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 2074 - 2350** **Volume 14**

Reporter's Transcript of Proceedings

Thursday, April 4, 2019

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(Multiple other counsel present as reflected in the minutes.)

I N D E X

Thursday, April 4, 2019

Thursday, April 4, 2019 8:47 a.m.

(Proceedings commenced in open court out of the presence of the jury:)

THE COURT: Good morning, Counsel.

ALL: Good morning, Your Honor.

THE COURT: Before we bring the jury in and we proceed with evidence, I will hear argument on the plaintiffs' motion to preclude advertisements related to safety testings and studies.

I've issued a tentative ruling. Have you had an opportunity to review it, and do you feel ready to argue?

MR. BRADY: Just briefly, Your Honor.

I've read and carefully considered your tentative, and thank you for taking the time to address this issue.

Your Honor, as far as the print advertising goes, it sounds like you've made your mind up although in our reply we talk about what we think is the substantial difference between attorney advertising and then touting the science and safety and then studies which really are at issue in this case. So, you know, if the Court is firm on that, I won't go any further.

But the thing that I would like the Court to address is we're still getting the geofencing here,

Your Honor. We're still having pop-up ads pop up on cell phones basically touting this same information here in this courthouse.

And the idea -- it's an interesting technological feature that Monsanto has availed itself of, but I think it's going too far. And I don't think that that affects their First Amendment rights or their ability to sell their product by popping specific information up to people who's geo coordinates are in this building.

We're willing to refrain from doing any attorney advertising until this trial is over if they're willing to refrain from doing any geofencing. It's just a --

THE COURT: So, you know, just one of -- and as I said in the tentative, one of my thoughts is this is just one trial.

First of all, I think prior restraint is just out of the question regarding this. But beyond that, we're talking about hundreds of cases. This is one case going on today. But there's the MDL and there's this coordinated case and apparently coordinated cases in St. Louis and hundreds of cases around the country that are going to be tried over time. So in another few months, there's going to be hundreds of cases being

tried at the same time about this product.

And so unless and until something changes with respect to Monsanto's ability to market Roundup, I can't say, "Listen, you can't advertise. You can't run an ad about how" -- essentially advertising Roundup, which is what they do. They sell Roundup. And until they can't sell Roundup or something changes, I can't simply say, "You can't" --

(Simultaneous colloquy.)

MR. BRADY: These aren't ads to buy Roundup. They're touting its safety and the science and the regulatory approval, in this building. And for people walking around this building, I still think that that's a different issue. I think that a narrow order just prohibiting geofencing within, say, quarter of a mile of this courthouse, you know, is a kind of a reasonable order that we'd like to see at all the future trials.

THE COURT: So these jurors are all over Alameda County, which is a very long distance, so it's not like just because they're here, whatever they see or hear -- I mean, I think that the ability -- the jurors are either going to follow my instructions or they're not.

So when they turn their TV on and watch whatever channel is -- you know, if you've used Roundup

and you think you might be sick, please call us, that's going to happen.

Advertising, I don't know, if it's just your firm or other firms, I don't think I've seen it yet on TV. But I understand that there are a number of ads that are being run. And so when they go home, when they get on BART or they're driving in their cars, these same jurors or whatever your potential jurors are in any jurisdiction, it's going to be too wide and far even if I were to say something like that.

MR. BRADY: I agree, but when they get up at break and they turn their cell phones back on because they're no longer under your admonition while they're in the courtroom where they finish here --

THE COURT: No, no, they're always under my admonition.

(Simultaneous colloquy.)

MR. BRADY: -- the first thing they see on their cell phone when they turn it on is a pop-up and its geofence targeted this building. It's just -- it's going too far.

THE COURT: And that assumes that it's targeting this building. I mean, you're assuming a subjective intent that I can't -- I don't know that.

MR. BRADY: That's how geofencing works. They

put in particular longitude and latitude coordinates and they pump advertisements to apps that are on the phones of people within those coordinates.

Look, I agree with you --

THE COURT: Unfortunately for -- I know from your perspective, you're talking about the First Amendment, and it is restraint -- prior restraint of speech is serious. And I know you know that and I know you appreciate that. I'm not trying to be condescending. It's just I can't do that. I can't do it.

MR. BRADY: Fair enough, Your Honor. Thank you for considering our motion.

MR. WISNER: Your Honor, I think there's one -- and I get your point. I think just to clarify one procedural factual thing. Right? If I were to walk over to a juror personally and say to you, "Hey, Juror Number 3, Monsanto's stuff causes cancer and all these studies show it," I mean, that would be a mistrial. Instantaneously. That's jury tampering. Right?

Now if they do that same thing -- if I did the same thing by targeting every person's phone in this courtroom or every single person's phone in this courthouse and pushing that information, that same message to them on their phone -- and what happens is --

I don't know if you use your phone for this kind of purposes, but, for example, when I look at my ESPN app and I'm looking at the scores for the UCLA water polo team, or whatever, you know, there's little ads that pop up.

THE COURT: Sure.

MR. WISNER: And those ads are saying "Federal judge says Roundup is safe." That's the kind of stuff we're seeing.

We saw this happening with quite intensity in the *Johnson* trial. Numerous jurors during voir dire mentioned that they were having these things pushed on them as soon as they walked in the building.

And so whether or not Monsanto is or is not doing that, I think that if they are, that should be prohibited. That's not really a point of First Amendment. That is now clearly targeting people that they know they can't speak to.

THE COURT: And you're asking me to assign a subjective intent that I don't know exists and it's still prior restraint. I mean, technology has taken us places probably we never thought it would go.

MR. BRADY: It's still jury tampering, though, Your Honor. You can talk about it in any nice way you want with whatever --

THE COURT: I guess if I were picking sides, I might believe that. But I can't pick sides.

MR. BRADY: Thank you, Your Honor.

MR. WISNER: We appreciate your taking the time to look at it.

MR. MILLER: Unrelated, if I could, Your Honor.

We were hoping to get time tomorrow on your, I know, very busy schedule to talk about some page and lines rulings on the Hugh Grant deposition.

THE COURT: All right. We'll probably have to do that this evening because -- I'll see if I have time tomorrow. Are you all going to be here?

MR. MILLER: We'll make ourselves available. Absolutely.

THE COURT: All right. Well, let me see if I can make some time tomorrow. I have to look to see what's on the calendars. I have three calendars. I don't know what's on them. If I do, I'd be happy to.

MR. WISNER: The only other issue, and I was talking with counsel before this, and I don't want to -- because it will come up in this deposition -- or during this testimony, is you've tentatively admitted portions -- and we haven't finished our conversation -- portions of EPA documents.

And my concern is if they're admitted, that means that they go back with the jury during deliberations. And if that's the case, then I'm going to attempt to lay the foundation to get the IARC monograph in through this witness. He was one of the authors of it. He was participating. He can lay the custodial foundation as a business record, et cetera.

THE COURT: So the monograph itself, my thought was that probably the summary or some part of it would probably come into evidence. Just off the top of my head, I would assume that the entire monograph would not but that some portions of it might in the same way that I have ruled that, you know, some of the EPA documents, the summaries, the analysis that's done by the agency itself would be appropriate, but the underlying data would not.

So that would be my thought. And I would think maybe you could have a meeting of the minds about what portion of the monograph might come in.

MR. WISNER: I think that's helpful guidance. And then I won't -- I will lay the foundation, Your Honor, for getting the whole thing in, but I won't seek to admit it during his testimony and we can address the admission of it or portions of it --

THE COURT: And I know we haven't finished the

conversation about which documents are coming in or what aren't. So after today we'll have some time to talk. I think that with respect to who can stay in the building, it's fine if you guys are here, we can talk a little bit after court, even after 5:00 o'clock. So we can plan to chat. And then we'll see how much more time we need.

It's just I can't keep the jury here or the public here late after court.

MR. WISNER: No problem, Your Honor. I just wanted to raise that issue because I didn't want to have a sidebar about it.

THE COURT: Well, yes. And there are some things about the page and line from our first conversation about just the page and line designations that remain confusing on some level because of the way that they were done.

I know we had some conversations about whether or not the documents were presented to be admitted or were part of a cross -- you know, to -- I don't know what purpose they're there and I don't know what the underlying concerns are about the objections themselves: Is it to the document? Is it to the mention of the document?

You know, when I had a conversation with Mr. Griffis, I think he and I kind of understood better

what some of the objections were and clarified that perhaps whether or not you could confront or introduce the document for the purpose of just a comment from the expert or whoever the witness is as opposed to seeking to have it admitted.

So I just went ahead and ruled based on admissibility, but you guys may have introduced it for a different purpose. I don't know if the effect on the listener is for admissibility or the effect on the listener was just for comment. So you need to clarify that with me.

MR. MILLER: We can walk that through this afternoon.

There were a couple of documents that we were just discussing and wanted to use for notice that I think we'd like Your Honor to look at again and be granted.

MR. ISMAIL: Good morning, Your Honor.

So to tell you the conversation about these foreign regulatory documents, indeed impeachment of experts while they're testifying as to certain of their opinions.

So we do have a category of documents and portions thereof which are admitted under the RJN, and as the Court indicated, we'll be talking about whether

that gets expanded or not and what goes back to the jury. And I understand Mr. Wisner wants portions of the monograph, and we'll work with him hopefully to not have a dispute -- or the Court on that issue.

The one issue I did want to raise, and we talked about it at sidebar a little bit yesterday during Dr. Portier, and that is, there are documents for which we have not sought their admission under the RJN but believe they are proper impeachment of the expert.

And I know yesterday we were all trying to accommodate Dr. Portier and get him off the stand, and we didn't have an extended hearing on that.

So, for example, when Dr. Portier testifies that the oxidative stress data all points one direction, we know his former institution has a study and made it publicly available that says the opposite. And when I sought to challenge him on that, there was an objection he's never seen it, and then I was asked to move on. And that's all well and good for Dr. Portier.

So even if we don't seek to have it admitted, sort of the contours of what would be permissible impeachable of an expert is what perhaps we --

THE COURT: We need to talk more about that.

MR. WISNER: I think on that one, though, my biggest concern was it wasn't published. It had no date

on it, it had no publication on it. It was literally just words with an NTP logo on it. We had no idea where it came from. And I think there has to be some authentication of this document before it can be used.

He'd never seen it. He said, "I looked at the medical literature, I've never seen this before." I don't know how he could use that for impeachment.

THE COURT: Well, you know, if we go back to our old ham sandwich analogy which, you know, he could say that: I have no idea, I'm not even sure this is an NTP document. But whether or not counsel can present him with it and then ask questions and attempt to impeach him, no, it's not admissible, but under the ham sandwich theory, yes. And he's free to say this doesn't even look like -- this doesn't even appear to be a document --

(Telephone interruption.)

THE COURT: I'm going to have the clerk work with CourtCall. I'll let him work that out.

But unless there's an issue with Dr. Jameson today, can we just table this until we have a conversation later? Or is that something that's going to come up today?

MR. ISMAIL: Well, I don't think we have to fully explore the contours of it, Your Honor. If it

comes up, we'll deal with it in the ordinary course.

THE COURT: That's fine.

(Recess taken at 8:59 a.m.)

(Proceedings resumed in open court in the presence of the jury at 9:16 a.m.)

THE COURT: Good morning.

ALL: Good morning, Your Honor.

THE COURT: Good morning, ladies and gentlemen. How are you this morning?

All right. We're all set to go. And Mr. Wisner is going to put on his next witness.

Mr. Wisner.

MR. WISNER: Thank you, Your Honor.

At this time, the plaintiffs call Dr. Charles William Jameson to the stand.

THE COURT: If you'd stand and be sworn, Dr. Jameson.

THE WITNESS: Good morning, Your Honor.

CHARLES JAMESON,

called as a witness for the plaintiffs, having been duly sworn, testified as follows:

THE WITNESS: I do.

THE CLERK: Thank you. Please be seated.

And would you please state and spell your name for the record.

THE WITNESS: Good morning. My name is Charles William Jameson. J-A-M-E-S-O-N.

DIRECT EXAMINATION

BY MR. WISNER:

Q. Good morning, Doctor.

A. Good morning, Brent.

Q. I understand you go by your middle name; is that right?

A. I've been called Bill since a child.

Q. Okay. Calling you Doctor Charles William Jameson was very awkward for me right now.

Please introduce yourself to the jury. Let them know where you're from and what you do currently for a living.

A. I currently live in Cape Coral, Florida, which is on the west coast of Florida, southwest coast, just above Naples, Florida and about two hours south of Tampa.

I retired there in 2007 after working for the federal government, National Institutes of Health, for over 30 years.

I have a Ph.D. in organic chemistry, but my career has been in toxicology basically in environmental cancer research. I worked -- well, I graduated from the University of Maryland with a Ph.D. 1975.

Q. Dr. Jameson, I'm going to go through all this.

A. Okay.

Q. I just wanted to know where you're from and what you do for a living.

A. Sorry.

Q. All right. Let's start off with your undergrad. Where did you go to college?

A. I did my undergraduate work at a small college called Mount St. Mary's College in Emmitsburg, Maryland. I got a bachelor's of science in chemistry from there.

Q. Now, Doctor, I personally studied philosophy in college. Why would you study chemistry?

A. I must admit I was influenced by a mentor, if you will, at a very young age, my brother-in-law. My brother-in-law was a Ph.D. pharmacologist. He worked for a laboratory in the Washington, D.C. area called Hazelton Labs. Eventually he went out on his own and started his own laboratory called Bionetics Laboratory, and they had contracts with the National Cancer Institute to do animal bioassay studies on pesticides.

And so I was always fascinated with the work he did. He would take me to his labs and show me the animals and the mixing rooms and all that, and I just got very interested in that and decided to pursue a career in science.

I loved chemistry in high school and decided to major in chemistry, and that's why I majored in that in college.

Q. You said you had a chance to sort of deal, with your brother-in-law, related to pesticide and animal studies.

A. Right.

Q. Did you ever have a chance to actually work on any of those studies yourself?

A. Well, showing my age. As a matter of fact, when I was a rising senior in high school, my brother-in-law offered me a summer job to work in his laboratories. The project I was working on was, like I said, a contract with the National Cancer Institute to study the effect of pesticides in mice.

Just being a junior in high school, what they assigned me to do was work in the animal rooms to change out the cages, change out the mice from the cages, and then dump the dirty cages and put the mice in clean cages. It was a pretty nasty job, but I loved it because I was, you know, working on an experiment.

I had the opportunity in talking to some of the people there and they asked me, well, what are your future plans, what do you plan to do? And I told them, well, I want to go major in chemistry. So they told me

go talk to the chemist.

The chemist said, oh, well, you need to come work for me. And what happened is I ended up in the chemistry department, and my job was to mix the pesticide in the animal feed.

I would take the pesticide and make up a premix in the feed and then put it in a blender and mix up the feed.

And then the chemist would take samples and make sure it was at the right concentration, that it was homogeneous. And so that was my first experience in doing -- being associated with an animal bioassay. And it just turned out that eventually my whole career was in that area.

Q. You got your undergraduate degree in chemistry. Did you pursue a Ph.D. at some point?

A. Yeah. Upon completion of my bachelor's, I applied to University of Maryland graduate program and got accepted in the Ph.D. program in organic chemistry. And initially I had a teaching assistantship and then a research assistantship that paid for my education. I was very fortunate. And I graduated from the University of Maryland with a Ph.D. in organic chemistry in 1975.

Q. Now, what is exactly -- what is organic chemistry? What is that?

A. Organic chemistry is the study of carbon, basically the study of carbon. It's the study of compounds that are made up of carbon and other molecules or chemicals with carbon in them. So it's basically the study of carbon compounds.

Q. And did you do a dissertation in graduate school?

A. Yeah. I did. It was a two-prong dissertation. One of them was called the effect of lanthanide shift reagents on NMR analysis of organic chemicals.

Q. I did the same thing.

(Laughter.)

THE WITNESS: NMR analysis is a method in organic chemistry where you can analyze the chemical that you synthesized and it can help you determine the structure of the organic chemical based on the signals you get from the MRI -- from the nuclear magnetic resonance that it's exposed to. And the shift reagents are something that we discovered would spread out the signals and make it easier to interpret what you would get.

The second part of my thesis was the photochemistry of polyamides and emides. These are organic compounds that have nitrogen in them as well.

And what I was trying to do was to develop a biodegradable polymer. I was trying to make a polymer that would hopefully have some useful applications; but if you exposed it to sunlight, the UV radiation of sunlight, it would degrade because of the chemical structure of it.

And so I made some polyamides and emides, but unfortunately the molecular weight of the polymers were very low and really had no practical application.

But I did the research and it helped me get my thesis done.

BY MR. WISNER:

Q. Did you ever see the movie *The Graduate*?

A. Yes.

Q. The scene where he goes, "I've got one word for you. Plastics."

A. Yes.

Q. Were you able to invent a biodegradable plastic?

A. Well, no. Well, let me qualify. We got a biodegradable plastic, but it had no practical use because the molecular weight of the material was so low you couldn't make it into anything, any kind of container or bag or anything like that. It was just too low in molecular weight.

Q. All right. So following your Ph.D. in organic chemistry, where did you begin your career?

A. Following that I started work for a company called Tracor-Jitco. That was an organization based in Rockville, Maryland, and they had the prime contract with the National Cancer Institute to manage their rodent bioassay program. That's the program that the National Cancer Institute sponsored where they would screen -- or test chemicals in rats and mice to see if they would cause cancer in these laboratory animals.

So I was hired there as a chemist. My first responsibility there was to work with a -- the group of scientists at the National Cancer Institute to identify materials that should be studied in the animal bioassay program.

So look at the literature and see if there was data that indicated there was, A, significant exposure to these materials to people, and B, if maybe they were similar to other chemicals that are known to cause cancer. Or even if there was -- wasn't that information, that there was no information known about the chemical, we would still put it -- choose to test it in the bioassay program just to screen it to make sure it was safe, if you will, or that it did not cause cancer.

I was also responsible for monitoring the chemistry that was performed at all of the bioassay labs that were under contract to Tracor-Jitco for doing these animal bioassays for the National Cancer Institute.

So I would make sure that the, A, that the chemistry support contract purchased the right material, analyzed it, made sure it was safe in the materials we wanted to mix it in to give to the animals. And then I would go to the laboratories and make sure they were handling it properly and dosing the animals properly and that type of thing.

Q. And, Doctor, the jury had the opportunity to hear from Dr. Christopher Portier for a few days this week. We're talking about animal bioassays. Are you talking about long-term rodent studies?

A. Yes, these are two-year rodent studies which are pretty much the lifetime of the animal. And that's the standard protocol for a rodent bioassay for carcinogenesis.

Q. Now, while you were at this laboratory and running the National Cancer Institute's -- or overseeing the rodent bioassay program, did the National Cancer Institute ultimately hire you?

A. Yes. After working for Tracor-Jitco for several years, I was actually recruited by the Cancer

Institute to work directly for them.

And in 1979, I think it was, I went to work directly for the National Cancer Institute as their senior chemist and continued to be responsible for the chemistry for the bioassay program and worked to identify the chemicals that we needed to put on tests for the bioassay program.

Q. Did anything change at the National Cancer Institute regarding your work?

A. Well, shortly after I joined the Cancer Institute, the animal bioassay program was transferred from the Cancer Institute to another institute of the National Institutes of Health called the National Institute of Environmental Health Sciences which is located in Research Triangle Park, North Carolina. And that's also where this new toxicology program for the government called the National Toxicology Program was headquartered.

So the bioassay program was transferred to the National Toxicology Program, referred to as the NTP, in North Carolina, and I went down there and worked on the bioassay program for the NTP, again being responsible for the same things: Identifying chemicals to be studied, being responsible for all the chemistry that was done for the bioassay program, and monitoring those

studies at the testing laboratories.

In addition, I became responsible for all the chemistry done for the National Toxicology Program at the National Institute of Environmental Health Sciences in North Carolina.

Q. While you were at NTP working at the NIEHS, did you know Dr. Portier?

A. Yes. I met Chris Portier in 1980 when I first moved down to the Research Triangle Park. I believe Chris was still a postdoc at the time. He was working in the laboratory of Dr. George Lucier as an up-and-coming biostatistician.

And I got to know Chris then. We eventually started working on a number of projects together throughout the 30-plus years I knew him down there.

Q. And as Dr. Portier sort of elevated in the ranks within NTP, did he actually become your boss?

A. Well, he was not my direct boss. He was my supervisor boss, if you will. He became director of what was referred to as the Environmental Toxicology Program for the NTP which was all of the research that was done for the NTP. So he was main director of that.

And then the deputy director, a fellow by the name of John Bucher, he was my supervisor at the time. So he was my supervisor's supervisor, if you will.

Q. And talking about specifically about some of the work you did at NTP, are you familiar with something called the Report on Carcinogens?

A. Yeah. The Report on Carcinogens, now do you want me to explain what the Report on Carcinogens or --

Q. Well, first of all, did you work on it?

A. I did.

Q. So what is it?

A. Okay. I started working on the Report on Carcinogens around 1990 when I moved from the bioassay program at NIEHS to the director's office at NIEHS.

I was in the director's office, and upon taking that new job, I became involved with what is referred to as Report on Carcinogens.

Report on Carcinogens is a report that is required by the Public Health Service Act of 1968-69, I believe. And that law requires that the Secretary of Health and Human Services provide Congress with a report, initially it was every year, but eventually it was changed to every two years, but the Secretary of HHS is to submit to Congress a report of all materials that are either known to be human carcinogens or reasonably anticipated to be human carcinogens and to which a significant population within the United States are exposed.

So the Secretary is responsible for submitting the report. The Secretary delegated the responsibility of preparing the report to the National Toxicology Program. And National Toxicology Program told me that it was my job to get this report together.

So I became involved with the Report on Carcinogens and in the way the report is prepared. Do you want me to go into those details now?

Q. I don't think we need to get into too much detail, but I guess the bottom line, the Report on Carcinogens, were you responsible for helping identify possible -- or probable human carcinogens?

A. Yes, through the Report on Carcinogens.

The report has been dubbed, if you will, the official United States government list of known or reasonably anticipated human carcinogens. So it is a document of fairly good -- fairly great importance, if you will.

Just as an aside, it is one of the sources that is identified in, for example, California Prop 65 for carcinogens. It's identified as an authoritative source for that, for them to regulate something on the basis of it being identified as a potential -- as a known or anticipated carcinogen.

Q. Now, the Report on Carcinogens, when you were

helping prepare that, did you just look at, you know, rodent studies or were you looking at all the science?

A. No. The specific criteria established for reviewing the data for a chemical to be included in the report as either a known or reasonably anticipated human carcinogen, and the data that we look at includes the exposure data, it includes the epidemiology data that's available on the chemical, it includes the animal toxicity data that's available for the chemical, and also any mechanistic data, the genotoxicity and the metabolism distribution and absorption data for a particular chemical is all used in evaluating the data and to see if it meets the criteria for including in the report. And all of that is outlined in the criteria for reviewing that information.

Q. And during your 30 years running the chemistry group and a lot of these rodent bioassay programs and the Report on Carcinogens for the NTP, how much of your work focused on cancer issues?

A. All of it. Basically all of it was associated with identifying environmental carcinogens.

Q. And since you retired, how much of your work after your retirement has focused on cancer issues?

A. All of it has. Again, all of the work that I've done in my retirement. When I retired from the

government, I set up a consulting firm, CWJ Consulting LLC. Employment of one, me. But I've used that to consult for individuals and industry as well on issues concerning environmental cancer.

Q. And so starting senior year of high school, you're helping your brother-in-law with rodent bioassays to however many years it's been to today, would it be fair to say that most of your adult life has focused on issues related to cancer?

A. Yes. Yes.

I don't know if this is relevant or not, but as an aside, my mother died when I was eight years old and she died from breast cancer, and that affected me. And I've always wanted to -- you know, as a child I said I think I want to look into the causes of cancer. And so I don't know why I brought that up, but anyway.

Q. Now you're here today; right?

I want to talk to you about something that came up. Well, before I do that, have you published in peer-review journal articles and book chapters on issues related to the cause of cancer?

A. Absolutely, yes.

Q. And have you done presentations to professional organizations?

A. I've done quite a number of presentations.

I've written quite a number of publications in the peer-review literature. I've written a large number of what are referred to as background documents on individual chemicals which was used to evaluate them for listing in the Report on Carcinogens.

And I've also participated in a number of IARC working groups to publish monographs on environmental carcinogens.

Q. We're here to talk about IARC considerably and that's what we're going to get to in a second.

But before that, I want to touch on something that you mentioned. I kind of have a question about it.

So you talked about this Report on Carcinogens that you started working up in the 1980s. Do you recall?

A. Correct.

Q. This is a tumor chart that we put together with Dr. Portier, who you know, about some of the tumors in the glyphosate data.

And I understand as part of your opinions in this case, you've actually reviewed all the same data; right?

A. Correct.

Q. And -- oh, I wanted the mouse one. All right.

Here's the mouse one. And what I wanted to

ask you about is this study right here from 1983. Now you said -- and the next one is obviously 1993. But you started working on the Report on Carcinogens in 1990; is that right?

A. Correct.

Q. I want to talk to you about this study right here.

A. Okay.

Q. This is the Knezevich & Hogan study from 1983. And specifically I want to talk to you about these kidney carcinomas and adenomas.

Are you familiar with the data about that tumor?

A. Yes.

Q. When the study was originally submitted to the EPA in 1983, what did this data show with regards to these tumors?

A. The original submission to the EPA showed that there were three adenomas in the high dose and one in the mid dose. And if you're referring to the very initial EPA evaluation of that data, they identified it as being meeting the criteria to be classified as a class C carcinogen.

Q. Okay. So when this first came out -- and I'll do it in the doses, right. So the control had zero.

The low dose had zero. The mid dose had one. And the high dose had three.

A. Right.

Q. And when that was -- when that was determined, that led the EPA to classify it as a class C carcinogen; is that right?

A. Initially, their initial evaluation of that data, the very first submission, that's what they determined, that it met their criteria for a class C, yes.

Q. And if it had remained that way, if it had stayed on a class C, is that -- would that have put glyphosate on your radar in the 1990s when you were talking about whether or not it was a carcinogen?

A. It would have put it on the radar. The fact that it was identified as a class C, it would have been something that we would have picked up and say, hmm, this may be something we need to look at.

But I would point out that all of the data, basically all of the data that was available for glyphosate was provided by industry to EPA. And since it was provided to EPA, because -- for registration purposes, it's considered confidential. And so we wouldn't be able to get that data from the EPA to look at for our exercise of Report on Carcinogens, especially

at that time back in the early '80s.

Q. All right. So the original study had this. And this result, was that a statistically significant trend?

A. It was a statistically significant trend for these adenomas in the kidney of the mice. Plus these tumors in the kidney of CD1 mice is a very rare tumor. It doesn't occur spontaneously in those animals at a very high incidence at all.

And so that's a surprising finding. And since it's an increase in a rare tumor, that places additional emphasis on this observation.

Q. Now, did this ever change?

A. Yes. In the course of -- well, what happened was this was a classification from EPA. I think then the sponsor of the study, Monsanto, went back to the original laboratory and said: Hey, can you take a harder look at the kidney tumors?

And when they did that, the pathologist that they asked to look at the tumors came back and said, oh, I found an additional tumor in the control. One in the control.

Q. So that would change it --

A. So that would change it from -- to 1, 0, 1, 3. So by finding an additional tumor in the control, it

takes away the statistical significance of the increase in the trend of the formulation of these -- of that tumor in those CD1 animals.

Q. Well, did the EPA ever look at it --

A. Well --

Q. Hold on a second. Is there actually a tumor in that control group?

A. Well, that is kind of up for question. I've been able to get some information concerning that review and some additional reviews that were conducted. I have some papers that -- that were from the Environmental Protection Agency. It was basically a report from a pathologist, a veterinary pathologist for the Environmental Protection Agency, who was asked to look at the kidney slides in this particular study.

So the pathologist got the slides. He looked at them. His initial review is he couldn't find that additional tumor in the control animal.

Q. This one right here?

A. That one there. He went to a couple of colleagues and asked them to look at it, and they really couldn't verify that that lesion was actually there. There may have been a questionable lesion in the control, but they did not think it was an adenoma.

So, and that was a report that they submitted

to the EPA.

Following that, the EPA required that Monsanto hold another Pathology Working Group on these kidney tumors. Now I don't know if Dr. Portier explained Pathology Working Group to you. But a Pathology Working Group is like you gather up a group of respected pathologists, veterinary pathologists who are experienced in reading the slides for tumors in experimental animal studies, and you give them the slides -- you blind the slides to them. In other words, you just give them a slide and say, "Tell me what you see on this." You're not telling them what tumors you're looking for. You may not even tell them what tissue it is. You just say, "These are the slides. Give me your interpretation of it," and it's like a peer review for pathology, if you will.

So that PWG looked at the slides, and they submitted a report. And their final report indicated that the incidence of the tumors in this particular study was one adenoma in the control, zero adenomas in the low dose, one carcinoma in the mid dose. So now they've upgraded the tumor that they saw initially from an adenoma, which is a benign tumor, to a carcinoma which is a malignant tumor. Then they also said in the high dose animals, they saw one adenoma, the benign

tumor, and two carcinomas, two malignant tumors in the high dose animals in this study.

