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Transcript of Philip Botham, Ph.D., Corporate Designee, Volume 2

Date: September 18, 2024
Case: Paraquat Products Liability Litigation, In Re:

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339

PHILADELPHIA COUNTY COURT OF COMMON PLEAS

TRIAL DIVISION

IN RE: PARAQUAT PRODUCTS LIABILITY LITIGATION, Case No. 220500559

This Document Relates to All Actions

CONFIDENTIAL

Videotaped deposition of

DEFENDANT SYNGENTA

by and through its corporate representative

DR. PHILIP BOTHAM

Volume II
(pages 339 - 690)

London, England
United Kingdom

Wednesday, September 18, 2024

Job No. 553164

Reported stenographically by:
LEAH M. WILLERSDORF, RMR, CRR, FBIVR, ACR, QRR2, CLR

340

Wednesday, September 18, 2024

09:02 a.m. to 6:03 p.m.
(British Summer Time)

Volume II of the videotaped deposition of SYNGENTA, by and through its corporate representative DR. PHILIP BOTHAM, held at the offices of Kirkland & Ellis LLP, 30 St. Mary Axe, London EC3A 8AF, England, United Kingdom, before Leah M. Willersdorf, Registered Merit Reporter and Certified Realtime Reporter, both with the US National Court Reporters Association, and Fellow of the British Institute of Verbatim Reporters, Accredited Court Reporter, Qualified Realtime Reporter (Level 2), and Certified LiveNote Reporter.

341

APPEARANCES

On behalf of Plaintiffs:

THE MILLER FIRM LLC

The Sherman Building
108 Railroad Avenue
Orange, VA 22960
(540) 882 2525

BY: DAVID J. DICKENS, ESQ.
JEFFREY TRAVERS, ESQ.
ddickens@millerfirmllc.com
jtravers@millerfirmllc.com

On behalf of Defendant Syngenta and the witness:

KIRKLAND & ELLIS LLC

1301 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(202) 389 5000

BY: RAGAN NARESH, ESQ.
ragan.naresh@kirkland.com

On behalf of Defendant Chevron:

JONES DAY

250 Vesey Street
New York, NY 10281-1047
(212) 326 3939

BY: AMANDA SIMMS, ESQ. (via Zoom)
klahaszow@jonesday.com

342

APPEARANCES
(continued)

On behalf of Defendant FMC Corporation:

TROUTMAN PEPPER LLP

3000 Two Logan Square
Eighteenth and Arch Streets
Philadelphia, PA 19103
(215) 981 4000

BY: CHRISTINA M. BOSTON, ESQ. (via Zoom)
christina.boston@troutman.com

ALSO PRESENT

Mark Smith, Esq.	-	Syngenta
Brian Brake	-	The Miller Firm (via Zoom)
Barry Boise	-	Troutman Pepper (via Zoom)
Randi Ellis	-	Special Master
Jeremy Dineen	-	Videographer
Linda Fleet	-	Remote technician

WITNESS INDEX

EXHIBITS INDEX

EXHIBITS INDEX

EXHIBITS INDEX

347

EXHIBITS INDEX

Exhibit No.	Description	Page
Exhibit 66	Email dated March 3, 2007 from John Bembridge to Barry Elliott, forwarding an email from Barry Elliot to John Bembridge, et al., dated March 5, 2007 (SYNG-PQ-21852216)	470
Exhibit 67	Syngenta slide deck entitled "Parkinson's Disease - What can Syngenta say about the issue?" and attached to the email in Exhibit 66 (36 pages, Bates cut off)	470
Exhibit 68	Global Product Registration document entitled "Paraquat dichloride PP148 Regulatory Options Document," with an issue date of September 28, 2007 (SYNG-PQ-03767922 - 935) [Confidential - Paraquat Litigation]	473
Exhibit 69	Document headed "Paraquat Vision Workshop 18th-19th April 2000" (SYNG-PQ-03708995 - 9086) [Confidential - Paraquat Litigation]	482
Exhibit 70	Email string, with the most recent being from Mike Clapp to Chris Sheard, dated May 3, 2001 (SYNG-PQ-21237289- 292)	494
Exhibit 71	Email from David Ray to Bruce Woollen, et al., dated April 7, 2003 (SYNG-PQ-01981616) [Confidential - Paraquat Litigation]	500

348

EXHIBITS INDEX

Exhibit No.	Description	Page
Exhibit 72	Email string, with the most recent being from Nick Sturgess to Mike Clapp, dated April 8, 2003 (SYNG-PQ-04206076 - 078)	504
Exhibit 73	Email from Nick Sturgess to David Ray, et al., dated April 23, 2003 (SYNG-PQ-01981617) [Confidential - Paraquat Litigation]	509
Exhibit 74	Email from Louise Marks to Mike Clap, et al., dated April 6, 2004 (SYNG-PQ-20878342)	511
Exhibit 75	Email string, with the most recent being from Barry Elliott to Louise Marks, dated September 12, 2006 (SYNG-PQ-20875665 - 667)	514
Exhibit 76	Email string, with the most recent being from Kersten Mewes to James Duan, et al., dated July 31, 2015 (SYNG-PQ-06879579 - 581) [Confidential - Paraquat Litigation]	520
Exhibit 77	Email string, with the most recent being from Duan James to Michael Stepan, et al., dated August 5, 2015 (SYNG-PQ-06865506 - 507) [Confidential - Paraquat Litigation]	527

349

EXHIBITS INDEX

Exhibit No.	Description	Page
Exhibit 78	Email string, with the most recent being from Andy Cook to Roland Mario Dieterle, dated August 17, 2015 (SYNG-PQ-6788000 - 003) [Confidential - Paraquat Litigation]	528
Exhibit 79	Email string, with the most recent being from Nick Sturgess to Mike Clapp, dated October 28, 2002 (SYNG-PQ-01740727 - 728)	536
Exhibit 80	Syngenta slide deck entitled "Paraquat US Regulatory," dated December 7, 2012 (25 pages, Bates cut off) [Confidential - Paraquat Litigation]	544
Exhibit 81	Document headed "The Gramoxone 'AWT' Key Message Toolkit," dated May 2004 (SYNG-PQ-13127901 - 103) [Confidential - Paraquat Litigation]	550
Exhibit 82	Email from Jonathan Sullivan to Andre Dias, dated March 11, 2008, forwarding an email from himself to Rolf Furter, et al., dated March 11, 2008 (SYNG-PQ-31449868 - 869) [Confidential - Paraquat Litigation]	554

350

EXHIBITS INDEX

Exhibit No.	Description	Page
Exhibit 83	Syngenta slide deck entitled "Proposal to move to a non Inteon paraquat formulation in the USA," dated April 10, 2010 (SYNG-PQ-13415655 - 663) [Confidential - Paraquat Litigation]	557
Exhibit 84	Email string, with the most recent being from Alan Nadel to Jonathan Sullivan, dated February 2, 2010 (SYNG-PQ-11623147 - 148)	561
Exhibit 85	Syngenta slide deck entitled "Gramoxone 2.0 SL in USA," dated May 25, 2012 (8 pages, Bates cut off) [Confidential - Paraquat Litigation]	564
Exhibit 86	Document with "Risk title: 10.2 Paraquat," and last updated January 2014 (4 pages, Bates cut off) [Confidential - Paraquat Litigation]	569
Exhibit 87	"Final Report to the World Bank on paraquat and possible alternatives," by Dr. A.L. Black, dated March 1994 (SYNG-PQ-29319252 - 410)	574
Exhibit 88	Ortho paraquat CL label as of 1969 (1 page, no Bates)	616
Exhibit 89	Ortho paraquat label as of 1968 (CHEV-SJ0086024 - 026)	617

EXHIBITS INDEX

(On the record at 09:02 a.m.)

THE VIDEOGRAPHER: Here begins media number 1 in the continued videotaped deposition of Philip Botham, In Re: Paraquat Products Liability Litigation, in the Philadelphia County Court of Common Pleas.

Today's date is September 18, 2024. The time on the video monitor is 09:03 a.m.

The videographer today is Jeremy Dineen representing Planet Depos.

This video deposition is taking place at Kirkland & Ellis in London, England.

Would counsel please voice-identify themselves and state whom they represent.

MR. DICKENS: David Dickens on behalf of plaintiffs, and Jeffrey Travers on behalf of plaintiffs.

MR. TRAVERS: Sorry.

MR. NARESH: Ragan Naresh on behalf of Syngenta.

MR. SMITH: Mark Smith, Syngenta.

MS. SIMMS: Amanda Simms, Jones Day, for Chevron.

MS. BOSTON: Christina Boston for FMC Corporation.

THE VIDEOGRAPHER: The court reporter today is Leah Willersdorf, representing Planet Depos. Would the reporter please swear in the witness.

THE STENOGRAPHER: It's Volume II. I don't think -- did you want me to re-swear?

MR. NARESH: I don't think you need to re-swear.

THE VIDEOGRAPHER: We may proceed.

DR. PHILIP BOTHAM,

having been previously sworn,

continued to be examined and testified as follows:

EXAMINATION ON BEHALF OF PLAINTIFFS

(continued)

BY MR. DICKENS:

Q. Good morning, Dr. Botham.

A. Good morning.

Q. I want to pick up where we had left off. We were discussing the biomonitoring or human exposure studies when we left off, and specifically with respect to -- oh, I need a microphone. Let's try that again.

MR. NARESH: It's his first deposition.

MR. DICKENS: Yeah. Yeah, I'm nervous.

Here we go.

///

BY MR. DICKENS:

Q. We were talking about the biomonitoring and the measurement of plasma in those particular studies.

Do you recall that?

A. I do.

Q. And the last document we had looked at mentioned not opening the can of worms, was a comment from Bruce Woollen in that email.

Do you recall that?

A. Yes.

Q. And part of the concern with the testing of plasma was worry with respect to how that would be handled by regulatory agencies, correct?

A. No, not entirely. It's more of a technical issue as to why a single plasma sample and the paraquat that you would find would actually be interpreted, or interpretable, more accurately.

Q. And you said "not entirely." At least one of the concerns for Syngenta in measurement -- or measuring plasma in the biomonitoring studies was how the regulatory agencies would react?

A. The two are related because if you -- if data is created and, actually, it's not essentially an accurate representation of exposure, then clearly

355

there's a concern that a regulatory authority would not necessarily see that context.

Q. Not see that context in not understanding Syngenta's position with respect to the relevance of plasma from biomonitoring studies?

MR. NARESH: Objection to form.

THE WITNESS: What Syngenta always tried to do with those studies was to try to get the best available information on exposure, and urinary monitoring was the quality standard, I guess you would say, to do that.

MR. DICKENS: Okay. I'm going to mark Exhibit 51 for the record.

(Exhibit 51 marked for identification.)

MR. DICKENS: This is topic 17 from the Notice of Deposition.

BY MR. DICKENS:

Q. Exhibit 51 are minutes from a PSAC Tox Subcommittee Meeting held by Syngenta on March 29, 1988, correct?

A. Correct.

Q. And you've reviewed this document prior to today?

A. Yes, I believe I have seen this before.

Q. Now, there's -- under "1. Recommended

356

Spray Strength" and it mentions results of a spray/absorption trial in Malaysia in 1988, correct?

A. It certainly mentions the spray trial in Malaysia. I'm just looking at where the date was, but --

Q. And just the date of the actual minutes of this meeting were March --

A. Yeah, yeah, okay.

Q. And this would have been the Malaysia trial in which we saw they measured plasma that we looked at previously, right?

A. I think that's right.

Q. Now, you had, in your notes, Exhibit 1, included a list of human exposure studies, correct?

A. That's right.

Q. The Malaysia 1988 study where they measured plasma is not included in the list in your notes; isn't that right?

A. That's right, it's not there, yeah.

Q. Is there a particular reason you left that study out?

A. I think it's probably in part because of what we have just been describing in terms of the -- what are the key studies, which were the ones which really gave us the most accurate scientific

357

interpretation.

Q. So you made a determination that this study did not give accurate scientific information?

A. Well, that was not a determination I made personally. And this is in consultation with people who were experts in the field. So I don't say this is definitely good and that's definitely bad; that's not my area of expertise.

Q. Consultation with who that you made that determination?

A. I don't recall exactly with whom I had a consultation specifically about that study.

Q. Okay. Did you discuss this 1988 Malaysia study with anyone in preparation for today's deposition specifically?

A. I don't think I went into any detail on this study, no.

Q. All right. It mentioned the trial involved the 1 in 40 dilution, and:

"... 24 sprayers were involved; half in normal clothing and others allowing maximal exposure..."

