SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SAN FRANCISCO

DEWAYNE JOHNSON,

Plaintiff,

vs. Case No. CGC-16-550128

MONSANTO COMPANY, et al.,

Defendants.

_____/

Proceedings held on Monday, July 16, 2018, Volume 10, Afternoon Session, before the Honorable Suzanne R. Bolanos, at 1:21 p.m.

REPORTED BY:

LESLIE ROCKWOOD ROSAS, RPR, CSR 3462

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Pages 2280 - 2422

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EXHIBITS ADMITTED

(None.)

Monday, July 16, 2018

1:21 p.m.

Volume 10

Afternoon Session

San Francisco, California

Department 504

Judge Suzanne Ramos Bolanos

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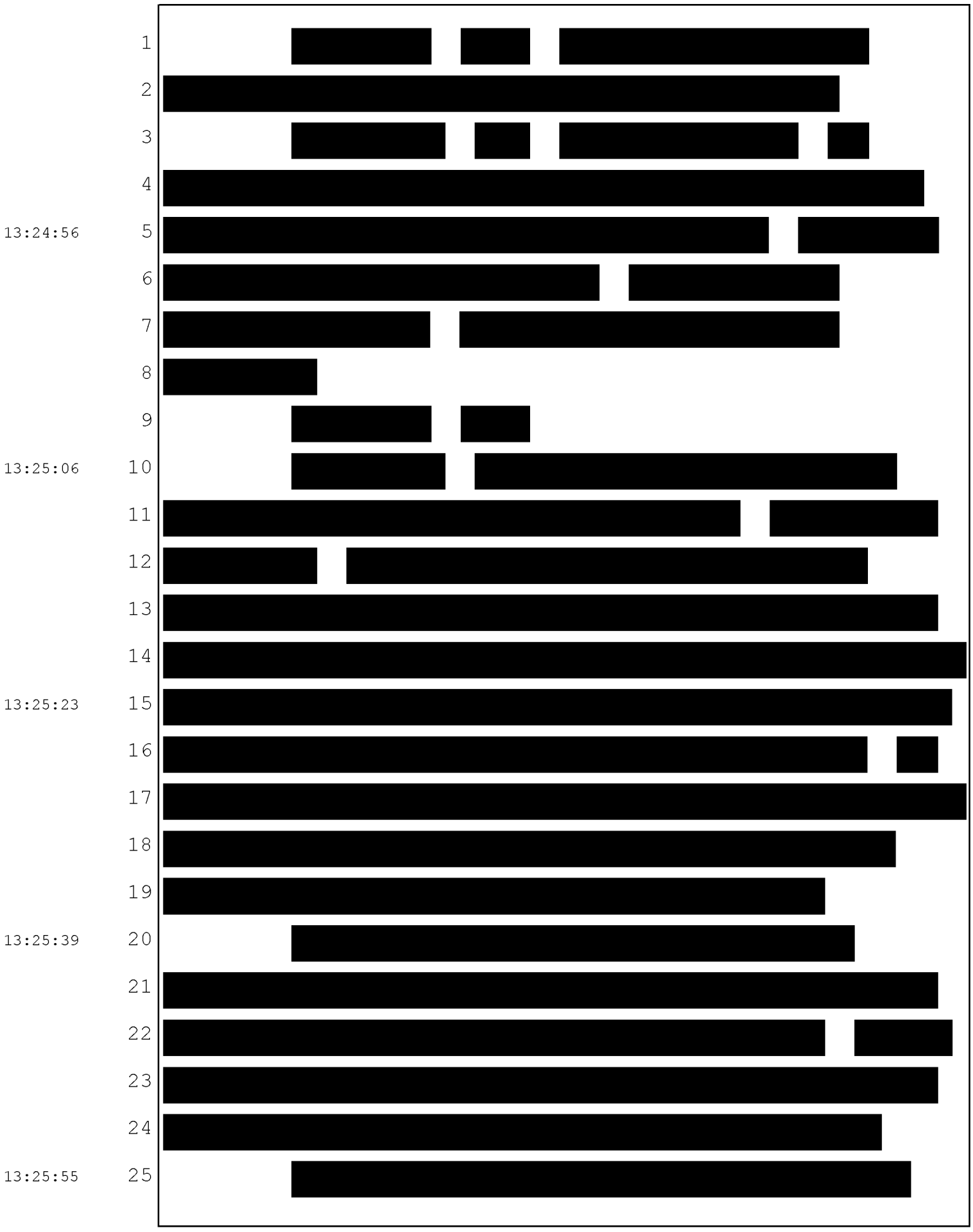
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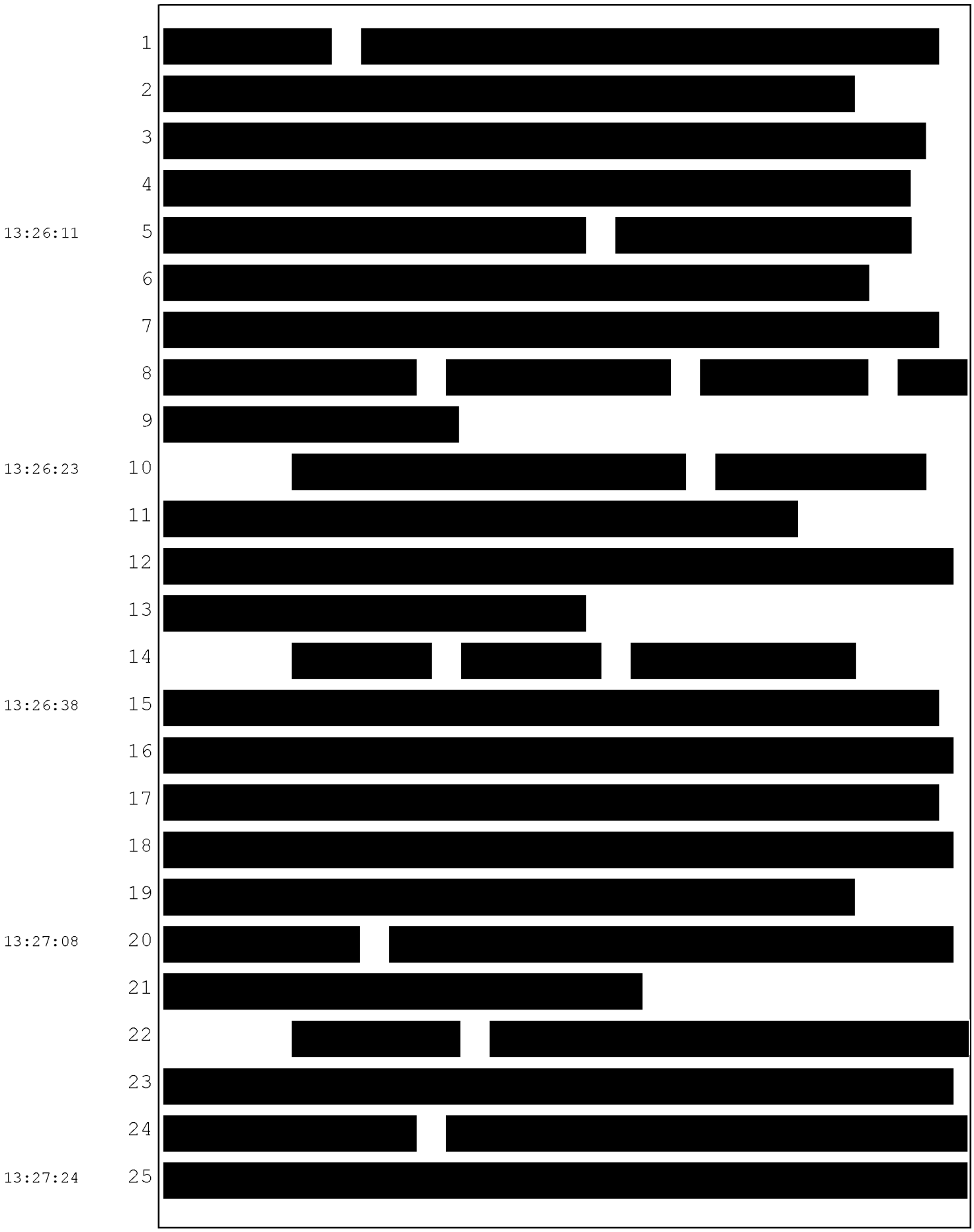
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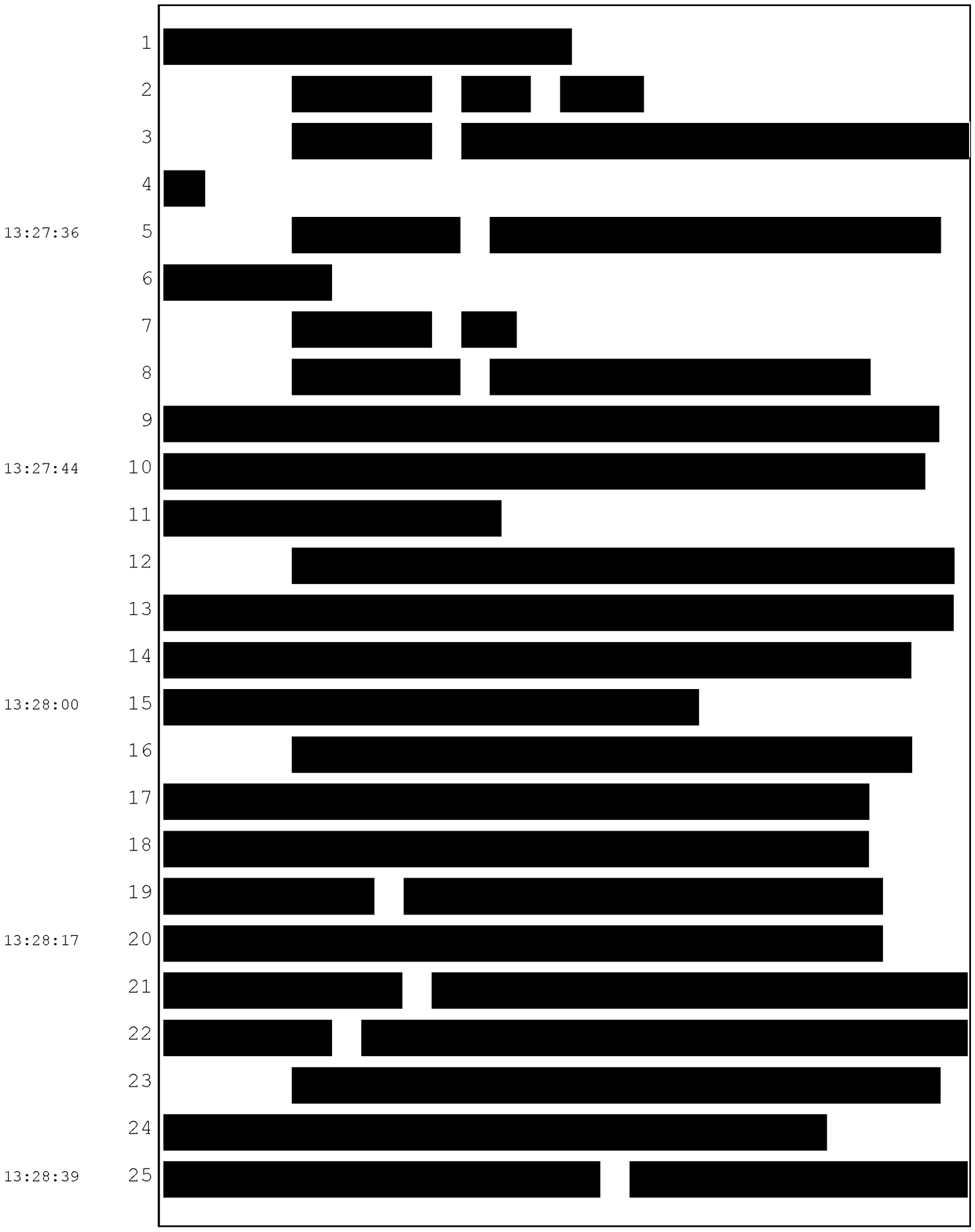
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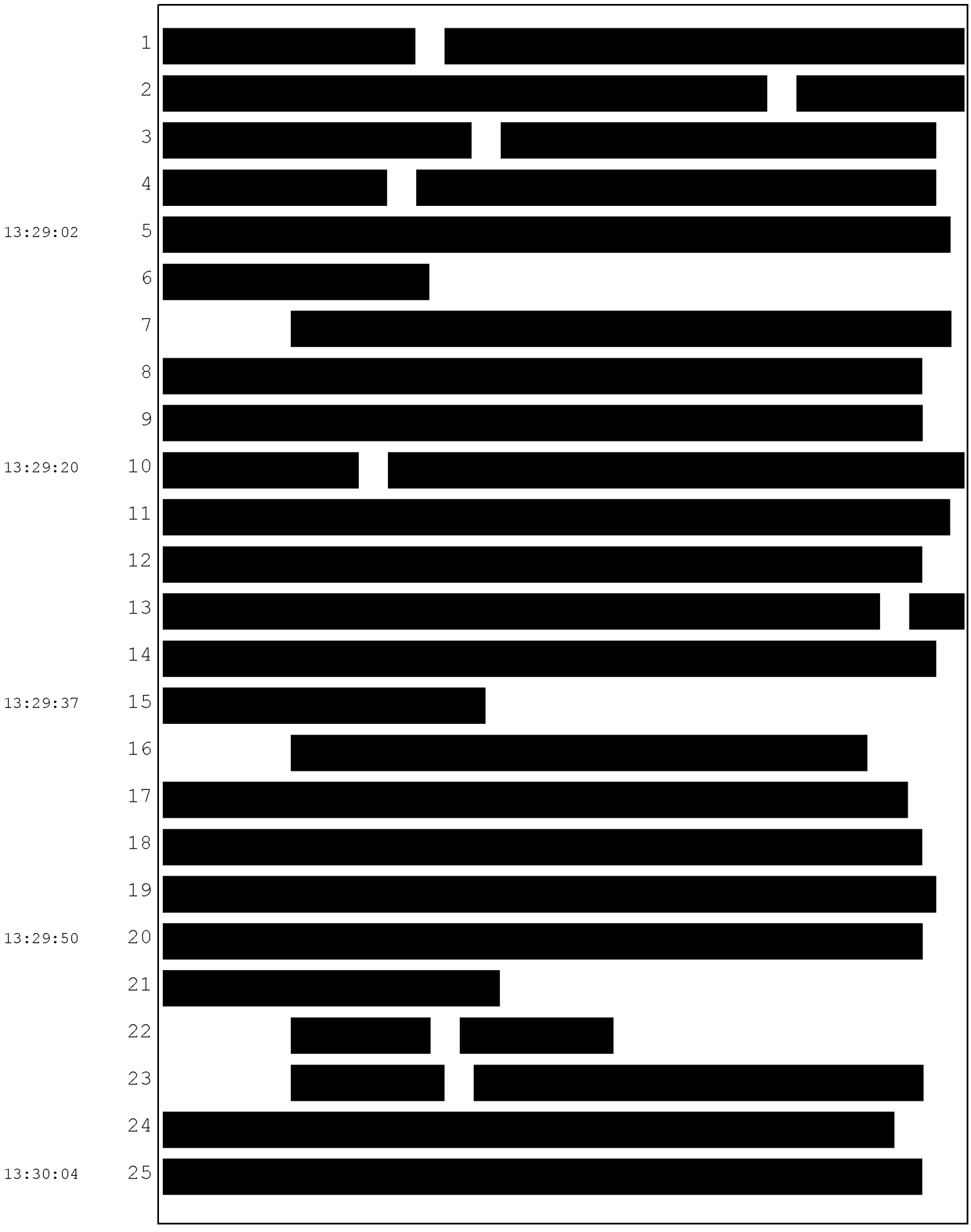
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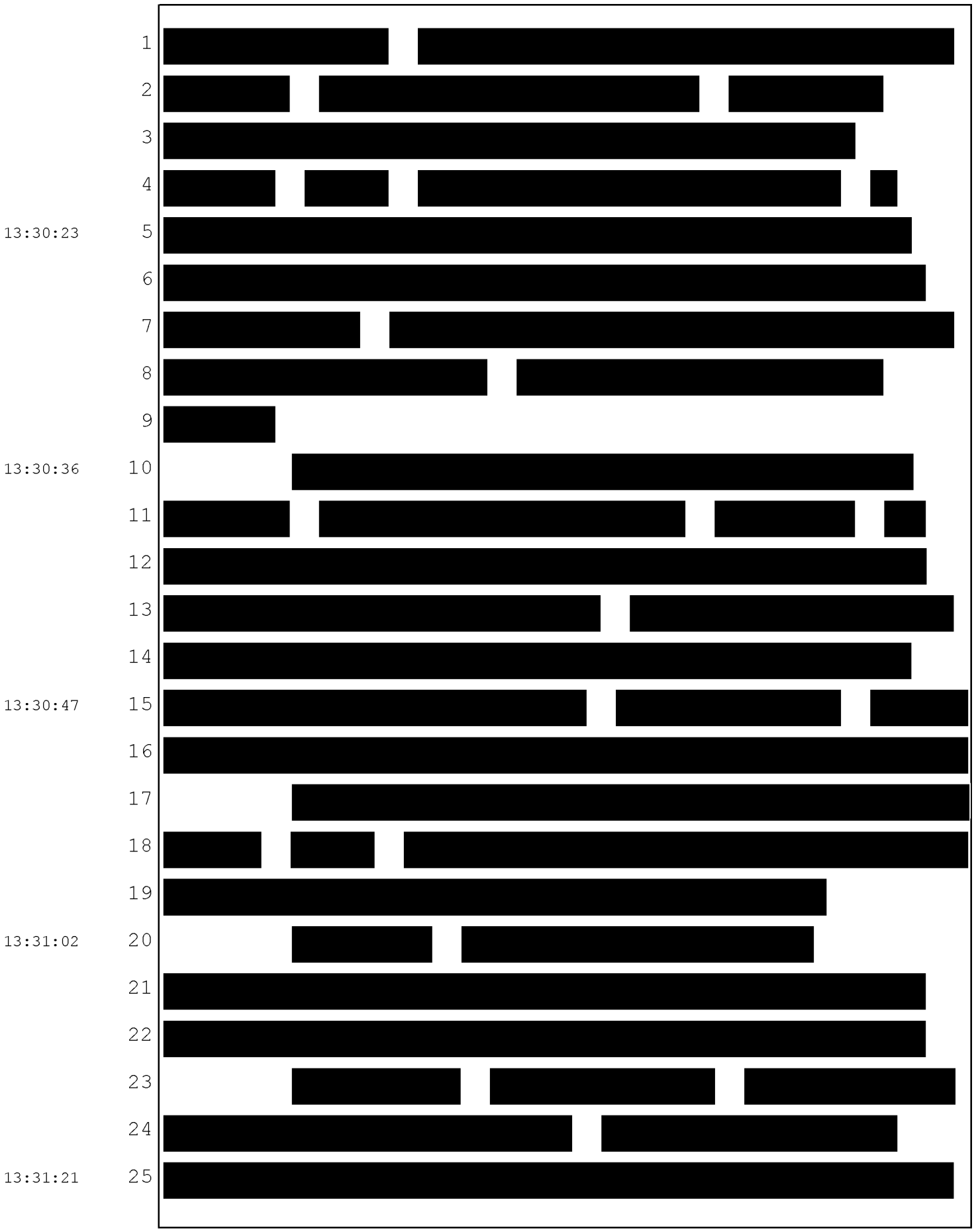
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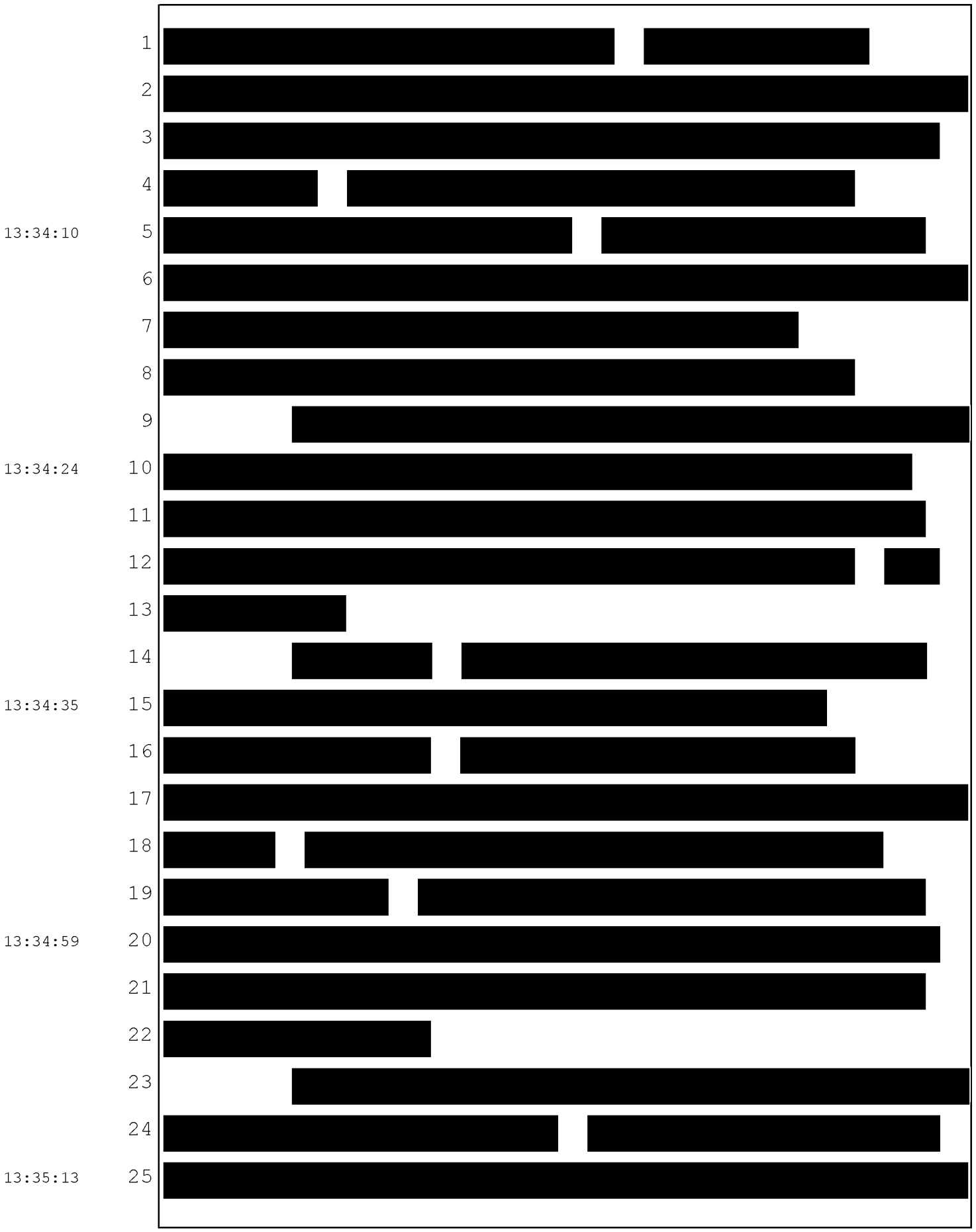
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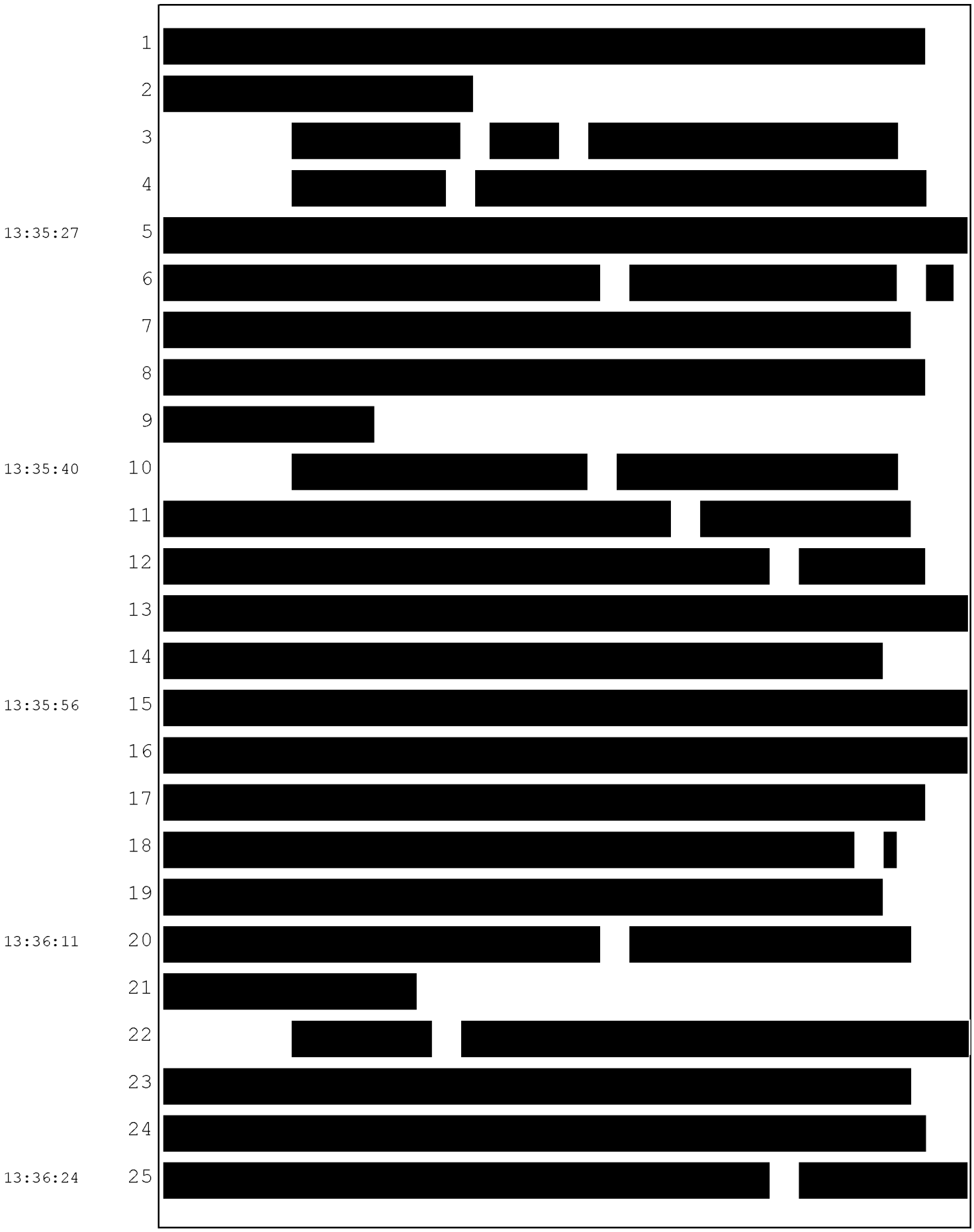
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[redacted]

