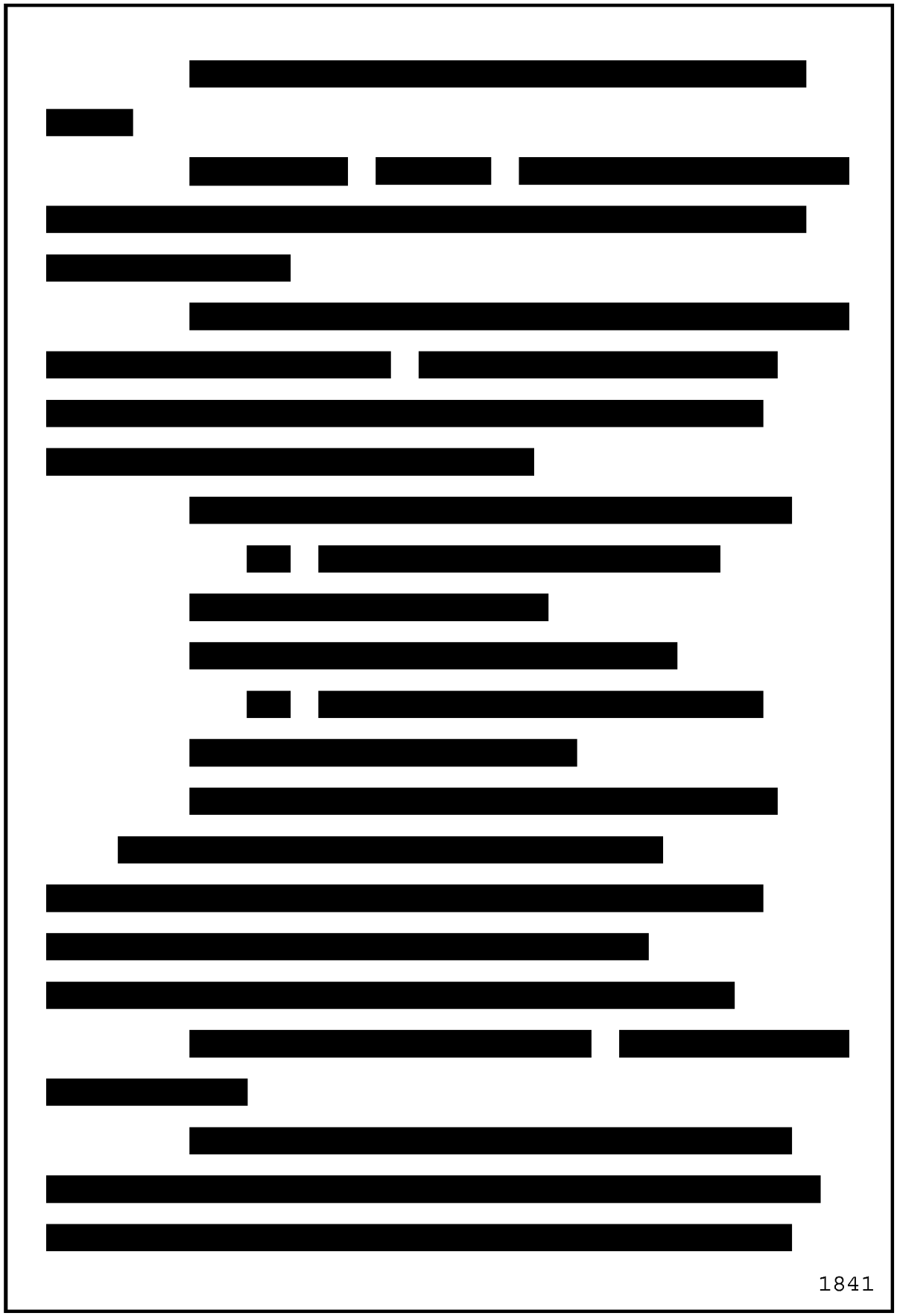
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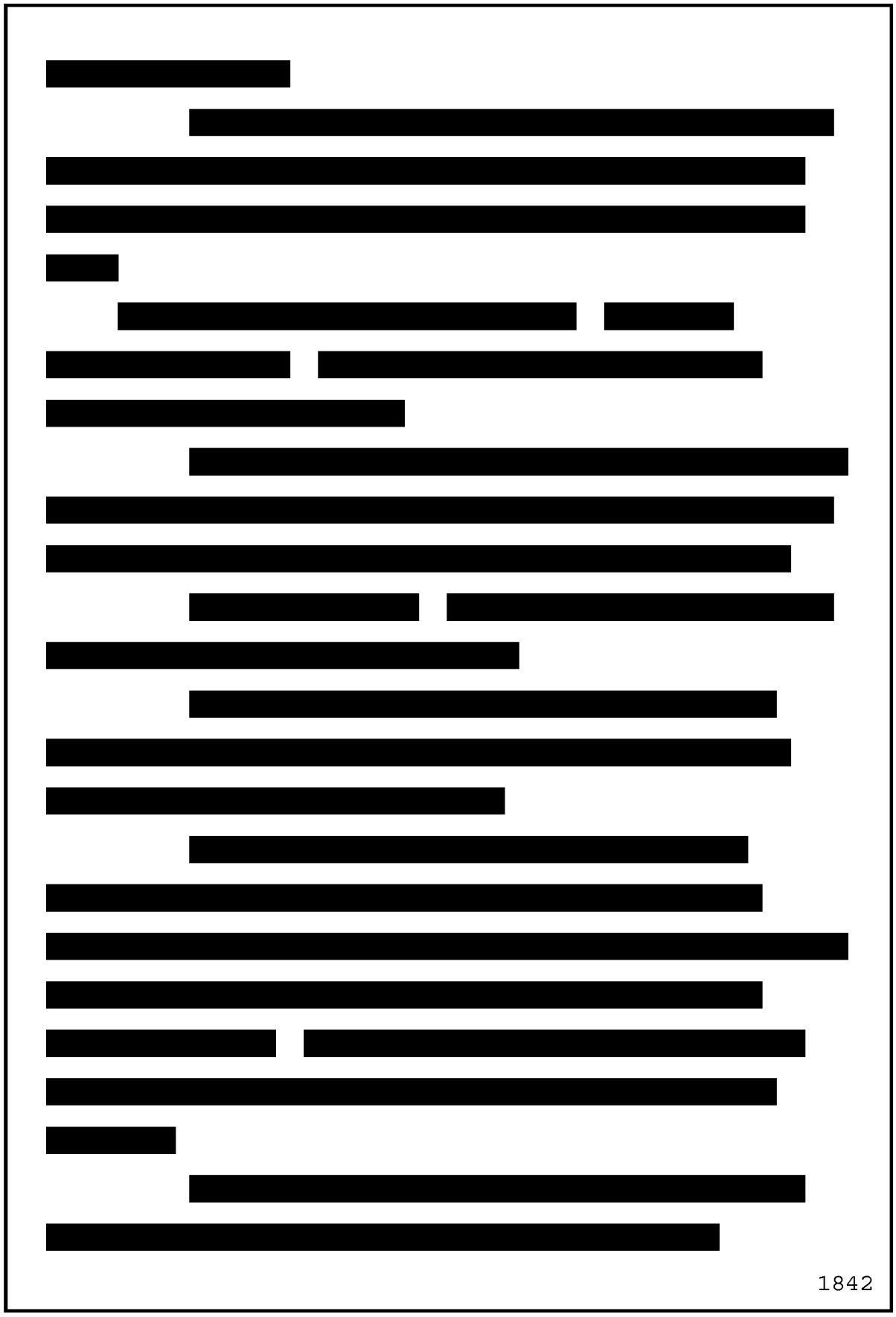
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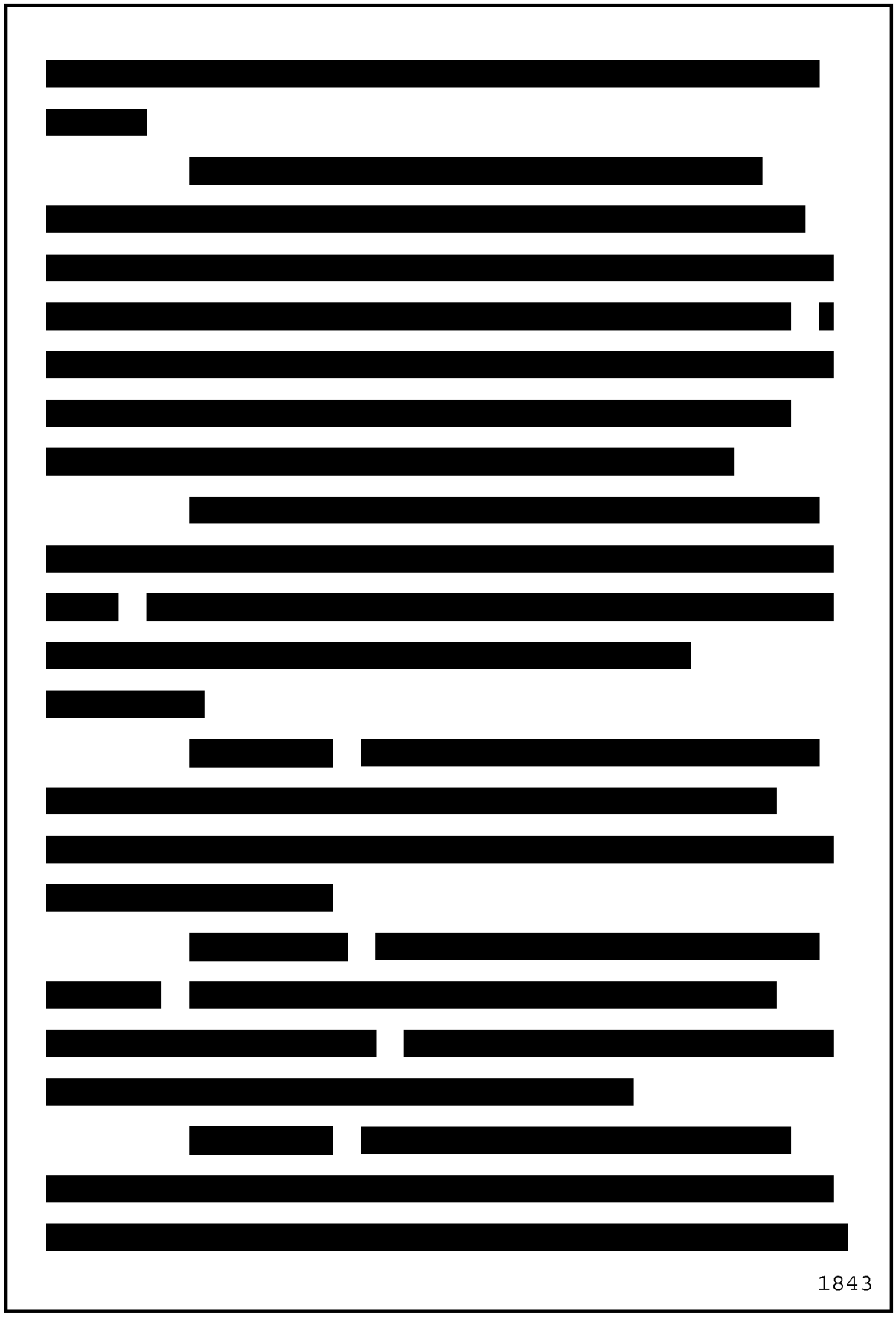
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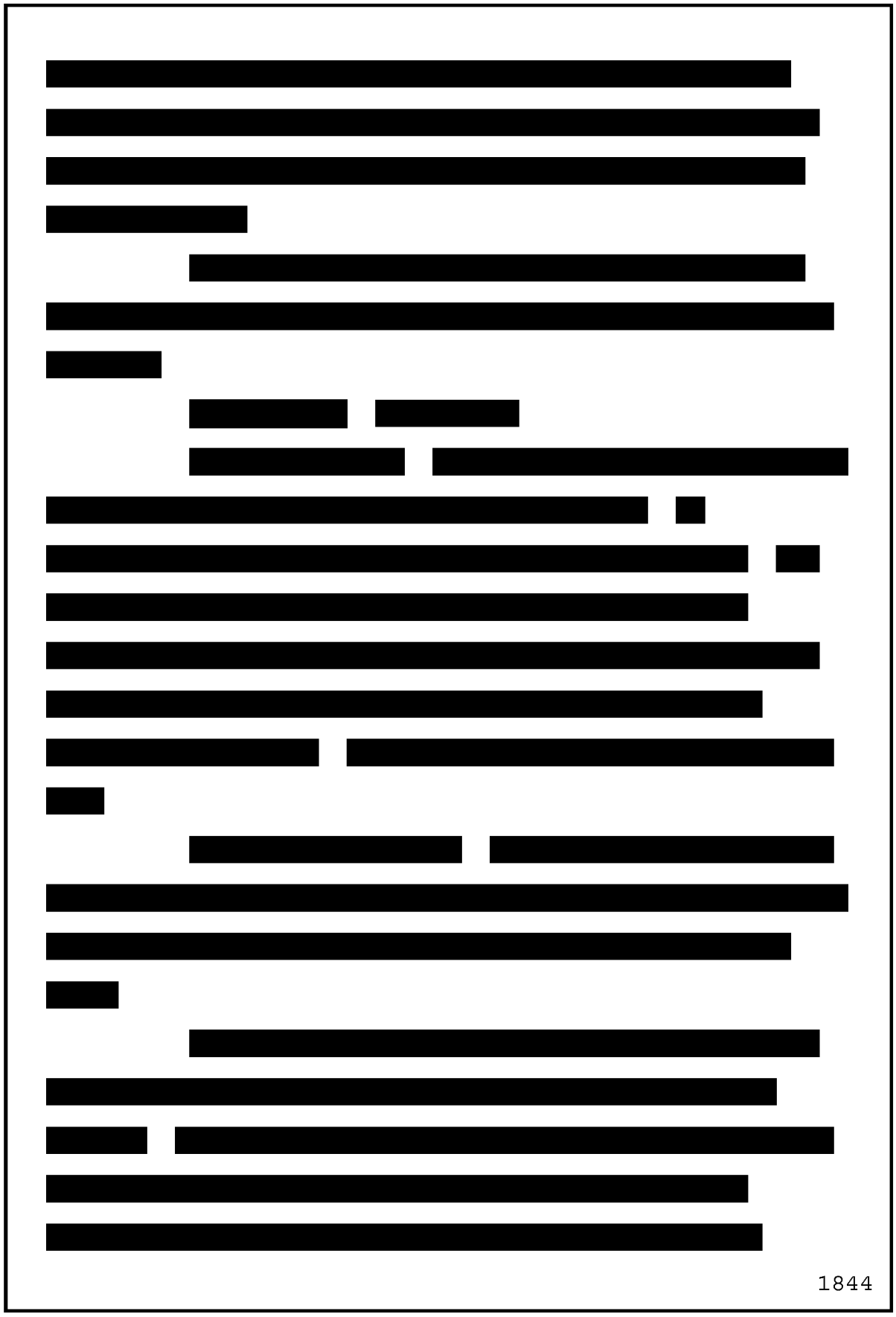
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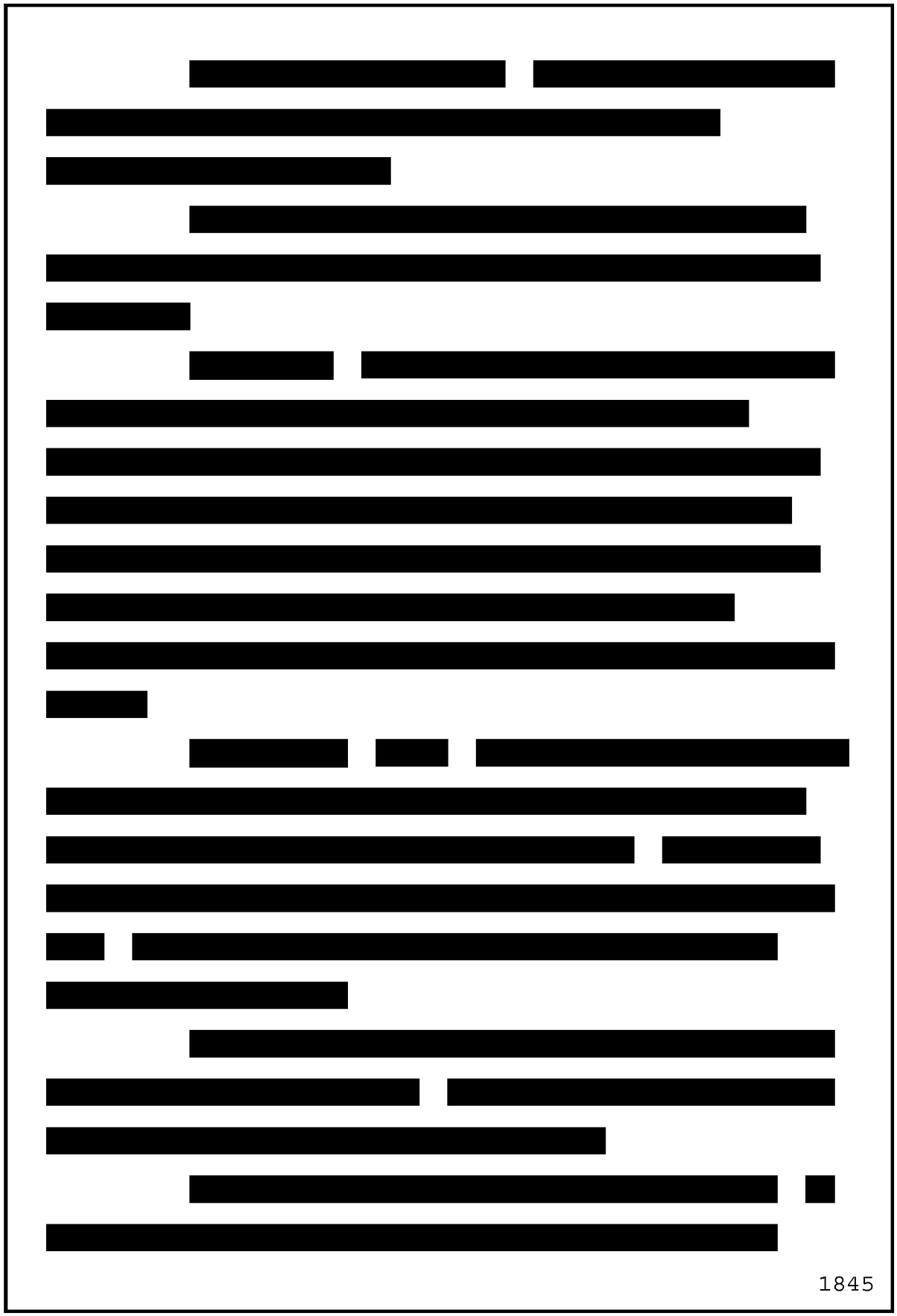
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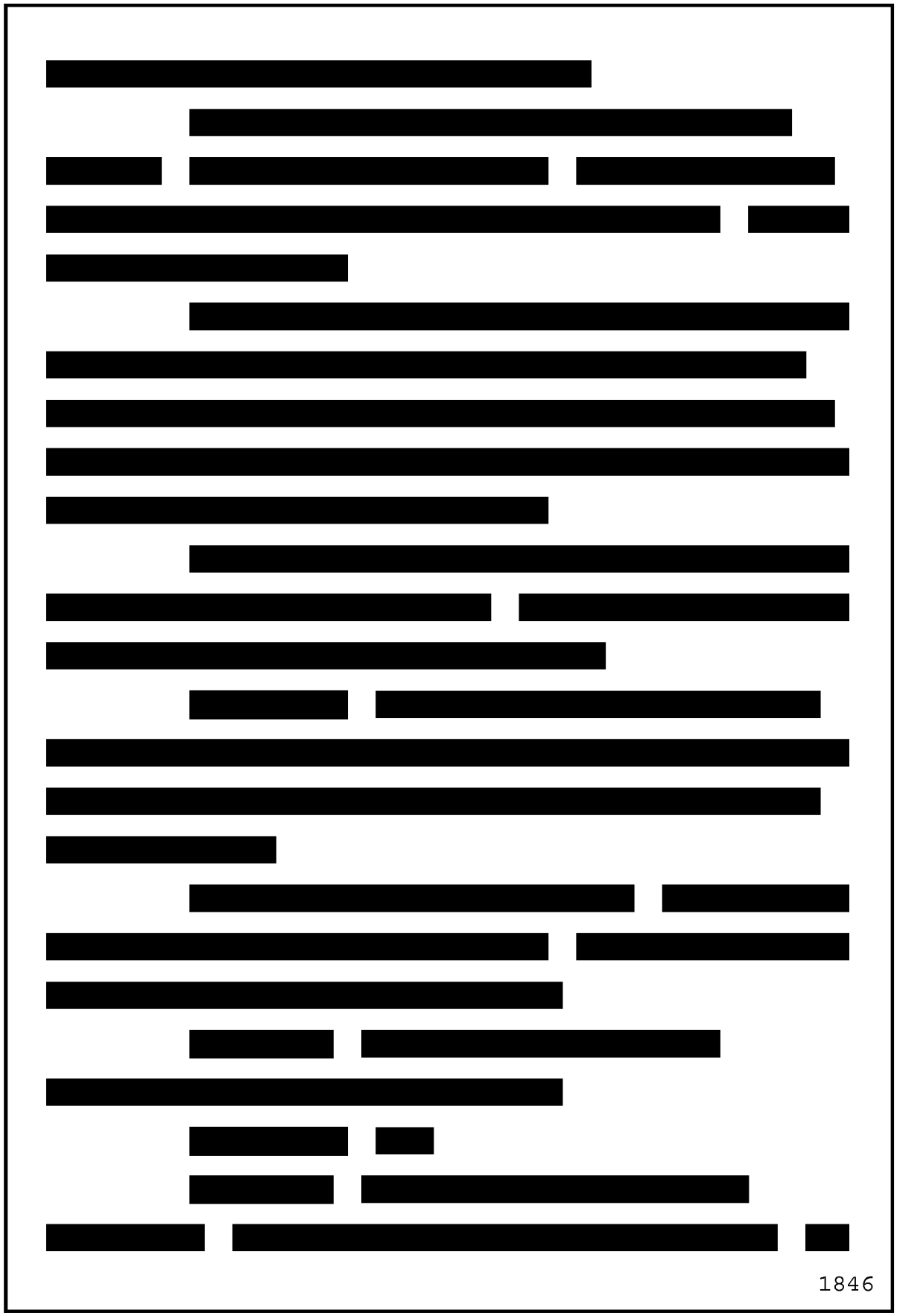
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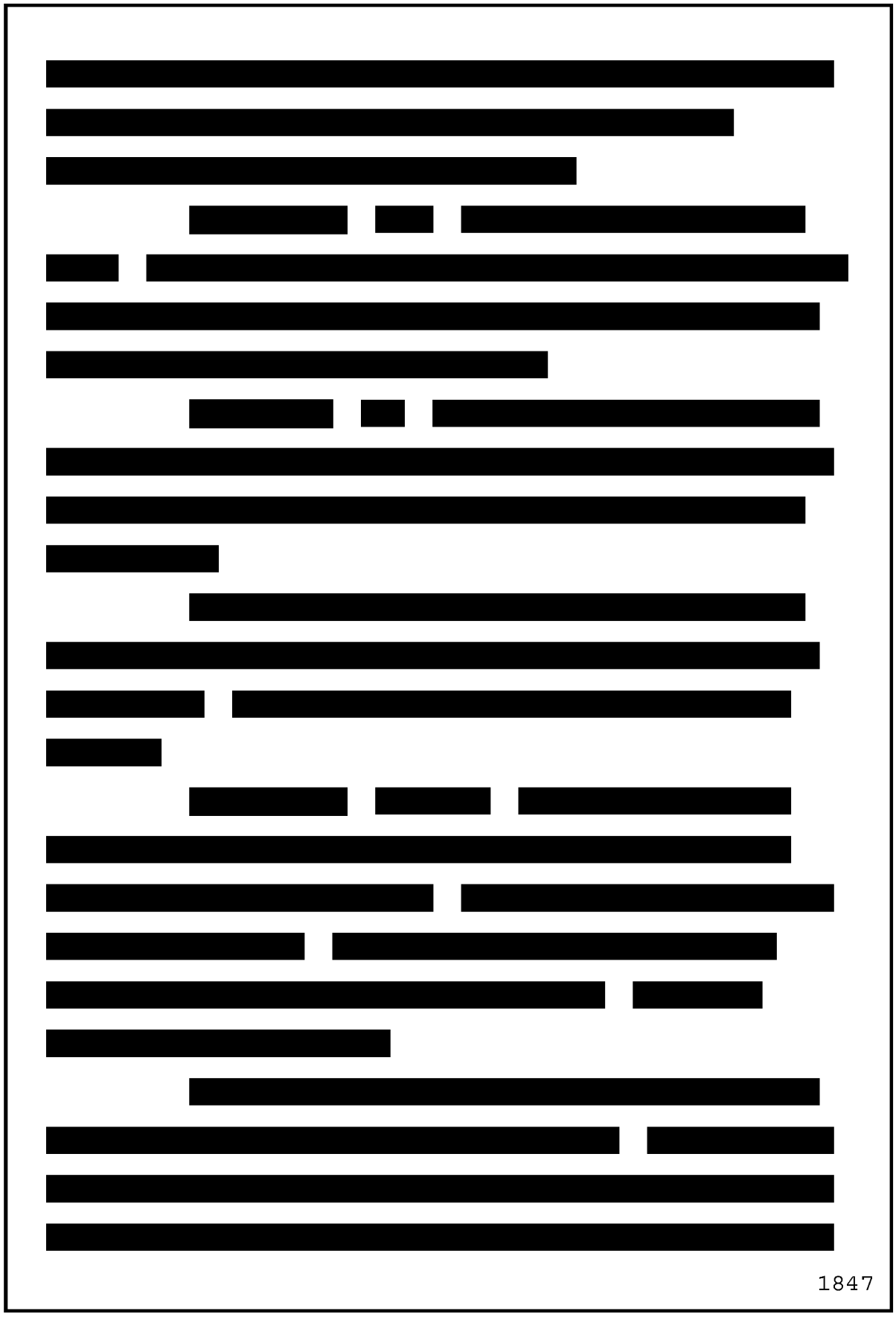
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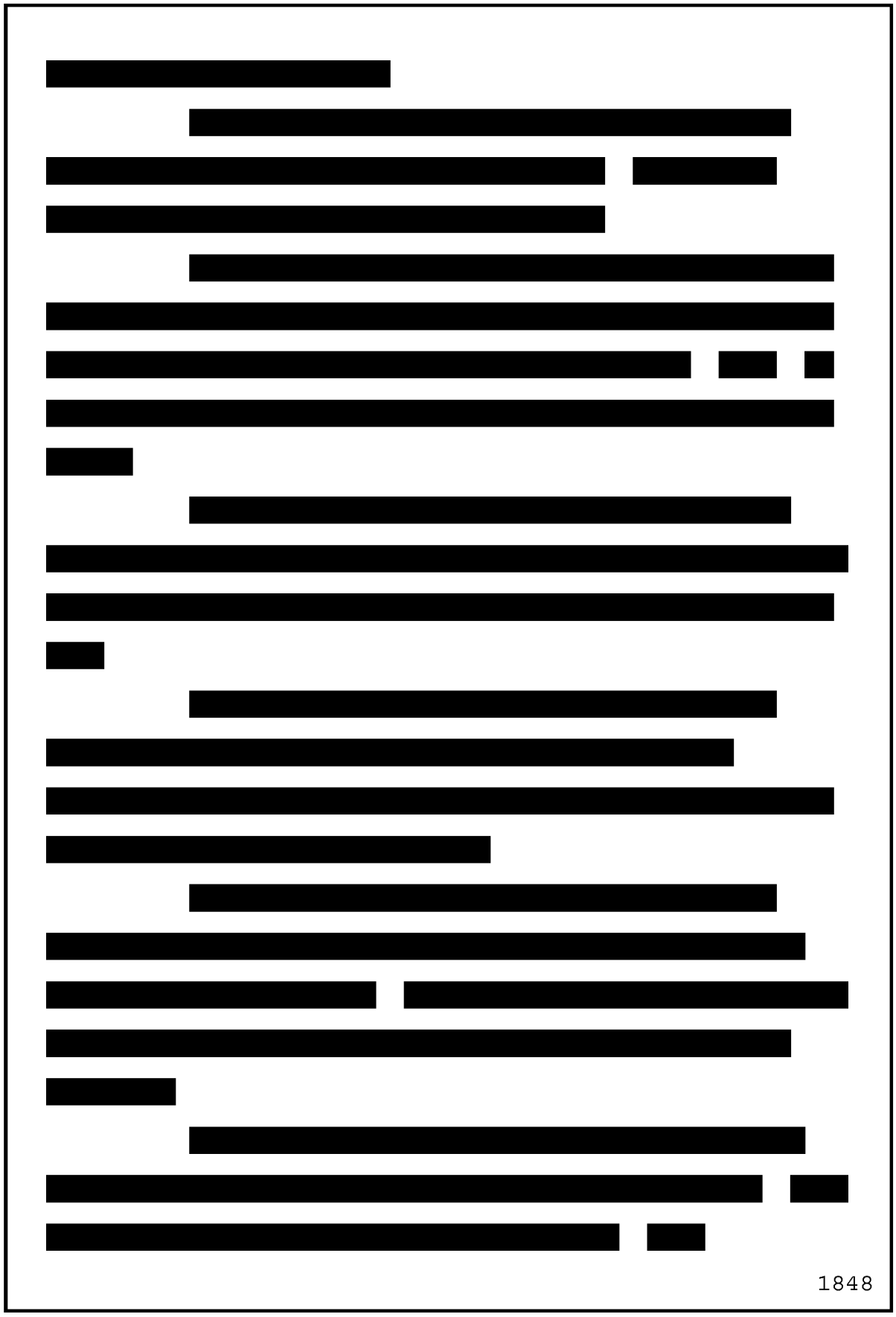
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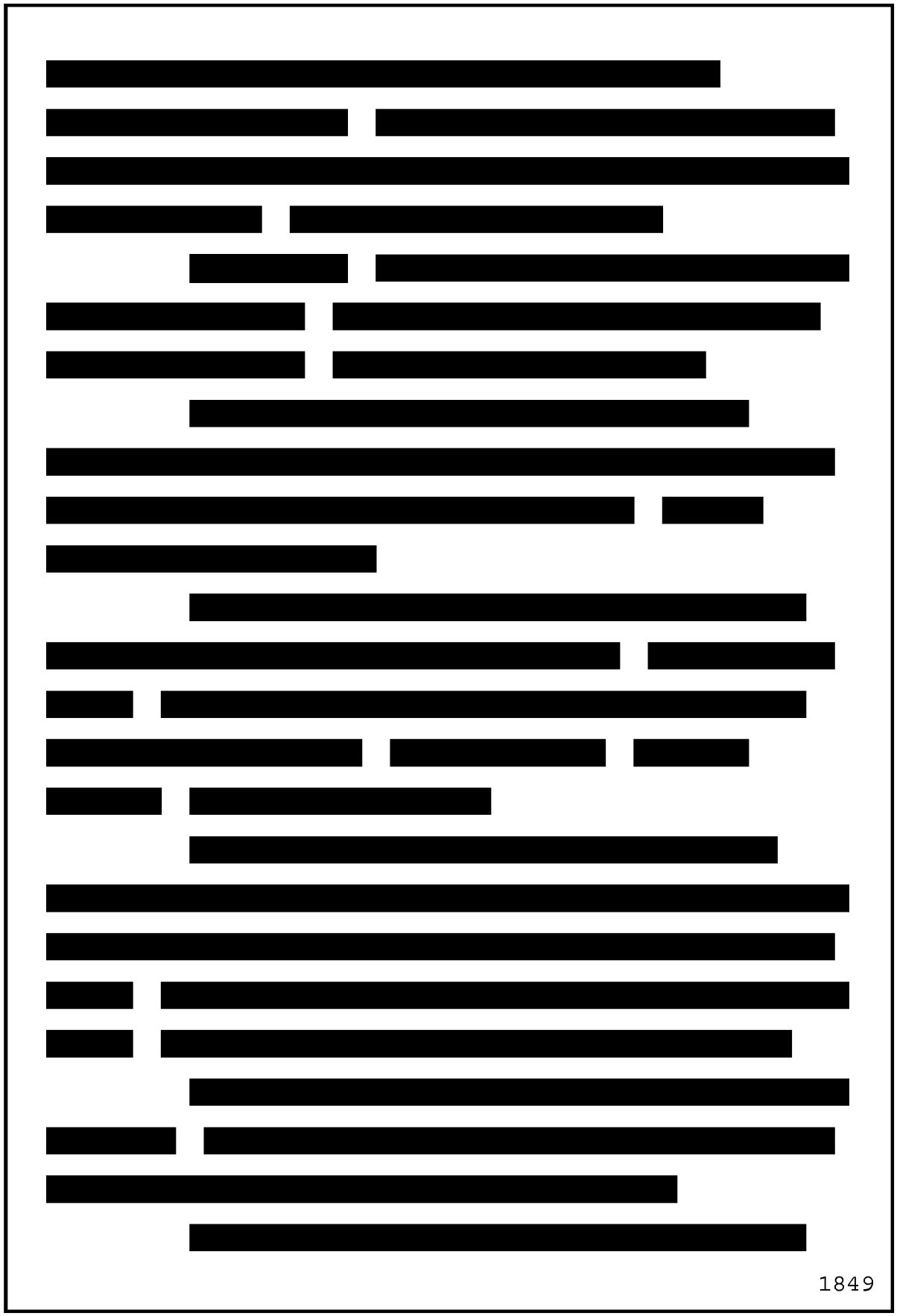
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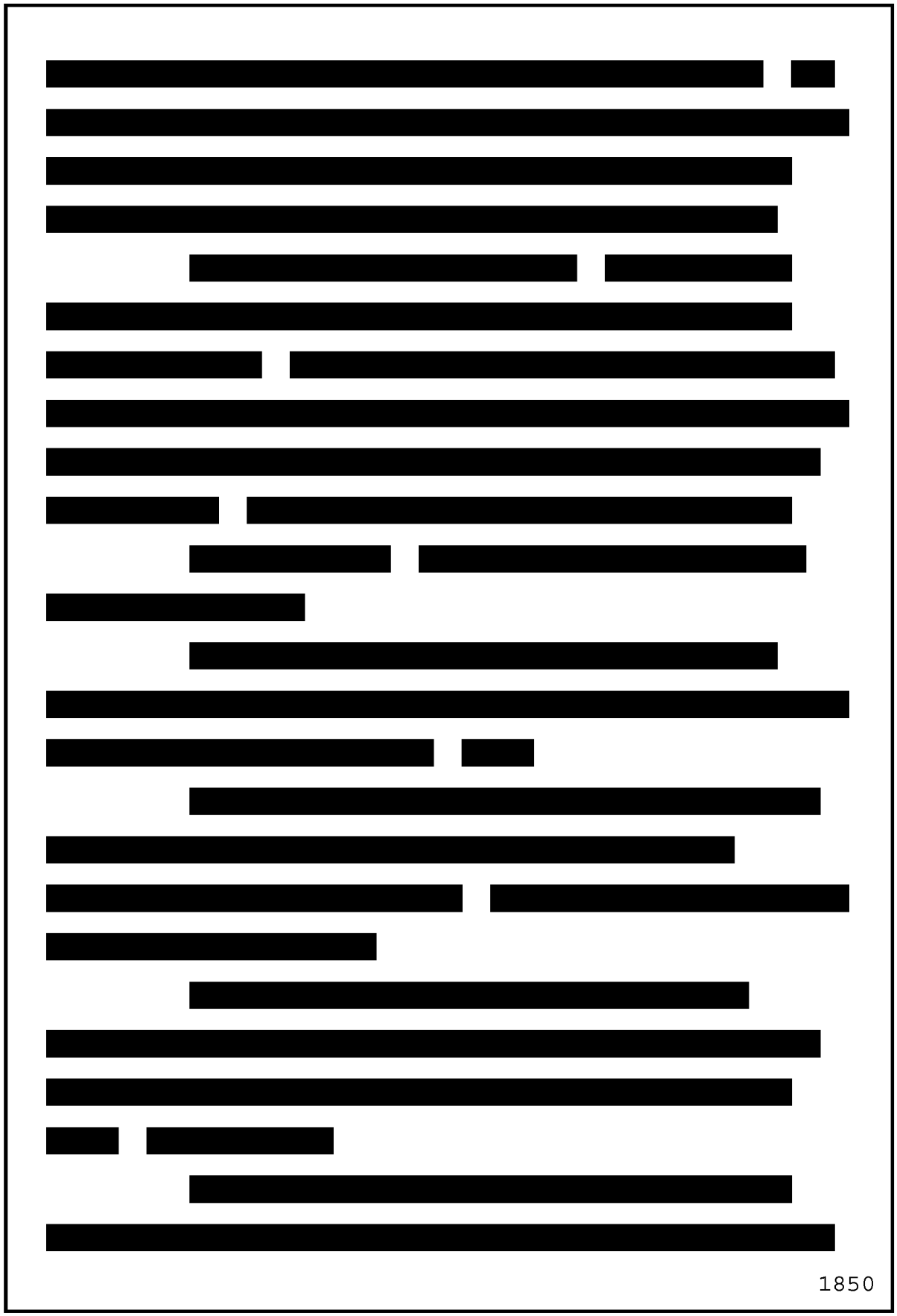
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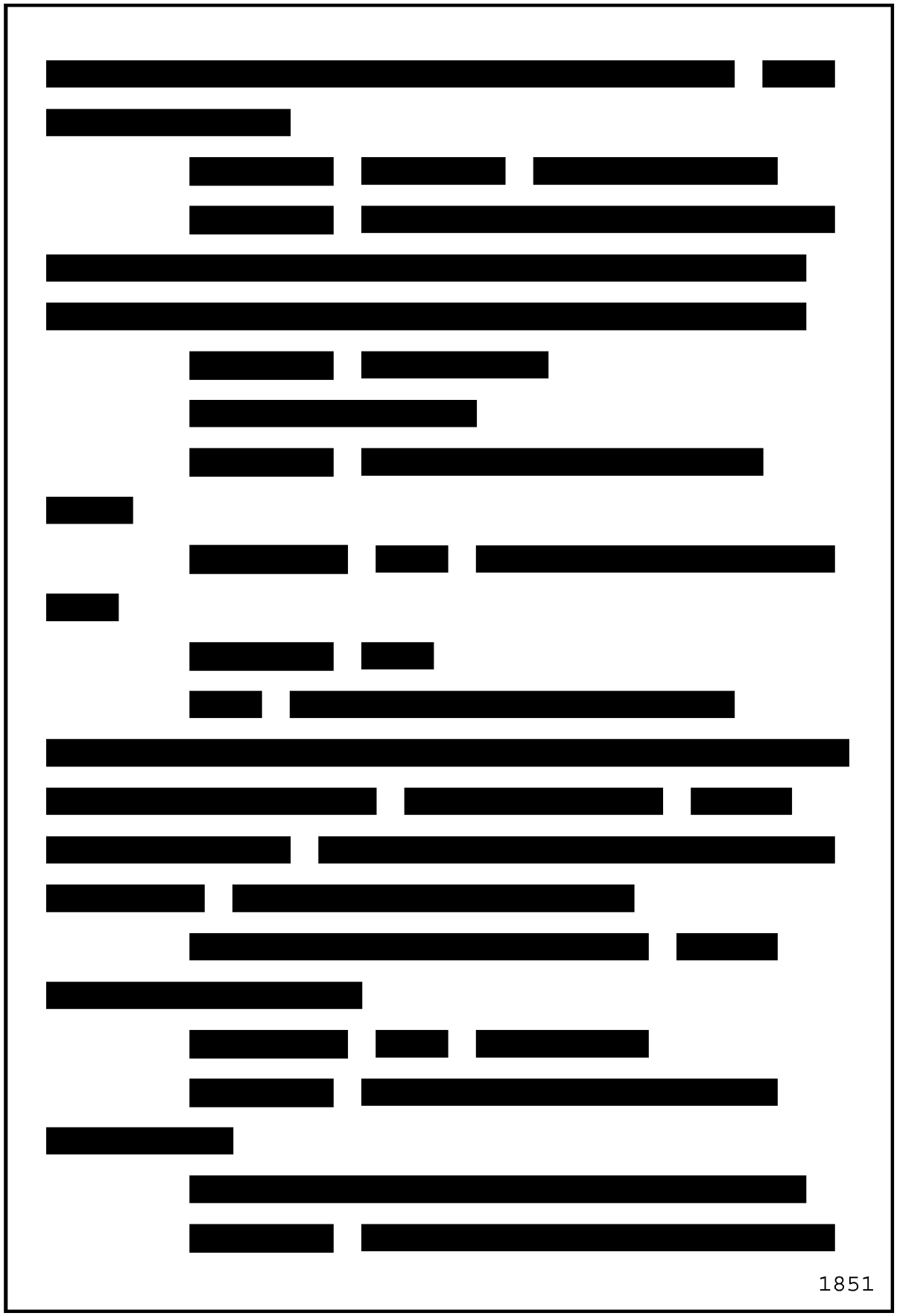
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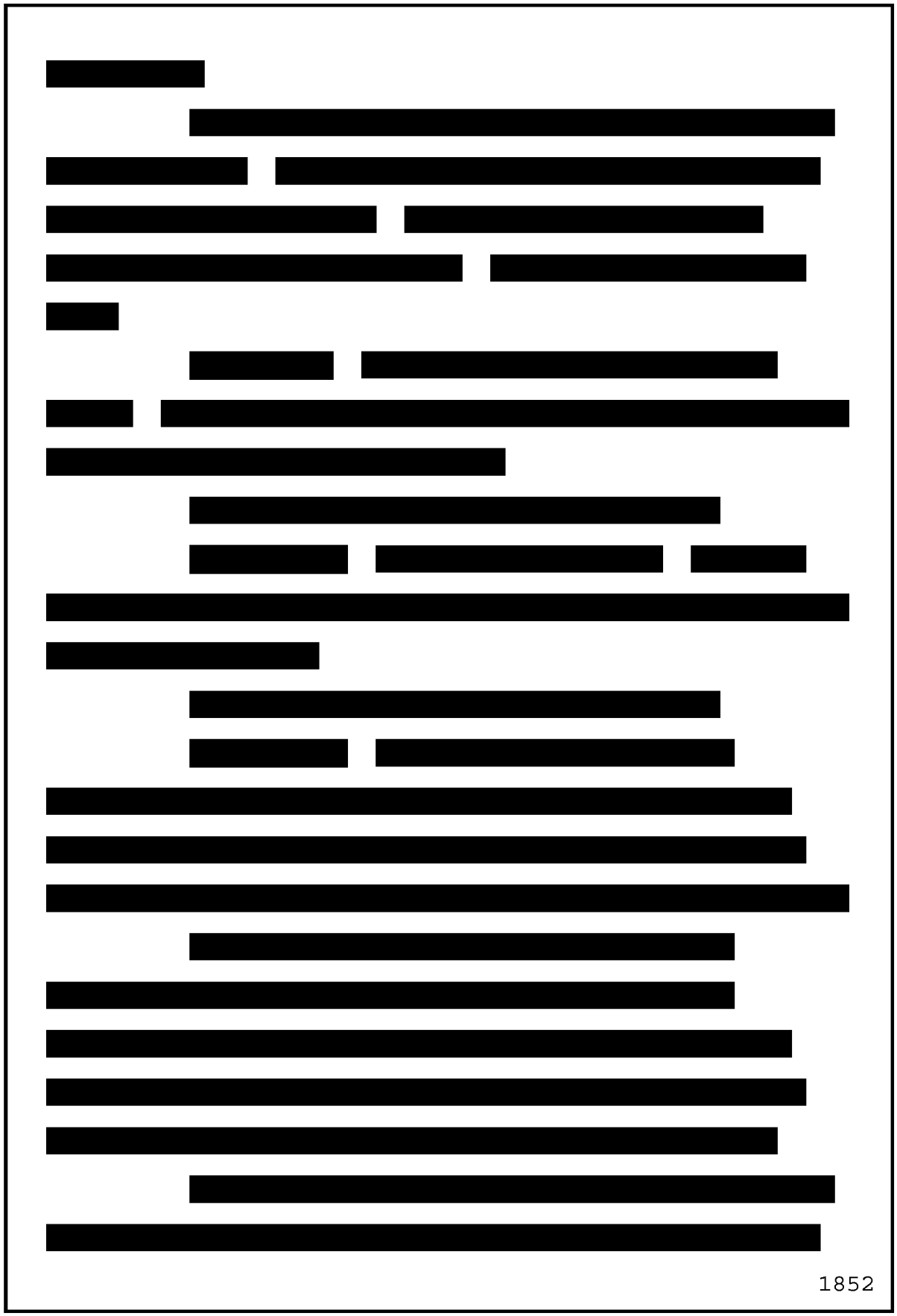
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(Recess taken at 9:09 a.m.)