Right?

A. Yes.

Q. Now, this clothing, this would be kind of

358

the habitual study, right, of people spraying with what they would typically wear?

A. Yes, I think that's right.

Q. Syngenta didn't instruct or have half the people wear minimum clothing?

A. That would be certainly true if it was habitual.

Q. Do you know if it was habitual?

A. No, I don't know for sure because it doesn't say so here, but it was -- I would suggest it probably is.

Q. Okay. It mentions:

"Under the latter conditions, an unexpected number of positive [...] tests [...] and spraying was halted on day 3."

Right?

A. Yes.

Q. 11 of 24 had nasal irritation, 5 of 24 with nosebleeds, correct?

A. Correct.

Q. It says:

"Recent analysis of results (only 12 available) has shown that all the maximally exposed sprayers had detectable levels of paraquat in plasma..."

359

Right?
A. It does.
Q. Okay. Now if we can turn the page, halfway down the page there's a paragraph that begins "LLS..."
Do you see that?
A. Yes.
Q. And do you understand that to be referring to Lewis Smith?
A. It is.
Q. Lewis Smith, he was with ICI?
A. He was.
Q. It says:
"[Lewis Smith] raised the point of the detection of paraquat in the plasma and the fact that this was the first time it had been observed and related this to the problem that may arise with the EPA."
Right?
A. That's what it says.
Q. What's the problem with the EPA with respect to plasma results?
MR. DICKENS: Objection to form, foundation.
THE WITNESS: I really wouldn't be able to

360

comment. This was 1988, a long time ago and I've no idea what Lewis Smith had in mind at that time.
BY MR. DICKENS:
Q. EPA at this time was concerned about the toxicity of paraquat?
A. EPA has reviewed the toxicity of paraquat over a long period of time. It's been under constant review. So it's certainly in EPA's mind, and so that would be always one of the considerations.
MR. DICKENS: I want to look at another document. Exhibit 52.
(Exhibit 52 marked for identification.)
MR. DICKENS: Topic 17 from the Notice of Deposition.
BY MR. DICKENS:
Q. This is a paraquat PBPK model for cross-species dosimetry, correct?
A. That's correct.
Q. And it was dated April 10 of 2014 and prepared by individuals at the Hamner Institute, correct?
A. That's right.
Q. And they were involved in the PBPK modeling study undertaken by Syngenta, right?
A. These were the people I referred to

361

yesterday who were the experts in modeling.
Q. Okay. So these are experts in the modeling, as you indicated, to determine exposure, right?
A. Yes.
Q. And they did, in fact, do that; is try to determine exposure for paraquat and assisted Syngenta?
A. Yes, they helped us to build these models.
Q. I want to direct your attention to the page ending in 5651.
At the bottom of the page, there's a section beginning "Human," right?
A. Yes.
Q. In the middle of that paragraph, the sentence:
"In the Malaysian banana plantation study [...], there were three subjects with measurable concentrations in both plasma and urine..."
Right?
A. Yes.
Q. And do you understand this to be referring to the 1988 study that we just looked at in Malaysia?
A. Well, I would need notice of that just to be absolutely sure.
Q. Are you aware of any other Malaysian study

362

where plasma was taken?
A. Again, I would have to double-check that, but let's assume that it is for now.
Q. We can agree Dr. Woollen said no plasma was taken in any of the studies, right?
A. Okay.
Q. That's correct?
A. That's what he said, yes.
Q. Okay. Now, the experts retained by Syngenta undertook -- for the PBPK modeling, analyzed some of the plasma data along with the urine:
"For subjects 13 and 16, the similarity in plasma and urinary excretion patterns allowed for the same dermal absorption constant..."
Do you see that?
A. Right, I'm sorry, I'm catching you up.
Q. Sorry. On the next page.
A. Yep. Yeah.
Q. It's about -- the second full sentence.
A. Yes, okay. I can see that, yes.
Q. Now, the dermal absorption constant, that's the rate of absorption rate, and dose?
A. Yes.
Q. And they determined the estimated dermal doses based on the plasma and urinary excretion

363

pattern for that particular individual to be 0.9, 1.8 and 0.9 for subject 13, right?
A. Okay, yes.
Q. And 1.6, 3.4 and 1.0 for subject 16?
A. That's what it says, yes.
Q. Now, in determining -- you can use the body weight of a human, which has been estimated roughly as 70 kilograms, correct?
A. Yes.
Q. And you can use that to determine those individuals' exposure levels, right?
A. Yes.
Q. And compare that to the AOEL?
A. Yes.
Q. And the AOEL, that's the milligrams of the chemical per kilogram of body weight?
A. That's how it's expressed.
Q. So you would divide those milligrams per day by the 70 kilograms to -- if you estimate 70, right?
A. Yes.
Q. And if you do that, then, for the individual who, at the highest exposure level, 3.4 --
A. Yes.
Q. -- 3.4 milligrams per day divided by

364

70 kilograms, that would be about 0.048 or close to 0.05, would it not?
MR. NARESH: I'll object to the form.
THE WITNESS: Yes.
MR. NARESH: If you have a calculator.
THE WITNESS: Well, yes, I don't have a calculator to hand, exactly, I was just going to say.
Yes, I take your word for the calculation you've just done.
MR. NARESH: Yeah, and, you know, if you're going to have him do long division, I'd rather he do long division as opposed to -- and if you're right, great, and if not, that's -- you know, we'll deal with that. But I don't want the witness winging it on the math.
BY MR. DICKENS:
Q. Do you happen to have a calculator with you?
A. I don't.
Q. Okay.
MR. DICKENS: I mean, I can give him a calculator.
MR. NARESH: Sure, yeah.
THE WITNESS: Okay. And what calculation

365

would you like me to do?
BY MR. DICKENS:
Q. Okay. So we're going to take the 3.4 milligrams per day divided by the 70 kilograms.
A. Yep. 0.048.
Q. And 0.048, that would be that particular individual's exposure level, right, if you assume 70 kilograms?
A. Yes.
Q. And the acceptable operator exposure level for paraquat is 0.0005, right?
A. Yes, which is -- comes from a calculation where there's a 100-fold safety factor added.
Q. Okay. And so when this is -- so the 0.05, that is -- or 0.048, that's roughly a hundred times over the acceptable operator exposure level, right?
A. Yeah, but I'm not quite sure where you're going with this, but let's just -- yeah, do carry on.
Q. That's correct, you'd agree with that?
A. I've got a feeling we're missing something here, but, you know, this -- you know, you're subjecting me to mathematics which, you know, I'd really, ideally, need some notice on, but what's -- let's proceed.
Q. Okay. Well, you'd agree that 0.048 is

366

roughly 100 times the 0.0005?
A. Well, that's true.
MR. NARESH: Let me have a continuing objection on this whole line of questioning, if I may, so I don't interrupt you each time. But I don't think this is fairly within the scope of the notice and I don't think it's fair to the witness to ask him to do operator exposure calculations on the fly when conducting operator exposure calculations was not part of the notice.
I'll make that objection one time. Unless you'd like me to make it each time.
MR. DICKENS: No; standing objection.
MR. NARESH: Okay.
BY MR. DICKENS:
Q. Do you agree with that? That 0.048 is roughly 100 times the 0.0005 acceptable operator exposure level?
A. It is, yes.
Q. And you would agree that in order to calculate an individual's exposure level, you would take the milligrams per day and divide that by their weight in kilograms?
A. To get milligrams per kilograms per day, yes.

367

Q. And that's the operator exposure level?
A. Yes.
Q. And that's how the acceptable operator exposure level is derived from?
A. Yes.
Q. Okay. I just want to point out, if you can turn to the next page, there's some Syngenta reports that were reviewed in preparation of this document by those experts retained by Syngenta. And the very last one, that's 1988, paraquat analysis of urine and plasma from Malaysian operator exposure study, right?
A. Yes.
Q. That's the operator exposure study we were just looking at?
MR. NARESH: I'll object on that; foundation, mischaracterizes the prior testimony.
BY MR. DICKENS:
Q. Is that correct?
A. Yes, I believe so.
Q. We can put that aside.
A. Can I give you your calculator back?
Q. Thank you.
MR. DICKENS: Why don't we go ahead and mark Exhibit 53 for the record.

368

(Exhibit 53 marked for identification.)
BY MR. DICKENS:
Q. I've handed you Exhibit 52 --
THE STENOGRAPHER: 53.
BY MR. DICKENS:
Q. -- 53. This is from topic 17 once again, and it's an email chain from June of 2007.
Do you see that?
A. I do, yes.
Q. This is from a Dr. Brouwer to individuals at Syngenta, correct?
A. That's correct.
Q. And this is referring to the studies we looked at yesterday conducted by Brouwer who was with TNO, right?
A. That's right.
Q. And he sends the results of the particular study to Syngenta and then, on June 15, 2007, Martin Wilks responds to those internally at Syngenta, right?
A. That's right.
Q. And looking at those results, he says:
"... this is bad news whichever way you look at it."
Right?

369

A. Yes, that's what he said.
Q. And he gives percent AOELs, so you don't have to do the math, from this particular study, right?
A. Yes.
Q. And for those two individuals, one exceeded the AOELs, 282 percent of the AOEL, right?
A. Yes.
Q. So roughly 2.8 times; yeah?
A. Yes.
Q. And the other rough -- over five times the AOEL?
A. That's correct, yeah.
Q. And this obviously was a concern within Syngenta with respect to the fact that there were individuals in these exposure studies who were exceeding the AOEL?
A. Yes. I mean, it was a surprise. It doesn't -- it normally doesn't happen, if you look at the totality of all the operator exposure studies, and I think we've just been discussing Malaysia, but there are many, many studies. And exceeding the AOEL is not the normal situation, and when it does happen, as was the case here, there are often explanations as to why people got a higher exposure than they should have

370

done.
(Exhibit 54 marked for identification.)
MR. DICKENS: Let's go ahead and look at 54. It's topic 31 in the Notice of Deposition.
BY MR. DICKENS:
Q. Now, this is a document from the Swedish regulatory agency, comments on paraquat report and proposed decision of the United Kingdom made to the European Commission, right?
A. That's correct.
Q. And we discussed a little bit yesterday, the Court decision with respect to the European Commission, right?
A. That's right.
Q. Now, by this point in 1997, Sweden had banned the use of paraquat within the country?
A. I don't remember the date when Sweden did that.
Q. Sweden filed a lawsuit challenging a decision to register paraquat by the EU?
A. That, I do remember, certainly.
Q. And the EU court determined that procedures were not followed in approving or registering paraquat, correct?
A. As mentioned yesterday, it was a

371

procedural decision, yes.
Q. Now looking to this document. If you could go to page 3. In 1997, Sweden notes:
"The proposed AOEL(s) is exceeded by the UK absorption rate model [...] and the German model..."
Right?
A. Yeah.
Q. That was the determination of Sweden, that the AOEL would be exceeded by using this absorption rate model in the UK as well as the German model, right?
A. Yes.
Q. Now, what is the UK absorption rate model?
A. This is at a level of technical detail which I can't comment on. I'm not an expert in the field of these different models. I know that there are many different models that regulatory authorities use to calculate AOELs, and exposure -- how exposure relates to those AOELs.
Q. But under those models, according to Sweden, they were -- the AOEL for paraquat was exceeded, right?
A. That's what they -- that's right. They did say that, yes.

372

Q. For both knapsack spraying and spraying by tractor?
A. That's what they said, yes.
Q. Any reason to dispute that that's correct using those models?
A. Depends what you mean by "correct." I mean, these things are mathematical and the way in which the mathematics works can sometimes -- will differ from one model to another. And so when you talk about exceedance, then it doesn't -- not necessarily mean that that exceedance inevitably means that that is a health risk.
Q. They note:
"Based on urine concentrations, AOEL(s) was exceeded in the knapsack study."
Right?
A. Yes.
Q. And then, for the tractor study, highest exposure level, the proposed long-term AOEL was exceeded and the short-term AOEL was close to be exceeded.
Right?
A. Yes.
Q. Now, the AOEL, once again, that's established as the amount that an individual can be

373

exposed to without being at risk for health effects?
(Stenographer clarification.)
MR. DICKENS: Yeah.
BY MR. DICKENS:
Q. AOEL, once again, is the amount that an individual can be exposed to without the risk of health effects?
A. And it's derived from a 'no effect' level in a toxicity study, and that -- which toxicity study is chosen can differ again, in the way as I've just described, to which are usually a 100-fold safety factor is added. So it's -- an AOEL does not equate to something which is at or close to the toxicity level of a substance such as paraquat.
MR. DICKENS: Take a look at Exhibit 55.
(Exhibit 55 marked for identification.)
MR. DICKENS: Topic 17 in the Notice of Deposition.
BY MR. DICKENS:
Q. This is additional comments to the report and proposed decision of the United Kingdom, right?
A. Yes.
Q. And these are, once again, from Sweden?
A. They are from Sweden, commenting on that same United Kingdom report, yes.