(Jury enters courtroom.)

THE COURT: Good afternoon, Dr. Portier. You may return to the witness stand.

Welcome back, Ladies and Gentlemen.

Dr. Portier remains under oath, and, Mr. Griffis, you may proceed.

MR. GRIFFIS: Thank you, your Honor.

CROSS-EXAMINATION (Continued)

BY MR. GRIFFIS:

Q. Good afternoon, sir.

A. Good afternoon.

13:38:52 MR. GRIFFIS: Could we briefly have back up the slide that was on when we adjourned.

Q. So we've been through the tables in the 2016 OPP report on this, and I just -- before we move on, I just want to call your attention to the header, which is

13:39:10 "Glyphosate Studies Considered By EPA," because we're about to look at something slightly different from that.

So take a look, again, at the Exhibit 2481. I believe that's in Regulatory Binder 2. That will, again, be the OPP 2016 report.

13:39:34 A. Okay.

Q. All right. And we looked at Tables 5.1 and 5.7. I now want to go to Tables F.1 and subsequent, which starts at page 214.

A. Okay.

13:40:08 Q. All right. So Table F1, starting on page 214, is an *in vitro* -- a series of -- again, it's a table of studies reviewed by EPA.

MR. GRIFFIS: You can take that down for the moment, Armando. Thank you.

13:40:25 Q. In the category *in vitro* tests for gene

mutations in bacteria glyphosate formulations; correct?

A. That's what it says.

Q. So glyphosate formulations would be the glyphosate and the surfactant and the other ingredients; right?

13:40:46

A. Correct.

Q. Okay. And there are a bunch of studies mentioned there. We're starting on 214. We go through page 218 in the category *in vitro* tests for gene mutations and bacteria; correct?

13:41:01

A. Correct.

Q. All right. And then table F2, *in vitro* tests for chromosome damage in mammalian cells, and that's again glyphosate formulations; correct?

13:41:15

A. Correct.

Q. F3. We're now on page 220. *In vivo*, living animals, tests for chromosomal aberrations in mammals, glyphosate formulations; correct?

A. Correct.

13:41:29

Q. Table F4 on page 221. *In vivo* tests for micronuclei induction in mammals, glyphosate formulations; correct?

A. Correct.

Q. That runs through 224. And then on table F5 on page 225, other assays for detecting DNA damage,

13:41:48

glyphosate formulations; correct?

A. Correct.

Q. Okay. Now turn in your blue binder to tab 3182. Sorry. Are you there?

13:42:13 A. Yes, I am.

Q. We have another chart much like the previous chart, but this one is labeled "Formulated Product Studies Considered by EPA." Correct?

A. That's what it's labeled, yes.

13:42:27 Q. And then we have the categories I just discussed starting with *in vivo* tests for gene mutation bacteria, from table F1, and running through other assays for detecting DNA damage?

A. Correct.

13:42:39 Q. Which corresponds to F5?

MR. GRIFFIS: I ask for permission to publish this table, your Honor.

THE COURT: Any objections?

MR. WISNER: With the same proviso of accuracy.

13:42:49 MR. GRIFFIS: Oh, yes.

Q. And again, you're not vouching for this one any more than you vouched for the last one; right, sir?

A. Correct.

Q. Okay. So let's go back to the first row, the

13:43:06 blue row. This is *in vitro* test for gene mutation in

bacteria, corresponding to table F1. And F1 again starts on 214.

A. So if I might point out, the title of this is wrong, just to be clear. These are *in vitro* tests for gene reverse mutations in bacteria, and it actually does matter.

Q. Okay. EPA got it wrong in its label, too; right?

A. Yes, correct.

Q. Okay. Please explain the difference between gene mutations and gene reverse mutation, given this kind of test.

A. A gene mutation is when you change a normal gene into something else. Here there's -- there's a gene which is stopping growth. It's a single gene, and when the DNA damage comes in, it's known that the repair machinery in that cell will reverse that mutation. It will take it out and clean it off, and the cell will then go back into replicating and build the colonies. And so it's a reverse mutation.

Q. And this is the special test assay you've described to the jury before.

A. Correct.

Q. There's a custom modified cell with a gene in it that keeps it from doing what it would normally do, grow,

and this is a test of whether a substance knocks that gene out, causing it to grow. And that's a nice elegant test because if it does, you can see it. It starts growing, you can look at your petri dishes; right?

13:44:46 A. It's cheap, it's fast, and it's easy to quantify.

Q. So column 1 or row 1, the *in vitro* test for gene reverse mutation in bacteria corresponding to table F1, those are all negative as reported by EPA, except for

13:45:07 one, which is reported as partially negative, partially equivocal; correct?

A. That is correct.

Q. Table F -- or sorry, row F2, *in vitro* tests for chromosome damage in mammals. That's the red one.

13:45:24 That's just two. One is reported as negative and one is reported as positive; correct?

A. That's what it says in the table.

Q. Table F3, the orange -- or sorry, the orange row corresponding the tables F3 and F4, we have a positive,

13:45:48 negative, positive in F3; correct?

A. Correct. That's the *in vitro* test for chromosome aberrations in males.

Q. *In vivo*; right? And then for micronuclei induction, we have a positive and then a long string of

13:46:06 negatives; correct?

A. There's a footnote on one of them I don't -- I can't seem to locate, but yes, they're all listed as negative.

Q. Okay. And then the last row, the purple, other
13:46:30 assays for detecting DNA damage, we have one, two, three, four, five, six. And those are all reported as positive one way or another. One of them says induced DNA migration at greater than 22 MG. I assume that's positive in some fashion; correct?

13:47:01 A. Excuse me. I count eight, and probably that they are intending that to mean positive.

Q. Okay. And several are sister chromatinic changes, the same kind of tests we discussed last time?

A. Three of the eight.

13:47:21 Q. Okay, sir. And again, I take it that you would not know without getting out the IARC Monograph and comparing item by item which of these IARC did not consider; is that fair?

A. That's -- that's probably true. I think
13:47:39 everything here that's labeled with a name and a number that is in the public's literature, IARC will have covered. But some of these in this last section for sure. But in some of these early ones that are coming from regulatory studies, I doubt if they would have
13:47:57 looked at it.

Q. All right.

MR. GRIFFIS: Take the slide down, please.

Q. Now EPA also looked at some of the human studies on the issue of mechanism that you relied on for your opinion that glyphosate is genotoxic, like the Bolognesi and Paz-y-Miño studies, and those are the ones that involved aerial spraying of glyphosate formulations in Ecuador; correct?

A. Correct. EPA looked at those.

Q. All right. And EPA classified them of being of poor design and unworthy of further analysis; correct?

A. Again, we'd have to look at the wording they used.

Q. Okay. Do you remember that?

A. I remember they didn't think highly of the studies.

Q. You think more highly of them than EPA does; is that fair?

A. I think they contribute to the information. I definitely would not exclude them.

Q. I'm sorry?

A. I definitely would not exclude them.

Q. Okay.

A. If the language you just used for EPA is correct, then they were basically excluding it from any

further evaluation.

Q. When you say you wouldn't exclude them, the EPA did exclude them. What -- how much -- what words would you use to describe how much weight they deserve?

13:49:19 A. The Bolognesi deserves significant weight. The Paz-y-Miño's probably less because they're more what's called an ecological study where you have two communities that are different from each other and you're attributing the difference to the spraying, whereas there could be

13:49:35 other things, versus the Bolognesi, where each person is their own control. And so you test before and test after. That warrants much more weight.

Q. Okay. Would you turn to page 2099. I think this is in your blue binder, the Bolognesi study.

13:49:57 A. You mean tab 2099.

Q. Tab 2099. Apparently I'm wrong about that. The -- I'm sorry, sir, not the blue binder. It's in the binder that's labelled "Trial Cost Number 2."

A. And what was that number again?

13:50:24 Q. 2099.

A. Okay.

Q. And that's the Bolognesi study; correct?

A. That is the Bolognesi study.

MR. GRIFFIS: Okay. Ask permission to publish

13:50:48 the Bolognesi study on the screen, your Honor.

MR. WISNER: No objection.

THE COURT: All right. Very well. You may proceed.

Q. BY MR. GRIFFIS: So let's go first to -- well, first of all, we're going to see a term, an abbreviation BNMN. What is BNMN in this study?

A. Bi-nuclei, micronuclei.

Q. That's what they were looking for, the endpoint they were looking at?

A. They looked at several endpoints, but that's the one they presented in greater detail.

Q. Okay. Let's go to page 995, the last page of text in the study.

A. Okay.

Q. That would two more pages, please. 995. That's it.

And first I'd like to start in the left-hand column. If we could blow this up because it's real small, just highlighting isn't going to work.

Evidence indicates. Thank you.

Dr. Bolognesi wrote: "Evidence indicates that the genotoxic risk potentially associated with exposure to glyphosate in the areas where the herbicide is applied for eradication of cocoa and poppy is of low biological relevance."

Correct?

A. Hold on for a second, please, while I read it.

That's what it says, yes.

Q. Over on the next column, the right-hand column, based on.

"Based on the applicable Bradford-Hill guidelines." These are the guidelines that you used right at the end of your direct examination; correct?

A. Yes.

Q. It's a fairly standard set of criteria to organize causation conclusions; right?

A. Correct.

Q. Okay. "Based on the applicable Bradford-Hill guidelines, it is not possible to assign causality to the increases in frequency of BNMN observed in our study."

Right?

A. That's what it says.

Q. And then in the last paragraph, starting "the smaller number of subjects." Well, they say first further studies are needed. Then the smaller number of subjects recruited in this study and the small amount of information about the exposure precluded any conclusions; right?

A. That's what it says.

Q. On page 994, the previous page, in the

right-hand column -- and I'm on the second paragraph from the end, first sentence. That's it.

There was no significant association between self-reported direct contact with the eradication sprays and frequency of BNMN; correct?

13:54:04

A. That's what it says.

Q. Okay. Now with regard to the Paz-y-Miño study, there were two, one in 2007 and one in 2011; correct?

A. Correct.

13:54:30

Q. Let's find them in your binder. It's going to be the same binder. 2883 for the 2007 one. 2882 for the 2011 one. Can you just identify that I got that right?

A. 288 --

Q. 2883. I don't have them in order. 2883 is the 2007, and then 2882 is the 2011.

13:54:55

A. Yeah, that appears to be the case.

Q. Okay. So let's go to 2883, the first study the 2007 one.

MR. GRIFFIS: And permission to publish this to the jury, your Honor.

13:55:11

THE COURT: Any objection?

MR. WISNER: No objection, your Honor.

THE COURT: All right. Very well. You may proceed.

13:55:18

Q. BY MR. GRIFFIS: Go to page 459 so we can look

at their last paragraph's conclusion.

A. Okay.

Q. And the last paragraph before they get to the acknowledgements says: "Our findings suggest the existence of a genotoxicity risk for glyphosate exposure in the formulation used during the aerial spraying and indicate the need for further studies on individuals exposed to glyphosate to determine its possible influence on genetic material."

13:55:34 13:55:49

Correct?

A. That is what it says.

Q. And they went on and did a larger study, which is the Paz-y-Miño 2011 study; correct?

A. It's slightly bigger, yes.

13:56:03

Q. Okay. 2882 is that study.

MR. GRIFFIS: Permission to publish it.

THE COURT: Any objection?

MR. WISNER: No objection.

THE COURT: Very well.

13:56:09

Q. BY MR. GRIFFIS: In the abstract, I'd like to just focus on the "in conclusion" sentence at the end. Well, two sentences.

"In conclusion, the study population did not present significant chromosomal and DNA alterations. The most important social impact was fear. We recommend

13:56:27

future prospective studies to assess the communities."

Correct?

A. That's what it says.

Q. On the subject of fear, of course, what we're talking about is military planes suddenly appearing and spraying people's villages and fields as part of a cocoa eradication project; right?

MR. WISNER: Objection. Speculation.

THE COURT: Overruled. He may answer, if he knows.

THE WITNESS: I would just be speculating. I have no idea.

Q. BY MR. GRIFFIS: Okay, sir.

A. It's not explained in here.

I will point out this study looked at DNA damage much later after the spraying than did the other study, which makes this study of less value because the DNA damage will disappear over time.

Q. On page 50, sir, left-hand column, very last line.

A. I'm there.

Q. And we're going to have to just do a little graphics move to get up to the top of the next column.

"Regarding our study, we have obtained results showing no chromosomal alterations in the analyzed

individuals."

Right?

A. Correct.

Q. And it goes on to talk about the socially and psychologically negative impact of the spraying on the community; right, sir?

A. Correct.

Q. Now, another genotoxicity article, it wasn't itself a study, but it was an article that you discussed in your direct examination was a metaanalysis by Dr. Ghisi; correct?

A. Correct.

Q. And you put up a graphic showing some comparisons of different exposure methods in that study; correct? For example, there was one that had spray over here and the oral exposure was right around the no effect line; right?

A. Correct.

Q. Okay. Spray was much farther to the right, and Mr. Wisner asked you is spraying greater than oral, and you confirmed that's what the chart showed; right?

A. Correct.

Q. And you said you thought that that was the spray, spray finding, you thought that was the human population, and you said the Bolognesi study; right?

A. That was my guess.

Q. Meaning the one where humans were sprayed in Ecuador that we just talked about.

Let's find Ghisi. That is 2190. It's in the blue binder, I believe.

13:59:07

A. That is the study.

Q. Okay.

MR. GRIFFIS: Permission to publish.

THE COURT: Any objection?

13:59:26

MR. WISNER: No objection, your Honor.

THE COURT: Very well. You may proceed.

Q. BY MR. GRIFFIS: That's the front page. If we go into page 46 where table 1 begins.

A. Yes.

13:59:40

MR. GRIFFIS: Would you put that up.

Q. Okay. So table 1, we'll look at in detail, but I know it's a long table, and these are each -- these aren't individual studies that were included in the metaanalysis. They're individual tests; right?

13:59:54

A. That is correct. There's individual doses and tests.

Q. So we have two different doses that are one and two, that correspond to one study, two doses that correspond to one study, et cetera. Sometimes one dose is one study; sometimes there are multiple doses for a

14:00:09

study; right?