(Proceedings resumed at 9:25 a.m.)

(The following proceedings were heard in the presence of the jury:)

THE COURT: Good morning, everyone. Welcome back. We're going to continue with the direct by

Mr. Wisner of Dr. Portier.

And you're under oath, Dr. Portier.

CHRISTOPHER PORTIER,

called as a witness for the Plaintiffs, having been previously duly sworn, testified further as follows:

THE COURT: And then we'll have cross-examination by Mr. Ismail. We'll have a short break after direct examination to allow a changing of the guard and then continue with cross.

Okay, go ahead.

DIRECT EXAMINATION (resumed)

BY MR. WISNER:

Q. Good morning, Doctor. How are you?

A. I'm good, thank you.

Q. Yesterday we went over the mouse charts, and we talked about all the tumors that EPA didn't address in their report.

I just want to do the same thing quickly for the rat tumors, okay?

A. Okay.

Q. All right. So in the Lankas study from 1981, which tumors did the EPA not address?

A. The thyroid tumors and the pancreatic tumors.

Q. For Sout & Ruecker?

A. The skin tumors, the thyroid tumors, and the

adrenal carcinomas.

Q. So they only addressed the pancreatic isolate cell tumors and the hepatocellular carcinomas?

A. Correct, those two.

Q. The Atkinson study from 1993?

A. None of them.

Q. They didn't get any of these tumors?

A. That's correct.

Q. The Enemoto study?

A. None of those. I don't know about the skin, basal cell tumors; I would have to go back and look. But the first two, they did not do.

Q. Well, let's look, because I want to be complete here.

Exhibit 336. This is the EPA report. And I believe we were on page 70. Atkinson, there we go.

A. We were looking at Enemoto.

Q. Oh, thank you. Here we go.

Is that right here, where it says:

"There were no treatment-related increases observed in the study"?

A. Correct.

Q. All right. Suresh, did they find any that you didn't?

A. No.

Q. All right. Brammer?

A. They did get the liver tumors. That's the only tumor there. Yes, they looked at that.

Q. Oh, the hepatocellular, that's a liver tumor?

A. That's a liver tumor.

Q. I'm going to call it that from now on. That's a lot easier to say.

How about Wood?

A. They missed the skin tumors and the pituitary tumors.

Q. So they just got the mammary ones?

A. That is correct.

Q. All right. Thank you, sir.

I briefly want to just go over one issue regarding the Kumar study, okay?

We discussed yesterday how the EPA dismissed the tumor findings in there because of an alleged viral infection.

Do you recall that?

A. Yes.

Q. And we also discussed how there had been a teleconference in that European document about an EPA official named Jess Rowland who had said about this viral infection.

Do you recall that?

A. Yes, I do.

Q. I want to call your attention, in your binder, to Exhibit 705.

A. Okay.

Q. Have you seen this document before?

A. Is this the report EPA put up on the web and then took it down? Yes, I've seen this report.

Q. Okay. This is often referred to as the report.

Do you recall that?

A. Yes.

Q. And this is something you reviewed?

A. Yes, I have.

MR. WISNER: Your Honor, permission to publish.

MR. ISMAIL: No objection, Your Honor.

THE COURT: Go ahead.

BY MR. WISNER:

Q. This is the initial report put out by the EPA. Do you see it's dated October 1st, 2015?

A. Yes, I do.

Q. This is how long after the publication of the IARC Monograph did this report come out?

A. I guess about six months.

Q. Okay. And we see right here, the first author

on this is a person by the name of Jess Rowland.

Do you see that?

A. Yes, I do.

Q. This is that person on the teleconference, telling the Europeans about that viral infection?

A. That is correct.

Q. All right. Go to page 45 in this. Actually, page 39.

We have this discussion down here at the bottom:

"A carcinogenicity study in Swiss mice (Feinchemie Schwebda, 2001) was not included due to the presence of viral infection within the colony, which confounded the interpretation of the study findings."

Do you see that?

A. Yes, I do.

Q. Is that what ultimately made it into the 2017 report?

A. It looks identical. I can't be certain.

Q. So it appears, then, that this viral infection that ultimately appears in the EPA's report in 2017 comes from this report that was, in part, authored by Jess Rowland?

A. It's certainly in there.

Q. All right. Now, Dr. Rowland, he actually was at IARC, wasn't he?

A. Are you talking about for the working group meeting, the Monograph meeting?

Q. Yeah, for glyphosate.

A. Yes, he was.

Q. And what was his role in that meeting when he was there?

A. He was an observer.

Q. So he didn't vote?

A. No.

Q. And do you know who he was an observer for?

A. United States EPA.

Q. So Dr. Rowland was actually at the IARC Monograph and observed the proceedings there?

A. Correct.

Q. Do you recall, when he was there, if he ever raised an issue about a viral infection in the Kumar study?

A. I don't -- no. Not that I'm aware of. I didn't sit in on all of the subgroup meetings for the animal subgroup, so I can't be certain.

Q. Okay. So I want to talk about some other participants in the IARC meeting, okay?

Previously, we discussed that a scientist by

the name of Lauren Zeiss participated; is that right?

A. Correct.

Q. And where is she from?

A. She's from here in California. She works for California EPA.

Q. Do you know what kind of scientist she is?

A. Her Ph.D. is in, I think, biomathematics. But she's a toxicologist/mathematician/statistician.

Q. When you say she's a scientist "here in California," do you mean for the California EPA?

A. That is correct.

Q. And are you aware, following the IARC Monograph, if the California EPA determined that glyphosate is a substance known to the State of California to cause cancer?

A. Yes.

Q. And did they conclude that?

A. Yes, that is what they concluded.

Q. Now, I understand that following the listing of glyphosate as a carcinogen, the California EPA did something called a no significant risk limit.

Is that right?

A. That's what they usually do, yes, and they did it in this case.

Q. Just generally speaking -- I don't want to get

too far into this -- but it's called an NSRL.

Do you know what that is?

A. It's a regulatory limit --

MR. ISMAIL: Your Honor, may we be heard briefly?

THE COURT: Yes.

(Sidebar discussion not reported.)

MR. WISNER: May I proceed, Your Honor.

THE COURT: You may.

BY MR. WISNER:

Q. Dr. Portier, just quickly, when that NSRL was being set by the California EPA, did you submit expert opinions or comments to that?

A. Yes, I did.

Q. All right. I want to turn to EFSA and ECHA.

Again, just for our understanding, what is EFSA?

A. European Food Safety Agency. They are responsible for providing scientific guidance to the EU on the safety of things that appear in food, including pesticides.

Q. And what is ECHA?

A. European Chemical Agency. They're responsible for how regulatory reviews occur within the EU. And then other things like the REACH program and things

along those lines.

Q. And when EFSA -- well, did EFSA respond in any way to the IARC classification of glyphosate as a probable human carcinogen?

A. Yes. They did respond. And they asked -- can I take a minute and explain how regulations are done in Europe?

Q. That would be helpful.

A. It's a little more complicated than the U.S. way of doing things.

The way a regulation is done in Europe for reregistration, the registrant, the companies that want to have this product on the market in Europe have to submit a dossier to EFSA.

What EFSA does is, when the product is ready for reregistration, EFSA has to nominate one of the member states, one of the countries in Europe that's a member of the European Union, to draft their risk assessments, draft a report about the science behind this particular compound.

And for glyphosate, the principal rapporteur state was Germany. So EFSA turns this document over to German authorities. They are supposed to write their own draft. The German authorities submit it to EFSA.

EFSA has a standing committee of a whole bunch

of people who read that thing, make comments. It goes back to Germany, they change it, and it goes back to EFSA. Finally everybody agrees, and they make a final decision and EFSA makes a recommendation to the European commission about what to do about this particular compound.

So that's the normal way. The way EFSA responded to the IARC review was, they asked the German government to look at what IARC did and draft a response. So they wrote an appendix to the overall review that was added into the review about what they thought about IARC's review.

Q. Just for background, the standards through which EFSA assesses a chemical compound, how are they in any way similar to what -- the standards that IARC uses?

A. You mean the rules?

Q. Yeah.

A. The guidelines that they're using, and the labels they use for sufficient evidence and things like that, they are identical to what IARC use. In fact, they reference the IARC as the source of their rules for evaluation.

Q. And is that -- in your opinion -- because IARC is such a renowned institution for assessing cancer risk?

A. It's very well-respected for the way in which they assess cancer risk, yes.

Q. Now, just curious, is the member country that's looking at glyphosate, has that changed recently for the EU?

A. Yeah. After a very tortuous process, the EU reregistered, for a period of time, glyphosate. But they're going to review it one more time.

And so now the member state that's responsible -- it's three or four member states now. They're trying to get a much broader review. It does not include Germany; it includes other countries.