But the PWG said that they didn't feel it was an association, but --

Q. Let me ask you something. Was that PWG, were those people paid by Monsanto?

A. I can't say for certain, but Monsanto was instructed to perform a PWG. So you could conclude from that that the PWG was paid for by Monsanto. And so those people were paid for -- paid by Monsanto, yes.

Q. So it appears that all the scientists that were being put up by Monsanto, they were seeing a tumor, but the ones at the EPA were not.

A. The report from the EPA pathologist said he could not confirm that there was a tumor in the control animals, that's correct.

Q. At this point, did EPA instruct Monsanto to just redo the study?

A. My understanding is that the EPA requested them to perform a study, repeat the study in CD1 mice, concentrate only on the males, and emphasize the pathology of the kidney, and increase the number from 50 per group to 100 per group and have multiple dose levels to see if they can find the tumor and the progression of the tumor in that study. That's what my understanding

is of what EPA told them to do after this PWG.

Q. And we have it on this chart, all these later mouse studies. Were any of those later mouse studies actually done by Monsanto?

A. Some of them were. Some of them were done by --

Q. These ones?

A. Pardon me?

Q. Any of these mouse studies done by Monsanto?

MR. ISMAIL: Your Honor, can the witness be allowed to finish his answers? Mr. Wisner keeps cutting him off.

THE COURT: Just one voice at a time.

MR. WISNER: I apologize.

THE WITNESS: It's all right.

To be honest, I'd like to look in my charts to make sure who sponsored them. But I don't remember if they were all -- if all or any of them were sponsored by Monsanto.

BY MR. WISNER:

Q. Well, I'll tell you they've admitted they never conducted a rodent --

MR. ISMAIL: Objection, Your Honor.

THE COURT: Sustained.

MR. WISNER: I'll read the admission.

THE COURT: Well, counsel --

MR. WISNER: No. I have their admission. They agreed to let me read that. I'll just read it if they're going to fight me about it.

MR. ISMAIL: Your Honor, I think we're here to get Dr. Jameson's testimony and not Mr. Wisner's. So perhaps we could just continue with the questioning.

BY MR. WISNER:

Q. I'll do it after. We'll talk about it later.

A. Okay.

Q. Doctor, in any event, every study after this Knezevich & Hogan study, is it your understanding that there's been findings of malignant lymphoma in every mouse study?

A. Yes.

Q. All right. Well, took a little side detour there because we were talking about the Report on Carcinogens. I just want to ask you one last question. In your assessment of the evidence in this case, did you evaluate the data with the same scientific rigor with which you evaluated the data when you working for the NTP?

A. Oh, absolutely.

MR. WISNER: At this time, Your Honor, we tender Dr. Jameson as an expert in the area of cancer

risk assessment.

THE COURT: Voir dire?

MR. ISMAIL: Your Honor, subject to prior briefing and the Court's rulings, we'll reserve for cross.

BY MR. WISNER:

Q. All right. Dr. Jameson, I want to focus on IARC this morning.

A. Okay.

Q. And specifically you stated earlier that you've worked with IARC before; is that right?

A. Correct.

Q. How many times have you worked with IARC as part of the monograph program?

A. As part of the monograph program, I think it's about 20 times -- or 18 to 20 times, I think. I can't remember exactly.

Q. Okay. Well, the first time that you participated in IARC, did you do so in your capacity working with the NIEHS?

A. Right. Looking at my notes. Sorry.

I participated in an IARC monograph meeting for a total of 16 times. I was -- anyway, for four of those 16, I was sent there as a representative of the NIEHS NTP as a representative for that -- for that

organization that I was working for at the time.

It turns out that the NIEHS provided funding to the IARC to perform some of the -- to perform these reviews of the chemical carcinogens. And so they would -- the NTP would send representatives. And since I was involved in similar work with Report on Carcinogens, they would send me to observe the goings-on.

And as an observer, I was allowed to participate in the discussions of the work groups and of the whole -- and of the subgroup -- subgroups. But I wasn't allowed to write any documents or vote on any of the listings, I was just there as a representative of my organization.

I then attended -- was invited to attend a total of 12 separate monograph meetings as a member of the working group. And as a member of the working group, I would be requested to participate in one of the subgroups, and it was always in the experimental animal subgroup.

They would ask me to write -- draft a monograph on the -- for the animal studies of several chemicals that were being reviewed at the time and then participate in the -- participate in the discussions and vote on the listing.

Q. Now, participation as a working group member on IARC, part of that you said is you actually vote and helped write the monograph; is that right?

A. I'm sorry, could you repeat that?

Q. Vote on the classification and help write it?

A. Right. Correct.

Q. Do you recall the first time that you were called and invited to participate as a working group member?

A. To participate as a working group member, it was in 2007, monograph Volume 97.

Q. And when you were invited for the first time to participate as a working group member, did you consider that to be an honor?

A. At the time I did. IARC is a well-respected international organization. It's part of the World Health Organization, part of the UN. It is known for inviting world-renown, I guess, or world-recognized experts in the area of chemical carcinogenesis. And to be provided to participate with those people, I felt it was an honor.

Q. And you said you've gone to 16 different working groups.

A. Right.

Q. Or monograph meetings.

And how many hours does it take to work on just one of them? I'm just curious.

A. Well, you have to realize that when you're invited to participate -- I'm going to go through the details of this, okay? And if you're going to cover it later --

Q. We're going to cover it later.

A. Okay.

Q. I just want to know how much time --

A. How much time --

(Simultaneous colloquy.)

BY MR. WISNER:

Q. I'm just curious. Ballpark, how many hours for one of these monographs? Or if you can guess cumulatively for all the time you've spent working for IARC.

A. The invitation usually comes out twelve to nine months ahead of the meeting. And then you start working on -- once you're accepted, you start working on the document.

I would say probably for each monograph, it's probably about at least a month's worth of work just until you get to the meeting.

Q. So considering all the monographs -- and I understand you've also done additional publications and

research for IARC independent of the monograph.

A. Correct.

Q. All totaled would it be fair to say that you've spent thousands of hours of your life working on IARC projects?

A. That would be fair, yes.

Q. So it would be fair to say, then, that IARC has obviously paid you a lot of money for all the time you've spent?

A. No. No. It's all done gratis. IARC agrees to pay the airfare to get you to Lyon, France and gives you a stipend to cover your meals and hotel room. And that's it.

Q. So all those hours back at home reading through studies and peer reviewing, all of that you're doing for free?

A. Yes, basically. Yes.

Q. Why? Why are you spending so much time on this?

A. Well, first of all, I think it's important -- my whole career has been devoted to investigating environmental carcinogens, to find -- to look at materials, to identify materials that cause cancer in humans.

I think it's very important that that

information be published and get out to every one in the world. Because knowledge is power. And my philosophy is: You look at the materials, you see if they cause cancer. If they cause cancer, you publish or you announce that this material has been found to cause cancer in laboratory animals and in humans and it is a carcinogenic hazard. And you, as a responsible individual, need to be aware of this so that if this is something that you're exposed to or are using in your everyday life or in your job, you need to know that, hey, this is a carcinogen, this is a hazard to me. And you need to be able to take steps to protect yourself.

It's not a situation where if a chemical is looked at and is identified as a carcinogen, then you just never have any dealings with it or contact with it again. That's not possible in a lot of cases.

But if you have knowledge that something is harmful to you, then you can take that knowledge to protect yourself. And a lot of times it's as simple as wearing a pair of gloves when you're handling something that contains a carcinogen, or use a mask or a respirator if you are spraying something that is a carcinogen. Or, you know, just take steps to avoid exposure to the carcinogen.

But you need to have that knowledge to be able

to protect yourself, to be able to do that. And so that's really why I got into this, is to study these materials, to find out if they cause a hazard, and get that information out to people.

That's why I felt that I was -- that's why I was proud of the work I did for the Report on Carcinogens. I was getting the word out to people that something causes cancer and you need to know this.

And that's why I was honored to be asked to go to IARC because they have the same philosophy. They're looking at these materials to identify them as potential carcinogens, to get that knowledge out to people so they can use it to protect themselves.

Q. Who funds IARC?

A. IARC is funded by a number of organizations. Like I said, it's part of the World Health Organization and the UN so they get funding from that. They also get grants from a number of U.S. agencies, the National Toxicology Program at NIEHS, the National Cancer Institute in Bethesda, the U.S. Environmental Protection Agency supports IARC. And there are several other. Those are the three main government agencies that I'm aware of that provide a lot of support for the IARC monograph.

Q. What's the history of IARC? How did it come

about?

A. Well, it actually started back in 1965, my understanding. There was an influential individual in France. I don't remember this name, the guy's name, sorry. And evidently he had a relative who came down with cancer and died of cancer and evidently it was from an environmental source. And he was -- he made it his goal to address the issue of identifying environmental carcinogens.

So evidently he was the friend of Charles de Gaulle. Charles de Gaulle was the President of France at the time. That's following World War II he became the president. So he was a very influential individual.

And he dictated that an organization be established in France to address environmental cancer and got it funded through the World Health Organization. And so that's why the headquarters are located in Lyon, France because the French President said he wanted this established.

So this all started, and I don't remember the exact date that the monograph series started. It was sometime later in the '70s, early to mid '70s that it started. But that's why it start.

Q. And are there a set of rules and procedures

that govern how the IARC monograph program operates?

A. Absolutely. The IARC has published a preamble to the monographs. And the preamble outlines all the procedures and steps that are needed in evaluating the chemical that has been selected for review in the monographs.

And it also lists the criteria. It's very important that the criteria be used in evaluating the data to establish if something is a known or possible, probable human carcinogen.

Q. What are the classifications that IARC -- the IARC monograph program assigns to compounds?

A. Okay. At the time -- currently?

Q. Why don't we just -- historically what has it been?

A. Historically, okay. Historically the categories have been either known to be human carcinogen -- a known human carcinogen, a probable human carcinogen which is also referred to as their 2A classification, a possible human carcinogen which is referred to as their 2B category.

I should backtrack. The known human carcinogen category is known as 1A.

And then there is the inadequate or unable to adequately evaluate the carcinogenicity, and that's the

category 3.

And there was an additional fourth category, not -- I forget the exact wording of it, but not expected to be or not known to be a carcinogen, a human carcinogen. I think there was all of one chemical in that category during the whole series.

Q. About how many compounds has IARC looked at to assess whether or not they cause cancer?

A. They have looked at -- the current IARC monograph contains a total of 1,013 chemicals.

Q. And of those 1,013, what percentage of them have fallen into number 1, a known human carcinogen?

A. Into the known category, 12 percent of all the materials they have reviewed have fallen into the known category, that's 12 percent.

Q. And then what about 2A, so the second highest?

A. In the second highest, as a probable human carcinogen only 8 percent of the chemicals reviewed have fallen into that category.

Q. And then of the third category, 2B?

A. The 2B is a little bit more. About 31 percent of those chemicals reviewed fall into the 2B category.

Q. And that's a possible human carcinogen?

A. That's a possible human carcinogen.

Q. And then the last one?

A. And just to round it out, the last category, which is not classifiable as to its carcinogenicity, is the wording that they use, 49 percent, essentially half of the chemicals that have been looked at by IARC are not classifiable.

Q. So you understand what the IARC classification for glyphosate is?

A. Yes.

Q. What is that?

A. That's 2A.

Q. So that's the second highest?

A. That's the second, a probable carcinogen.

Q. So for 1 and 2A, only about 20 percent of compounds fall in that category?

A. That's correct.

Q. So 80 percent of the compounds looked at by IARC fall below what glyphosate was chosen for.

MR. ISMAIL: Objection. Leading, Your Honor.

THE COURT: Overruled. You can answer.

THE WITNESS: That's correct.

BY MR. WISNER:

Q. When we talk about the evidence regarding whether or not something causes cancer, what does the IARC program look at?

A. Well, as I indicated, the preamble outlines

what must be looked at to review a chemical. It includes exposure information. It's paramount to make sure that we have adequate exposure information that documents human exposure to the material.

We look at the human epidemiology data for cancer. We look at the experimental animal data for cancer in experimental animals.

And we also look at the mechanistic data. The mechanistic data is an area that is quickly expanding in the field of toxicology. And that includes looking at genotoxicity information: Does it cause gene -- or strand breaks or chromosomal aberrations? And also does it cause oxidative stress? And that type of information. As well as absorption distribution and metabolism data on the compound.

Q. And when you talk about these compounds that are reviewed, how are they selected?

A. For IARC?

Q. Yeah.

A. The method for selecting in IARC is every five years or so, they have an advisory group, they call together an advisory group. And I served on one of these advisory groups early on. When was that? 2003, I served on an advisory group at IARC.

And what we do -- what was done at these

advisory groups is, again, they call in experts from around the world on chemical carcinogenesis, and they ask them to prioritize lists of chemicals for review by the IARC monograph group.

And prior to this meeting, the IARC sends out announcements either targeted to particular individuals or organizations that they have worked with before and they also put out announcements on the Internet asking anyone who has a concern or information about a chemical that could be a potential carcinogen to please identify them to see if it's something that the IARC should look at.

So IARC gets all these nominations, if you will, from various sources. They also have staff that do a literature search of the available cancer data that has been published recently, if something new has come up and shown to be a carcinogen, either from epidemiology studies or animal studies or the strong mechanistic evidence that a material could be a carcinogen.

Then they have this list. The experts look at the list, and based on -- usually, to be honest, I think based on the -- exposure plays a very important role in prioritizing which chemical would be looked at first. If you have a material that, you know, a lot of people

in the world are exposed to and it poses a potential carcinogenic risk, then they would put that at the top of the list to review. Whereas if it's something that doesn't have a significant or a large amount of exposure, it may get a lower priority.

But they look at the list, prioritize it, and from there the IARC staff proceeds to make its schedule for reviewing or for performing different monograph reviews.

Q. So the IARC monograph program only looks at these chemicals that have gone through this process; is that right?

A. That's correct.

Q. So of those ones that have already gone through that initial process for selecting things that we actually have evidence or reason to look at them, amongst that group only 20 percent of that group ever get classified as a 2A or 1; is that right?

A. That's correct.

Q. Is IARC pretty robust or rigorous program as they evaluate these compounds?

A. Oh, definitely, yes. Like I said, the preamble specifically outlines what data needs to be looked at and the rigor with which they must perform the reviews.

And, for example, for epidemiology the preamble states that the Hill criteria for evaluation of causality must be applied when reviewing the epidemiology data for cancer in the monographs.

Q. The Hill -- are you talking about the Bradford --

A. The Bradford-Hill criteria, yes. That's specifically identified in the criteria as something that should be applied for the evaluation of the epidemiology data.

MR. WISNER: Your Honor, I have a binder for the witness as well as for yourself.

THE WITNESS: Thank you.

BY MR. WISNER:

Q. Doctor, we're going to talk about the actual glyphosate monograph in just a second.

But shortly after the meeting in March of 2015, there was a publication that came out. It's Exhibit 2068 in your binder.

A. Okay.

Q. Is this an article that you've seen and studied before?

A. I can't say that I've studied it. I've read through it, yes.

Q. Okay.

MR. WISNER: Your Honor, permission to publish.

MR. ISMAIL: No objection, Your Honor.

THE COURT: Granted.

(Exhibit published.)

BY MR. WISNER:

Q. So this is the article. As you can see right here, the title of it is "IARC Monographs: 40 Years of Evaluating Carcinogenic Hazards to Humans."

Did I read that right, sir?

A. Yes.

Q. And as you can see right here, there's a lot of authors; do you see that?

A. Yes.

Q. Some of them are going to be relevant later.

Do you know Dr. Aaron Blair?

A. Yes, sir, I do.

Q. Dr. Charles Lynch, do you know him?

A. Lynch, yes.

Q. He's actually one of the authors on the current AHS publication?

A. Yes.

Q. Dr. Aaron Blair, what was his relationship with the AHS?

A. He actually would be considered the principal

investigator on the AHS. He is the individual who initiated that study and has been overseeing it from the beginning.

Q. And did he have any involvement in the IARC monograph for glyphosate?

A. In the IARC monograph for glyphosate, he participated in the working group. In fact, he chaired the meeting for Volume 112.

Q. All right. So in this article, at the end of it they sort of explain where it comes from. And it says right here -- just to clarify, Doctor, look at the front page. This came out in June of 2015. Do you see that?

A. Yes.

Q. And it's on the bottom here.

All right. So it says right here at the end:

> For more than four decades the IARC monograph program has provided evaluations of cancer hazards to humans from many different exposures and agents. These are often the first evaluations of new and emerging threats to public health and consequently are subject to intense scrutiny.

Doctor, in your experience working in IARC on

16 different occasions, does IARC often deal with new and emerging threats?

A. Yes.

Q. And why is that?

A. Well, it's -- you know, they try to keep on the forefront, if you will, of new research findings and new data. And if something comes up in the literature that indicates that something is a strong or is a potential carcinogen, they try to address it immediately.

Q. It says here:

Although -- it says:

> Although these evaluations are widely respected and used by many organizations, institutions, companies, and government agencies to improve the public's health, IARC has recently been subject to criticism over conclusions on specific agents, the process that led to such conclusions, and membership of the Working Groups. Debate and criticism --

We'll stop right there, actually.

A. Okay.

Q. In June of 2015, so this is just a few months after the glyphosate program, did you observe that there

were suddenly criticisms being levied against IARC?

A. Oh, very --

MR. ISMAIL: Objection, Your Honor. Hearsay.

THE COURT: Sustained. Unless he has personal knowledge.

MR. WISNER: Yeah, I asked if he observed.

Q. Is it your understanding that following the monograph program in 2015 on glyphosate, that there was criticisms raised against IARC?

MR. ISMAIL: Same objection.

THE COURT: Personal understanding to the document?

MR. WISNER: That's correct.

THE COURT: Not general "I think I know."

MR. WISNER: Sure. Let me clarify that then.

THE COURT: Personally aware.

BY MR. WISNER:

Q. Doctor, were you personally aware of any criticisms levied against IARC following the glyphosate program?

A. Yes, sir, I am.

Q. Were you personally subject to some of those criticisms?

A. Yes, sir, I was.

Q. And, frankly, were you personally attacked?

MR. ISMAIL: Objection, Your Honor.

THE COURT: Argumentative.

BY MR. WISNER:

Q. Let's go to the conclusion here. And I'll ask if you agree with this. It says:

> Disagreement with the conclusions in an IARC Monograph for an individual agent is not evidence for a failed or biased approach. Some disagreement about the carcinogenic hazard of important agents seems inherent to the scientific enterprise and is unavoidable at the earlier stages of the hazard evaluation, where IARC usually operates. Because the evaluations are not—and should not be—static, it is difficult to see how such assessments could be addressed any differently. Substances now universally recognized as human carcinogens, for example, tobacco, asbestos, at one time went through a quite lengthy period of contentious debate. Any process can in theory be improved with fair and constructive criticism; appropriate reviews may take place from time to time,

and we would support continued review and improvement of the IARC processes.

However, as a group of international scientists, we have looked carefully at the recent charges of flaws and bias in the hazard evaluations by IARC Working Groups, and we have concluded that the recent criticisms are unfair and unconstructive.

The criticisms that you personally observed and experienced, do you agree that they were unfair and unconstructive?

A. Yes, they were absolutely unfair and obstructive. They in fact were false, what they were saying.

Q. And let's take a step back and talk about the actual IARC meeting.

So the program -- well, when was glyphosate announced that it was going to be reviewed by IARC?

A. I don't remember the exact date, but it was probably -- probably two years before the actual review took place.

Q. And when did you become aware -- let's lay some foundation.

Did you participate in the IARC working group?

A. I did. I participated as a member of the working group, and I also served as chair as the experimental animal subgroup for Volume 112.

Q. And as the chair of the experimental animal subgroup, does that mean you were going to look at all the rodent studies?

A. Yes, sir.

THE COURT: You know what, Doctor, if you could just speak a little more into the mic, your voice might project a little better.

THE WITNESS: I'm sorry.

BY MR. WISNER:

Q. We can scoot it over too, if you want to, to make it easier. There you go.

When did you first become aware that you would be working on the glyphosate monograph?

A. I received an e-mail inviting me to participate as a member of the working group. And as a standard procedure for an invitation of that type from IARC, they said if I would be interested and available to participate, to submit what they referred to as their document of interest, or DOI, which is a conflict of interest statements, if you will, to submit that to IARC for their review for them to ensure that there would be no conflict of interest in the review of any of the

materials that were going to be reviewed at a working group meeting. And upon review and acceptance of the conflict of interest statement, they would send a formal invitation.

So I did. I submitted my conflict of interest statement. And then about, I don't know, two or three weeks later I got another e-mail inviting me to serve as a member of the working group for Volume 112 and also asked me if I would serve as chairman of the experimental animal subgroup.

Q. What kind of work goes in to the working group? What kind of work -- strike that. Let me ask a better question.

What sort of work do you do leading up to the actual program in March?

A. Okay. Once you receive the formal invitation, that is usually followed up by --

I'm sorry, one of the jurors has a question, I think. Sorry.

THE COURT: That's okay. We'll deal with that. Go ahead.

THE WITNESS: Once you get the formal invitation, they also assign you specific chemicals to be responsible for, to write a draft of the monograph for the subgroup to which you have been assigned, and

for me that was the animal -- experimental animal subgroup.

They also give you a link to a website that they have at IARC where they have files of all the references that they have found in their literature search for all of the chemicals that are being considered under the -- for the particular monograph.

They say these are provided for your information, but as a working group member you are expected to conduct your own literature search and find all the available literature you can to ensure that you have all of the most recent information that has been published in the open peer-review literature for the material that's under consideration.

So once you do the literature search and find the files of the actual articles in the IARC monograph files, then you have to sit down and go through all those papers, evaluate the studies, evaluate the data in those papers, and then prepare a draft, what's referred to as a draft monograph for the animal -- experimental animal section that summarizes each and every study that you've looked at, and then also prepare a table that outlines, gives specific information for each study that you have evaluated.

///

BY MR. WISNER:

Q. And so --

THE COURT: Okay. So we need to take a quick break.

MR. WISNER: Sure.

THE COURT: We'll take our morning break now. We'll come back at 10:30. Thank you.

(Jury excused for recess.)

(Proceedings continued in open court out of the presence of the jury:)

THE COURT: I'm not going to give you the question. It was just a request for a short break.

I'm not going to count that as a juror question. I didn't want to single out anybody.

(Recess taken at 10:18 a.m.)

(Proceedings resumed in open court in the presence of the jury at 10:34 a.m.)

THE COURT: Thank you.

Mr. Wisner, you may proceed.

MR. WISNER: Thank you, Your Honor.

Q. Dr. Jameson, we were talking about the IARC program for glyphosate. Before we go back to that, I just want to ask you a quick follow-up question.

My first one is: As part of your career looking at things that cause cancer, how many -- what

percentage of that has focused on chemicals?

A. On just on individual chemicals as opposed to mixtures and biological?

Q. Yeah.

A. Oh, probably 75 to 80 percent are on individual chemicals.

Q. And as part of those, have you looked at pesticides before?

A. Oh, yes. A number of pesticides for both the Report on Carcinogens and at IARC.

Q. Do you have a particular interest in looking at pesticides as potential carcinogens?

A. That's what sparked my interest in participating in IARC Monograph Volume 112 was that they were looking at a range of pesticides.

I've always been interested in looking at pesticides. It's always been my impression that pesticides need to be looked at because they're developed as poisons to begin with. I mean, that's why they are made, to be poison to something, to kill a weed or a rodent or a bug or what have you.

So if they're designed to be a poison, then obviously they're suspect right from the get-go that they could be hazardous to humans.

So I feel it's very important to look at the

potential carcinogenicity of pesticides just to ensure that they don't cause cancer.

Q. This is sort of an also aside question before we go back to IARC. But you've had the occasion to oversee the budgets for running rodent studies; is that right?

A. Correct.

Q. I mean, how much money does it cost to do a two-year bioassay on rodents?

A. Well, it depends if you're talking currently or if you're talking when I started in 1980 or --

Q. Let's do both. How has it changed?

A. Well, let me just, for example, in 1980 when I started with the National Toxicology Program, we started 100 new animal bioassay studies in one year. That's how many we started, 100.

The average -- the price depended on the route of administration. The cheapest were dose feed and drinking water studies because you just mix it in either their feed or their water and put it in the cage, and that's it for the week.

The other studies like skin painting or gavage, which is put a tube down the throat and deliver it directly to the stomach, those are a little more expensive because they're more labor-intensive. You

have to dose the animal onces a day for five days every week.

And then the most expensive was inhalation because of all the engineering and other technical difficulties you had to come over in generating the gas or the aerosol or the particulate.

But an average cost for, say, let's just take, for example, the dose feeding study because most of the studies that we did were either dose-feed or dose-water.

One of those in 1980 would cost anywhere from let's say 250- to $300,000 per study.

As a side, I would say we realized when we started 100 chemicals in 1980, we probably made a mistake because that meant in 1982 we'd had 100 chemicals finishing and all needing pathology and that caused us to get backed up and we actually got criticized for not getting the studies published quick enough. But anyway that's an aside.

1980. For a feeding study it was about 250- to $300,000.

Currently the bioassay program starts maybe three bioassays a year now. That's mainly because of the budget has been restricted pretty extensively over the past year. Plus the studies have become so expensive. And because the protocol has expanded and

there's a lot more to a particular study rather than just feeding the animals and evaluating the tissues for tumors, there's a lot of additional, you know, tox studies done and metabolism studies done. Anyway, a current feeding study for the NTP is probably running anywhere between two-and-a-half and three million dollars each.

Q. Okay. And -- all right. That's helpful. I just wanted to get a sense --

A. Sure.

Q. -- of how much money.

And how long do they take typically?

A. Well, it's called a two-year animal bioassay. But the two years refers to the amount of time that the animals are actually being dosed.

From initiation of the contract to do the study, if you will, until you finish the pathology? Or are you talking about until you publish the report?

Q. The whole thing.

A. Okay. The whole thing, it can take anywhere from five to six years.

Q. Okay. All right. So back to the IARC monograph.

MR. WISNER: Permission to publish Exhibit 3029. It was published yesterday. It's the

list of participants.

MR. ISMAIL: No objection, Your Honor.

THE COURT: Granted.

(Exhibit published.)

BY MR. WISNER:

Q. All right. Doctor, we have here the list of the IARC participants. I'm going to call out the members.

What does "the members" refer to?

A. The members refer to the actual working group members of the IARC monograph. And those are the individuals who participate in reviewing the data, drafting up the actual monograph for the particular sections that they were assigned, evaluating the data, applying the criteria, and voting on what category the materials would fall in based on the IARC criteria.

Q. And here are some individuals we've already discussed. Dr. Aaron Blair; do you see that?

A. Yes.

Q. And he was the overall chair?

A. He was the overall chair for the whole volume.

Q. And then we have down here, we have yourself, Dr. Jameson. Do you see that?

A. Yep, there I am.

Q. And you are the subgroup chair?

A. Correct, for the cancer in experimental animals.

Q. We have some other individuals on here. We have, for example, Dr. Lauren Zeise. Do you see that?

A. Yes. She's with the California Environmental Protection Agency.

Q. Do you know her?

A. I've known Lauren for a number of years. Yes, she's an excellent scientist.

Q. And we have Dr. Matthew Martin from the U.S. EPA?

A. Yes. He was an EPA representative who participated on the working group.

Q. And does that create any problems having -- being that he works at the EPA in his day job but he's now participating in the working group?

A. No. What it would be is, as a working group member, he's there as a scientist really and not as a representative of the EPA.

I think if you look at the list of either -- I don't know if he was listed as an observer or representative, but there was an individual there that was also from the U.S. EPA that was not a member of the working group but was there at the meeting.

Q. Is that --

A. Yeah, Mr. Rowland, yes.

Q. You said Mr. Rowland. And this actually came up yesterday. Is Jesudosh Rowland a doctor?

A. No. I think he has a master's, but I don't think he has a Ph.D.

Q. All right. And then we have obviously observers here. What role do the observers play at the monograph?

A. Well, because the process is an open process, the monograph review process, people are invited to send observers if they have a particular interest in the material -- any of the materials that are being reviewed for the monograph -- for the particular monograph.

And so industry routinely sends observers just to monitor what's being done at the monograph review. But the IARC is -- restricts, if you will, that only one observer per an organization can come because if you were allowed to have, you know, multiple people from the different organizations, it would just be such a crowd, it just wouldn't work.

So they outline very specifically in their procedures that observers are welcome, but only one observer per particular organization.

Q. We have here Thomas Sorahan, Dr. Sorahan, from the Monsanto Company.

A. Yes, he was the representative of Monsanto at the Volume 112 review. He's an epidemiologist. In fact, Dr. Sorahan has served on several monographs before as an actual member of the monograph. So I'm sure he was chosen to be an observer for Monsanto because he understood the process, understood the program.

Q. And then we have this person, Christian Strupp from the European Crop Protection Association. Do you know who that is?

A. That is a trade association in Europe of farmers and producers, I believe. I really don't know. To be honest, I really don't know. I know that there was representatives there from the European agrichemical companies. And maybe that's what that is. But I'm sorry, I was speculating based on the name.

Q. All right. And I understand there was a photograph taken of all the people who were there?

A. Yeah. Routinely they have a group photo of the whole working group and observers and representatives and what have you, is taken for every monograph that's done. I have a portfolio of 16.