374

Q. In the first paragraph under "General comments," it notes critical health effects of paraquat, including the possible effects of delayed neurotoxicity, right?
A. Yes, that's what it says.
Q. Turn to page 2. From the neurotoxicity, Sweden notes:
"Paraquat should be more closely evaluated as a potentially neurotoxic agent."
Correct?
A. That's what it says, yes.
Q. And then they give some information again on the operator exposure, right?
A. Yes.
Q. They say, once again:
"... AOEL is almost always readily exceeded, with or without PPE, according to the UK-POEM and the BBA models."
Right?
A. Right, and, again, that illustrates my previous point that exceedances of the AOEL are very dependent on the model that you use, and the key parameter in the models is, essentially, the way in which the exposure estimations are used. And some are very conservative, others are, I would guess you would

375

say, more realistic.
Q. Well, earlier you testified that the AOEL was almost never exceeded; it was exceedingly rare for that to be the case, right?
A. If it -- again, it depends on which model you choose to use. But, yes, I mean, those two examples we saw earlier this morning of the exceedances of the AOEL were the ones which we certainly agreed were clear exceedances of the AOEL, whichever way you looked at it, but they were not the normal situation.
Q. Syngenta's position is that any exceedance of the AOEL would be extremely rare? That's Syngenta's position, right?
A. No, I'm not saying extremely rare. It's not -- they are not things which would -- which were routinely seen. Most people are not exposed to levels exceeding the AOEL.
Q. Sweden certainly disagrees with you, though. They say it's almost always readily exceeded, right?
A. That's because of the conservative nature of them -- of the models that are being used here.
Q. Do you think the UK POEM and the BBA models are inappropriate to determine whether an

376

individual's exposure exceeds the AOEL?
MR. NARESH: I'll object to scope and foundation.
THE WITNESS: Now we're moving into a level of detail that would require an operator exposure expert to comment on. I'm not such an expert, so in answering such a question, I would always rely on somebody to say -- to help me to understand where all those conservatisms and differences lie.
BY MR. DICKENS:
Q. You reviewed the statement by Sweden in preparation for today's deposition, right?
A. Yes.
Q. Did you do anything to evaluate the UK POEM and the BBA models?
A. No, I did not.
MR. NARESH: Tell me where in the notice it says Syngenta's evaluation of the POEM and BBA models is identified.
MR. DICKENS: About this particular document we identified and we're going to ask him questions about this document.
MR. NARESH: And you can ask questions, but, Counsel, to the extent you're arguing that

377

Syngenta's position as to foreign POEM and BBA models is within the notice, this is precisely why we sought to get from you the nature of the questions that you're asking about certain documents and you refused to give them.
So I don't think the questions that you're asking are fairly within the scope of the notice, nor have those been identified in subsequent correspondence, despite extensive efforts by us to get the kind of detail about the kinds of things they are looking for.
So you can ask the questions but these are all outside of the scope of the notice. And to the extent Dr. Botham can --
(Stenographer interjection.)
MR. NARESH: And to the extent Dr. Botham can answer those in his personal capacity, I have no objection to that but it is not proper corporate representative testimony.
MR. DICKENS: Your objection is noted.
BY MR. DICKENS:
Q. Now, we go on:
"The results from exposure models clearly show that the operator cannot reasonably protect himself from exposure by wearing commonly used PPE."

378

Right?
A. I completely disagree with that statement. Those models don't tell you that. They actually are models which give a very conservative interpretation of the safety margins and they do not, in any sense, suggest that an operator is unable to protect themselves from the toxicity of paraquat.
Q. If operators were almost always exceeding the acceptable operator exposure level, then that would be evidence that individuals cannot protect themselves even by wearing common PPE, right?
MR. NARESH: Objection; form, foundation, and scope.
BY MR. DICKENS:
Q. You'd agree with that at least?
A. No, I would not agree with that. Again, it depends on which model you're talking about and how conservative that is. And in any case, even in the least conservative, there is -- there are -- there is still that 100-fold safety margin between the AOEL and the 'no effect' level from a toxicity study which is also a part of the protection.
So I don't -- I disagree that people are -- that workers are unable to protect themselves from the potential health effects of paraquat.

379

Q. With the commonly worn PPE?
A. With -- exactly. As always, assuming that the individuals are wearing PPE and are complying with other label instructions and they're not using the product in a way which we wish they should not be.
Q. Now, the PPE identified in -- for wearing in the United States, for spraying, that's always included long-sleeved shirts, long pants, right?
A. I think we'd need to look at labels to be absolutely sure about that, but that's the kind of PPE, yes.
Q. Do you know whether or not the PPE recommended in the labeling in the United States has ever included more than a long-sleeved shirt or long pants while spraying?
MR. NARESH: I'll object to the extent you -- if you'd like to show him labels, I think he can answer questions about labels, but if you're asking him for total recall of 60 years of labels, I don't think that's a fair question.
THE WITNESS: Absolutely. And, again, in my discussions with Mr. Dixon I referred to yesterday, we were looking at some examples of that, and I certainly don't have documents in front of me, labels in front of me, to be able to definitively

380

confirm.
MR. DICKENS: I'm going to hand you Exhibit 56 for the record.
(Exhibit 56 marked for identification.)
BY MR. DICKENS:
Q. I've handed you Exhibit 56, which is a study "Paraquat: Penetration through protective clothing materials from a Malaysian 'Gramoxone' formulation," by R.J. Scott, R.C. Scott, dated March 14, 1986.
Do you see that?
A. R.J. Ward and R.C. Scott, yes.
Q. Okay, thank you.
And this is a document you reviewed in preparation for today's deposition, right?
A. That's right.
Q. And so this study or report was compiled in order to determine how paraquat can penetrate through protective clothing materials, and they used a Malaysian Gramoxone formulation, right?
A. That's correct.
Q. And the Malaysian Gramoxone formulation, that included a surfactant? If you know.
A. I don't know for sure, but I believe so. But I would need to have confirmation of that.

381

Q. And the next page, second page, the purpose of the study was:
"To provide information on the efficiency of various protective clothing materials against paraquat penetration from a Gramoxone formulation, the penetration rates and breakthrough times for paraquat..."
Right?
A. Yes.
Q. And they tested a polyethylene-coated Tyvek, Saran-coated Tyvek, Tyvek, Kimguard, Corovin, and unfinished cotton.
Right?
A. Yes.
Q. And they applied Gramoxone to these materials to determine the penetration rate and breakthrough times?
A. Yes.
Q. Turn to page 6. There's a discussion, right?
A. Yes.
Q. "No paraquat [...] was found to have penetrated the polyethylene-coated and Saran-coated Tyvek during the 6-hour exposure time."
A. Yes.

382

Q. Right?
A. Correct.
Q. Now, at the bottom, the last sentence of that paragraph:
"Tyvek, Corovin and unfinished cotton offered little resistance to either formulation, the breakthrough times being immediately after application."
Right?
A. Yes.
Q. And that's what Syngenta found in this particular study?
A. Yes, it did.
Q. "These data would indicate both polyethylene-coated and Saran-coated Tyvek will offer spray operators protection against both concentrate [...] and the spray strength dilution."
That's another finding Syngenta had in 1986, right?
A. That's what this study showed.
Q. And then it gives the results for the Tyvek, Corovin and unfinished cotton, right?
A. Yes.
Q. It says it:
"... cannot be recommended for protective

383

clothing for use during the application of Gramoxone."
Right?
A. That's what this report says.
Q. Right. This report says that Tyvek, Corovin and unfinished cotton cannot be recommended because it does not offer protection against the concentrate or the spray-strength solution.
Right?
MR. NARESH: Objection; asked and answered.
THE WITNESS: That's what this report says.
MR. DICKENS: You can put that aside. I'll hand you Exhibit 57.
(Exhibit 57 marked for identification.)
BY MR. DICKENS:
Q. All right. Exhibit 57 is another study undertaken by Syngenta, this time in November of 1987, this time studying the "Absorption through Wellington and trooper boots from Gramoxone"?
A. That's correct.
Q. Do you know what Wellington and trooper boots are?
A. Different types of footwear which can be used in situations such as the application of

384

pesticides. But not exclusively so; they are, you know, common workwear that can be used in various situations.
Q. Common workwear that's used with paraquat application, correct?
A. I don't know whether these were both used with paraquat applications. That's a possibility.
Q. It certainly wouldn't be out of the ordinary to hear somebody was wearing Wellington or trooper boots while spraying paraquat, right?
A. Again, that's not -- well, outside of my area of expertise. I can't comment on whether this was -- whether these were used routinely, rarely, or never.
Q. Now, page 2, once again there is an introduction that provides the purpose, and the purpose of this study was:
"To provide information for hazard assessments, [and] the permeation of paraquat through trooper boots and Wellington boots was measured from a Gramoxone formulation..."
Right?
A. Yes.
Q. And, once again, looking at the rate of absorption and the breakthrough time?

385

A. Yes, exactly.
Q. Turn to page 2, or the last page.
A. Yes.
Q. Under the Conclusion section:
"No paraquat was detected to have penetrated through the Wellington boot material during 7 hours..."
Right?
A. That's right.
Q. "However, paraquat penetrated the trooper boot material within 0.25 hours."
A. That's right.
Q. "The subsequent steady [...] absorption rates were not proportional to the applied concentration."
And then they concluded:
"It is possible that the neat formulation altered the structure of the trooper boot material, enhancing the rate of paraquat penetration."
Right?
A. That's what it says.
Q. These authors determined that paraquat could have altered the boot, which would have allowed more penetration, essentially?
A. My interpretation of this is that that is

386

a hypothesis. I don't think they actually tested whether that happened in practice.
Q. At any point in time, did Syngenta warn any paraquat users or farmers in the United States to wear polyethylene-coated Tyvek while spraying?
MR. NARESH: Objection to foundation and the scope.
THE WITNESS: I'm, again, not able to comment on that. I would need to see documents to show one way or the other.
BY MR. DICKENS:
Q. Do you know whether or not Syngenta ever instructed or warned users to wear Wellington boots while applying paraquat?
MR. NARESH: Same objections.
THE WITNESS: And same answer: I would need to see what evidence the documents show as to what advice was given.
MR. DICKENS: Mark 58 for the record.
(Exhibit 58 marked for identification.)
MR. NARESH: What's the topic number on this one, please?
MR. DICKENS: There is no topic number. It's just the only label I have.
///

387

BY MR. DICKENS:
Q. Dr. Botham, what I've handed you is a document, which is a label from September 13, 1993 for Gramoxone Extra herbicide in the United States.
Do you see that?
MR. NARESH: I'll object to the characterization. I think this is a description of the label, not an actual label.
THE WITNESS: Yes. I mean, this is not an area of expertise, so I'm not sure what the status of this is as to whether it's a label or something which goes with a label.
BY MR. DICKENS:
Q. Okay. That's all right. But if we can turn to page ending 5578, there's some precautionary statements that are listed, right?
A. Yes.
Q. And the precautionary statements that are included here are similar to what you've seen in your review of paraquat labels in the United States, right?
A. I mean, I have not extensively reviewed labels in the United States, as I indicated before, so this -- yes, this looks like the kind of information that I would have expected to see on a label.
Q. Okay. This, in 1993, is roughly six,

388

seven years after those two studies in the penetration of PPE that we looked at?
A. Yes, that's right.
Q. It states:
"When pouring, loading, mixing concentrate or when exposure to concentrate is possible, wear..."
It lists:
"Protective clothing (disposable suit/coveralls or long-sleeved shirt and pants)."
Right?
A. Yes.
Q. And that could include unfinished cotton long-sleeved shirts or pants, right?
A. I don't know what that could include.
Q. Well, you have an understanding -- well, there's no description as to what type of long-sleeved shirt or pants to wear, right?
A. It doesn't describe that, and it says "disposable suit." Again, I'm not sure what "suit" is.
Q. So you would agree that if someone wore a long-sleeved pants and shirt made of unfinished cotton, that would be consistent with the labeling information for Gramoxone being sold in the United States, right?