Q. Countries like France?

A. Yes.

Q. And has France decided to ban glyphosate?

MR. ISMAIL: Objection, Your Honor.

THE COURT: Sustained.

MR. WISNER: Can I get a quick sidebar, Your Honor, clarification?

THE COURT: Sure.

(Sidebar discussion not reported.)

BY MR. WISNER:

Q. Dr. Portier, has France taken any action to ban, restrict, or phase out the use of glyphosate?

A. As far as I know, they have restricted the

over-the-counter sale of glyphosate-based products to the public. I don't think they have restricted its use in farming or commercial enterprise.

Q. Thank you.

Just generally speaking, are you aware of countries around the world -- I don't need to know which ones -- but are there countries around the world that have taken action to restrict or ban glyphosate use?

A. Not that I would feel comfortable trying to list off, no.

Q. But there are some that you've heard about.

Is that right?

A. Yes.

Q. Okay. Well, then I want to get back to EFSA, because that's where we were at.

Now, the German rapporteur, they did this initial analysis. And then they responded to IARC.

Is that right?

A. Correct.

Q. And did you respond back to them?

A. Yes, I did.

Q. And were you joined by anyone?

A. Yes. I think there were a total of 96 authors on the letter back to the Commissioner of Health for Europe.

Q. If you look at Exhibit 2131 in your binder. Is that a copy of that letter?

A. Yes, it is.

Q. To be clear, this wasn't just a letter that was just sent, you know, by mail; this was published in a journal?

A. This one is published in a journal. There was another letter, slightly different than this, that was sent to the Commissioner of Health. And that was a letter.

Q. Now, to be clear, why was this letter published? I mean, why didn't you just mail it to the commissioner? Why is it in a journal?

A. We felt that the issue needed to be brought to the scientific community, as well as sort of the public debate that we had put ourselves into. And so we published it.

MR. WISNER: Permission to publish, Your Honor.

MR. ISMAIL: No objection.

THE COURT: Go ahead.

BY MR. WISNER:

Q. This is Exhibit 2131. And the title of this publication is "Differences in the Carcinogenic Evaluation of Glyphosate Between the International

Agency for Research on Cancer and the European Food Safety Authority."

Is that the title of it?

A. Yes.

Q. And I see you, right there, are listed as the first author?

A. Yes.

Q. And then if we actually look at the rest, there are approximately, you said, 96 other authors on this letter with you?

A. I think on this letter, there's 94, but I'm not certain.

Q. Okay. And are these just random people, or are they scientists?

A. They're scientists.

Q. From all over the world?

A. Correct.

Q. And I want to call out a few of them, just because I think the jury is going to hear about them, particularly when we talk about epidemiology.

We have here Lennart Hardell.

Do you see that?

A. Yes.

Q. Who is Dr. Hardell?

A. He's an epidemiologist in Sweden.

Q. By the way, my counsel pointed this out to me earlier. I kept calling Jess Rowland a doctor.

Do you know if he's actually a doctor or not?

A. No, I guess I don't.

Q. Let's just run that one to the ground because I don't want to be misspoken here. If we go to the IARC participant list, this was --

MR. ISMAIL: Your Honor, the witness just said he has no idea in answer to the question.

MR. WISNER: I'm sorry, what?

THE COURT: He said, "No, I guess I don't."

MR. WISNER: Yeah. So we're going to look --

THE COURT: Do you know if he's actually a doctor?

He doesn't know.

MR. WISNER: Sure. I can show him the participant list -- I'm going to show him.

THE COURT: Okay. You can refresh his memory.

MR. WISNER: Exhibit 1329, this was shown later. And right here, we have the observers, and we have -- I guess it doesn't specify, does it? Sorry. We can't run it into the ground, Your Honor.

THE COURT: Okay.

BY MR. WISNER:

Q. So back to where we are on the publication.

We're looking at this article, and I talk about Hardell.

Has Dr. Hardell published any epidemiological studies related to glyphosate and non-Hodgkin's lymphoma?

A. I believe he's a co-author on three of them.

Q. And in through here, we also have Anneclaire De Roos.

Do you see that?

A. Yes.

Q. Is she an author on some of the epidemiological literature in this case?

A. Yes. Again, I think she's an author on three of them.

Q. And specifically, she's an author on both of the studies involving the Agricultural Health Study?

A. Both of the papers, yes.

Q. And I believe there's another -- well, right here we have Dr. Charles Lynch.

Do you see that?

A. Yes, I do.

Q. And Dr. Charles Lynch, he's also an author on the recent AHS publication?

A. Yes, that's correct.

Q. I just want to go to the very end of what you and your co-authors conclude.

And you say right here:

"The most appropriate and scientifically-based evaluation of the cancers reported in humans and laboratory animals, as well as the supportive mechanistic data, is that glyphosate is a probable human carcinogen. On the basis of this conclusion, and in the absence of evidence to the contrary, it is reasonable to conclude that glyphosate formulations should also be considered likely human carcinogens."

Was that you and your co-authors' conclusion here?

A. Yes, it was.

Q. Was that based primarily at this point on the information that was reviewed by IARC?

A. To some degree, as well as the appendix that BfR had written. Because in their appendix, they brought more tumors into the issue that we were just surprised to see, and it strengthened our overall conclusion.

Q. That's kind of going to where I'm headed.

IARC's assessment had some limitations. But following IARC, did you go beyond what IARC had done?

A. Yes.

Q. And when you looked at all these animal

studies and the genotox studies and the epi studies and the recent meta-analysis by Dr. Zhang, did you consider all that additional data before you rendered your opinions in this case?

A. Yes.

Q. Is there a scientific method that exists to assess causality?

A. Yes.

Q. What is that called?

A. I'm not going to call it a scientific method. It's more of a process or -- a series of things you would like to see. And it's called the Bradford Hill criteria.

Q. And did you go through the Bradford Hill criteria or considerations in looking at Roundup and whether it causes cancer?

A. Yes.

Q. I understand we prepared a demonstrative to help us walk through those. It's Exhibit 99.

MR. WISNER: Your Honor, permission to publish. I don't think it should be objected to.

MR. ISMAIL: No objection.

THE COURT: Granted.

BY MR. WISNER:

Q. All right. So we have this chart here. It

reads "Bradford Hill Considerations," and it has these considerations here on the right.

Do you see that?

A. Yes.

Q. And what I want to do -- we want to do this quickly, because I want to hand you over to Defense Counsel so they can ask you some questions.

What is the consideration, and then I'm going to ask you what your opinion is about it, okay?

A. Okay.

Q. So start out with consistency of association.

What is that?

A. That's asking the question, had you looked across the scientific literature, does it seem to be consistent, especially when considering the epidemiology data? Do all the studies show the same thing, is it in the same direction, et cetera?

Q. And just to be clear, these Bradford Hill considerations, are they the same considerations discussed in the EPA guidelines?

A. Yes.

Q. Same discussions discussed by IARC?

A. Yes, they are.

Q. Are these the standard considerations used by scientists such as yourself to assess causality?

A. Yeah, with some twists from different times and different places.

Q. Sure. All right.

So what is your opinion about consistency of association based on the glyphosate data here?

A. It's strong.

Q. Okay. Strength of association.

What does that refer to?

A. That's referring to the magnitude of the relationships that you see. Originally, Bradford Hill thought it was -- he was looking for big numbers in the epidemiology data, but most groups like EPA and IARC now look at the statistical significance of the overall picture to talk about strength of association.

Q. Okay. And what is your opinion about the strength of association observed in this data?

A. That's also strong.

Q. Biological plausibility.

What does that refer to?

A. Do you have an understanding of a mechanism that could have caused this to happen? Do you have animal evidence, other mammalian systems that are getting cancers, the same types of cancers? All of those questions go in that box.

So we looked at the mice studies, and they all

have lymphoma in it.

Q. Does that lend to the biological plausibility that, in fact, Roundup or glyphosate caused lymphoma?

A. Yes, it does.

Q. And the genotoxicity data that we went through, does that lend to that biological plausibility?

A. Yes, it does.

Q. And the oxidative stress, does that also add to it?

A. Yes, it does.

Q. What is your opinion about the strength of that criteria?

A. That's very strong.

Q. Okay. What is gradient?

A. Gradient means, do you see -- in the epi data, as you increase the exposure level, do you see an increase in the risk ratio? And at the same time, you have to see the same thing in the animal evidence, as well. So you would want to look at both of them.

Q. Okay. And we didn't really spend too much time on epidemiology because we have an epidemiologist coming.

But in the epi data, did they look at, the more exposure people have to Roundup, the more chance they have of getting non-Hodgkin's lymphoma?

A. Yes, that's been looked at.

Q. What has that data generally shown?

A. It's mixed. But it's generally showing an increase.

Q. And so what would you give the gradient criteria?

A. I would give moderate to that one.

Q. Okay. Temporality.

What does that refer to?

A. The exposure has to come before the disease. It's a very simple thing. You have to have that one. It's the only one that absolutely must be there, and it is satisfied.

Q. Okay. Just to be clear, it's because in animal studies, they got exposed to glyphosate before they had tumors, right?

A. Yes.

Q. And in the epidemiology, they were exposed to Roundup before they got non-Hodgkin's lymphoma?

A. Yes.

Q. And when we talk about the genotoxicity studies, the cells didn't have genetic damage until they were exposed to glyphosate or Roundup?

A. We checked against the controls. They had -- they always have some genetic damage. It just wasn't as

big as it was after the exposure to glyphosate.

Q. Fair enough.

This next one is a little trickier: Specificity.

What does that refer to?

A. Yeah, that is a little trickier. I originally read that differently than EPA read that and others have read that, and I finally concluded that there are two meanings to that.

First, specificity is, if you have a disease for which this is your only known cause, that adds strength to the overall evaluation. You've finally got some knowledge of a new cause for disease.

That was my original interpretation. And since NHL has other causes, that one was not satisfied. It's not there.

Q. Okay.

A. But others, including the EPA and others, look at it the flip way. If this is the only disease associated with this compound, and you've looked at a lot of other diseases, and they all fall away, and you're just left with this one, that adds strength to the overall interpretation.

And there's a lot of reasons to that. And that is satisfied here.

Q. So let's break those down to clarify.

So the first one is when you have a disease that only has one possible cause, right?

A. Correct.

Q. Can you think of an example of that, that you know.

A. Mesothelioma in the lung and asbestos exposure.

Q. So that type of cancer is only caused by asbestos?

A. Yeah. That's pretty specific.

Q. But that's not what we're talking about here.

We're talking about when we have all the scientific data, they all keep pointing to the same specific disease?

A. Correct.

Q. So, for example, in the mice data, it's pointing to lymphoma?

A. Correct.

Q. In the human epidemiological data, it keeps pointing to lymphoma?

A. Correct.

Q. So the first part is not there, right?

A. Correct.

Q. But the second one is satisfied?

A. I would say it's strong.

Q. Okay.

A. Satisfied is fine.

Q. I want to use your words.

Coherence.

A. Coherence has to do with looking at the whole picture itself. So have you evidence that shows that the compound is getting into the body? Have you evidence that shows you where it goes in the body? Have you evidence that shows how long it stays in the body before it's released? Have you evidence that the lymphomas in the mouse are part of coherence, as well as biological plausibility?

All of that plays into this category of coherence.

Q. Let me just ask you: Is it coherent that a pesticide can cause lymphoma?

A. Yes.

Q. Is it coherent that a pesticide can cause lymphoma in animals?

A. Yes.

Q. So how -- what's your opinion about the coherence of this criteria?

A. That's strong.

Q. Okay. To sort of finish up this examination,

I want to talk about how all these criteria play into your ultimate opinions, okay?

And before I do that, I guess my question is: The opinions that you've offered in this case, have you reached them to a reasonable degree of scientific certainty?

A. Yes.

Q. Okay. And if we go back to the document camera, we kind of went through this, but these are the different pillars of science that you looked at related to Roundup and glyphosate, right?

A. Correct.

Q. I would like to go through the last demonstrative we have here. It's Exhibit 114.

MR. WISNER: I would like permission to publish.

Oh, I don't think you have a copy.

Permission to approach, Your Honor?

THE COURT: Yes.

BY MR. WISNER:

Q. Dr. Portier, this exhibit is the, sort of, summary of some of your opinions?

A. It's questions.

Q. Yes. That reflect some of the things you've been asked to look at in this case?

A. Yes.

MR. WISNER: Permission to publish, Your Honor.

MR. ISMAIL: No objection.

THE COURT: Granted.

BY MR. WISNER:

Q. All right. So the question to begin is does Roundup cause, okay?

So question number 1 -- and this is to a reasonable degree of scientific certainty -- does Roundup cause tumors in mammals?

A. Yes.

Q. Does Roundup cause malignant lymphoma in mice?

A. Yes.

Q. Does Roundup cause genetic damage in human lymphocytes?

A. Yes.

Q. Does Roundup cause oxidative stress in human cells?

A. Yes.

Q. And finally, Doctor, does Roundup cause non-Hodgkin's lymphoma in humans at real-world exposures?

A. I'm almost 100 percent there, but not 100 percent there. It's probably yes.

Q. And when you say "probably," sir, not close to 100 percent. But, like, 90, 95?

A. I'm in that range. I'm very close.

The animal evidence is very strong. I'm still less comfortable with the epidemiology evidence. I would like another one or two good solid studies in there to get me to that point of absolutely, undeniably, yes, this causes non-Hodgkin's lymphoma in humans.

Q. Does it more likely than not cause cancer, specifically non-Hodgkin's lymphoma?

A. Definitely more likely than not.

MR. WISNER: Thank you, Your Honor.

THE COURT: Okay. We'll take a quick break. Don't leave the building. Thank you.

(Recess taken at 10:06 a.m.)

(Proceedings resumed at 10:19 a.m.)

(The following proceedings were heard in the presence of the jury:)

THE COURT: All right. Mr. Ismail, you may proceed.

MR. ISMAIL: Thank you, Your Honor.

Your Honor, may I approach the witness with some exhibit binders?

THE COURT: Yes.

MR. ISMAIL: And I provided them to

Plaintiffs' counsel. You're being handed them as we speak.

CROSS-EXAMINATION

BY MR. ISMAIL:

Q. I'm going to be asking mostly yes or no questions through my examination, and to the extent you can, I would appreciate it if you could give me a direct yes or no answer to the questions I pose.

Is that fair?

A. That's fair.

Q. I want to go over a couple points of your background, and sort of the scope of your testimony here today, okay?

You're not a medical doctor, true?

A. That is correct.

Q. And by extension, you're not a pathologist, for example?

A. That is correct.

Q. You've never diagnosed a patient with non-Hodgkin's lymphoma?

A. That is correct.

Q. You have never, obviously, treated a patient for non-Hodgkin's lymphoma?

A. That is correct.

Q. You've never told a patient the cause of his

or her NHL, true?

A. True.

Q. Now, you've also never reviewed human pathology slides to diagnose a case of NHL, correct?

A. Correct.

Q. You're not a veterinary pathologist yourself, right?

A. Right.

Q. And you talked about the tissue stamps and tumor findings in normal animal studies.

That's not something, as a pathologist, that you do in your scientific work, correct?

A. I have done it, but I don't routinely do that, correct.

Q. Fair enough.

You are not here in this case to testify about Mr. Pilliod or Mrs. Pilliod specifically, correct?

A. Correct.

Q. You're not here to tell the jury what caused Mr. Pilliod or Mrs. Pilliod's NHL, true?

A. True.

Q. You have not reviewed the plaintiffs' medical records, correct?

A. Correct.

Q. You do not know their medical histories from

your own review, true?

A. True.

Q. You do not know either plaintiffs' clinical risk factors for developing NHL, true?

A. True.

Q. For example, you do not know whether either Mr. Pilliod or Mrs. Pilliod had a weakened immune system, correct?

A. Correct.

Q. You do not know when Mrs. Pilliod or Mr. Pilliod were diagnosed with NHL, how they were treated, or whether they're in remission today, correct?

A. Correct.

Q. You do not know Mr. Pilliod or Mrs. Pilliod's exposure to Roundup or glyphosate, correct?

A. That is correct.

Q. You don't know how many days, how often they used the product, correct?

A. Correct.

Q. Now, there are different subtypes of non-Hodgkin's lymphoma, correct?

A. That is correct.

Q. And you are not an expert in the clinical risk factors for developing any particular subtype of NHL, true?

A. I wouldn't call myself an expert.

Q. That was my question, thank you.

A. That's true.

Q. Now, other than NHL and things that might be forms of NHL, you are not giving an opinion that glyphosate causes any other form of cancer in humans, true?

A. That is true.

Q. And just to finish that line of questioning, you do not know whether Mr. Pilliod or Mrs. Pilliod had other forms of cancer before they developed NHL, true?

A. I will stipulate that I know nothing about their medical history.

Q. Fair enough.

Now, during your direct examination and even today, there was, I guess, a metaphor, a demonstrative about the pillars of different types of scientific evidence.

Do you recall that discussion with Mr. Wisner?

A. Yes.

Q. And I think I can put it up on the screen here. This is the demonstrative aid you used to sort of guide your presentation to the jury, correct?

A. Correct.

Q. And you talked about the various forms of

scientific evidence that you reviewed and relied upon for the opinions you're offering?

A. That is correct.

Q. Now, during opening statements, I know you weren't here, but there was some discussion about the difference between glyphosate and the formulated products.

Do you understand that there's a difference between talking about the ingredient versus the formulated product?

A. Yes.

Q. And would you agree, sir, that you are in no way, shape, or form an expert on the difference between glyphosate and the glyphosate formulations?

A. In what sense is "the difference"? Because obviously there's chemical difference, there's difference in the response in animal studies, there are differences in the response in cells.

So if you're asking about chemical differences between them, I would have to say correct to your question.

MR. ISMAIL: Your Honor, may I approach with a copy of the witness' prior testimony?

THE COURT: Sure.

MR. ISMAIL: I'll give a copy to Mr. Wisner.

MR. WISNER: Page and line?

MR. ISMAIL: Page 137, line 17.

Your Honor, would you like a copy?

THE COURT: I would.

MR. ISMAIL: I'm sorry.

MR. WISNER: Your Honor, I would object to this being improper impeachment. There's been no prior inconsistent statement.

THE COURT: Sustained. This indicates he doesn't know.

MR. WISNER: Okay.

BY MR. ISMAIL:

Q. So you would agree, then, that you're not an expert on the chemical differences between the formulated product and the active ingredient glyphosate, correct?

A. Correct.

Q. Now, in terms of these pillars of the different categories of evidence here, you would agree that there are studies that look at the active ingredient glyphosate, and studies that look at the formulated product, and some studies that look at both?

A. Correct.

Q. So, for example, there are mechanism studies, genotoxicity studies that look at both the formulated

product and the active ingredient, correct?

A. Correct.

Q. And there are animal studies that look at glyphosate, correct?

A. Correct.

Q. And the epidemiology only looks at the formulated product that has been published in the literature?

A. That is correct.

Q. And you would agree, sir, that between the glyphosate studies and the formulated product studies in the various categories of evidence, there is sufficient testing and data to allow a competent scientist to conclude whether or not these products cause cancer, correct?

A. Correct.

Q. And that was true in 2015, true?

A. True.

Q. And that was true even before 2015, correct?

A. Correct.

Q. Now, one of the pillars you spoke about yesterday were the mechanism studies.

And that's like those genotoxicity studies you just referenced, correct?

A. Correct.

Q. Now, the genotoxicity studies are not used to establish that glyphosate causes NHL in people, true?

A. Could you say the question again.

Q. Genotoxicity studies are not used to establish that glyphosate causes NHL in people, true?

A. So you're asking, specifically genotox studies, do they specifically pertain to NHL in humans?

Q. Yes, sir.

A. No.

Q. So you would agree with my --

A. They can pertain, but there's nothing that says it's that specific.

Q. In terms of the animal data you talked about, you would agree, sir, that it would be difficult to conclude that glyphosate is causing NHL in humans using only the animal evidence, correct?

A. "Difficult" maybe too strong of a word. One would have to walk through a bit of evidence that has not been presented yet on the relationship between seeing malignant lymphomas in mice and seeing NHL in people.

MR. ISMAIL: Now, if I could provide you with prior testimony.

MR. WISNER: Thanks.

MR. ISMAIL: Page 377, line 19.

THE WITNESS: Could you say that again, please.

MR. ISMAIL: The page is 377, line 19.

MR. WISNER: Your Honor, I have no objection to the reading of the testimony, but I do believe, for completeness sake, it needs to go through 378, to line 10.

THE COURT: Do you have any objection to that?

MR. ISMAIL: Sure. Happy to read it.

THE COURT: Yes.

BY MR. ISMAIL:

Q. Okay. Doctor, were you asked --

MR. ISMAIL: So, Your Honor, this is the first time I think the jury has seen reference to a deposition. I don't know if Your Honor has an instruction or commentary to that effect that you give the jury usually.

THE COURT: I do. I don't have it in front of me, but the essence of it is that deposition testimony is evidence; it's to be considered like all other evidence.

I'll read the complete instruction to you. Deposition testimony is to be considered as any other piece of evidence submitted by either party.

///

BY MR. ISMAIL:

Q. So are you with me, sir, at page 377, line 19?

A. Yes, I am.

Q. And you were under oath when you gave the testimony on this date, correct?

A. Correct.

Q. And this was about five weeks ago, in a deposition?

A. I think so.

Q. And there was a court reporter there, just like there is here, taking down what was asked of you and your responses, correct?

A. Correct.

Q. So line 19:

"Q. In order to determine whether or not glyphosate was causing NHL, we would really need to look at the human epidemiological evidence, right?

"A. In my opinion, it would be difficult to conclude that glyphosate is causing NHL in humans using only animal evidence."

Have I read it correctly so far?

A. Yes, you have.

Q. And that was your answer, under oath, to the

question, correct?

A. Correct.

Q. And then going on:

"Q. Is that a yes?

"A. I'm not sure, the way you stated the question. I'm trying to state the answer that I'm comfortable with."

And there was a new question:

"Q. You need to look at the human data, correct?

"A. We would need human data in order to make that leap from animals to humans for a specific disease."

Were you asked those questions, and was that your sworn testimony under oath?

A. It is.

Q. So you agree, sir, that you would have to consider that the animal data alone, without looking at the human data, it would be difficult to form a causation opinion in this case, as you stated?

A. In my opinion, I'll go a little stronger. If all I have is the animal data, making a causal statement about a specific human disease would be very difficult, close to impossible.

But that's not what you always have. You always have human data.

Q. And so in terms of the human data we have in this case, you agree that you cannot make a firm statement that Roundup causes NHL from the epidemiology data alone, true?

A. Correct. I can't do it from the epidemiology data alone.

Q. Now, you went through with Mr. Wisner -- you had a long discussion of -- let me back up.

You agree, sir, that there are scientists who disagree with the views you've offered to the jury in this case?

A. Yes.

Q. And you talked with Mr. Wisner about one group of scientists at the EPA who have concluded differently than what you've given opinions about to this jury, true?

A. That's true.

Q. And you would recognize that there are scientists at regulatory bodies around the world who have assessed the data and have come to conclusions different than yours, true?

A. Well, I would first question the statement "have assessed the data." But certainly they have

looked at some part of this data and reached the conclusion that was different than mine.

Q. Now, in terms of the various organizations and scientific bodies that have looked at this data, you talked about the EPA, correct?

A. Correct.

Q. And you made some reference to a couple of the scientific bodies in Europe who have assessed this issue?

A. Correct.

Q. I don't think you showed the jury what they concluded, but we'll do that, perhaps, this afternoon.

But I would ask you to turn to Exhibit 5129 in your binder.

A. 512...

Q. 5129.

Are you there, sir?

A. Yes, I am.

Q. And you've seen this document before; it's been shown to you in prior testimony, correct?

A. That is correct.

Q. You recognize that on the front page, it's described as the reevaluation decision of Health Canada on the issue of glyphosate, dated April 28th, 2017, correct?

A. That is correct.

Q. Now, the IARC decision was in 2015, correct?

A. That is correct.

Q. And prior to 2015, all the health agencies that looked at the data and came to a final conclusion concluded that glyphosate was not carcinogenic, correct?

A. I can't be certain. I mean, I have not read every single risk assessment for every agency around the world.

Q. Right. My question was a little more narrow.

Of those that you are aware of, as of the IARC meeting in 2015, all of them had concluded that there was not a carcinogenic risk with glyphosate, correct?

A. That's only two, but yes, the answer would be correct.

Q. And since 2015, there have been several agencies that have looked at that question, correct?

A. That is correct.

Q. One of which we have in front of you, and that's the assessment from Health Canada, correct?

A. Correct.

MR. ISMAIL: Permission to publish.

THE COURT: Yes.

Any objection?

MR. WISNER: I believe there are specific

pages that are admissible.

THE COURT: Correct. Pursuant to the MIL.

MR. ISMAIL: Thank you, Your Honor.

Just to orient everyone, this is the reevaluation decision from Health Canada in 2017.

BY MR. ISMAIL:

Q. And you agree, sir, that Health Canada is a scientific -- has scientists who are part of their evaluation process?

A. Yes.

Q. I would ask you, sir, if you could, to turn to page 9.

Are you there, sir?

A. Yes, I am.

Q. Now, if you look at the top paragraph -- I'll call it out so everyone can see.

Just to orient where they are in the timeline here, Health Canada is referring to the decision of IARC that classified glyphosate similar with how you described it to the jury, correct?

A. Say that again, I'm sorry.

Q. All I'm trying to establish here, sir, is that, at the time that Health Canada did this assessment of glyphosate, by their own document, they are aware of and referencing that IARC had come to its determination

in 2015.

A. If that's the thing you want to take from this, that's fine. That's correct.

Q. Okay. And then I want to ask you about the next paragraph.

So let's just walk through what's described here. First sentence says:

"In November 2015 the European Food Safety Authority, EFSA, finalized their reassessment of glyphosate, concluding that glyphosate is unlikely to pose a carcinogenic hazard to humans."

Did I read that correctly?

A. Yes, you did.

Q. And EFSA is the organization that you were talking about with Mr. Wisner this morning, correct?

A. Correct.

Q. And you were aware of that in 2015, as we'll see in a minute, because you actually corresponded with EFSA about their conclusion, correct?

A. Correct.

Q. Then it goes on, talking about some -- another statement, and this is in May of 2016, an organization called JMPR.

Do you see that listed there?

A. Yes, I do.

Q. And I believe yesterday, you made reference to your review of a regulatory document prepared by JMPR, correct?

A. It's not regulatory. They have no regulatory authority, but it is a document done by JMPR.

Q. I appreciate that clarification, because actually JMPR is a part of the World Health Organization, correct?

A. Correct.

Q. And I think you mentioned that IARC has some affiliation with WHO, as well?

A. Correct.

Q. But JMPR is another World Health Organization-affiliated organization?

A. It's not really an organization; it's a committee.

Q. Fair enough.

A. It's a WHO committee.

Q. A WHO committee that includes scientists and other specialists in the field of study, correct?

A. Correct.

Q. And as reflected here in this document by Health Canada, there's a reference that it's unlikely to be genotoxic, correct?