Q. Turn to Exhibit 1039 in your binder.

Is that a fair and accurate photo of the group taken for the monograph program?

A. Yes. That looks like the photograph for Volume 112.

MR. WISNER: Permission to publish, Your Honor.

MR. ISMAIL: No objection, Your Honor.

THE COURT: Granted.

(Exhibit published.)

BY MR. WISNER:

Q. So here we have IARC monographs on carcinogenic risk to humans, Volume 112.

Let's take a little tour around here and introduce the jury to some of the people.

So first, let's start off with you. Is that you back there?

A. That's me in the back.

Q. All right. There's Dr. Jameson.

Here we go. Who's that right there?

A. The tall person in the middle is Chris Portier. And behind him to his right is Tom Sorahan, the Monsanto representative.

Q. Okay. So those two -- all right. What about here in the front, who is that?

A. That is the EPA observer or representative.

Q. Jess Rowland?

A. Right. He wasn't a working group member, but

he was there for the EPA.

Q. Okay. And who's next to Jess Rowland? Who are those people?

A. To the right is Kurt Straif who, at the time, was the head of the monograph program at IARC.

And to his left is Kate Guyton. She was the IARC staff member who was responsible for coordinating and organizing the Volume 112 monograph review.

Q. All right. And right there, is that Dr. Zeise, Lauren Zeise, from the California EPA?

A. Right. The blonde lady, right. That's Dr. Zeise, that's Lauren Zeise.

Q. All right. And right here in front next to these three, who's that individual?

A. That's Dr. Aaron Blair. He was the overall chair of the working group for Volume 112.

Q. And just to get a sense of things, you know, you were at this meeting with these individuals for over a week. Did you get to know them and interact with them on a scientific basis?

A. That's correct. That's one of the things that I liked about the IARC monograph or being able to participate in the IARC monographs, is it gave me an opportunity to interact with all these international scientists and afforded me a chance to discuss data and

get their ideas of what the data meant because sometimes people in different countries have a different approach to evaluating the data that I would be looking at.

And so that gave me the opportunity to pick their brains, if you will, as to, well, in this particular situation, how do you look at the data or have you seen this before and that type of thing.

So, to me, that was part of the great thing of going to IARC was to interact with all of these internationally known and recognized scientists.

Q. Now, ultimately, what classification did the working group give to glyphosate?

A. Glyphosate was given the 2A category as a probable human carcinogen.

Q. Now, were you there and present for the debates and discussions about what to classify glyphosate?

A. Yes. I was present for all the debates.

Q. And my first question is: Was there ever consideration giving it a class 1 or a group 1 classification?

A. What I can say is during a plenary session where all of the members of the working group and where everybody was present, when we started reviewing the epidemiology section for the glyphosate, they were

discussing all of the different studies, all the cohort studies, the AHS study data that was available at the time, the meta-analysis that had been done on the epi studies.

And there was a debate at one time. Several of the members raised the point that they felt the data raised was at a point where they would say it was sufficient in humans that it would lead to a 1 -- to a category 1 listing.

But I think it was the majority of the epidemiologists which I guess you could say swayed the rest of the working group that because the AHS study, which was the only cohort study available for this, and in epidemiologists' eyes, a cohort study is the gold standard, if you will, for doing an epidemiology study. And since the data there wasn't showing a positive association -- a significant positive association for cancer, they said that it's more in the limited category, they felt, for human epidemiology data.

And so that was their argument and that's what carried the vote.

Q. Now, Doctor, you said cohort studies are often the gold standard.

A. I said for epidemiologists, that's --

Q. Have you looked at the AHS?

A. Have I?

Q. Yes.

A. Yes. Oh, yes.

Q. Do you think it's a good study?

A. No. It's not a good study at all. It has a lot of flaws in it that seem to keep getting worse and worse. And in my mind, in my opinion, it wasn't designed very well from the get-go.

And the flaws in the design, especially the number of people who were in the initial response to the questionnaires about their exposure and what have you, and then the relatively few -- well, I mean, only 60 percent of the initial responders responded to the questionnaire for follow-up.

And so they had to guesstimate what the people who didn't respond, what their exposure was, and that wasn't a very good thing to do because, as it turns out -- I'm sorry. Am I going into too much?

Q. No. Keep going.

A. As it turns out, in the AHS study from when it first started, the amount of glyphosate or Roundup being used was high, very high.

But then right after the cohort study started is when Monsanto introduced genetically modified seeds to the -- to make them available to the farmers. And

these seeds would make the wheat or the corn or soybeans or whatever, would make those plants resistant to Roundup.

MR. ISMAIL: Your Honor --

THE COURT: I think we're --

MR. ISMAIL: Getting far afield.

THE COURT: Gray territory.

BY MR. WISNER:

Q. Sure. Let's not talk about that.

A. Sorry.

Q. No, it's fine.

Did Roundup use change at that time?

A. Roundup. Okay, the bottom line is Roundup use changed significantly in the course of -- from the time the cohort study started until the follow-up questionnaire came. And so the guesstimates or the estimates that they were making for the people that didn't respond were not accurately calculated.

Q. And when you pit all that flawed AHS study against all these positive case-control studies --

A. The positive -- the case-control studies are essentially all positive. They're not all statistically significantly positive, but they're all positive. They're all showing an association between use of Roundup and non-Hodgkin's lymphoma.

And in my mind, those consistent results far outweigh any result that you didn't see in a cohort study. And the other point being I feel the cohort study is flawed.

Q. All right. So earlier with Dr. Portier, we put together something called the three pillars of causation. Okay. And I'm just going to write in here what we did so you can get some background.

The first pillar was the animal data. The second one was epi. And the last one was the cell data, or I think we called it mechanistic data.

A. Mechanistic data, right.

Q. So did you, as part of your work on the working group, look at all three of these pillars?

A. Yes.

Q. All right. I'm going to go through each one.

What was the classification given to the animal data?

A. For the IARC monograph review, the classification for animals was that there was sufficient data that glyphosate caused cancer in experimental animals.

Q. And what does "sufficient" mean?

A. "Sufficient" meaning that a positive association has been seen in multiple studies, in

multiple sexes, multiple species, or to an unusual degree -- the tumor incidence is at an unusual degree observed in the animals.

Q. And is that the highest classification?

A. That's the highest classification for the animals, is "sufficient."

Q. All right. What about epidemiology, what did the working group give that?

A. The epidemiology was identified as limited.

Q. Is that what you were saying a second ago, between the sufficient and limited fight?

A. Pardon me? I'm sorry.

Q. Is that what you were talking about the sufficient and limited fight that was happening?

A. What do you mean? I don't understand what you're --

Q. Sorry. Earlier you talked about how category 1 was brought up as a possibility.

A. Oh, yeah.

Q. Was it about this point?

A. Okay, yeah.

Q. And so what did you guys find?

A. Well, the working group indicated that for epidemiology the data was limited. "Limited" means that the -- an association between exposure to the material

and cancer is reasonable, it's found that a causative relationship is -- what is the proper term? Reasonable or -- a causal association has been found. But bias confounding and could not be absolutely accounted for.

Q. Do you want to look at the preamble just to verify?

A. Sure.

Q. It's Exhibit 0946. And I believe the classification for limited --

A. I'm sorry, I should have had this written to memory.

Q. It's all right.

All right. It starts on, I think the very bottom, page 21 --

MR. WISNER: Your Honor, permission to publish the preamble?

MR. ISMAIL: No objection.

THE COURT: Granted.

(Exhibit published.)

BY MR. WISNER:

Q. So I'll just show. This is the preamble; right?

A. Right.

Q. Go to page 21. Down here they have the definitions of "sufficient" and "limited."

A. Sufficient and limited.

Q. Limited evidence of carcinogenicity; do you see that?

A. Right.

Q. All right. And it says right here:

> A positive association has been observed between exposure to the agent and cancer for which a causal interpretation is considered by the Working Group to be credible, but chance, bias, or confounding could not be ruled out with reasonable confidence.

A. That's exactly what I was trying to say.

Q. Well, it says here, I mean, I want to be clear, the word is limited.

A. Right.

Q. But it says a causal interpretation is considered by the working group to be credible.

What does that mean?

A. That means that the data shows that exposure -- in the case of glyphosate, that says that the exposure to Roundup caused the observed non-Hodgkin's lymphoma in the people exposed -- in the workers exposed to it from the various cohort studies and also from the meta-analysis of the cohort studies

and the -- I'm sorry, I was mistaken.

That means that an association is credible from all the case-control studies and also from all the meta-analyses of the case-control studies and the cohort studies.

So an evaluation was credible that exposure to Roundup caused non-Hodgkin's lymphoma. And these are all at real world exposure levels. These are people who are using this stuff in their -- you know, daily in their work and so they're exposed to real world concentrations of this material.

And it is a causal relationship between exposure to Roundup and non-Hodgkin's lymphoma, but there are con -- but confounders and bias could not be completely explained away.

Now, some of the bias -- some of the confounders are that farmers and lawn care people aren't exposed solely to glyphosate, they use other pesticides in their day.

And so it wasn't -- the use of these other pesticides was not taken into consideration when the data was evaluated by the scientists in the papers for the epidemiology that they did for these particular workers.

But I would say that most of the pesticides

that the workers would be exposed to have not been identified as causing non-Hodgkin's lymphoma. But the fact that it wasn't -- that wasn't addressed in the paper for the epidemiology, that's why they said the confounders weren't considered.

And so because that's in there, there's also some bias could be associated with the questionnaires that people were asked. You know, the questions that people were asked, their responses might have been biased because of their particular situation.

For example, if I may. For example, you may ask a worker:

> We're investigating non-Hodgkin's lymphoma in the use of Roundup. You have non-Hodgkin's lymphoma. Have you ever used Roundup?

Well, since the guy has non-Hodgkin's lymphoma, he's going to think, oh, that's why I have it, yes. But in reality he didn't. He didn't. So but he would have been placed incorrectly in a category that hadn't been exposed to glyphosate or to Roundup and has non-Hodgkin's lymphoma.

Q. Dr. Jameson, in these studies that you're talking about, that's not how it went?

A. Oh, no. No, no, no. I was just giving an

example. I'm sorry. I didn't mean to -- I'm sorry. I was just trying to use a relevant example.

Q. Sure. I appreciate that.

All right. So I'm going to go back to the thing -- I had to rewrite it because it disappeared when I moved off the last document.

But this limited categorization, is that the highest, second highest, third highest?

A. Well, I guess you can refer to it as the second highest category for epidemiology.

Q. Okay. It's sort of legible.

All right. The last one here is the cell data. What category did IARC give that?

A. They gave that -- the category that they gave to that is strong, strong mechanistic evidence for carcinogenicity.

Q. And what was the mechanisms they identified?

A. Basically they identified genotoxicity, which refers to the DNA, affecting the DNA and that type of thing. And also oxidative stress.

Glyphosate causes extreme oxidative stress in some cells. And oxidative stress is a known mechanism for the causing of cancer in humans and in animals. And I think oxidative stress has also been associated with non-Hodgkin's lymphoma formation in humans.

Q. And is that the highest category?

A. That's the highest category for genetox -- or mechanisms, excuse me.

Q. All right. Now, I understand that IARC focuses on publicly available data; is that right?

A. That's right.

Q. Why? Why don't they look at anything under the sun?

A. Well, it's important that it's restricted to peer-review data because you want to assure yourself that the quality of the study and the quality of the reporting of the data is verified by a review of peers, if you will.

It's important to -- just to have confidence that the data as reported is reliable and factual.

Q. The decision to classify glyphosate as a class 2 probable human carcinogen, was that a unanimous decision?

A. That was -- yes, it was a unanimous vote for the classification, yes.

Q. So every person on that working group voted yes?

A. Yes.

Q. Now following the IARC classification, I understand -- well, let's back up.

How did you get involved in this litigation?

A. You want the whole story?

Q. Yeah, sure.

MR. ISMAIL: Your Honor, just may we approach?

THE COURT: Sure.

(Sidebar held but not reported.)

BY MR. WISNER:

Q. Let's not talk about this issue.

A. Okay.

Q. Let's instead focus in on what happened after IARC.

A. Okay.

Q. Were you and your working group members -- well, were you subpoenaed by Monsanto following the IARC decision?

A. Yes. I was personally subpoenaed, and every member of the animal working group was subpoenaed for copies of documents that we prepared for the IARC monograph review.

Q. And I just want to be -- you've been on 16 other panels; right?

A. Right.

Q. Has that ever happened before?

A. No, never.

Q. Following the IARC monograph, are you aware of

a group called EFSA disagreeing with it?

A. Yes.

Q. And I believe you joined a letter talking about this issue with Dr. Portier; is that right?

A. That's correct.

Q. If you look in your binder, it would be Exhibit 2131 -- oh, I'm sorry.

Actually if you look at Exhibit 1020, is that one of the open letters that you signed from November 2015?

A. It looks like it, yes.

MR. WISNER: Permission to publish, Your Honor. It was published yesterday.

THE COURT: Granted. If it's already been published once, then you don't have to ask.

MR. WISNER: Sorry. I don't want to do anything wrong.

THE COURT: No, it's fine.

(Exhibit published.)

BY MR. WISNER:

Q. So this was a letter that was sent to the Commissioner of Health and Food Safety, and it looks like it was dated November 27, 2015; is that right?

A. Correct.

Q. Okay. And I just want to quickly go to the

signature line. It starts here on page 8, and the first signatory is Dr. Christopher Portier.

A. That's correct.

Q. And then if we just zoom in here, there's a bunch of other signatories following that, someone from the University of Sydney, Australia; do you see that?

A. Yes.

Q. University of Auckland in New Zealand; do you see that?

A. Yes.

Q. And the next page, it goes on. We have researchers from Russia, France, Italy, Chicago, more Italy; do you see that?

A. Yes.

Q. It keeps going. We have people from Norway, it looks like a researcher from Massachusetts, professors at various universities, Boston University; do you see that?

A. Yes.

Q. Let's keep going. This one is sort of interesting. You have Dr. Anneclaire De Roos; do you see that?

A. Yes.

Q. And she's an author on the AHS study?

A. The AHS study, that's correct.

Q. And earlier -- we're still in the D's.

All right. Hardell, do you see Dr. Hardell here?

A. Yes.

Q. Is he also an author on some of the epidemiological studies?

A. Yes, he is, yes.

Q. And then we have you. Do you see that? That's you, Doctor.

A. Yes. There I am.

Q. And the list goes on for a while. We have different people from different places.

I want to talk about what was actually said in the letter. Okay?

A. Okay.

Q. So if we go to the first page, the first paragraph reads:

> We are a group of independent academic and governmental scientists from around the world who have dedicated our professional lives to understanding the role of environmental hazards on cancer risks and human health. We have banded together and write to you at this time to express our deep concern over the recent

European Food Safety Agency, EFSA, decision that the widely used herbicide glyphosate is, quote, unlikely to pose a carcinogenic hazard to humans. We ask that you forward the letter to the representatives of all EU member states before the next meeting of the standing committee on plants, animals, food, and feed.

Dr. Jameson, are you one of the people that stood with this group of people who were banding together?

A. Yes, I did.

Q. Why?

A. Because I agreed with what was being said in the letter, that the EFSA, the European Food Safety Agency, decision was wrong. I don't think they adequately evaluated the data that was available on glyphosate and their risk assessment or risk analysis of it was not correct. And I felt that it was something that I agreed with, with the premise that they should be -- it should be brought up that a number of people disagreed with what they were coming out with.

Q. The next paragraph reads:

The EFSA decision, based on the

renewal assessment reports provided by the German Federal Institute for Risk Assessment, BfR, runs counter to the finding earlier this year by the International Agency for Research on Cancer, IARC, the highly respected cancer arm of the World Health Organization, that glyphosate is a probable human carcinogen. This IARC classification is based on a comprehensive assessment of the peer-reviewed toxicologic and epidemiologic literature undertaken over a 12-month period by a working group of 17 independent expert scientists.

I'm going to stop right there.

Is that correct, you guys were independent expert scientists?

A. That's correct.

Q. It goes on:

> The IARC review linked glyphosate to dose-related increases in malignant tumors at multiple anatomical sites in experimental animals and an increased incidence of non-Hodgkin's lymphoma in exposed humans.

Do you agree with all that?

A. Yes, sir, I do.

Q. It says down here:

In October 2015, the EFSA reported on their evaluation of the renewal assessment report for glyphosate. EFSA concluded that glyphosate is unlikely to pose a carcinogenic hazard to humans and the evidence does not support classification with regard to its carcinogenic potential.

And then it reads:

In response to that, we have serious concerns with regard to the scientific evaluation in the BfR addendum and feel that it is misleading regarding the potential for a dose-dependent carcinogenic hazard from exposure to glyphosate. Since the BfR addendum is the basis for the European Food Safety Agency conclusion, it is critical that we express these concerns.

Why was it critical that you express these concerns, Dr. Jameson?

A. Well, it was important to get out that -- at least what I was reading from the European -- from the

EFSA review is they were addressing mostly contamination of food products by Roundup and glyphosate. So their assessment was focusing only on that and not on the general exposures of any other type, like the farmers and lawn care workers and that type of thing.

So their evaluation was not -- was not focused on the right issues and on the right outcomes that the epidemiology studies especially. So -- and to be very honest with you, I didn't understand how they could look at the same animal data that I had looked at and come to such a different conclusion.

Q. Now we go through some of the data. In fact there's a whole discussion about the animal data right here. And it kind of goes through their findings. And then sort of bottom line is it says:

> Given this evidence, it is clear that BfR differed from standard scientific practices in order to reach their conclusions.

Do you agree with that?

A. Yes.

Q. It says:

> BfR reported seven positive mouse studies with three studies showing increases in renal tumors, two with

positive findings for hemangiosarcomas and two with positive findings for malignant lymphomas. BfR additionally reported two positive findings for tumors in rats. Eliminating the inappropriate use of historical data, the unequivocal conclusion is that there are negative studies but in fact -- that these are not negative studies but in fact document the carcinogenicity of glyphosate in laboratory animals.

Do you agree with that?

A. I agree with it. Like I was saying, I could not believe they could be looking at the same data I was and come to such a radically different conclusion.

Q. All right. I just want to go to the final conclusions. It says:

> Science moves forward based on data, careful evaluation of those data and a rigorous review of the findings and conclusions. One important aspect of this process is transparency in the ability to question or debate the findings of others.

Doctor, this principle of transparency, is that part of the monograph philosophy?

A. Yes, absolutely.

Q. Why?

A. Well, it's important that any reviews that the IARC monograph performs is done in an open and transparent manner so that everybody knows the process by which the reviews took place and how the decisions were made for listing something in the monograph.

Q. It says:

> Due to the potential health implications of this extensively used pesticide, it is essential that all scientific evidence be freely available, reviewed openly in an objective manner, and that financial support, conflicts of interest, and affiliations of authors be fully disclosed. Many aspects of the evaluation conducted by the BfR and EFSA do not meet this fundamental objective criteria and raise significant concerns of validity.

Do you agree with that?

A. Yes.

Q. Why is that, sir?

A. Well, some of the data that EFSA used was of questionable quality or of questionable sources.

Q. All right. The very last point is right here. It says on page 7:

> The most parsimonious scientific explanation of the cancer seen in humans and laboratory animals supported by the mechanistic data is that glyphosate is a probable human carcinogen.

Sir, when you say "probable" there, are you using it in the context of IARC?

A. Yes, that's what it was meant.

Q. (Reading aloud:)

> On the basis of this conclusion and the absence of contrary evidence, it is reasonable to conclude that glyphosate formulations should also be considered probable human carcinogens.

Do you share that opinion, sir?

A. Yes.

Q. All right. Now, the jury -- the jury heard a little bit about this letter from Dr. Portier yesterday. So I'm not going to go through it. I didn't have a chance to go through it with him like I am with you due to time constraints, but you were an author on this letter; is that right?

A. Yes. I signed the letter.

Q. Well, let me back up.

Following this letter or even just before the letter but following IARC, did you go beyond the data that IARC considered in your evaluation?

A. In -- are you talking about in my evaluation that I used to prepare my report?

Q. Yeah. Let me back up.

So after IARC --

A. Okay.

Q. -- did you go farther than you had done in IARC to look at glyphosate data?

A. Yes, I did.

Q. How much farther did you go?

A. Well, when I -- when I came to the IARC working group meeting, the first time I was made aware of a particular publication that had just recently come out, which is referred to as "the Greim paper" which was a summary of all -- of a number of industry studies that had been submitted to EPA evaluating the data on those studies, all of which were not previously publicly available.

Since I was just made aware of that study when I arrived at the IARC working group meeting, the animal subgroup did not have enough time to adequately evaluate all the information in that paper, especially since

there was supposed to be a supplemental table that contained a lot of the data on individual animals that was needed to do the evaluation, and the website or the link that they provided for that we just couldn't get it to work during the meeting. So we really weren't able to get to look at the data.

I think a hard copy of the reams and reams of tables was made available to us sometime during the meeting. But, I mean, at the meeting we weren't just evaluating glyphosate, we were looking at several other chemicals as well, and so we did not have time to adequately evaluate the Greim paper.

Some of the studies in the Greim paper, some of the studies we had already had the opportunity to look at because we got the information from EPA documents.

But that's not to say we didn't address the Greim paper in the monograph. The Greim paper is addressed in the monograph itself, and we summarized what the information is for a particular study but say we did not have ample time to adequately evaluate this data. So we acknowledged it, but we didn't -- we couldn't evaluate it.

But anyway, following the monograph meeting, it gave me the opportunity to go back and look at the

Greim paper again, get all the tables and be -- have the time to go through and look at the tables. And what happened was that with the animal data available from those tables, I was able to find additional tumors that we didn't find at IARC.

And so all of that information in that particular paper was helpful in identifying more tumors in different studies and to strengthen the evidence as far as the animal carcinogenicity is concerned that glyphosate is an animal carcinogen.

Q. And what about the epi, has there been more epidemiological evidence that has come out since IARC?

A. Since IARC there has been an update of the AHS study, the Agricultural Health Study. I think that came out in 2018. Basically that -- the results from that particular study didn't change what was observed in the first set of data, is that no effect on any particular cancer site was observed in that update.

But there have also been several additional meta-analyses.

And has the jury been explained what an meta-analysis is?

Q. Yes.

A. Okay. If Chris was here, I'm sure he did.

Anyway, the meta -- two additional

meta-analyses were published, some of them quite recently, which took another look at all of the case-control studies and added the information from the 2018 update of the AHS study.

And the two meta-analyses that have come out just confirm you get a statistically significant positive increase in risk for the association of exposure to Roundup and non-Hodgkin's lymphoma. Again, these are all at real world concentrations. These are people that are using the material in their work and daily lives.

So those additional works, really the data that has come out since the IARC monograph just tends to strengthen the data that it is, A, an animal carcinogen, and B, that the epidemiology just continues to get stronger that it is -- it causes non-Hodgkin's lymphoma in exposed workers.

Q. Now I understand there's a recent AHS update 2018; right?

A. Correct.

Q. When was the original AHS data published?

A. That was -- was it 2006? 2007, I believe. I don't remember the date. I'm sorry.

Q. Fair enough. But would it be fair to say that as part of the working group, you guys considered that

data carefully?

A. Oh, absolutely. The AHS was part of the consideration of the epidemiology for the IARC working group. We had the reports, and those were taken into consideration and evaluated by -- first by the epi working group and then by the entire working group.

Q. Hold on a second. You said Dr. Aaron Blair was the overall chair of the group.

A. Yes.

Q. And you also said he was the principal investigator for the AHS.

A. That's my understanding, yes.

Q. And he -- despite that, he voted with you in classifying Roundup as a class 2 carcinogen.

A. Class 2A. Yes, he did.

Q. Did you, as part of your analysis for this case, conduct a Bradford-Hill analysis?

A. I did.

Q. And I'm not going to run through it. We did that with Dr. Portier yesterday or the day before -- I think it was yesterday.

Did you come to a conclusion based on your Bradford-Hill analysis?

A. Based on the Bradford-Hill criteria, I think it met most of the criterias that are outlined in the

Bradford-Hill for causality of the association of exposure to glyphosate -- or to Roundup, excuse me, and non-Hodgkin's lymphoma.

Q. Now, yesterday we spent a lot of time reading foreign regulatory conclusions to Dr. Portier and asking if he disagreed with it.

And we actually showed this slide to him. I'm going to show it to you now.

It was a slide, and it had the regulatory agencies -- it has the regulatory agencies -- the regulators here and whether or not Dr. Portier agrees right there. Okay.

A. Okay. Yes.

Q. I guess you can imagine what his opinion was about each one of those.

A. Yes.

Q. Let me just ask you: Does Dr. Portier stand alone? Do you also disagree with these?

A. Yes, I also -- I concur with Chris' opinion, and I also disagree with these -- these organizations and their evaluation.

Q. Indeed when we talk about, for example, EFSA and ECHA, we looked at that letter a second ago; right?

A. Right.

Q. Not only does Chris not stand alone with you,

but he has a hundred scientists that stand with him.

A. Right.

Q. Final thing, Doctor. These are the final questions I asked Dr. Portier, sort of the global questions that we're trying to answer here. I'm going to ask them to you.

Based on your review of all the science, does Roundup cause tumors in mammals?

A. Yes.

Q. Does Roundup cause malignant lymphoma in mice?

A. Yes. In several studies, in at least three studies.

Q. Does Roundup cause genetic damage in human lymphocytes?

A. Yes.

Q. Does Roundup cause oxidative stress in human cells?

A. Yes.

Q. Does non-Hodgkin's lymphoma -- sorry. Does Roundup cause non-Hodgkin's lymphoma in humans at real world exposures?

A. Yes.

Q. And, Doctor, these answers you just gave me, were they all given to a reasonable degree of scientific certainty?

A. To a reasonable degree of scientific certainty, glyphosate and glyphosate-formulated products are probable human carcinogens, and the data is very strong that glyphosate causes non-Hodgkin's lymphoma in exposed workers.

MR. WISNER: Thank you, Your Honor.

One second.

No further questions, Your Honor. We pass the witness.

THE COURT: Do you need a minute to transition the equipment?

MR. ISMAIL: Yes, Your Honor.

THE COURT: Okay. So we're going to take a five-minute break just to transition the technology. So if anyone would like to hop up and go to the ladies' and men's room, but come right back, please.

(Recess taken at 11:31 a.m.)

(Proceedings resumed in open court in the presence of the jury at 11:36 a.m.)

THE COURT: Mr. Wisner has a couple of questions he'd like to ask.

So before we go to cross-examination.

BY MR. WISNER:

Q. Sorry, Dr. Jameson, there's a few more things I want to ask you about.

So you know we have these different -- the tumor chart we were looking at a second ago; right?

A. Right.

Q. We talked earlier about the kidney tumors; do you remember that?

A. Yes.

Q. And I wanted to ask you about the dosing levels for some of the latter studies.

A. Okay.

Q. I understand that you've looked at the Sugimoto study; is that right?

A. Yes.

Q. And do you recall what the low-, mid-, and high-dose levels were for that study?

A. For the Sugimoto, which was published in 1997, the dose levels were zero, 1,600 parts per million, 8,000 parts per million, and 40,000 parts per million.

Q. And when you say that, is that milligrams per kilograms per day or --

A. No. That refers to the concentration in the feed.

Q. Okay. How does that -- we've heard previous testimony about milligrams/kilograms per day. Do you know what that number would be for those ones?

A. Just off the top of my head, no. I can't do

the calculation. Given a little time, I could do it. But the milligrams per kilograms per day -- this is for mice -- it depends on the amount of feed consumed during the day and the body weight of the mouse.

Now, the mouse weighs about 30 or 40 grams, and, you know, they consume about 2 or 3 grams of feed. So --

Q. Okay. Let me ask you this way. And I think this might get closer to it.

We've heard reference to the dosing levels in the Knezevich & Hogan study. What were those numbers?

A. Those numbers were a thousand -- were zero, a thousand, 5,000, or 30,000 parts per million in the feed.

Q. So the Sugimoto study had higher doses?

A. Higher levels, right.

Q. What about the Kumar study?

A. Kumar, those dose levels were zero, 100, 1,000, and 10,000 parts per million in the feed.

Q. So they were almost --

A. Lower.

Q. -- a third less than the Knezevich & Hogan study?

A. Correct.

Q. And in all three of those studies, there was a

kidney tumor finding; is that right?

A. That's correct, in the males.

Q. And I -- we kind of addressed this, but I just want to clarify. You talked about a second ago how you went and looked at the Greim article and found additional tumors; is that right?

A. Correct.

Q. How does that work? How did you not catch them at IARC, but now you do see them; how does that happen?

A. Like I said, we had very -- we didn't have adequate amount of time to adequately evaluate the Greim paper when we arrived at IARC. For whatever reason, the paper wasn't made available to us until we got to the meeting.

So having more time, you go in and look at the actual tumor tables or the tumor incidences that were in the supplemental data to the Greim paper. And to be honest, in addition, I had access to some of the actual laboratory reports from the labs that performed the studies for both Monsanto and for other industry sponsors that were submitting these carcinogenicity studies to EPA for the regulation. And so I was able to get some of those tumor incidence data from those reports as well.

So that was subsequent to the IARC meeting.