A. Correct.

Q. And right here we can see the route, the route of administration; correct?

14:00:20 A. Oh, yes.

Q. Spray, oral, et cetera. So why don't you look at the whole table, and it goes on for another page, and see where we get the spray data from.

A. I stand corrected.

14:00:52 Q. Okay. Corrected in what fashion, sir?

A. The only spray data up there was crocodilian, crocodiles.

Q. From the Poletta study right here, that one study?

14:01:03 A. Correct.

Q. Would you turn to page 3187 in your binder, sir, and see if that is a true and accurate depiction of the species --

A. You mean tab?

14:01:12 Q. Tab, yes. C. latirostris, which is the species from that study.

MR. WISNER: What tab?

MR. GRIFFIS: The last tab, 3187.

THE WITNESS: I don't -- I don't have a 3187 in

14:01:31 this book.

MR. GRIFFIS: (Indicating.) It's in the blue binder, sir. There you are.

THE WITNESS: It's either a crocodile or an alligator.

14:01:45 MR. GRIFFIS: Permission to publish 3187, your Honor.

MR. WISNER: I would object. He hasn't laid the foundation that this is exactly what we're talking about. I've never seen the picture before.

14:01:55 Q. BY MR. GRIFFIS: It's a picture of a broad-tailed caiman, sir. Does it look close enough for government work?

A. I wouldn't know.

Q. Okay. It's a crocodilian species; right? If 14:02:05 it's not that one, it's one that looks reasonably similar?

A. Crocodilian or alligator, I don't know. But if you tell me it's a caiman, it's neither. It's a caiman.

Q. Take a look at the dose that was used in the 14:02:19 study, please. When you've found it, let us know what it is.

A. It says 19,800 --

Q. 19,800 what?

A. Oh, sorry. Milligrams per liter per milligrams 14:02:52 per kilogram.

Q. What does that mean?

A. I have no idea. But that's what it says on the top, dose in.

Q. Is it the biggest one in the chart?

14:03:02 A. Yes, it is.

Q. You aren't telling the jurors that they should conclude anything from that spray finding in the Ghisi metaanalysis about the risks to human pesticide applicators from glyphosate formulations; right?

14:03:24 A. That is correct. I stand corrected.

Q. Yes, sir. Thank you.

The authors didn't perform -- and this is a -- this is a metaanalysis, not a study. They didn't perform their own assay or test or study; correct?

14:03:40 A. Correct.

Q. And this is the first time you've seen a metaanalysis Forest plot in published genotoxicity literature; right?

A. Yes.

14:03:48 Q. Okay. Let's pull up that Forest plot for a moment.

My mind is going blank. Let's to the bottom of page 48, which is 0007. Just pull that up for a second.

And we have a very disparate group of animals 14:04:21 and even non-animals in this; correct?

A. What would constitute a non-animal?

Q. Well, 93, this one that's farthest over to the right is an onion; right?

A. Oh, right. I think that's the only one.

14:04:36 Q. Onion, and the next one is a fish and the next one is a fish.

A. Yes, Fish.

Q. Okay.

A. All kinds of things.

14:04:47 Q. All kinds of things; right? And one of the things they looked for is statistically homogenous pairings; right? They did statistical analyses to see where results in different studies were statistically homogenous?

14:05:04 A. You're actually testing for heterogeneity, but yes.

Q. All right. And if I get into detail about exactly what they did, I think --

A. We'd be locked up. Sorry.

14:05:14 Q. We'd be here a while.

But one of their findings was that crocodiles and mammals form the statistically homogenous group; correct?

A. You'd have to point me to where they actually

14:05:29 said that.

Q. Okay. That's on the same page, which is page 48 of the study, second column, first paragraph. The sentence starting in figure 2B.

And I'm sorry, and it's not the crocodilians and the mammals; it's the crocodilians and the mice. In figure 2B we can see the clear formation of two groups. Crocodilians are very close to mice. And then there's a fish and amphibian cluster as well; right?

A. The p-value for that is .066.

Q. So --

A. Marginally significantly different.

Q. Okay.

A. Now, their interpretation of that is there's nothing there. My interpretation is there's something there.

Q. Okay. Are you in your blue binder? I've lost track.

A. I'm still in the blue binder.

Q. 3039, this is the Tarazona article again. Are you there?

A. I'm ready.

MR. GRIFFIS: Permission to publish.

THE COURT: Any objection?

MR. WISNER: I'm sorry, I wasn't paying attention.

MR. GRIFFIS: We're back at Tarazona.

MR. WISNER: Oh, yeah. Go ahead.

Q. BY MR. GRIFFIS: Page 12 of our Exhibit 3039, 12, also the 12th page of the article. And I'd like to go to the bottom paragraph starting "a recent metaanalysis."

14:07:14

Dr. Tarazona is head of pesticides unit at EFSA. He wrote: "A recent metaanalysis on micronuclei frequency, Ghisi, et al., 2016, has confirmed that positive effects are limited to intraperitoneal administration and that the response is much higher for glyphosate-based formulations than for the active substance."

14:07:39

So remind us what an intraperitoneal administration is, please, sir.

A. That's where the needle is used to insert it into the intraperitoneal cavity.

Q. And one reason that that is used is because the intraperitoneal cavity is very rich in blood vessels and takes up substances very rapidly and it also gives access to lots of organ surface; correct?

14:08:09

A. That's one of the reasons.

Q. It's obviously not something that happens to people. It only happens to experimental animals in these kinds of studies; right?

14:08:21

A. Yeah, I would hope. I don't think it ever happens to people.

Q. "Cytotoxicity of the surfactant added to the formulation is presented as a plausible explanation, while the cytotoxicity of glyphosate in intraperitoneal administrations at high doses is not discussed."

So Dr. Tarazona is talking about the surfactant ingredient causing the cytotoxicity we were discussing earlier today, the direct irritation, the direct acute effect on the tissues that it comes into contact with in the intraperitoneal administration; correct?

A. That's what he's talking about.

Q. "Significant differences are observed for males, but not for females. The general difference his report in the comparison of mammalian and non-mammalian systems although similar responses are observed for mice and crocodilians, Ghisi, et al., 2016."

Correct?

A. That's what he says.

Q. Now, over on page 13, the one where we ended up here, over on the second column, first full paragraph, at the end he talks about the issue of carcinogenicity and genotoxicity testing being done on individual chemicals versus formulations; right?

A. Where? Where are we talking?

Q. In fact. I'm starting with in fact.

"In fact, the UN and EU guidance recommends carcinogenicity and genotoxicity studies to be conducted on individual chemicals, limiting testing of mixtures/formulations to cases where synergistic effects are expected, United Nations, 2015."

Correct?

A. That's what it says.

Q. And manufacturers seeking approval for a product are required to submit carcinogenicity testing and genotoxicity testing on the so-called active ingredient by itself; correct?

A. Correct.

Q. You wouldn't be allowed to just submit formulated product testing; right?

A. I don't know.

Q. And there may be cytotoxicity reasons that formulated product testing in whole animals wouldn't work so well; is that fair?

A. I don't know.

Q. Okay. Let's go to the last page of tests. That's 18. Right-hand column. I'm sorry, the left-hand column.

The first full paragraph at the bottom, starting "in fact." And again, we're talking about genotoxicity

evidence; correct?

A. Starting with where, "in fact"?

Q. "In fact."

A. Okay. I've got it.

14:11:46 Q. "In fact, all oral studies, even at very high doses, are negative, and the only *in vivo* mammalian positive evidence was for intraperitoneal studies at very high doses in which cytotoxicity is expected. This is again linked to the consideration of secondary effects 14:12:06 due to severe systemic toxicity described above for the animal studies, which should be excluded for the classification of genotoxicity and carcinogenicity according to the UN GHS criteria."

Did I read that right?

14:12:19 A. You read it right.

Q. What's Union GHS criteria, please?

A. Globally Harmonized System of classification and labeling of chemicals. And why they have guidelines on -- why you only do a single chemical versus mixtures, 14:12:47 I don't know. I've never read those guidelines.

Q. Sir, last week we talked about a consulting contract that you signed nine days after *The Lancet* article was published with the Working Group 112 results; correct?

14:13:00 A. Correct.

Q. And I would like to look now at a quote you gave to *Agri-Pulse* magazine. So turn to page 3021. Not page, tab 3021 in the blue binder, please.

A. Okay.

14:13:19 Q. And that is an article in *Agri-Pulse* called "Oh Brother." Right?

A. Yes.

Q. And it's called "Oh Brother" because it's a little piece about how you and your brother, Kenneth

14:13:33 Portier, who is also a Ph.D. biostatistician and on the EPA science advisory panel for glyphosate, disagree about glyphosate; right?

A. I'm sorry?

Q. Okay.

14:13:44 A. I missed that last point.

Q. Disagree about glyphosate.

A. Who disagreed?

Q. You and your brother.

A. That's not what this article is about.

14:13:53 Q. What's it about?

A. It's just about the fact that my brother's on the SAP. I don't think --

Q. You two do disagree about glyphosate; right?

A. Not -- not totally. Certain things -- certain

14:14:09 pieces of data, we disagree about, correct.

Q. Okay. Take a look, sir, at -- you gave a quote that is excerpted here. It's at the bottom of page 2, sir. I'll read it. Tell me if I get it right.

"'Nobody has paid me a cent to do what I'm doing with glyphosate,' he said," meaning you. "I have no conflict of interest whatsoever."

A. That's what the article says.

Q. That was October 12th, 2016; correct?

A. Correct.

14:15:12 Q. Is it an accurate quote?

A. As I pointed out to the author and to other people who have asked me that, I don't really know. It's in the interview. It's in the context of them talking about the work I do with the Environmental Defense Fund, 14:15:30 and I have no idea if I was answering a question about whether they were paying me to do what I'm doing or whatever. So I don't know.

But with regard to the document presented here, I just don't know.

14:15:44 Q. Okay. Would you turn to 2300 in the blue binder.

MR. WISNER: Your Honor, could we have a sidebar?

THE COURT: Yes.

14:15:55 (Sidebar.)

[redacted]

(End sidebar.)

THE COURT: You may proceed, Mr. Griffis.

Q. BY MR. GRIFFIS: All right. Sir, so what you find at 2300 --

A. I don't have the tab.

Q. You don't have 2300? It is --

A. These were in order; right? I have 2190 to 2334.

14:17:46 Q. You may have mine (indicating). Sorry.

I'll give you a moment.

A. Okay.

Q. All right. So this is an email from the author of the an article that we were taking about, dated

14:18:11 October 19, 2017, and it's addressing this issue of whether you were -- were or were not misquoted in the article; correct?

A. Correct.

Q. He quotes you -- and this is about halfway

14:18:23 through this first page, which is the body of the email. And it says -- he points out that you've said: "This pertains to the work I did part-time for the Environmental Defense Fund. It's conceivable the reporter got this quote out of context. I can't tell you

14:18:40 whether certainly I got it or not. I've been misquoted many times."

And then he responds to that; correct?

A. That this is what it says, yes.

Q. Okay. He says: "While the quote comes after

14:18:51 the EDF paragraph, it also is fairly broad, as it says

nobody has paid you anything to do what you were doing with glyphosate."

"Concerning that the EDF graph" -- meaning paragraph -- "notes that you have done no pesticide work for them, it seems clear to me that you are not talking about EDF, but about a hypothetical anyone else."

"I looked back at my notes and you said nobody has paid me a cent in any way, shape, or form to do what I'm doing with glyphosate. I have no conflict of interest whatsoever."

"Either I conflated that without any ellipsis or my editor did, but that quote with any way, shape or form is actually more broad, it seems to me."

Have I read that correctly?

14:19:31 A. You did.

Q. Do you have a response to that?

A. Again, I -- I don't know that I'm not absolutely certain it's my quote.

Q. Okay. And then he had several questions for

14:19:41 you. I'd like to read the first and third.

A. Okay.

Q. "After I sent the article to you, you responded with the comment, 'balanced and fair.' Is that still your assessment, or on reflection, do you think your

14:19:55 quote was taken out of context?"

Do you have an answer to that?

A. Do I think my quote was taken out of context is the question.

Q. Yes, sir.

14:20:03 A. I'm not sure.

Q. And then the other question is: "Would receiving money from a law firm representing plaintiffs (suing Monsanto alleging that exposure to Roundup caused their NHL) constitute a conflict of interest that should

14:20:24 be disclosed when submitting comments to EPA or testifying before a public body like the EU, for example."

And then he says: "I haven't looked into the specific disclosure requirements in the EU."

14:20:37 Do you have an answer to that question?

A. The answer is yes. That's why I disclosed them in both cases.

Q. I want to talk a little while about epidemiology, sir.

14:20:52 Last Thursday, on your first day of direct examination, Mr. Wisner said he'd be bringing in an epidemiologist to testify in detail about the epidemiology, and you said good.

Why did you say "good"?

14:21:05 A. I don't want to be in San Francisco for the next

three weeks.

Q. That's a good answer.

And in your expert report -- we'll go look at it if you need it, but see if you recall -- when you start your section on epidemiology, you say other experts will be discussing the studies as well as their strengths and their weaknesses. I will focus on using the results of these studies in evaluating causality. I will only briefly describe each study."

14:21:18

14:21:33

Right?

A. Correct.

Q. So you wouldn't be the main person we would rely on to talk about the strengths and weaknesses of the epidemiology studies; is that fair?

14:21:41

A. This is my expert report on the -- all the studies. Certainly I know the strengths and weaknesses and I didn't put them in the expert report. That doesn't mean I don't know them.

Q. All right. We've been told that Dr. Neugut, who is a professor of epidemiology, Dr. Neugut, one of the expert epidemiologists for plaintiff, who was mentioned in opening statements, will testify that he's a professor of epidemiology at Columbia University, has an MPH in epidemiology. Would he be more qualified than you in epidemiology?

14:21:54

14:22:12

A. I would say yes.

Q. And would you defer to him on issues of epidemiology?

A. Not necessarily. I would --

14:22:19 Q. You'd need to hear the issue?

A. I'd need to hear the issue and then he would have to convince me if we were at odds.

Q. Okay. Let me ask you this: Do you agree that one should not rely for causation on any positive

14:22:33 association in an epidemiology study that is not statistically significant?

A. Say that again, please.

Q. In finding whether causation exists or not, do you agree that you should not rely, for purposes of

14:22:47 causation, on any positive association in an epidemiology study that is not statistically significant?

A. I don't quite know how to answer that question because it depends on where the emphasis is. Should I rely on associations from studies that are not

14:23:09 statistically significant? Yes, I should. I clearly have to look at them. The negative ones tell me as much as the positive ones. So certainly I have to consider them and rely on them in my -- in my judgment.

If -- if you're -- that's the only answer I can

14:23:29 give. Yes, I would rely on all of them.

Q. "Confounding occurs when there's an exposure or some other factor that is tightly associated with both glyphosate exposure and NHL, non-Hodgkin lymphoma, diagnosis that if controlled for could explain the results."

14:23:48

Do you agree with that?

A. I agree with that.

Q. And the most likely source of confounding in the epidemiology studies that we have discussed is exposure to other pesticides.

14:23:57

Do you agree with that?

A. No. Exposure to some of those pesticides, yes. Clearly not all of them. I'd have to think about some of the other -- other confounders to decide if they're more important. But pesticides are important.

14:24:13

Q. Let me adjust the question slightly.

The most likely source of confounding in these studies -- meaning the glyphosate ones -- would be exposures to some other pesticides.

A. Can we alter it a little more. The most likely -- see, they controlled for a bunch of other things besides the pesticides, even in the -- in the analyses where they said they didn't adjust for pesticides, they were still adjusting for other things, and those could likely be strong confounders. But I wouldn't know

14:24:27

14:24:44

because they adjusted for them. They don't show me the unadjusted.

So I'm willing to say that the most likely confounders that were not adjusted for in the baseline analysis are the pesticides.

Q. You made written comments to EPA in October of 2016; right?

A. Correct.

Q. And you -- and you address the issue of confounding in these studies, and you've told them that it's fair to say that confounding could not be ruled out in these studies, talking about Eriksson and De Roos 2003 and Cardell and Worsi; correct?

A. And De Roos 2015 -- 2005. All of them.

Q. 2005. And that's still your opinion today?

A. Correct.

Q. Now you briefly discussed a study called the NAPP study, the North American Pooled Project study, on Friday; right?

A. Yes. I was previously asked a question, if I remember.

Q. Okay. And that combined all the US and Canadian study data; is that right?

A. That's what they claim. I haven't seen any paper on it.

Q. There hasn't been a publication yet. Do you know why that is?

A. No publication.

Q. Do you know why that is?

14:26:02 A. No.

Q. And Dr. Weisenburger, I believe is an expert witness for plaintiff, is one of the people involved in that project; correct? Have you ever asked him?

A. I think he's involved in it. No, I have not

14:26:13 asked him.

Q. Turn in your blue binder, sir, to 2867, please.

A. I hate to say this, but I don't have 2867. 2811 to 2882.

Q. Here you are (indicating).

14:27:22 A. So 67.

Q. I also gave you 2868 so I'll also be asking you about that.

You know that the -- first of all, can you describe what you understand the North American Pooled

14:27:36 Project to be?

A. Yes. It's a pooled evaluation of data from the three studies that were pooled for the De Roos 2003 pooled analysis and the data from the study in Canada, McDuffie study.

14:27:55 Q. And it's not just an effort to come up with

information about glyphosate-based herbicides; right?

A. Correct. It's a pooled study of exposure of NHLs, but it is a broad range of exposure that they're looking at.

14:28:11 Q. They could look at other exposures and they could release study reports. They could release studies and published studies about other exposures; correct?

A. Correct.

Q. And they have done so?

14:28:22 A. That I don't know.

Q. You don't know whether the North American Pooled Project has published other studies about other issues?

A. That's correct. I do not know that.

Q. All right, sir. Do you know that they ran

14:28:38 statistical tests and determined that several herbicides were confounders in their data?

A. I've seen the slide decks that have been passed around. There are things like that in the slide deck.

Q. Okay. Do you recall that they used statistical

14:28:59 tools to establish that herbicides 2,4-D and dicamba and the insecticide malathion were confounders?

A. You would have to show me where and give me some indication of the methods used for the evaluation. The problem is all of these are just slide sets are

14:29:20 abstracts. An abstract is a short piece. And I don't

feel there's enough information there for me to fully understand the study.

Q. It would be nice to have a publication.

A. If there was a publication on that and glyphosate, yes.

Q. Turn to 2868. That was the second tab I gave you because I assumed you didn't have that, either.

That is a draft of an article; correct?

A. It's an edited version, yeah. It's some sort of draft.

Q. So it's a little bit than a slide show or an abstract; right?

A. I don't know. I don't think I've read this.

Q. You haven't, sir?

A. I don't believe.

Q. It says date of last revision, September 21, 2015; correct?

A. Correct.

Q. And the date of the slide show that you looked at on direct examination was from the summer of 2015; correct, do you recall?

A. It's not on here, and I don't recall.

MR. WISNER: Objection. I don't believe anything was shown on direct. Are you talking about deposition?

MR. GRIFFIS: Are you asking questions?

MR. WISNER: No. I'm sorry.

Q. BY MR. GRIFFIS: The numbers that you talked about on direct came from a summer 2015 slide show, or do you know, sir?

14:30:57

A. I don't know. I do not know.

Q. Okay.

A. I didn't rely on this information.

Q. Okay. Why not?

14:31:05

A. Because it's not published.

Q. Turn to page 8 of 19, sir.

A. On which document?

Q. The second, 2868.

A. Okay.

14:31:23

MR. GRIFFIS: Permission to publish so the jury can follow along.

THE COURT: Any objection?

MR. WISNER: I think we need a sidebar, your Honor.

14:31:31

MR. GRIFFIS: If you say no, I'll just read.