A. Specifically, unlikely to be genotoxic in anticipated dietary exposures.

Q. And in March of 2017, there's a reference to the European Chemical Agency, correct?

A. Correct.

Q. And that's another one of the organizations that you talked about with Mr. Wisner, correct?

A. Correct.

Q. And you know that in 2017, the European Chemical Agency concluded that glyphosate is not a carcinogen, correct?

A. That's not their conclusion.

Q. Okay. We'll look at their conclusion in a minute.

But you know that they concluded contrary to what you testified to the jury, correct?

A. Correct. It didn't reach the level of concern to be listed in their criteria.

Q. So ECHA has the sort of criteria that, if a certain chemical reaches a level of concern, then they list it as a carcinogen?

A. Correct.

Q. And ECHA, in 2017, after the IARC decision, decided that glyphosate did not reach that level of concern?

A. That is correct.

Q. Very good.

And then there's another reference here to the Australian Pesticides and Veterinary Medicines Authority, correct?

A. Correct.

Q. And as Health Canada indicates, that organization determined that glyphosate is not a carcinogen?

A. That's correct.

Q. And Health Canada goes on to say:

"Currently, no pesticide regulatory authority, including Health Canada, considers glyphosate to be a carcinogenic risk of concern to humans."

Did I read that correctly?

A. Yes, you did.

Q. And as of 2017, when this was prepared, that is a correct characterization, true?

A. Of what they believe, yes.

Q. And that is still true today, right?

A. I'm unaware of a new document coming out of Health Canada.

Q. Or any other pesticide regulatory authority that's contrary to this statement, true?

A. True. I'm unaware of any.

Q. Thank you.

Now, I want to talk a little bit further about your background before you got to the IARC in 2015, okay?

A. Okay.

Q. You told us yesterday about your years at various governmental agencies and the positions that you held. For example, at NTP or the National Institute of Environmental Health Sciences, those organizations at which you worked, correct?

A. Correct.

Q. But it's true that in this case, you are not speaking on behalf of any of those agencies, correct?

A. That is correct.

Q. You are here only offering your personal opinions of Dr. Portier, true?

A. True.

Q. Did you retire in 2013?

A. Yes, I did.

Q. Until your retirement in 2013, you were employed in a governmental position for approximately 30, 35 years?

A. Let's see. I'll just figure it out for you. Thirty-five years.

Q. Very good.

And in that 35 years of work in the various roles that you described, you never came to the opinion that glyphosate was a carcinogen, true?

A. That is true.

Q. The first time you personally came to that belief was in 2015, when you attended the IARC working group meeting, correct?

A. Yes.

Q. And I guess while we're on this topic, you're not here speaking on behalf of IARC, correct?

A. No. In fact, I didn't even -- I didn't even render my opinion in their opinion.

Q. Right.

A. Because I was not allowed.

Q. And with respect to glyphosate, you never spoke on behalf of IARC?

A. That is correct.

Q. Okay. And again, you're here offering your personal opinions based on the review you described?

A. That is correct.

Q. Now, you served for a time as the associate director of the National Toxicology Program, correct?

A. Correct.

Q. You recognized the NTP as an authority, true?

A. That is true.

Q. There are researchers at NTP you believe and understand to do good quality toxicology research, correct?

A. I haven't followed them as closely as I used to. But I assume they're still doing that, yes.

Q. Based on your experience in government service, you would certainly agree that that's a true statement?

A. While I was there, absolutely that's true.

Q. And a major part of your job at NTP was to figure out methods and ways in which chemicals may cause cancer, true?

A. A major part? It was certainly part.

Q. Fair enough.

You told us yesterday that 80, 90 percent of your work was on carcinogens, especially when you were at NIH and NTP, true?

A. That is true.

Q. Now, the NTP will do their own studies at times, correct?

A. They contract them out to laboratories.

Q. They sponsor and fund studies, correct?

A. Correct.

Q. And that would include studies in mice or rat

models, correct?

A. That is correct.

Q. And they will even do some of those genotoxicity studies that you talked about with Mr. Wisner yesterday, correct?

A. Correct.

Q. And you know that NTP actually has studied glyphosate, correct?

A. That is correct.

Q. Now, the NTP has evaluated close to 3,000 substances since its inception, correct?

A. I would guess that's about the right number.

Q. I won't hold you to the precise number, but it's in that neighborhood?

A. It's bigger than that now because of the program I put in with high fructose screening. Now they're well into tens of thousands, but it's not intense study like the 3,000 you're talking about.

Q. So there's different levels of investigation by NTP, some of which they'll sponsor and fund, rodent studies or actual laboratory work on substances, correct?

A. Correct.

Q. And then you described other sorts of evaluations or computerized model screening of

substances, as well?

A. It's not computerized model screening. It's still laboratory work, but with robots and all kinds of things. And running it through as quickly as you can to get a broader picture for chemicals.

Q. Through your work at the NTP, you gained familiarity with something called the Report on Carcinogens, correct?

A. That is correct.

Q. Now, the purpose of the Report on Carcinogens is for the United States Secretary of Human Health to retain a list of what is known or reasonably anticipated to be a human carcinogen, correct?

A. Correct.

Q. The NTP is designated to provide advice and guidance to those maintaining the list, correct?

A. Yes.

Q. And actually, the Report on Carcinogens is submitted to Congress, right?

A. As far as I understand, yes.

Q. And the NTP makes recommendations on identified causes of cancer to be included in this Report on Carcinogens, correct?

A. That is correct.

Q. Now, your job at NTP was to recommend what you

believe should be included in the Report on Carcinogens, true?

A. The recommendations were usually generated by either staff or from outside of the NTP. It was my responsibility to look at those recommendations and narrow it down into what would be included. I made the final decision.

Q. Right. That would be my next question.

For a period of time -- for at least five or six years -- you were the person who made the final recommendation to the United States Secretary of Human Health on what should go in the Report for Carcinogens?

A. Yes. Technically, that was my boss, but he never once changed my opinion; so, in essence, it was me.

Q. And you obviously took on your responsibilities as best you could while at NTP?

A. Yes.

Q. Including your work with respect to the Report on Carcinogens, true?

A. True.

Q. You never recommended that glyphosate be on that list of carcinogens when you had that responsibility, correct?

A. That is correct.

Q. Now, the Report on Carcinogens, I believe, is in its 14th edition now?

A. Probably.

Q. And you know that if you go on the Report on Carcinogens today, there are over 200 substances listed there, right?

MR. WISNER: Objection. Lacks foundation. Hearsay.

THE COURT: Sustained.

BY MR. ISMAIL:

Q. Doctor, do you have any understanding of the -- well, let me ask it this way: While you were at NTP, do you know approximately how many substances were on the official Report on Carcinogens that were prepared with the assistance of NTP?

A. I think the 10th edition, which I was -- the last one I was in charge of -- had about 140 chemicals.

Q. And your expectation would be, as that work continued to go on, there would be additional chemicals added to the list? That's how this works?

A. Correct.

Q. So reasonably putting those pieces together, you would expect that the Report on Carcinogens is even larger today than when you had some responsibility for it.

Is that fair?

A. That would be fair.

Q. And you know, sir, through your work in this case, that glyphosate is not on the Report on Carcinogens today, true?

A. I would guess. I haven't gone to look. But it would surprise me if it was. They generally don't review things that EPA has authority over.

Q. Thank you for that.

Now, in terms of your time in government service, that ended in around 2013?

A. Yes.

Q. And then you became a private consultant for a period of time, and still are today?

A. Amongst other things, yes.

Q. Amongst other things.

So in the 35 years you spent in -- as part of various agencies in which you've described, at least for some of those years, a large part of your work was identifying potential causes of cancer, right?

A. I have to back off from that. I mean, much of my work was looking at the ways in which you do that. Not necessarily taking the next chemical and the chemical after that and identifying it.

It was more methodology, developing the

methodologies and the processes.

Q. Certainly, you worked with scientists in your organizations who had those responsibilities, as well, correct?

A. Correct.

Q. Okay.

A. I did some of that. But it's not the main part of my work.

Q. Fair enough.

A. That's the part I was having trouble with.

Q. I appreciate the clarification.

Again, throughout all of that work that you did, whether it's a major part, minor part, or somewhere in between, you never concluded glyphosate was a carcinogen, true?

A. That is true.

Q. So you're invited to this working group meeting in 2015. There were other chemicals that were under consideration by IARC at that meeting, correct?

A. That's correct.

Q. And you were not invited to the IARC meeting because of glyphosate, but rather the other pesticides that were being considered, true?

A. That is my understanding.

Q. So right up to that IARC meeting in 2015,

there was no time in that period that you came to the judgment that glyphosate was the cause of cancer, true?

A. True.

Q. Prior to that working group meeting in March of 2015, you had not looked at any of the scientific evidence on the carcinogenicity of glyphosate, correct?

A. That's not correct.

Q. You got some materials brought up to that meeting; is that correct?

A. Yes. But I've also -- I -- as you know if you've read my depositions, I had looked at McDuffie at one point years and years earlier.

But there is another one that I hesitate to mention. I wrote a letter with two colleagues regarding the retraction of a paper that we were not happy with. And I had read that paper, too.

Q. Now, prior to the IARC meeting, you did not review the publicly-available material from EPA or other regulatory organizations.

Is that fair?

A. Up to -- close to the IARC meeting, I did scan some of the regulatory material prior to the meeting. It was in the near neighborhood.

Q. Sure. So just so we're all clear on the timeline here.

Within the weeks before that meeting, you had made available to you some of the regulatory materials?

A. That is correct.

Q. Fair enough.

Now, the working group members of IARC, you went through some of their professional affiliations with Mr. Wisner.

Do you recall doing that?

A. Yes.

Q. Now, when an individual appears at IARC, they are appearing in their individual capacity, true?

A. Absolutely.

Q. And so --

A. On the working group.

Q. On the working group?

A. Observers are not required to have that issue.

Q. And the observers don't write the Monographs or vote on the outcome, correct?

A. That is correct.

Q. So those who are actually writing the materials and voting on IARC's classification, they're all there in their individual capacities?

A. That is correct.

Q. So if someone was from EPA on the working group, it's not as if they're saying this is EPA's

position or EPA agrees with what's being included here?

A. That would be correct.

Q. And that's true for each and every one of the affiliations that you went through with Mr. Wisner yesterday?

Those were not those organizations adopting and ratifying what IARC said, true?

A. That's true. The preamble that IARC has lays out rules, and that's one of the rules. You're here on your own, not representing whatever.

Q. You told us that the working group classified glyphosate as category 2A, correct?

A. I don't think I said 2A, but yes. Probable human carcinogen.

Q. So there's probable, possible -- various classification structures within the IARC system, correct?

A. That is correct.

Q. Now, by IARC's own description, those terms probable or possible have no quantitative significance, correct?

A. Quantitative in the sense of -- I have to be a little more specific.

Quantitative in the sense of exposure response relationships, dose response concepts, and risk to a

population. It has quantification -- or in terms of the magnitude of the science behind it. But not necessarily in the magnitude of the risk.

Q. You would agree, sir, that a particular finding of probably carcinogenic or possibly carcinogenic doesn't mean 75 percent or 80 percent or even 40 percent, because those descriptors have no quantitative significance, true?

A. So if that was your question, that is true.

Q. Okay.

Now, you described your work with IARC -- the working group -- as an invited specialist.

That's the formal title that you held, right?

A. That is correct.

Q. What that means is you weren't a voting member, as you referenced this morning, true?

A. True.

Q. And the reason you were not a voting member is because IARC concluded you had a possible conflict of interest, correct?

A. That is correct.

Q. You disclosed that to them as part of the vetting process?

A. That's correct.

Q. Because you believe potential conflicts of

interest are important?

A. They are.

Q. Being hired by Plaintiff lawyers would be an actual conflict of interest, correct?

A. Absolutely, yes.

Q. So shortly after the IARC meeting in March of 2015, you were contacted by Plaintiff lawyers to serve as a consultant for them, correct?

A. That is correct.

Q. And before the end of March 2015, so within a few weeks of the IARC meeting, you had signed a contract to consult with Plaintiffs' lawyers, correct?

A. I believe that is correct.

Q. And these were lawyers you knew from even before the IARC meeting in other professional contexts?

A. Professional -- just providing them advice on the phone every once in a while, but yes.

Q. So from that point forward, from March 2015, you have received compensation from Plaintiff lawyers with respect to your work on glyphosate, correct?

A. No. Not all my work. With respect to the specific things I've been asked to do for them, I have received compensation.

Q. And that wasn't the spirit of my question, but I appreciate you being precise.

You have received compensation for the work you've done on behalf of Plaintiff lawyers since March of 2015?

A. That is correct.

Q. And I don't think you told us yesterday or today, but what is your hourly rate?

A. $450 an hour.

Q. And is that for work you do both inside the courtroom and outside the courtroom?

A. That is correct.

Q. On behalf of Plaintiffs' counsel?

A. That is correct.

Q. Now, I think you told us this morning that in the course of -- let me rephrase.

IARC has very specific rules as to what data the working groups are allowed to consider, correct?

A. That is correct.

Q. And one of those rules is that it has to be publicly peer-reviewed data, correct?

A. No. It has to be publicly available.

Q. Publicly available.

A. The working group can peer-review it themselves. So it has to be publicly available.

Q. So just to sort of cut to the chase here, IARC, at that working group meeting in 2015, did not

review all the scientific data that had been generated by that point on the potential link between glyphosate and NHL, true?

A. That is true.

Q. Just to be a little more specific, there were epidemiology data that had not been published in 2015.

You know that now, correct?

A. Well, there is always new data coming out, yes.

Q. My question, in fairness, is a little more specific.

You know that in March of 2015, there were epidemiology data that had not yet been published that actually showed there was no association between glyphosate and NHL, true?

A. I would not agree to that.

Q. Okay. Then we'll -- we'll circle back to that when we talk about some of the data.

A. I would agree to say that the authors of that draft document had concluded that.

Q. So the distinction you're making is that you, Dr. Portier, don't interpret that data the way the authors of the study interpreted it?

A. Correct.

Q. So let's just sort of close the loop on that.

You know that there were epidemiology data that the researchers themselves believed show that there was not a link between glyphosate and NHL, true?

A. That was a draft document where that's what they had said.

Q. And when we say "glyphosate" in this question, really we're talking about formulated product because it's human epidemiology?

A. That's correct.

Q. And the draft document you're talking about, those included researchers from the National Cancer Institute, right?

A. That is correct.

Q. And the National Institutes of Viral Health Sciences, where you used to work?

A. That's correct.

Q. We're going to come back to that study as we continue our conversation.

But just on this question of what IARC had available to them to consider, there's some human epidemiology data that, by the rules, they did not look to when they were making their assessment, correct?

A. To be fair, no one could have looked to that.

Q. Do you know whether working group members had access to that data before that meeting was held?

A. The co-authors of the paper had access to that paper, it seems, before the meeting.

Q. My question was more specific.

Do you know whether members of the working group, in March of 2015, had access to the epidemiology data that showed no link between glyphosate and NHL that had not yet been published in a journal?

A. One of the working group members was an author of that draft.

Q. So that's a yes?

A. That's a yes.

Q. Now, in terms of the other sort of pillars that we've talked about, the mechanism studies, I think you told us there are -- I think you said over 100 different genotoxicity studies that have been done on glyphosate, correct?

A. Correct.

Q. And by their rules -- I'm not debating whether they're good rules or bad rules -- but by their rules, IARC did not consider the totality of that genotoxicity data, correct?

A. They came pretty close, because much of it was available in advance. They came pretty close.

Q. Do you know what fraction of the genotoxicity data the IARC working group considered in March of 2015?

A. If you exclude the salmonella assays -- I'll explain that very clearly.

IARC said the salmonella was just negative. And there was a large review document, and they said, we're just not going to go there. We're just going to concede it's negative.

If you include that, then they probably got 80, 90 percent of the data available at that time.

Q. Right. But if we actually look at all of it, not excluding a category, it was less than 80 percent, correct?

A. Correct.

Q. And in terms of the animal data that you described during the course of your testimony, you identified some 12 or 13 rodent studies that you believe are of sufficient quality to -- for you to review and opine on, correct?

A. Correct.

Q. And IARC did not consider the same set of rodent studies in its assessment that you did here, correct?

A. That would be overstating it. They were aware of all 12 studies because of the Greim paper. But they felt that five or six of them -- they didn't have sufficient information in hand to review it.

Q. Okay. So just to be precise then: IARC was aware of additional rodent studies, but did not have access or sufficient comfort level that they knew the data to specifically analyze them in their assessment.

Is that fair?

A. Right.

Q. Okay. And you know that regulatory agencies, the likes of which we've already seen summarized here in court, had access and considered more information than did IARC when answering this precise question, true?

A. That would be true.

Q. Now, following the IARC meeting in 2015, you personally interacted with several of the scientific groups in various regulatory agencies, correct?

A. I'm not sure that would be a fair statement, other than EPA's head of their science advisory panel review group.

Most of my interactions were at the level of letters and conversations, not with them directly.

Q. My question was imprecise.

When I say "personally interacted," I intended to include written correspondence.

A. Written correspondence, yes.

Q. Okay. So --

A. But I want to be fair. Again, the written

correspondence never went to the regulatory authorities.

It went to -- one went to the head of the Health -- Department of Health for the European Commission, and the other one went to the president of the European Commission.

There were letters to the EPA as a public record letter on some of their things.

Other than that, there was very little correspondence directly with regulatory people.

Q. Is it your testimony, sir, that you did not direct correspondence, for example, to ECHA?

A. They got copies, yes.

Q. By your direction?

A. Yes, of course. They got copies. Thank you.

Q. You sent it to them?

A. Yes.

Q. When you're saying you did not personally correspond with ECHA or EFSA, there was a different top line, but you, Dr. Portier, sent correspondence to ECHA and EFSA?

A. That's correct.

Q. Okay. And you also submitted written documentation to EPA, true?

A. That is correct.

Q. Now, I think this is agreed to in your

testimony, but just so I'm clear.

During the entire time in which you had written correspondence with either U.S. or European regulators about glyphosate, you have been a paid consultant for Plaintiffs' counsel in this litigation for the work you were doing on their behalf, correct?

A. Yes.

Q. Now, you talked about this morning about the European Union's structure for reviewing the safety of chemicals, herbicides, pesticides, and their regulatory approval.

Do you recall doing that this morning?

A. Yes.

Q. And as you indicated, it's a different structure than we have here in the United States; there's various groups within different parts of that governmental structure that have very specific roles, correct?

A. Correct.

Q. And one of the things you indicated was that in its process, the European Union, in terms of the doing the initial heavy lifting on the science evaluation, will designate a member state to review the scientific record and prepare a report, correct?

A. Correct.

Q. And that was done with glyphosate with respect to the alleged link with non-Hodgkin's lymphoma, true?

A. It's not that specific.

Q. The review by --

A. Was everything. It does everything. They weren't specifically looking at that question of non-Hodgkin's lymphoma.

Q. So let's just expand on that.

So as part of its review process, the European Union structure would designate a member state to review various types of toxicity information with respect to a product or chemical that's being sought to be registered to be used in Europe, correct?

A. Correct.

Q. And one of the things that they considered in that process, specifically as to this compound, was the alleged carcinogenicity, correct?

A. Correct.

Q. And the member state that did that review in Europe was Germany, correct?

A. They led the review. There was another state who had some minor roles.

Q. And that was Slovenia?

A. I believe, yeah.

Q. So as a member state that's designated sort of

the lead group of scientists doing the heavy lifting, they can get support from another member state, scientific review as needed to prepare the written documentation?

A. Correct.

Q. Very good.

And prior to the IARC meeting, the German health and safety organization -- I'm not going to attempt its name in German -- did that review for glyphosate, correct?

A. Correct.

Q. And I believe it was --

A. Well, that's not totally correct.

BfR, which is the German agency, reviewed a review. They didn't write their own. But they reviewed a review.

Q. Right. And that means that glyphosate formulations had been approved on the market in Europe for many years.

And then by 2013, as part of the process of re-review, BfR, this German organization, did that scientific evaluation, correct?

A. Correct.

Q. Very good.

And I think in Exhibit 4203 -- and maybe you

can do this from your own recollection, sir, but if you want to look at the German written documentation assessing this product glyphosate, do you recall that in 2013, their conclusion was that glyphosate is unlikely to pose a carcinogenic risk to humans?

A. That is what I recall.

Q. So in the timeline, we have that glyphosate has been assessed by Germany, and that is unlikely to pose a carcinogenic risk in humans, and that was adopted by the European Union-wide organization, correct?

A. EFSA, you mean?

Q. EFSA.

A. Yes, correct.

Q. So IARC makes its determination in 2015. And as far as your review in this case, that was the first scientific body that had raised -- or had classified glyphosate as a possible or probable carcinogen, true?

A. Let me make sure I have the question right. EFSA didn't reach that conclusion of not likely to be carcinogenic in humans until after IARC. They had not finished the 2013 BfR thing.

We can get back to the IARC question now.

Q. I appreciate you being precise.

The German regulators and scientists made that -- made the determination of unlikely to pose a

carcinogenetic risk to humans before IARC, right?

A. It's carcinogenic. I want to fix that. I keep saying yes to you.

It's carcinogenic, not carcinogenetic.

Q. I apologize if I misspoke.

And that was the determination of the German scientists, correct?

A. Correct.

Q. And IARC comes out in 2015, and Europe was in the middle of its -- EFSA was in the middle of its evaluation, correct?

A. That's correct.

Q. Now, I think you were -- I think my question prior to your clarification was as follows:

When IARC made its determination in 2015, that was the first scientific organization that had ever classified glyphosate as a probable carcinogen, true?

A. That's my understanding. I can't be absolutely certain.

Q. To your knowledge and your investigation in this case, that's a true statement, correct?

A. I didn't even investigate it. But as far as I know, it's true.

Q. But you accept it as true, sitting here today?

A. Correct.

Q. Now, EFSA then, once IARC came out, said, okay, we have this new finding from IARC, and we're in the middle of this re-review. We want to make sure that we have an opportunity to consider what IARC has set forth in their Monograph.

Words to that effect, correct?

A. I believe they were told they had to. But -- the net effect is they did, indeed, look at it.

Q. They were instructed to consider IARC, correct?

A. Correct.

Q. And what they did was, they then delegated that task initially to Germany to make that assessment because Germany was the member state who was doing that review?

A. That is correct.

Q. And then EFSA evaluates the safety of products like glyphosate, correct?

A. Correct. Well, they are -- technically ECHA has the authority to do that, but they give that authority to EFSA.

Q. Now, do you recall what Germany concluded in 2015 upon considering the conclusions of IARC?

A. I can't remember the exact wording of the conclusion.

Q. It was similar to the finding they made before, correct?

A. They clearly disagreed with IARC.

Q. Now, just so we can sort of keep track of the timeline here, in around 2013, Germany makes its initial determination, correct?

MR. WISNER: Your Honor, I don't have any objection to this. But before he publishes anything, I should see a copy.

MR. ISMAIL: I apologize. I'll give you a copy.

MR. WISNER: Okay.

MR. ISMAIL: Here is a copy for the Court, as well, Your Honor.

MR. WISNER: No objection to the demonstrative -- strike that.

MR. ISMAIL: Permission to publish, Your Honor.

THE COURT: Yes.

BY MR. ISMAIL:

Q. Just to orient, because we have different organizations and different dates. So 2013, that's the review from Germany that we talked about.

Then the IARC meeting in 2015 is held, and there's determination made, correct?

A. Correct. I'm not going to testify correct to the months. I will for the IARC one. But I don't know if it was December 2013 for BfR. I know it was 2013.

Q. I included the exhibit there in your binder, if you want to review back to it. That's fine.

But we know it was before IARC?

A. Yes.

Q. Good enough.

And then in or around October of 2015 -- is there a problem?

MR. WISNER: Is there an exhibit number?

MR. ISMAIL: We have not marked it as an exhibit. We'll give it an exhibit number.

MR. WISNER: I didn't mean to interrupt, sorry.

MR. ISMAIL: No worries.

BY MR. ISMAIL:

Q. So in around October of 2015, EFSA comes out with a conclusion. And they include, as part of their conclusion, the findings of the German BfR, correct?

A. Correct.

Q. Now, you -- and you understand that EFSA's position today is almost identically stated to that of EPA, correct?

A. It's very similar.

Q. What is that conclusion, as you understand it?

A. It's not likely to be carcinogenic to humans.

Q. When EFSA made its determination in 2015, you directed correspondence to individuals at EFSA, among others, correct?

A. Correct.

Q. And Exhibit 5403 --

A. Yes, it is.

Q. -- is a November 2013 letter you sent to several individuals, correct?

A. Correct.

MR. ISMAIL: May I publish, Your Honor?

THE COURT: Any objection?

MR. WISNER: No objection.

THE COURT: Yes.

BY MR. ISMAIL:

Q. So to orient everyone, the date is November 27, 2015. And this is the Commissioner for Health and Food Safety who you have on your top line -- to whom you were sending this letter, correct?

A. Correct.

Q. And as you and I chatted a moment ago, you included other individuals; for example, the executive director of EFSA, among others?

A. Among others.

Q. And what you did here was, you were pointing out where you disagree with both the process and the conclusions of what EFSA had determined, correct?

A. That is correct.

Q. You believe that EFSA should have classified this product as a carcinogen, correct?

A. I believe that it warrants a classification as a carcinogen, so I guess that's the same thing.

I more passionately believed at the time that EFSA should have done their job right.

Q. And you provided various analyses and commentaries as to where you think EFSA didn't do their job right?

A. That is correct.

Q. One of the things you did -- and I'm going to refer back to this in a minute -- but just in terms of the body of evidence that you were including in your letter, you talked about some of the epidemiology, some of the animal studies.

And one of the things you said -- I'm sorry, I'm on page 4, sir. I didn't tell you where I was. I'm on page 4 of your letter.

You talked about some of the epidemiology studies that were referenced on that forest plot you showed yesterday, correct?

A. That's correct.

Q. And I'm at the top of page 4 if you want to see the context more fully. But at the end of that paragraph, you say, in reference to one of the studies:

"There were only 92 cases of NHL included in the Agricultural Health study unadjusted analysis, and fewer in adjusted analyses, compared to 650 in the pooled case-control analysis from the United States."

Did I read that correctly?

A. Correct.

Q. And what you're referring to there is, you were comparing the size of the Agricultural Health Study to a different study that you had on your chart, called De Roos, correct?

A. That is correct.

Q. And your interpretation was that the case-controlled study had a larger dataset?

A. It had more cases.

Q. Now, you got a response back, correct?

A. Yes, I did.

Q. And just so we're pointing it back on the time, we have your letter of November 2015.

You actually got a letter back from EFSA in January of 2016, correct?