Q. And that sort of evaluation you did after IARC looking at the data that was made available, is that what allowed you to find these tumors that you guys weren't able to find in IARC?

A. Correct.

Q. And since you already classified the animal data in the highest category in IARC, finding yet even more tumors in more animal studies, did that strengthen or weaken your assessment?

A. No, I'm sorry. That absolutely strengthened. The data just got stronger.

As I indicated before, the data just gets stronger the more you look into the available information for glyphosate.

Q. And just to be clear, Doctor, if you look in your binder, it's Exhibit 1019.

A. Okay.

Q. And that is -- is that a fair and accurate copy of the IARC monograph?

A. It looks like that, yes.

Q. And that's the monograph that you helped write?

A. Correct.

Q. It's the monograph that you voted on?

A. Correct.

Q. And I just want to clarify, making these monographs, is that something that's done in the regular course of what IARC does in the monograph program?

A. Correct. It's part of the process. But I would point out and emphasize that this monograph on glyphosate is the product of the entire working group. Even though I initially drafted this -- that was my assignment, to initially draft the glyphosate monograph -- the entire monograph is then reviewed by the animal working group and then in plenary session by the entire working group, and it is the entire working group that is the author of this monograph. No individual person at the monograph meeting is considered to be the author.

Q. And that document, is that document created in the routine and regular course of the monograph program?

A. That's right. That's correct.

MR. WISNER: Thank you.

Pass the witness.

THE COURT: All right. Cross-examination.

MR. ISMAIL: Good morning, everyone.

CROSS-EXAMINATION

BY MR. ISMAIL:

Q. Good morning, Doctor.

A. Good morning.

Q. We still have some part of the morning left.

Dr. Jameson, just sort of to orient the process for this cross-examination, my questions are going to be a little more different in format than what Mr. Wisner was asking. I'm going to be largely asking yes-or-no questions. And if you need to explain or if I ask you to explain, of course we can get there.

But for the most part, if you wouldn't mind, sir, can you answer my questions "yes" or "no" when they fairly call for a yes-or-no answer.

A. I'll try.

Q. Very good. Thank you.

Now, Doctor, just so we can orient the scope of what you're testifying to here in this trial, you are not a medical doctor; correct?

A. I am not a medical doctor, that is correct.

Q. And so given that, you have never diagnosed or treated a patient with non-Hodgkin's lymphoma; true?

A. That is true.

Q. And in terms of your role here, you are not here to discuss either Mr. Pilliod or Mrs. Pilliod specifically; true?

A. That is true.

Q. You are not here to tell the jury what you

believe caused or did not cause their non-Hodgkin's lymphoma; correct?

A. That is true.

Q. You're not -- you are not familiar with either plaintiff's medical history; correct?

A. That's correct.

Q. Because you didn't review their medical records, the depositions of their treating physicians, for example; true?

A. That's correct.

Q. And so you're not aware of the risk factors, clinical risk factors that Mr. Pilliod and Mrs. Pilliod had for the development of non-Hodgkin's lymphoma; true?

A. I know nothing about their exposure situation.

Q. I'm sorry. I didn't mean to interrupt.

A. I don't know anything about their exposure situation, that's accurate.

Q. And I was actually going to ask that next. Just in terms of how often, how much, on what days they sprayed Roundup residentially, that's nothing that you have any information about and can share with the jury; true?

A. That's correct.

Q. Now, you do not consider yourself an expert on non-Hodgkin's lymphoma; correct?

A. Could you define "expert"?

Q. Well, I'm going to provide -- give you a copy of your deposition.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Sir.

A. Thank you.

MR. WISNER: Your Honor, I'm going to object if this isn't impeachment. He hasn't answered the question. He asked for a definition. I'm not sure what's going on.

MR. ISMAIL: Well, Your Honor, if I could direct counsel and the Court's attention to page 132, line 6.

THE COURT: Let's just see where we're going with this.

(Reviewing document.)

MR. WISNER: So this was in the context -- if you read the previous question, they're asking about subtypes of NHL. If he wants to ask if he's an expert on the subtypes of NHL, I think that's a fair question.

MR. ISMAIL: I asked literally the question posed to the witness in the deposition.

MR. WISNER: You didn't ask the questions

before it. That's what -- he hasn't even answered the question. He's asking for a definition.

THE COURT: No speaking objections.

MR. WISNER: Sorry, Your Honor.

THE COURT: You can ask the question. Go ahead.

MR. ISMAIL: May I proceed, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Dr. Jameson, are you at page 132 of your sworn testimony?

A. Yes, sir.

Q. And you gave a deposition in this case; correct?

A. Correct, yes.

Q. And this was taken September 2018?

A. Yes.

Q. You were under oath at that deposition, were you not?

A. Yes.

Q. And a court reporter was there to transcribe what was asked of you in your sworn testimony; correct?

A. I'm sorry. Could you repeat?

Q. There was a court reporter there to transcribe both the questions and the answers.

A. Yes.

Q. And if you're with me at 132, line 6, were you asked --

MR. WISNER: Well, my objection, Your Honor, was completeness. We'd have to read the questions leading up to it. That was my point.

THE COURT: That's okay. You can ask that question and answer that question.

BY MR. ISMAIL:

Q. Are you at line 6, sir?

A. I'm at line 6, yes.

Q. So were you asked the following question?

You are not an expert on NHL; right?

And did you answer under oath?

No, I'm not an expert on NHL.

A. That's what the document says, but I think we should look at what led up to that particular question in order to get a clarification as to why I answered that way.

Q. Sure. So you were asked:

Do you know whether or not NHL is 60 separate diseases?

And you say:

I've heard it's a lot of different diseases, separate diseases, but I don't

know if 60 is the number.

You were asked if you were an expert on NHL, right?

And you say:

No, I'm not an expert on NHL.

That's your sworn testimony; correct?

A. That's what I said there, yes.

Q. Very good, sir.

Now in terms of your prior work in this case -- I'm sorry -- prior work before you got involved in this case, you described your professional background at the National Toxicology Program; true?

A. Before -- I'm sorry. Would you repeat the question?

Q. I'd be happy to.

Before you retired, you worked for many years at the NTP?

A. Correct.

Q. How many years did you work at that organization?

A. For the NTP, I worked 30 years.

Q. So you gained some familiarity with the quality of the -- both the scientists and the work of NTP; true?

A. That's correct.

Q. You would agree that NTP employs good qualified scientists; correct?

A. Yes. Yes.

Q. And you would agree that NTP performs good quality scientific research; correct?

A. Yes.

Q. And NTP performs good quality evaluation of data that has been generated both by their own scientists and that which they review generated by others?

A. Yes.

Q. Now, while you were at NTP, you had access to the technical reports produced by the agency?

A. Yes. In fact, I participated in the publication of quite a few of them myself.

Q. So you are aware, sir, that there was an evaluation by your colleagues at NTP on glyphosate?

A. Yes, there was a -- the NTP performed a pre-chronic study of glyphosate and published it in a technical report series -- or a toxicology report series, if you will.

It was conducted as a dose finding study in anticipation of doing a chronic two-year bioassay on glyphosate.

Q. So I'm going to provide you a copy of that

report that you just referenced, Exhibit 4455.

MR. ISMAIL: Tender to the Court.

THE COURT: Sure. Thank you.

BY MR. ISMAIL:

Q. This is a report you are familiar with; correct, sir?

A. Yes, sir.

Q. And we have on the screen the copy of the technical report. Sir?

A. I'm sorry?

Q. Just confirming we're showing the jury --

A. Okay, correct.

Q. -- a copy of the technical report.

A. Yes. Sorry.

Q. So the -- this report was actually prepared during the time you were at this agency; correct?

A. 1992. It's a time that I was at the agency. However, I wasn't working in the bioassay program at that time. I had moved on to the director's office. And my emphasis then at that time was the Report on Carcinogens.

Q. So, and we'll get to that in a minute, sir. But just in terms of looking at which of the -- your scientific colleagues at NTP worked on this particular report, we see several of them listed here under the

National Toxicology Program; correct?

A. Yes.

Q. And as is, you have the NTP pathology review, are those the scientists who look at the actual samples from the rodents in the studies?

A. Those would be the pathologists that would review the slides that were prepared from the necropsy and his pathology that was performed on all the animals from all the different dose groups in that study, yes.

Q. And you can see that there was other individuals who are listed here as contributors to this study report; correct?

A. That's correct. The --

Q. That's all I asked, sir.

A. All right. Yes.

Q. And then you know that this study report underwent peer review; correct?

A. Yes.

Q. And you can see on page 7 a listing of peer reviewers who had a chance to comment and hopefully improve the quality of the scientific evaluation being undertaken in the report; correct?

A. Sorry. You say it's on page 7?

Q. On page -- yeah.

MR. WISNER: It's 9 on the bottom.

BY MR. ISMAIL:

Q. If you're looking at the bottom numbering.

A. Oh, I'm sorry.

Q. It says "Peer Review."

A. I got you, yes. Thank you.

Q. And just, by the way, can you confirm that NTP technical reports go through peer review to improve the quality of the scientific analysis being undertaken; is that a fair description?

A. That's correct. They're peer-reviewed by the NTP board of scientific counselors, they have a subcommittee that reviews the technical reports.

Q. And you've reviewed this report, have you not?

A. I've read through the report, yes.

Q. You know that there is described in here a genotoxicity study done in rodents; correct?

A. Correct.

Q. If you'd like to confirm, you can go to page -- in terms of the dosing given, it's on page 23, Table 7.

Are you there, sir?

A. I'm just -- I'm confused by the numbering at the top and the bottom. I'm sorry. 23 at the top?

Q. 23 at the top.

A. Okay. Thank you.

Q. Table 7, are you there?

A. Yes, sir.

Q. Okay. So this is reporting the dosing levels on the rodents being studied in this analysis; correct?

A. Correct.

Q. In terms of the glyphosate consumed over here on the far right column, in fact, if you go down to the little footnote, that's telling us that's in milligrams per kilograms per day.

Am I reading that correctly, footnote E?

A. Footnote E is milligrams per kilogram per day. Yes, I see. Sorry.

Q. So when Mr. Wisner was asking you this morning about some of the rodent studies that you had analyzed and was asking parts per million versus milligrams per kilograms, this last column here is the milligrams per kilograms; right?

A. The conversion to milligrams per kilogram, that would be based on feed consumption data, yes.

Q. I'm sorry?

A. That would be based on feed consumption data, how much feed the animals ate.

Q. So I think Dr. Portier told us yesterday that in these rodent long-term -- any of these rodent studies that we're talking about, the rodents are actually fed

the glyphosate daily at the dosing levels described?

A. That's accurate.

Q. Now, in terms of what you can see here, some of these doses are -- the two I've highlighted here -- in excess of 10,000 milligrams per kilogram of body weight; correct?

A. That's what the calculation says, yes.

Q. In terms of this study, the researchers conducted doses up to about the maximum dose that you would ever try to conduct in a study like this?

A. It looks like they were dosed at 50,000 parts per million in the feed. 50,000 is the top dose they would use in any NTP bioassay study.

That's essentially -- converts to 5 percent of the feed was glyphosate. They do not go above 5 percent in the feed because going above 5 percent would affect the nutritional value of the feed on the animals.

So therefore the question would come in, was the effect you're seeing because they weren't getting enough nutrition from the feed, or was it from the actual chemical itself?

So that's why in any bioassay study, the maximum dose that they could give to an animal in feed is 50,000 parts per million.

Q. Okay. So thank you.

So in terms of the results of what this study showed, if you can turn to page -- I'll use the top page -- 33.

A. Okay.

Q. Are you there?

A. Yes.

Q. And on this page, some of the results are being described; correct?

A. Okay.

Q. You go down --

A. Yes.

Q. Going down to the bottom, where it says genetic toxicology.

A. Okay.

Q. Does -- do the scientists here at NTP say: Glyphosate did not induce gene mutations in salmo --

A. Salmonella.

Q. -- salmonella strains in referencing the particular strains being studied. And then it goes on to describe the protocol that these researchers were evaluating in these studies; correct?

A. That's accurate. But it is well-known in the literature that glyphosate is not a bacterial mutagen, and this salmonella is a bacteria, and so therefore it's not surprising that it was negative because glyphosate

doesn't affect bacteria.

Q. Sir, again I'm just asking you to confirm what your colleagues wrote here in this paper. It's a yes-or-no question respectfully. And I'm going to ask you to do your best to restrict your answer to what I actually ask.

A. Okay. Sorry.

Q. Then they go on to describe a different type of analysis, peripheral blood monochromatic erythrocytes; that's a type of genotoxicity study; correct?

A. Correct.

Q. And what they found was no increase in micronuclei was observed for either males or females at any dietary concentration of glyphosate.

Did I read that correctly?

A. That's accurate for the doses they used in the strain of mouse that they used. But the B6C3F1 is -- and all the other studies that I've looked at, this is -- the NTP is the only one that used a B6C3F1. The CD1 is usually what's used in the others.

Q. The question is did I read that correctly?

A. You read it correctly.

Q. So the conclusion from these scientists at NTP was that the glyphosate did not induce any increase in

micronuclei in mice; correct?

A. In these strain of mice, correct, yes.

Q. And so this was a negative finding, meaning there was an absence of effect in genotoxicity following glyphosate exposure; correct?

A. In this strain of mice, correct.

Q. Now, you're aware that scientists at NTP have also examined oxidative stress?

A. Yes.

Q. And you have reviewed recent data that has been produced by scientists at NTP; true?

A. Well, I can't say that I've reviewed the data. I've reviewed what appeared to be a press release from the NTP about some oxidative stress -- some oxidative stress data that was done, but I don't think I've seen a publication to that effect.

Q. So let's just back up and make sure we have the context correct.

Within the last couple of years, actually within the last year, you're aware that your former colleagues at NTP have studied the effects of glyphosate and glyphosate formulations on this question of does it increase oxidative stress; you're aware of that from your review?

A. I'm aware of that from following the status of

the NTP and looking at the NTP website indicating that the board of scientific counselors was provided a research plan for addressing those issues, yes.

Q. And you know that you have -- that that study is being done in human cells?

A. I wasn't aware of that, no.

Q. Do you know from your review that the scientists at NTP have found that both glyphosate and glyphosate formulations do not increase oxidative stress?

A. I can't say that I've seen a publication to that effect, no.

Q. Not my question.

A. Oh.

Q. I didn't ask if you saw a publication. I'm asking if you are aware of the fact and the findings of NTP scientists that there is no increase in oxidative stress following the administration of glyphosate?

MR. WISNER: Objection. Move to strike. The attorney is testifying.

THE COURT: Overruled. He can answer.

THE WITNESS: Are you saying this is in human cells?

BY MR. ISMAIL:

Q. Yes, sir.

A. I'm not aware of that.

Q. Do you know whether scientists at NTP have presented the results of their oxidative stress findings at scientific conferences?

A. I think there was an abstract for one that was available, yes.

Q. Did you, before you came to talk to this jury about oxidative stress, did you review that abstract to see what the scientists at NTP found?

A. No.

Q. Are you -- you said you're aware that there's an abstract available?

A. I think I saw an abstract for a meeting that they were going to present some data, yes.

Q. Do you know whether that meeting occurred?

A. I -- I cannot remember which meeting it was supposed to be at. So I don't know if the meeting was held or not. It might have been the Society of Toxicology meeting, but I can't remember.

Q. I'm going to provide you a document to see if it refreshes your recollection, sir.

A. Thank you.

Q. Exhibit 5810.

And just first a foundational question.

Dr. Jameson, you've obviously attended

scientific conferences in your career.

A. Yes.

Q. You know the format of poster presentations that can be presented by scientists?

A. Yes.

Q. NTP participates in scientific conferences and presenting their data to others in the scientific community; correct?

A. Yes.

Q. And if you -- are you familiar with any of the names on this document that I provided?

A. I'm familiar with the last one listed, Dr. DeVito.

Q. Dr. DeVito, you recognize, is a scientist who works with NTP?

A. Yes.

Q. And when you talked about that abstract where you were made aware that the scientists at NTP, this quality scientific organization at which you used to work, was studying glyphosate and glyphosate formulations for oxidative stress, you remember seeing Dr. DeVito's name listed in that abstract?

A. Yes.

Q. So in terms of this document I've provided you, does that refresh your recollection that indeed the

results of the study from the scientists at NTP, that oxidative stress analysis was actually presented at a scientific meeting?

A. That's what this would indicate, yes.

Q. Now, in terms of the results of the study, are you, sir, familiar or made yourself aware of what the NTP scientists actually found when they studied one of the issues that you discussed with the jury?

A. I'm sorry. Could you repeat the question? I was --

Q. Sure.

A. I was reading something, and I had a question for you, but I know I can't ask you a question.

Q. Fair enough. Let me break that down.

One of the things that you said, and I believe it was on Mr. Wisner's last exhibit where he wrote "yes," was a question of oxidative stress.

A. Right.

Q. And you gave your opinion to this jury about whether or not you believe glyphosate and its formulations increase oxidative stress.

A. Right. Correct.

Q. My question to you, sir, is whether before you came to talk with the jury about oxidative stress, whether you reviewed the findings recently made

available by the scientists at NTP on that precise issue?

A. I had seen this abstract and part of the poster online, yes.

Q. So you have seen it?

A. Yes. I'm sorry, I didn't mean to mislead you if I did. Sorry.

Q. No. I was confused. I thought you were telling us you hadn't reviewed the results.

But, okay, so you have reviewed the results?

A. I have looked at them, yes.

Q. And so you know that the findings of the NTP scientists was that glyphosate does not increase oxidative stress?

A. In this one study that they did, yes.

Q. And this one study that they did was in human cells; correct?

A. I'd have to read through just to verify that.

MR. ISMAIL: In light of the witness's testimony, Your Honor, may I publish?

MR. WISNER: I actually don't believe that's permitted, Your Honor. That wasn't the agreement.

MR. ISMAIL: He's reviewed the poster.

MR. WISNER: Yeah, but it's not the Evidence Code. Published literature, yes, but not abstracts.

BY MR. ISMAIL:

Q. Is this data -- let me lay more foundation for you.

Dr. Jameson, you know as part of the process of NTP's work that they do internal peer review on their work; correct?

A. Internal, you mean the NTP scientists peer review their own work; is that what you're saying?

Q. Let me rephrase.

Do you consider research generated and analyzed by the NTP generally to be reliable research?

A. Yes.

Q. You generally accept it as authoritative research?

A. The research is authoritative, yes.

Q. Quality research?

A. Right. But it also goes through a peer review.

Q. That was going to be my next question. It also goes through peer review; correct?

A. Well, let me -- not all the research that is performed at the NTP goes through a peer review.

Q. The -- okay. Now, in light of your testimony --

MR. ISMAIL: Your Honor, in light of the

witness's testimony that the research is authoritative and reliable, may I publish?

THE COURT: I'm sorry. Why don't you approach?

MR. WISNER: Yeah.

(Sidebar held but not reported.)

BY MR. ISMAIL:

Q. Dr. Jameson?

A. Yes, sir.

(Pause in the proceedings.)

THE COURT: All right. Go ahead.

MR. ISMAIL: Thank you, Your Honor.

Q. Dr. Jameson, did you bring a copy of the abstract with you?

A. No, sir.

Q. The document that you have in your hand there?

A. This?

Q. Yes.

A. It's what you gave me.

Q. Oh, good. Okay. I was just confused.

Continuing with our conversation.

In terms of the study methods, you know that in this particular analysis, glyphosate and glyphosate formulation were included; correct?

A. That's what the abstract says, yes.

Q. And they were using different dosing levels of both the glyphosate and the glyphosate formulations; correct?

A. Yes.

Q. And they measured whether oxidative stress was increased in both the glyphosate and the glyphosate formulations; correct?

A. That's what the abstract says, yes.

Q. And the researchers there in this study found there was no increase in oxidative stress; correct?

A. That's what they are reporting here.

Q. Now --

MR. ISMAIL: I'm going to turn to a new topic, Your Honor.

THE COURT: If you're going to turn to a new topic, we're going to take our lunch break.

We're going to take an hour lunch break. We'll come back at 1:15.

So please don't discuss anything that you've heard in the courtroom. Please don't do any outside research. Please don't talk among yourselves or with anyone else about anything that has occurred in the trial today.

So I will see you at 1:15.

If the gallery would remain for a few minutes,

I would appreciate that.

(Jury excused for lunch recess.)

(Chambers conference held but not reported.)

(Proceedings continued in open court out of the presence of the jury:)

THE COURT: So, Dr. Jameson, I just want to ask you a couple quick questions.

THE WITNESS: Yes, ma'am.

THE COURT: So I understand that while we were having a sidebar, there was an exchange with a juror.

THE WITNESS: Oh.

THE COURT: And I want to know what that was, who approached, who started the exchange.

THE WITNESS: The juror sitting in the second seat there, when you went to sidebar, evidently you turned the sound off or something and it causes a hissing sound.

THE COURT: It's white noise so they can't hear what's said.

THE WITNESS: White noise, right. When that happened, the -- I just happened to be -- turn my head and looked at the juror, and he said, "Uh-oh, here comes the rain again." And I smiled. And then he started saying something, and I noticed the juror sitting next to him nudge him in the leg, and so he stopped talking.

THE COURT: Okay.

THE WITNESS: And then this young lady came over and instructed me that I'm not supposed to interact with the jury. So I apologize. But that's what it was.

THE COURT: Well, I just need to know what it was because I'll need to admonish the jurors also not to say anything to the witnesses. But I just, for the record, needed to know what that was.

THE WITNESS: Yes, ma'am. I'm sorry.

THE COURT: You don't have to apologize.

And we're going to take our lunch break. We'll be back in an hour.

(Luncheon recess was taken at 12:14 p.m.)

AFTERNOON SESSION 1:20 p.m.

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

THE COURT: All right. Are we ready to continue?

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, sir.

Q. I want to turn to a topic that was raised with you during the direct examination, this submission called the Report on Carcinogens, okay?

A. Okay.

Q. And as you've described it, just to remind everyone, this is a document that is submitted by the secretary -- U.S. Secretary of Health and Human Services, correct?

A. Yes.

Q. And it's actually a document submitted to Congress?

A. That's correct.

Q. And what you told us this morning is that this Report on Carcinogens is, to use your words, the official list of substances that are known to the United States government reasonably expected to be --

A. Anticipated, sorry.

Q. Anticipated, sorry. Since I mixed up the terminology, let's make sure we're all clear.

It's the list of substances that are known or reasonably anticipated to be carcinogens?

A. Correct.

Q. And you describe it as sort of the official list of the United States government, correct?

A. The official list of carcinogens for the

United States government, that's correct.

Q. And in terms of how this document is prepared, you described for us that the National Toxicology Program has a role in advising the U.S. Department of Human Health, correct?

A. Well, just a point of clarification. The secretary is required to submit the report to Congress, now, every two years.

The secretary delegated the responsibility of preparing the report to the National Toxicology Program. So the National Toxicology Program prepares the report for the secretary.

Ultimately, the secretary has to approve the report once it's provided to her by the NTP, but then the secretary submits it to Congress.

Q. So the actual preparation of the list of known or reasonably anticipated to be carcinogens is prepared by delegation by the NTP for approval and submission by the Secretary of Health and Human Services?

A. Correct.

Q. And during your tenure at NTP, you had a role in the preparation of the Report on Carcinogens, correct?

A. Correct.

Q. Obviously, a role you took seriously?

A. Yes, sir, very seriously.

Q. And from a personal and professional perspective, you wanted to be able to communicate what you and your colleagues believed were carcinogens just to have them out in the public?

A. To get the information to the general public and to the world that, based on our evaluation of the available data, that these materials posed a carcinogenic risk.

Q. And your experiences with your colleagues at NTP also took the role seriously in advising on and preparing this list for the Report on Carcinogens?

A. Yes, sir.

Q. During the time you were at NTP, the Report on Carcinogens never included glyphosate, true?

A. Glyphosate was never considered for inclusion in the Report on Carcinogens, that's right.

Q. And even right up until today, you can confirm for the jury that glyphosate or glyphosate formulations is not on the Report on Carcinogens, true?

A. It is not on the report because it has not been reviewed for inclusion in the report.

Q. Now, the NTP, you described, has -- well, withdraw that question. Let me ask you a different question.

The NTP has some -- you said funding connection with IARC?

A. They provide annual funding; I believe it's in the form of grants. But they provide annual funding to the International Agency for Research on Cancer, yes.

Q. And, of course, NTP scientists have available to them the IARC Monographs, as they were prepared and issued publicly, correct?

A. The IARC Monographs are available publicly, and you can access all of the Monographs on the web.

Q. And IARC is an organization well-known to the NTP because they have some -- at least official connection in terms of funding source and the like?

A. Correct.

Q. And even though the glyphosate Monograph from IARC has come out in 2015, four years later, NTP has never included glyphosate on its official list of substances known or reasonably anticipated to be carcinogens, true?

A. It hasn't yet been reviewed by the Report on Carcinogens for inclusion in the report, that's correct.

Q. In fairness, sir, my question was different.

I was asking whether, today, it is on the list.

Can you confirm for the jury that glyphosate

is not on the list for the Report on Carcinogens?

A. As of today, it is not on the list. That is correct.

Q. Now, in terms of the role or the scope of the review that IARC did and the IARC working group, what IARC performed was what's known as a hazard assessment, correct?

A. Correct.

Q. And the opinions you are offering in this litigation also are a hazard assessment, correct?

A. I performed a hazard assessment to identify the carcinogenic hazards of glyphosate and glyphosate formulations, yes.

Q. And just to get our terminology straight.

In this scientific field, there's one type of analysis known as hazard analysis, and that's what IARC did and how you would describe the scope of your opinions in this case, correct?

A. Correct.

Q. And there's another type of analysis called a risk assessment, true?

A. Correct.

Q. And you are -- you agree that those distinctions between what a hazard assessment is and a risk assessment is an important distinction to keep in

mind, true?

A. That's true. It's defined as -- a hazard assessment is the first step in a risk assessment. And that risk equals hazard times the dose.

Q. Dr. Jameson, we'll get there. We just have to take it in steps. So if you just bear with me and do the best to answer the questions as posed.

So I think you've agreed that hazard assessment and risk assessment are different, correct?

A. Correct.

Q. And IARC, in its evaluation and its Monograph program, does not perform a risk assessment, correct?

A. That is not their job. As you read in the preamble in the beginning of the Monograph, there's is a hazard assessment, correct.

Q. Okay. So the answer to my question is: IARC does not do a risk assessment, true?

A. Correct.

Q. And you also did not do a risk assessment, true?

A. Correct. I was not asked to do a risk assessment.

Q. You described a cancer hazard as a potential to cause cancer at some dose, correct?

A. Correct.

Q. And as you indicated a moment ago, in sort of the progression or hierarchy of these things, a hazard assessment is the first step in the process?

A. In a risk assessment, yes. A hazard assessment is usually the first step in a risk assessment.

Q. Now, you've described a risk assessment as what happens at the human-relevant doses, correct?

A. A risk assessment -- a risk is -- like I said, risk is equal to hazard times dose.

And so to do a risk assessment, you have to see if, at the levels people are exposed, does it cause harm?

Q. Right. So a risk assessment looks to the actual level of exposure that humans are exposed to and whether that causes harm, correct?

A. Correct.

Q. That's not what IARC did in its review, by definition, since they did a hazard assessment only, true?

A. Correct. But what we looked at was the epidemiology data at real world exposure levels, which showed the positive association for non-Hodgkin's lymphoma in Roundup.

Q. Doctor, the answer to my question is: IARC

only did a hazard assessment, not the risk assessment as you've described, true?

A. Correct.

Q. And again, your review of this case, since you did a hazard assessment, also did not look to see whether there was a risk at human-relevant doses, true?

A. No. That's not accurate, because I looked at the human epidemiology data as part of my hazard assessment.

And again, the human epidemiology data is for people who are exposed at real world concentrations, the people that use the material as a farmer or a lawn keeper or what have you.

So those results from the case-control studies and the meta-analysis indicate that at real world exposure levels, Roundup formulations cause non-Hodgkin's lymphoma.

Q. We'll get to your assessment of the epidemiology this afternoon, Doctor, I promise you.

But let me hand you an exhibit first.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

BY QUESTIONER:

Q. Doctor, do you recognize Exhibit 5629 as the 11th Report on Carcinogens submitted by the

U.S. Department of Health and Human Services, dated 2004?

A. Yes, sir.

Q. And if you turn the page, do you see on the title page, it has, in addition to the U.S. Department of Health and Human Services noted, also the National Toxicology Program?

A. That's correct.

Q. You can confirm for the jury that this particular Report on Carcinogens was something that you had responsibility for, correct?

A. Correct.

Q. You actually wrote the introduction to this report, correct?

A. Correct.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: No objection.

THE COURT: Granted.

BY QUESTIONER:

Q. So that's the title page, the 11th Report on Carcinogens. I think you told us initially it was a document prepared yearly, and it's since progressed to a every-two-year cycle for updating this report?

A. Yes. It's supposed to be submitted every two years. But if the truth be known, they've had trouble

getting it published -- submitted to Congress in the two-year period. But it's supposed to be every two years, yes.

Q. So the work that the NTP scientists do and the others that work on this document, sometimes it takes a little longer than two years to update the document.

Is that a fair description?