389

MR. NARESH: Object to scope and foundation.
THE WITNESS: It would.
BY MR. DICKENS:
Q. Now, as we looked at in 1986, the Syngenta individuals who conducted this study indicated that unfinished cotton should not be recommended, right?
MR. NARESH: No, hang on. Let me -- well, I'll just object to the form and foundation on that.
THE WITNESS: Yes, that's what the 1987 report for the Malaysia said, certainly.
BY MR. DICKENS:
Q. Roughly seven years before this, right?
A. Right. But I would note, however, that in this document we're now looking at, it also recommends a waterproof apron, and so it's not just simply being reliant on the shirt.
Q. Okay. And that's for the pouring, loading and mixing, right?
A. Correct.
Q. Now, underneath there, they're spraying the end-use dilution, right?
A. Yes.
Q. And that includes the same protective clothing: disposable suit/coveralls or long-sleeved

390

shirt and pants.
Right?
A. Yes.
Q. This one does not include any type of apron, right?
A. It does not, no.
Q. Just waterproof footwear, wide-brimmed hat, protective clothing, including disposable suit/coveralls or long-sleeved shirt and pants.
Right?
A. Correct.
Q. And once again, there's nothing here to indicate to users or farmers that they should not be wearing unfinished cotton, long-sleeved shirts or pants?
MR. NARESH: Objection; scope, foundation.
THE WITNESS: No, it does not specify that.
BY MR. DICKENS:
Q. And there's nothing here that instructs users or sprayers of paraquat to wear polyethylene-coated Tyvek, does it?
MR. NARESH: Same objections.
THE WITNESS: It does not specify, no.
MR. DICKENS: You can put that aside.

391

BY MR. DICKENS:
Q. Sir, in your notes you prepared, Exhibit 1, specifically tab 4, on the second page you note a timeline for approved respirator, right?
A. Yes.
Q. And based on your review, it's fair to say that a approved -- well, first of all, what's a respirator?
A. It's a -- essentially, it's a more sophisticated respiratory protection than a mask would be; so it allows the air to be properly filtered.
Q. Does that include or does that require any type of cartridge to filter out particles or dust in any way?
A. Again, outside of my area of expertise, but a respirator would normally have something of that sort, which is what I described as a filter.
Q. So a respirator was added to the labelling in the United States in 1991?
A. That's right.
Q. It was then removed in 1998 and 1999, correct?
A. For the reasons given here, yes, that the hazard from ex- -- or the likelihood of exposure by that route was deemed to be low.

392

Q. And then it was added back to the label again in 2001, right?
A. It was, yes.
Q. And that was shortly after we looked at that memorandum from the EPA from Dr. Blundell [sic], correct?
A. Yes.
Q. And this was shortly thereafter, right?
A. Yes. And, again, this is a re-evaluation, if you wish, of what was actually happening in the field. So the fact that nosebleeds were being seen, for example, suggested that it might be prudent to bring that requirement back.
Q. Nosebleeds were being seen in the field from the 1960s, though, correct?
A. Yes.
Q. There was no respirator or mask that was required to be worn on the labeling for paraquat until 1991?
A. Well, that's my understanding from the information that I was given, yes.
Q. So a little under 30 years after the product was on the market in the United States?
MR. NARESH: Object to the form.
THE WITNESS: That's the -- what the history of that is telling us, yes.
MR. DICKENS: I'll hand you 59 for the record.
(Exhibit 59 marked for identification.)
MR. NARESH: What's the topic number, please?
MR. DICKENS: Topic 23.
BY MR. DICKENS:
Q. Topic 23 [sic] is an "Investigation into the incidents of nose bleeding on a paraquat plant," December 10, 1968, right?
A. Yes. So, just to be clear, we've now switched gear from using paraquat in the field to a manufacturing plant.
Q. Correct. This is a plant where, at this time, ICI employees were working, right?
A. Yes.
Q. So these are actual employees of the company, correct?
A. They probably were, yes.
Q. If we can turn to the second page, at the bottom.
Now, this investigation was undertaken specifically because nosebleeds were being seen within the manufacturing plant, right?

393

394

A. That's right.
Q. Okay. And "On a few occasions, persons have suffered nosebleeds after being in a zone..." where they were wearing FiltaSafe or an air-fed mask all the time?
Correct?
A. Correct.
Q. Now, these FiltaSafe masks, these included filter pads, right?
A. Again, outside my area of expertise, but the name "FiltaSafe" would suggest that there was a filter.
Q. Okay. And even individuals who were wearing the mask with the filter were experiencing nosebleeds?
A. Yes, and it goes on to say further down, there may be explanations around that as to those masks becoming contaminated.
Q. And that includes that those individuals either wore a contaminated mask or a mask that was removed temporarily, left in a contaminated zone and then replaced.
Right?
A. Yeah, and this is very reminiscent of the recent experience with mask-wearing in Covid, that

395

you've got to have -- make sure that you wear a mask appropriately and you don't, you know, accidentally contaminate it. So this was actually reinforcing that when masks are used, they have to be used appropriately and not left in a place where they could become contaminated or that they should be changed if they are dirty.

Q. But the employees for Syngenta, at this point, were unknowingly contaminating their masks, which resulted in exposure causing nosebleeds, right?

A. These individuals on the plant obviously needed to be reminded about the best practice of how to use masks.

Q. Now, that best practice in how to wear masks, had the users or sprayers of paraquat ever been instructed by Syngenta on the best way to wear masks?

MR. NARESH: Objection; foundation, scope.

THE WITNESS: Okay, so we're now switching back into the field.

BY MR. DICKENS:

Q. Correct.

A. And, again, the specifics of what --

(Test fire alarm system sounded.)

MR. DICKENS: Why don't we go off the record.

396

THE VIDEOGRAPHER: We are going off the record at 10 o'clock.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record at 10:01.

BY MR. DICKENS:

Q. Dr. Botham, you mentioned that the individuals at the plant for paraquat needed to be reminded about the best practice of how to use masks. And so my question turned to those who were actually using paraquat out in the field, the farmers.

Were they ever instructed by paraquat [sic] as to proper measures on how to wear a mask?

MR. NARESH: And I'll object again to the scope and the foundation.

THE WITNESS: Again, outside my area of expertise, but, broadly, I can say that I know that there was always a constant process of making sure that farmers were either reminded or trained about how to use personal protective equipment and what best practice actually meant.

BY MR. DICKENS:

Q. By Syngenta, that training?

A. Including by Syngenta. I mean, this is industry practice that farmers and growers should be kept -- as part of their licensing requirements, properly trained in the use of personal protective equipment.

397

Q. Okay. There was a system put in place by Syngenta whereby all FiltaSafe masks were to be returned decontaminated and having filter pads replaced, and expected to clean and change their filter pads daily, right?

A. And, for the record, you're now switching back into the document about manufacture. So, yes, that's what that says.

Q. Okay. And that's what the employees were instructed to do, correct?

A. Yes.

Q. Do you know whether or not the United States label instructed farmers or other users of paraquat to ever wear a mask that contained a filter pad?

A. Again, the level of detail is beyond my level of expertise, so we're talking about -- we were talking before about NIOSH-approved respirators. My assumption is, as we said before, that they indeed may have contained a filter.

Q. You did undertake a review, however, of the NIOSH-approved respirators on the labeling in the United States?

398

A. I didn't undertake a review to the extent that I asked about the detail of what that respirator looked like, how it was used, and so on. This is simply to document when such a respirator was added or removed from the label.

MR. DICKENS: Okay. We can put that aside.

We've been going an hour. Do you want to take a break now?

MR. NARESH: Yeah, let's do it.

MR. DICKENS: All right.

THE VIDEOGRAPHER: We are going off the record at 10:04.

(Break taken.)

THE VIDEOGRAPHER: We are back on the record at 10:20.

MR. DICKENS: Dr. Botham, I'm going to hand you Exhibit 60 for the record.

(Exhibit 60 marked for identification.)

MR. DICKENS: Topic 22 in the Notice of Deposition.

This exhibit is a document produced by Syngenta in the litigation, "Myths versus Facts: Setting the Record Straight."

399

BY MR. DICKENS:
Q. This is a document you've seen before, Dr. Botham?
A. Yes, I saw it during preparation.
Q. Okay. And this is a marketing brochure issued by Syngenta; is that your understanding?
A. I think that's correct.
Q. And this is specifically for Gramoxone Super, right?
A. That's right.
Q. And, as a brochure, this would have been a document that would have been circulated to distributors and end users, farmers, who were spraying paraquat; is that your understanding?
A. I don't know exactly to whom it went, but I guess that would be the kind of person who might be customers of this.
Q. And on the first page, it includes "Myths" and says:
"Myths are untrue statements that usually arise from misunderstandings or misinterpretations of facts."
And that's what's represented here by Syngenta; is that right?
A. That's right.

400

Q. And then on the next pages, it includes some myths and then the facts as Syngenta sees them, right?
A. Yes.
Q. Okay.
MR. NARESH: Have you established the year of this, sorry?
MR. DICKENS: My understanding is that it is 1986.
MR. TRAVERS: Or '87, maybe.
MR. NARESH: Okay, thank you. Well, I'll take your representation on that.
Unless you know?
THE WITNESS: I don't know, no. I think I did remember asking that question myself and I didn't get an answer to that.
BY MR. DICKENS:
Q. Okay. As you just mentioned, Doctor, you attempted to determine the date; is that right?
A. Yes.
Q. Okay. And do you know when Gramoxone Super was on the market in the United States?
A. No, I don't have specific dates for that.
Q. Okay. It does say for one of the myths that:

401

"Paraquat was recently developed by the US government to spray on marijuana in an effort to deter the illegal use of the plant."
Right?
A. That's right, yes.
Q. And we saw earlier in your testimony, in the statement by Michael Rose to the United States Government, he was discussing use of paraquat on marijuana, right?
A. Yes, he was.
Q. And that was in the mid-to-late '80s, right?
A. Yes.
Q. If we can turn to the page ending 2798. One of the myths:
"Gramoxone Super causes Parkinson's disease."
Do you see that?
A. I do.
Q. And that was something that was being discussed publicly in the late 1980s, right?
A. Yes.
Q. And Syngenta informs farmers and others that there is absolutely no scientific evidence that Gramoxone Super can cause Parkinson's disease, right?

402

A. It was true then as much as it's true today.
Q. So your position today remains the same: There is no scientific evidence that Gramoxone Super can cause Parkinson's disease?
A. We put it slightly differently, that the weight of evidence suggests that there is no causative link between paraquat exposure and Parkinson's disease.
Q. You agree there is currently some scientific evidence that Gramoxone Super can cause Parkinson's disease, right?
A. As in many issues of this sort, you will find scientific evidence which leans more in one direction or another, but we're talking about the overall weight of evidence. And it's also that same weight of evidence analysis that's been done by the US EPA to come to the same conclusion.
Q. Now, have you ever issued a Syngenta brochure or marketing statement to users or farmers to indicate that, "There is some scientific evidence Gramoxone Super can cause Parkinson's disease but we don't believe so based on weight of the evidence"?
A. I'm not -- I've not seen such a document, no.

403

Q. Do you have an understanding that the US EPA's review of paraquat is still ongoing?
A. I mean, the US EPA has reviewed paraquat almost on an ongoing basis since the 1980s, so, yes, there is current -- there is currently another review ongoing.
Q. Including an ongoing review of the evidence with respect to Parkinson's disease?
A. That's part of their review.
Q. Next myth:
"Breathing spray mists of Gramoxone Super will cause lung damage."
It states:
"In fact, there have been no substantiated cases of systemic poisoning or death from inhaling spray mists containing paraquat."
Do you see that?
A. Yeah, that's what it says.
Q. And we saw yesterday there were reports, and we looked at the one from Ireland of an individual who was -- died from what the coroner determined was inhalation of paraquat, right?
A. We did. But what I don't know about this statement, or indeed some of the others, is, if you wish, what evidence base was being used to make these

404

statements.
What I did ask in my preparation is whether there was anybody from Product Safety that was involved in this document. I don't believe that was the case. I don't know who actually wrote this document.
Q. Okay. This document, though, I mean it is a marketing document, right?
A. Indeed, yeah.
Q. And it's a marketing document that is meant to provide facts about the toxicity of Gramoxone, right?
A. About the safety of it, yeah.
Q. Yeah. And, in fact, on the page we were looking at, right above "Gramoxone Super causes Parkinson's disease," it says:
"Myths about the toxicity of Gramoxone..."
A. It does.
Q. And it's your understanding from your review of this document that it's a marketing document and individuals from Product Safety were not involved, right?
A. We don't believe that was the case. I mean, we didn't do an extensive search on that but I did ask that question.