A. Correct. There was an earlier letter directly from Andriukaitis telling me that EFSA would respond, just to be clear.

Q. So the specific person to whom you sent the letter said that EFSA is going to respond for our organizations to the comments you referenced in your letter, correct?

A. Correct.

Q. And that's Exhibit 6764, which is in your binder. And I'll ask you if you can identify that as the January 2016 response to the letter you sent.

A. Yes, that is the response.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection, Your Honor.

THE COURT: Yes.

BY MR. ISMAIL:

Q. And so what we have here is a response from the executive director of EFSA.

And it's dated January of 2016, correct?

A. Correct.

Q. And what EFSA does in this letter, is they talk about the conclusions -- first of all, they talk about their critique of your comments, correct?

A. Correct.

Q. And, in fact, they have a rather detailed 13

or 14 single-spaced response to the various comments you made in your prior letter, true?

A. True.

Q. And you viewed this carefully, correct?

A. Yes, I did.

Q. Now, if you turn to page 2, in the paragraph -- the second paragraph.

A. Yes.

Q. We'll continue this conversation when my computer is brought back to life here.

So the second paragraph that begins, "EFSA's assessment of glyphosate."

Do you see where I am?

A. Yes, I do.

Q. It reads:

"EFSA's assessment of glyphosate is an essential part of the EU regulatory system with relation to pesticides widely regarded as one of the strictest in the world," correct?

A. That is what it says.

Q. And then it goes on to say:

"This is the system EFSA has followed in the assessment of hundreds of active substances since 2003"?

That's in the next paragraph.

A. That's what it says.

Q. And so if you turn then to -- as we page through this letter and the responses, you'll see the annex, which includes the scientific response to what you said in your letter, on page 4.

The second paragraph begins, "EFSA notes that."

Tell me when you're there, sir.

A. I'm there.

Well, there are two of those.

Q. There are. The second paragraph.

A. Okay.

Q. And it's on the screen, if it's easier to follow.

What EFSA is doing here is, they're commenting specifically on that portion of your letter I showed where you were comparing the size of the Agricultural Health Study to the case study done by De Roos, correct?

A. Correct.

Q. And EFSA has critiqued your analysis of the epidemiology data, correct?

A. No. They are -- at this point, they're just trying to respond to the 92 versus 650. They're not critiquing my analysis of the epidemiology.

Q. What I'm referring to is that specific comment

regarding the size of the Agricultural Health Study compared to De Roos.

A. And other comments involving the meta-analysis and the weights used in the meta-analysis, but yes.

Q. Here, they say:

"The open letter states, 'There were only 92 NHL cases included in the AHS, Agricultural Health Study, unadjusted analysis, and fewer in the adjusted analyses, compared to 650 in a pooled case-control analysis from the United States.'"

That's the --

A. That a quote.

Q. That's a quote from you that we showed the jury just a moment ago?

A. Correct.

Q. And EFSA, the bottom paragraph, while discussing your comments, described your commentary as "misleading," correct?

A. That's what it says.

Q. And thought that you had not fairly represented the epidemiology data in that particular characterization we just read, true?

A. This is being taken out of context, but yes.

Q. I'm sorry?

A. It's taken out of context.

Q. EFSA notes that a comparison is made between the relative strength of the De Roos, et al.

That is the case-controlled study in your letter, correct?

A. Yes.

Q. And that is one of the case-controlled studies you talked about with the jury yesterday, correct?

A. Correct.

Q. And comparing that to the Agricultural Health Study, that's the De Roos '05, correct?

A. Correct.

Q. Okay.

"By using just one figure from each of those two studies, this is misleading."

Did I read it correctly?

A. You read it correctly.

And it is misleading, but it's taken out of context. The context of the sentence that they are quoting, that you have extracted here, dealt with the fact that there was weight given to the studies in the meta-analysis, but EFSA was giving all the weight to the cohort study.

Q. Okay. So the description of your prior letter as misleading is EFSA's, not mine, correct?

A. No. This is just a little piece of them

answering one sentence in a whole paragraph that dealt with the issue of them putting too much weight on the cohort study.

Q. So the answer to my question is yes?

The particular passage from your letter that EFSA is commenting on here, their description, not mine, is that your sentence that is quoted here was misleading, true?

A. True. That's what they say.

Q. Thank you. That's all I'm asking, sir.

Now, when you continue in this discussion -- well, let's just ask it this way: There are several points throughout the contents of this letter where EFSA specifically disagrees with your conclusions and how you characterize EFSA's work, true?

A. That is true.

Q. And at the end of this analysis, EFSA tells you what their conclusions are, right?

A. I don't recall.

Q. Well, it's in the section called "Summary" on page 12.

Tell me when you're there.

A. Yes, I'm there.

Q. Okay. And herein, EFSA says they've considered the arguments that you brought forth in your

letter, correct?

A. Yes.

Q. And the arguments you brought forth in your letter include some of the arguments that you've talked about with the jury, true?

A. Yes.

Q. And then going forward, EFSA says:

"There is very limited evidence for an association between glyphosate formulations and non-Hodgkin's lymphoma. And the overall evidence is inconclusive for a causal or otherwise convincing associated relationship between glyphosate and cancer in human studies."

Correct?

A. That's what it says.

Q. And that was their interpretation of the epidemiology evidence described in this letter, correct?

A. Correct.

Q. And then they go on to critique the animal data that you were relying on, correct?

Very next sentence.

A. Yes.

Q. Okay.

"There's no evidence" --

A. I was reading it to make sure that's the case.

Q. Okay.

"There's no evidence of carcinogenicity in either rats or mice."

And they go on to explain why they have come to that conclusion, right?

A. Can we finish the sentence?

Q. Happy to.

A. Thank you.

Q. Okay.

"Due to a lack of statistical significance in pairwise comparison tests, lack of consistencies in multiple animal studies, and slightly increased incidences only at dose levels at or above the limit dose, MTD, lack of pre-neoplastic lesions and/or being within historical control range."

Do you want me to keep going?

A. No. That's enough. That's exactly the points where they're also not following their own guidelines.

Q. I understand your opinion is that these scientists got it wrong as well, correct?

A. No. They're not following their own guidelines.

Q. They're saying they did follow the guidelines, they just came to a different conclusion, true?

A. I can tell you that their guidelines very

specifically state that the range of historical controls is not something you use to exclude a study.

Hence, in this one sentence, they have simply reinforced my belief that they did not follow their guidelines.

Q. And I'm sure -- Doctor, we know you have critiqued these other scientific groups and their analysis, and you believe they did not follow either their own guidelines or guidelines you think are appropriate for the reader.

A. That's correct.

Q. We'll take that as a given that that is your personal belief, okay?

A. Okay.

Q. But what you have to acknowledge at the same time is, throughout this letter, the scientists at EFSA are explaining to you why they came to the conclusions they did and why they believe they were following the guidelines, true?

Whether you agree with it or not, that is the conclusions of this organization; is that fair, sir?

A. That would be fair.

Q. Thank you.

Now -- and you know that in the final analysis, what EFSA concluded here is that, even with

IARC's decision and the Monograph explaining IARC's decision, even with your letter explaining your point of view, EFSA concludes that there's not a carcinogenetic risk with glyphosate, correct?

A. Carcinogenic risk, correct.

Q. Now, going back to --

A. Well, not likely a human carcinogen, is their conclusion.

Q. So we have here, EFSA's response to you.

And EFSA actually publishes a conclusion in 2017, correct?

A. Yes, correct.

Q. And I believe -- well, we'll get to that document in a minute.

But you sent another letter in 2017, correct?

A. Probably. Which letter are you talking about?

Q. Okay. If you would turn to Exhibit 5404.

A. Oh, there we go. Yes.

Q. And you identify this, sir, as a --

MR. ISMAIL: Before I finish that question, Your Honor, did you want to take another morning break, or should we press on?

THE COURT: No. We'll take a lunch break at noon or shortly after.

MR. ISMAIL: I just knew we had been going for

a while.

THE COURT: Madam Reporter, is that all right with you?

THE REPORTER: Yes, that's fine. Thank you very much.

BY MR. ISMAIL:

Q. Can you identify Exhibit 5404 as a May 28, 2017 letter that you wrote?

A. Yes, I can.

Q. And to whom did you write it?

A. The president of the European Commission.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection.

THE COURT: Go ahead.

BY MR. ISMAIL:

Q. So this is another letter that you wrote, correct?

A. Correct.

Q. And there was, earlier, some discussion that -- there was other signatories to the first letter that you sent to the European regulatory bodies.

This one is just you?

A. That is correct.

Q. And so we say -- this is an open letter review of the carcinogenicity of glyphosate by ECHA, that's the

European Chemical Agency?

A. Correct.

Q. EFSA, which is the European Food Safety Authority, and BfR, which is the abbreviation for a German word that means the German health science safety organization?

A. Yes. Risk assessment organization.

Q. And what you're sending it to is -- or commenting on all three of these organizations, because all three have some involvement in this review following the IARC meeting, correct?

A. I'm not sure that the intent of the letter was to comment on those, other than to inform them they had missed some tumors. That was all. But I'm sure there's comment in there.

Q. Okay. You write in the executive summary, your understanding of what both EFSA and ECHA included, correct?

A. Yes.

Q. And you said that both EFSA and ECHA have completed their assessments, right?

A. Right.

Q. And what was your understanding of what those two organizations concluded?

A. The evidence does not support a classification

for glyphosate.

Q. For what?

A. For glyphosate.

Q. And so you took -- you sent this letter to critique the EFSA/ECHA review, correct?

You're looking at me puzzled, so let me withdraw that question and ask a more precise one.

A. Okay.

Q. You sent this letter to point out some things that you believed these organizations did not consider appropriately in their prior review?

A. Correct. It wasn't a repeat of the previous complaints, which still exist.

Q. And these organizations had the benefit of your prior letter because you sent it to them, correct?

A. Correct.

Q. And now you're sending additional comments, pointing out additional information you thought should be considered?

A. That is correct.

Q. And you spell it out in your letter. We are not going to go through it in detail; we can if you like.

But you can confirm for the jury that it includes some of the things you discussed for the jury

here, right?

A. It was my analysis of the raw data that brought forth new tumors that I felt they hadn't considered.

Q. And that includes some of the analysis you shared with the jury here in court?

A. Absolutely.

Q. You got a response, did you not?

A. I did get a response.

Q. That's at Exhibit 5395.

Tell me when you're there, sir.

A. I'm there.

Q. Do you recognize this exhibit as the response jointly signed by an official from ECHA and an official from EFSA?

A. Yes.

Q. In July of 2017?

A. Yes.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection.

THE COURT: Granted.

BY MR. ISMAIL:

Q. Again, just to orient everyone here, this is actually a joint response to you from both organizations, correct?

A. Correct.

Q. And I believe L-U-G is some abbreviation, maybe in Italian, for July?

A. That is correct.

Q. So now we're two-years-plus after IARC, correct?

A. Correct.

Q. And this is a letter to you.

It's directed to "Dear Dr. Portier," correct?

A. Correct.

Q. Now, in this letter, these two officials describe what had occurred to date, which is that there had been -- sorry. Before we get there.

This letter is saying it's got -- has the input of both EFSA scientists, ECHA scientists, and those from the German safety organization, correct?

A. Correct.

Q. So this is a joint letter that has conclusions from three different organizations and their respective scientific bodies?

A. Correct.

Q. And they reference, sort of, the history of the review that you and I have gone over, which includes the various conclusions of these regulators regarding the same types of information we talked about with the

jury so far in this trial, correct?

A. That was a complicated statement.

Q. I'll make it simpler.

In its review of glyphosate, you can confirm that EFSA and BfR looked at human epidemiology, true?

A. Yes, true.

Q. They looked at mechanism data, true?

A. True.

Q. And they looked at rodent -- the rodent data, as well?

A. That's correct.

Q. And they came to a different conclusion than you?

A. That's correct.

Q. Now, in this letter, these two officials, the head of -- let's get their proper titles.

Director of Risk Management and the EFSA Head of Department of Scientific Evaluation of Regulated Products.

That's who you directed this letter to?

A. That's who wrote back, yes.

Q. And you know these are both Ph.D. scientists who lead these organizations, correct?

A. That, I do not know.

Q. You do not know them personally, I take it?

A. No.

Q. And in the course of this letter, both EFSA and ECHA are telling you that they've considered your comments, both those that you made in 2017 and that you've made in 2015, and continue to disagree with your opinions.

Is that fair?

A. That's -- it's a long letter. That summary is -- if I could try in my own words?

Q. Please.

A. What they're basically saying is, no, we considered all these tumors you've given to us. We just didn't write about them in the actual report.

And then they gave me case-by-case on each of the tumors that I had put together for them.

Q. So what these organizations and scientists are telling you is, no, we didn't miss the tumors; we considered them and just didn't write up those analyses in the relevant documents?

A. Effectively, that's what they're saying.

Q. So it's not as if they didn't -- at least that's their description -- consider those tumors, they just disagree with you as to whether they are evidence of a positive finding.

Fair?

A. I didn't say these are evidence of a positive finding. I simply told them these are things.

I mean, I don't know if they're coming back to me and saying -- I don't remember that part in here.

Q. Then I'll make it shorter.

A. Okay.

Q. EFSA and ECHA are telling you, hey, Dr. Portier, thank you for your letter. We are aware of the information you brought to our attention, and we continue to believe that glyphosate is unlikely to be a carcinogen.

Fair?

A. I think that would be a pretty fair statement of what they wrote.

Q. And as we go through this letter -- it's actually a pretty detailed description of statistical methods, EFSA and ECHA's assessment of the findings of the various rodent studies, correct?

A. There's some of that in there.

Q. And it goes on for several pages.

And if you actually go through, as they go to their conclusion, which is on page 11, I believe -- there it is.

You see the section "Conclusions"?

A. Yes, I do.

Q. And then they go through and they describe what they conclude from the rodent data that you were -- that had been generated and what you were pointing out to them, correct?

A. Correct.

Q. And similar to what we looked at before, EFSA and ECHA have a different conclusion as to what those data show than what you shared with the jury, true?

A. That is true.

Q. And we know from your comments earlier that you disagree with these scientists and how they approach their work and how they interpret the data, right?

A. I -- I'm not sure it's disagree, okay? I just simply feel they did not follow their own guidelines.

Q. So you disagree with them that they followed their own guidelines?

A. Absolutely.

Q. And they were telling you, hey, we believe we followed our own guidelines?

A. That's correct.

Q. So that level of disagreement is Dr. Portier telling EFSA and ECHA, my view is that your scientists did not follow your own associations guidelines.

True, so far?

A. True.

Q. And they wrote back and said, no, we do believe we followed our own guidelines, correct?

A. Correct.

Q. And your interpretation of the data led you to conclude one thing, correct?

A. Correct.

Q. And you talked with the jury about what your conclusions have been and the personal opinions you have, right?

A. Correct.

Q. And these other scientists are writing back to you and saying, we're looking at the same data, and we just have a difference of opinion on the scientific literature, correct?

A. Correct.

Q. Now --

THE COURT: If you're at a transition at some point in the next 15 minutes --

MR. ISMAIL: Pick a spot?

THE COURT: Yeah, just pick a spot.

MR. ISMAIL: Thank you, Your Honor.

BY MR. ISMAIL:

Q. I'll just complete the timeline here.

Starting back pre-IARC with the German safety review, the re-review in light of IARC, the back and

forth, the scientific back and forth you had with EFSA and ECHA, we sort of walked through that with the jury here.

And that's sort of what we're summarizing on this timeline, correct?

A. Correct.

Q. And as far as, you know, sir, it remains the opinion and findings of EFSA and ECHA today that glyphosate is unlikely to be a carcinogen, correct?

A. They would not classify it as a carcinogen, correct.

Q. So the conclusions we just reviewed remain the official position of those European Union-wide organizations, correct?

A. Correct.

Q. And you talked about this morning, a reference to France putting restrictions on over-the-counter versus agricultural use.

Do you remember that?

A. Yes.

Q. That is not -- there's not a scientific document from France that French officials are critiquing the evidence that we talked about with the jury that you're aware of, correct?

A. I'm not aware of one, but I haven't looked for

one.

Q. Sure. So that was the -- the decisions of France that you referred to a moment ago, at the end of your direct testimony, is not a specific scientific review that we've talked about, to your best understanding?

A. Again, I can't comment on it. I haven't looked. I have no clue.

Q. So when you told the jury this morning, in response to Mr. Wisner's questions, there's restrictions in France; in fairness, you have no idea what that's based on?

A. No, I have no idea what it's based on.

Q. That's important information to know.

So you have no idea what the process was that France went through to make that decision, if, indeed, they have?

A. That is correct.

Q. And in terms of the official scientific review, that's what we've talked about with the jury in terms of the European Union-wide effort to assess this product.

Fair?

A. That's fair.

Q. And as far as you know, the German

organization, the BfR, hasn't changed their view regarding glyphosate, true?

A. Yes. I have no idea. The only thing I have from them is the draft. Their draft -- their documents that they put up to EFSA.

Q. It's not their draft; it's their --

A. Review of the science.

Q. Perfect.

A. Suggested review of the science for peer review by EFSA's committee.

MR. ISMAIL: And on that, Your Honor, this is a good time.

THE COURT: Ladies and gentlemen, we're going to take 45 minutes for lunch. We're going to be breaking at 3:30 today. So we're only going to take 45 minutes for lunch. So please be ready to come back in at 12:35.

Please don't discuss anything you've heard this morning with yourselves or amongst anyone else. Thank you very much.

(Luncheon recess was taken at 11:51 a.m.)

AFTERNOON SESSION 12:42 p.m.

(The following proceedings were heard in the presence of the jury:)

THE COURT: You may be seated.

All right, Mr. Ismail. You may proceed.

MR. ISMAIL: Thank you, Your Honor.

BY MR. ISMAIL:

Q. Good afternoon, Doctor.

A. Good afternoon.

Q. Are you ready to proceed?

A. Yes.

Q. Okay, terrific.

Doctor, I want to continue our discussion. We were just going through some assessments and conclusions of some folks at different scientific organizations in Europe, and I want to continue on that discussion in terms of the EPA, okay?

A. Okay.

Q. In your binder, there should be Exhibit 5737.

A. Okay.

Q. Can you identify that, sir, as a -- let me back up one step.

I think you told us this morning, or maybe it was yesterday, that EPA has been in the process of considering and assessing the alleged cancer risk with glyphosate over the past couple of years, right?

A. That is correct.

Q. And you indicated that, at one time, the EPA set out some assessment for public comment, correct?

A. Correct.

Q. And in 2016, you submitted your comments and interpretation of the data directly to the EPA, correct?

A. Correct.

Q. And what we're looking at, Exhibit 5737 is one such set of your comments to the EPA, correct?

A. This is the first comment, correct.

Q. I'm sorry?

A. The first comment, correct.

Q. Yes. You had subsequent comments as the dialogue continued on the scientific debate, correct?

A. Correct.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection.

THE COURT: Yes.

BY MR. ISMAIL:

Q. We have up on the screen, sir, what we were just referring to as your first set of public comments.

A. Yes.

Q. And as you indicate: My comments -- you describe them as rather long and detailed, correct?

A. Correct.

Q. We don't have to go through each and every one of these comments, but what you are doing here is setting forth your interpretation of the data, and as

you described previously, where you think the EPA scientists differed in what you understood to be the guidelines for review.

Is that fair?

A. That is fair.

Q. And so the EPA, at least since 2016, has had the benefit of your perspective on the questions we've been talking about with the jury, true?

A. True.

Q. Now, in the final analysis -- in your letter, you articulate your point of view that EPA should classify glyphosate as a carcinogen, correct?

A. I'm not sure. I say a lot of things.

Q. You do.

A. I'm not certain.

Q. I'm sorry?

A. I'm not certain.

Q. If you want to confirm it, page 4, last paragraph. "Probable human carcinogen," that was Dr. Portier?

A. Yes.

Q. And you marshal whatever arguments you have to support and set that forth for the scientists at EPA to consider, correct?

A. Correct.

Q. And then the EPA had a -- I think the Scientific Advisory Panel was some subject of your testimony yesterday?

A. Correct.

Q. And that is an organization that is outside the EPA. I called it an organization. It's a group, outside the EPA, of scientists and specialists who advise the EPA on certain issues?

A. Correct.

Q. And you have some familiarity with groups of the SAP, correct?

A. Yes.

Q. And in this case -- well, the SAP is part of a peer review process for EPA.

Is that a fair description of it?

A. They're set up under the law. They are required to have it. It's not peer review; it is an advisory panel. It's advice.

In fact, seldom do they actually peer-review something. Mostly what they do is just provide general advice.

Q. I'll rephrase in light of your comments.

It's an effort by which the EPA has set, by law, to sort of improve the quality of the scientific process and conclusions for the agency.

Is that fair?

A. Specifically for pesticides.

Q. Specifically for pesticides.

So it's part of that improvement of the scientific process for test sides?

A. Correct.

Q. So the EPA had the benefit of the comments from the Scientific Advisory Panel in 2016, right?

A. The Scientific Advisory Panel, in 2016, was asked to answer questions that EPA gave them -- very specific questions to answer -- about their document.

Q. Right. And that's the EPA's assessment about the alleged cancer risk with glyphosate?

A. And that was the first draft.

Q. Right. And the SAP includes -- I think you went through some of the folks who were on that panel -- people with relevant expertise, toxicologists, biostatisticians and the like?

A. Yes.

Q. And that's the goal, is to get some input from people who have something relevant to say?

A. Correct. Again, I want to be accurate. So there's the SAP, and then there are special added scientists to the SAP.

So you mean the entire meeting group, which is

the SAP and the added scientists.

Q. And I appreciate the distinction.

So there's a standing group. And then as particular issues come, the SAP or EPA or whoever can bring in additional expertise to help the EPA come to the correct decision?

A. That is correct.

Q. And you know some of the people on the SAP, correct?

A. At that particular meeting, yes.

Q. That's what I was getting at.

So the meeting that we've been talking about with respect to glyphosate review, you indicated that you know some of the folks who helped advise the EPA.

A. Correct.

Q. And who are some of those people?

A. Well, the first one that comes to mind is my brother. The rest, I would have to look at the list again to remind me which ones I really know.

Q. You told the jury Dr. Zhang, Dr. Sheppard, I think, yesterday.

A. I don't know Dr. Zhang.

Q. Oh, okay. You know of her?

A. I know of her.

Q. Fair enough.

But you said a moment ago that your brother was on the SAP that -- the Scientific Advisory Panel that helped provide comments to EPA, correct?

A. To answer EPA's questions, correct.

Q. And I think you told us yesterday, in some of your first comments to the jury, that you followed your brother to the University of North Carolina, and you both have degrees in biostatistics, I believe?

A. That's correct.

Q. And your brother is a Ph.D., as well?

A. That is correct, yes.

Q. And he actually spent some time as a researcher at an academic institution specifically about health risks in agriculture, correct?

A. I'm not sure about health risks, but certainly agriculture.

Q. And then following that, your brother went to serve at the American Cancer Institute?

A. American Cancer Society.

Q. Thank you.

And he served there as the principal statistician for about ten years?

A. Yes, that's correct.

Q. And at the time of the SAP on glyphosate, your brother was in that capacity -- was in that position at

the American Cancer Society, but participating in the SAP on his own badge?

A. Correct.

Q. Have you, as part of this case, reviewed the comments and advice your brother gave the EPA at this meeting?

A. The actual verbal record?

Q. Yes.

A. No, I have not.

Q. Okay.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

MR. WISNER: Your Honor, can we have a short sidebar about this?

THE COURT: Sure.

(Sidebar discussion not reported.)

BY MR. ISMAIL:

Q. Dr. Portier, a new question.

Are you aware that some of these qualified expert scientists that were on this SAP that we've been talking about with the jury commented on the EPA's conclusion regarding glyphosate and concurred and agreed with the EPA assessment?

A. I would have to look back at the full report from the committee to see if it was -- if they fully

concurred.

The assessment -- are you talking about the final decision or the overall assessment itself? Because that's two different things.

Q. Sure.

My question went to the final assessment of EPA that glyphosate is not a human carcinogen.

A. I am aware that some members said that, not likely to be a human carcinogen.

Q. And when we say "some members," we're talking about these -- the Scientific Advisory Panel and the scientists for whom you described are brought in to help advise EPA on matters of science?

A. Correct.

Q. Now, you are aware that following the EPA's -- sorry. That public hearing and the written comments from the SAP, the EPA issued a further document on the alleged cancer risk with glyphosate, correct?

You went over it on your direct examination?

A. Yes. I don't think they called it that. But yes, they had a document.

Q. It was the revised glyphosate paper that you talked about with Mr. Wisner, correct?

A. Correct. That's the paper.

Q. And it's in the binder I gave you at

Exhibit 4941.

But if you have notes or anything on the version Mr. Wisner gave you, feel free to refer to that.

MR. ISMAIL: I believe this was already allowed to be published, Your Honor.

MR. WISNER: No objection.

THE COURT: Granted.

BY MR. ISMAIL:

Q. This is the December 12th, 2017 revised glyphosate position paper, correct?

A. Yes, it is. I think.

Q. And just in terms of how this document is organized, it's actually several hundred pages long, correct?

A. Correct.

Q. And if we go towards the end, you'll see that there's actually -- on page 148 or 147, there's references.

And you're familiar with scientific papers, that the scientists who are preparing the documents will conclude the scientific references in support of the conclusions that it reached?

A. Yes.

Q. And that's what's reflected here and goes on for many more pages?

A. Yes.

Q. And in terms of what the conclusions were, if you go to page 133, there's a discussion here about the epidemiology data, correct?

A. There is a discussion.

Q. Let's put it up so folks can follow along.

The first sentence says: "At this time" -- and by the way, the EPA in this document, the scientists who wrote this were considering many of the epidemiology studies you discussed with the jury during your direct examination, correct?

MR. WISNER: Objection. Speculation.

MR. ISMAIL: I'm sorry?

THE COURT: Overruled.

THE WITNESS: Oh. Ask the question again, please.

BY MR. ISMAIL:

Q. Well, in this document, the EPA scientists discussed some of the epidemiology data that you discussed with the jury during your direct examination, true?

A. True.

Q. And it says:

"At this time, a conclusion regarding the association between glyphosate exposure and

risk of NHL cannot be supported based on the available data due to conflicting results."

Is that what the EPA scientists concluded here?

A. That's what it says, yes.

Q. You disagree?

A. Yes, I disagree.

Q. Now, if you turn the page, there's a discussion of some of the animal data.

Now, in fairness, this document has pages and pages of discussion, but we're just talking about what the bottom-line conclusions are.

And there's a discussion of the eight rat and six mouse studies, correct?

A. Yes, correct.

Q. And it talks about what the EPA scientists concluded: "None of the tumors" -- second sentence:

"None of the tumors evaluated were considered to be treatment-related based on weight of evaluations," correct?