A. Between trouble updating and other obstacles thrown at us to delay the publication of the report, yes.

Q. Here, we have 2004. And there's a current Report on Carcinogens out there, whenever the issue date was.

But this is one that you actually worked on, right?

A. Correct. The most recent one is the 14th Report on Carcinogens.

Q. So if you turn, sir, to the introduction, which, if you use the page numbering at the bottom, is actually page 7.

Are you there?

A. Yes, sir.

Q. So this is material that you helped put together, correct?

A. Yes, sir.

Q. Let's look at what you wrote.

So at the top, you say:

"The probability that a resident in the United States will develop cancer at some point in his or her lifetime is one in two for men and one in three for women."

That's information you provided in this document, correct?

A. Correct. That is provided in the publication from the American Cancer Society.

Q. And then you note, as everyone here would agree:

"Nearly everyone's life has been directly or indirectly affected by cancer, correct?"

A. Correct.

Q. And then you say:

"Most scientists involved in cancer research believe that the environment in which we live and work may be a major contributor to the development of cancer."

That's something that you and your colleagues at NTP obviously believe in, right?

A. Correct.

Q. But then you define what you mean by "environment" in the next sentence, right?

A. Correct.

Q. You say: "In this context" -- so "context" being what you're saying here in this document, right?

A. Okay.

Q. Okay.

"The environment is anything that people interact with, including exposures resulting from lifestyle choices, such as what we eat, drink, or smoke; natural and medical radiation, including exposure to sunlight; workplace exposures; drugs, socioeconomic factors that affect exposures and susceptibility; and substances in air, water and soil."

And then you provide scientific support for that statement, correct?

A. Yes, sir.

Q. So when you describe environmental sources for causes of cancer, you're including all of those things you had in that long sentence, correct?

A. Among other things, yes.

Q. And then you say:

"Other things that play a major role in cancer development are infectious diseases; aging; and individual susceptibility, such as genetic

pre-disposition."

Did I read that correctly?

A. Yes, sir.

Q. That's information you thought is scientifically valid and important to include in this document, correct?

A. Correct.

Q. So you note infectious diseases as playing a role in development of cancer, true?

A. Sure, yes.

Q. Aging?

A. Absolutely.

Q. And individual susceptibility, such as genetic pre-disposition, correct?

A. Correct.

Q. Some people just genetically are more likely than others to develop cancer, right?

A. That's accurate, yes.

Q. And then you say:

"We rarely know what environmental factors and conditions are responsible for the onset and development of cancers; however, we have some understanding of how some types of cancer develop, especially cancers related to certain occupational exposures or the use of specific

drugs."

Correct?

A. Correct.

Q. And then you say:

"Many experts firmly believe that much of the cancer associated with the environment may be avoided."

Right?

A. Correct.

Q. And when you say "environment" there, it's the same context that you provided earlier in the paragraph, true?

A. Right. Among other things, correct.

Q. Among other things.

And then you say in the next paragraph -- I think this is consistent with how you described it in your testimony:

"The Report on Carcinogens is a list of all substances that, one, are either known to be human carcinogens or may reasonably be anticipated human carcinogens, and to which a significant number of persons residing in the United States are exposed."

Right?

A. Right.

Q. So, then, when you describe the context for what would -- just so -- I'm at the bottom of the left column, if you wanted to follow along on the exhibit.

A. Okay.

Q. So then you say: "The ROC" -- that's Report on Carcinogens, correct?

A. Yes.

Q. Okay.

"Does not present quantitative assessments of the risks of cancer associated with these substances."

Correct?

A. That's correct. The Report on Carcinogens is a hazard identification document.

Q. Exactly. That was going to be my next question.

The Report on Carcinogens is a hazard assessment document, true?

A. Correct. Very similar to IARC.

Q. IARC is a hazard assessment document, true?

A. True.

Q. Dr. Jameson's testimony and opinions are a hazard assessment in this case, right?

A. I did a hazard assessment in deriving my conclusions about glyphosate and the glyphosate

formulations, that's correct.

Q. Okay.

"The listing of substances in the Report on Carcinogens only indicates a potential hazard, and does not establish the exposure conditions that would pose cancer risks to individuals in their daily lives."

Did I read that correctly?

A. That's correct. That's not the job of the NTP; that's the job of the regulatory agencies.

Q. And we're going to see that described here in a minute.

I've underlined the last clause here in this document. So the first part of this, which is describing the listing of substances in the Report on Carcinogens only indicates a potential hazard.

That's a hazard assessment, correct?

A. Yes, it's a hazard assessment.

Q. What I've underlined here:

"Does not establish the exposure conditions that would pose cancer risks to individuals in their daily lives."

That is a risk assessment, true?

A. That is correct.

Q. And that's what you say in the very next

sentence:

"Such formal risk assessments are the responsibility of the appropriate federal, state, and local health regulatory and research agencies."

Correct?

A. That's correct.

Q. So putting this description together, the Report on Carcinogens and IARC are only indicating a potential hazard, correct?

A. Identifying a cancer hazard, right.

Q. The step of determining whether or not exposure conditions that would result -- that would pose cancer risks to individuals in their daily lives is the risk assessment that IARC did not perform, true?

A. They do not do risk assessment, that's correct.

Q. And so -- okay. Dr. Jameson, we're going to get off this chart so we stay on track.

MR. ISMAIL: Do you mind if we keep going?

THE COURT: No, go ahead.

BY MR. ISMAIL:

Q. When you say here that the risk assessments are the responsibility of the appropriate federal, state, and local health regulatory and research

agencies, that's what you were referring to a moment ago when you were saying the risk assessment belonged to the regulators?

A. The regulators are supposed to determine at what exposure levels you may not get the cancer.

Q. Okay. And in the case of pesticides, the regulator in the United States is the EPA?

A. Yes, sir.

Q. And when we're talking about some of the other regulatory agencies around the world that were referred to in your direct examination -- either EFSA or Health Canada -- they're doing risk assessments, correct?

A. That's their job.

Q. Right. So IARC equals a hazard assessment, right?

A. Correct.

Q. And as you've described, a hazard assessment equals a potential hazard, correct?

A. I don't know that I agree with "potential" as a -- in that particular context.

A hazard assessment is performed to see if material, it causes cancer. So it's either a known -- it's either sufficient evidence that it causes cancer or limited evidence or inadequate evidence.

So -- but once it's identified as a

carcinogenic hazard, it is a hazard. It's a hazard for causing cancer. It's not a potential hazard. What we have determined is that it's an actual hazard for causing cancer.

Q. So I'm using your words that you wrote for submission to the United States Congress: "Only indicates a potential hazard."

A. Okay.

Q. You were speaking truthfully when you wrote those words, correct?

A. Yes.

Q. And as you confirmed, IARC is doing the same type of analysis as the Report on Carcinogens, correct?

A. Correct.

Q. Okay.

A. But what I'm saying is: Now, today, I may rewrite the sentence and not use "potential" and just say hazard.

Q. Okay. So I will -- I don't know how you want me to mark that. But I'll just say 2004.

That's what you wrote, correct?

A. Okay.

Q. And in 2015, that was still the definition, right?

A. Still the definition?

Q. Yeah. That a hazard assessment is a potential -- identifying a potential hazard, right?

A. To be very honest with you, I need to see a more recent edition of the Report on Carcinogens and what the introduction is. The introduction is changed every time a report is published.

So in order to answer that question, I would have to see a more recent edition of the Report on Carcinogens to verify that.

Q. I'll tell you what, Doctor, would it be better if I said "hazard at some dose"? That's what you said earlier.

A. I guess I would be comfortable with that.

Q. All right. So I will write: Hazard at some dose. And I'll note that this is from 2019, your testimony here today.

Now, as we've talked about, you're very clear -- I think in your prior testimony, you said hazard assessments and risk assessments are like apples and oranges, comparing them, right?

That's your view?

A. I don't remember saying anything like that.

Q. Okay. Not today, but at your deposition.

Do you recall saying that?

A. No, I don't. Sorry.

Q. Fair enough. So let's continue on this conversation.

So we have EPA and EFSA and Health Canada. And you know I can go on and on; there's other regulatory agencies that have commented on this issue, right?

A. Sure, yes.

Q. And they do a risk assessment, right?

A. Yes.

Q. And you're very clear that these are two different things, correct?

A. Yes. But I also stated earlier that I didn't agree with their evaluation of the data.

Q. I know, sir. But I'm just talking about the description of what the organizations themselves are doing, okay?

A. Okay.

Q. And to use the definition that you use here in this 2004 document:

"A risk assessment is determining whether there's a cancer risk to individuals in their daily lives," right?

A. Correct.

Q. Okay. So IARC, in its assessment, did not do a risk assessment; they did a hazard assessment. And

risk assessments belong to the regulatory agencies, correct?

A. It's their responsibility, correct.

Q. Now, you know -- so you agree EPA has done a risk assessment on glyphosate, correct?

A. Yes. Many times.

Q. They've also done a hazard assessment on glyphosate, correct?

A. They've done a hazard assessment?

Q. Yeah. As part of their review.

And if you don't know that, you can just tell us that.

A. I'm really not sure that they did the hazard assessment part. They just did the risk assessment.

Q. Okay. So EPA was trying to answer this question --

A. Right.

Q. -- that at the exposures that people have in their daily lives, is there a cancer risk?

You agree, at least, that EPA has done that several times?

A. Right.

Q. And EFSA has done that more than once, right?

A. Correct.

Q. And Health Canada has evaluated and

re-evaluated whether there's any cancer risk to individuals in their daily lives, correct?

A. Correct.

Q. Now, you can have a hazard without a risk, right?

A. Yes.

Q. So it's possible for IARC to identify something as a hazard that is still not a risk by using these definitions, true?

A. It's possible. But again, if you identify the hazard, then people protect themselves from that particular hazard, and it no longer proposes a risk. So --

Q. Yeah, but that's not what -- I'm sorry, I didn't mean to interrupt.

Are you done?

A. That's the whole reason for doing a hazard assessment, is to warn people of the carcinogenicity of things they may be exposed to.

Q. IARC was not undertaking an analysis of whether protective gear changes the risk that comes from any hazards, right?

A. No. That wasn't part of what they did, no.

Q. That's not their scientific investigation, correct?

A. No.

Q. And you haven't investigated that, in fairness, either, true?

A. As far as what? I don't understand the question.

Q. Okay. I'll rephrase.

Well, let me ask it to you this way, sir: When we're talking about animal studies and their role in cancer -- either hazard assessment or risk assessment, that's part of the information that you considered in this case, correct?

A. Correct.

Q. The dose levels that are used in an animal study, the purpose of that is to see whether it causes cancer in the animals, not to mimic the levels in a human situation, true?

A. That's correct.

Q. And you know, sir, that the doses used in the animal studies were several thousand times higher than humans are exposed to in their daily lives, true?

A. That's probably true, yes.

Q. And you're not aware of any biomonitoring study that would establish that doses that humans are exposed to in their daily lives in any way approaches the doses that the animals are exposed in the rodent

studies you discussed in your direct examination, true?

A. The biomonitoring studies I've looked at have indicated that there are residues or traces of glyphosate in the biological samples from the humans that they took the samples from, indicating that they were exposed.

It didn't indicate at what doses they were exposed; just that they found positive residues in the humans, that they had been exposed to glyphosate.

Q. Just to make sure we understand what you're saying.

First, in answer to the question I asked you, there's no biomonitoring study that would, in any way, equate what humans are exposed to in applying Roundup to the massive doses that the rodents are exposed to in these tests.

You agree with that, correct?

A. I don't know that you can really say that. Because a human could have been exposed to a massive dose of glyphosate, but the amount of circulating glyphosate or metabolized glyphosate in the body would be relatively small.

Q. Okay.

A. I don't know that they do the study to equate the amount of material circulating in the blood and try

to figure out at what level the person was exposed to.

Q. In fairness, Doctor, the last answer you just gave, you're speculating as to what the data might show, right?

You're not aware of any study that would support your prior answer, true?

A. I guess I'm confused.

Q. Sure. Let's just take it in pieces.

I think you agree with at least this concept, and then I'll ask you about what you just referred to.

A. Okay.

Q. You're not aware of any study that attempts to equate what humans are exposed to -- in terms of applying Roundup, for example -- to the massive amounts of doses given to the rodents.

You're not aware of a human study that said this is anywhere on par, true?

A. I'm not aware of any; but I'm also not aware of any that would even look at something like that.

Q. Sure. And in terms of what you said a moment ago, you said that you're aware of some studies that will measure whether there's any detectable residual in folks after applying Roundup, right?

A. Yes. There are studies that have shown that there is residual in the blood of people that have

applied Roundup.

Q. But lots of those individuals had no detectable glyphosate in their system after applying Roundup, correct?

A. Well, some didn't have detectable levels, and others did.

Q. And we're talking about folks who are agricultural workers that use large amounts of pesticides?

A. Well, we're talking about those. But there were also some studies on people who were sprayed mistakenly when they were trying to get rid of some illegal crops down in South America.

Q. And even those studies, though, don't equate the doses to the animal doses; not even attempting to do that, right? Correct?

A. That's not the purpose of their study, so why would they address that?

Q. It was a really simple question, Doctor. You brought up these studies, and I just wanted to make sure --

MR. WISNER: Your Honor, I'm going to object. I've been letting it go on for a bit. It's argumentative. He's badgering the witness.

THE COURT: I'm going to overrule the

objection. I think Mr. Ismail can clarify -- actually, let him clarify. If the witness doesn't understand it, then he can clarify. I don't see this, at this point, as argumentative. So let him finish up his questions.

MR. WISNER: Okay.

BY MR. ISMAIL:

Q. Dr. Jameson, I asked you questions earlier, and you mentioned residual studies, and I just wanted you to confirm that in those studies, none of them, do they attempt to say that the human doses approximate anywhere near what the animals were given.

Do you agree with that?

A. That wasn't the purpose of the study. As far as I can tell, they don't address that anywhere in the report, that we confirm that the levels that people were exposed to were so much lower than or equal to what the animals were exposed to.

And I think, as has been explained before, the purpose of an animal bioassay is to expose the animal to the maximum amount they can tolerate for their lifetime.

MR. ISMAIL: Your Honor, may I approach?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Doctor, I've handed you Exhibit 5129. And it is a reassessment of glyphosate performed by Health

Canada. And I'd ask you to turn to page 9 of the document.

Let me know when you're there, sir?

A. Okay.

Q. Now, Health Canada is one of the regulators that did a risk assessment, correct?

A. Correct.

Q. And what they say in this document -- this document is dated 2017, if you want to confirm that. It's in the earlier part of the document.

But if you're comfortable with that representation, we can move on.

A. I'm sorry, you want me to verify that this was in April of 2017?

Q. Yes.

A. Yes. That's what the document says.

Q. And what they're describing here is this March 2015 IARC meeting, which was the subject of much of your direct examination today?

A. Yes.

Q. And what they -- first of all, I think you indicated that there were multiple pesticides or herbicides that were being discussed at that Monograph meeting, correct?

A. There were several additional pesticides

reviewed at that same meeting, that is accurate.

Q. So it is important to note that:

"An IARC classification is a hazard classification."

That's a description that I know you agree with, right?

A. Correct.

Q. Okay.

"And not a health risk assessment."

Which is also a definition that I know you agree with, right?

A. Correct.

Q. Okay.

"This means that the level of human exposure, which determines the actual risk, was not taken into account by IARC."

Did I read that correctly?

A. That's what the document says. But I vehemently disagree with that statement.

Q. By the way, Health Canada is an organization that, at times, has participated in the Monograph program, right?

A. I believe they have, yes.

Q. And the scientists at Health Canada and the folks who are preparing this reassessment, you would

expect to have some familiarity with the IARC program?

A. I can't say for sure how much familiarity they would have with the IARC program.

But the case in point, if you will, is that the level of human exposure was definitely taken into account by IARC.

The epidemiology data that was thoroughly reviewed at IARC is based on case-control studies and cohort studies of people who are actually using Roundup in their work and in their daily lives. And that is a real world exposure.

And based on those exposures and the data in the epidemiology data, there's a strong correlation between exposure to Roundup and non-Hodgkin's lymphoma in the individuals. So that statement is inaccurate. Because real world exposures are definitely an important consideration of the IARC Monograph.

In fact, they have a whole --

THE COURT: Sorry, Doctor. That's not responding to the question. I want you to listen to Counsel's question and just answer what he asks.

THE WITNESS: I'm sorry. I just got a little --

THE COURT: That's okay.

MR. ISMAIL: Thank you, Your Honor. May I

strike the answer as nonresponsive, Your Honor?

THE COURT: Part of it, but we'll have to go back. Not right now.

MR. ISMAIL: Thank you.

BY MR. ISMAIL:

Q. Dr. Jameson, in terms of the epidemiology -- and I promise you we'll discuss that this afternoon -- as you've testified, the IARC working group's assessment of epidemiology, which you point out is at human doses, that evidence is limited, according to the definition you told the jury about this morning, true?

A. True. A causative interpretation is credible, but bias, confounding, and others couldn't be absolutely discounted. But a causal association is credible under the limited definition.

Q. Now, Mr. Wisner showed you these statements from regulatory agencies around the world that we took some time yesterday to go through with Dr. Portier. And don't worry, we're not going to go through all those documents again.

But you indicated to Mr. Wisner that you disagreed with every single one of these, right?

A. Yes, sir, I do.

Q. Did you actually read these documents?

A. The first three, I did. The Health Canada,

I -- to be honest, I skimmed through very briefly. And the rest of them, I have not looked at.

Q. So you noted your disagreement without actually looking at how those scientists describe their work and how they reach their conclusions, true?

A. Correct. But they were doing risk assessments. And if -- well, I'll just leave it at that. Yes.

Q. Right. They were doing risk assessments, according to the definitions that we went over with the jury; as opposed to a hazard assessment, like you and IARC did, true?

A. Right.

Q. Okay. So you -- you indicated that, in particular with respect to EFSA, that's the European Food Safety Authority, that was the one agency that you co-signed a letter with Dr. Portier?

A. Yes.

Q. I think this came out yesterday. But you and Dr. Portier are friends and long-time colleagues, going back 30 years?

A. I've known Chris since 1980. Worked together with him in quite a number of projects, yes.

Q. And you indicated that you sent this letter, you laid out some of your -- I mean the collective you;

Dr. Portier was the signatory, you were noted as signing on to that letter, right?

A. Correct.

Q. So you noted your -- the scientific disagreement you had with the conclusions EFSA has reached regarding glyphosate, correct?

A. Correct.

Q. And you brought together whatever arguments and data that you thought were important to press your side of the argument, so to speak, correct?

A. Correct.

Q. But EFSA wrote back to you, correct?

A. I believe they did.

Q. They wrote back to Dr. Portier and asked him to distribute it to others who were signed on the letter, right?

A. Uh-huh.

Q. And we walked through EFSA's response yesterday.

Have you seen that, by the way?

A. Yes, I've seen it. But it's been awhile. I need to look at it again to refresh my memory.

Q. We don't need to go through the details, the jury saw it yesterday.

But you know that EFSA wrote back to

Dr. Portier and noted their continuing disagreement with the positions advocated in your letter, right?

A. Yes.

Q. And EFSA not only did that, the scientists also kind of had their own detailed scientific rebuttal, as it were, to the points you and your colleagues raised, right?

A. I -- yeah. I vaguely remember that, yes.

Q. And that's the -- that was, sort of, the state of the correspondence.

But more than the correspondence, there was the actual formal risk assessment documents prepared by the scientists at EFSA, correct?

A. You mean in their response, in their reply?

Q. On the one hand, there was the scientist communication between Dr. Portier and the folks at EFSA, and that was a correspondence that, one portion of which, you referenced this morning.

But there was kind of a back and forth between the scientists on those letters, right?

A. I don't recall, to be honest.

Q. So you know that EFSA responded in some fashion?

A. Right.

Q. But beyond just the correspondence, EFSA

actually prepared a formal risk assessment or cancer hazard assessment documents, right?

A. I don't remember.

Q. I guess I'm confused. Because when Counsel had this up and noted your disagreement with respect to EFSA, for example, have you actually read their scientific position paper that resulted in their conclusion that's reflected on this slide?

A. So "on this slide," which document are you referring to?

Q. I'm referring to, sir, EFSA's submitted document wherein they assess the issue of whether glyphosate poses any cancer hazards.

A. So that's their initial assessment?

Q. Are you aware of that document?

A. Yes. And that's the one I disagree with.

Q. Now, ECHA also had a submission -- I'm sorry, a scientific document on this question, correct?

A. Yes.

Q. Have you reviewed the contents of that document?

A. That's the European -- yes.

Q. The European Chemical Agency.

A. Right. It's part of the European Union, right?

Q. Yes.

A. Okay.

Q. So you know that the document -- the letter submitted by Dr. Portier, to which you signed on, was also distributed to ECHA, right?

A. Yes.

Q. And ECHA had this scientific document, which -- to which they conclude no hazard classification for carcinogenicity is warranted, correct?

A. That's what they said.

Q. Right. And they had their own scientific assessment of the rodent data, the epidemiology data, and the mechanism data, correct?

A. Yeah. But I still, for the life of me, couldn't figure out how they came to that conclusion, based on what they said.

Q. I'll accept, Doctor, that you have a scientific disagreement with the scientists at ECHA, correct?

A. That's fair.

Q. So the scientists at ECHA have how they interpreted the data and why they reached the conclusions, and Dr. Jameson is entitled to his scientific interpretation that just disagrees with ECHA, right?

A. Right. Most of their risk assessment is looking at hazard from residue in food, not every -- overall exposure.

Q. Doctor, they're looking at the exact same rodent studies that you looked at, right?

A. But their risk assessment is mostly based on food safety.

Q. And they're looking at the exact same epidemiology data, which looks at, for example, agricultural exposure, occupational exposure, correct?

A. That's why, for the life of me, I can't imagine why they came up with that evaluation. Because the data is so strong.

Q. Noted.

You have a scientific disagreement with the scientists at ECHA and EFSA and EPA and Health Canada and Australia.

You accept that as true, right?

A. I do, yes.

Q. In terms of the animal data, you, of course, agree that there are biological differences between rodents and people, right?

A. Yes, sir.

Q. Probably the easiest question you'll get all day.

And there are plenty of examples in the literature of compounds that are carcinogenic to animals, but have not proven so to humans, true?

A. I'm sorry, say again.

Q. There are plenty of examples in the literature of substances that have -- that are shown to be a cancer hazard to animals, but not humans.

Are you aware of that?

A. There are a large number that have shown to be carcinogenic to animals and have not yet been shown carcinogenic in humans, yes.

Q. Now, you indicated that -- I think your words -- for the life of you, you don't know how others can look at the same data and come to a different conclusion?

A. Right.

Q. I'm paraphrasing, not exactly quoting.

So there were differences in, sort of, the methods that the scientists at all these other worldwide scientific groups thought were important, and some of the considerations that you and others thought were important, right?

A. That's true. They don't look at high-dose -- they don't look at high-dose animal studies in the same way we do. They mostly discount them because they set a

limit of a dose level that they would consider in part of their risk assessment.

Q. You anticipated my next question.

One of the reasons you diverge from all these other scientists who are doing their risk assessment as we've defined it is that those scientists consider that the really high doses given to some of those animals have less biological relevance, for example, correct?

A. Well, that's not true.

Q. I know you disagree. But you were trying to figure out how you disagreed with these other scientists. And one of the reasons you disagree is this difference on philosophy of how to handle super high doses in the animal studies.

That's fair, right?

A. Mainly because the regulatory agencies usually restrict themselves to only looking at lower doses.

Q. So the answer to my question is yes?

A. They look at lower doses, yes.

Q. So that's one point of disagreement with you and the regulators, right?

A. Yes.

Q. Another reason why you and all these other scientists may come to different conclusions is -- well, let me back up.

You indicated that as part of IARC's review, they have very strict guidelines as to what data they can consider and what data they cannot consider, true?

A. That's accurate.

Q. And again, I'm not wanting to debate whether those are good rules or bad rules.

But the consequence of that is that IARC considered a smaller dataset to answer this question than do the scientists at these regulatory bodies, true?

A. I don't know if I necessarily agree with that. Because for the IARC -- for -- specific to the IARC review of glyphosate, we had access to all the publicly available peer-reviewed literature, we had access to a number of EPA documents that address the review of several glyphosate studies submitted for registration that was obtained by the Freedom of Information Act.

And then we also have the Greim study, the Greim publication, which was a review of a fairly large number of bioassays that were performed for various industries and submitted to various regulatory agencies for registration of the material.

So for glyphosate, we had a very large -- much more than usual -- amount of data to look at and evaluate.

Q. Okay.

A. So --

Q. Sorry. Were you done?

A. Yeah, I'm sorry.

Q. Let me just break that down.

You told us candidly this morning that this Greim publication -- which the jury hasn't seen yet -- is sort of a collection of different rodent studies on glyphosate and cancer assessment, right?

A. Correct.

Q. And there were very voluminous data tables that were submitted along with that publication, right?

A. Eventually, yes.

Q. And I think you told us this morning that it wasn't until you arrived in France that your working group was given access to those data?

A. We were made aware of that data at that time, yes.

Q. And because of the volume of data included in the Greim publication, just candidly, you didn't have enough time to assess and analyze it all, true?

A. Not all of it, but there were several studies in there that we already had access to, either from information that was obtained from the EPA, or I think one or two of them had actually been published.

Q. So, I guess, going back to my prior question:

By definition, the regulators had more information about these rodent studies that they had time to analyze and consider than did IARC in March of 2015.

That's fair?

A. That's probably fair.

Q. In addition to that, there were genotoxicity studies that you know were done and have been submitted to regulators that were not part of the IARC review, true?

A. I'm sorry, repeat the question.

Q. Genotoxicity studies.

A. Right.

Q. You know that there were many genotoxicity studies that had been performed by 2015. But because of IARC's rules, were not part of the mechanism subgroups review, true?

A. Is that because they were done by industry and submitted to a regulatory agency and were therefore proprietary information --

Q. Yes.

A. -- and not available to the public?

Q. Correct.

So the answer is yes?

A. I guess that's true.

Q. Again, I'm not criticizing IARC's rules or

guidelines in any way. I just want you to confirm the fact that the regulator scientists had more information than did the IARC working group, by definition.

A. I don't know. I don't know if the industry submitted those studies to those regulators or not.

Q. Okay. Now, in terms of the animal subgroup, you indicated that you were assigned the responsibility of preparing the -- that portion of the Monograph, correct?

A. Glyphosate? For glyphosate?

Q. Yes.

A. Yes. I drafted the initial Monograph for glyphosate.

Q. And I think you told us this morning that you got your assignment and the data -- let me back up one second. The last question on our prior conversation.

You know that there are individual animal data available -- made available to the regulators for some of those rodent studies that IARC did not have access to.

You know that, correct?

A. Yeah. I know that, but I know that for some of the studies, they were able to obtain EPA documents that summarized the data.

Q. So the answer to my question is: Yes, there

are individual animal data the regulators had that IARC did not, true?

A. I am aware of that, yes.

Q. Okay. Thank you.

Now, in terms of the drafting of the Monograph, the section you were responsible for, you got your assignment and some of the relevant materials, what, three to four months before March 2015?

A. It was probably closer to six months.

Q. And you had the opportunity to do your own literature review?

A. Correct.

Q. You were actually encouraged to do that?

A. Yes. Everybody is instructed to do their own literature search.

Q. So for the members of the jury, that means there's, like, articles for -- that can be available and accessed through search engines, for scientists to see what's been published, right?

That's what a literature review is?

A. A literature review -- for example, the National Library of Medicine has an online service where you can go online and search topics. And you can look at -- for example, you can do a search for glyphosate and cancer, or glyphosate and animal studies, and

glyphosate and epidemiology. And that would -- the MEDLINE would print out all of the publications that have been published on that particular topic.

Q. Okay. Thank you, Doctor.

And in terms of the process that you went through to prepare the draft of the Monograph, you, I think, described when Mr. Wisner was asking you questions, how seriously you took it, how much time you committed to it, your review of the data, doing a literature review, all that fairly captures -- even before you get to the meeting, right?

A. Right.

Q. And then you prepared a draft of the Monograph, right?

A. Right.

Q. I'm sorry, of your section.

A. Right.

Q. And you had the opportunity to submit it to your colleagues on your working group for comment, correct?

A. Correct.

Q. And when you get to France and you're all together, you have a plenary session, where you can discuss where you are in the drafting of the Monograph?

A. First you meet in subgroup. And the subgroup

goes through each draft and -- through that. So all the members of the subgroup have an opportunity to review and make comment on the initial draft.

And once the subgroup is happy with the initial draft, then it's sent -- it's distributed in the plenary session for their comment.

Q. With that background, I'm handing you what has been marked as Exhibit 4005.

MR. ISMAIL: Your Honor, a copy.

THE COURT: Thank you.

BY MR. ISMAIL:

Q. Dr. Jameson, do you recognize 4005 as a draft of the animal subgroup for the glyphosate Monograph?

A. That's what it's labeled as, yes.

MR. ISMAIL: May I publish, Your Honor?

MR. WISNER: Is this actually it? I don't know. He says it says that. I don't know if it is.

If it is what it is, then I have no problem.

MR. ISMAIL: Well --

THE COURT: Why don't we give him a minute.

Dr. Jameson, tell us yes or no, whether it is or not.