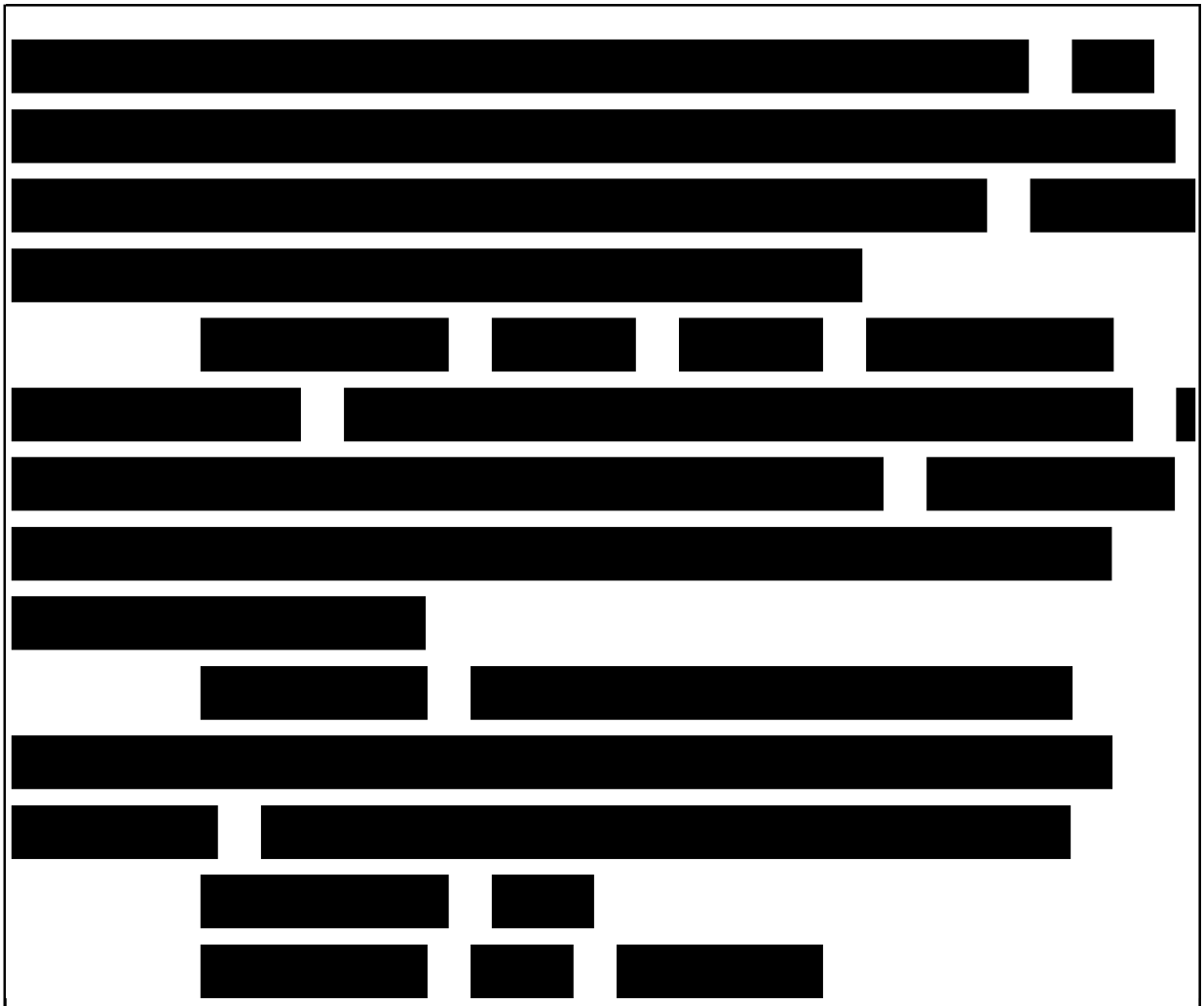
MR. WISNER: I think there's a bigger conversation.

MR. GRIFFIS: Okay.

(Sidebar.)

14:31:47

[redacted]



(End sidebar.)

THE COURT: All right. You may proceed, Mr. Griffis. So there's no objection to publication; is that right?

MR. WISNER: That's right, your Honor.

Q. BY MR. GRIFFIS: So 2868, please. Let's not go to page 8 yet. Let's go to the first page.

So this is a -- this is the draft that you were looking at in your binder, sir?

A. Correct.

Q. An evaluation of glyphosate use and the risk of

non-Hodgkin lymphoma, major histological subtypes, from the North American Pooled Project, N-A-P-P, NAPP, and date of last revision of this draft was September 21, 2015.

14:33:24 And as we've both agreed, this hasn't ever been published; right?

A. Correct.

Q. On page 8, I'm just directing you to this so we can address that issue of confounding. And look at the

14:33:36 second paragraph under statistical analyses.

A. Okay.

Q. Starting "pesticides" over here.

Pesticides that were most strongly correlated with glyphosate, and they give the statistics that you

14:33:52 wanted, I hope. And there were significantly or strongly associated with NHL and previous studies were evaluated as confounders. These were herbicides 2,4-D and dicamba as well as the insecticide malathion; correct?

A. That's what it says, yeah.

14:34:22 Q. Let's go to 2867, the slide show. And this is a slide show with a number of data tables presenting data from this study; correct?

A. Sorry. Yes.

Q. Okay. If you'll turn to page 10 of this slide

14:34:44 show is a table entitled "Glyphosate Use and NHL Risks,"

and there is an overall row, and then for various subtypes; correct? Subtypes of non-Hodgkin's lymphoma?

A. NHL subtypes, number of cases. Yes, I think I found the right one.

14:35:08 MR. GRIFFIS: Permission to publish this.

THE COURT: Any objection?

MR. WISNER: No objection, your Honor.

Q. BY MR. GRIFFIS: Let's actually start with the first page cover. And do you see a title and that one of

14:35:28 the authors is Dennis D. Weisenburger?

A. Yes.

Q. Okay. Now let's go to page 10. I'd like to focus on the overall risk reported here. We have an odds ratio A and an odds ratio B. And would you just tell the

14:35:56 jury what -- not what these specific A and B's mean, but what it means when you say odds ratio A and odds ratio B in a study as a tool for reporting?

A. It's a superscript. It tells you to look at the bottom of the table, A to B.

14:36:11 Q. They've been adjusted and controlled for in different ways and look down to see the details? Okay.

A. Correct.

Q. So what is this column adjusted for statistically, the first column?

14:36:23 A. First column A? Odds ratios adjusted for age,

sex, state and province, lymphatic or hematopoietic in a first-degree relative, use of a proxy respondent, use of any personal protective equipment.

Q. And odds ratio B was controlled for what?

14:36:44 A. Odds ratio adjusted for all co-variants in model A. That means all the other ones that were already in A, plus use of 2,4-D, dicamba, use of dicamba, use of malathion.

Q. And when they controlled for those pesticides

14:36:57 that they had found statistically to be confounders, what happened to the odds ratio?

A. They went down.

Q. And it was not statistically significant; correct?

14:37:06 A. The confidence bound now includes one.

Q. Would you go to page 26, please, sir.

Now I know that the NAPP data is not one of the ones you relied on so let me ask if you know this: Do you know that they found that controlling for proxy

14:37:36 versus self-respondents affected the data?

A. I've seen these slides, yes.

Q. So you know that that's true?

A. I've seen the slide sets. I haven't seen the paper. I don't know exactly what it means because I

14:37:57 don't know exactly what they did.

Q. Yes, sir. Nobody's seen the paper.

A. So I have to make an assumption to evaluate what they are saying there, and I don't know -- I don't know that my assumption will be correct.

14:38:12 Q. Let's start here. What's a proxy responder?

A. Generally a proxy responder is when a person in the case-control study has passed away, they ask a relative to answer the questions for them.

Q. And a self-respondent is the person himself or

14:38:31 herself; right?

A. Correct.

Q. It's generally thought that self-responders do a better job accurately reporting their exposures and their history than a proxy responder does; correct?

14:38:42 A. I don't think there's a generalization to be made there. But it can be different. It can be very different.

Q. Okay. And when they controlled for self-respondents. Let's look at that column. This is

14:38:56 the never-ever figure. Never used glyphosate versus ever used glyphosate; correct?

A. I assume that's what it is. That's what it says.

Q. For self-respondents, what is the odds ratio and

14:39:12 the confidence interval?

A. The odds ratio is .95 and the confidence interval is .69 to 1.32?

Q. And what is the significance of the 0.95 odds ratio?

14:39:28 A. It's below one.

Q. And one means what?

A. One means there's no effect whatsoever.

Q. Okay. And then we have three different measures of intensity. We have duration of use, number of years

14:39:42 of use -- and again, this is pooled data from all the North American, US, and Canada data; correct?

A. I don't -- I don't -- there's a lot of problems with that in looking at this, and I just can't answer these questions. I didn't rely on this data because of

14:40:04 concerns. They had three slide sets or four slide sets, not one. In the four slide sets, there's different numbers. So which set of numbers am I supposed to believe?

Then when you look at the total number of

14:40:17 members in the case-control study, it's more than any individual for -- in the individual studies from which they're pulling. So I don't know where they got the extra individuals from.

There are so many unanswered questions about

14:40:32 this because there's not a publication, I'm very

uncomfortable even commenting on it.

Q. I'll ask you one more question then, and then we'll move on. It might be one of my slightly complicated questions, and I might have to ask you two.

14:40:48 But we've got duration, number of years. We've got frequency, number of days per year. And then we have a combination, lifetime days, number of years times number of days in the year. So that's the one that combines these other two in a, sort of, aggregate

14:41:04 frequency of use analysis; right?

A. That -- that's normal.

Q. Okay. And let's look at these results, and tell me whether they are at all statistically significant.

A. You're just asking me to look at the numbers --

14:41:27 Q. Yes, sir.

A. -- and tell you whether it's in -- contains one in the confidence bound or not?

Q. Yes.

A. I mean, that -- that's inherent just looking at

14:41:34 the numbers.

Q. Thank you, sir.

I want to talk to you a little bit about the 2018 Journal of the National Cancer Institute, JNCI, study. And that is a study published by the AHS group;

14:41:48 right, the Agricultural Health Survey group?

A. Agricultural Health Study.

Q. Agricultural Health Study, I'm sorry.

A. The authors are from that study.

Q. And we need to make a distinction between the AHS and the single publication journal of the National Cancer Institute 2018; correct?

14:42:00

A. I didn't understand that.

Q. Well --

A. The Andreotti publication in the JNCI 2018.

14:42:15

Q. The Agricultural Health Study isn't one study that culminated in the JNCI 2018; correct?

A. Correct. There are multiple publications.

Q. It's a big research project.

A. Correct.

14:42:28

Q. So they're gathering data and have been gathering data for years -- they put out the De Roos 2005, for example -- about agricultural exposures to many different chemicals and their associations with many different substances; right?

14:42:44

A. Correct.

Q. And they're able to take that pooled data, take the parts that are relevant to a particular issue, analyze it, have their various experts work on it and do a publication on a particular issue; right?

14:42:59

A. Correct.

Q. So although they have data on, for example, diesel fume exposure in the 1990s, they could do a study that has nothing to do with that, but focuses instead on glyphosate, for example?

14:43:12 A. Theoretically, yes.

Q. Yes, sir.

MR. GRIFFIS: Permission to publish the JNCI 2018?

THE COURT: Any objection?

14:43:22 MR. WISNER: No objection to the publication of the Andreotti paper.

Q. BY MR. GRIFFIS: Okay. This is Defense Exhibit 2052.

A. Blue?

14:43:34 Q. It is in your blue binder, I hope. It's in mine.

A. Yes, it is.

Q. And this is called "Glyphosate Use and Cancer Incidents in the Agricultural Health Study"; right?

14:43:49 A. Correct.

Q. It's a study on glyphosate use and cancer; right?

A. Right.

Q. It's not on a whole bunch of other substances in

14:44:02 cancer; right?

A. True. I'm sorry, it's not about other diseases. It's cancer.

Q. Now, the first thing I want to talk about is your initial reaction to this publication coming out, sir.

A few days after this study was published, you emailed a critique of it to a member of the press; right?

A. I might have.

Q. 2407 in your binder.

A. Okay.

Q. Let's -- I want to show you something. First published online November 9, 2017; right?

A. Correct.

Q. Okay. And now we have, at Tab 2407 of the blue binder, an email that you sent on November 10th, 2017, to a member of the press; right?

A. Correct.

Q. And you sent her expert reports from another epidemiologist in this litigation, for plaintiff's; correct?

A. Correct.

Q. In the emails, you criticized JNCI 2018 for using an imputation method. And you said that, "It would incorrectly classify as unexposed in a later time period any subject of the study who had been unexposed in an

earlier time period."

And that was incorrect; right?

A. I'm sorry, which sentence are you talking about?

Q. It's the one under, "So to answer your questions."

A. I'm sorry?

Q. You say, "So to answer your questions," colon, and then there's a paragraph. That's the one I'm referring to.

14:46:19 A. "The study does add to the scientific data." "It does add to the scientific" -- so what I said, which was wrong, was that in the imputation, people who had no exposure in the previous request for doses would have no exposure in the imputed doses. That is incorrect.

14:46:43 Q. And you were, kind of, attacking before you properly understood the study; is that fair?

A. No. I just misunderstood a small part of the study.

Q. Okay.

14:46:53 A. The imputation. Or one part of it.

Q. On November 12th, you sent an email that looks like it was actually cut-and-pasted from the text of the one you sent to the reporter. And you'll find that, sir, at Tab 2334.

14:47:18 This is to a government official in France

involved with the EU's regulatory review of glyphosate; right?

A. Say that again. I'm sorry.

Q. It was to a government official in France involved with the EU's regulatory review of glyphosate; right?

A. It appears to be, yes.

Q. And you were trying to influence the EU's response to and reaction to this paper; is that right?

A. No. He asked me a question. He sent me an email asking me what I thought of this particular paper. I wasn't attempting to influence the EU. I was answering his question.

Q. Now I want to talk to you a little more about imputation, sir.

A. Sure.

Q. Now, I mean, you said that that -- you misunderstood and got this part wrong in the emails that you sent.

So what you testified about imputation on Friday is about a somewhat different aspect of the issue; is that right?

A. It's -- it's an -- it was testimony on imputation. I don't know what some other aspect means.

Q. Okay. Well, it's not the wrong thing that you

said to the reporter and to the French official?

A. It's -- it's -- it was not testifying about the fact that people who had no exposure before still had no exposure in the imputation, that's correct.

14:48:40 Q. Okay. And you recently gave a presentation about your views about the 2018 JNCI study. And you used slides that you made; correct?

A. I give a lot of talks.

Q. Okay.

14:48:55 A. Probably.

Q. Let me see if I can find --

MR. GRIFFIS: I've lost track of break times, your Honor.

THE COURT: This would be a good time for a

14:49:10 break. Do you wish to take it?

MR. GRIFFIS: Okay. Why don't we do that.

THE COURT: All right. Ladies and Gentlemen, we're going to take the afternoon recess now. We'll be in recess until five after 3:00 on the wall clock.

14:49:21 Please remember: Do not discuss the case. We'll see you again at 3 o'clock. Thank you.

(Jury leaves courtroom.)