405

Q. Okay. But, nonetheless, it is meant to provide users of paraquat with safety information, correct?
A. It's meant not to give -- it's not like an alternative to a label or a safety datasheet. It is purely to give some headline messages to dispel myths and to hopefully give facts as they were perceived or known at the time.
Q. Okay. Including -- well, strike that.
Nothing in this document tells the reader that it is not meant to provide safety information in lieu of the labeling, does it?
A. No. I'm saying that this was not, as I understand it, the intention, to be a replacement for the label. The labels and the information about safety and precautions were still the most important documents. This was because there -- clearly, media and other outlets were perhaps giving farmers and growers an incorrect perception about the safety of paraquat.
Q. So the readers were supposed to know that this information is merely supplementing what's included in the labeling as to toxicity?
A. I mean, I don't know exactly how this was positioned, but I would have anticipated that this

406

was not meant to be a replacement for the normal means of communicating on safety.
Q. And so, therefore, the Product Safety people at ICI or Syngenta were not involved in coming up with the terms or evaluating this document for accuracy, right?
A. I don't know for sure. As I said, I asked the question and I'd not received any evidence that we were -- or that Product Safety was involved.
Q. If we can turn to the page ending 2800, under "Myth":
"Gramoxone Super always requires special clothing to protect workers from exposure."
Right?
A. Yes.
Q. That's one of the myths that Syngenta is informing the end users and farmers as to whether or not they need to wear protective clothing?
A. But that headline is then given -- the "Fact" is then actually giving more detail underneath that as to what that actually means in practice and that's more familiar, more similar to what we've been discussing with regard to what's on the label.
Q. Okay. So:
"After mixing, [...], diluted Gramoxone

407

Super poses no serious risk to spray operators as a result of absorption through skin, although prolonged contact with skin can lead to irritation."

Right?

A. Yes.

Q. So farmers and other end users are instructing -- or instructed that they have no serious risk of being exposed to the diluted Gramoxone Super, right?

MR. NARESH: I'll object on the rule of completeness grounds.

THE WITNESS: I think that's going one step too far. I mean, what this says is that in addition to the other good practice which we were talking about earlier in terms of farmer training, the risk of exposure is also down to how they apply it; it's not just about what -- the clothing that they're making -- that they're wearing.

BY MR. DICKENS:

Q. None of that is said in this particular Fact section. It says:

"... poses no serious risk to spray operators as a result of absorption through skin."

Right?

MR. NARESH: Well, again, rule of

408

completeness.

THE WITNESS: That's what that says here.

BY MR. DICKENS:

Q. And at this point in time, as we discussed, there had been no long-term neurotoxicity studies that had been done with paraquat?

A. Even that is -- excuse me. That's not entirely true. So, again, we need a date for this, but there had been, by that time, a number of long-term toxicity studies, which would have included assessments on the central nervous system.

Q. No long-term study specifically measuring neurotoxicity?

A. Long-term studies that would have been done to guidelines would always have included an assessment of, for example, clinical observations and pathology, which are an assessment of the nervous system.

Q. Did you review or see any evidence that the EPA would have approved this brochure or marketing document?

A. I --

MR. NARESH: Objection; scope, foundation.

THE WITNESS: Yeah. No, I have not seen any evidence of that.

409

BY MR. DICKENS:

Q. Okay. It states:

"Once mixed, only waterproof footwear and work clothing need be worn."

Right?

A. That's what it says, yes.

Q. And that's what we had discussed earlier, is work clothing could be any type of long-sleeved shirt or long pants, right?

A. That is a possibility. I don't know exactly whether further detail was -- or recommendations were given to farmers.

Q. And that would include unfinished cotton, right?

A. It's possible. I can't -- can neither say yes or no to that.

Q. There's a Myth:

"Paraquat accumulates in the body."

It says:

"... it is not stored or accumulated in body fat."

A. Excuse me, where are you now looking?

Q. Oh, sorry, right underneath that. That last one we were looking at.

A. Okay, right, yeah. Thank you.

410

Q. "Paraquat that may have been absorbed in the blood is rapidly and effectively eliminated in the urine by the kidneys."

Do you see that?

A. I do.

Q. And then I want to turn to the final page. The final Myth here:

"The long-term health hazards from Gramoxone Super are not fully understood."

And that's a myth, right?

A. That's described as a myth, yes.

Q. It's described as a myth; therefore, the reader would take it as "the long-term health hazards from Gramoxone Super are fully understood," right? That's a fact.

MR. NARESH: I'll object to the form and the foundation.

THE WITNESS: And that would be based on what I've just said: that, by this time, we don't have an exact date, but extensive safety testing had been done on paraquat.

BY MR. DICKENS:

Q. So Syngenta's position in 1983 was that they fully understood the long-term health hazards from Gramoxone?

411

A. As much as they could from the toxicology studies and other safety studies that had been done.

Q. There was no long-term health hazard in 1983 that Syngenta did not fully understand at that point in time?

MR. NARESH: Object; asked and answered, form.

THE WITNESS: There are always potential health hazards, at any time, that you could argue have not been fully addressed. Toxicology does not necessarily allow you to predict every possible adverse health outcome. It does -- it is designed to determine whether there's any risk from those kinds of health hazards that can be predicted by animal models.

BY MR. DICKENS:

Q. And by this point in time, in 1986/1987, countries had already banned the use of paraquat, right?

MR. NARESH: Objection; foundation, form.

THE WITNESS: Well, again, I don't have the dates immediately to hand. I've got the list of countries that we were talking about yesterday, but I don't have dates against those.

BY MR. DICKENS:

Q. You understand Sweden initially banned

412

paraquat in 1983?

A. I'm not sure whether that's correct, but you may be right.

Q. Do you understand that part of the reason Sweden banned paraquat was because of concern of long-term health hazards associated with paraquat?

A. I think we saw earlier that there were some concerns that Sweden were raising, but I don't -- I didn't realize -- didn't know that was in 1983. But certainly Sweden continued to have those concerns.

MR. DICKENS: Go ahead and mark Exhibit 61.

(Exhibit 61 marked for identification.)

BY MR. DICKENS:

Q. Dr. Botham, I've handed you a document. This is a "Gramoxone Information Bulletin." This one, on the last page, appears to have a copyright date of 1983.

Do you see that?

A. Yes, this is definitely 1983.

Q. And this is an information brochure, once again, provided to farmers and other users of paraquat?

A. Yes, I believe so. This is a commercial information bulletin.

413

Q. And is this, once again, a document that was prepared by the marketing division within ICI or Syngenta?

A. Again, I can't tell you exactly who was involved in this. The list of references that are included would suggest that there was certainly some consultation with regulatory and potentially safety experts as well.

Q. Okay. If you can turn to the third page, ending in 3269, there's a picture in the column. It's the second picture from the right, and it says:

"Gramoxone application before planting crop beans."

Right?

A. Yes.

Q. And it shows an individual spraying paraquat, right?

A. It's a very small picture, so it's hard to see exactly what that person is doing.

Q. Okay. But it's represented as "Gramoxone application before planting."

Right?

A. Yeah, I mean, that's what the caption says.

Q. So the caption is meant to represent

414

someone spraying paraquat?

A. That's right.

Q. You'd agree that this person's not spraying paraquat in accordance with the labeling on paraquat as of 1983?

A. No, I don't know that's the case. This is far too small a picture for me to see exactly what's going on here.

Q. You can see he's wearing short sleeves?

A. Probably, yes. I -- yes.

Q. Do you know whether or not the labeling for paraquat has ever instructed users to not wear long sleeves while spraying?

MR. NARESH: I'll object to the scope and the foundation.

Are you asking that question worldwide for all time?

MR. DICKENS: In the United States.

MR. NARESH: Is this a picture of the United States?

BY MR. DICKENS:

Q. Well, let me ask this: When it says "Herbicides in the Americas," do you know where this information bulletin was distributed to?

A. No, I have no idea. I mean, it's produced

415

in the United Kingdom, so that much I do know. Whether it was meant to have global readership or just European readership, I am not sure.

Q. Okay. And under Contents, it uses "Principal uses in the Americas."

Do you see that on the first page, left column?

A. First page?

Q. Yes. On the far left, there's Contents and it gives some introduction, product, and then "Principal uses..." --

A. Oh, "Principal uses in the Americas," yes, indeed, right. Mmm-hmm.

Q. Right. So you don't know whether or not this was distributed to users/farmers in the United States?

A. I don't know, no.

Q. The individual in the picture doesn't appear to be wearing gloves, correct?

A. Well, I would need a magnifying glass to confirm that.

Q. So you can't tell?

A. Well, you may have better eyesight than me.

Q. That's fine. I'm just asking if you can

416

tell or not. If not, that's fine.

A. I can't tell.

Q. Okay.

Now if we can turn to the page ending in 93271.

And it is very small. There is a section, "Safety to human health."

Do you see that?

A. Yes, I do.

Q. The second paragraph cites to an epidemiological study of spray workers in Malaysia.

Do you see that?

A. Yes. So that would be the Howard, et al., paper.

Q. And it's cited and meant to indicate that there are no health hazards to individuals spraying or applying Gramoxone, right?

MR. NARESH: I object to that; form.

THE WITNESS: So this was one of the studies we discussed yesterday with regards to studies that had been done, and this was a study which included an assessment of the health as well as the exposure of workers, in this case, in Malaysia.

BY MR. DICKENS:

Q. Okay. And it specifically is cited, from

417

the last sentence there:

"... there is no health hazard associated with the normal use of paraquat."

Right?

A. There were no health -- adverse health effects seen in this -- in that particular study.

Q. There had been health hazard effects seen in other studies analyzing paraquat, right?

A. We've seen that over the last couple of days. Of course, there are situations where people have experienced skin irritation and nosebleeds, yes.

Q. Has an information bulletin or marketing brochure been issued by ICI or Syngenta to users in the United States informing them of epidemiological studies that have found health hazards associated with the normal use of paraquat?

A. I can't comment on that. I don't know what's been provided.

Q. The section on the far right, "Handling spray strength dilutions."

Do you see that?

A. Yes.

Q. It states:

"... Gramoxone does not cause [...] injury to healthy skin (though prolonged exposure should be

418

avoided)."

And do you agree that diluted paraquat or Gramoxone is not a skin irritant?

A. It would normally not cause the kind of effects that you would see with concentrated Gramoxone, certainly.

Q. Okay. And understanding it wouldn't cause the same effects as concentrated, do you believe that diluted Gramoxone is not a skin irritant in any way?

A. Well, it depends how you measure that. You can look at what the toxicology studies that have been done say, but then you also have to look at what happens in practice in humans; so I think it's broadly true that in humans with intact skin, who don't let even diluted paraquat stay on their skin for a prolonged time, would not normally expect to have skin damage.

Q. In the toxicology studies, there was skin damage, right?

A. Because they -- toxicology studies often give exaggerated exposure, yes.

Q. And Syngenta is not aware of any situation where an individual who got diluted Gramoxone on their skin has experienced skin irritation or skin problems?