THE WITNESS: It looks like a draft of a Monograph. But it's just that, it's a draft. It's a working document. It's something that's being reviewed

and modified as we go along.

MR. WISNER: No objection, Your Honor.

MR. ISMAIL: Thank you.

BY MR. ISMAIL:

Q. Okay. So this draft -- and if we look here at the bottom, this plenary, we know this version of it is, at some point, during the five-day meeting when you're in France, correct?

A. I guess, okay.

Q. And it is -- so this is a document that you had those six months in the quiet of your office, looking at your data to prepare the first draft of, send out for comments, and incorporate as you saw fit to discuss with others in France, correct?

A. To be honest, I can't say if this is that one or not. I don't know.

THE COURT: Why don't we give Dr. Jameson time to take a look at it and tell us yes or no if this is what he drafted. That way we can proceed or not.

MR. ISMAIL: Sure.

THE WITNESS: This looks like it could be a draft.

THE COURT: Is or isn't? We just need to know for purposes of publishing or to continue to discuss it.

We can take a break, if you need to.

THE WITNESS: No, I don't need it. This looks like a draft document that we worked on, but we had many drafts we worked on in the course.

I don't know. This is probably one of the drafts that we worked on.

MR. WISNER: Your Honor, the question pending is if this is the one he wrote in the comfort of his own home. He can't answer that.

THE COURT: So let's take a ten-minute break so he can look at it.

(Recess taken at 2:20 p.m.)

(Proceedings resumed at 2:38 p.m.)

(Proceedings held in chambers outside the presence of the jury.)

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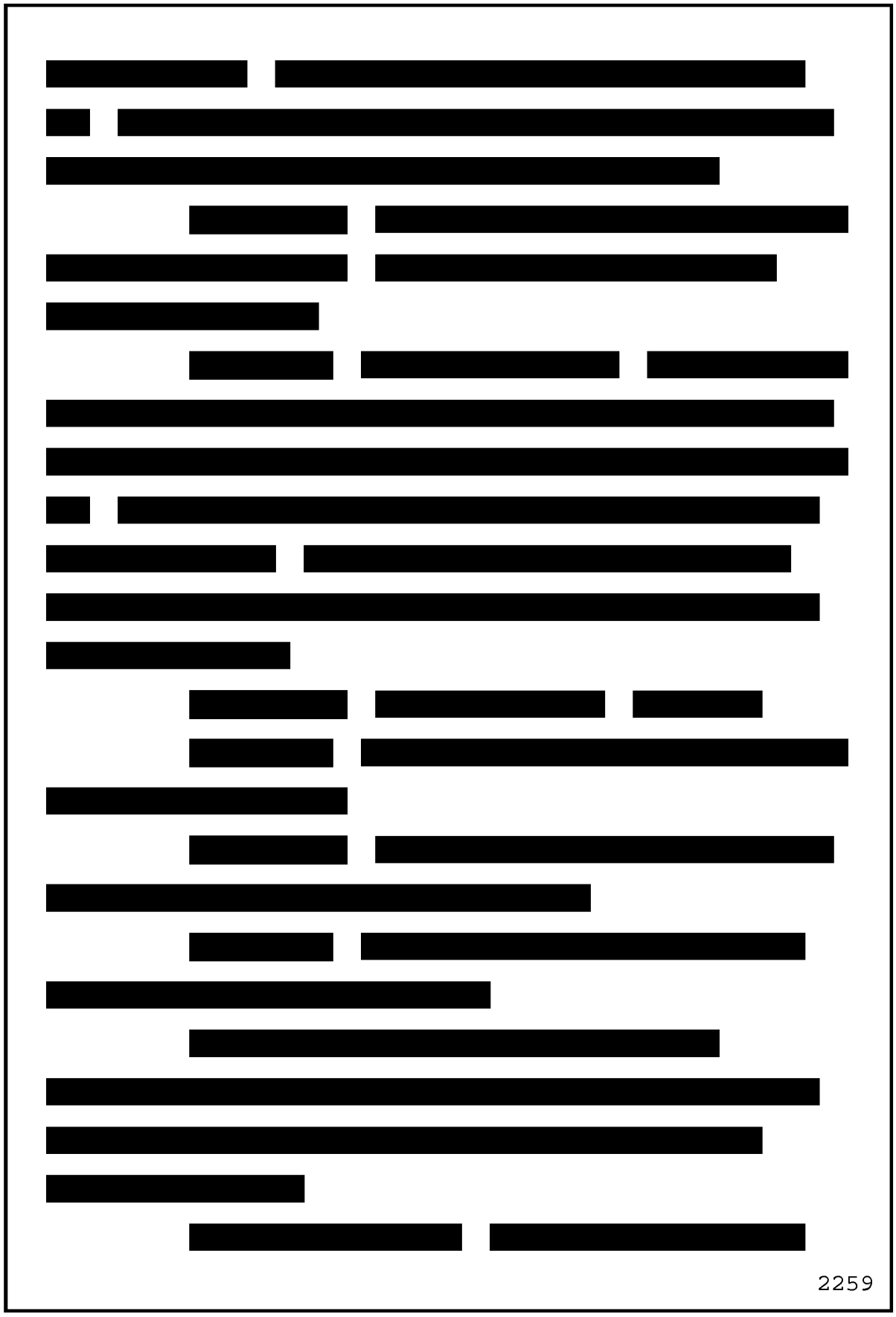
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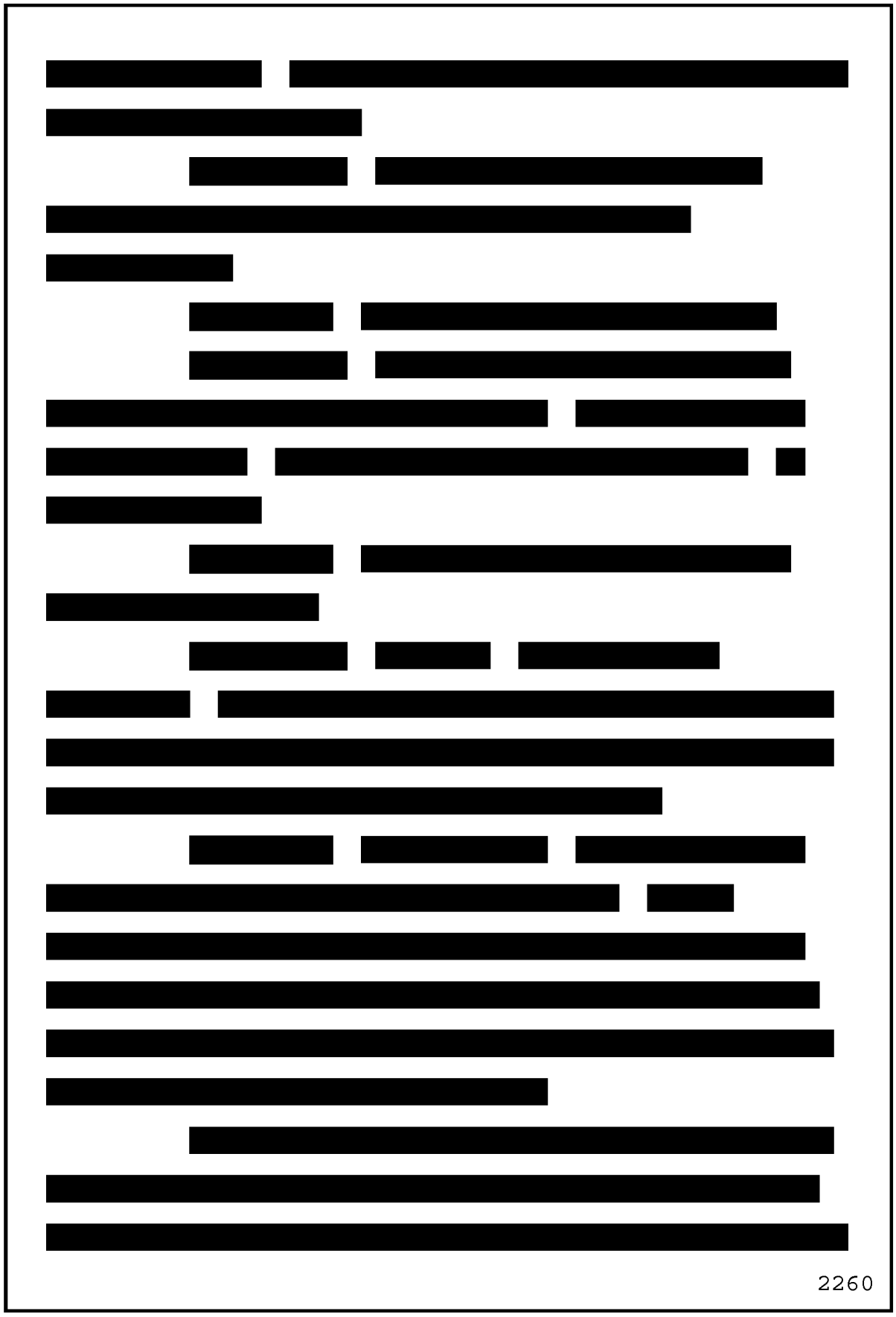
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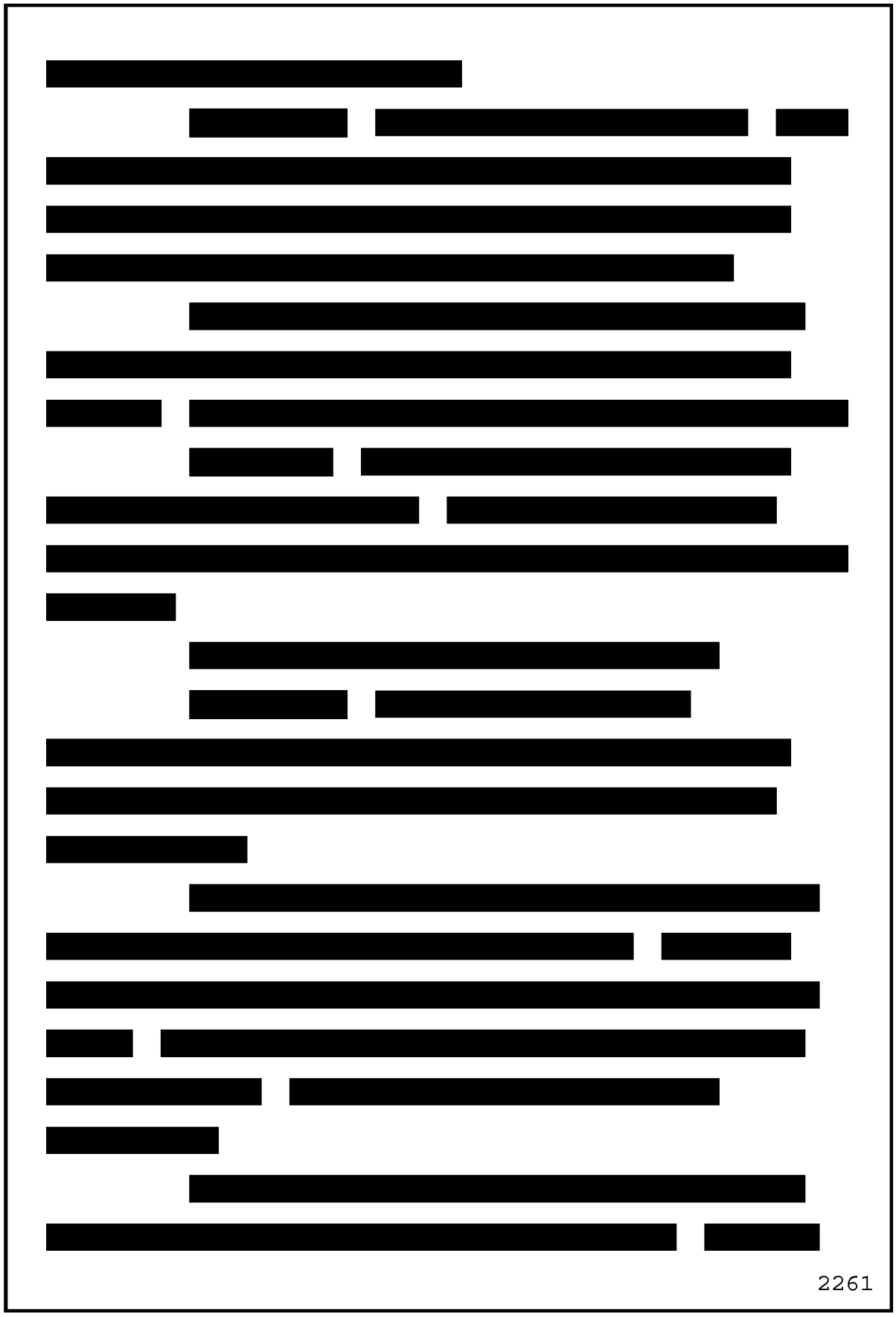
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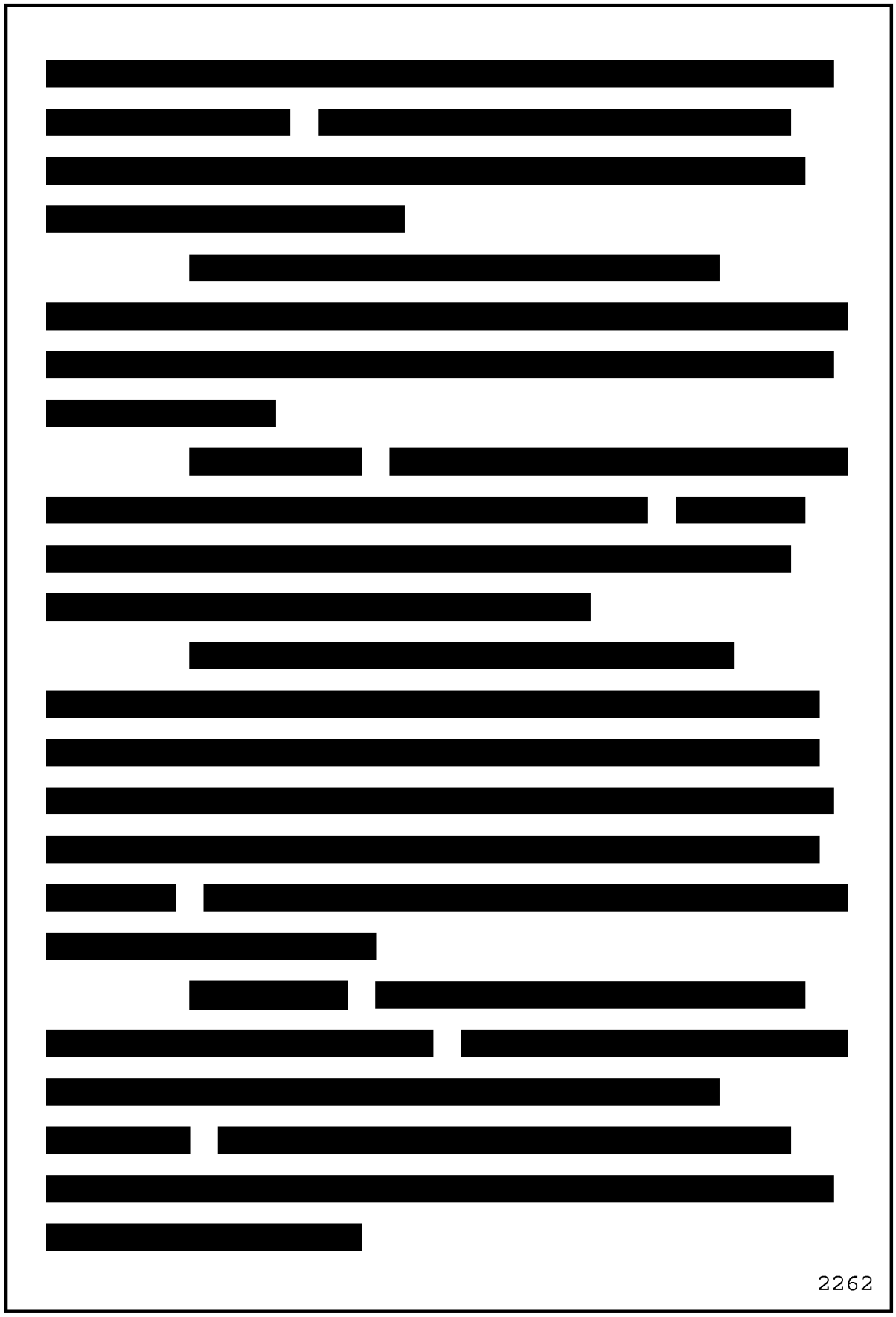
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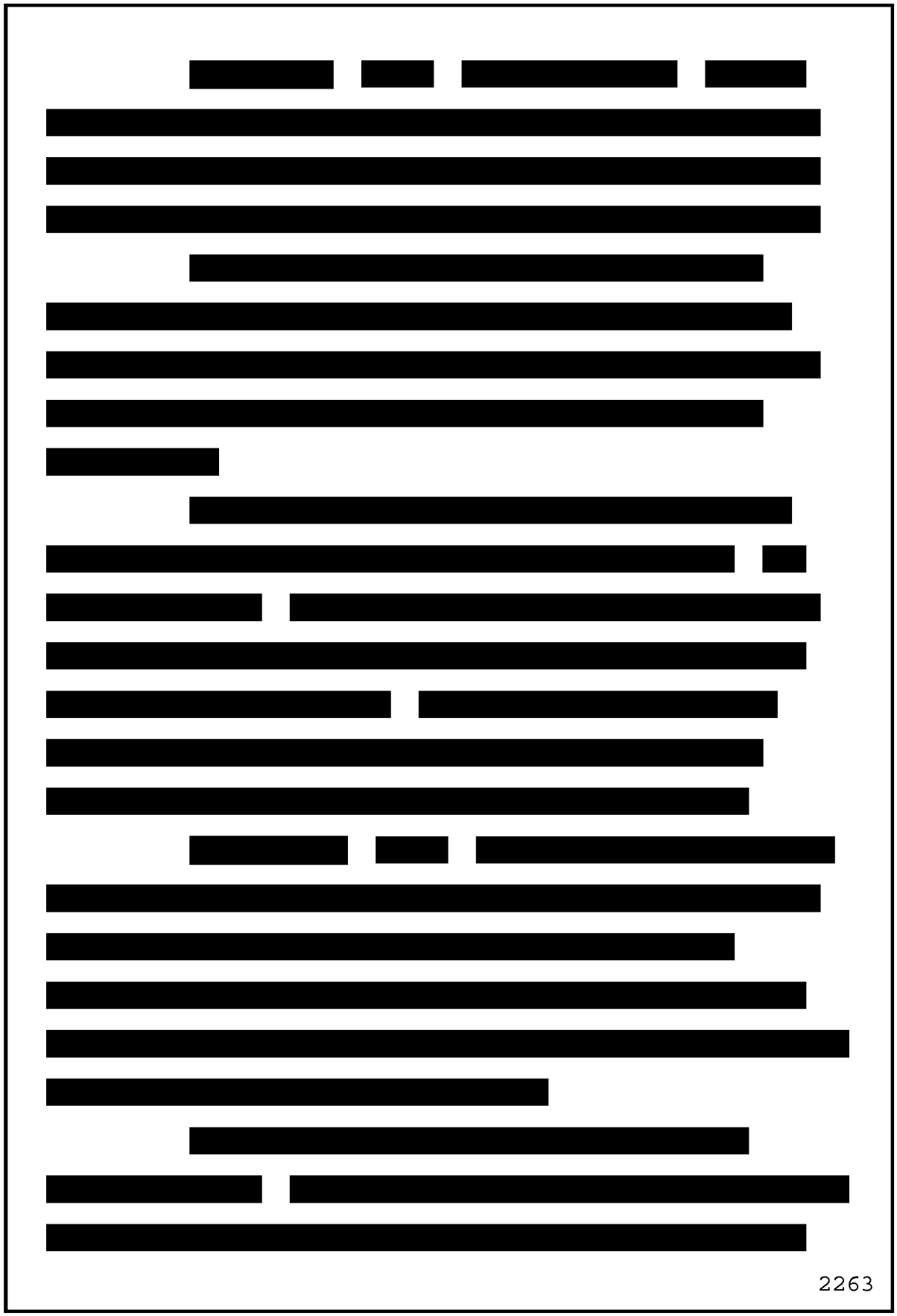
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[redacted]

(Proceedings resumed in open court out of the presence of the jury at 2:41 p.m.)

THE COURT: Proceed, Mr. Ismail.

MR. ISMAIL: Thank you, Your Honor.

BY MR. ISMAIL:

Q. Okay. Dr. Jameson, have you had a chance to review Exhibit 4005?

A. Yes.

Q. And just so we reorient everyone to where we were before the break, we were talking about how you had a drafting process of the Monograph that you went over with Mr. Wisner, as to the animal section, the rodent

section of that study -- or that Monograph.

You had responsibility for doing the first draft and sort of marshaling the comments through the process?

A. Correct.

Q. Have you had a chance to look at this exhibit and confirm that this looks like a draft of the work that you and your colleagues were creating that resulted in the Monograph?

A. This appears to be a draft that was one of the ones we were working on, as indicated in the top. It says: "Section 3, 2nd draft, revision 4."

So this is the fourth revision of the second draft of that Monograph.

Q. Section 3, was that your section?

A. Section 3 was an experimental animal section.

Q. I want to direct your attention, sir, to the second page. And there's a discussion of one of the rodent studies there beginning at line 16.

A. Okay.

Q. And looking at how that study is characterized -- and feel free to consult your notes I know that you have there -- that's concerning the Atkinson study, right?

A. Atkinson?

Q. Yes.

A. Hold on.

It doesn't say Atkinson. It just refers to the WHO FAO report. But based on dose levels, it looks like it may be the Atkinson study.

Q. All right. Do you see in the draft, it reports in the last line that:

"The report indicates that the tumor incidences recorded in this study fell within the historical ranges for controls."

Do you see where I am? Lines 23 and 24.

A. So it's referring to the tumor incidence for the lymphoreticular/hematopoietic tissue?

Q. Yes, sir.

A. Okay.

Q. And do you see how, in this draft, the working group describes the underlying report that you all had a chance to review, that the tumor incidences recorded in this study fell within the historical ranges for control?

Do you see where I am?

A. Are you talking about the bracketed comments at the very end?

Q. Right before the bracketed comments. Line 23, "The report indicates."

Do you see where I am?

A. Yes.

Q. Okay. So that's information that was gathered by the working group at this point in time, correct?

A. Okay.

Q. And you know that's a true statement, right?

A. That the report indicated that the incidents fell within the historical range?

That's what's written here, yes.

Q. If we roll forward in this document; if we go to, say, page 4 of the document, there's a study described in -- at line 11. And you can take a minute to look at it.

And you'll recognize that as what we've been describing here in court as the Sugimoto study?

A. Okay.

Q. If you look at line 16, after describing a lung adenoma, a lung adenocarcinoma, and lymphomas, that was one of the findings in that study, right?

A. Okay.

Q. This draft of the Monograph says:

"The authors concluded that glyphosate was not carcinogenic in CD-1 mice in this study."

Is that what's reflected in the draft?

A. That's what this version of the Monograph --

this draft of the Monograph stated.

Q. And that was a true statement, as reflected here in this --

A. That's what the report from the authors stated.

Q. Right. And you can go down to the next -- on that same page, at line 18, there's another study that the jury has heard about; that's the Kumar study.

And if you look at line 24, does this draft of the Monograph say:

"The authors indicated they felt the finding was considered incidental"

Let me back up.

The draft of the Monograph is describing lymphoma in the high-dose male group, correct?

A. I'm sorry, could you repeat the question.

Q. Sure. I got ahead of myself in asking the question.

If terms of the Kumar study here, it's describing an incidence of lymphoma in the high-dose male, correct?

A. Okay.

Q. And then in the section that I was directing your attention to, the draft of the working group Monograph says:

"The authors indicated they felt the finding was considered incidental background variation based on historical control rate of 39.6 percent, and therefore technical grade glyphosate was reported as not carcinogenic in Swiss albino mice."

Did I read that correctly?

A. That's what this draft says.

Q. And that was and is a true statement, correct?

A. That the author said that of this study, yes.

Q. And we can go through several more examples in this Monograph, this draft Monograph, but I think you can confirm the bottom line: That every single one of the tumors identified as positive by the IARC working group was determined by the authors of those studies themselves as not being related to glyphosate, true?

A. Okay. The studies -- the authors of the studies of the industry-sponsored studies, that's what their report said, that they submitted to industry.

Q. And so can you confirm, Dr. Jameson, that those additional statements that we just went over with the jury did not make it into the final Monograph?

A. Well, if you look at the final Monograph, they're not in there, absolutely.

Q. Okay.

A. There's a good reason for that. The IARC directs the authors of the Monograph to draft the Monograph to not include any conclusions that were provided by the authors of the report, and they want the working group to come to their own conclusion about what the data says.

So that's why those statements were mistakenly included in the draft section. That's why it's such a bad thing to get a draft of a working document. Because a draft of a working document --

THE COURT: Dr. Jameson, that's nonresponsive to the question.

THE WITNESS: I'm sorry.

BY MR. ISMAIL:

Q. Dr. Jameson, I think you --

A. What was the question again, please?

Q. Sure.

So Dr. Jameson, I'm not, in my question, challenging whether it was a good thing or bad thing to take it out of the draft; my question was actually different.

Which was: If you go through this draft, you'll see statements in here in which the working group is confirming that the authors of the individual studies determined those findings to be not related to

glyphosate, true?

A. It's stating what the authors of the report said.

Q. And what you're telling us is that it came out of the draft of the Monograph because, according to IARC protocols, it's supposed to reflect the working group comments, not the researchers providing the under --

A. The Monograph is to reflect the working group's evaluation of the data and their conclusions, not the conclusions of the authors.

Q. Okay. So continuing in our discussion of the Monograph, there was a study the jury heard about called the George study.

Are you familiar with that?

A. Yes, sir.

Q. Exhibit 5184.

MR. WISNER: I'll object to cumulative.

We didn't cover this study in his direct, and this was covered with Dr. Portier yesterday.

THE COURT: Overruled.

He can ask him questions about it if it's within his expertise.

MR. WISNER: Okay.

BY MR. ISMAIL:

Q. So you're familiar with the George study,

correct, sir?

A. George was the initiation promotion study; is that correct?

Q. That is, indeed, the study I'm talking about.

A. Okay.

Q. And the IARC working group considered whether that study was well-done and adequate for evaluation in terms of your work, correct?

A. Yes.

Q. And if you turn to page 5184 -- sorry, it's Exhibit 5184, page 34.

Are you with me, sir?

A. Yes, sir.

Q. So that we're oriented, we're talking about this George study, and the jury may remember that this is the painting study.

That was the method of this particular analysis, right?

A. Yes, sir.

Q. And if we go over here, in the right column, we see how the working group assessed the reliability of the study, correct?

A. Okay.

Q. And these Monographs actually have a format to them, where the things in brackets are the commentary

from the working group member, right?

A. That's accurate, yes.

Q. So in the brackets is what you and your colleagues are saying about the George study?

A. Yes.

Q. And you write:

"The glyphosate formulation tested appeared to be a tumor promoter in this study."

That's what those authors report, correct?

A. Yes.

Q. Then you say:

"The study design was poor, with short duration of treatment, no solvent controls, small number of animals, and lack of histopathological examination. The working group concluded that this was an inadequate study for the evaluation of glyphosate."

Did I read that correctly?

A. That's what it says.

Q. And you voted to include that language in this assessment of the George paper, true?

A. Yes.

Q. Now, there was a discussion you had with Mr. Wisner about the -- one of the mouse studies that underwent additional pathological evaluation.

Do you recall the description of the pathology working group?

A. For the tumor kidneys -- for the kidney tumors, excuse me, yes.

Q. For the kidney tumors.

And you told the jury that, in the initial read of those samples, there was no tumor found in the control group, and then it underwent reevaluation in several different ways, correct?

A. Correct.

Q. Now, handing you what we marked as Exhibit 4908. If you turn to the second page of the exhibit, sir -- second page of the document, first page of the exhibit, you'll see -- this is some of the EPA documentation surrounding the re-review of this study, correct?

A. Okay.

MR. WISNER: Your Honor, I need a quick sidebar on this.

THE COURT: Okay.

(Sidebar discussion not reported.)

BY MR. ISMAIL:

Q. Dr. Jameson?

A. Yes, sir.

Q. Do you recognize Exhibit 4908 as -- on the

topic that you were discussing with Mr. Wisner about the tumor in the control group, which was ultimately assessed as being there by the pathology working group, correct?

A. In this report, they say they see an adenoma, yes.

Q. Just so we're clear about the process, there was initially a null finding, they didn't see a tumor in the control group.

But then upon re-review, there was a tumor identified, correct?

A. The initial analysis was no tumors in the control group.

Q. And you indicated that as part of this process, the EPA required Monsanto to convene a pathology working group, right?

A. After two additional analyses of the kidney tumors, then the EPA requested an additional PWG, yes.

Q. And you told us that the purpose of a pathology working group is to bring in external experts in the field that's being -- in the subject matter of what's being discussed, true?

A. True.

Q. And you indicated that, as part of their review, they were, quote, blinded to what they were

reviewing, right?