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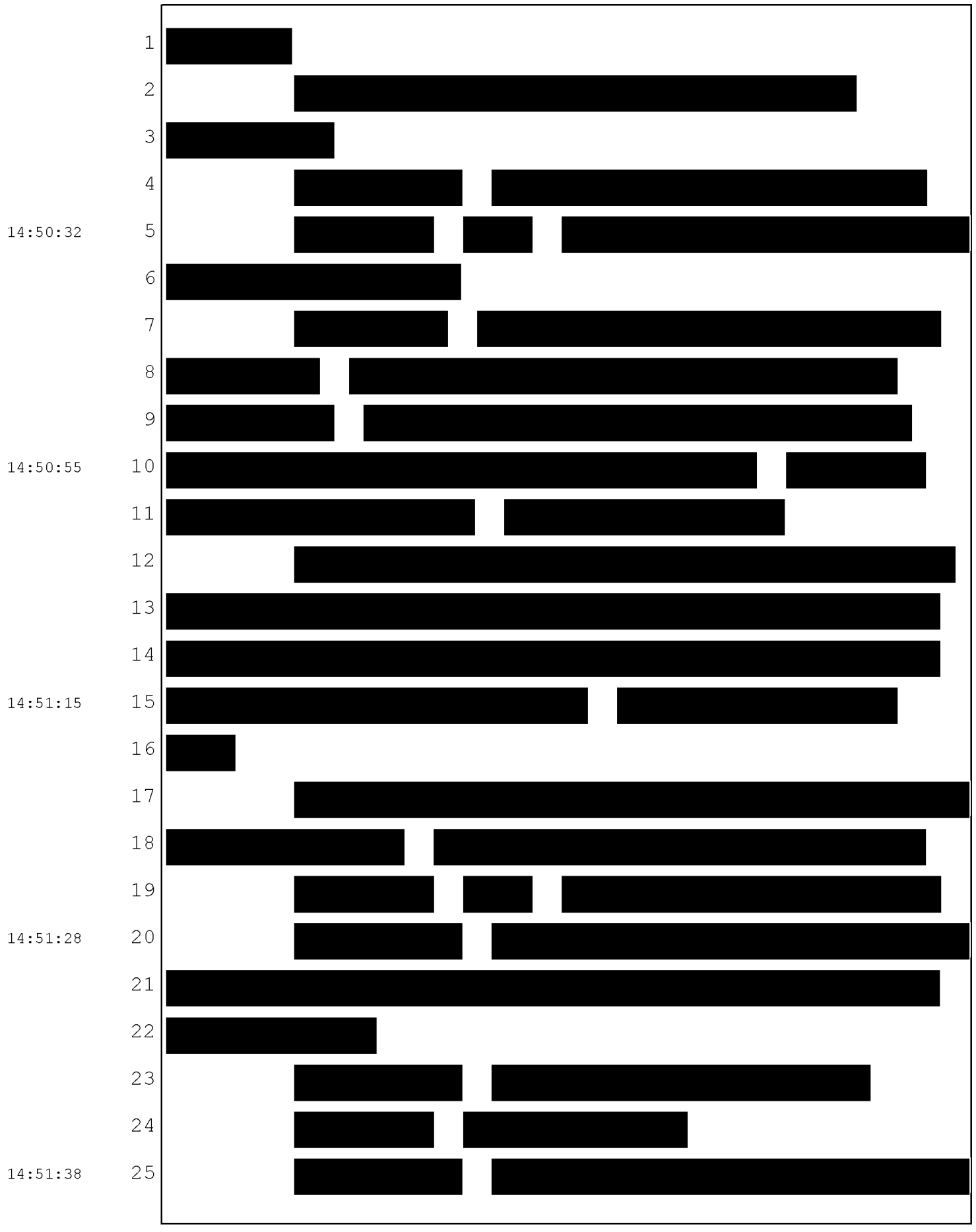
14:50:22 [redacted]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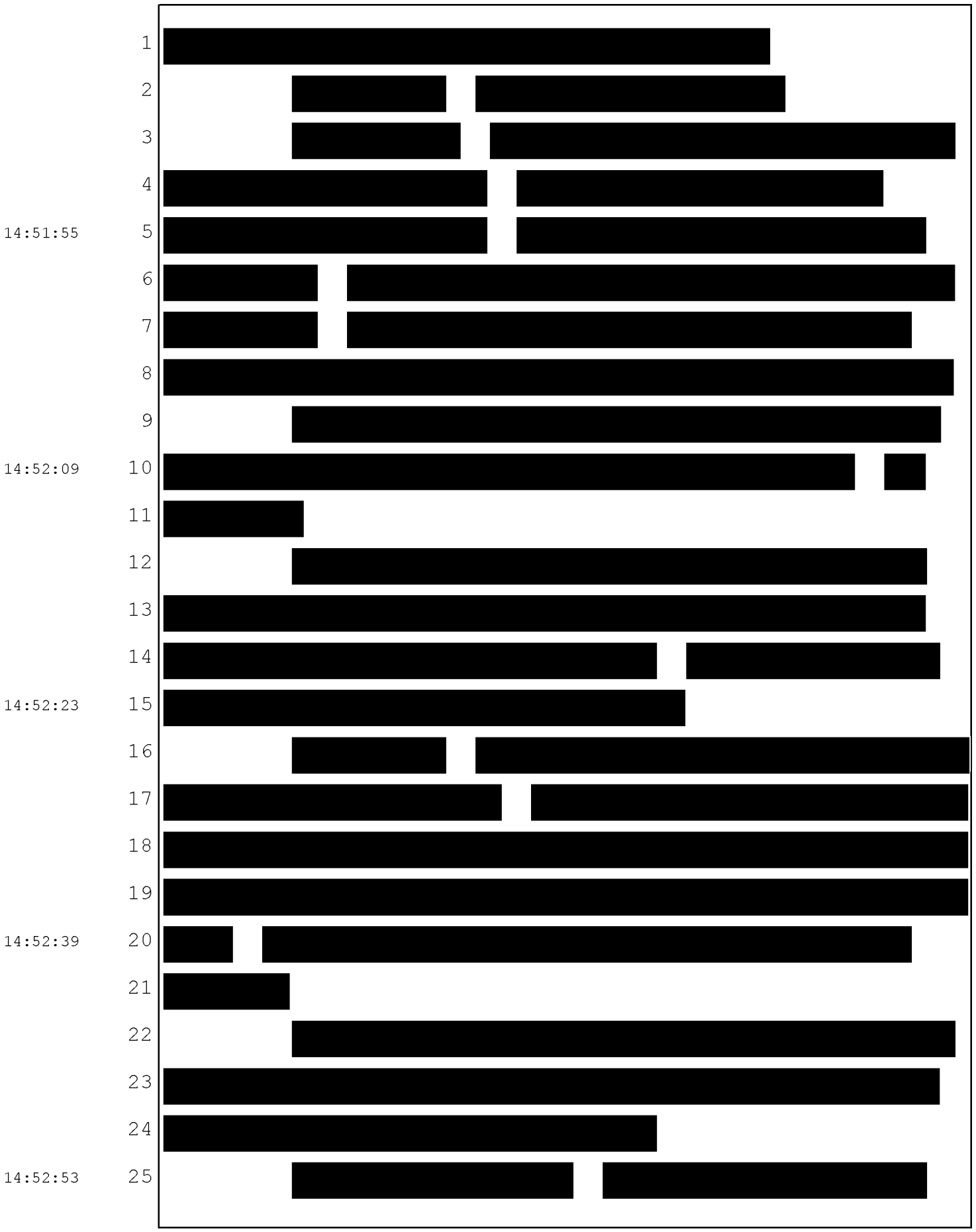
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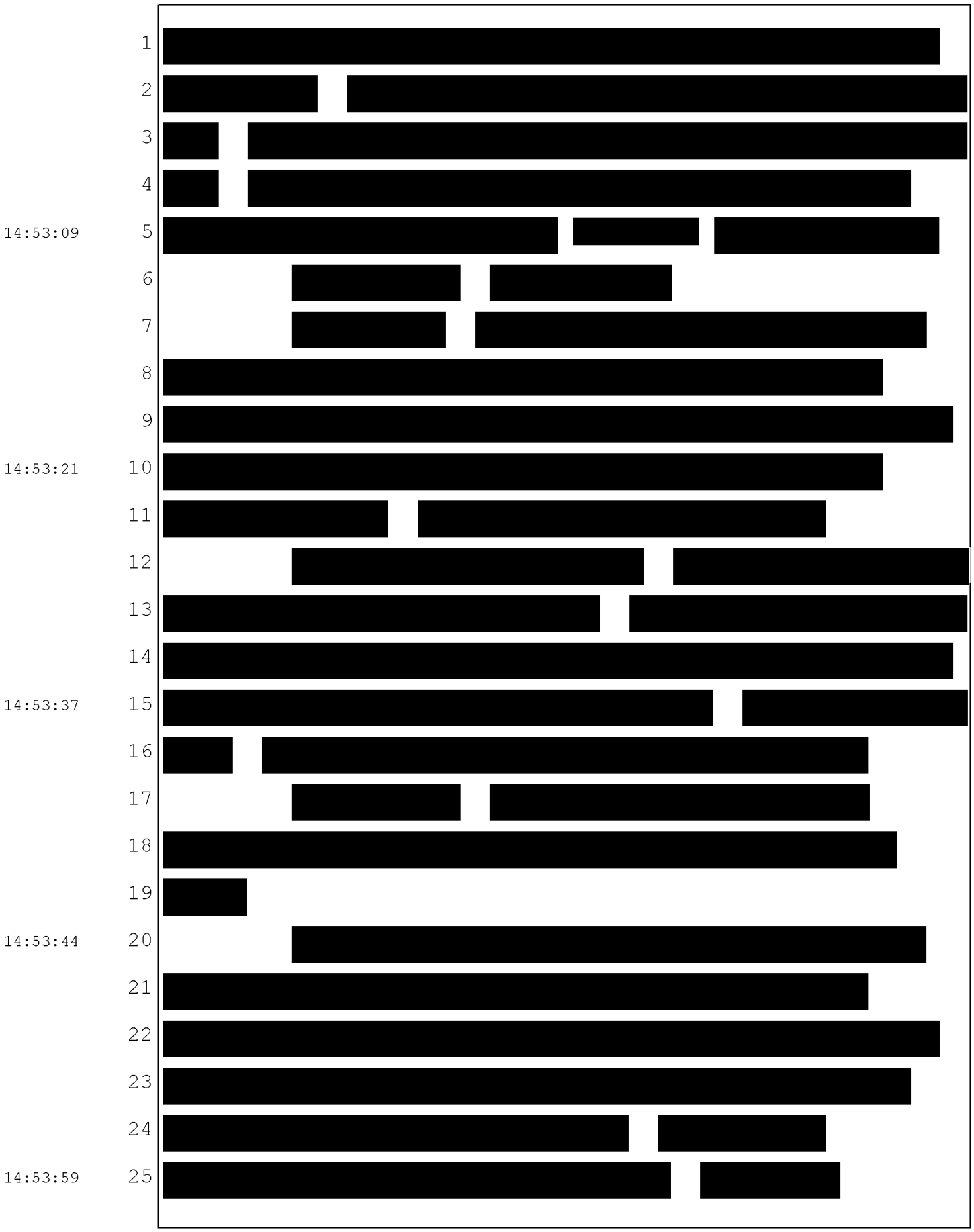
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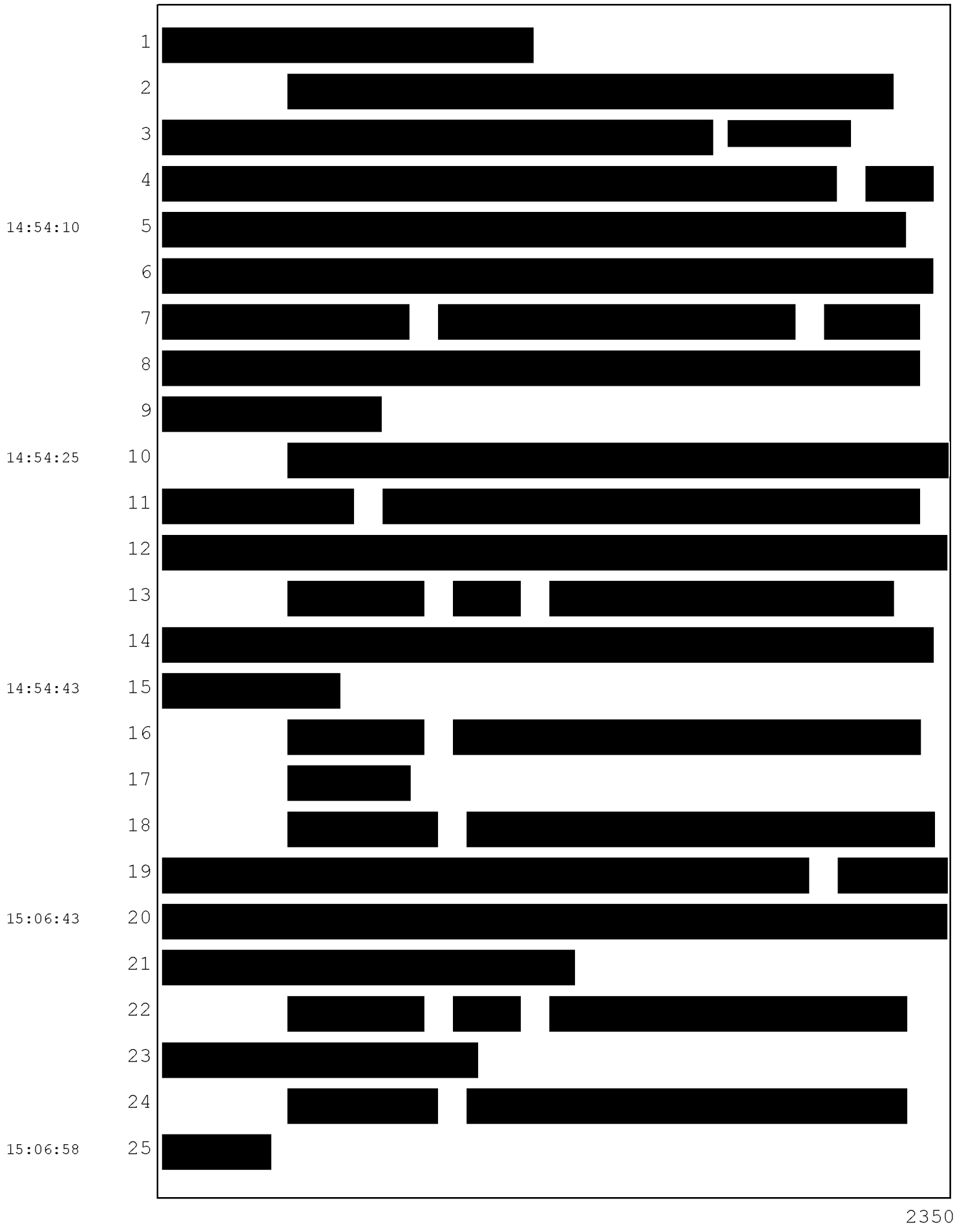
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(Jury enters courtroom.)

THE COURT: Welcome back, Ladies and Gentlemen.

Dr. Portier remains under oath, and,

15:10:58 Mr. Griffis, when you're ready, you may continue.

MR. GRIFFIS: Thank you, your Honor.

Q. Sir, so we've been talking about the JNCI 2018 study, and I would like to hand you one slide. And this is the only one I'm going to ask you about, from a

15:11:16 (indicating) presentation of yours about that study.

Do you recognize that slide?

A. No, not really.

Q. No, sir?

A. It -- it's a slide. But I have to see the

15:11:36 context from which it came. I don't --

Q. Okay.

A. You could have removed something. Anything's possible. I don't know what this is.

Q. Turn to Tab 3180.

15:11:54 A. I'm sorry, I don't have it.

Q. Definitively my fault somehow.

Please take a look at that and -- so that you'll understand the context. And then we'll talk about the one slide that I want to talk to you about, sir.

15:12:40 A. Okay. At least the title and content makes

sense.

Q. Okay.

A. I still can't swear that's my slide exactly, but certainly the things on it are things I would say.

15:12:53 Q. Okay. So let's put up that slide.

MR. GRIFFIS: I asked for permission from Mr. Wisner, and he's granted it.

THE COURT: No objection?

MR. WISNER: No objection, your Honor.

15:13:07 Q. BY MR. GRIFFIS: So it's entitled "Why Andreotti" -- which is the JNCI article -- "is Methodologically Unsound"; correct, sir? I think it's the 12th -- Number 12 in there.

A. That's what it says.

15:13:24 Q. Okay. And then there are just two bullets: "Evaluations with imputed exposures are unreliable," and then, "Only reliable numbers are the complete case analysis."

Will you please tell the jury what a complete

15:13:40 case analysis is?

A. Sure. When you have a cohort study where large -- any number of people in the cohort study stop participating in the study until you have some percentage of them not there, you have multiple options as to how

15:13:59 you do your analysis. But the two obvious ones that

apply here are you impute the dose, like they did in this study, or you only use the people who actually responded to your questionnaire, and you remove everybody else.

So the complete case is where you only used the people who responded to the questionnaire, and you don't use the imputed dose.

Q. Okay.

MR. GRIFFIS: Permission to publish 125?

THE COURT: Any objection?

MR. WISNER: Yes, your Honor.

THE COURT: Can you approach?

(Sidebar.)

[redacted]

[redacted]

(End sidebar.)

15:15:43 THE COURT: All right. You may proceed.

Q. BY MR. GRIFFIS: All right. The JNCI article, let's go to that, so we can lay a little bit of groundwork there. Tab 2052 in your blue binder, I surely hope.

15:16:10 A. 2052?

Q. Yes.

A. Yes. Okay.

Q. Okay.

MR. GRIFFIS: Permission to publish the JNCI

15:16:35 2018 study?

MR. WISNER: No objection.

THE COURT: All right, Counsel. Proceed.

MR. GRIFFIS: Let's have Slide 323, which is a callout from page 3.

15:16:50 No. No, no, no. I apologize.

Q. Okay. So we are on page 3, sir, first column. This is under the "Results" section. It says, "Risk ratios and lag and intensity weights, lifetime days, et cetera."

15:17:51 And then you rate ratio. In top exposure

quartile was 0.87 for NHL. And it gives a confidence interval; correct?

A. Correct.

Q. Okay. And that also corresponds to Table 2, which is on pages 4 and 5 of the study. If you'll go to page 5.

Under "Non-Hodgkin's Lymphoma," we have -- first of all, Table 2 is showing a bunch of different cancers and cancer subtypes; correct?

A. That is correct.

Q. Okay. For non-Hodgkin's lymphoma, we have none, and then Q1, Q2, Q3, Q4. Would you explain what the Q's mean?

A. Okay. This is the intensity weighted lifetime days of glyphosate use in the health study. It's a complicated formula. How deep do you want me to get into it?

Q. Oh, Lord. No formulas. Just "Q" means -- what word does "Q" stand for?

A. So they made this formula that created these exposure categories for what they call intensity weighted lifetime days. And they have a whole distribution of these from very small to very large. And they take one-fourth of them, that's Quartile 1. The next four going in magnitude upwards is Quartile 2, et cetera.

Q. Okay. So "Q" is for quartile?

A. "Q" is for quartile.

Q. None is the unexposed group, A1 is the lowest dose group and Q4 is the highest; right?

A. Correct.

Q. And when we see --

A. People with the -- with the top 25 percent of the exposures.

Q. Okay. And there are other places on the
15:19:57 chart -- well, like over here, we have M1, M2. And that's for Moiety 1 and Moiety 2, meaning there wasn't enough data to make quartiles, so they made half?

A. Correct.

Q. And a moiety is a half. And there are also
15:20:13 terciles on there.

A. Which are thirds.

Q. Okay. When they had an in between amount of data.

So non-Hodgkin's lymphoma, they had enough data
15:20:20 to do quartiles. And there is our figure again, 0.87 for the highest exposed group, with a confidence interval of 0.64 to 1.20; correct?

A. That's correct.

Q. Okay. Now, there -- because of the issue of
15:20:37 imputation and because the author is -- of JNCI 2018 were

aware that that was an issue, they did a number of checks on their procedure; correct?

A. I'm not sure what you're talking about.

Q. Well, they did a whole case analysis, for example; right?

A. They presented one number for the whole case analysis.

Q. And that number was 1? On page 4?

A. Yeah. It's on page 4. Let's see. There it is. 1.04 for relative risk, Quartile 4.

Q. It's -- it's the one in the middle, isn't it? "To evaluate" -- let me show you. Starting here (indicating).

"To evaluate the impact of using computed exposure data for participants who did not complete the follow-up questionnaire. We limited the analysis to 34,698 participants who completed both questionnaires?"

So that's what we were talking about for a whole case analysis. You just leave out the people who didn't complete the second questionnaire and look at the ones who completed both, which is a smaller group of people, but you can just run those numbers; right?

A. I'm still trying to find it. Hold on a minute.

Okay. I found it.

Not totally. So they -- they collected exposure

data in 2000 to 2005 in a rapidly -- so they -- there were a lot of options for how they could have analyzed these data. But I wanted to see -- to give me a complete case is they -- they obtained information on exposures for people from 2000 to 2005.

15:22:40

So I would have wanted to see a case where they only used people who responded to the questionnaire, and they used data up until 2005 or '6 or '7, something close, on the NHL cases. And that's the number I was quoting. That's where that comes from.

15:23:01

Q. Okay. The number that I quote -- I mean, the line that I've highlighted, it's also a whole case analysis, because it's limiting the data to people who answered both questionnaires; right?

A. Correct. But it's assigning exposure in 2012 and 2011 based upon exposure experience in 2000 and 2005.

15:23:14

Q. The numbers from that whole case analysis are 0.90 relative risk, Quartile 4, the highest dose group; correct?

A. Correct.

15:23:33

MR. GRIFFIS: You can highlight that, if you can see.

Q. And the confidence interval is 0.63 to 1.27; right?

A. That's correct.

15:23:44

Q. And then they also did the exposure that you wanted, the analysis that you wanted; correct?

A. Correct. It's --

Q. And the relative risk for the highest exposure quartile was what?

15:23:55

A. 1.04.

Q. With a confidence interval of what?

A. .7 to 1.57.

Q. So the numbers don't change much when you do the controls for imputation; correct?

15:24:07

A. They change somewhat, but the exposure misclassification beyond that also can take you down to a relative risk of 1. So it's -- it's slightly better in terms of a more stable number.

Q. You know how yesterday you were talking about a 15 percent error that you calculated with regard to the imputed group?

15:24:26

A. It's a 7 -- I didn't calculate it. Heltsche has it in his paper. It's a 7 percent misclassification of the group that is imputed for exposures.

15:24:43

Q. And you said that goes both directions, so it turns out to be 14 percent?

A. No.

Q. And your best estimate was 15? Okay. I totally misunderstood your 15 percent number. Would you tell me

15:24:57

what it is?

A. I'm not sure I remember it myself.

Q. Okay.

A. The number 7.8 percent, when they tried to impute exposures in people for whom they had the exposure, that estimate came out to be wrong, with 7.8 percent of the people who said they were exposed being classified by that algorithm as unexposed.

Q. And when we're looking at the -- all the people in the study, we're looking at that number, the -- the 7.8 percent, is that the number we're using for the error?

A. I have it right here.

Q. Okay. Tell me the correct number to use for that.

A. It was in those slides. What was that slide? It's in the back; right?

7.31 percent.

Q. 7.21?

A. 31.

Q. 7.31. Okay.

And that applies to the 36 percent of the group that's imputed; right?

A. Well, no. That's -- I'll try to do it as simply as possible.

Okay. What Heltsche gave us was the number provided in their paper was an estimate of the number of people who responded saying they were exposed in the group they held off to the side. And then what he gave us was the number of people he predicted to be positive, using his algorithm for prediction. Okay?

15:26:42

Now, the problem with that number, 7.31 percent there, is that's the best case. That only occurs if every one of those estimates of people who were exposed match an actual person who was exposed. But, of course, that's not the case. It's not likely to be the case. There's going to be people that the algorithm estimates are exposed who are not really exposed.

15:27:10

Q. I'm sorry?

A. So that 7.31 percent is only in the margins. The total number of -- the total amount of misclassification could be as high as 98 percent.

15:27:25

Q. 7.31 percent, that was your best estimate?

A. 7.31 percent.

Q. Okay. That's of the imputed group could be misclassified or is likely to be the right number of misclassified from that group?

15:27:45

A. No.

Q. Okay.

A. That's the best case scenario. The likely

15:27:54

number is somewhere between 7.3 and 98 percent.

Q. And the part I'd like to focus on is it's out of the 36 percent; right?

A. It's out of the 36 percent.

15:28:08 Q. Okay. And out of the 36 percent, we already know from Questionnaire Number 1, which they did fill out, that 75 percent of them were exposed; right?

A. Something in that range. But I don't know if that's the same group.

15:28:20 Q. If they were exposed -- if 75 percent of the people who filled out -- who were missing from the second questionnaire filled out the first questionnaire and said they were exposed, we still know they were exposed. We've got them right; right?

15:28:38 A. No. It's an imputed doses for them. And that imputed dose may be 0.

Q. As far as whether they are exposed were right?

A. But they didn't give me the exposed yes/no. And I don't know what number they would have chosen. They'd

15:28:52 have to tell me what they meant by "ever exposed."

If that were the case, then it would have been 80-something percent exposed. But that analysis is not shown here.

Q. I'm going to ask you one more question. Then

15:29:05 move on to -- 7.31 percent times 36 percent, the imputed

group, times 25 percent, the group for which we didn't previously have exposure information, because they didn't say they were exposed back at the time of the first questionnaire, is a number less than 1 percent; right?

15:29:24 A. I have no idea what you're calculating. So I don't know what you're trying to calculate here.

Q. Okay.

A. I told you it could be 7.31 percent or 98 percent. So you could completely mischaracterize

15:29:41 every single exposed and almost every single unexposed and still get the 7.31 percent agreement -- a disagreement that Heltsche showed. Because Heltsche didn't show me how many exposed he missed and how many unexposed he missed. I can't -- I can't answer the

15:30:02 question.

Q. I think it may not be too productive for us to get to the bottom of this today.

There's a whole bunch of articles about the -- both the agricultural health survey -- agricultural

15:30:15 health study and its methodologies, its methods of data collection and analysis, studies, analyzing it and assessing the accuracy of it, validating its methods and improving its methods.

And there are a number of studies analyzing

15:30:31 things like the imputation method that were used. All

those are published and peer-reviewed in the agricultural -- NCI 2018 is, of course, published and peer reviewed; is that right?