MR. NARESH: I'll object to the form of

419

that, and the foundation and the scope.
THE WITNESS: Again, I think that we've probably said -- discussed this before. If -- those kind of things do happen, especially when the individual has found themselves exposed to the formulation for a prolonged period of time, maybe because they've soaked their clothing, for example.
BY MR. DICKENS:
Q. Some answers to Frequently Asked Questions on the page ending in 3272.
A. Yeah.
Q. One of them:
"Is Gramoxone really safe in use?"
The answer:
"Yes, certainly."
And then goes on to describe the product's been used around the world for more than two decades.
Do you see that?
A. Yes.
Q. And that's what was being told to farmers and users in 1983, right?
A. It was.
Q. You can put that aside.
I do want to go back to something you said yesterday and see if I understand, and so I want to

420

look at Exhibit 1, which are your notes, and tab 3.
Now, I believe you said yesterday that Syngenta never sold a residential -- or paraquat for residential use in the United States; is that right?
A. What I was told is that there was a registration for residential use but that we never sold paraquat for residential use. That was the information I was given.
Q. Okay. And what I wanted to clarify to make sure I understand is, in your notes here, you note that Chevron transferred a product registration for residential use to Syngenta in 1986, right?
A. Yes.
Q. And then you go on to say:
"Syngenta never produced or sold the product in the United States for residential use."
A. Yes.
Q. Do you know whether Chevron sold paraquat for residential use prior to 1986?
A. I'm not able to speak on behalf of the Chevron marketing, no.
Q. So when you say Syngenta never produced or sold, you're talking from 1986 forward, right?
A. That's the information that I was given.
Q. So you don't know whether or not it was

421

sold for residential use from the time it was approved in the United States in the '60s through 1986?
A. This is the history from 1986.
Q. Now, there was a relationship between ICI and Chevron from the time paraquat was introduced in the United States in the '60s up until 1986, right?
A. Yes.
Q. And Chevron was responsible for the marketing and sale within the United States?
A. Yeah.
Q. And ICI was responsible for the manufacture?
A. Yes, that's right.
Q. And, as we saw, there was some back-and-forth in that time frame with respect to marketing documents and labeling, right?
A. Yes, that's right.
MR. DICKENS: I'll hand you what we'll mark as Exhibit 62, which is topic 108.
(Exhibit 62 marked for identification.)
MR. NARESH: And can I have a standing objection as to the foundation with respect to this document --
MR. DICKENS: You can.
MR. NARESH: -- and questions regarding

422

the document?
MR. DICKENS: Your standing objection is noted.
BY MR. DICKENS:
Q. Dr. Botham, I have handed you a document titled "Evaluating paraquat's position in the herbicide business." It's a proposal by a McKinsey & Company, dated November 22, 1985, right?
A. That's what it says, yes.
Q. And this particular proposal was to Chevron Chemical as well as ICI Americas, Inc., correct?
A. That's right.
Q. ICI Americas, Inc. was associated with ICI?
A. It was the American company for ICI.
Q. It was the company responsible for paraquat in the United States?
A. Yes.
Q. And this is a document you reviewed in preparation for today's deposition?
A. Yes, we looked at this.
Q. And this document, once again, it's your understanding this is a proposal submitted to both ICI and Chevron?

423

A. Well, that's what this suggests, certainly, yes.
Q. And you understand both ICI and Chevron participated with McKinsey in generating information for both the proposal and what later became a final report, right?
A. I don't know what -- who was involved in providing the information to McKinsey. I have just read the report.
Q. Now, first I'll turn your attention to the page ending 11485.
Right?
A. Yes.
Q. It is "Objectives":
"The project would have two specific objectives..."
And it gives Chevron's perspective and it gives an ICI perspective, right?
A. That's correct.
Q. Okay. And ICI's perspective includes that Chevron's marketing performance was inadequate.
Right?
A. That's what it says.
Q. Now, do you understand this is information that ICI would have provided to McKinsey at the time

424

of the initial proposal?
A. That's an assumption. As I said, I don't know who gave McKinsey the information.
Q. Okay. Let's turn to 11493. And in the proposal, there's some suggested staffing in order to generate a final report, right?
A. Yes. That was what I understood this was meant to be, yeah.
Q. And that staffing includes individuals from McKinsey, Chevron and ICI America, right?
A. Yes.
Q. And your understanding is that this proposal was accepted and a final report was indeed generated, right?
A. That's right, there was a report.
Q. And you reviewed that report in preparation for today's deposition?
A. That was in my material, yes.
Q. Now -- sorry. Back to the first real page, ending 11467. It notes:
"As we understand it, paraquat's recent performance has led to tension in the ICI Americas and Chevron Chemical relationship."
Correct?
A. Yes.

425

Q. And, indeed, that relationship ended within a year of this proposal, roughly?
A. Well, there was a change in who was then responsible for marketing paraquat. I mean, I don't know any detail about the relationships in -- other than what I've read in a few documents.
Q. Okay. Proposal:
"Paraquat has been an attractive product for both ICI America and Chevron."
With sales of 60 million to 70 million annually in the 1980s, right?
A. Yes.
Q. And that represented high profitability?
A. Yes.
Q. And, indeed, paraquat was one of the most profitable compounds for ICI throughout the 1980s and 1990s, right?
MR. NARESH: Scope, foundation.
THE WITNESS: I mean, I'm not a commercial person, so I'm not able to talk about profitability and relative profitability.
BY MR. DICKENS:
Q. Turn to 11475.
It notes:
"There are serious disagreements between

426

ICI and Chevron as to how to best manage the business."
Right?
A. Yes.
Q. Chevron's perspective: Paraquat was "increasingly difficult to market."
That's what it says, right?
A. That's what it says, yes.
Q. Part of that is because of high environmental risk, right?
A. And it doesn't define what it meant by that.
Q. Do you have an understanding of what is meant by that?
A. No, I don't know whether it's to do with toxicology or whether it's to do with, literally, risk to the environment. I'm not clear what the specific -- or specific issues may have been there.
Q. Okay. If you can turn to the next page, it says:
"Paraquat's toxicity is high relative to competitors'."
Right?
A. Yeah. This is certainly about the toxicity.

427

Q. Okay. "Relative toxicity," paraquat and then some of the competitors on the market at the time, right?
A. Correct.
Q. Paraquat included as the pesticide that has the highest toxicity?
A. Yes, that's right, compared to four other products.
Q. Okay. Now turn to 4, the next page. Under "Issues," it suggests that McKinsey had undertaken interviews of both parties, right?
A. Yes.
Q. And both parties being ICI Americas as well as Chevron?
A. That's, I assume, to be correct, yes.
Q. So the information provided here would have been based on things told to McKinsey by both the individuals at ICI as well as Chevron, to your understanding?
A. That would be my understanding.
Q. One of the concerns includes:
"Do environmental risks outweigh cost advantages?"
Right?
A. Yes.

428

Q. In fact, concerns exist in almost every element of the business system, right?
A. I don't know what you mean by that last statement.
Q. But that's what it says?
MR. NARESH: Well...
BY MR. DICKENS:
Q. That's what it says?
A. Where does it say that, sorry? Oh, you mean the top --
Q. That's what --
MR. NARESH: Oh, you're reading --
THE WITNESS: Yeah.
MR. NARESH: You're reading from a different part.
THE WITNESS: Right, okay.
MR. NARESH: Okay.
THE WITNESS: By the way, I think while we're talking about that, do environmental risks outweigh cost advantages, that -- I mean, that's a phrase which I recognize, it's something which, in my experience, is always an issue, constantly an issue: making sure that we are aware of risks and that we are not simply being driven by profit or cost.
///

429

BY MR. DICKENS:
Q. We did see yesterday the email that specifically asked would those in the public, as well as academics, understand us putting economics over safety.
We saw that document, right?
MR. NARESH: Objection to the form.
THE WITNESS: Yes, but all these documents have to be put into context and I'm describing you a big-picture truth, which is that, in my experience, because I was a member of Product Safety, our input was always taken very seriously.
BY MR. DICKENS:
Q. The context within the document we reviewed yesterday was one of the disadvantages to having a symposium to talk about the risks of paraquat was that "Some may not understand us putting economics over safety"; that was the context, right?
A. And if I remember rightly, that was 40 to 50 years ago and I think I said yesterday that, you know, it's the kind of conversation that would be very different to today.
Q. Okay.
MR. DICKENS: You can put that aside. I'll hand you the biggest one of the batch,

430

Exhibit 63.
(Exhibit 63 marked for identification.)
MR. NARESH: Same as before, may I have a standing objection as to foundation as to the document and any questions related to it?
MR. DICKENS: You can.
BY MR. DICKENS:
Q. Okay. This exhibit's a final report of McKinsey & Company, which was finalized on February 24, 1986, correct?
A. That's right.
Q. Okay. And, once again, you reviewed this in preparation for the deposition?
A. We looked at this, yes.
Q. Now, if we can turn to the page ending in 1500 and the Introduction section:
"This report details the findings of the investigation into paraquat marketing in the United States."
Right?
A. Yes.
Q. And both Chevron as well as ICI Americas separately sponsored this particular study, right?
A. Yes. Excuse me. I was just making sure I could read the full page. Yes, indeed. Yes.

431

Q. So it wasn't only Chevron but ICI agreed for this study to move forward, right?
A. Yes.
Q. And, indeed, they sponsored it?
A. Yes.
Q. And, indeed, they would have received a copy of the report at the time of finalization, right?
A. I assume they did.
Q. Do you see anything that would suggest that they did not?
A. No.
Q. At the bottom of that introduction:
"... McKinsey was asked to perform the study from the point of view of the paraquat industry, without addressing issues that may arise from the competitive relationship between the two companies."
And do you understand "the two companies" being Chevron and ICI Americas?
A. Yes.
Q. The implications: "economic feasibility of possible paraquat opportunities."
Right?
A. Yes.
Q. And:
"Second, past and present marketing

432

decisions made by each company may differ from those recommended herein..."
Right?
A. Yes.
Q. And part of what was done in this particular report included interviews with growers, correct?
A. Yes, I believe it did.
Q. If we can turn to page 11537.
I apologize, wrong page. 570.
Now, we discussed yesterday and I believe you said that glyphosate and glufosinate were less toxic than paraquat was; is that right?
MR. NARESH: Objection to form.
THE WITNESS: I don't know -- I can't remember whether we discussed glyphosate and glufosinate, but in terms of acute toxicity, that is true.
BY MR. DICKENS:
Q. It states:
"In addition to issues of efficacy, it also seems that paraquat may be losing some sales to Roundup due to cost, despite the fact that generally Roundup is more expensive."
Do you see that?

433

A. I do.
Q. It says the:
"Interviews suggest [...] in certain parts of the country, growers find use of Roundup to be cheaper than paraquat, which, combined with its superior efficacy, makes it the product of choice."
Right?
A. Yes.
Q. And that's what these interviewers were telling McKinsey, who was conducting this study on behalf of Chevron and Syngenta, right?
A. Yes, and that would be the opinion of people for whom, if you like, the agronomic need for a herbicide would make that true. There are other agronomic needs where paraquat is more effective, more appropriate than Roundup.
Q. Turn to page 1616.
It states:
"However, there are a number of times where the choice of paraquat or a competing herbicide is a 'close-call' decision. In these cases, dealers can influence the growers' purchase decision if they have an incentive to do so."
Right?
A. That's what it says.

434

Q. And, in fact, the report finds that distributors or dealers have the most influence on the growers' herbicide decisions, right?
A. Where are you looking to make that point?
Q. We can turn to 11620.
A. Yes, okay, that's what that says there.
Q. Specifically:
"Dealers appear to have the most influence on the grower's herbicide decision."
That's what McKinsey found?
A. That's what it says, yes.
Q. And turn to 11698.
That says:
"In the growers' buying decision, toxicity operates as a negative product characteristic that must be traded off against [...] efficacy and cost..."
Right?
A. Yes.
Q. "... many users are willing to pay a 'toxicity premium' for a product they perceive as safer. [...] premium does not appear large..."
So, in essence, individuals would be more willing to pay more for a safer product?
A. If that was -- if that alternative product was able to do the job that they needed, perhaps.

435

Q. McKinsey states:
"... there is little potential of changing paraquat's basic toxicity level [...], there is the opportunity to change its perception in the marketplace."
Right?
A. That's what they said.
Q. And, indeed, that's what ICI/Syngenta attempted to do after it took over the marketing and sale of paraquat in the United States in 1986, right?
A. I think that's a misrepresentation. I think that at no time was ICI trying to say that paraquat is safe to use, you don't need to worry about it. It was, as we've said many times, it was ensuring that people understood, farmers understood, that there are situations where that toxicity could become an issue.
Q. With respect to the toxicity issues and concerns, Syngenta and ICI undertook efforts to change the perception of paraquat in the marketplace, did they not?
MR. NARESH: Objection; asked and answered.
THE WITNESS: No; again, I think that's the wrong way of putting it. I mean "perception gap"

436

is a phrase used by McKinsey. What we've been seeing is that ICI/Syngenta were trying to inform the users of its product about hazards and how they could be avoided and the product could be used safely.
MR. DICKENS: You can put that aside. I'll mark Exhibit 64 for the record.
(Exhibit 64 marked for identification.)
MR. DICKENS: This is topic 44.
The exhibit I handed you is a "Gramoxone PLT," dated April 10, 2001.
BY MR. DICKENS:
Q. A document you've seen before, right, Dr. Botham?
A. Yes, I have.
Q. And do you know what PLT is referring to?
A. I don't know that this is correct: I believe it is product leadership team.
Q. Okay. What was the role of the product leadership team at Syngenta?
A. Again, I've not seen a remit of this team as to what it was in 2001, but this would suggest that it would be to take an overview of Gramoxone and how it's being marketed and any concerns that may surround that, including safety.
Q. And the individuals that would have been

437

part of this team are part of the leadership within Syngenta itself, right?
A. Again, I don't know exactly who was on the PLT at this time to confirm their status in leadership.
Q. Now, we've looked at the McKinsey document, the final report, in February 1986. It was in 1986 that Chevron stopped the marketing and sale of Gramoxone in the United States?
A. Yes, that's right.
Q. And so Syngenta took over in 1986 and has held the responsibility for the sale and marketing from 1986 to the present?
A. That's my --
MR. NARESH: Well, I'll object to the foundation and form. Are you asking as between ICI and Chevron, or are you asking generally?
BY MR. DICKENS:
Q. Generally, with respect to the --
MR. NARESH: Well, are you asking if Syngenta is the sole supplier of paraquat in the United States?
MR. DICKENS: No. So, yeah, let me ask you that way. I guess that is a better -- thank you, Ragan.