A. True.

Q. What that means is, you brought in -- I think it was five pathologists, correct?

If you look on page 7 of the document.

A. Five pathologists, okay.

Q. Correct?

A. Five pathologists, yes.

Q. And one of them, you actually know quite well, Dr. Ward, correct?

A. I know Jerry Ward, yes.

Q. And you can speak to Dr. Ward's expertise and integrity, true?

A. He's a well-known veterinarian pathologist, yes.

Q. And Dr. Ward and the other four pathologists, when we say they are blinded, that means when they're given the tissue samples to look at, they don't know whether they're looking at a control group sample or a sample from the rodent that's been exposed to glyphosate, true?

A. True.

Q. That's what blinded means.

And the idea is to try to take out any bias, subjective or otherwise, in the review?

A. True.

Q. So they're just calling balls and strikes. They don't even know where these tissue samples are coming from?

A. Right.

Q. And when they did that review, blinded expert pathologists, they concurred that there was a tumor in the control group in the study; isn't that right, Dr. Jameson?

A. That's what this report says, yes.

Q. And thereafter, in IARC's review or EPA's review or in EFSA's review, all the reviewers considered the -- this study as having a tumor in the control group, true?

A. I'm trying to remember. I'm trying to remember.

Q. Okay.

A. Yes. I was going through in my mind, the review we did at IARC. And about the adenoma in the controls not being there, and then being there and not being seen by the EPA pathologist, and then going to a PWG and it's there.

There's no explanation and no discussion, I don't think. I didn't see anything in here that says they addressed, you know, how it was missed in the first

place.

But, yes, at IARC, we knew that the final evaluation was one adenoma in the control.

Q. And in terms of what this expert panel concluded, if you go to page 8, if you look at the very bottom, under Table 1.

A. Okay.

Q. This PWG, pathology working group:

"Firmly believes and unanimously concurs with the original pathologist and reviewing pathologist that the incidences of renal tubular-cell neoplasm in the studies are not compound-related."

True?

A. That's what this report says. But you'll also notice that they've upgraded the adenomas in the high-dose and the mid-dose from -- two of the adenomas are now carcinomas, or malignant neoplasms, and the one in the mid-dose is also upgraded to a malignant neoplasm.

And I think if you still look at these incidents of tumors, and you compare them to historical controls, you do see a significant trend in their formation.

Q. Okay. Let's break that down.

Even after doing the upgrading that you just testified to, this five-person expert pathology working group still concluded unanimously that the tumors were not related to glyphosate, true?

A. That was their opinion. But I don't see where they did any statistics anywhere.

Q. And in terms of the statistics, do you recall, Doctor, that the statistical significance assessment of this study that IARC relied upon was not accurate?

A. The statistical significance that IARC -- no, I wasn't aware of that.

Q. Do you recall how the statistical significance for trend was determined in this study?

A. By IARC?

Q. Yes. Do you recall that the working group requested the assistance of Dr. Portier in calculating the p-value for trend?

A. Yeah, I'm sorry. Yes, I remember that. Since he was there at the meeting, and he's one of the best-known biostatisticians around, we asked him for some help in calculating that.

Q. And he gave you a test to use for calculating the p-value, correct?

A. I believe he did, yes.

Q. And it resulted in a p-value less than .05,

and that was relied upon by IARC as a positive study, right?

A. Okay, yes.

Q. Do you know, since then, that Dr. Portier has concluded that the p-value is above .05?

A. Yes, he's rounded it to be 0.06. Just barely under significance.

Q. Under IARC standards --

THE COURT: One at a time. Hold on a second.

THE WITNESS: I'm sorry, Your Honor.

BY MR. ISMAIL:

Q. Dr. Portier was here yesterday, and he explained how this went down.

A. Oh, okay.

Q. So the working group, you folks believed and relied upon the test that suggested this was statistically significant, reported it as a positive finding.

Now you agree that, under the better test, it is not statistically significant at a .05 level, correct?

A. Correct.

Q. And IARC, in determining what is a positive finding, uses statistical significance at the .05 level, true?

A. Yes.

Q. And the national toxicology program, this gold standard organization that you worked at, also uses for positive finding p-value of .05, correct?

A. Correct.

Q. So this study, which was reported as positive in the IARC Monograph, does not meet that positive finding standard of .05?

A. Not based on that criteria.

Q. Thank you.

Now, in terms of the animal studies, Doctor, I think it was described -- you told us on direct examination that, after the IARC meeting, you went back and did some additional analyses and identified all the tumors that you believe constituted positive findings?

A. Yes.

Q. And do you recall when you did that, that you looked at both the rat studies and the mouse studies?

A. Correct.

Q. And you considered a total of 12 studies as the collection of reliable studies for your review, right?

A. Rats and mice?

Q. Total. Five mice, seven rats.

A. Actually, I looked at 14 total.

Q. Oh, okay.

And when you did your -- well, back up one step.

You agree that when animal researchers conducting these studies are looking at tumors, they're actually looking at a large number of different possible tumor findings, correct?

A. Right.

Q. Up to 50 different tissues may be sampled for tumors?

A. Possibly.

Q. And you're considering both whether there are any trends and any what they call pairwise significant findings, correct?

A. Correct.

Q. And you're looking at the males and the females?

A. Correct.

Q. So each study has lots and lots and lots of possible comparisons to look at, right?

A. Yes, sir.

Q. And you're familiar with the -- well, when you did your review, you prepared a report for this case, correct?

A. Yes.

Q. And you reported what you, Dr. Jameson, believed are the positive findings from the 12 or 14 rodent studies that you reviewed, correct?

A. Correct.

Q. And what you found were -- what you said were 16 positive findings, correct?

A. I'd have to count them up to see, but that sounds about right.

Q. If you would like to -- it's page 29 of your report, if you want to confirm it.

If that comports with your recollection, we can move forward.

A. Page 29 of my report. Now I have to find my report.

Q. I can give you a copy. I saw it was in your binder, but I'm happy to give you a copy.

A. That's okay. I think I have it here.

You say it's on page 29?

Q. I believe so.

A. Okay.

Q. Are you there?

A. Yes, sir.

Q. And we don't need to put it on the screen or show it. You can just eyeball that paragraph and confirm, hopefully, that I did the math correctly.

A. I'm sorry, the question again is how many --

Q. The positive findings you found in all the rodent studies you reviewed.

There are 16, right?

A. I count 17.

Q. Okay. Your report has what it is. I don't know what document you're looking at now, but we'll call it 17 for this discussion.

A. Okay.

Q. What you did when you were trying to identify a positive finding was to use what you always did in your scientific practice with statistical significance of .05 level, true?

A. That's what I tried to do, yes.

Q. And you know from looking at this that you relied on Dr. Portier's initial statistics to identify some of these tumor findings, right?

A. In some cases. In other cases, I used the EPA's statistics. I think for one of them, I used statistics provided in the Greim study.

Q. And you know that Dr. Portier has revised some of the statistics that you relied upon?

A. Yes.

Q. And you know that some of the tumors that you identified as positive because they were statistically

significant, turns out that they're not statistically significant, right?

A. A few of them.

Q. So, for example, this kidney tumor that you and I were just talking about?

A. Kidney tumors.

Q. And there were others that Dr. Portier initially said were statistically significant, and then recalculated, and they're no longer statistically significant, true?

A. I'm checking. Sorry.

There may have been one or two.

Q. So the revised positive finding summary would be some number below 17?

A. Probably some -- maybe 15, 14 or 15. Maybe.

Q. Okay. So first of all, you can confirm that when you looked at the animal data, and applying the same approach you did as a scientist outside of this litigation, you did not find 35 tumors in the open studies, right?

A. Thirty-five?

Q. Yes. You found some number below 17?

A. According to what I just read, I found 17.

Q. And we already know that the truth of the matter is somewhere below 17, right?

A. It may be on -- looking at the statistics that were redone, it may come down to 15.

Q. So we know Dr. Jameson doesn't think that there are 35, 20, 25, or even 20 positive findings in the glyphosate rodent studies, true?

A. Okay.

Q. Okay. That's your --

A. That's -- I told you that 15 is what I found.

Q. Very good.

And you're familiar with the concept -- well, there are hundreds of different comparisons done from which you identified your findings, correct?

A. I don't know if I follow what you're getting at.

Q. Sure. We talked about how many different possible analyses there are?

A. You mean comparing tissues?

Q. Yes.

A. Okay.

Q. And you know that the collection of the comparisons from which you identified 15 positive findings number in the hundreds, right?

A. Would you -- could you say that again, please.

Q. Sure. You identified 15 positive findings, right?

A. Okay.

Q. Out of a collection of hundreds of different possible comparisons?

A. But that's not true. That's not the comparisons that are made.

Q. So let me try this --

A. When you do the histopathology on an animal, you do look at all the tissue sites within the animals. But then you compare, within the tissue sites, the controls to the low, the mid, and the high dose. That's the comparison you're doing.

You can't go and say, look at all of the hundreds or possibly thousands of different tissues I looked at and compare a tumor in the liver to a tumor in the lung or a tumor in the esophagus to a tumor in the testes. That's not how it's done.

That's not how the science is done. And that's what you're asking me to compare.

Q. That's not what I'm asking you.

A. Okay.

Q. Let me ask it this way: Do you know how many comparisons were run from which you identified 15 positive findings?

And if you don't know, you can tell us you don't know.

A. How many comparisons?

Q. Yes.

A. Well, you have to go and identify which tumor site I'm finding a positive effect. And if it's the lymphoma in the mouse, then you look at the lymphomas in that particular study.

Q. So my question, Doctor, is: Do you know how many there are or how you would go about calculating that number?

If you don't, just tell us.

A. I don't understand your question at all.

Q. Let's move on, Doctor.

Epidemiology. You talked about that this morning, okay?

A. Okay.

Q. You don't have a degree in epidemiology, correct?

A. No, sir.

Q. You've never designed an epidemiology study, true?

A. I participated in epidemiology studies, but I didn't design it, no.

Q. Now, one of the papers or studies you talked about was the Agricultural Health Study, correct?

A. Right.

Q. And the Agricultural Health Study had an analysis that was peer-reviewed and published, and that was available to the working group in 2015, correct?

A. That's right. The 2006 De Roos study.

Is that what you're referring to?

Q. Yes, sir.

A. Okay.

Q. And the working group looked to the Agricultural Health Study to determine whether it was a reliable and informative study, right?

A. That's correct.

Q. What the working group concluded was that the Agricultural Health Study was a highly-informative study, true?

A. I think that's the wording they used for it, yes.

Q. And you know that the Agricultural Health Study, in its publication in 2005, showed no increased risk of non-Hodgkin's lymphoma following formulated glyphosate exposure, true?

A. You're saying the publication of the Agricultural Health Study in 2005?

Q. Yes, sir.

A. I don't know if I'm aware of a 2005 publication of the Agricultural Health Study.

Q. Well, I'll show it to you.

Doctor, do you recognize Exhibit 4603 --

A. Okay.

Q. -- as the Agricultural Health Study that was available for the working group to consider?

A. Yes. Sorry, I was mistaken.

Q. And just so everyone is on the same page, you just had the years mixed up.

A. Yeah. I had the years mixed up. Sorry.

Q. So this is the paper that we're looking at, and we went through some of this yesterday with Dr. Portier.

But since this was a study the working group thought was highly informative, I want to ask you to confirm the findings from this paper, okay?

A. Okay.

Q. If we go to page 52 of the paper.

The way these articles are prepared, the authors will describe their methods, and then they'll describe the results, and then they'll provide a discussion of what these data mean, right?

A. Correct.

Q. What we're looking at here is how these authors wrote up the results of their study.

They say:

"There was no association between glyphosate exposure and all cancer incidence for most of the specific cancer subtypes we evaluated, including NHL, whether the exposure metric was ever used, cumulative exposure days, or intensity-weighted cumulative exposure days."

Did I read that correctly?

A. That's correct.

Q. You agreed with that interpretation of the data that's reported here, true?

A. For this particular paper, yes.

Q. So this was a study that the working group thought was highly informative and was correctly assessed to show no connection between glyphosate formulations and non-Hodgkin's lymphoma, correct?

A. And that's for exposures up to that time. But this really didn't take into account a lag time for the formation of the tumors.

Q. So then there was an updated study.

And you're familiar with this paper, correct?

A. Yes.

Q. And this paper comes out in 2018, so it comes after the IARC working group in 2015, right?

A. Yes, sir.

Q. So when you were talking about, since the

working group meeting, new studies have come out on this issue, the Andreotti paper is one such --

A. It's one of the studies that have come out since the IARC meeting, that's correct.

Q. And just to orient everyone here, these are the authors on the paper.

And you know some of these folks, right?

A. Yes. I know Dr. Sandler.

Q. You know Dr. Sandler, and you would agree she is a highly-qualified, competent scientist?

A. She's one of the investigators on the Agricultural Health Study. She's the lead pathologist at the National Institute of Environmental Health Sciences. I've known Dale for quite a while.

Q. Again, my question was qualified.

A. She's qualified, yes.

Q. And other folks on here, you know and respect. You've got Dr. De Roos and other folks in here whose qualifications and expertise you can vouch for, right?

A. Yes.

Q. And in terms of their affiliations, we've got folks from your former shop, the National Institute of Environmental Health Sciences; we've got folks from the National Cancer Institute; we've got university researchers and experts working on this paper, as well,

correct?

A. Correct.

Q. And this is published in the Journal of the National Cancer Institute?

A. Yes.

Q. One of the most highly-respected journals in cancer research?

A. Yes.

Q. Undergoes peer review?

A. In order to get it published.

Q. And this is the post peer-reviewed publication of this study, correct?

A. If it came out in the Journal of NCI, then it has been peer-reviewed. Correct.

Q. By definition.

Now, you recall, from reviewing this study, that these authors whom you respect published results in 2018 that updated the Agricultural Health Study data, correct?

A. Okay.

Q. Yes?

A. Yes. Up to that date.

Q. Up to that date.

And they report on lots of different outcomes, including non-Hodgkin's lymphoma, true?

A. That's correct.

Q. And the jury has become accustomed to seeing these values over here. They recognize these as relative risks. And we know that if it's below 1 or above 1 or around 1 -- let me start over.

A relative risk around 1 would show no effect, positive or negative, correct?

A. That's accurate.

Q. And what we see here are values for how many days of exposure the agricultural workers and other participants had to glyphosate, correct?

A. Which numbers are you referring to?

Q. You know that the Q1, Q2, Q3, and Q4 are showing increasing amounts of exposure to the agent glyphosate?

A. That's what they defined in the paper. That's how they defined it in the paper.

Q. My point only being: When they looked at the various results from the data, they were trying to get a look at dose response?

A. That's what they were trying to get.

Q. And what you can confirm here is that there's no increased risk whatsoever shown in this peer-reviewed study, correct?

A. That's what they're reporting.

Q. Now, you talked about the epidemiology section of IARC. And I think I'm going to use your exhibit. You were talking about the definition for what would be limited or sufficient or inadequate data for human epidemiology, according to the IARC definition?

A. Uh-huh.

Q. Okay. This is a document you put up on your direct examination, correct?

A. I believe Brent put it up, yes.

Q. Okay. And so you were asked -- this was the section you were asked about.

You were asked whether -- how the epidemiology group and the working group assessed the human epidemiology on glyphosate and non-Hodgkin's lymphoma, right?

A. Yes.

Q. And you told Mr. Wisner, in response to his question, that it was the second-highest classification.

Do you recall that?

A. That's what we talked about, it being the second-highest classification in human data.

Q. In fairness, Doctor, it would be important to know that there are -- the levels of data are sufficient, limited, inadequate in evidence, suggesting lack of carcinogenicity, correct?

A. That was the definition in 2015, yes. They have since changed.

Q. So in terms of what the working group is looking at and assessing, they used the definition -- what they didn't conclude was that the human epidemiology shows that a relationship has been established.

That was a classification that they rejected, correct?

A. They said it didn't meet sufficient evidence.

Q. Right. And instead, they chose limited evidence as the classification, correct?

A. A positive association is credible.

Q. And there's a difference between association and causation, correct?

A. Association and causation?

Q. If you don't understand the question, we can move on. I'll withdraw the question. Let's move on.

A. Okay.

Q. In terms of what they said about causation, they said it's credible, but they don't say it's been established, true?

A. They said it met that particular criteria for the IARC.

Q. And what they say is:

"Chance, bias, or confounding could not be ruled out."

Correct?

A. Correct. That's part of the definition.

Q. We don't have to go over it here because we did it yesterday.

But there's lots of potential confounders when looking at the development of non-Hodgkin's lymphoma and exposures, true?

A. There could be.

Q. Okay. Last document I want to show you, sir.

You told us that additional studies have come out since IARC; and one of these was AHS, which shows no effect. And there was --

A. But that's not necessarily true. That's not accurate to say, the AHS showed no effect. Because they took the data from the 2018 AHS study and did two meta-analyses including that data.

And the meta-analyses, in combination with the case-control studies, get a significantly positive meta risk.

THE COURT: Dr. Jameson, I don't want to interrupt you, but I am because Counsel didn't finish his question.

THE WITNESS: Oh.

THE COURT: I would like you to wait until Counsel finishes his question, and then either respond or not respond.

THE WITNESS: I apologize, Your Honor.

BY MR. ISMAIL:

Q. Was one of the papers you were referring to as coming out since IARC the Leon study?

A. Yes.

Q. Is it your interpretation of that study that it shows an overall increased risk of NHL following glyphosate exposure?

A. Based on their meta analysis?

Q. Based on the cohort study that's described in there.

A. I'm under the -- the Leon study is a meta-analysis of the data.

Q. Are you familiar with the -- is it your interpretation of the study that it shows an overall increased risk of non-Hodgkin's lymphoma?

A. The meta-analysis that they did, yes.

Q. Have I handed you a copy of the Leon paper to which you were referring?

A. Yes.

Q. And it's Exhibit 6762.

Yes, sir?

A. I'm sorry, I was reading.

Q. I was just making sure we have here the Leon paper from 2019; Exhibit 6762, correct?

A. Correct.

Q. And if you turn to Table 2.

THE COURT: Page?

MR. ISMAIL: Page 8, Your Honor.

THE COURT: Thank you.

BY MR. ISMAIL:

Q. Are you there, sir?

A. Page 8?

Q. Yeah.

A. Okay.

Q. In Table 2, do they report what the relative risk is with glyphosate in this analysis for non-Hodgkin's lymphoma?

A. Okay.

Q. Do you see it?

A. Yes.

Q. Tell the members of the jury what the relative risk is for overall non-Hodgkin's lymphoma.

A. For overall non-Hodgkin's lymphoma, yes, .95.

Q. .95. And is that indicative of an overall increased risk of non-Hodgkin's lymphoma with glyphosate exposure?

Yes or no?

A. Well, not for overall non-Hodgkin's, but I think it was for the B-cell that they found that it was statistically significant.

Q. Are you aware -- let's just take this one step at a time, sir.

The study which looked -- that just came out, that you talked about with the jury as new information, these researchers looked at whether glyphosate exposure increased the risk of non-Hodgkin's lymphoma overall.

Correct?

A. Of non-Hodgkin's lymphoma, okay.

Q. And these researchers determined that, by their data, there was no increased risk using the overall NHL end point, true?

A. For overall NHL. But for B-cell, it was significantly increased.

Q. And are you aware of any other -- in terms of the B-cell lymphoma that you're talking about, have you looked to see whether other researchers have also assessed whether there's a risk of B-cell lymphoma?

A. I would be drawing on my memory. I think so, but I can't say for sure.

Q. In terms of whether those other data show no increased risk with B-cell lymphoma, you would have to

rely on your memory to confirm or deny there's no increased risk in those other studies, as well?

A. Yeah. I would have to find the studies and look at them to give you a definitive answer on that. Sorry.

Q. In terms of the overall risk of non-Hodgkin's lymphoma in the Leon paper that's come out since IARC, you can agree that it shows no increased risk in NHL, true?

A. In overall NHL, but it is positive for B-cell.

MR. ISMAIL: Thank you, sir. No further questions.

THE COURT: Redirect?

MR. WISNER: Yes, Your Honor. Thank you.

REDIRECT EXAMINATION

BY MR. WISNER:

Q. Good afternoon, Doctor.

How are you holding up?

A. Okay.

Q. I understand you just had back surgery.

Is that right?

A. Yes, it is.

Q. Are you doing all right?

A. I am, thank you.

Q. I want to go backwards, starting from --

(Short discussion off the record.)

BY MR. WISNER:

Q. Doctor, I would like to sort of move backwards from where Counsel was asking you questions. We actually have some time to do this today. So let's go backwards.

Let's start off with the Leon paper you were just looking at, okay?

A. Okay.

Q. This is a pretty recent paper; is that right?

A. That's correct. It just came out, not too long ago.

Q. And the title of it is:

"Pesticide use and risk of non-Hodgkin's lymphoid malignancies in agricultural cohorts from France, Norway, and the USA: A pooled analysis from the AGRICOH Consortium."

Do you see that?

A. Yes.

Q. Is it your understanding that this looked at results from three cohort studies?

A. Yes.

Q. One was the AHS?

A. Yes.

Q. And there was one from France and one from

Norway, right?

A. That's correct.

Q. And if you actually go into the data here, here on Table -- Figure 1, we have here some numbers about the number of people included in the analysis.

Do you see that?

A. Yes, sir.

Q. So there's three studies. There's the AGRICAN study.

Do you see that?

A. Yes.

Q. That was the one from France?

A. Yes.

Q. The CNAP was from Norway?

A. Right.

Q. And the AHS?

A. Absolutely.

Q. And you would agree with me that the CNAP study and the AGRICAN study are significantly larger than the AHS?

A. Significantly. Yes.

Q. When you look at if something is causing non-Hodgkin's lymphoma, the way you measure the size of the study is, you look at the number of people who have cancer, right?

A. Correct.

Q. And if we turn here to -- if we actually use that table -- here it is.

If you go to the end of the study, Doctor, there's some supplementary tables.

Do you see that?

A. Okay.

Q. If you go to, I believe it's the second one. It lists out the size, the number of people that were looked at.

Do you see that?

A. Is this supplementary Table 2?

Q. That's right. Do you have it?

A. Okay.

I found it. All right.

Q. So if you look under non-Hodgkin's lymphoma.

Do you see that?

A. Yes.

Q. It breaks it down by the three different studies: AGRICAN, CNAP, and AHS.

A. Yes.

Q. The AHS had 493.

Do you see that?

A. Yes.

Q. It looks like CNAP had 1,498 cases.

Do you see that?

A. Yes, sir.

Q. Let's look and see what the CNAP data showed about overall NHL.

A. Overall NHL.

Q. To do that, you have to go to the portion of the paper that specifically says glyphosate.

So that would be on page -- if you find it first, let me know.

A. Page 11.

Q. Thank you, sir. Page 11.

And you see that it starts at the bottom, talks about glyphosate.

Do you see that?

A. Yes.

Q. And then we turn to the next page. It actually records the incident rates for CNAP.

Do you see that?

A. Yes.

Q. And it says:

"In CNAP, adjustment for ever use of other pesticides generated a fully-adjusted hazard ratio for ever use of glyphosate of larger magnitude, 1.67 1.05-2.6."

Do you see that?

A. Yes, sir.

Q. So the fully-adjusted cohort study that looked at 1,500 cases had a statistically significant elevated rate?

A. Yes. Correct.

Q. So in the direct examination, when I said the recent epidemiology that's coming out is reporting the higher classification, is this what you were referring to?

A. Yeah. That, and the other recent meta-analysis that was published in a separate publication.

Q. We're going to get to that in two seconds.

A. Okay.

Q. There's also a section in here that looks at something called diffuse large B-cell lymphoma.

Do you recall that?

A. Yes.

Q. I think you were saying that the study looked at that specific subtype.

A. Right.

Q. When we talked about looking at the subtypes of lymphoma, you would agree with me that, because they are a rarer type of cancer, you need a lot of data?

A. Correct.

Q. And pulling in three massive cohorts kind of gives you that data?

A. It does.

MR. ISMAIL: Your Honor, this is all leading.

THE COURT: Pardon me?

MR. ISMAIL: It's all leading, Your Honor, the entire examination.

MR. WISNER: I'll ask open-ended questions.

BY MR. WISNER:

Q. Sir, there's a section here that says, "Diffuse large B-cell lymphoma."

Do you see that?

A. Yes.

Q. And it reads:

"There was an elevated mHR of DLBCL with ever use of glyphosate, 1.36, confidential interval 1.00-1.85."

Do you see that?

A. Yes, sir.

Q. What does that mean?

A. That means there was a statistically significant increase in the formation of this diffuse B-cell lymphoma in the exposed group.

Q. Sir, do you know that the two plaintiffs that are filing this lawsuit --

MR. ISMAIL: Objection, Your Honor. He testified he has no information about the plaintiffs in this case.

MR. WISNER: He'll say he doesn't know.

THE COURT: Well, no. We agreed --

MR. WISNER: I'm asking if he does. I don't know -- okay. Let me ask an open-ended question.

BY MR. WISNER:

Q. Do you know what type of cancer the two plaintiffs have in this case?

A. I know nothing about their condition, no.

Q. Okay. That's fine.

I want to talk about that Zhang study, okay?

A. Okay.

Q. This was a study we showed the jury yesterday with Dr. Portier. It's Exhibit 233.

MR. WISNER: Your Honor, permission to publish? Actually, we published it yesterday.

BY MR. WISNER:

Q. Is this a copy of the Zhang article, Doctor?

A. Yes, sir. I recognize it.

Q. One of the things we see right here at the beginning of it is that the title of it is: "Exposure to Glyphosate-based Herbicides and Risk for Non-Hodgkin's lymphoma: A Meta-Analysis and Supporting

Evidence."

Do you see that?

A. Yes.

Q. And we have these different authors, right?

A. Yes.

Q. And it says right here that the lead author, she's from Berkeley.

Do you see that?

A. Yes.

Q. All right. And then there's a -- I want to go to the signatory line, see what their declarations of interest are.

It says right here -- oops.

It says:

"The authors have no financial conflicts of interest to declare. We disclose Drs. Zhang, Taioli, and Sheppard served as Science Review Board members of the U.S. EPA FIFRA Scientific Advisory Panel meeting that evaluated glyphosate in December 2016."

Do you know what that is referring to?

A. That's the EPA Scientific Advisory Panel that came out with the recommendation on regulating glyphosate.

Q. And you said this was a meta-analysis.

What do you mean by that?

A. Meta-analysis is a way of pulling the data from several different studies that are similar in design. And by adding all of the studies together or pooling the data from these studies, you're able to increase the number of cases, the number of analyses that you can do, thus giving you -- strengthening the findings that you get.

Q. It says right here:

"We conducted a new meta-analysis that included the most recent update of the Agricultural Health Study (AHS) cohort published in 2018, along with five case-control studies."

Do you see that?

A. That's correct.

Q. Is it your understanding that this paper, this meta-analysis, used the most recent AHS data?

A. Yes, they did.

Q. And if we go to the second part.

It says:

"We report the overall meta-relative risk of NHL in GBH-exposed individuals was increased by 41 percent (meta-RR 1.41; confidence interval 1.13-1.75)."

Do you see that?

A. That's correct.

Q. And then it goes on.

They said:

"To contextualize our findings of an increased NHL risk to individuals with high GBH exposure, we reviewed available animal and mechanistic studies."

Do you see that?

A. Yes.

Q. This study they showed you a minute ago, did they look at animal studies?

A. No. That's just the publication of the results of the cohort study.

Q. Did they look at genotoxicity studies?

A. No. They didn't look at anything like that. Like I said, they just reported the results of their cohort study.

Q. So what Dr. Zhang and her colleagues are doing is going a step further?

A. Yes.

Q. It says:

"We documented further support from studies of malignant lymphoma incidence in mice treated with pure glyphosate, as well as potential links between GBH exposure and immunosuppression, endocrine destruction and genetic alterations that are

commonly associated with NHL. Overall, in accordance with evidence from experimental animal and mechanistic studies, our current meta-analysis of human epidemiological studies suggests a compelling link between exposures to GBHs and increased risk for NHL."

Do you see that?

A. Yes.

Q. When you were working with the IARC working group for glyphosate, did you have the benefit of this comprehensive meta-analysis?

A. No, we didn't have this analysis. This just came out in 2019.

Q. Earlier, when I asked you about the recent epidemiology that was coming out that was strengthening your opinion, were you talking about this?

A. Yes, this is what I was talking about.

Q. During your cross-examination, do you recall that Counsel showed you the IARC Monograph?

A. Yes.

Q. And if you actually look in our binder, there is a copy of that Monograph. It's Exhibit 1019.

A. Okay.

Q. During cross-examination, he showed you one portion of it that related to the George study.

Do you recall that?

A. Yes.

Q. Did he show the jury the rest of it?

A. No.

Q. Let's take a quick tour through.

MR. WISNER: Permission to publish, Your Honor?

THE COURT: Granted.

BY MR. WISNER:

Q. So this is the glyphosate Monograph.

Do you see that?

A. That's correct.

Q. Just to give the jury a sense of things, it's a substantial document, right?

A. Yes.

Q. And it has -- well, let's run through it quickly.

The first section of the Monograph is what?

A. First section discusses exposure.

Q. But I thought IARC didn't consider exposure, sir?

A. No, exposure is a very important part of the overall review. If you look at the preamble, there's a big description in there about the part exposure plays and how people are to go about identifying and using the

exposure information in the evaluation.