A. There --

15:30:45 MR. WISNER: Objection. Compound. The lawyer's testifying.

THE COURT: All right. Sustained.

Please break it down, Mr. Griffis.

MR. GRIFFIS: Yes, sir.

15:30:52 Q. JNCI is published and peer-reviewed; right?

A. The Andreotti paper in 2018 was published in the journal JNCI.

Q. And there's a cloud of other papers that have been published with regard to the methods and methods of

15:31:09 analysis of both the Agricultural Health Study and this paper itself; right?

A. There are many, many papers, correct.

Q. Let's leave it at that.

This is a slide from your direct examination,

15:31:35 sir, showing a progression of cancer cells.

A. Correct.

Q. All right. This is a process that you told the jury receives from normal cells to damaged cells to mutated cells. And you have more stages there. You've

15:31:51 left off a number of details, because this isn't an

oncology class. And then cancer; correct?

A. I'm sorry? What was that last part? I didn't understand. I didn't hear it.

Q. You left off a number of steps. It says, "More steps." We didn't go into those steps. And I said, "Because this isn't an oncology class." In other words, it would be complicate to explain all those steps. And then at the end, we have cancer; right?

15:32:03

A. They're somewhat repeated steps.

Q. Okay.

MR. WISNER: Just for the record, this is Exhibit 1024.

Q. BY MR. GRIFFIS: This is a process that takes time; right?

15:32:26

A. It can, yes.

Q. And you've given testimony in your critique and your analyses to regulatory agencies about glyphosate and non-Hodgkin's lymphoma with regard to the fact that this is a process that takes time; right?

15:32:43

A. I've -- not really. I gave testimony from a number of published papers on NHL. And then -- as to how fast it comes up. But I'm no expert there.

Q. Yes, sir. And that came up because of the issue of the De Roos 2005, which is from the Agricultural Health Study project, and a critique of yours that that

15:33:09

study may underestimate risk because the median follow-up time is just 6.7 years; right?

A. That's correct. It's a -- it's a cohort study. So you have to get enough patients with the disease before you can actually start seeing a significant effect.

And so you have to accumulate them. You're starting with 0 NHL patients, and you must accumulate them over time. And that's what the follow-up time is.

15:33:31

15:33:44

Q. All right. And 6.7 years, you were saying, may not be enough time to start to see adequate cases to get a good result; right?

A. Correct.

Q. Okay. Because cancer takes time.

15:33:56

A. That's because it takes time to build a cohort of people with enough cancers.

Q. And you gave testimony to EPA on the subject of the latency of non-Hodgkin's lymphoma; correct?

A. I -- I gave them some references in my interpretation of the references.

15:34:13

Q. Yeah, you gave them written comments, not testimony --

A. Correct.

Q. -- from your mouth.

15:34:23

2929, which is probably in Trial Cross 2, is

your October 14, 2016, comments to the EPA, sir.

A. 29?

Q. 2929.

A. No, not that one.

15:35:13 Q. We're almost done, sir.

A. That's -- that's fine. I just can't find it. Which one do you think it is?

Q. I think it is -- I'm sorry. Trial Cross 2. Yes, 2929.

15:35:32 A. Trial Cross Exhibits 2 and 2929 something?

THE COURT: 2929.

THE WITNESS: I'm afraid I don't have that one here either, unless I have the wrong folder. It says -- oh, this is regulatory documents. Sorry.

15:36:01 (Interruption in proceedings.)

MR. WISNER: Your Honor, may I approach and help him?

THE COURT: Yes.

THE WITNESS: Thank you for waiting.

15:36:26 Q. BY MR. GRIFFIS: Okay. You found it, sir?

A. Yes.

Q. So these are written comments that you gave to the EPA on October -- October 4th, 2016; correct?

A. Correct.

15:36:36 Q. And they're in the form of a statement by EPA --

I'm looking at page 6, for example -- where it says, in the middle of the page, Number 4, "Recall bias is a concern. Especially in the case control studies." "Comment: I agree."

15:37:01 A. Page 7?

Q. Page 6.

A. Page 6. Sorry.

Let me put this in context, so I know what I'm saying here.

15:37:17 Q. Yes. I don't have a question about that. I'm just trying to establish how this document works. They're making a comment, and you're responding to the comment; right?

A. Correct. "Recall bias is a concern. Especially 15:37:29 in" -- well, they say, "in the case control studies." I probably read it as "in case control studies."

Q. Okay. I'm not actually intending to ask you about that one. I'm just asking how this works.

And then the next question or comment by EPA -- 15:37:44 I'm sorry. Let's go down to 6.

A. Okay.

Q. Item 6: "The follow-up time in the De Roos, et al, 2005 study is sufficient that it should be given more weight than the other studies."

15:37:55 And then you had a comment in response to that;

right?

A. Yes.

MR. GRIFFIS: Ask permission to publish 2929, the October 4th, 2016, comments of Dr. Portier?

15:38:07 THE COURT: Any objection?

MR. WISNER: No objection.

THE COURT: Very well. You may proceed.

Q. BY MR. GRIFFIS: Let's go to page 6, at the bottom.

15:38:24 Okay. "So as noted by Portier, et al" -- this is your comment. You're citing yourself --

A. Right.

Q. -- in one of your publications. "The median follow-up time in the AHS study was 6.7 years, not 7, and

15:38:36 there is a question of whether this is long enough."

And then you start to talk about some of the literature on how long it takes for non-Hodgkin's lymphoma to develop; correct?

A. Correct.

15:38:47 Q. And the question -- I mean, the epidemiological question here is that we're trying to find out whether exposure to glyphosate causes cancer. And if you do a study where you expose people to glyphosate and then check them six months later, that's not enough time,

15:39:04 right?

A. That, I don't know.

Q. Well, that is the general issue, whether the period of time from exposure to checking whether they have the disease is long enough; right?

15:39:17 A. No. We're talking about first -- this first talks about a follow-up time. That's not what follow-up time is. Follow-up time is from the beginning of the study until the time you evaluate something.

And you have to have a long enough follow-up

15:39:35 time to have enough cases to be able to do the evaluation.

Then I went into discussion of latency, which is a different thing.

Q. Okay. Tell us what latency is.

15:39:45 A. Latency is the time from first exposure to our -- if you can estimate it, from exposure to the onset of the disease.

Q. Okay. And the two have something to do with each other?

15:39:56 A. Latency has a distribution to it.

Q. Okay.

A. Some people are very susceptible, and it happens fast. Other people are very resistant, and it takes a very long time.

15:40:09 Latency and follow-up time have somewhat of a

relationship. But it's not that strong of a relationship. If the latency for everybody is ten years minimum, then the follow-up has to be at least ten years in a case -- well, no. That's not true. Because in a cohort study, people could have been exposed nine years earlier, and you'd see your first case one year into the study, because the latency is way back then.

So they're not actually that related to each other.

Q. Okay. Let's talk about your discussion to the EPA of the issue of latency, which is the time between exposure to a substance, if that substance is going to cause cancer, and the cancer.

And let's look at the next page, please.

So first of all, up here you're talking about Weisenburger 1992. That's a publication; right?

A. That's correct.

Q. And he says that, "The latency for NHL following environmental exposure is largely unknown." And then he talks about some information like chemotherapy and radiation treatment; correct?

A. Correct.

Q. Okay. And then part of your comment is right here, "These are rather extreme exposures relative to those from glyphosate."

And by rather extreme exposures you're talking about chemotherapy and what else?

A. Radiation.

Q. Okay. So radiation and chemotherapy treatment are both extremely cancer generating because of the way they operate; right?

15:41:45

A. Well, chemotherapy, because it is aimed at killing cells and damaging quite a bit to try to get the cancer to go away, many chemotherapeutic agents are -- they call them secondary cancers. They create secondary cancers. And sometimes very rapidly. But, yes, they're -- they're big exposures.

15:42:13

Q. So your comment was, "These are rather extreme exposures relative to those from glyphosate, and it would not be surprising for the glyphosate lag time to be longer than that from chemotherapy and radiation treatment, as suggested by Weisenburger, et al"; right?

15:42:28

A. That's what it says.

Q. And the latency was from 1 to 11 years, and up to 16 in these papers that you said were probably on the short side compared to glyphosate; right?

15:42:41

A. This -- that's what it says, but I should have used "median lag time" and "median latency," because it's an entire distribution, as I pointed out before. And so you may --

Q. It's an entire distribution? Is that what you said?

A. It's an entire distribution of times. And people who are sensitive to massive dose could be sensitive to low dose as well. So it still may include very short periods of time. But your distribution would spread out. So more people would have longer periods before they would see the glyphosate toxicity.

Q. And there would be a curve?

A. There's a whole curve to it, yes.

Q. Sort of a bell curve --

A. Correct.

Q. -- distribution?

Now, you've also testified on this subject before the Scientific Advisory Panel; correct?

A. I did not testify, no.

Q. Okay. You presented comments to the SAP?

A. I sent in written comments.

Q. Okay. And they discussed your comments; right?

A. This -- these are the written comments that went to that meeting.

Q. All right.

A. As well as two follow-ups.

Q. Okay. Let's take a look at SAP's discussion of your comments.

A. Okay.

Q. This is 2440.

A. Same book?

Q. Regulatory 2.

15:44:30 A. Okay.

Q. All right, sir. And I am on page -- I'm on page 37.

A. Okay.

MR. GRIFFIS: Permission to publish the SAP's

15:45:02 findings on latency?

THE COURT: Any objection?

MR. WISNER: Provided there's no objection if we publish when we use it, no.

THE COURT: All right. Very well.

15:45:13 You may proceed.

Q. BY MR. GRIFFIS: On page 36. That's actually -- yeah. This is the section on latency; correct?

A. I've got it.

Q. Okay. All right. And at the top of page 37,

15:45:38 the next page, they talk about you, "For instance, Portier, et al, 2016, stated that the follow-up period in De Roos, et al, is not long enough to account for cancer latency."

So the follow-up period, you explained what that

15:45:55 is, isn't long enough to account for cancer latency, and

you explained how that's a separate but related concept; correct?

A. Yes. It was separate and a different concept. I don't agree with the sentence I have here, but --

15:46:09 Q. I'm sorry?

A. They've misquoted me.

Q. Okay. What would be the correct quote?

A. Well, I dealt with latency separate from follow-up time.

15:46:20 Q. All right.

A. And they've -- they've brought them together and say it's not long enough. I don't think I ever said that.

Q. "Panelists has also noted" -- now I'm down at

15:46:30 the bottom. "Panelists also noted the evidence presented by Weisenburger 1992, who stated that while median latency for NHL was five to six years for high exposures to chemotherapy or radiation, it is expected to be much longer for lower exposures."

15:46:50 That paper goes on to state that, "A median range of 15 to 20 year latency is plausible for lower chronic exposures"; correct?

A. That's what it says.

Q. So do you believe that Dr. Weisenburger's

15:47:05 statement -- that Dr. Weisenburger's correct, that median

latency for NHL would be five to six years for intense exposures like chemotherapy or radiation?

MR. WISNER: Objection. Hearsay within hearsay.

THE COURT: Overruled.

15:47:18 You may answer.

THE WITNESS: Can I see the Weisenburger paper? I certainly know that in the Weisenburger paper the median latency he cited is five to six years based upon the cases he looked at.

15:47:33 But I don't know that he went on to say the other thing about median 15 to 20. It wouldn't surprise me, but I'd love to see the paper.

Q. BY MR. GRIFFIS: Let me show you this. Look at 2749. In the -- yeah, not in the regulatory binder. In

15:47:47 the blue binder.

A. Okay.

Q. So these are the written comments of Dr. Weisenburger to the EPA?

A. I don't have it.

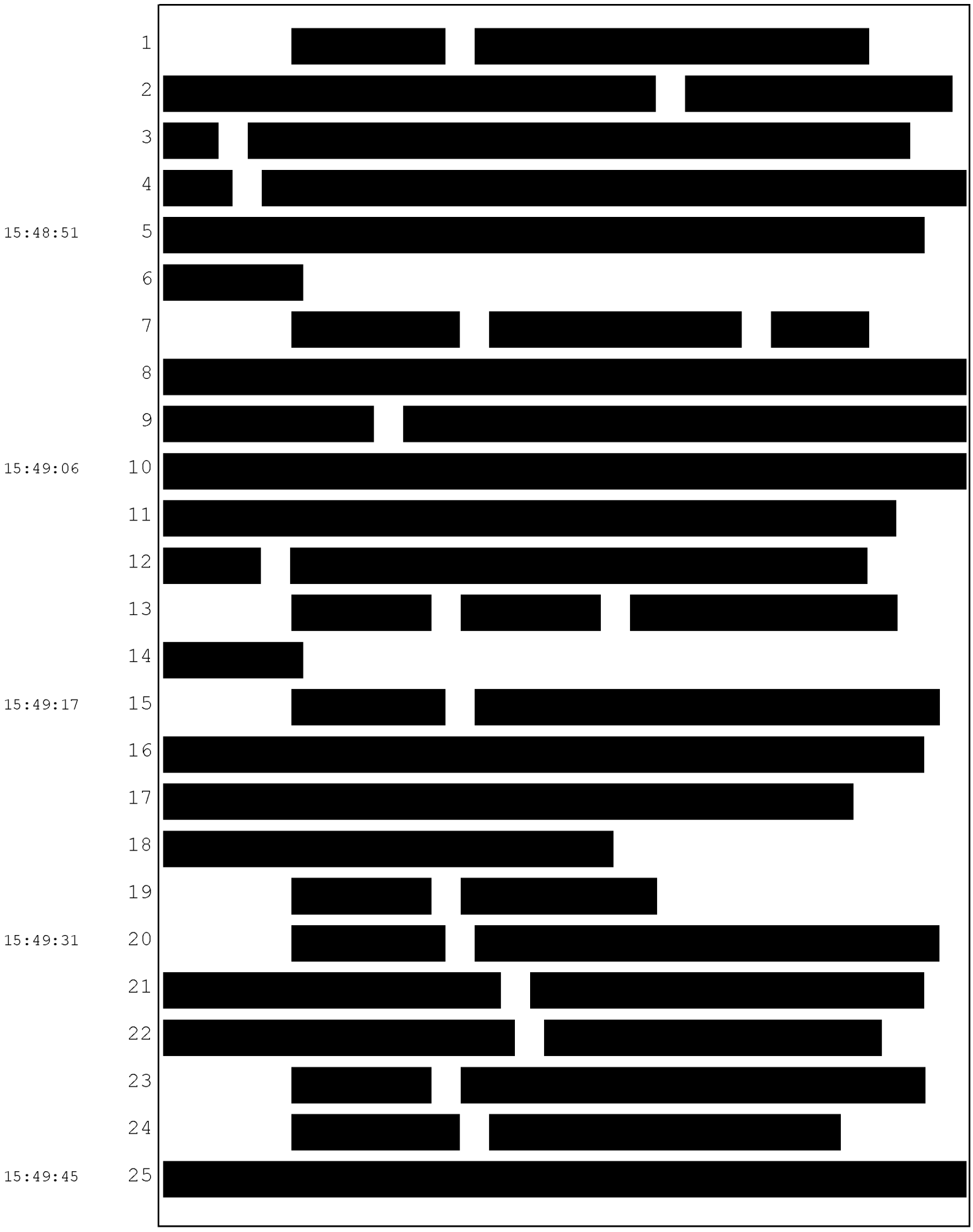
15:48:08 Q. Oh, of course.

MR. WISNER: Your Honor, I'm going to object. Can we have a sidebar on it?

THE COURT: Yes.

MR. GRIFFIS: Hand you that, sir.

15:48:24 (Sidebar.)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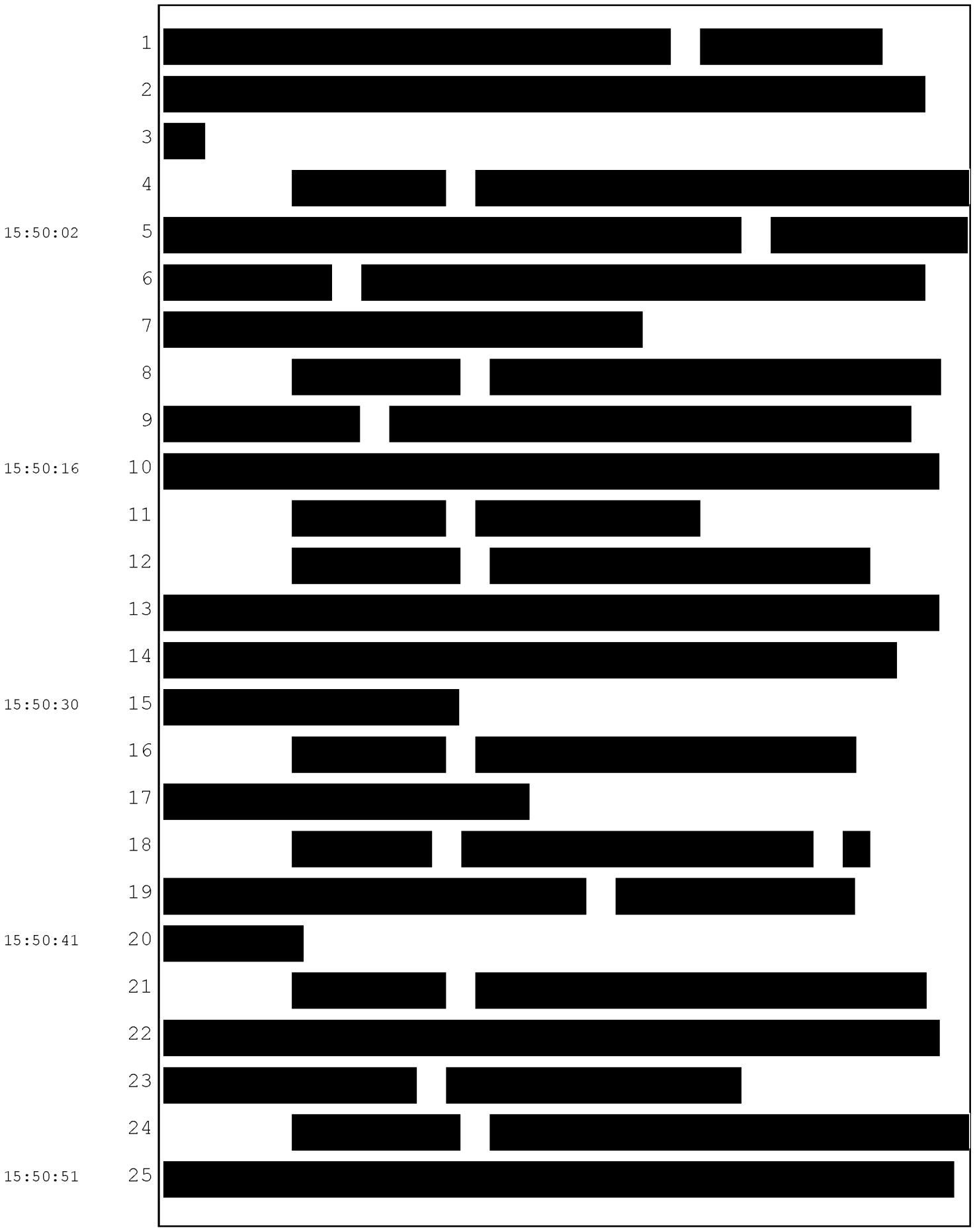
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[redacted]

(End sidebar.)

THE COURT: You may proceed.

THE WITNESS: Counsel, I must apologize. I actually had the insert. I found it.

Q. BY MR. GRIFFIS: Oh, I'm so happy.

So you know that Dr. Weisenburger submitted written comments, as you did, to this SAP panel; correct?

A. Correct.

Q. On the subject of latency?

A. Correct.

Q. And commenting about his 1992 paper; correct?
A. If I remember his comments, yes, correct.
Q. Okay. And have you seen those comments?
A. Yes, I did read the comments.
15:52:21 Q. Is that what this is (indicating)?
A. It looks like it, yes.
Q. Now, he -- in -- he says, "This statement of the EPA document implies" -- let's back up.
This is a letter from Dr. Weisenburger to
15:52:40 Steven Knott at the US EPA, where a comment to the EPA issued paper on glyphosate, dated September 12th, 2016. "Dear, Mr. Knott, I am providing the following comments to the EPA regarding the above cited document. On page 67 of this document, it states that the latency period
15:52:57 for non-Hodgkin's lymphoma, NHL, in general is unknown and that estimates range from 1 to 25 years, with a citation to my 1992 paper," and then he gives the cite; right?
A. Correct.
15:53:10 Q. Okay. This statement in the EPA document implies that the range of latency period for glyphosate exposure and the potential development in NHL is likely to be within the range, i.e., the range of 1 to 25 years; correct?
15:53:26 A. That's my interpretation of the sentence.