438

BY MR. DICKENS:
Q. Chevron has no more responsibility for sale and marketing of paraquat or Gramoxone in the United States, as far as you know?
A. As far as I know.
Q. And Syngenta continues, from 1986 to present, to sell paraquat-containing formulations in the United States?
A. Yes.
Q. If we can turn to page 2. At this stage there was a regulatory update and one of the issues that was listed is Parkinsonism, right?
A. Yes.
Q. And there is a "US dust mist filter," right?
A. Yes.
Q. And that -- 2001 is when the respirator was put onto the labeling once again for the Gramoxone products within the United States?
A. Right.
Q. Turn to page 5. There's a slide here, "Parkinsonism," right?
A. Yes.
Q. It states:
"Parkinsonism is the issue of the day and

439

is likely to remain so for the foreseeable future."
Right?
A. It does say that.
Q. And that was the case in April of 2001?
A. That's when these slides were produced, yes.
Q. And Parkinsonism remains an issue of the day as we sit here in 2024, right?
A. Parkinson's disease, I guess you would say, was more accurately what the issue is.
Q. Okay. It's still an issue for Syngenta today?
A. It is certainly still something which we are very much involved in, yes.
Q. They note that there will be a Neurotox conference to be held, right?
A. Yes.
Q. And Syngenta will ensure that they have appropriate representation in attendance, correct?
A. Correct.
Q. And that, in fact, happened, as far as you know?
A. Yes, I believe it did.
Q. Do you know who was at that particular conference?

440

A. I think Lewis Smith may have been there.
Q. And did you -- okay. Strike that.
It states:
"Research into environmental causes will continue to increase as a result of the high scientific profile and the research that suggests there is not a predominantly genetic element to the condition."
Right?
A. That was what was now coming out in various places, including in the meetings that are being described here, that there may be environmental factors.
Q. The next page. There are some concerns listed, right?
A. Yes.
Q. And it lists some new data relating to neuronal cell loss in the substantia nigra following paraquat administration down to 1 mg/kg IP dose, right?
A. So these were the data that were emerging from the use of that mouse model that we'd been talking about before, intraperitoneal injection, exaggerated exposure as a consequence, and sometimes paraquat was being applied in with other pesticides,

441

including maneb, so, yes, that's what was happening at this time.
Q. And by this point in 2001, Syngenta had not undertaken a similar study to measure neuronal cell loss in substantia nigra, right?
A. No, not true. I mean, we had done work in the 1990s, so some of the work that was published by Widdowson and Naylor and others did include some pathology work; so it wasn't -- it's not that we didn't start looking at this issue until after this time.
Q. And did that measure neuronal cell loss in the substantia nigra?
A. It was -- the pathology was certainly a component of what Peter Widdowson was measuring.
Q. And Widdowson/Naylor, that study was in rats, correct?
A. That was in rats.
Q. The first study undertaken by Syngenta measuring neuronal cell loss in the substantia nigra in mice, that was the first of the Marks study?
A. Yeah, we -- so we started to work in -- after this date, which was 2001, in the mouse model, the one that we'd just been describing here, and the work was led by Ted Lock that was conducted by Louise

442

Marks.
Q. Now, the study that's referenced here under "Concerns," the result of that study is a suggestion that paraquat can cause neuronal cell loss in the substantia nigra, right?
A. They were claiming to see a loss of cells in the substantia nigra, that's right.
Q. And so the concern was obviously that those type of findings could link paraquat to Parkinsonism or Parkinson's disease?
A. Absolutely, and we were not saying at that time this is not possible; so our positioning of this was, it may be described as a concern, but it's a concern because it's something that needed investigating. It may be real.
Q. Okay. So you didn't know if it was real or not at this point in 2001?
A. Absolutely not, no.
Q. It was a possibility that it was real?
A. And we'd started from the premise that it, indeed, possibly indeed was real, so we wanted to take this very seriously.
Q. Let's look at the next page. It lists Syngenta's strategy. Syngenta's strategy was to "steer the focus of serious research away from

443

paraquat."
Right?
MR. NARESH: I'll object on the rule of completeness grounds. I think you need to read the whole sentence and not just a snippet of it.
BY MR. DICKENS:
Q. "... which is an interesting academic model (because of its crude similarities to Parkinsonism-like agent MPTP) and on to other agents that have neurotoxicity and exposure profiles more consistent with being a potential causative or contributory agent."
That was the strategy of Syngenta at this time in 2001, right?
A. It's more subtle than that. I think this was a very blunt way of describing the strategy. And, look, I'm also describing how that strategy also evolved very shortly after that.
So, yes, we wanted to see whether -- what the weight of evidence was for other environmental agents, and we certainly did some work on that, but it didn't stop us from taking seriously the possibility that paraquat was one such environmental agent.
Q. And, as you said earlier, you/Syngenta didn't know if this was a real effect or not, right?

444

A. We didn't, no.
Q. And then if you didn't know and you didn't have the answers, why would the focus be to steer serious research away from paraquat?
A. I think that's because this slide does not represent the strategy as it was actually implemented, and implemented in reality very shortly after this date of 2001. We've mentioned the Marks studies. I mean, they started only a couple of years after that.
Q. The last sentence referenced a review paper of the epidemiology studies.
Then it says:
"... we will evaluate options for publication and/or further studies to discredit assertions that paraquat is in any way implicated."
Right?
A. I say, again, this is a strategy which was put very bluntly at that time as being a way in which we could, if you like, look at this issue, but it is not, in any sense, the way in which we actually implemented that strategy. That strategy was much more open. It was not simply about discrediting the research.
Q. Do you agree that the slides presented at

445

the paraquat leadership team meeting in 2001 specifically says, "We will try to discredit assertions that paraquat is in any way implicated with Parkinsonism"?
That's what the slides said, right?
A. The slides certainly say that and suggest that people have that ambition, but I think that was an ambition that was not one which was supportable.
Q. So that was an ambition at the time in 2001 but it's not an ambition that Syngenta stands by here today?
A. It's not an ambition which we pursued, absolutely, and the record shows that in terms of our investment in this area of research.
Q. There was no efforts to discredit that paraquat is implicated in epidemiology that you saw in your role or in your position speaking on behalf of the company?
MR. NARESH: I'll object to the form.
THE WITNESS: The word "discredit" is a loaded term. What we also did, of course, is try to talk, and to collaborate in some cases, with researchers who were working in this field, working on paraquat, to understand what they were doing, how they were doing it, and, in some cases, to have

446

conversations about not over-interpreting their findings at that stage, which is potentially one way in which the word "discredit" has been used. But that was not what was really meant by that.
MR. NARESH: Are you done with this one?
MR. DICKENS: That's a good question. Yes, we're done with that one. You can put it away.
Mark 65 for the record.
(Exhibit 65 marked for identification.)
MR. NARESH: Can you just remind me of the topic number, please?
MR. DICKENS: This one's 47.
MR. NARESH: All right. Thank you.
BY MR. DICKENS:
Q. Dr. Botham, this document I've handed you is "Paraquat Regulatory Status, Outlook and Strategy," December 2003, authored by Ian Wheals, right?
A. That's right.
Q. Remind me, Mr. Wheals is someone you spoke with in preparation for today's deposition?
A. That's right, because he was a regulatory manager for paraquat.
Q. The global regulatory manager for paraquat?
A. He had been European and global regulatory

447

manager.
Q. And did you discuss particular documents with Ian Wheals?
A. Yes, we did.
Q. Do you know if you discussed this document?
A. We didn't discuss this in detail. It was -- we acknowledged that this was one of the documents that had his name on it.
Q. Now, this document is roughly two years after -- a little over two years after that last document from the paraquat leadership team meeting that we saw, right?
A. That's correct.
Q. And this document is to provide the status, the outlook and a strategy for undertaking regulatory actions with respect to paraquat, right?
A. And perhaps it's worth saying that there's nothing special here about paraquat. These documents were documents that were produced on a wide range of products because this was part of the role of the regulatory affairs department.
Q. This is a -- this is something that Syngenta would do for all products. This one just happens to deal with paraquat?

448

A. Correct.
Q. And it was done for all products in order to create, kind of, a look back as well as a look ahead with respect to how we're going to handle regulatory issues?
A. That's correct.
Q. Under The Executive Summary, the third paragraph begins "Paraquat registrations..."
Right?
A. Yes.
Q. "Paraquat registrations will remain insecure and will require considerable proactive defense."
Right?
A. Yes.
Q. Syngenta at this time was proactively defending its paraquat registrations in numerous locations throughout the world, right?
A. That's correct.
Q. The last sentence:
"The situation between 2008-2013 and beyond will be determined by a combination of factors..."
Do you see that?
A. Yes, I do.

449

Q. The fourth factor from the bottom states:
"Success in containing the perceived association between paraquat and Parkinson's disease as an academic rather than a regulatory human safety issue."
Right?
A. Yes, and let me explain that because it actually fits with what I've been saying. Because, by "academic," it means that -- this is not just true for paraquat, again. Sometimes experiments are done, again under exaggerated conditions, which have, in reality, little or no relevance to human safety. And so that was one view of the possible implications of the kind of data that had been emerging before then.
But we went on to look at that in detail. We did not dismiss it as a human safety issue at this time, or beyond.
Q. So academic, once again, is looking at, as you said, doses and methods of exposure that did not mimic what was happening in the field?
A. That is certainly the case with intraperitoneal injection, for example.
Q. Yet, when Syngenta undertook its studies on an effect of paraquat on neuronal cell loss in substantia nigra, you used IP studies, right?