It's critical for documenting human exposure and the extent of human exposure that is known to the materials we're reviewing. And it also is essential to the epidemiology people, for them to get a feel for what industries are affected, what individuals in the public domain are affected.

And, in fact, it's so important to the epidemiologists that, here in the recent past, they always assign an epidemiologist to the exposure section to make sure that all the issues that the epidemiologists need are addressed in the exposure section.

Q. So the first portion of it talks about exposure, goes on for a while. It has charts. Keeps going.

Then the first -- the next section is "Cancer in Humans."

Is that right?

A. That's correct.

Q. It looks like the very first section they discuss is cohort studies, correct?

A. That's right.

Q. And the only cohort study relevant here at this time was?

A. The Agricultural Health Study. That was the only one available to us at the time.

Q. If you go through it here, it looks like they're looking at a whole bunch of different versions of the Agricultural Health Study. There's the De Roos '05 one, there's Flower 2004, Engel 2005, Lee 2007, Andreotti 2009.

Do you see all that?

A. Yes, sir.

Q. Are these various publications that came out of that cohort?

A. The Agricultural Health Study, yes.

Q. So they weren't just looking at NHL, all cancers?

A. Yes, that's right.

Q. So after that, it gets into case control.

Do you see that?

A. Yes, sir.

Q. If you go through here, there's a table that goes on for a while, and it's discussing these case-control studies; is that right?

A. Yes.

Q. I'm just going to call one out here at random.

You mentioned Hardell earlier, this is one of the studies, right?

A. Yes, one of the studies.

Q. And it looks like the working group discusses the study, discusses its size, discusses its analysis, and discusses its results.

Do you see that?

A. Yes.

Q. For example, here, they highlight -- they note the tripling of the risk.

Do you see that?

A. Yes.

Q. But they also highlight only 85 percent increase, as well?

A. Right.

Q. So they're showing all the data and what they're considering?

A. That's correct.

Q. All right. This table goes for a bit.

And then after we get through the case-control studies, they look at -- then we get to animals, right?

A. Yes.

Q. And you start off here with the mouse?

A. Yes.

Q. And then you move on to the rat?

A. Rat.

Q. If there were other animals, they would look

at that, as well?

A. Yes.

Q. So we get through it all. There's a section titled "Mechanistic Data."

Do you see that?

A. Yes, sir.

Q. It says "toxicokinetic data."

Do you know what that means?

A. That's looking at the kinetics of how the material affects the different organisms in the body, toxicokinetic studies.

Q. I just wanted to sort of -- it looks like it even has the chemical -- this is your area, right, chemistry --

A. Right. That's glyphosate. That's the chemical structure of glyphosate.

Q. Is it true that glyphosate is actually a very simple molecule?

A. Yeah, it's not very complicated. It's a phosphorus IMIDE.

Q. We're going to act like we all understood what that meant.

It keeps going, talks about metabolism, mechanisms of carcinogens.

Do you see that?

A. Yes.

Q. It keeps going. More tables, more tables. Each one of these lines here, just to specify, this is a study?

A. This is a genotoxicity study, yeah. This particular one is in plant systems. They're looking at DNA damage in the plants.

Q. And you know that because it says DNA?

A. Correct.

Q. Or, for example, chromosome malignant damage?

A. Correct.

Q. So it keeps going, and finally we get to an analysis of all this data: "Summary Report."

Correct?

A. Yes.

Q. And they talk about the exposure, all those sections we just went over; is that right?

A. Yes.

Q. All right. And finally, we get to the overall evaluation.

And I want to clear something up. I think it might have gotten confusing back there on cross-examination.

There are assessments given to the epi?

A. Yes.

Q. The animal data?

A. Yes.

Q. And the mechanistic data?

A. Yes.

Q. But then there's an overall assessment done?

A. Correct.

Q. Okay. And so when you look at the evaluation of the first section, the epidemiology, it states:

"There's limited evidence in humans for the carcinogenicity of glyphosate."

A. Correct.

Q. Is that referring to the causal --

A. A causal relationship is credible, but confounding, bias, and other factors should not be completely excluded.

Q. Would it be fair to say that it's sort of like saying that it's more likely than not causal?

MR. ISMAIL: Objection, Your Honor. A, it's leading; and B, there's no quantitative significance to any of --

THE COURT: Sustained.

BY MR. WISNER:

Q. It says right here:

"A positive association has been observed for non-Hodgkin's lymphoma."

A. That's an important part of the finding, too. The IARC working group stated that a positive association has been observed for non-Hodgkin's lymphoma and exposure to glyphosate and glyphosate formulations.

Q. Typically when a chemical is classified as a Group 1 carcinogen, there's usually an explanation as to what tumor they say it's a carcinogen in.

A. Right.

Q. Is that what's going on here?

A. Basically, that's what's being done here, yes.

Q. We have the experimental animals:

"There's sufficient evidence in experimental animals for the carcinogenicity of glyphosate."

A. Yes.

Q. And in cross-examination, we explored what sufficient meant.

Do you remember that?

A. Right.

Q. It means a causal association is established?

A. It's established, yes.

Q. And then down here, we have this -- sorry.

We have the overall evaluation. We discussed this before, Group 2A?

A. Group 2A.

Q. Then we have this part down here. It says:

"In making this overall evaluation, the working group noted that the mechanistic and other relevant data support the classification of glyphosate in Group 2A. In addition to limited evidence for the carcinogenicity of glyphosate in humans and sufficient evidence for carcinogenicity of glyphosate in experimental animals, there's strong evidence that glyphosate can operate through two key characteristics of known human carcinogens, and that these can be operative in humans."

I want to break that sentence down.

A. Uh-huh.

Q. They talk about these two key characteristics.

Do you remember that?

A. Yes.

Q. What are those?

A. The two key characteristics?

Q. Yes.

A. For glyphosate, it's genotoxicity and oxidative stress.

Q. And here is the part that I want to focus on: "And these can be operative in humans."

A. Right.

Q. What does that mean?

A. That just means that the genotoxicity and oxidative stress are both known mechanisms to lead to cancer in humans.

Q. And in the data for glyphosate, do we actually have data -- like, genotox of real people in real world exposures having real genotoxicity?

A. Yes.

Q. That leads me to the point that was brought up on cross-examination, the hazard and risk assessment.

Do you recall that?

A. Yes.

Q. And he put up a board and wrote some stuff on it?

A. Uh-huh.

Q. I want to make sure I fully understand this concept, okay?

Before you engage in a risk assessment, do you first have to do a hazard assessment?

A. Yes. A hazard assessment is the first step of a risk assessment.

Q. And so you first ask the question, does it cause cancer?

A. Right.

Q. And then if it does cause cancer, what is a risk assessment trying to determine?

A. After you've established the hazard, the risk assessment is trying to determine at what level -- at what level of exposure to that particular material would one be expected to get cancer.

They're trying to set limits of exposure they can define as being safe for humans.

Q. And if you don't conclude that it can cause cancer in the first place, do you ever get to that second set?

A. No. Not in my experience. You have to identify what the hazard is before you can do a risk assessment for that particular hazard.

Q. Counsel talked about the EPA, right?

Did the EPA ever conclude it could cause cancer?

A. Did the EPA conclude that glyphosate can cause cancer?

Q. Yeah.

A. They did at one time.

Q. Fair enough.

Currently, have they concluded --

A. Currently, they said it does not cause cancer.

Q. So if they didn't get to the first step, they never got to the risk assessment?

MR. ISMAIL: Objection, Your Honor. Leading.

Contrary to his prior testimony, in fact.

MR. WISNER: Let me reask the question.

THE COURT: Rephrase.

MR. WISNER: Sure.

BY MR. WISNER:

Q. If they didn't do a hazard assessment, could they have done a risk assessment?

A. It does not follow that they could have, no.

Q. Did EFSA ever say it could cause cancer?

A. No. Not that I'm aware of.

Q. So could they have gotten to the second question?

A. No.

Q. That applies to all these regulators that were shown to you a second ago.

Do you recall that?

A. Yes.

Q. Now, this distinction between risk and hazard, did IARC respond to this issue publicly?

A. Yes. Because of all the controversy and criticisms that IARC took over the evaluation of glyphosate, the director of IARC wrote a pretty extensive letter addressing all the issues that had been cast against the IARC for their review.

Q. Have you reviewed that letter?

A. Yes.

Q. Turn to your binder, Exhibit 2264.

Is that a copy of that letter?

A. Yes, it is.

Q. And this is a document you've considered?

Is this a document you've considered in rendering your opinions?

A. Yes.

MR. WISNER: Permission to publish, Your Honor?

MR. ISMAIL: Objection. Hearsay, Your Honor.

THE COURT: It is, actually.

Source material?

MR. WISNER: Sure. So I can't publish?

THE WITNESS: Right.

MR. WISNER: Then I won't publish.

BY MR. WISNER:

Q. Let's go through this a little bit, okay?

A. Okay.

Q. If you turn to page 9.

Do you see that?

A. Yes.

MR. WISNER: Your Honor, I want to clarify, I'm going to read passages and ask if he understands and can explain.

Is that okay?

THE COURT: That's okay.

BY MR. WISNER:

Q. So on page 9 -- is everything okay?

On page 9, the title is: "IARC Monographs Identify Cancer Hazards and Do Not Include a Risk Assessment."

Do you see that?

A. Yes.

Q. So Dr. Wild is actually responding to this criticism?

A. Yes.

Q. And it reads:

"The IARC Monograph has identified carcinogenic hazards, i.e., those agents having the potential to cause cancer under some circumstances. This has led some to downplay the relevance of hazard identification and to even suggest the exercise is without value."

MR. ISMAIL: Objection. Hearsay, Your Honor.

THE COURT: Step over to sidebar.

(Sidebar discussion not reported.)

(Recess taken at 4:06 p.m.)

(Proceedings resumed at 4:13 p.m.)

THE COURT: Let's wrap it up.

MR. WISNER: Yes, Your Honor.

BY MR. WISNER:

Q. We were talking a second ago about this letter from Dr. Wild.

Have you had a chance to take a look at it over the break?

A. Yes.

Q. I'm not going to read from it. I want to talk to you about some concepts that are in there, that I think apply to what happened earlier.

We have this concept of hazard, right?

A. Correct.

Q. And that's step one, right?

A. Correct.

Q. Step two is risk. Correct?

A. Correct.

Q. Now, in that letter, there's a discussion about how risk is extrapolated after a hazard is identified, right?

A. Correct.

Q. And that's a mathematical computation?

A. The determination of the risk is a mathematical determination, yes.

Q. But the question of whether or not it can cause hazard, is that a mathematical computation?

A. No. That's part of the hazard assessment.

Q. So, essentially, we're asking, can it cause cancer in step one?

A. Exactly.

Q. And then we're trying to answer, when does it cause cancer in step two?

MR. ISMAIL: Your Honor, this is all leading again.

THE COURT: Overruled.

Go ahead.

THE WITNESS: When or at what levels does it cause cancer?

BY MR. WISNER:

Q. So you're here to answer question one, right?

A. Correct.

Q. And question number two, that requires us to take a look at the plaintiffs in this case?

A. Yes. For the determination of risk -- I hope I'm not speaking out of turn.

But I think that's what the purpose of this trial is, if the risk was high enough for them to develop cancer.

Q. And you haven't done that analysis, right?

A. No, I have not.

Q. Well, that analysis would look at how much

were they spraying, for how long; that type of stuff, right?

A. Those types of things. The exposure is the essential part of determining the risk.

Q. I want to clarify this.

When IARC did a hazard assessment, or when you did a hazard assessment, you're helping us answer question one, right?

A. Correct.

Q. And obviously, hopefully, some other person is going to help answer question two?

A. Question two, exactly.

Q. Okay. There was some discussion about the data available to IARC as part of the Monograph.

Do you recall that?

A. Yes.

Q. And there was a discussion about the animal data.

Do you recall that?

A. Yes.

Q. And there was an issue about whether or not the EPA had access to, like, animal-level data, right?

A. Yes.

Q. You got a chance to look at the EPA report, right?

A. Yes, I have.

Q. This is Exhibit 3066.

This is a copy of that EPA report, right?

A. Yes.

Q. And if we go to the animal section, and we start looking at as it discussed various studies. Like, for example, Lankas.

Do you see that?

A. Yes.

Q. If you look at the citation, where does it take you to?

A. The citation? I'm sorry.

Q. Yeah. Right here, it talks about Lankas.

You see that, 1981?

A. Yeah.

Q. And it has a citation. What is that to?

A. To Greim, et al., 2015.

Q. So the EPA is looking at the same thing you're looking at?

A. Basically, yes. They relied -- in their risk assessment, they relied considerably on the Greim publication for getting their information.

Q. Now, I understand that there was a question about dosing and the levels of doses in animal studies compared to what a human might experience?

A. Uh-huh.

Q. I want to clarify something.

Is that a relevant or appropriate question to ask?

A. No. It's not really a relevant question. Because as I've indicated before, the purpose of the animal studies is to determine, if exposed at the highest level they can tolerate for their life without showing overt signs of toxicity, do the animals get cancer?

To answer the question: Under the most extreme circumstances that we can give to these animals, does the chemical cause cancer in those animals? Yes or no?

You do the study, you analyze the tissues, you determine tumor incidence and answer the question: Given the maximum tolerated dose, given the most they can tolerate, does it cause cancer in these animals?

If the answer is yes, then it's identified as an animal carcinogenic; and then it is biologically plausible that this material can also cause cancer in humans.

So epidemiology studies, if they haven't been done, they should be conducted.

Q. If you were to do an animal study using

human-level dose exposures, how many animals would you need to be able to see anything?

A. Oh, to do it at human exposure levels? Oh, you'd probably need several orders of magnitude more animals than the 65 per sex, per species, per dose.

Q. Why would you need so many more animals --

A. Because at those low dose levels, the probability of detecting the cancer is very low. So you would need a large population, if you will, to be able to find an effect.

Q. And up here, we have the Lankas study.

Do you see that?

A. Yes.

MR. WISNER: Permission to get the board, Your Honor?

THE COURT: Yes.

BY MR. WISNER:

Q. This is the tumor board we made with Dr. Portier --

A. Okay.

Q. -- yesterday or the day before.

And Lankas 1981. Do you see that?

A. Correct.

Q. That's that same study there, 1981?

A. 1981.

Q. Now, Monsanto is pointing to some of the high doses of some of these studies to suggest that they're very high.

A. Right.

Q. They pointed to the Knezevich and Hogan one, which has 30,000 or whatever.

A. Right.

Q. What is the dosing in Lankas?

A. The highest dose tested was 31 milligrams per kilogram per day, is what this is saying.

Q. They were talking about 4,000.

So this is orders of magnitude smaller?

A. Right.

Q. So it's closer to what you would expect to see at human doses?

A. It is, yes.

Q. And notwithstanding that, there's still tumors in the animals?

A. Yes, sir.

Q. So what is the significance of seeing, even at lower doses, these rodents who were exposed to glyphosate still getting tumors?

A. Even at low doses, the material seems to be causing cancer in these animals. But you still can't say -- can't equate it to a human dose, because the

human dose is probably still much lower than that.

And it's not the purpose of the study. The purpose of the study is to determine if the material can cause cancer in the animals. And the Lankas study indicates that the -- even at these relatively lower doses compared to some of the other studies, you still get tumors caused by the glyphosate.

Q. And then when we get to the epi, what kind of dosing levels there?

A. Those are real world exposure levels. You're recruiting people to participate in the study that is using the material, the Roundup, in their everyday working situation; they're spraying it in their fields, they're using it in their landscaping, that type of thing.

Those are the case -- the cohort and case-control study people you're identifying that actually use the material in real world situations. So therefore, it's at real world doses to see if that was the cause of their non-Hodgkin's lymphoma.

Q. And in the epidemiology from the case-control studies, they're drawing from millions of people, right?

A. Oh, yes. Yeah.

Q. And in the cohorts, they're dealing with hundreds of thousands of people?

A. Yes.

Q. And because you have so many, you're actually able to see the cancer at real world exposures?

A. Right.

Q. Finally, there was a discussion about this technical report.

Do you remember that from the NTP?

A. Yes, sir. On glyphosate?

Q. Yeah.

A. Yes.

Q. And it did some genotox studies in this one type of mouse?

A. Right. The 63F1 mouse. It was negative.

Q. That's one study?

A. Right.

Q. How many studies, overall, have there been on genotox?

A. Oh, for glyphosate?

Q. Yeah.

A. Oh, geez. Hundreds, probably. Hundreds.

Q. And this jury got the chance to see the data in humans.

A. Right. And that's very important to emphasize, that a lot of the genotox data available on glyphosate is in humans.

The most relevant test cells or test agents you can use in trying to establish a cause and effect is the exposure of the glyphosate to human cancer. If you do it in human cells, it's very significant.

Q. And in all of those various human cells that have been examined by researchers around the world, is it overwhelmingly positive or negative?

A. It's pretty much all positive, yeah. It's pretty amazing how strong it seems to be in effect.

Q. And on the first question that you've been here to testify on, sir, do you have any doubt whatsoever about whether or not Roundup can cause non-Hodgkin's lymphoma?

A. No. Based on my evaluation of all of the relevant data, the epidemiology data, the animal data, the mechanistic data, to a reasonable degree of scientific certainty, exposure to Roundup causes non-Hodgkin's lymphoma in humans.

MR. WISNER: Thank you, sir. No further questions.

MR. ISMAIL: May I have three minutes, Your Honor, for cross?

THE COURT: Yes.

MR. ISMAIL: Thank you.

///

RECROSS-EXAMINATION

BY MR. ISMAIL:

Q. Dr. Jameson, in terms of the epidemiology, when you told the jury this morning that, since IARC, the epidemiology has all been positive, you were excluding in your testimony the Agricultural Health Study publication in 2018 and the National Cancer Institute journal, correct?

Because that's not been positive.

A. Well, I guess maybe I was -- I kind of misspoke.

What I was considering in that answer was the fact that the 2018 Agricultural Health Study has been included in the more recent meta-analyses. And when it's included in the meta-analyses, you get a positive response from the medical -- from the meta-analysis of all the data, which includes the 2018.

Q. Right. So that study doesn't show an increased risk, the Agricultural Health Study, right?

A. That's what they report. Now, I have a problem with the Agricultural Health Study because of its design. I think it's -- basically, I think it's a flawed study.

Q. And we went through the authors who you respect and the journals that you respect --

A. Right. But I still feel the design of the study is flawed.

THE COURT: Can you just wait until --

THE WITNESS: I'm sorry.

THE COURT: The reporter can't take down two voices at once --

THE WITNESS: I'm sorry, I'm sorry.

THE COURT: We're almost done.

BY MR. ISMAIL:

Q. This is the Leon paper. And Mr. Wisner went through, this is a meta-analysis, how big it was and how that increases the reliability of the data, and lots of different cohort studies combined, right?

You remember that in the redirect just now?

A. Yes.

Q. So this is data that's come out since IARC, right?

A. Yes.

Q. And we have hazard ratio, correct?

A. Yes.

Q. And I'm showing you in this large meta-analysis, the reliability of which you vouched for on redirect, can you confirm for the jury that there's no increased risk for non-Hodgkin's lymphoma overall with glyphosate exposure?

A. That's what these numbers are saying, yes.

Q. And then with respect to the other meta-analysis you talked about, the Zhang paper, you know, sir, that that analysis did not incorporate all the Agricultural Health Study data to record the relative risk that you talked about on redirect, true?

A. I believe it used just the high exposures in that; so therefore, I see that as a valid thing to just include the high doses in there.

Q. So, yes or no, did the meta-analysis in Zhang include all the data from the Agricultural Health Study?

A. No. It just included all the high dose levels.

Q. And the one thing you point out on redirect with Mr. Wisner is this result over here: 1.36.

This is that meta-analysis result for a particular subtype, right?

A. For the B-cell, correct.

Q. And you can't tell from your own review and recollection that there's any other study that replicates this finding, correct?

A. None comes to mind right now. I might be able to find one, but none comes to mind right now.

Q. And it touches 1 as the lower bound of the confidence interval, correct?

A. Right. But that's the definition of being statistically significant, if it includes 1.

Q. If it just touches it, right?

And the overall risk, you can confirm for the jury, is below a relative risk of 2, even for the data that you are pointing to from this study.

Isn't that correct?

A. What it is showing is a 36 percent increase in the risk for B-cell lymphoma.

Q. So the answer to my question is what, sir?

A. That it shows a 36 percent increase.

Q. Do you remember my question?

The question was: Can you confirm for the jury that the relative risk in this particular subset of the data, that you went over on redirect with Mr. Wisner, is below a relative risk of 2?

Yes or no?

A. No. I mean, this is what the paper says: 1.36, the 36 percent increase.

Q. Thank you, Doctor.

A. So it is below 2.

Q. That's what I was asking. Thank you very much.

THE COURT: I think we're all done.

THE WITNESS: Thank you, Your Honor, for

letting me testify in your court today.

MR. WISNER: Your Honor. I just want to read this request for admission that came up during his direct.

Do you recall?

THE COURT: I do.

MR. WISNER: They don't object.

THE COURT: Okay. I'm trying to recall exactly what we're talking about.

MR. WISNER: It was about whether or not Monsanto had done another study.

THE COURT: All right. Go ahead.

MR. WISNER: Dr. Jameson, you can step down. You're free.

THE WITNESS: That's a wonderful thing.

(Witness excused.)

THE COURT: I think I should explain this. It's 4:30, and I need to explain what that means.

That is, in fact, evidence, and maybe that's --

MR. WISNER: Can I just do admission, and we can be done with it? We can do it later.

THE COURT: First of all, go ahead and step down.

MR. ISMAIL: We'll clean up, Doctor.

THE WITNESS: I'm just trying to get my junk.

THE COURT: Ladies and gentlemen, Mr. Wisner is going to read a response from discovery which is evidence. Just like the deposition that was referenced yesterday, what qualifies as evidence, this qualifies as evidence. He's going to read it to you.

MR. WISNER: Thank you, Your Honor.

It's Request for Admission Number 4:

"Admit that Monsanto has conducted no animal carcinogenicity studies on glyphosate since 1991."

Response:

"Monsanto admits that after reasonable inquiry into the information that is known or readily obtainable, it has not identified any 12-month or longer animal chronic toxicity studies that it has conducted on glyphosate since 1991."

Thank you.

THE COURT: So ladies and gentlemen, we're done for the week. It's Thursday. We'll be back on Monday at 9:00. And I want to thank you for your time and attention this week.

And I want to reemphasize even more so, since this is the weekend, that it's really important not to talk about anything that you've heard in the case so far. We're into it, but just barely.

So when you talk about things that you are hearing, you're sort of making decisions in your mind, that's why it's important not to talk about it.

And you may not even realize it, but you do it anyway. So it's really critical that when you walk out the door, that you leave all of this behind and not do any research, not have any conversations, and just enjoy yourself this weekend and come back ready to roll Monday morning at 9:00.

Thank you for your time and attention so far. You are excused until Monday. Thank you.

(Short discussion off the record.)

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

THE COURT: So I would suggest that you figure out what things you want to cover, that we can cover in a couple hours. I know there were some issues regarding the deposition. So those page and line.

And I think we need to talk through some of these documents. Some of this issue we're having with the documents; and that is to say, what we talked about earlier, the meeting and conferring on documents that we will have some issue with before we get into it. I don't know whether that's happening or not. Maybe we should talk a little more about how that's going to go.

So just think about it.

MR. WISNER: I'm going home. I haven't been home in a couple months.

THE COURT: So when are you going home?

MR. WISNER: Tonight. Can I call in to the hearing tomorrow at 2:15?

THE COURT: So you won't be here?

MR. WISNER: I won't. But I'll have people ready to argue the issues on the EPA documents, if I could appear by phone.

THE COURT: Sure.

MR. WISNER: Thank you.

THE COURT: I guess you'll have to set up a CourtCall, because I don't think I have conferencing ability on this phone.

MR. WISNER: I'll set it up.

THE COURT: All right.

MR. BROWN: And I set up a medical appointment for tomorrow afternoon. But I trust my colleagues implicitly, so I will be doing that.

THE COURT: They're not going home.

MR. BROWN: I'm not going home either.

Also, Your Honor, today was the first time -- we've only had two witnesses, and we've had some rulings on some motions in limine and this witness got into GMOs

and all that.

It's important to remember that those witnesses should be talked to before they hit the stand and told what the parameters of the MILs are. Because we're certainly doing that with our witnesses, and I think it's important.

THE COURT: True. There should be some incidental mention of that, and I know that. I'm certainly not going to pipe up.

But to the extent that the subject matter shouldn't be GMOs. And to the extent we sort of started going down that path today, it should not.

That Monsanto manufactures GMOs or that it will incidentally be mentioned, it will happen from time to time. I know that.

So I want to be clear: GMOs are going to come up in conversation about what Monsanto either produces or how it affects -- a little bit. But I don't want the subject matter to be production of or how anybody feels about GMOs.

MR. MILLER: Very, very minimally. Only in the context of, they sprayed more Roundup after GMOs came out. That's it. Because that affects the results of the epi study. But no one is going to talk about commercial or scientific --

THE COURT: I know. But if they're going down the -- you know, more resistant, then that's kind of what --

MR. MILLER: Not going there. Not going there.

MR. WISNER: I think Dr. Jameson didn't realize --

MR. EVANS: The increased use of glyphosate, we certainly don't disagree with that. But I don't understand why it needs to be tied to GMOs.

THE COURT: And it doesn't.

MR. WISNER: I think he wasn't thinking --

MR. EVANS: But Mr. Miller just said that.

THE COURT: It doesn't. Particularly because of the MIL, I would prefer that we stay away from it.

MR. MILLER: Sure, Your Honor. I understand.

THE COURT: I'm not going to ask that no one say the word GMO, because I know it's not possible not to actually say the word in connection with some things that are going to come up.

But I do take Mr. Brown's suggestion seriously. And every witness should be told what topics are off limits and what topics are accepted.

MR. MILLER: We agree, Your Honor. We will.

MR. BROWN: And I wasn't just referring to

GMOs. There are other issues that were covered on the MILs.

THE COURT: I know.

MR. BROWN: I just want to make sure that those things are covered with the witnesses before they get on the stand. That's all.

THE COURT: I'm sure everyone is going to do that with their witnesses.

MR. MILLER: Absolutely.

Monday's witness will be Dr. Ritz, an epidemiologist. And I anticipate that will go the entire day.

MR. WISNER: And Tuesday will be Dr. Weisenberger. And we're hoping to be done by Tuesday, but if he has to stay through Wednesday morning, he's available. And then Wednesday afternoon, we believe Dr. O'Shanick will be here.

So we're disclosing our witnesses far ahead in advance, and I think maybe the last witness next week will be Sawyer. That's not confirmed yet.

MR. EVANS: Then you're resting?

MR. WISNER: No.

THE COURT: Okay.

MR. ISMAIL: Your Honor, on the Sargon rulings, I know they're still tentative.

THE COURT: I thought I --

MR. ISMAIL: For example, for this witness, we had -- at the hearing, we raised the question of epidemiology subject of the last witness. Dr. Jameson was excluded from that in the MIL.

We asked at the Sargon hearing for Your Honor to consider that in the final order.

THE COURT: I -- that -- I thought I filed an order which would have been very much, if not the exact same order, that I would have filed it.

In fact, I thought I did. I'm pretty sure I signed it.

Chris, would you take a look and see.

MR. ISMAIL: Just for the preservation of the record purposes.

THE COURT: I just thought I had.

MR. ISMAIL: I know there's a final MIL ruling. I had not seen --

THE COURT: And before Monday, I'm going to try to get the other rulings that we discussed finalized and filed so that they're filed.

But the Sargon ruling is -- I know there were a couple of modifications, but I didn't change the tentatives, I don't think, on any of the initial rulings.

So with respect to Dr. Jameson, did I --

MR. WISNER: You did not exclude him.

MR. ISMAIL: And I was operating on that assumption, given the Court's comments. I just would like it -- that I wasn't waiving our objection to qualifications since we had that change today. And I hadn't seen the final. If it's in the record, it's my mistake.

THE COURT: I'll check right now. Because I know I signed something. So whether it got off my desk and actually filed, I don't know. But I thought for sure I had done that. I'll double-check.

THE CLERK: March 18th, it was filed. Let me see if I can print it. The order on Sargon motions and motion for summary judgment.

THE COURT: Yeah, I did file it. Yeah.

MR. ISMAIL: Then I'm three weeks behind.

THE COURT: I know I'm a little behind.

MR. MILLER: You're fine, Your Honor.

THE COURT: Well, listen. Thank you.

I'll see everybody tomorrow.

(Proceedings adjourned at 4:42 p.m.)

State of California)
)
County of Alameda)

We, Kelly L. Shainline and Lori Stokes, Court Reporters at the Superior Court of California, County of Alameda, do hereby certify:

That we were present at the time of the above proceedings;

That we took down in machine shorthand notes all proceedings had and testimony given;

That we 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 we are not a party to the action or related to a party or counsel;

That we have no financial or other interest in the outcome of the action.

Dated: April 4, 2019

Kelly L. Shainline
CSR No. 13476, CRR

Lori Stokes
CSR No. 12732, RPR