Q. Okay. "Such an interpretation from my 1992 paper is incorrect. As stated in the paper, the latency period for NHL would be short following cancer treatment with chemotherapy and/or radiation, e.g. 5.6 years, and for atomic bomb survivors, about 9 years, with a longer latency for those receiving smaller doses. I further stated that long-term low-level exposure would be expected to result in a long latency period."

Am I doing well reading so far?

15:53:48

A. You're doing fine.

15:54:05

Q. Okay. Do you disagree with anything he said so far about his 1992 paper on latency?

A. I think he's -- he's missed a couple of years in here. In his paper, it's median was 5 to 6 years --

Q. Okay.

A. -- not exactly 5 to 6 years. And for atomic bomb survivors, it's -- it's a little more complicated than his 9-year number in his paper. He's just, kind of, drawing one number from a much more complicated.

15:54:36

Q. Okay. He's kind of summarizing a more detailed picture than inside his 1992 paper as far as atomic bomb survivors?

A. Correct. Some of those people had -- had leukemia within one year and others still don't.

Q. Okay.

A. So it's a complicated picture.

Q. All right. It's not everyone at nine years. It's a distribution.

A. Correct.

15:54:52 Q. But the median was nine years; right?

A. He gave several medians. He didn't give one.

Q. Okay. All right. "I further stated" -- I'm quoting from the letter again. "I further stated that long-term low-level exposure would be expected to result

15:55:06 in a long latency period. For example, the average latency period for the development of NHL due to long-term low-level exposure to organic solvents is about 20 years."

And do you agree with that, that the average

15:55:21 latency period from NHL for long-term low-level exposure to solvents is about 20 years?

A. I have no idea.

Q. Okay. "Since exposure to glyphosate would be expected to be long-term low-level exposure, the citation

15:55:34 of my paper for the proposition that a latency period for glyphosate exposure in relation to NHL can range from 1 to 25 years would contradict the conclusion of my 1992 paper.

I would expect the average latency period for

15:55:52 glyphosate exposure in relation to potential NHL to be at

the upper end of this range. Most likely 20 or more years from initial exposure."

That's what he wrote; right?

A. That's what he wrote.

15:56:05 Q. Do you disagree with Dr. Weisenburger, that the average latency period for glyphosate exposure in relation to potential NHL would be most likely 20 or more years from initial exposure?

A. I have no idea.

15:56:28 Q. Mr. Johnson was diagnosed in August of 2014, sir, and began spraying glyphosate in 2012 --

MR. WISNER: Objection.

Q. BY MR. GRIFFIS: -- and if his non-Hodgkin's lymphoma was caused --

15:56:42 THE COURT: Just a minute. There's an objection.

Do you need to approach?

MR. WISNER: Yes, your Honor. I'd like to approach on this.

15:56:52 (Sidebar.)

[redacted]

15:57:10

[redacted]

(End sidebar.)

MR. GRIFFIS: No further questions, sir.

15:57:37 Thank you.

THE COURT: Thank you.

THE WITNESS: Thank you.

THE COURT: Mr. Wisner.

MR. WISNER: Yes, your Honor.

REDIRECT EXAMINATION

BY MR. WISNER:

Q. Good afternoon, Doctor. How are you?

A. I'm good. Thank you.

15:58:04 MR. WISNER: May I proceed, your Honor?

THE COURT: Yes.

Q. BY MR. WISNER: All right. I've got a lot of stuff to cover. I'll try to get it done today, so you can go home. But the likelihood is you'll be back

15:58:15 tomorrow morning for a short period of time. And I'm

forever sorry for that.

A. That's what I'm here for.

Q. Okay. Let's start off with some things that were covered on cross-examination. Let's start off with the NAPP. Do you recall questions about the NAPP?

15:58:30

A. I recall there were questions about the NAPP.

Q. And that's a North American Pooled Project; right?

A. Correct.

15:58:42

Q. And that's an epidemiology project that's looking at a bunch of North American studies and pooling the data?

A. Correct.

Q. And you haven't seen a publication on it yet, have you?

15:58:52

A. That's correct.

Q. Why is that important to you?

A. Well, many times draft publications don't stand the test of time if they go through all the authors of the publication. Things change. Authors want it analyzed a slightly different way, et cetera. They want the conclusions written in a slightly different way. There's all kinds of changes that can -- that can come up.

15:59:02

15:59:17

Q. Do you recall on cross-examination being shown a

draft manuscript?

A. Yes, I do.

Q. It had, like, redlines in it and everything?

A. Correct.

15:59:26 MR. WISNER: Permission to publish, your Honor, Defendants' Exhibit 2868?

THE COURT: Any objection?

MR. GRIFFIS: No objection.

THE COURT: Very well. You may proceed.

15:59:34 MR. WISNER: Thank you, your Honor.

Q. So this is that document, Exhibit 2868.

And do you see right here, date of last revision, September 21st, 2015?

A. Correct.

15:59:42 Q. So we know that this draft is well over -- well, almost three years old?

A. Yes.

Q. Okay. Mr. Griffis showed you some portions of it. I want to show you some portions of it.

15:59:59 Let's look at page 12 of 9. And it says right here, "This report confirms previous analysis indicating increased risks of NHL in association with glyphosate exposure."

Do you see that, Doctor?

16:00:15 A. Yes.

Q. Okay. And then if we go down here to this next paragraph, "Our results are also aligned with findings from epidemiological studies of other populations that found an elevated risk of NHL for glyphosate exposure and
16:00:31 with a greater number of days per year of glyphosate use, as well as a meta-analysis of glyphosate use and NHL risks. From an epidemiological perspective, our results are supportive of the IARC evaluation of glyphosate as a probable Group 2A carcinogen for NHL."

16:00:54 Do you see that?

A. Correct.

Q. So based on what we've read here, at least the authors of the NAPP study are confirming IARC, aren't they?

16:01:02 MR. GRIFFIS: Objection. Leading.

THE WITNESS: At one point.

Q. BY MR. WISNER: Fair enough.

MR. WISNER: I'm sorry. Was there an objection?

MR. GRIFFIS: Yes, it was leading.

16:01:09 THE COURT: Overruled.

Q. BY MR. WISNER: All right. I understand there was some other data in that NAPP study, Doctor, that was shown to you, that presentation. Do you recall that?

A. I recall the presentation, yes.

16:01:34 Q. Doctor, do you recall that there was data about

greater than two days of year per use?

A. Yes.

Q. And that data showed a positive association with NHL?

16:01:49 A. I lost the exhibit.

MR. WISNER: Permission to publish, your Honor? It's Defendants' 2827.

THE COURT: Any objection?

MR. GRIFFIS: No objection.

16:01:58 THE COURT: Very well. You may proceed.

Q. BY MR. WISNER: So this is the presentation we're talking about. And I'll just pop it up on the screen.

Well, let's just start off with the overall,

16:02:11 never, ever. Doctor, this is the overall, never, ever data in this slide show?

A. Correct.

Q. And overall has a 1.43 statistical significance?

A. Yes.

16:02:35 Q. And then it has all these different subtypes.

Do you see that?

A. Yes.

Q. And there's obviously other that's statistically significant at 166?

16:02:45 A. Yes.

Q. Okay.

A. Well, the confidence bound doesn't include 1.

Q. Yeah. Well, just barely, but it doesn't include 1.

16:02:54 And to the best of your knowledge, FL, DL, BCL and SLL, do those include T-cell lymphoma?

A. I don't know.

Q. Okay. Fair enough.

16:03:16 Here's another chart that was not shown to the jury.

All right. This is -- it says, "Frequently days per year of glyphosate handling and NHL risks"; right?

A. Yes.

Q. Okay. And then it has between zero and two

16:03:28 days.

Do you see that?

A. Yes.

Q. And that's not an elevated or statistically significant rate?

16:03:33 A. Correct.

Q. And then we have greater than two days per year.

Do you see that?

A. Yes.

Q. And that's more than doubling of the risk?

16:03:41 A. Yes.

Q. And it's statistically significant?

A. Yes, it is.

Q. And if you look across all the subtypes, it is also above 2 across the board.

16:03:49 Do you see that?

A. Yes, I do.

Q. And for FL, although it's not statistically significant, it's close at .99?

A. Correct.

16:03:56 Q. And then it is statistically significant for DL, BCL.

Do you see that?

A. Yes.

Q. Okay. And then these ones aren't significant,

16:04:05 but they're elevated.

Do you see that?

A. Yes.

Q. Okay. And would that -- would those results be consistent with the portion of the manuscript we just

16:04:15 read to the jury?

A. Yes.

Q. Okay. All right. Let's look at --

MR. WISNER: Your Honor, permission to publish Defendants' Exhibit 3183?

16:04:39 THE COURT: Any objection?

MR. GRIFFIS: No objection.

THE COURT: Very well. You may proceed.

Q. BY MR. WISNER: All right. Doctor, do you recall being shown this little chart with all the various agencies?

16:04:48

A. Yes, I do.

Q. All right. Let's break them down a little bit. And, Doctor, I don't want to know which agency it was, but you looked at other agencies besides just this one; correct?

16:05:00

A. Yeah, there was at least one more.

Q. Okay.

MR. GRIFFIS: Your Honor --

Q. BY MR. WISNER: And you weren't asked any questions about that?

16:05:07

MR. GRIFFIS: May I approach?

THE COURT: Yes.

(Sidebar.)

[redacted]

16:05:24

[redacted]

16:05:40

[redacted]

[redacted]

(End sidebar.)

THE COURT: You may proceed.

Q. BY MR. WISNER: All right. Doctor, let's talk about these one at a time. I'm not sure if it was clear on cross-examination.

Do you agree with the EPA?

A. No.

Q. That was an attempt at levity. Probably didn't work.

Let's talk about these one at a time. First, let's talk about the EPA.

A. Okay.

Q. And that's this one right here (indicating); right?

A. Yes.

Q. All right. Now, the EPA convened as a science advisory panel; is that right?

A. Correct.

Q. And I'd like to show you -- would you recognize a copy of that SAP panel report if you saw it here today?

A. We had one in evidence, yes.

MR. WISNER: All right. Permission to approach, your Honor?

THE COURT: Yes.

MR. WISNER: I'm handing the witness Plaintiff's Exhibit 762.

Q. Is that a copy of the SAP report, Doctor?

A. Yes.

MR. WISNER: Your Honor, permission to publish?

THE COURT: Any objection?

MR. GRIFFIS: No objection, your Honor.

THE COURT: Very well.

Q. BY MR. WISNER: So this is the SAP report. It's dated March 16, 2017; right, Doctor?

A. Yes.

Q. And this is Plaintiff's Exhibit 762. I'd like to turn your attention to page 18 of the document.

A. I'm there.

Q. There was a lot of discussion -- do you recall on cross-examination there being a lot of discussion

about whether or not the EPA followed their own guidelines?

A. Yes.

Q. And do you recall the SAP discussing that?

16:08:08 A. Yes, at several points.

Q. Okay. I want to read this sentence in and ask what you understand it to mean.

"Overall, the panel concluded that the EPA violation does not appear to follow the EPA cancer

16:08:24 guidelines in several ways. Notably for use of historical control data and statistical testing requirements."

What does that mean, Doctor?

A. It's very clear in what it means. There are

16:08:40 guidance in their cancer guideline document about when and how to use historical control data and what statistical tests to use and what are the requirements for using them and interpreting them. And they did not follow those guidelines.

16:08:55 Q. And this is not your opinion; is that right?

A. No, this is not my opinion.

Q. Whose opinion is this?

A. This is the science advisory panel and their expert consultant's opinion.

16:09:07 Q. And I understand a guy by the name of

Dr. Portier was on that panel; is that right?

A. He was one of the expert consultants to the --

Q. And he was the one -- he's your brother; is that right?

16:09:18 A. He is my brother.

Q. Now, the fact that he's related to you, doesn't that make him biased overall in his scientific assessment?

A. I would hope not.

16:09:28 Q. Why do you say that?

A. Because we were raised to not, sort of -- in scientific areas, we'd debate ourselves to death rather than try to believe one or the other if we didn't agree with it. So there shouldn't be a bias.

16:09:47 Plus, he and I never talked about it. So we specifically said we were not going to talk to each other about it when he was named to the panel.

Q. Do you recall on cross-examination there was some conversation about a newspaper article that you were

16:10:02 quoted in? Do you recall that?

A. Yes.

Q. And in that newspaper article, there's a quote from you about your brother's potential impartiality.

A. Okay. There probably was.

16:10:15 Q. Okay. What was the context of that?

A. There was a push by two groups -- I think they were industry-supported groups -- to have my brother and one other panelist taken off the SAP.

Q. And were these people who had been on the SAP before?

16:10:35

A. I don't know about the other panelists, but my brother was on the SAP as a member. SAP meetings have members and invited experts, and so he was a member of SAP for, I believe, seven years, and now he servers as an invited expert sometimes.

16:10:53

Q. And what was the basis of challenging his participation in that committee?

A. He's my brother.

Q. And did the EPA buy it?

16:11:01

A. No, they did not.

Q. All right. Let's go back to this chart. It's Defendant's Exhibit 3183. It's this chart of agencies. Let's move on to the next three. Look at ECHA, EFSA and BfR. Okay?

16:11:27

A. Okay.

Q. And let's just clarify. Are they essentially the same thing?

A. BfR and EFSA, as far as glyphosate is concerned, are essentially the same, because they're all working from -- they're working from the same document.

16:11:39

ECHA is different, but the document that was created for ECHA comes basically from the same group, and the -- the review is basically a similar group, so, no, they're not very different from each other.

16:11:57 Q. And to be clear, BfR does the initial draft; right?

A. Not in this case.

Q. Okay. Who did the initial draft?

A. The glyphosate task force.

16:12:08 Q. And that's an industry-sponsored group of scientists?

A. I -- I guess that would be a description of them, yes.

Q. And then they give a draft to BfR; is that

16:12:17 right?

A. They gave BfR a huge draft, yes.

Q. And then the BfR makes edits and sends it to EFSA?

A. Yeah. Sometimes EFSA considers their approach a

16:12:29 peer review, which means they don't write anything, they review something written to them. BfR usually writes it themselves, but this time they didn't. They did a peer review, basically, editing and cutting and pasting and correcting things in the document.

16:12:44 Q. And would it be fair to say, then, that the

version that BfR initially reviewed and edited, it contained verbatim passages written by industry?

A. Yes. Although, I can only -- yeah -- yes. I mean, it's hard for me. These are -- these are -- these documents are quite complicated, but in the reassessment report that BfR put out, in the first part of it, they talked about they took the draft from the glyphosate task force.

16:13:07

Now, I assume all of their comments and changes are in there, because it's a huge redline document in that sense, but there might be some that aren't, but there are a lot of verbatim parts of it from industry.

16:13:26

Q. Okay. And actually, I just was reminded, this is kind of important, do you recall who wrote the original OPP report for the EPA?

16:13:44

A. No.

Q. Okay. Well, let's take a look. It's actually in the Defendant's exhibits. It's in Volume 2, and it's Exhibit 2071.

A. Regulatory Volume 2?

16:14:01

Q. That's right.

A. 2071?

Q. I think I'm wrong. It's your trial cross exhibit to -- is it there?

A. So the cross exhibits, but not regulatory?

16:14:30

Q. That's right. No, it's not there either. So 2071.

A. Christopher Portier Trial Cross Exhibits, Volume 2?

16:15:05 Q. Yeah, is it in this, 2071?

A. I don't have 2071 in here.

Q. Okay. I've got it here. I got it. It's Exhibit 2437, Volume 2 Regulatory. I got it.

A. That one I have.

16:15:52 Q. Okay. And what's the name of the author of the original CARC report?

A. You're talking about the memorandum delivering the document to EPA?

Q. That's correct.

16:16:06 A. It's two people, Jess Rowland and Carolyn Middleton.

Q. And, Doctor, do you know anything about Jess Rowland?

A. Never met him.

16:16:37 Q. Okay. All right. So let's move on to -- sorry. Back to these ones. We were discussing the EFSA and ECHA process, and I understand you and EFSA had a back-and-forth, and you published an article specifically represented to ECHA; is that right? Sorry. EFSA.

16:16:52 A. EFSA, yes.

Q. Comparing EFSA and IARC; right?

A. Correct.

Q. And in that article, there were some questions by opposing counsel about whether or not you disclosed the fact that you were working on glyphosate litigation. Do you recall that?

A. Correct.

Q. Did you disclose it in that open letter to the world?

A. In the open letter or in the article?

Q. In the article.

A. In the published article, it's clearly disclosed.

Q. Okay. And why did you do that?

A. Because the journals required it. Any conflict of interest has to be published.

Q. Now, I want to be clear. All 95 of those co-authors, were they also working as experts in glyphosate litigation?

A. No.

Q. Okay. All right. I want to talk about something that came up on cross. You remember there was a discussion about the Kumar study?

A. Yes.

Q. And there were some discussions about whether or

not there was a virus in the colony. Do you recall that?

A. Yes, I do.

MR. WISNER: Permission to publish Plaintiff's 1020?

16:17:52 THE COURT: Any objection?

MR. GRIFFIS: No, I don't have an objection.

Q. BY MR. WISNER: All right. Doctor, this is the mouse chart. We talked about it a little bit at length. We are talking about the Kumar study here.

16:18:09 Do you see that?

A. Yes.

Q. And firstly, is there any evidence whatsoever that there was actually a viral infection in that colony?

A. Nothing I can find, other than that one sentence 16:18:18 in the EPA's document, and then in EFSA's original document, they had a sentence in there that was removed later and edited out because they couldn't find any documents. There was no documented blood cytogenicity testing going on.

16:18:38 Q. Why don't you turn to the Defendant's Regulatory Binder 1, and this one I'm sure about it. It's 2071.

A. Okay. I have it here.

Q. What is the document, sir?

A. This is the -- to make it simple, this is the 16:19:04 ECHA document.

Q. And this is where they discussed their classification of glyphosate?

A. That's correct.

Q. Okay. Now, if you turn to page 72 in the document.

16:19:14

A. Okay.

Q. That first big paragraph at the very bottom, do you see, "During a teleconference"?

Do you see that?

16:19:25

A. Where are we looking at?

Q. So the first --

A. First huge paragraph?

Q. The first huge paragraph, at the very bottom, starting, "During a teleconference."

16:19:39

A. Yes, I do see it.

Q. All right. It says, "During a teleconference on carcinogenicity of glyphosate held by EFSA, it was mentioned by a US EPA observer that Kumar, 2001, study had been excluded from US EPA evaluation due to the

16:19:56

occurrence of viral infection that could influence survival as well as tumor incidences, especially those of lymphoma. However, in the study report itself, there was no evidence of health deterioration due to suspected viral infection, and thus the actual basis of EPA's

16:20:14

decision is not known."

Do you see that?

A. Yes, I do.

Q. Do you agree with that sentence?

A. Yes, I do.

16:20:19 Q. Why?

A. Because every time anyone is asked for that evidence, it has not been produced.

Q. So ruling out malignant lymphoma in males in the Kumar study because of a viral infection would not be an

16:20:35 appropriate scientific thing to do?

A. If they really had the viral infection, they would -- you would not rule it out. You would -- you would take that into consideration, but without evidence of a viral infection, of course you keep it in.

16:20:50 Q. And to this day, has anyone ever shown you any evidence that there was a viral infection?

A. No, none at all.

Q. All right. One of the issues that came up on cross-examination was something called multiple

16:21:06 comparisons. Are you familiar with that?

A. Yes.

Q. And what is a multiple comparison?

A. It's -- well, it's when you take a lot of statistical tests and you begin to worry about false

16:21:20 positive findings.

Q. Now, Doctor, is there a difference when you're looking for false positives between a bunch of random different tumors appearing and the same tumors appearing over and over again?

16:21:35 A. Yes. They -- as I mentioned, you can -- you could count -- so that concept of false positives deals with the idea that each and every tumor you're looking at is independent of any other tumor you're looking at, so when I have two studies now, that's no longer the case,

16:21:57 because we're looking at the same tumor in the same strain in the same sex. And so then when you start looking at this idea of multiple comparisons, you also have to take into account the linkage across tissues to make sure that you don't make any mistakes. And when you

16:22:16 start seeing the same tumor showing up in multiple sites, you become very much not worried about the false positive problem.

Q. Why is that?

A. Because the chances of it replicating in two or

16:22:30 three or four studies is extraordinarily low by chance.