A. That's what it says, that's correct.

Q. Do you disagree with the conclusion of the EPA scientists, as stated here?

A. Yes, I disagree with them.

Q. The EPA scientists also considered the

mechanism issues that you talked about with the jury, correct?

A. Correct.

Q. If you go to page 143, Section 6.7.

Tell me when you're there, sir.

A. Yes, I am.

Q. Now, before we get further down this document here on this discussion -- well, this is the sentence I wanted to direct your attention to.

Here it is at the bottom:

"This includes epidemiological, animal carcinogenicity, and genotoxicity studies."

And that's part of the current evaluation for registration review.

Do you see where I am?

A. Yes, I do.

Q. As the EPA is describing here, they're looking at the same pillars of evidence you told the jury would be appropriate for any cancer risk assessment, correct?

A. Correct.

Q. And as we go further in this document, the EPA undertakes further discussion of the data that you've talked about with the jury, correct?

MR. WISNER: What page are you on?

MR. ISMAIL: 144.

MR. WISNER: Thank you.

BY MR. ISMAIL:

Q. It goes through and discusses the extensive database for evaluating -- here we are: 63 epidemiological studies, 14 animal carcinogenicity studies and nearly 90 genotoxicity studies for the active ingredient glyphosate, correct?

A. That's what it says. It's not correct, but it's what it says.

Q. And then they go on to do a discussion of the Bradford Hill analysis, correct?

A. Yes, correct.

Q. And that was what you ended your direct examination with today?

A. That's correct.

Q. And you described that as being -- I think you disagreed that it was a method, but it was a process of assessing causality?

A. I don't disagree with the method. I just simply said it had been modified.

Q. It's a process scientists can use to assess causality?

A. Correct.

Q. What the EPA scientists are doing here, they are going through the modified Bradford Hill criteria,

much of the same categories that you went over with the jury, correct?

A. Correct.

Q. And what they conclude, in going through the analysis, is that glyphosate is not likely to be a human carcinogen, correct?

A. The middle paragraph, yes.

Q. That's -- right.

After going through all the analysis and describing it, that was the EPA's conclusion, correct?

A. Correct.

Q. And this is where the EPA describes its final conclusion.

What did the EPA conclude in December of 2017 was the strongest support, what classification?

A. Not likely to be carcinogenic to humans.

Q. And that is the current EPA evaluation for glyphosate today, true?

A. It's whatever it was before they started reviewing. I think that's what it was. They haven't finalized this. So this is not the current opinion. The current opinion is the registration opinion.

Until this is finalized, this opinion won't hold. So whatever the old registration opinion is.

Q. Which is what?

A. I think it's not likely to be carcinogenic to humans, but I'm not certain.

Q. Thank you.

When we took your deposition a few weeks ago, didn't you tell us that you had not read all of the EPA's 2017 review?

A. That's true.

Q. I think you told us that you maybe only read the executive summary; is that right?

A. That, and pieces and parts of it.

Q. And have you since read the entirety of the EPA's entire review?

A. I don't think I've been through every appendix, table, et cetera. But I would characterize it as I read the report.

Q. And when did you do that?

A. What did I do then?

Q. When did you do that?

A. When did I do that?

Shortly after the --

Q. Last time you gave a deposition?

A. Yes.

Q. So are you aware, sir, that as recently as December 2018, the EPA has reaffirmed its conclusion that was in the 2017 document that we just went over

with the jury?

A. No, I'm not aware of that.

Q. After your last deposition, have you made yourself available of the 2018 statements by EPA reaffirming their confidence in the assessment made in December of 2017?

A. I went to their website. I didn't see anything, but I might have missed it.

Q. Now turning to the question of -- we saw earlier, in the Canadian assessment, that they reference that the scientific bodies in Australia had done a similar review, correct?

A. Had reached a similar decision. I don't think they said they did a similar review.

Q. So if you can turn to Exhibit 4136.

A. I have it.

Q. Very good.

MR. ISMAIL: Your Honor, permission to publish that with respect to the judicial notice.

THE COURT: Yes.

MR. WISNER: No objection.

BY MR. ISMAIL:

Q. We have up on the screen, Exhibit 4136. It's the final regulatory position consideration of the evidence for a formal reconsideration of glyphosate

conducted by the Australian Pesticides and Veterinary Medicines Authority.

A. Is that what you have --

Q. Yes. Is that what this document is?

A. Yes.

Q. And if you look at the -- if you turn to page 9 of the document, sir.

A. Okay.

Q. After describing their process and what they looked at, what was the final regulatory position of the Australian scientific review body on the first bullet point?

A. It says:

"Exposure to glyphosate does not pose a carcinogenic or genotoxicity risk to humans."

Q. You disagree with the conclusions of the scientific authority in Australia, as well, correct?

A. Correct.

Q. As of the last time we had -- at your last deposition, you had not formed any opinion as to whether or not the Australian regulators did or did not follow their own guidelines in making this assessment, correct?

A. That is correct.

Q. Now, turning back to Canada, which was --

A. But to correct that statement, I have since

read what they did --

Q. And I take it you disagree --

A. -- in the reassessment.

Q. I take it you disagree with not only their conclusions, but how they came to their conclusions?

A. I'm actually confused about what this document in front of me is. No, there it is. Okay.

No, this is what I read. They didn't do a new assessment. That's what this is.

Q. They decided, based on their -- the question posed, as to whether to do a reevaluation based on the evidence that was presented at IARC about this.

Correct?

A. That was the question they were asked to look at.

Can I take a little bit of time to explain?

Q. In the effort of trying to finish today, sir, if you need to clarify your prior testimony, that's fine.

A. I just want to point out that what they ended up doing was evaluating three papers and accepting the evaluations of other papers that had come from EPA.

Q. Right. So what they did was, they looked at some of the scientific material that came to conclusions different than yours and agreed with those other

scientific papers?

A. They looked at the material that IARC referenced that they had looked at before, narrowed it down to a number of papers, which they reviewed three of, and accepted EPA's review of the others.

Q. And this is their final regulatory position?

A. That is correct.

Q. So now turning back to the Canadian review, which we chatted about briefly, that's Exhibit 5129.

A. There it is. Okay.

Q. In the executive summary at the top, it says:

"Health Canada's primary objective in regulating pesticides is to protect Canadians' health and their environment."

Right?

A. That's what it says.

Q. I think you agreed with me this morning that Health Canada is a scientific health organization, correct?

A. That is correct.

Q. And then if you go through this document, on page 8, does the Health Canada organization give their overall finding?

It's on the screen, sir, if it's easier to follow.

A. What page?

Q. I'm sorry, page 1.

A. Oh.

Q. It's -- there's two different numberings, one is page 8, the other is page 1.

A. Yes, I see it.

Q. First of all: The overall finding from Health Canada, glyphosate is not genotoxic.

Correct?

A. Correct.

Q. And you disagree with that, correct?

A. Yes, I do.

Q. And furthermore, glyphosate is unlikely to pose a human cancer risk, true?

A. That's what they say, and I disagree with that.

Q. Now, in doing this review you see above, Health Canada indicates -- well, in doing this review, Health Canada had available to it the decisions of IARC, correct?

A. That's correct.

Q. And do you know that your comments had been forwarded to Health Canada to consider, as well?

A. Somebody mentioned that at the last deposition. I don't know it firsthand.

Q. I want to provide further comments from Health Canada, sir. It's Exhibit 5131 in your binder.

MR. WISNER: 5131?

MR. ISMAIL: 5131.

Oh, I'm sorry, it's not in your binder.

Permission to approach, Your Honor?

MR. WISNER: May I approach, Your Honor?

THE COURT: Yes.

(Sidebar discussion not reported.)

THE COURT: We're going to take a real quick break for Juror Number 3.

(Recess taken at 1:17 p.m.)

(Proceedings resumed at 1:19 p.m.)

(The following proceedings were heard in the presence of the jury:)

THE COURT: You may proceed.

BY MR. ISMAIL:

Q. Dr. Portier, we're looking at Exhibit 5131.

My first question to you, sir: Have you seen this document before today?

A. No, I have not.

MR. ISMAIL: Your Honor, I provided just now to Mr. Wisner a demonstrative that he's reviewing, but I would like to walk through it with Dr. Portier.

MR. WISNER: I have a cumulative objection,

but it's fine, Your Honor. No objection to publish it.

MR. ISMAIL: Okay.

BY MR. ISMAIL:

Q. Dr. Portier, we've gone through now several position statements -- scientific documents with the jury. I want to see if we can wrap up this conversation, okay?

A. Okay.

Q. Now, on the left, we have the various scientific organizations that we've covered: ECHA, EFSA, EPA, Health Canada, and Australia.

And in the middle, we have some -- the statements that we've read to the jury from their conclusions, okay?

A. Yes.

Q. And I want to find out whether you, Dr. Portier, agree or disagree with how these scientific organizations have characterized the issue that the jury is deciding.

A. Okay.

Q. First one, ECHA:

"Based on the epidemiological data, as well as the data from long-term studies in rats and mice, taking a weight of evidence approach, no hazard classification for carcinogenicity is

warned."

Do you agree or disagree?

A. Disagree.

Q. Now EFSA. That's one of the organizations you corresponded with, correct?

A. Correct.

Q. What was EFSA's conclusion in their review?

A. It's right here.

Q. Right.

"Glyphosate is unlikely to pose a carcinogenic hazard to humans."

Correct?

A. Correct.

Q. And do you agree or disagree?

A. Disagree.

Q. EPA: As it's provided here, do you agree or disagree with the EPA's conclusion?

A. Disagree.

Q. Health Canada, their conclusion that we just saw is that:

"Glyphosate is not genotoxic and is unlikely to pose a human cancer risk."

Do you agree or disagree?

A. Disagree.

Q. And the last one we just looked at was

Australia, and we just had it up on the screen.

Do you agree or disagree with this conclusion?

A. Disagree.

Q. Now, you told the jury this morning, I believe, that -- you were asked a question about California EPA.

Do you recall that?

A. Yes, I do.

Q. And when we last had a chance to talk to you a couple weeks ago, do you recall testifying that you do not -- that you didn't even know whether or not California EPA determined whether glyphosate was a known carcinogen?

A. I don't recall saying that. It would be wrong.

Q. Would you like to see your testimony?

MR. WISNER: Your Honor, this will require another sidebar.

MR. ISMAIL: Let's just move on. We're trying to get to the finish line here, okay?

MR. WISNER: Sorry.

BY MR. ISMAIL:

Q. So as to the California EPA, in terms of their process that they determined, whatever it is that they determined, you don't work for that agency, correct?

A. That is correct.

Q. And do you know, sir, that the California EPA, to make the determination that you testified to this morning, there's not an independent scientific review to make that determination?

A. I do know that, correct.

Q. All that requires is, if IARC has made a determination, that automatically gets a certain classification by California EPA, true?

A. It's a tad more complicated, but approximately that.

Q. So there's not one of these rigorous scientific evaluations, the likes of which we've talked about with the jury today, by California EPA to make the determination you testified to?

A. That's correct.

Q. Okay. So I would like to turn, Doctor, to our conversation of the mechanism studies, okay?

A. Okay.

Q. Now, one of the issues you raised was genotoxicity, right?

A. Correct.

Q. Now, just from a big picture perspective, from the time glyphosate was approved to be used and up until that IARC meeting in March of 2015, no public health

agency ever determined glyphosate was genotoxic, correct?

A. As far as I know. Again, I can't know what every public health agency says.

Q. Those that you're aware of?

A. Correct.

Q. Now, genotoxicity is what occurs when there's damage to cells, correct?

A. Damage to their DNA.

Q. To their DNA.

Now, it's fair to say that we all have damage to our cellular DNA going on all the time?

A. That's correct.

Q. A lot?

A. A good amount, yes.

Q. And human cells ordinarily have this damage to the DNA, but there's a repair mechanism involved?

A. Correct, several.

Q. You talked about that in your direct examination. You had a cartoon up where you went through that, correct?

A. Correct.

Q. So just having a genotoxic finding itself does not lead to cancer, correct?

A. Correct.

Q. And for a chemical to cause cancer through genotoxicity, the genetic change has to progress to a mutation, true?

A. A specific type of mutation, true.

Q. So just because any exposure, a chemical, anything, can cause damage to DNA, that doesn't mean it's going to cause a mutation, true?

A. It doesn't guarantee it, that is true.

Q. Okay.

A. A crucial mutation, let's say it that way. You will get mutations, but they won't be crucial.

Q. And I appreciate that precision.

It's not just any mutation you need, you need to have one of the crucial ones you described yesterday?

A. Correct.

Q. So the genotoxicity studies Mr. Wisner put up on the board and put pluses, minuses, question marks, do you recall doing that yesterday?

A. Yes.

Q. None of those studies showed that glyphosate caused genotoxicity that progressed to actual mutations, true?

A. Give me a second to go through the assays.

I believe that's true.

Q. What is a mutagen?

A. It's a chemical that causes a mutation, or something that causes a mutation.

Q. You've reviewed the evidence on mutagenicity with glyphosate, right?

A. What little evidence there is.

Q. And there's not enough evidence to say that glyphosate causes mutations, true?

A. That is true.

Q. In fact, those tests that exist for glyphosate are overwhelmingly negative, correct?

A. The only tests that exist for mutations for glyphosate are the salmonella tests.

Q. And they are overwhelmingly negative, correct?

A. They are overwhelmingly negative.

Q. Now, going back to the National Toxicology Program, NTP, you've described that organization as doing excellent work, correct?

A. Correct.

Q. You recognize NTP as an authority?

A. Yes, I do.

Q. And we said earlier -- I think you agreed earlier that there was no public health agency of which you were aware that concluded that glyphosate causes genotoxicity, and that includes the NTP, right?

A. Yes, of course.

Q. Now, you've described the NTP as the gold standard, correct?

A. For the animal cancer studies, absolutely. I haven't described it -- not here today. But yes, before, I have.

Q. Yes. I believe -- in your litigation report, I believe you use that phrase, correct?

A. Probably.

Q. So you agree with that description, how about that?

A. Yes, absolutely.

Q. Very good.

So that includes -- so the NTP is the gold standard not just in doing the test, but also in presenting the results, correct?

A. Yes. For cancer studies. Again, for cancer studies.

Q. In 1992, were you working at NTP?

A. I was working with NTP. I was technically at NIEHS.

Q. So you were working with that organization?

A. Correct.

Q. And are you aware, sir, that NTP assessed whether or not glyphosate was genotoxic in 1992?

A. No, they did two studies. One study in two

species. And reported out that study.

Q. You've read that report, have you not?

A. Yes, I have. It's part of my review.

MR. ISMAIL: Can I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Do you recognize Exhibit 4455 as a copy of that report, sir?

A. Yes, I do.

MR. ISMAIL: Can I publish, Your Honor?

MR. WISNER: No objection.

THE COURT: Yes.

BY MR. ISMAIL:

Q. Is that what we have up on the screen, sir?

A. Yes, it is.

Q. Now, if you turn to page 2, you'll see the individuals who contributed to this report.

A. Yes.

Q. And without going through each of their qualifications and their names, it looks like there are one, two, three -- about ten or so Ph.D. scientists on this review?

A. Yeah.

Q. And in addition to that -- I think you would agree that NTP has excellent scientists?

A. Yes, I would agree.

Q. If you go to page 7, it describes the peer review panel for the preparation of this report.

Is that right?

A. Yes, it does.

Q. And that's common with the preparation of NTP scientific reports, is that they undergo peer review?

A. Yes.

Q. This particular discussion includes -- this particular review includes a discussion of a rodent study done by the researchers at NTP, correct?

A. Correct.

Q. Have you had a chance to review that data?

A. Yes, I have.

Q. If you go to page 14 -- I just want to orient you to the study.

You'll see that the methods are described there?

A. Correct.

Q. You'll see the rodents are given very large doses, correct?

A. Yes.

Q. And if you go to page 16.

A. I thought that's where we were.

Q. Well, we're there now.

Do you see that it describes a couple of the tests -- it describes the mutagenicity studies and the peripheral blood micronucleus test?

A. Correct.

Q. And that's what the researchers at NTP were looking at, correct?

A. That is correct.

Q. And they report -- in terms of what they were looking at here in this micronucleus test, 10,000 normochromatic erythrocytes from each animal were scored for micronuclei?

A. Yes.

Q. And micronuclei is part of that process of genotoxicity described?

A. It's a label for genotoxicity being there.

Q. So that's one of the --

A. Markers.

Q. Markers, perfect.

So these authors report the results of their work, correct?

A. Correct.

Q. If you go to page 36.

Are you there?

A. Yes.

Q. I'm at the section that starts, "The results."

A. Yes.

Q. Okay.

"The results of the salmonella" --

A. Typhimurium.

Q. -- "assays," and that means tests, correct?

A. Correct.

Q. Okay.

"And micronuclei tests showed no evidence that glyphosate is genotoxic."

Did I read that correctly?

A. Yes, you did.

Q. And then they go on to describe that their findings agree with similar conclusions by some of the other findings in the literature, correct?

A. Correct.

Q. Using standard test methods for testing genotoxicity, correct?

A. Correct.

Q. And this was the finding of the National Toxicology Program even at the time you were working with them, true?

A. This is the finding of that one study, correct.

Q. The other method you described was oxidative stress?

A. Yes.

Q. Now, oxidative stress is happening all the time in our bodies, correct?

A. Correct.

Q. Exercise causes oxidative stress?

A. It increases the amount of free oxygen radicals in our cells.

Technically, I don't know if you would call that oxidative stress under that situation, but it does increase the free oxygen radicals.

Q. You've called it oxidative stress?

A. I would have to say yes, oxidative stress increases in your muscles when exercising.

Q. And being sick, having a cold, can cause oxidative stress?

A. In some tissues, yes.

Q. An exposure that increases oxidative stress does not mean that it causes cancer.

Would you agree with that?

A. I would agree with that.

Q. Oxidative stress is not unique to cancer induction, true?

A. True.

Q. In fact, there are some medicines that are used to treat cancer that cause oxidative stress,

correct?

A. That is correct.

Q. The body has repair mechanisms that are constantly responding to cellular damage, including oxidative stress, correct?

A. Because you put damage in there, I'm a little confused. Oxidative stress is not cellular damage.

Oxidative stress is a normal process in the cell. It can cause cellular damage, but there are things in place to fix the cellular damage, and there are things in place to catch the free oxygen radicals.

Q. Thank you.

No oxidative stress study that you reviewed with the jury can establish in and of itself that glyphosate causes NHL.

You would agree with that?

A. I agree with that statement.

Q. Now, when you showed the jury yesterday a board that said -- I think it said in vitro oxidative stress data. I forget exactly what the board was titled.

But do you recall going through with the pluses and minuses again?

A. Yes.

Q. You're aware that your former colleagues at

NTP have studied oxidative stress with glyphosate, correct?

A. I have some recollection of it. I'm not absolutely certain. I certainly have not seen a publication, if there is one. It didn't come up in my search.

MR. ISMAIL: Can I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. I've handed you what's been marked as Exhibit 5810, Dr. Portier.

You've been to scientific conferences before, I assume?

A. Yes, I have.

Q. And you recognize the format of a poster presentation that scientists will give to their scientific colleagues at a meeting such as this?

A. Yes, I do.

Q. And this particular poster presentation is entitled "Effects of Glyphosate and its Formulation on Markers of Oxidative Stress and Cell Viability," correct?

A. "In HepaRG and HaCaT Cell Lines," yes.

Q. Those are human cell lines?

A. Those are human cell lines.

Q. And this poster presentation is actually from 2018 or 2019, very recent.

A. I don't know.

Q. Well, when you were talking with Mr. Wisner yesterday, that EPA and NTP were collaborating or discussing doing further human cell testing regarding glyphosate, did you look to see whether those tests were done?

A. I searched the literature for information on those -- on everything that's been published.

Q. So in terms of what's reported in the results here, is it your testimony to the jury that you were unaware of the findings of the National Toxicology Program on the precise issue you discussed with the jury?

MR. WISNER: Your Honor, I'm going to object. This is undated, it doesn't state where it was published. I don't know how the line of questioning is proper.

THE COURT: He can answer the question.

THE WITNESS: As I said before, I heard they were doing it. I don't recall ever seeing a final publication on it. I can't even read this. I don't know what this product is and what the results really are in here.

But that's the most I can tell you, my remembrance of this.

BY MR. ISMAIL:

Q. So let me just back that up a little bit.

You know the NTP scientists were looking at this question of oxidative stress with glyphosate and its formulations, correct?

A. Correct. I thought they were looking at it in the high 2-foot screening program, not this way.

Q. When you say "this way," this is a human cell study, correct?

A. It's a classic in vitro study of oxidative stress.

Q. Classic in vitro study of oxidative stress, the likes of which you were discussing with the jury yesterday?

A. Correct.

Q. And are you saying to this jury that you don't know what the NTP found about oxidative stress and glyphosate?

A. Obviously, they must have found nothing. But again, I don't recall ever having really reviewed this. So I don't have an opinion on it one way or the other.

MR. ISMAIL: May I examine the witness on the contents, Your Honor, or would you like me to move on?

THE COURT: Move on.

MR. ISMAIL: Okay.

BY MR. ISMAIL:

Q. Dr. Portier, in terms of this issue of mechanism that you've talked about, I think we saw in the earlier documentation from the other scientists at regulatory agencies that this question of genotoxicity and oxidative stress were considered, correct?

A. That is correct.

Q. And you know that the conclusions of those scientists were the opposite of yours on this issue?

A. With the exception of EFSA, I would agree with you. I think EFSA was a little less totally negative than EPA and others on oxidative stress.

Q. If you turn to Exhibit 4722.

You recognize this document, correct, sir?

A. This is ECHA's document, not EFSA.

Q. I know.

A. Okay, yes.

Q. You're familiar with this?

A. Yes, I am.

Q. And you reviewed this carefully?

A. I've read this, yes.

Q. And you read this carefully, both as part of your process of corresponding with these agencies, and

as part of your work in this case, correct?

A. In corresponding with them, I didn't read it that well. But for this case, I read this very carefully, yes.

MR. ISMAIL: May I publish, Your Honor?

THE COURT: Yes.

MR. WISNER: No objection.

MR. ISMAIL: Okay.

BY MR. ISMAIL:

Q. So this is a -- what they call the risk assessment document, correct?

A. Yes.

Q. And they comment in here, "they" being ECHA, on this question of whether these mechanism studies that you talked about with the jury are a matter of concern for cancer risk, correct?

A. Yes. Correct.

Q. And if you turn to page 25.

Are you there?

A. Yes.

Q. Up on the screen, I have a number of organizations, international and national.

And it's referring to several of the scientific bodies we've talked about today:

"Have assessed or are in the process of

assessing the carcinogenic potential of glyphosate."

Correct?

A. Yes, correct.

Q. Okay. Then they go on to say:

"So far, only IARC has concluded that glyphosate is genotoxic."

Did I read that correctly?

A. Yes, you did.

Q. And that's a true statement, right?

A. At that time.

Q. And the date of this document is what, sir, to the best that you recall?

A. 2017. Late '16, '17.

Q. May of 2017 ring a bell?

A. That would be about right.

Q. And since the publication -- the submission of this document, no public health agency has concluded glyphosate is genotoxic, true?

A. Again --

Q. To the best of your knowledge?

A. To the best of my knowledge, that is true. Other than IARC.

Q. So IARC stands alone in that, correct?

A. Correct.

Q. Now, if you go to page 26.

A. Yes.

Q. There's a discussion of studies in exposed humans.

Do you see where I am?

A. Yes, I see where you are.

Q. And what they're doing here is discussing the three human in vivo mechanism studies you talked about with the jury, correct?

A. Correct.

Q. These are the only three that exist?

A. That I'm aware of, correct.

Q. And what they do here is talk about whether these data and these studies support a finding that glyphosate is genotoxic, correct?

A. Correct.

Q. And what these scientists conclude is that -- in the next paragraph, RAC, that's the Risk Assessment Committee?

A. Yes.

Q. Okay.

"RAC concludes that the data available is not sufficient to conclude that glyphosate is the factor likely to explain the association between glyphosate-based herbicide and higher incidences of micronuclei in the studies where this has been

observed."

Did I read that correctly?

A. Yes, you did.

Q. This is the Paz-y-Mino and Bolognesi studies you talked about yesterday with Mr. Wisner, correct?

A. Correct.

Q. And what these scientists are concluding is something different than what you told the jury on this issue, correct?

A. Yes.

Q. Now, let's take a look at the Bolognesi study.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Do you recognize Exhibit 4285 as a copy of one of the Bolognesi studies you talked about yesterday?

A. Yes.

Q. This is the human in vivo study that you talked about with Mr. Wisner, correct?

A. Correct.

MR. ISMAIL: Permission to publish, Your Honor.

THE COURT: Any objection?

MR. WISNER: No objection, Your Honor.

THE COURT: Granted.

BY MR. ISMAIL:

Q. We have that up on the screen.

This is the paper you were talking about?

A. Yes.

Q. And this study is one of the aerial application studies or exposure studies?

A. Yes, it is.

Q. Now, the authors comment about their interpretation of the study that they performed, correct?

A. Yes, they do.

Q. And that's typical in a scientific paper, the researchers will write up the results and provide their interpretation of their own data, right?

A. Correct.

Q. Did you share yesterday what these researchers concluded from their data when you were testifying about this study?

A. No.

Q. Okay. If you turn to page 995 of this paper. Left column. Tell me when you're there.

Are you there, sir?

A. Yeah.

Q. Okay. In the middle of that paragraph, there's a sentence that begins, "Evidence indicates."

If it's easier to follow on the screen, I'll continue highlighting.

A. Okay. I found it.

Q. All right.

So these researchers write:

"Evidence indicates that the genotoxic risk potentially associated with exposure to glyphosate in the areas where the herbicide is applied for eradication of coca and poppy is of low biological relevance."

Is that what these researchers conclude from their data?

A. Yes, that's what they conclude.

Q. Did you tell the jury, when talking about this same study, that the researchers expressed their own data of being low biological relevance?

A. That wasn't the question we were discussing. We were discussing whether it was a positive study or a negative study. It is a positive study.

They are arguing here that because it's just genotoxic results, they're not sure it has any biologic meaning whatsoever, their opinion.

Q. That was my question.

A. Okay.

Q. In the dialogue you had yesterday when you

were talking about this study, did you point out to the jury that the folks -- the scientists doing the study -- interpreted their data as having low biological relevance?

A. No. I did not.

Q. And these are scientists. They are not Monsanto scientists, these are independent researchers, right?

A. I don't know them, but I assume they are.

Q. Do they also, on the next page, go through the application of the Bradford Hill guidelines? Or at least a discussion of them?

A. Yes. They seem to discuss that, yes.

Q. And they say:

"Based on application of Bradford Hill guidelines, it is not possible to assign causality to the increases in frequency of BNMN."

What is that abbreviation? Something micronuclei?