Q. And did you calculate that probability?

A. No, I didn't. I'm sorry.

Q. Okay. Do you have a copy of your expert report?

A. Yes, I do.

16:22:39 Q. Please turn to Table 15 in your expert report.

A. Okay. This is the general expert report, not one --

Q. That's right.

A. -- of the later ones?

16:23:05 Okay.

Q. What is this?

A. This is where I look at the question of is it possible that these findings arose by chance.

Q. And I see at the bottom of this, through across

16:23:19 all studies, you looked at the probability of seeing these types of tumors as many times as you did; is that right?

A. Correct.

Q. And how did -- based on that 1-percent

16:23:30 confidence interval --

A. Okay --

Q. -- what was the expected observation of these number of tumors?

A. 4.6.

16:23:36 Q. And how many did you actually see in the data?

A. 12.

Q. So more than three times as many as you would expect to see?

A. Correct.

16:23:45 Q. What's the relevance of that?

A. Again, you're doing what I said we shouldn't do --

Q. I'm sorry.

A. -- dumping all the sexes and species and animals together.

16:23:56

The important -- the really important parts of that come from the male mouse studies where you expected .4 tumors and saw 5. That's almost a twentyfold increase over what you would see expected, and the probability of that is extremely small.

16:24:15

And then you could see in the male Sprague-Dawley rats, you doubled what's expected. Although that's not going to be a small statistical p-value, it's still a big difference. The same is true for the -- where am I here? The -- anyway, those are the big ones. But when you look at that, it becomes unlikely that all of those tumors arose by chance.

16:24:29

Q. When you discuss multiple comparisons this way, is it ever appropriate to just disregard the fact that you're seeing the same finding over and over again?

16:24:48

A. No.

Q. Based on your personal opinion and based on review of these studies of -- in pretty much extreme detail, what is your opinion about the likelihood of these being the result of false positives?

16:25:03

A. It's very, very, very low.

Q. All right. Doctor, there was some discussion about the various mechanistic studies that you reviewed as part of your analysis. Do you recall?

16:25:28 A. Yes.

Q. And then they went over how the EPA characterized certain studies as positive and whatnot. Do you remember that?

A. Yes, I do.

16:25:36 Q. Okay. Let's just talk a little bit about some of those studies, because I want to make sure we all understand what they say. Let's start out with Cavusoglu, 2006.

A. Okay.

16:25:47 Q. What did that show?

A. That showed that people who live in an area near sprayed -- near areas that are air-sprayed with a glyphosate formulation had greater DNA damage by the common assay, I believe, than people who lived further

16:26:04 away.

Q. And when they looked at a similar group of people in 2011 -- strike that -- Cavusoglu did a study in 2011; right?

A. Correct.

16:26:18 Q. That wasn't the same people, was it?

A. No, it was not.

Q. But they looked at people who lived in villages who had been sprayed versus people who lived in villages that had not been sprayed; right?

16:26:30 A. That is correct.

Q. But they waited two years after the last spraying; is that right?

A. It was a considerable time, and they used a different assay.

16:26:38 Q. And if you wait two years to test for genetic damage, they didn't see any difference between people who were sprayed and people who didn't?

A. That's correct.

Q. Is that what you would expect to see?

16:26:49 A. If there was no additional exposure in that two-year period, even if some other component's highly genotoxicity, you wouldn't expect to see it.

Q. Now, let's talk about Bolognesi.

A. Okay.

16:27:02 Q. Do you recall opposing counsel showed some portions where they stated they didn't think it was a -- a long-term effect. Did you see that? Do you remember that?

A. Yes.

16:27:11 Q. What did the Bolognesi study data actually show?

A. Well, I'd really love to get to my notes, but I'll give you a general. The Bolognesi study was four cities that -- where there was exposure in one city organic farming area, where there was no exposure. They
16:27:34 showed that five days after exposure compared to before exposure, three of the four cities saw a significant increase in the amount of DNA damage, and then they went at four months, give or take, and then another one for some of the cities much later, and, of course, it was
16:27:56 going down with time.

Q. And is that, again, consistent with your understanding of the genotoxicity of glyphosate?

A. It's my understanding of the genotoxicity of anything. If there's a point of exposure and you follow
16:28:10 time, it's going to -- it's going to decrease.

Q. For purposes of understanding genotoxicity for people who are chronologically exposed, what's the most importance data to be looking at here?

A. The five days after exposure.

16:28:25 Q. Why is that?

A. Because if they're constantly re-exposed, it will just be in that same range or maybe even a little over time.

Q. Okay. Doctor, there was a discussion about
16:28:37 something called the Ghisi paper. Do you recall that?

A. Yes, I do.

Q. And are you familiar with that paper?

A. Yes, I am.

MR. WISNER: Okay. Permission to publish, your Honor?

16:28:44

THE COURT: Any objection?

MR. GRIFFIS: No objection, your Honor.

THE COURT: And Mr. Wisner, you do need to start wrapping up for today.

16:28:52

MR. WISNER: I know. I'm just going to get through this, and then we can stop, and then he'll come in tomorrow morning, and we'll be out of here right away.

THE COURT: Okay.

Q. BY MR. WISNER: All right. Doctor, on the

16:29:04

screen -- look at that. It works -- you have a copy of the Ghisi paper.

Do you see that?

A. Yes, I do.

Q. And we won't belabor this, but you were asked

16:29:12

some questions about things in here. Do you recall?

A. Yes.

Q. And there was -- if we go into it, we see these different tests, and then here's the -- the big meta chart.

16:29:23

Do you see that?

A. Yes, I do.

Q. And again, here's the -- the grand mean right up here (indicating).

A. Yes.

16:29:31 Q. Okay. And now if we go to the next page, there was a discussion of type of exposures. Let me see if I can pull it up here. Do you remember this?

A. Yes, I do.

Q. And it turns out that the spraying study, that

16:29:44 related primarily to spraying on crocodiles?

A. Yes, it did.

Q. Okay. But there's also topical exposures here.

Do you see that?

A. Yes, I do.

16:29:54 Q. Immersions as well?

A. Yes.

Q. Did Mr. Griffis ask you about those at all?

A. No, he did not.

Q. All right. Let's look at when they break it

16:30:04 down by animals. This is Chart B.

Do you see that, Doctor?

A. Yes, I do.

Q. And what do we see as it relates to mammals versus non-mammals?

16:30:13 A. Mammals have a much larger effect.

Q. And crocodiles, are these mammals or non-mammals?

A. They're non-mammals.

Q. Okay. So what would be in the mammal section?

16:30:24 A. Rats, mouse, cows.

Q. Okay. And then we also have -- on the next page, actually, I thought this was interesting. I didn't show it to you before, but I'm going to show it to you now. This is a chart as it relates to Roundup and

16:30:43 glyphosate.

Do you see that?

A. Yes, I see that.

Q. And this is showing mononuclei in cells after exposure; right?

16:30:50 A. Oh, I'd have to see the legend.

Q. Oh, sorry.

MR. WISNER: We're almost done, your Honor, two minutes.

THE WITNESS: I think it's micronuclei, but yes.

16:31:08 Q. BY MR. WISNER: I'm sorry. Did I say something different?

Okay. But in any event, Doctor, what does this chart show?

A. That Roundup appears to be more effective than

16:31:18 glyphosate over the broad spectrum of species and animals

use.

Q. And the data you've seen as it relates to Roundup, has that additional effect that you've seen on genetic damage, is it explained by cytotoxicity?

16:31:36 A. I -- I wouldn't know. I'd have to look at each study carefully, but I doubt if it's all explained by cytotoxicity.

Q. In your reviewing of it, you looked for it; right?

16:31:47 A. Yes. Although in animal studies, where most of this comes from, it's much more difficult to review that. Unless they tell you something about significant survival differences, you really can't tell. Certainly in the *in vitro* studies, you have to look for that.

16:32:01 Q. One last question and then we can end for the day.

In the human studies, real people actually sprayed with this stuff in Columbia and Ecuador, that wasn't cytotoxicity, was it?

16:32:15 A. Probably not.

Q. Because that's real-world exposures on real-world people?

A. Correct.

MR. WISNER: We can end for the day, your Honor.

16:32:23 THE COURT: All right. Ladies and Gentlemen,

we're going to adjourn now for today. Please remember do not discuss the case, do not do research, and we'll resume again tomorrow morning at 9:30. Remember, this week our schedule is different from all the other weeks.

16:32:38 We're going to be in session tomorrow and Wednesday, but not on Thursday, and then we'll be in session on Friday. Thank you. We'll see you tomorrow at 9:30.

And, Counsel, can you please remain.

Thank you, Dr. Portier.

16:32:51 THE WITNESS: Thank you, your Honor.

(Jury leaves courtroom.)

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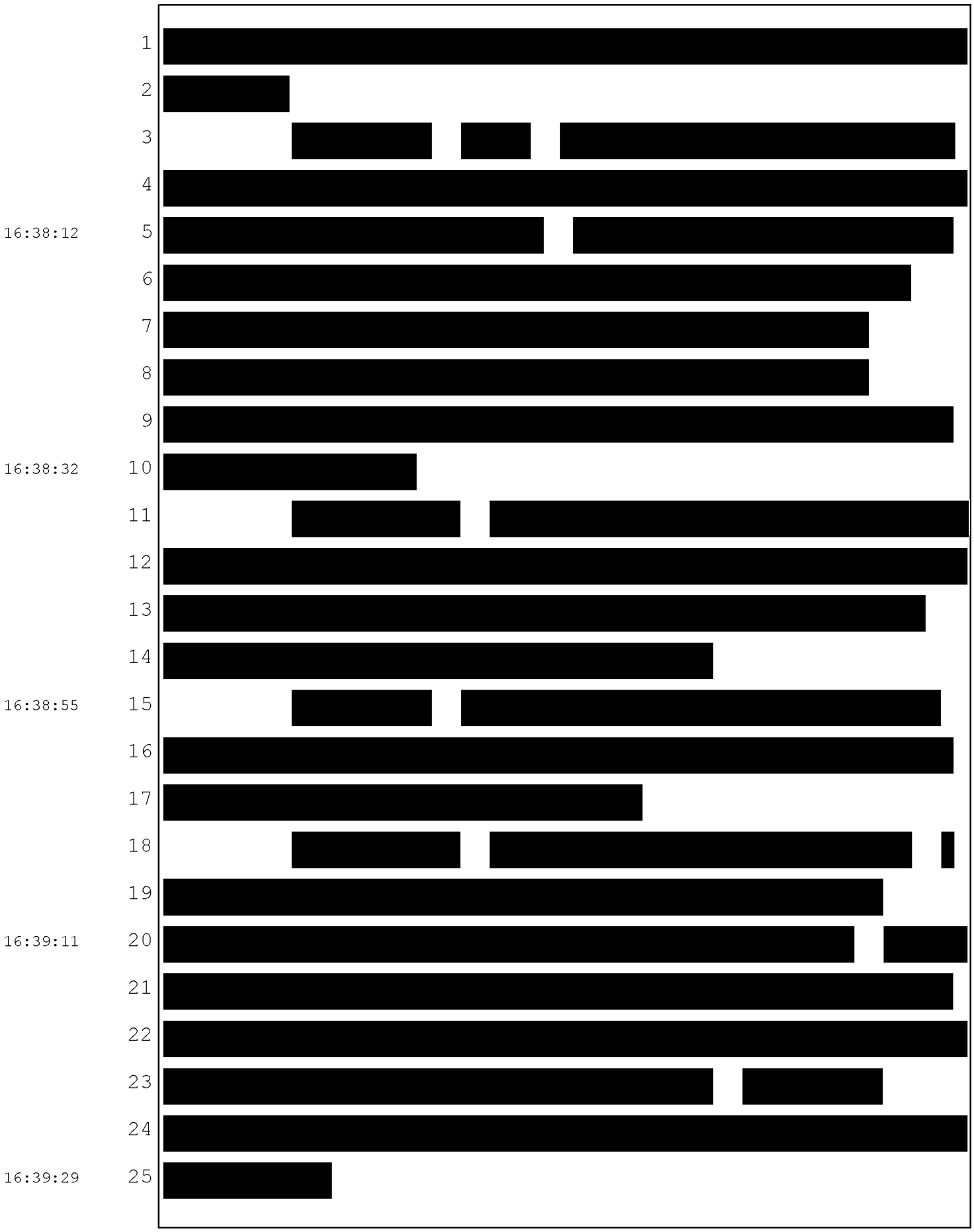
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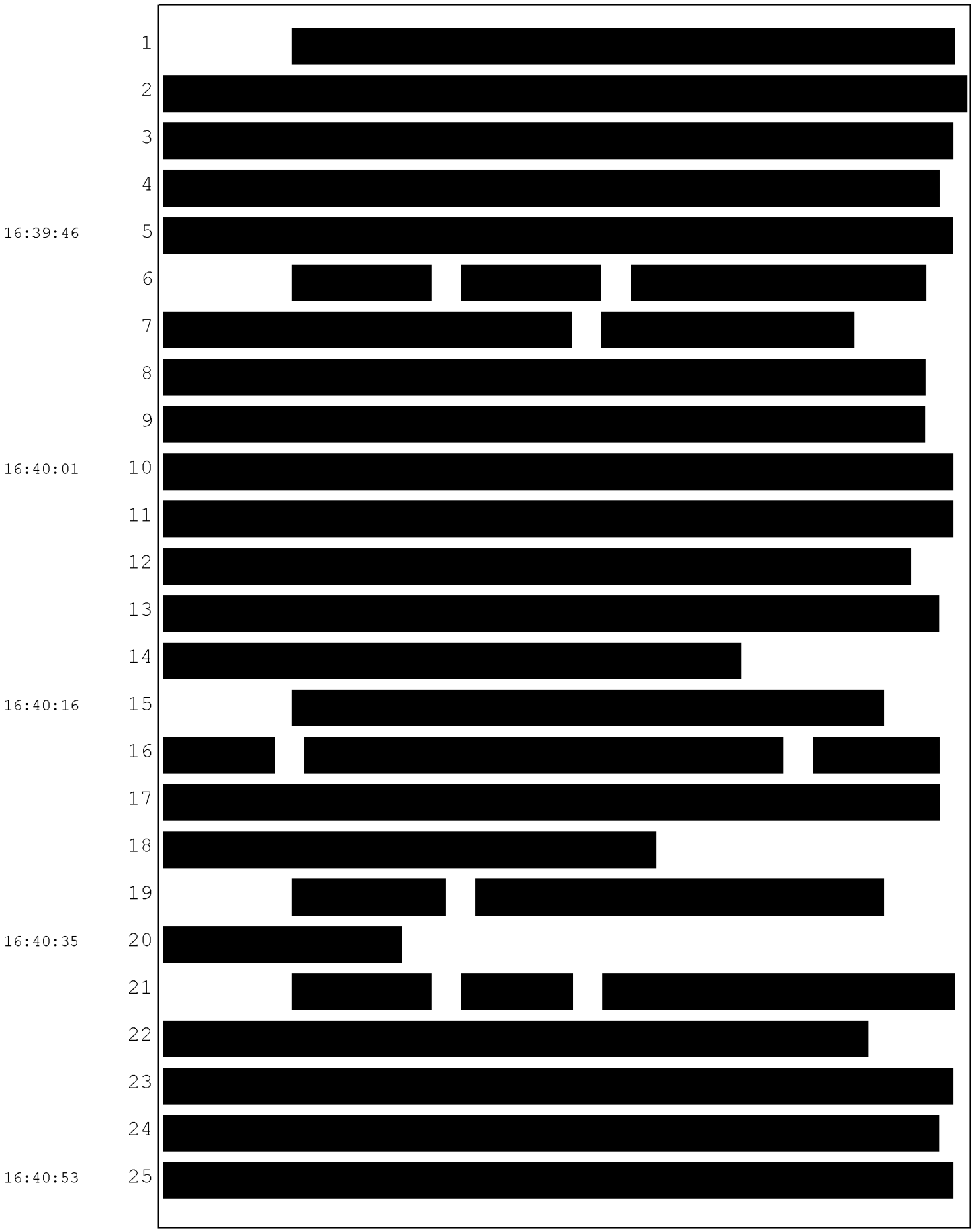
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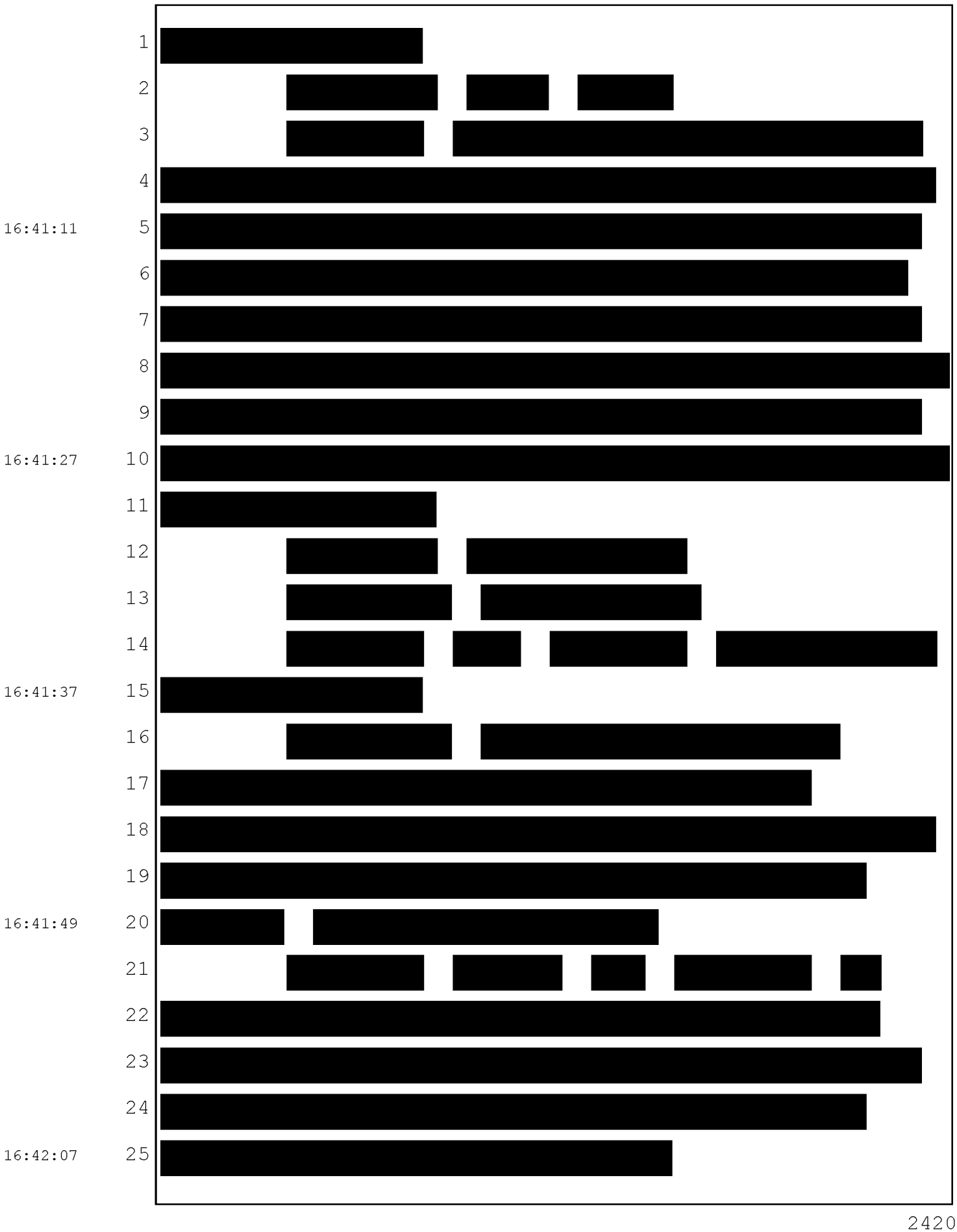
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(Time noted: 4:42 p.m.)

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REPORTER'S CERTIFICATE

I certify that the proceedings in the within-titled cause were taken at the time and place herein named; that the proceedings were reported by me, a duly Certified Shorthand Reporter of the State of California authorized to administer oaths and affirmations, and said proceedings were thereafter transcribed into typewriting.

I further certify that I am not of counsel or Attorney for either or any of the parties to said Proceedings, not in any way interested in the outcome of the cause named in said proceedings.

IN WITNESS WHEREOF, I have hereunto set my hand: July 16th, 2018.

<%signature%>
Leslie Rockwood Rosas
Certified Shorthand Reporter
State of California
Certificate No. 3462