A. Yeah. It's bionucleated micronuclei.

Q. Okay. So this is saying, hey, using the Bradford Hill criteria, you can't assign causality with respect to the results we found.

Is that what they put in the peer-reviewed literature?

A. That's what they put, yes.

Q. Now, with respect to --

MR. ISMAIL: Your Honor, did you have a plan for the afternoon break? I'm happy to keep going.

THE COURT: If it's a quick break, just a ten-minute break.

MR. ISMAIL: Perfect.

THE COURT: And then go until 3:25.

MR. ISMAIL: Yes. Okay.

THE COURT: We'll take our ten-minute break.

(Recess taken at 1:51 p.m.)

(Proceedings resumed at 2:05 p.m.)

(The following proceedings were heard in the presence of the jury:)

THE COURT: You may continue, Mr. Ismail.

BY MR. ISMAIL:

Q. I would like to turn now to the discussion of the animal studies that you referenced.

A. Okay.

Q. I think you agreed with me this morning that, really, you need human data to be able to make the leap from animals to humans for a specific disease, true?

A. Correct. "Human data" in the broader sense.

Q. And that's true for NHL and any agents alleged to be associated with it?

A. Correct.

Q. Now, you would agree, sir, that:

"When human data of high quality and adequate statistical power are available, they are generally preferable over animal data and should be given greater weight in hazard characterization and dose response assessment, although both can be used"?

A. I would agree with that statement.

Q. And you recognize that passage as coming from the epidemiologist guideline document that you discussed with Mr. Wisner?

A. It makes sense that it would come from there.

Q. You further agree that:

"In the evaluation of human health risks, sound human data, wherever available, are preferable to animal data"?

A. Yes.

Q. Now, in terms of the dataset to consider in this case, I think you described earlier -- I think yesterday -- that ordinarily, you would only expect to see maybe two rodent carcinogenicity studies?

A. That would be correct.

Q. And to your understanding, most herbicides or pesticides would have been approved on the basis of two

or three rodent studies?

A. Correct.

Q. But for glyphosate, I think you told us yesterday, there's actually a great deal more testing and data available?

A. Although to link back to your last question, it was approved with just one or two, yes. But now there's lots of data.

Q. In terms of the reassessments and evaluations we went over, there's been a great deal of testing for scientists and regulators to consider on this question?

A. It's there. It's not fully available for you to see, but there's a lot there to use.

Q. And that's an important point that you sort of touched on this morning.

Is that regulators will have access to more information than, for example, gets published in the literature, correct?

A. For the regulatory studies that are being submitted to them, yes.

Q. And I think you've agreed that glyphosate has one of the largest collections of rodent carcinogenicity studies that you've ever seen?

A. That I have ever seen, that is correct.

Q. Now, it's not uncommon to see certain tumors

in rats or mice, even when they're not exposed to any agent, correct?

A. That is correct.

Q. So the simple fact of seeing a tumor in a rodent study doesn't answer the question for you, true?

I'll rephrase.

Just seeing tumors is not enough, as a general rule. Would you agree with that?

A. They have to be increasing with dose. But yes, if they're increasing with dose, that's enough.

But just seeing it -- I'm trying to get your question in my head. Just seeing tumors in the animals, without paying attention to whether it increased or decreased, doesn't help.

Q. So you were discussing the concept of temporality this morning; does the agent precede the development of the condition?

Do you recall that conversation?

A. Yes.

Q. When we're talking about rodent studies, it's not simply, did I administer glyphosate to a rodent, and I saw a tumor in that study?

There's more that has to be done to analyze that data?

A. That is correct.

Q. Okay. And, in fact, you saw tumors that were -- not you saw, you weren't the pathologist -- but you saw in the data, there were tumors in the control groups that weren't exposed to any chemical agent whatsoever?

A. Correct.

Q. And that's common for some of the tumors that we've been talking about?

A. Yes, it is.

Q. Now, as we've seen much of the day, your interpretation of the rodent data is at odds with other scientists at regulatory agencies, correct?

A. That is correct.

Q. And we don't need to go back over the actual documents, but you recall as we went through either the letters that came back to you or the assessment documents, those other scientists believe that the rodent data did not evidence a carcinogenicity with glyphosate.

Is that fair?

A. That's fair.

Q. So what I want to talk about is some of the potential reasons for that difference, okay.

So I think, as you just mentioned, the scientists at the regulatory groups for the registration

studies will get a great deal more data than is publicly available, correct?

A. Correct.

Q. And that would include, in many instances, individual animal data, correct?

A. That is correct.

Q. In your review, you did not have access to the same depth of data that the regulators did on these rodent studies for certain of the studies?

A. That would be correct.

Q. So you didn't have access to individual animal data, correct?

A. For every study, I did not.

Q. I think you told us that Monsanto turned over its information.

So for the Monsanto studies, you had a chance to have that sort of granular view, correct?

A. Correct.

Q. But for studies that were proprietary to other organizations or sponsors, you didn't have that ability, correct?

A. That's correct.

Q. I'm not faulting you; that just wasn't available to you, right?

A. Right.

Q. But the regulators, in many instances, did?

A. I presume.

Q. And with respect to IARC, IARC was also in the same boat as you in this question; didn't have access to individual animal data all the time, correct?

A. Correct.

Q. Now, another issue is the issue of dose. And you touched upon that in your conversation with Mr. Wisner.

And I think it's fair to say that you have a difference of interpretation of how dose impacts how one looks at the tumor results.

Is that fair to say?

A. Different interpretation than whom?

Q. Thank you.

Than some of these other scientists and regulators that we've seen throughout the day.

A. That would be a fair statement.

Q. Now, you have not done a calculation to determine how doses that the rodents were exposed to compared to the doses that humans might see in either agricultural or residential use, true?

A. I have not done such a calculation.

Q. And do you know from your review of the regulatory documents that scientists at these regulatory

bodies have done some of that analysis?

A. Yes.

Q. And one of the things that you, I believe, criticized, for example, EPA for was -- I don't know if your word was discounting or what have you -- doses above a certain level.

Do you recall that being part of your direct examination?

A. Yes. Basically discarding them.

Q. So what you were saying was -- well, in terms of the doses in the rodent studies, just to give a sense of the magnitude of what the mice and rats are exposed to, you said these are feeding studies, correct?

A. Correct.

Q. So the glyphosate is incorporated in the rodent chow, I guess?

A. Yes.

Q. And it's fed to the animals day after day after day after day for two years or 18 months?

A. Correct.

Q. And the amount of glyphosate that is exposed to these animals is typically recorded in the study documentation that you had access to, correct?

A. I got that information predominantly from EFSA's write-up of the reports.

Q. Very good.

So, for example -- and I can give you a copy of your report if you would like to cross-reference this, or maybe the magnitudes will ring a bell.

But, for example, in the Knezevich and Hogan study, in the high-dose group, those rodents were exposed to 4,841 milligrams per kilogram of body weight.

A. Per day.

Q. Per day.

A. Yes.

Q. And so the unit -- when we talk about milligrams per kilogram of body weight, mice and rats, relatively low weight, but you can see how much glyphosate am I giving them for their size, correct?

A. Correct.

Q. And you can, if one did the analysis, compare that to what a human might be exposed to in residential or agricultural use, correct?

A. Correct.

Q. And you haven't done the second part of that, true?

A. No.

Q. But others have, right?

A. Yes.

Q. Now, but you would agree -- just to use

another example, Sugimoto, that was one of the studies you talked about, the doses in the high-dose group were 4,348 milligrams.

Does that order of magnitude sound about right?

A. It sounds about right.

Q. I'm happy to give you your report if you want to cross-reference it.

A. It's in that ballpark.

Q. Sure. And there were other doses, as well. Sometimes the high-dose group went 800, 900, 1,000; the lower doses were just that, lower doses.

So these high-dose groups that you talked about with the jury, and the results, you would agree that they are thousands of times greater than what humans are exposed to?

A. That is my understanding from reading the literature.

Q. Right. And so again, you haven't done the calculation, but you have some familiarity with the magnitude difference between what rodents are exposed to in studies versus what a human realistically could be exposed to in the environment?

A. The results look at the highest dose, per the thousands. Yeah.

Q. Yes. And you know from some of the regulatory documents that those scientists concluded that the findings from the rodent studies that you have focused on have less biological relevance because they are at such massively high doses, it doesn't relate to the human experience.

Is that fair?

A. That's part of their driving argument to get rid of those high doses, correct.

Q. When you say "get rid of" them, they saw them and had a different interpretation than you?

A. If -- they have to discard them in order to get rid of the positive finding in the mouse.

Q. Okay. Well, how about we --

A. It's like this: If they are argued that the high dose is too high, you can remove it and still do an analysis with the animals. And that's, in essence, what they're doing.

So they're actually removing the high dose and saying, the rest, there's no significant increase there.

Q. Got it.

A. That's why I'm saying remove it.

Q. So just to sort of finish this conversation, you have a difference in approach -- or your view of what would be the proper approach of how you would

assess those massively high doses given to the rodents than do other scientists who have looked at the same data.

Is that a fair way to wrap this conversation up?

A. I would think that's fair, but I would do it the way the guidelines say to do it.

Q. Well, we'll get to that in a second.

Another difference between you and the regulators is the approach to statistical significance.

Yes?

A. I can't speak to that as a general rule.

Q. Okay.

A. The guidelines discuss not just using a p .05, but you can use your best judgment in looking at all of the p-values.

So I'm in agreement with the guidelines.

Q. And we'll look at the guidelines in a minute.

But you would agree that it's standard in toxicology to use statistical significance at the .05 level, true?

A. That's true.

Q. And, in fact, the guidelines that you talked about refer specifically to that level of statistical significance, correct?

A. Correct.

Q. We'll just show the jury where that is.

This is -- I gave it to you at Tab 4879. I think it was in Mr. Wisner's binder, as well, his Tab 940.

MR. ISMAIL: Your Honor, this has already been published to the jury.

THE COURT: Okay.

MR. ISMAIL: No objection, I assume?

MR. WISNER: No objection.

BY MR. ISMAIL:

Q. Page 2-19, I'll put it on the screen, sir.

You're familiar with this, correct?

A. Correct.

Q. And I think throughout your direct examination, you referred to this as how you believe the cancer risk assessment should be undertaken, correct?

A. Correct.

Q. And so there's a discussion of trend tests and pairwise comparison tests.

Those are the two types of tests you talked about?

A. Yes.

Q. Then it talks about with some more detail here, how to calculate statistical significance that we

don't need to get into.

But it says:

"By convention, for both tests, a statistically significant comparison is one for which p is less than 0.05 that the increased incidence is due to chance."

Correct?

A. That's what it says, correct.

Q. And then it says:

"Significance in either kind of test is sufficient to reject the hypothesis that chance accounts for the result."

Correct?

A. Correct.

Q. So the guideline document that you agree with does report that statistical significance is defined at the .05 level?

MR. WISNER: Objection.

THE WITNESS: No.

MR. WISNER: Never mind.

THE COURT: Overruled.

You can answer.

MR. ISMAIL: He said no.

Let me rephrase.

///

BY MR. ISMAIL:

Q. The passage that we just referred to reports that, by convention, statistically -- a statistically significant comparison is one for which p is less than 0.05, true?

A. That is true. That is true.

Q. Okay. Now, in your -- by the way, when IARC was reporting its results, it used statistical significance at a .05 level, correct?

A. I believe that would probably be the case.

Q. When you were --

A. For animal studies.

Q. In the animal studies.

When you were reporting what you found to be positive findings in the animal studies, you did not strictly adhere to the .05 significance level, true?

A. True.

Q. How many of the tumor findings that you told the jury about yesterday would not qualify as statistically significant at the .05 level?

A. I would have to look at the table. I can't pull it straight out of my head.

But it would be maybe 30 percent.

Q. Okay. Of the findings you reported here in court?

A. Yes.

Q. Now, another issue that you differed with the regulating scientists about is this question about multiple testing and what that -- how that complicates the analysis.

So let me ask it this way: When people are doing these types of animal carcinogenicity tests, there are multiple -- many dozen kinds of tumors that can be analyzed, correct?

A. Correct.

Q. I think you told us 40 or so when you were describing this process yesterday, true?

A. Forty tissues with different types of cancers. But in practice, only somewhere between 20 to 25 statistical evaluations per bioassay.

Q. So for each study, you can see -- pathologists are examining up to 20 to 25 tumors?

A. No. The pathologists are examining everything. The evaluation is only for, in the end, 20 to 25 tumors.

Q. Because some of them are obviously negative, and there's no reason to report on them?

A. Correct.

Q. So for the analysis, though, you're going to have 20 to 25 tumors per study, correct?

A. Twenty to 25 evaluations per study, correct.

Q. I said it exactly wrong.

Twenty to 25 tumors for the evaluation?

A. Correct.

Q. And that's both for the male group and the female group, correct?

A. Correct.

Q. And you described that there's two different types of tests, the pairwise and the trend?

A. Correct.

Q. And you incorporated something you called historical controls, at times?

A. Yes, correct.

Q. So when you're doing these types of tests, you can see 20 to 25 tumors for evaluation, you're looking at males and females, you're looking at dose, pairwise, trends, lots of different analyses?

A. People do that. My analysis, as stated, is based upon the trend test.

Q. Well, that's not what you limited your --

A. I show pairwise comparisons.

Q. Okay.

A. And I show the pairwise comparisons that EPA and others looked at. But those are not my positives.

Q. "Those are not my positives."

A. No. They are things that are pairwise comparisons, but they're there because EPA found them.

Q. Oh.

A. I was looking at trend tests. That is my focus.

Q. Well, that's an important clarification.

So of the various tumors you put on the board yesterday for rats and mice, where there was a positive finding for pairwise --

A. But no trend.

Q. -- but no trend, that's not Dr. Portier's belief as to how to report that data?

A. I would not report that as a positive, because of the way I'm doing a positive.

Q. But you did yesterday, right?

A. You're correcting me.

That should have been made clear. There are only three, I think, in the whole dataset that are like that.

Q. And just to wrap this up.

So you would, I guess, amend your comments from yesterday about what significance you took from the animal data to exclude any pairwise positive finding for which there was not a trend positive finding?

A. Correct.

Q. Okay.

A. And I have excluded some of those that the agency didn't find, that I found that I didn't put on the chart.

Q. Okay. So you -- I think we -- I think we're communicating. Okay.

So back to where we were, which is lots of different tests can be done within any particular study?

A. Correct.

Q. You're familiar with the term false positives, correct?

A. Correct.

Q. And that means when -- I guess we'll be specific to glyphosate.

A false positive would mean you conclude that glyphosate increased the risk for a tumor; when the truth is, there's no impact of glyphosate on the risk of getting that tumor?

A. Correct. You declared it positive when it truly is not positive.

Q. And because of the large number of evaluations done in an animal -- individual animal carcinogenicity study, there's a concern that the false positive rates can be exaggerated?

A. That is correct.

Q. So if you have enough tests, you will get some positives simply by chance alone, correct?

A. That is correct.

Q. And if you assess statistical significance at the .05 level, if truth means there's no effect of the chemical, roughly speaking, one out of every 20 times, you would get a false positive?

A. Correct.

Q. And if you relax the statistical significance from .05 to something higher, you'll get even more false positives?

A. You could. There's no guarantee.

Q. No guarantee, but as a matter of statistics, that's what you would expect to see, on average?

A. Correct.

Q. So if you do enough tests, you are almost guaranteed to get false positives at some point?

A. Yes.

Q. And generally speaking, the more studies you have, the more false positives you have to deal with?

A. Probably.

Q. And so as you've told us, glyphosate has an unusually large set of data on the animal two-year studies or 18-month studies to consider, correct?

A. Correct.

Q. And so you have to be very -- any good statistician would consider the issue of false positives?

A. And I do.

Q. And so did the scientists at other regulatory organizations, correct?

A. No.

Q. Do you recall having some --

A. EPA did. EFSA did not.

Q. That's fine.

You had some back and forth with EPA about this issue, some of the biostatisticians who engaged with you on this topic?

A. I had some back and forth with other statisticians who were sending in comments. Dr. Haseman, I believe, is the one I had comments with.

Q. Okay. Keeping this moving.

So this issue of false positives is something that one has to be concerned about, particularly when you have such a large data set, as we do here?

A. Correct.

Q. Now, some of the findings you talked about with Mr. Wisner yesterday are probably false positives?

A. I would agree with that.

Q. How many false positives did you tell the jury

about yesterday?

A. I can't know which ones are false positives.

Q. How many, by number, did you tell the jury were on your board yesterday?

A. Again, I can't know if there are truly any. I can't know if they're all false positives. The only thing I can tell you is the probability of seeing a false positive when I did calculate.

Q. So in terms of the -- well, let's go on to discussing some of the specifics, if we could.

Now, you told the jury yesterday that you interpreted the data here as showing positive results in both the rat studies and the mouse studies, correct?

A. That's correct.

Q. Now, can you confirm for the jury, though, that what you testified to yesterday about the rat studies is contrary to what you published in a journal?

A. I don't understand the question.

Q. Okay. Do you recognize Exhibit 5470, Doctor?

A. Yes, I do.

Q. This is an opinion piece. Sort of a pro/con piece written by, in one case, you; and there was a contrary view expressed by a different scientist.

Correct?

A. Correct.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection, Your Honor. No objection. It's fine. It's not worth the time.

MR. ISMAIL: Okay.

BY MR. ISMAIL:

Q. So this is something that you wrote, correct?

A. That is correct.

Q. Okay. And it's -- in part, at least -- talking about the animal data, right?

A. Correct.

Q. And I'm in the middle column.

Do you see where I am, sir?

A. Yes.

Q. Okay. So the last sentence says:

"The conclusion is that glyphosate causes various tumors in laboratory mice."

That's what you wrote in this piece, correct?

A. Correct.

Q. And this is your personal opinion piece, correct?

A. Correct.

Q. And that's consistent with what you said yesterday, right?

A. Correct.

Q. But above that, you write:

"With the exception of growth in a few nonmalignant tumors, none of the rat studies showed any effect."

Did I read that correctly?

A. Correct.

Q. And that's contrary to what you told the jury yesterday, correct?

A. The difference is, this was before I reanalyzed all the datasets.

Q. So the answer to my question is yes?

A. The answer to your question is yes.

Q. This isn't the only time that you publicly stated that your view was that the rat glyphosate studies did not show an effect, correct?

A. It depends on the date. Again, the analysis was done early 2017. So before that, I would have said the rat studies were negative because I was looking at the same results as the regulatory agencies.

After that, I would say they were positive because I reanalyzed them and found the other ones.

Q. Okay. So let me just get the timeline right.

So within 18 months of -- after IARC, includes the time that you were working with Plaintiffs' counsel, during that period of time, you were of the view that glyphosate studies done on rats did not show --

A. Carcinomas.

Q. -- carcinomas, correct?

A. Correct. They were nonmalignant tumors.

Q. And that's actually a view you shared with EPA, correct?

A. Probably.

Q. In terms of the additional studies that you looked at, one of the things you talked about was lymphomas yesterday.

Do you recall that?

A. Which study?

Q. Lymphomas. Malignant lymphomas as a tumor type.

A. Yes.

Q. You discussed that yesterday?

A. Correct.

Q. And you referenced the study by Takahashi?

A. Yes, I did.

Q. Now, in fairness, sir, when you prepared your litigation reports in this case, you make no reference to that study, correct?

A. That is correct. I reference the place where the study came from, but I didn't talk about the study because I missed it.

Q. So the -- your opinions as written in your

litigation report, discuss 12 rodent studies; seven rat, five mice?

A. Correct.

Q. And the study that you were talking about was from 1999, correct?

A. I believe so.

Q. And it was described in a regulatory document dated in 2016, correct?

A. Not a regulatory document.

Q. Right. JPMR?

A. JMPR.

Q. JMPR, yes.

And that's the World Health Organization?

A. Correct.

Q. And it's referenced there, but that was from three years ago?

A. That is correct.

Q. And I think when Mr. Wisner was asking you about the study, he asked you, EPA missed it?

Do you remember that question being asked about the Takahashi study?

A. Yes.

Q. And in fairness, so did you?

A. Absolutely.

Q. So continuing on this discussion, we have now

13 studies that you are considering, correct?

A. Correct.

Call it 12.2. I don't have all the other tumors for the Takahashi study, only what was written about in JMPR.

Q. So fair to say that your interpretation of that study is limited by the fairly limited amount of data that you had?

A. For that one, yes.

Q. And do you recall in the high doses in that study, they actually were 8-, 9,000 milligrams per kilogram, something to that effect?

A. It was huge.

Q. Huge?

A. That was clearly the highest-dose study of all of these, and it was close to what would be acceptable in a mouse study.

Q. Continuing on in this discussion.

So we have -- you said 12.2, but 13 studies from which you derived opinions about lymphoma, at least here in court. Whether or not they're in your reports or not we'll save for another day.

A. Correct.

Q. And for each of those, they are male and female, correct?

A. Right.

Q. For each of those, you can do a trend test?

A. Correct.

Q. So there's 26 possible trend tests?

A. It varies from study to study and how the tests are done. I actually evaluated that question.

Q. My question simply is -- if you can't answer it yes or no, you can tell me.

With 13 rodent studies, with both male and female, are there 26 possible trend tests?

A. So you're thinking it's 26 plus 26, all times 13?

Q. No, I'm not.

A. Sorry.

Q. I'm simply doing it as such: Thirteen studies, and in each study there are males and females?

A. Correct.

Q. So that's 26 groups between the 13 studies? Twenty-six -- there's 13 studies, each have males, each have females, and you can do trends by gender?

A. Correct.

Q. And that's the way you should do a trend test, by gender?

A. Correct.

Q. So there are 26 trend tests possible in the 13

studies?

A. Correct.

Q. And you can also do a pairwise test, correct?

A. Yes.

Q. And in a pairwise test, you would take the control group and compare it to the low, you can compare it to the middle, and you can compare it to the high.

A. Correct.

Q. And in some of your analyses, you do just that.

A. I always report it.

Q. You always report it.

So there's three possible pairwise tests per gender, per test?

A. That would be correct.

Q. And so for each test -- if my math is essentially correct -- you can do three pairwise per gender, and one trend test per gender for each test?

A. If you wanted to.

Q. If you wanted to.

So that's eight per test?

A. Eight per --

Q. Per study?

A. Males and females.

Q. Males and females.

A. Okay.

Q. Are we aligned?

There's eight possible tests you can run?

A. Correct. But that's not what I would make a decision on, which is what matters with false positives.

Q. So in the number of possible tests, then, from all the rodent studies -- trend and pairwise -- how many possible tests are there?

A. There were, all told, a little more than 500 evaluations when you look at everything. So all told, that would be about 2,000 evaluations, give or take.

Q. You found no lymphomas in the rats, correct?

A. That's correct.

Q. No lymphomas in either the pairwise or the trend?

A. I don't know. I didn't report the pairwise, so I don't remember. I doubt it.

Q. So for trend, you saw no lymphomas for males or females in the rats, correct?

A. That is correct.

Q. Now, one of the studies you talked about was -- I'm sorry, one of the tumors you talked about was renal tumors.

Do you recall that?

A. Yes, I do.

Q. I'm trying to do this quickly and get to an agreement on this issue, but if you want to look at documents, let me know.

One of the studies that this was an issue for was the Knezevich study, right?

A. Yes.

Q. And that was a study that was available to IARC, right?

A. A summary of it was available to them.

Q. And one of the things that the IARC working group wanted to do was see if that test was statistically significant according to the standards that IARC is using of .05?

A. Correct.

Q. And one of your contributions at the working group meeting, as an invited specialist, was to assist the animal subgroup to make that determination, correct?

A. I did weigh in on that determination, yes.

Q. And there was a question about -- I won't get into the nitty-gritty details of this -- what statistical test would be most appropriate to make that assessment?

A. Correct.

Q. And you assisted the animal subgroup in where

to get such a test, and you verified the results, so to speak?

A. They did it without me, but I did provide some input on that.

Q. And what IARC had available to it for its decision was what they thought was a statistically significant finding for that renal tumor in that study, correct?

A. Correct.

Q. Since IARC, you have come to the conclusion that the test used at that meeting was not the best test to use?

A. The test was the best test to use. The way in which the p-value was calculated for the test was not the best way to do it.

Q. Fine. And regulatory scientists and other biostatisticians pointed that out to you, and you agreed?

A. Correct.

Q. And when you did the p test by the better method, it no longer was statistically significant?

A. That's correct.

Q. So we can agree here that one of the positive findings reported in the IARC Monograph for animal tumors as statistically significant, the better

interpretation is that it doesn't meet the .05 level.

True?

A. But that wasn't why the IARC -- there's more to that than just that test.

But yes, I will tell you, it did not meet the .05 value.

Q. Very good.

And you talked yesterday about a study by George. And it was the initiation versus promotional study?

A. That's correct.

Q. And there was a -- is that the painting study?

A. Yes.

Q. Now, that study was available for the IARC working group to consider, right?

A. That is correct.

Q. And again, I'm happy to show you the document if you want to be refreshed on this.

But do you recall how the working group -- the IARC working group assessed the quality and reliability of the George study?

A. They felt that the sample sizes of 20 animals per group were too small. And they gave it less weight.

Q. It wasn't just the sample size that concerned them, right, Doctor?

A. Now I have to look at the document again.

Q. Sure. We'll get that out, Doctor.

But in the final analysis, an IARC working group -- are you looking for the Monograph?

A. Yeah, I'm looking for it now. But go ahead.

Q. Let me see if we can --

MR. WISNER: It's not in my binder.

MR. ISMAIL: Because it's in my box.

BY MR. ISMAIL:

Q. Dr. Portier, if you turn to page 34 of this.

THE COURT: Which exhibit are we?

MR. ISMAIL: I'm sorry, Your Honor. I put a copy on the bench. Exhibit 5184.

THE COURT: Oh, okay.

MR. ISMAIL: I don't need to publish it, I just want to refresh Dr. Portier's recollection about what the working group said about the George study that was the subject of his direct yesterday.

BY MR. ISMAIL:

Q. Are you at that page, sir?

A. Yes.

Q. There's a discussion about the working group, the study, the methods, and whatnot?

A. Correct.

Q. And then the working group comments on that

study, right?

A. Correct.

Q. And if you're with me under the right column on the top, it says:

"The glyphosate formulation tested appeared to be a tumor promoter in the study."

Do you see where I am?

A. Yes.

Q. Then they go on to say:

"The design of the study was poor with short duration of treatment, no solvent controls, small number of animals and lack of histopathological examination."

Did I read that correctly?

A. That is correct.

Q. So the working group had more criticisms of this George study than just, there weren't enough animals, correct?

A. That's correct.

Q. And they go on to say:

"The working group concluded that this was an inadequate study for the evaluation of glyphosate."

Correct?

A. Correct.

Q. Do you agree or disagree with the conclusions

of the IARC working group about the George study we just read?

A. At the time I was there, I disagreed with them. They don't always take their advisor's advice. Yes, I disagreed with them on this study.

Q. Okay. Last topic.

Discussion of the epidemiology that you went over with Mr. Wisner, okay?

A. Okay.

Q. Now, I think you agree that the human epidemiology studies deal with the actual exposure humans have to the product, correct?

A. Correct.

Q. And you recall that the IARC working group found that there -- I think you wrote it up, or somebody did, on one of the documents that there was limited evidence in humans for the carcinogenicity of glyphosate, correct?

A. Correct.

Q. And what "limited evidence" means, that's a term of art at IARC; it means specific things when talking about the epidemiology, correct?

A. Absolutely, yes.

Q. And what it means is that there's a positive association that appears to be credible, but chance,

bias, or confounding could not be ruled out with reasonable confidence, correct?

A. That's the definition.

Q. And you agree with that assessment of the epidemiology, right?

A. Yes, I do.

Q. So let's talk a little bit about those factors that led IARC and you to conclude the epidemiology is limited, okay?

Chance, I think we talked about. You can get a positive finding just by rolling the dice, right?

A. Right.

Q. And bias -- well, let's do confounding first.

Confounding occurs when there's an exposure or some other factor that's associated with both the glyphosate exposure and the NHL diagnosis, that if you controlled for it, it would explain the results?

A. It wouldn't necessarily explain the results. It would explain some of the results.

Q. Sure. So you referred yesterday to sort of a classic biostatistician's analysis. That was the storks and birthrate.

A. Correct.

Q. That's often used as a teaching example.

And included in this, you have confounding,

right?

A. If I do an analysis of something else -- like what we eat and birth of children -- and I don't include the storks, it's confounding.

Q. So in the stork study, there were other factors that explain this apparent positive finding that birth rate is related to storks?

A. I would guess it would be the case.

Q. There's lots of factors that go into that.

But if you just looked at the stork finding, you would say there's a 1 in 150 chance that storks don't deliver babies, if you don't actually look at the confounding factors, right?

A. Correct.

Q. So when we're talking about the human epidemiology with glyphosate, there are important confounders that you agree should be adjusted for, right?

A. Correct.

Q. And an important source of the confounding here is whether the individuals in the study were exposed to other chemicals or pesticides, correct?

A. Correct.

Q. Since there are some -- particularly in agricultural occupational use, there are lots of

herbicides, pesticides, insecticides, that various individuals can be exposed to, that might confound the analysis of glyphosate exposure in those studies, right?

A. It might.

Q. You agree that the proper way to analyze the epidemiology is to use the most fully-adjusted risk estimates from the epidemiology, true?

A. From each study, what the working group did was exactly that.

I guess that's probably generally true. You can overanalyze the confounders, and it can mess up your analysis. I would argue that one of these studies actually did that.

But as a general rule, that's okay.

Q. Just to make sure we have an understanding here, IARC used the most fully-adjusted risk estimates, correct, which you just testified to, when available?

A. When available. When making their overall decision, that's what they said.

Q. And in your report in this case, you wrote that:

"When discussing the epidemiology data, the most reasonable comparison is to use the most fully-adjusted risk estimates."

And you stand behind what you wrote, here in

court?

A. Me? In my report, I wrote that? Or in the IARC Monograph?

Q. No, you wrote it here. I'm happy to show you.

Well, do you agree, sitting here today, the reasonable comparison is to use the most fully-adjusted risk estimates?

A. From these particular studies?

Q. Yes.

A. Yes.

Q. Terrific.

A. I'll agree with that.

Q. Now, the IARC working group looked at six epidemiology studies, correct?

A. Correct. Well, they looked at a bunch of them, but six for NHL.

Q. And none of the most fully-adjusted risk estimates in the six glyphosate epidemiology studies that were the core of that IARC working group assessment showed a statistically significant increased risk of non-Hodgkin's lymphoma, true?

A. I believe that is true.

Q. Even when you adjust for pesticide use, you can't rule out other potential confounders, right?

A. Correct.

Q. And, in fact, you wrote comments to EPA.

When EPA said words to that effect, you wrote back and said you agree with that statement, scientifically, right?

A. Say it again.

Q. Well, let me ask it more simply.

You agree that just adjusting for pesticide use doesn't solve all the potential confounders when doing a study on NHL and glyphosate exposure, correct?

A. There are other potential -- well, no.

I can't know that. The bottom line, scientifically, I can't know that.

Q. Sure. But let me -- I'm sorry?

A. But I can say it in the abstract.

Q. Okay. In the abstract, you agree?

A. Yes.

Q. And let me ask it specifically.

In terms of this dataset, there's other confounders for, for example, agricultural workers, unrelated to pesticides, like diesel exhaust and solvents and livestock, farm animals, that may confound an analysis of NHL, true?

A. That is true.

Q. And none of the case-controlled studies that you showed yesterday with Mr. Wisner controlled for

those other confounders that you and I just discussed, correct?

A. That is true.

Q. Okay. If you turn to 4727, this is the EFSA review that we talked about. And if you turn to page 11.

Are you there, sir?

A. Yes, I am.

Q. With respect to this topic of epidemiological studies, these scientists write:

"For the wealth of epidemiological studies, the majority of experts concluded that there is very limited evidence of an association between glyphosate-based formulations."

Let me stop right there.

They're saying "glyphosate-based formulations" because these are the final products like Roundup, correct?

A. Correct.

Q. There's very limited evidence between products like Roundup and non-Hodgkin's lymphoma.

And then they go on to say:

"Overall, inconclusive for a causal or clear associative relationship between glyphosate and cancer in human studies," correct?

A. That's what it says, correct.

Q. And then they describe:

"Minority views, nevertheless, were expressed that there was either inadequate or limited evidence of an association."

Correct?

A. Correct.

Q. So as described here, the majority of scientists that are referred to here would find that the body of epidemiological evidence shows very little evidence of an association, correct?

A. They used the term "very limited."

And "limited" is a term of art at IARC. "Limited" is a term of art at EFSA.

They have three categories: Sufficient, inadequate, and limited evidence for human data. They don't have a very limited evidence category. I don't know what it means.

So I can't tell you, in terms of art, what this means here.

Q. Okay. Those are the words on the page, though?

A. Correct. Those are the words on the page.

Q. Now, one of the studies you referred to yesterday was the Agricultural Health Study, right?

A. Correct.

Q. And there were actually two publications that came out thus far that are on this issue of whether glyphosate formulations increase the risk of NHL, correct?

A. Correct.

Q. Do you recognize Exhibit 4603 as the first of those publications?

A. Yes.

Q. Now, just in terms of orienting the jury about what this study is, and its initiation, this study had approximately 55,000 people who used pesticides occupationally, correct?

A. Correct.

Q. And the researchers have been collecting data from this survey since the early to mid-'90s?

A. That's correct.

Q. And even at initiation, the participants in the studies had, on average, pesticide exposures of 10 or 15 years?

A. I can't say. But probably.

Q. It's described in the paper. That's in the ballpark of what you recall.

Is that fair?

A. Yes.

Q. So this study has been collecting data for almost 25 years, or more than 25 years at this point?

A. They don't collect data all the time. It's a little tough. But the study has been going for almost 25 years.

Q. And this study is actually funded through a grant of the National Institute of Environmental Health Sciences, correct?

A. Partially.

Q. Partially?

A. Predominantly.

Q. And that's the agency with which you formerly worked?

A. That's correct.

Q. And it's sponsored and funded by the National Cancer Institute, as well, correct?

A. Correct.

Q. It includes on it, university researchers at the University of Iowa, correct?

A. Yes. Correct.

Q. It has no funding from Monsanto, true?

A. Not that I am aware of.

Q. Or any other industry company?

A. It would be very, very unlikely.

Q. Very unlikely, all right.

So this is a National Cancer Institute and NIEHS-funded cancer study, right?

A. Correct.

Q. What I'm showing you here is the first publication from 2005.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection.

THE COURT: Yes.

BY MR. ISMAIL:

Q. Just in terms of -- these are the authors who are reported here, and their affiliations.

You have the University of Washington, the Fred Hutchinson Cancer Research Center, the National Cancer Institute, National Institutes of Health, NIEHS, among others, correct?

A. Correct.

Q. Now, you agree that the analysis done in this study was done extremely carefully?

A. I will agree to that.

I want to correct something. This is not the first publication from the Agricultural Health Study. This is the first one on glyphosate in human health.

Q. Excellent point. This dataset, the AHS dataset, has produced hundreds of publications.

This is one on the topic of concern here in

this trial?

A. Yes.

Q. Back to my question: You recall that the analysis was done extremely carefully in 2005, right?

A. Yes, I do.

Q. And you would agree that it's a very reliable study, right?

A. It's a useful piece of information. Very reliable within its limitations, yes.

Q. Now, if you turn to the discussion. And we can look at the data down below, as well:

"There was no association between glyphosate exposure and all cancer incidence or most of the specific cancer subtypes we evaluated, including NHL."

Did I read it correctly so far?

A. Yes.

Q. Okay.

"Whether the exposure metric was ever used, cumulative exposure days, or intensity-weighted cumulative exposure days."

Did I read it correctly?

A. Yes.

Q. Now, what those latter terms mean is that the researchers look to see how many days the individuals

were exposed to for glyphosate, and also the intensity of their exposure, correct?

A. Correct.

Q. And those results are reported down below, here in Table 3.

And for NHL, the different days of exposure -- I'm doing this quickly, trying to beat the clock, sir, so if you need me to slow down, let me know -- as there's increasing exposure, the relative risk does not go up, correct?

A. Correct.

Q. And stays around 1, correct?

A. Correct.

Q. And if you use intensity of exposure, same deal, you do not see an increase in dose relationship, and you don't see an increased risk, correct?

A. Correct.

Q. So this -- you agreed with -- well-done study and carefully-done study shows no increased risk of NHL from glyphosate exposure, true?

A. No apparent. No apparent in this exposure response here.

Q. Right.

And no matter what set of the data you look at, there's no increased risk, correct?

A. No statistically significant increase in relative risk. There is an increased relative risk. It's 1.2 for the yes exposed, no exposed. But it does encompass 1.

Q. Not only is it not statistically significant, when you look at the effect of increasing dose, there's no increase in risk at all by these data?

A. As measured by them in this study, yes.

Q. There was a more recent publication by this dataset from Andreotti.

Do you remember that?

A. Yes, I do.

Q. I think that was the paper that you offered some criticism of yesterday; not in detail, but you said there was some controversy with respect to that second paper.

I think that was the word that you used?

A. Yes.

Q. And those authors, again, were from the National Cancer Institute and NIEHS, as well, correct?

A. Correct.

Q. And what those researchers did, is they updated the analysis from the Agricultural Health Study.

And concluded, yet again, in the peer-reviewed literature, there's no statistically significant

increased risk with glyphosate, correct?

A. For NHL.

Q. For NHL.

Now, you put up, yesterday, what was described as a forest plot.

A. Yes.

Q. And I think it was Exhibit 105.

And I've recreated it here because I want to make sure the jury understands what some of these numbers are.

First, you can agree these are not all the epidemiology data on this question, true?

A. True.

Q. And one of the things that's evident here is that several of the data points reflect risk estimates that do not adjust for other pesticide use, correct?

A. That is correct. Those papers didn't provide that information.

Q. But even those papers that did provide that information, you still report on this forest plot, unadjusted data, right?

A. The forest plot derives from the Zhang study. I was just using what Zhang had done. Or what everyone did.

Because here, I've got every single analysis

up here that appeared in anybody's meta-analysis. That's the purpose of this table.

Q. So let me make sure we're clear.

This -- the selection of these studies and the relative risks that are reported here, that's what I'm going to focus on, so we understand what these numbers reflect.

Several of these numbers are numbers that don't meet your own criteria of using the most fully-adjusted risk estimates when available, true?

A. True.

Q. And so -- I don't know if you can see it. I think it's coming through a little bit.

I've highlighted here, and you can confirm for the jury: Each of the risk estimates and studies I've highlighted are those that are reporting data that are not the most fully-adjusted risk estimates, true?

A. I think the McDuffie is the most adjusted. And so is Orsi, from what they gave us. I think those are the most adjusted.

They're not adjusted for things we wish they had been adjusted for, but that's the most adjusted one they gave us.

Q. Then let me rephrase.

Adjusted for pesticide use?

A. Some of the authors did not adjust for other pesticide use.

Q. For example, the Eriksson study reflected here, line F, that is not adjusted for other pesticide use, correct?

A. Well, it was in line G.

Q. Well, that was going to be my next question.

A. The problem was that Schinasi and Leon used F, so I had to put F in there.

Q. I'm going to get there, sir.

A. Okay.

Q. So Eriksson reported both adjusted and unadjusted numbers, correct?

A. Correct.

Q. And using the Dr. Portier standard, the relative data point to look at is the most fully-adjusted number, correct?

A. For these data, yes.

Q. And we'll get to what Schinasi did in a minute.

But in fairness, if you want to know what the data are, you would look at line G, not line F?

A. Correct.

Q. And when you do look at the most adjusted, the statistically significant finding goes away?

A. That's true. Correct.

Q. And that's true for other cuts of this data, correct?

A. That is correct.

Q. So if we wanted to look at only data that had been adjusted, what I've done here is I've grayed out those that do not adjust for other pesticide use, okay?

A. That's one way to cut the data.

Q. Well, you've agreed that you should look at the most adjusted data, right?

A. From each study. You don't discard the study just because they didn't adjust the data.

Q. And as you see here, I left the most adjusted results; for example, Eriksson and Hardell.

A. But you threw out McDuffie.

Q. I'm not throwing it out, sir.

It just didn't adjust for other pesticide use, correct?

A. Correct. But I wouldn't remove it from my thoughts just because they didn't adjust.

Q. Bear with me while we finish this conversation about your forest plot.

At a minimum, where you say "Eriksson unadjusted" and "Eriksson adjusted," we can agree right now that the right way to look at it is the most

adjusted?

A. You still look at both. I'm sorry, I'm slowing my own -- I'm selling my ownself.

You still look at both. But the better number is the most adjusted.

Q. Fair enough.

And what you're saying is that some of these studies didn't do any adjustments for other pesticide at all, correct?

A. That is correct.

Q. So, for example, McDuffie.

I think that's one you said didn't do any adjustment?

A. I believe that's the case, yes.

Q. So you don't know if they did the analysis in the way that you would prefer on what the actual relative risk would be on this study, true?

A. What the adjusted relative risk would be? I don't know what the actual relative risk is anyway.

Q. Exactly. So understanding that, for some of these, you wouldn't gray them out.

But I have to move on to a different topic.

A. Okay.

Q. And that is the question about duration and intensity of exposure.

You reported here one number from the Andreotti study, correct?

A. Correct.

Q. And that is a very specific look at that dataset, correct?

A. Correct.

Q. That's high exposure with a 20-year lag?

A. Because that's what Zhang used, yeah.

Q. But there's other data reported in that study, as well, correct?

A. Correct.

Q. And they looked at different -- it looks at the data looking at the exposure -- essentially, a dose response, right?

A. Correct.

Q. And what I'm reflecting here are the -- when they say Q1, that's the quartile.

That's, sort of, the every 25 percent cut of the data?

A. Correct.

Q. And what they show is relative risk all to the left of 1, correct?

A. That's what they show.

Q. And the De Roos study -- the one we just had up on the screen that you said was carefully done --

also looked at rate of exposure, correct?

A. That's correct.

Q. And they looked at it a couple of different ways, like we saw on the table a moment ago?

A. Yes, correct.

Q. Remember when you were talking with Mr. Wisner about the Bradford Hill criteria called gradient?

A. Yes.

Q. And one of the things you wanted to see is whether the epidemiology data showed increase with increase in use?

A. Yes.

Q. The data that we're talking about here would be contrary to a finding of gradient, correct?

A. If I believe the Andreotti study was perfect and did its job right, this would be contrary to that.

Clearly, De Roos is contrary to that belief.

Q. Fair enough.

But there's, as you confirmed, other data than what is shown on this chart, right?

A. Other analyses in these same datasets.

Q. So, for example, you're familiar with a study called NAPP, North American Pool Project?

MR. WISNER: At this time, Your Honor, I have to object. I've not seen this demonstrative, and it's

not something he's reviewed.

THE COURT: I'm sorry. You mean the adjusted demonstrative?

MR. WISNER: Yeah. He's added stuff to it. The last study he showed was not part of his opinion.

THE COURT: So to the extent that it's augmented from the original, no. But you can continue what was shown yesterday, even if you made adjustments to it.

MR. ISMAIL: That's what I was doing, but I'll just finish here. I don't want to argue with Mr. Wisner.

I want to get Dr. Portier out of here, respectfully.

THE WITNESS: Thank you.

BY MR. ISMAIL:

Q. You're welcome.

So there are other epidemiological studies available to consider on this question, right?

A. Other than the ones presented here in that picture? Yes, there are.

Q. Okay.

A. But the NAPP is not a new study, it's an evaluation of existing studies. But there is a new study.

Q. Okay. So let me see if we can get agreement on this.

The forest plot you showed yesterday did not include all the epidemiological data that speaks to this issue.

Is that fair?

A. That is fair.

Q. And there are -- for example, the NAPP study, which I understand you're not going to comment on, you're not as familiar with.

There's some data in that study that speaks to whether there is any increased risk, true?

A. From the posters I've seen, possibly true, yes.

Q. And there are, in terms of -- I'll just go back to your version of this forest plot so we don't have any disagreement.

In terms of the analysis and the relative risks here, can you confirm, Doctor, that there is no study showing a relative risk greater than 2 in its most adjusted analysis?

A. For NHL as a group.

Q. The answer is yes?

A. I'm correcting your question.

Q. Yes.

A. For NHL as a group, are there any studies that showed a relative risk of greater than 2 in the most fully-adjusted analysis?

Q. That's my question.

A. And the answer to that question is: There are none.

Q. And you would agree, sir, that when we have relative risks less than 2, it's true that many toxicologists would consider that an effect -- a small effect?

A. Some would, yes.

Q. Now, in terms of the data here -- just so we're all clear on what you looked at -- this De Roos study, letter D; and then you have Bayesian regression underneath it?

A. Yes.

Q. That row E is a more fully-adjusted of D, correct?

A. Oh, you know, my answer to your question is wrong. I'm sorry. You've just corrected me.

The De Roos study is, indeed, above 2. And it is the most fully-adjusted. The Bayesian regression is as adjusted as the other one, but it's a completely different method of analysis.

Q. Exactly. So in terms of the De Roos study,

the column -- the row D, the researchers did a further analysis using the Bayesian regression, correct?

A. Correct.

Q. And when they did that further analysis, they found a relative risk that went below 2 and was not statistically significant, correct?

A. That is correct.

Q. And these data from De Roos are included more fully in the NAPP study, correct?

A. I'm not commenting on that.

Q. Okay. So you don't know whether these data have been analyzed further by other researchers, correct?

A. I know they've included it in NAPP. I don't know if it's fully included. Again, it's just posters, I don't know.

Q. Okay. So whether there's more data on the De Roos study that informs further what the true relative risk is from that study and whether it's statistically significant, you're going to defer?

A. Correct.

Q. Now, the meta-analyses, as you've already pointed out, each and every one of those includes studies that did not have fully-adjusted -- did not fully adjust for other pesticide use, correct?

A. That is correct.

Now, let me just take a look here.

MR. ISMAIL: Do you mind if I just read the question?

MR. WISNER: I thought we agreed that if any questions get read, they're from the judge.

MR. ISMAIL: That's right.

THE COURT: Actually, you guys can figure it out.

BY MR. ISMAIL:

Q. Doctor, in terms of this last couple, three questions, in terms of the -- pardon me.

You went through these five questions with Mr. Wisner at the end of your examination, correct?

A. Yes, I did.

Q. And I think, as we've established throughout the course of the day, the answers to these five questions is that you gave "yes" or "probable yes" to each of them.

Is that right?

A. Yes, I believe so.

Q. And you would agree, sir, that in terms of what other scientists at other organizations answered to these same questions, they answered each of these "no," true?

A. True.

MR. ISMAIL: Dr. Portier, thank you for your time.

THE COURT: Redirect until 3:28.

REDIRECT EXAMINATION

BY MR. WISNER:

Q. Doctor, I understand your wife is waiting for you to come home tonight. In an effort to spare her wrath, I'm going to go as fast as I can.

Now, let's -- there's been a lot of questions asked of you.

MR. WISNER: Permission to grab my boards?

THE COURT: Sure.

BY MR. WISNER:

Q. Let's rock and roll.

Just now, Mr. Ismail asked you a lot of questions about what other regulatory agencies thought, right?

A. Correct.

Q. Now, during our examination, we spent the vast majority talking about the hard science, right?

A. Correct.

Q. What the actual studies talked about.

And did he ever actually directly challenge any of these findings that you found?

A. No.

Q. Okay. Did he challenge any of these studies in the mice?

A. No.

Q. There were some questions about false positives.

Do you recall that?

A. Yes.

Q. That's when something is showing something, but it's actually false, right?

A. Correct.

Q. Okay. We see here, in every single mouse study, lymphoma. Right?

A. Correct.

Q. Is that a possible false positive finding?

A. No.

Q. How do you know?

A. Because I calculated what the probability was of seeing the tumors I saw in male mice. And that probability was below 1 in 10,000.

I think it's infeasible that all of the results we see here are false positives.

Q. And the fact that study after study after study shows lymphoma -- even a study, as he pointed out, that you missed originally -- the fact that they all

have lymphoma, is there any reasonable reason to assume this is a false-positive finding?

A. Not in my mind, no.

Q. So then he went through a bunch of genotoxicity data.

Do you recall that?

A. Yes.

Q. And let's be clear: Did Mr. Ismail challenge you about any one of these studies?

A. A little bit about the Bolognesi study.

Q. Fair enough.

And in the Bolognesi study, he showed you some language where the author said, well, it's transient, so it must not be a problem.

Do you recall that?

A. Yes.

Q. But what did the data actually show in their study?

A. It showed genotoxic effect of the strain.

Q. And when you take that study and combine it with all this human cell data, what does it tell you?

A. Well, with all the other data, it tells me it's genotoxic.

Q. Now, one of the things they talked about was this idea that IARC didn't have all the data, right?

A. Correct.

Q. This chart actually starts in 2017, right?

A. Correct.

Q. So IARC didn't have any of this positive data?

A. No.

Q. All right. Oxidative stress, there was some discussion about that.

Do you recall?

A. Yes.

Q. And they showed you some conclusions by regulatory agencies.

Do you recall that?

A. We only saw the conclusion from one regulatory agency. EFSA and ECHA both concluded there was data on oxidative stress, but they didn't think it was that important.

Q. So the one they showed you, they disagreed.

But did Mr. Ismail actually challenge you about any of the actual data?

A. No.

Q. Okay. They showed you this letter that was sent to you by EFSA.

Do you recall that?

A. Correct, yes.

Q. And in it, they specifically pointed to a

passage where they supposedly accused you of being misleading.

Do you recall that?

A. Yes, I do.

Q. If we actually read the passage, it is specifically referring to two studies by -- there it is.

It says right here: De Roos 2005 and De Roos 2003, right?

A. Correct.

Q. And they said your characterization of De Roos' studies was misleading in the letter you wrote, right?

A. That's what it says.

Q. Let's look at that letter that you wrote.

This is it; it's Exhibit 5403.

This is the letter, right?

A. Right.

Q. All right. And if you actually go to the actual language of the letter, we have a discussion here where you mention the De Roos study, right?

A. Right.

Q. And below that, you have a pretty strong statement. You say -- at the very last sentence here, you say:

"Legitimate public health concerns arise and

causality is credible, i.e., when there is limited evidence. BfR's language is misleading and not internationally acceptable, and thus fails to meet EC guidelines."

Do you see that?

A. Yes.

Q. They keep saying that you wrote this letter, but isn't it true that there were hundreds of scientists that signed on with you?

A. Almost a hundred.

Q. Let's point out one of them. Right here.

A. It's not in focus.

Q. Killed my punch line.

There it is. Dr. De Roos.

A. Who wrote this article, yes.

Q. So the very author who they're saying you're being misleading about joined you in accusing them of not following their guidelines?

A. She wrote that section.

Q. Thanks. All right.

A. Or rewrote it. I drafted something and she rewrote it, to be perfectly honest.

Q. Well, that's even better. I lost my outline. It probably fell over somewhere.

A. I think it's on the light thing.

Q. There it is. All right.

Last point, Doctor, and then I'll let you go.

I even have time for potential redirect; I'm doing this lightning speed.

They showed you a timeline about how IARC -- about how the European authorities responded to you and responded back.

Remember that?

A. Yes.

Q. Let's do a more basic outline, okay?

1974, Roundup comes on the market, right?

A. Correct.

Q. Today, 2019, in that 45-year history, has Monsanto, the inventor of glyphosate, the inventor of Roundup, ever told a soul that it could cause cancer?

MR. ISMAIL: Objection, beyond the scope.

THE COURT: Sustained.

BY MR. WISNER:

Q. They talked about the National Toxicology Program, right?

A. Right.

Q. And they talked about the Report on Carcinogens, right?

A. Yes.

Q. When you were running that program, if

Monsanto told the world, hey, this stuff causes cancer, would that have been something you considered in whether or not you added it to the report?

A. That's the whole review process. I have to get a lot of scientists to give me some advice. But if their advice was to add it to the report, I would have added it to the report.

Q. And during your 35 years at NTP, did any scientist from Monsanto ever come to you, you know, Doctor, NTP, we have a concern about our product. Will you please test it for us or tell us if it does cause cancer?

A. I can answer this slightly differently. Again, to the best of my knowledge, no one has ever nominated glyphosate to the National Toxicology Program to be reviewed for the Report on Carcinogens up until 2006, when I was still there.

MR. WISNER: Thank you.

No further questions.

THE COURT: All right. Ladies and gentlemen. We're done for the day. We are going to reconvene tomorrow morning at 9:00. We will go all day. But remember that tomorrow is the last day of the week you will be hearing evidence.

Please don't talk about anything that you've

heard. Please don't talk about the evidence you've heard throughout the trial. I'm going to remind you every day.

Have a good evening. Don't think about this trial. Don't think about the fact that you're a juror. Have a good evening. I will see you tomorrow morning at 9:00. Thank you for your time.

(Proceedings adjourned at 3:26 p.m.)

State of California)
)
County of Alameda)

I, Lori Stokes, Court Reporter at the Superior Court of California, County of Alameda, do hereby certify:

That I was present at the time of the above proceedings;

That I took down in machine shorthand notes all proceedings had and testimony given;

That I thereafter transcribed said shorthand notes with the aid of a computer;

That the above and foregoing is a full, true, and correct transcription of said shorthand notes, and a full, true and correct transcript of all proceedings had and testimony taken;

That I am not a party to the action or related to a party or counsel;

That I have no financial or other interest in the outcome of the action.

Dated: April 3, 2019

Lori Stokes, CSR No. 12732