450

A. Because one of our research questions was: Is this effect actually real? And part of that is, can it be replicated in different labs, so we wanted to ask that question. But we also ask other questions, like is this relevant to humans, so we did studies with different routes of exposure, including the oral route.
Q. And you did find, in the IP studies, that the effect was indeed real and could be --
A. When we first started looking at this, yes. The Marks -- Louise Marks studies initially did seem to replicate that and that was fine. You know, we went on to do more to try to understand that.
Q. The next item:
"Success in managing the development and implementation of hazard based, precautionary, and comparative regulatory policies."
Right?
A. Sorry, where are you looking now, please?
Q. Right under the last bullet point.
A. Okay, right.
Q. Do you see that?
A. Yeah.
Q. And that was one of the strategies of Syngenta, not only at this time but moving forward,

451

is to manage the development and implementation of the precautionary principle, if you will?
A. This was a general point, actually, so this was not specific to paraquat.
Q. Okay. Precautionary principle, that's an approach to risk management where, if a risk exists, then particular action should be taken, right?
MR. NARESH: I'll object to the scope --
MR. DICKENS: Generally.
MR. NARESH: -- and the foundation.
You can answer if you can.
THE WITNESS: Yeah, it's better to describe that if a hazard is identified, assume that it might be a risk and take action appropriately.
BY MR. DICKENS:
Q. And that would include action such as warning about that hazard?
A. It could, yes.
Q. And that's something that Syngenta thought inappropriate, is if we don't know whether or not there is a hazard or risk we shouldn't be warning if we only believe it's a hazard?
A. Let's talk generalizations for a minute, if I may. What we were trying to readjust, if you like, was that to try to regulate products purely on

452

the basis of hazard and not taking into consideration exposure, and therefore risk, was not only precautionary, but, actually, was unnecessary in order -- in many cases, not all but in many cases, to protect human health and the environment.
Q. And that's true from Syngenta's position even if the company didn't know whether or not there was a risk yet?
A. We always looked at, as we've been describing here, and now specifically with paraquat, if you wish, the findings in the mouse model, there's a hazard that's identified. So we wanted to understand is that hazard real, is it replicable, is it -- and is it relevant in terms of is this ever likely to be seen in human beings?
Q. Now, at this point in 2003, there were epidemiological studies that were conducted that showed a substantially increased risk of Parkinson's disease following paraquat exposure, right?
A. By 2003, certainly epidemiology studies had begun to appear. Some showed an effect, others did not do. There was a mixture of outcomes.
Q. In 2003, there was a mixture of outcomes?
A. Yeah, and that was certainly something that continued over the forthcoming years, that you

453

saw a variety of outcomes.
Q. And one of the strategies undertaken by Syngenta was to discredit the findings within the studies that did find a substantially increased risk of Parkinson's associated with paraquat, did they not?
A. No, no, never to discredit.
MR. NARESH: Let me --
THE WITNESS: Sorry.
MR. NARESH: I'll object to the form, foundation and the scope.
Please go ahead.
THE WITNESS: Yeah. No, "discredit" is not a term that I would use, definitely not here. It was always to understand and to do -- to use the scientific process of, in some cases, reanalyzing data, discussing with other researchers.
BY MR. DICKENS:
Q. "Discredit," to be fair, wasn't my term. That was the term specifically used by the paraquat leadership team when they were discussing epidemiology studies, right?
A. It's a term which is loaded and it's not a term that I feel comfortable with and wouldn't have felt comfortable with it then.
It's -- more importantly, however, it's --

454

when I talked about strategy and implementation, we did not implement a strategy purely based on discrediting other people's research. We entered into that world of research on paraquat and Parkinson's through significant investment.
Q. Key regulatory strategy elements, and there are some bullet points. The second from the last:
"Build capability to defend both the license to sell and freedom to sell paraquat in potential future risk assessment (neurotoxicity) and hazard paradigms."
That's what it says, right?
A. Yeah, correct. And perhaps I could explain --
Q. Okay.
A. -- because it's important. What we meant there, license to sell is how would regulatory authorities view issues, for example around safety.
Freedom to sell was much more about what we felt as a company: Do we feel that we should be selling any substance, not just paraquat, if we feel that there is any genuine health or environmental concern. So I'm talking generically here but it equally applied to paraquat.

455

MR. DICKENS: And I'll move to strike.
BY MR. DICKENS:
Q. My question simply was, this document says at the time, in 2003:
"Build capability to defend both the license to sell and freedom to sell paraquat in potential future risk assessment (neurotoxicity) and hazard paradigms."
That's what this document says, right?
MR. NARESH: And I'll object to the motion to strike and note for the record that if we're just here to ask what the document says, then we could have done that in writing.
MR. DICKENS: I'll follow up, but I can't get long-winded answers after I ask if that's what the document says.
MR. NARESH: Well, if you let the witness --
MR. DICKENS: Answer my questions.
MR. NARESH: If you let the witness answer the question, you know, you just struck the answer to the question.
MR. DICKENS: No --
MR. NARESH: You're free to move to strike. But I'm just saying, you know, all you're

456

doing is making the deposition longer because I'm obviously going to ask on redirect what that meant, and so we can do it two times or we can just move on.
But, you know, this is just extending the deposition. Go ahead. Do what you want to do.
THE WITNESS: Would you like to repeat your question, please.
BY MR. DICKENS:
Q. In 2003, one of the key regulatory strategy elements that's noted in this document is:
"Build capability to defend both the license to sell and freedom to sell paraquat in potential future risk assessment (neurotoxicity) and hazard paradigms."
That's what's written in this document in December 2003, correct?
MR. NARESH: I'll object as asked and answered.
THE WITNESS: And that meant capability both in regulatory expertise and safety expertise.
BY MR. DICKENS:
Q. Turn the page. Now, one of the reasons for the wanting to maintain license and freedom to sell was that paraquat was a blockbuster product for Syngenta, right?

457

A. Many products from Syngenta are important and it was always essential that we had the right capability to be able to understand whether, in this case, the sales of a blockbuster product are things that we can sustain from that perspective of license to operate and freedom to operate.
Q. The objective was to achieve Gramoxone sales at $388 million, right?
A. Indeed. So there were commercial targets, indeed.
Q. And, as we know from looking at previous documents, concerns of toxicity had a potential effect, negative effect, on the sales of paraquat, right?
MR. NARESH: Let me just make a belated question to the prior -- belated objection to the prior question, which left out a word.
THE WITNESS: Right. So, yeah, we were talking about the perception of toxicity before. A lot of those perceptions were about its acute toxicity, so we need to avoid conflating what was meant by "toxicity" here.
BY MR. DICKENS:
Q. Okay. So you don't believe that the concerns of neurotoxicity have affected Gramoxone

458

sales?
A. I don't know whether those concerns have affected sales. That's something that I've not been able to measure.
Q. Well, certainly it's affected sales to the extent that countries have withdrawn the registration of paraquat due to concerns of neurotoxicity, correct?
A. The only country that has specifically cited neurotoxicity Parkinson's disease as a reason, not the only reason, for withdrawing the registration is Brazil.
Q. Brazil, at this point in 2003, was one of the top ten markets for Gramoxone business, right?
A. That's right, yes.
Q. And that remained true all the way up until it withdrew the registration of paraquat?
A. I don't have those data to hand, so...
Q. We looked at the document earlier with respect to Sweden in 2003, and in the comments Sweden specifically brought out, as one of its concerns, potential neurotoxicity, right?
A. It did, but if you remember, there were two reasons given for that: One was a specific finding in some of the chronic toxicity studies about, I think it was sciatic nerve degeneration, and they

459

also mentioned Parkinson's disease but purely because of analogy with MPTP at that time.

Q. Okay. At that time in 2003, but then in 2007 when it challenged the EU commission through the court system, it once again raised neurotoxicity, right?

A. It did, yes.

Q. Okay. And that, at that point, had -- and it was armed with the epidemiology as well as additional studies?

A. At that time, of course. Things had moved on, so it was adding additional concerns to that, yes.

Q. Turn to page ending in 715. Section for NAFTA and then USA.

Do you see that?

A. Yes.

Q. At this point in 2003, USA was the largest market globally?

A. That's what it says, yes.

Q. Then the very last sentence begins "NIEHS funding..."

Do you know what that's referring to?

A. Yes. Yes, I believe that this is likely to be the NIEHS funding of the study that is now known as the Agricultural Health Workers study.

460

Q. Okay. And they were funding a study that would study environmental effects of pesticides, right?

A. They were looking at, yes, the adverse health effects in farmers that could have been due to exposure to substances in the environment.

Q. And that included a review of pesticides and a potential link to Parkinson's disease, right?

A. It was initially meant -- very much directed towards cancer and pesticides generally, not just paraquat, but then one of the interests that was included was Parkinson's disease.

Q. So you're aware the AHS study was ongoing at this time. Were you also aware that a Dr. Bede Ritz was undertaking studies on Parkinson's disease and pesticides?

A. So, yes, Dr. Ritz is in California. This is a separate study. So, yes, she was doing -- investigating the potential link between paraquat exposure and Parkinson's disease in the California Valley.

Q. Do you know whether Dr. Ritz had received NIEHS funding for her studies?

A. I don't have to hand what her funding sources were, I'm sorry.

461

Q. Okay. So you don't know if this is actually referring to Dr. Ritz's study, but you believe it's the AHS, right?

A. Well, that's what I've said; I assumed it was, but I may have mispositioned that. But you're quite right; there were two studies going on and the Ag Health Study was certainly funded through NIEHS.

MR. NARESH: Just to clean the record, I think you've been using the AHS acronym and I think it's showing up as N --

(Stenographer interjection.)

MR. NARESH: I think Dave has been using the AHS acronym for the last couple of sentences. I don't think that acronym has been defined. I think you're talking about the Ag. Health Study, but in the -- I think Leah picked it up as "NIEHS study," so you --

MR. DICKENS: Got it, okay.

MR. NARESH: -- may want to fix that.

THE STENOGRAPHER: Thanks.

MR. DICKENS: Thank you.

BY MR. DICKENS:

Q. So the Agricultural Health Study, that's often referred to as "the AHS study," A-H-S, right?

A. It is.

462

Q. And that may or may not be the study that received NIEHS funding, as far as you know?

A. It probably is.

Q. Now, at this stage, the results of this study would not have been available, as it was just funded, right?

A. Correct.

Q. The sentence goes on:

"... will ensure Parkinson's disease remains a high profile in the US academic, medical and potential regulatory communities. This could potentially pose a threat to paraquat and needs to be proactively managed."

Right?

A. Yes, which, in practice, means we need to understand how is that study being conducted, do we -- can we see protocols, do we -- can we find reports, make sure that we're aware of publications.

Q. And it would have posed a threat if it indeed found that there was a link between Parkinson's disease and paraquat, right?

A. Absolutely. Going back to my definition of "freedom to sell," if a study such as this, looking at real human beings, gave a sort of definitive position on causation, then that would be something

463

that we would need to act upon.
Q. And one of those ways to act upon that or proactively manage it is to be ready to challenge or support the AHS results depending on how they came out?
A. It's certainly to understand them and, if necessary, to challenge if we think that there may have been interpretations which we wouldn't agree with.
Q. Challenge if they found a link, and support if they did not find a link, right?
MR. NARESH: Objection; asked and answered, and also vague as to the word "link."
THE WITNESS: I think that's, you know, a very strong misrepresentation. We will, and always have wanted to, address the findings of any research programs, including AHS, as objectively as we can as fellow scientists.
BY MR. DICKENS:
Q. Turn to page 719. The section at the bottom, "Neurotoxicity."
A. Yes.
Q. The second sentence:
"New studies pose risk of unexpected findings at doses below current reference doses."

464

Right?
A. That's because at that time, I think what this is referring to is that we had seen, for example, those studies with intraperitoneal dosing, and there had not yet been a thorough evaluation of not just the relevance of that dosing route but how low in the dose response does any effect -- can any effect be seen.
Q. And the risk was that there would be findings showing an effect on the brains of the animals after paraquat administration that were below the current reference dose? That was the risk posed to Syngenta, correct?
MR. NARESH: Object to the form.
THE WITNESS: This is at a time where, again, we were not in any sense disputing that these effects could be real, and so obviously, as in all good toxicological good practice, we would want to understand where is the 'no effect' level for that, is there a margin of safety which would mean that it would be improbable or implausible for humans to be exposed to sufficient paraquat to cause that effect.
BY MR. DICKENS:
Q. And then at the bottom it includes some strategies, right?
A. Yes.

465

Q. "Develop links with key researchers to gain forward visibility and influence [future] work."
Right?
A. Yes.
Q. Influence in the favor of paraquat?
A. No. This is -- again, I think as we discussed yesterday, "influence" is an overused word and I think that this -- again, the record shows that, actually, what we were largely doing was to be able to talk to researchers in this area, to understand what they were doing, how they were interpreting their work, and if we didn't agree with their interpretation, we would certainly be -- you know, feel open to do that. That's what scientists do.
Q. The fact you implement an influencing strategy to "once again shift the focus of serious Parkinson's research to other environmental factors and exposure profile more consistent with being a Parkinson's disease risk factor."
This is the same statement that we saw in the 2001 document, right?
A. Yeah, but you're just reading one bullet point there out, or one sub-bullet point from that particular section. So we're also talking about ensure that a rational risk assessment will prevail.

466

So that's, again, back to the point we've just been talking about. If the effect is real, then, you know, what is the -- is that hazard really a risk; that's what that actually means. So it's not just about deflecting to other substances. Of course that was something that we also wanted to try to understand, and it was something that we did.
Q. Syngenta was really concerned about why -- if the risk was real, why would it want to shift the focus of serious Parkinson's disease research away from paraquat?
MR. NARESH: I'll object to the form.
THE WITNESS: It wanted to -- predominantly, it wanted to understand the hazard and the risk, particularly the risk, of exposure to paraquat. It also wanted to understand whether there were other environmental factors that could also be contributory to Parkinson's disease.
This is, you know, still, and still to this day, a very open subject.
BY MR. DICKENS:
Q. Wouldn't the best way to find out if there was a particular risk is to allow the serious Parkinson's disease research on paraquat to continue?
MR. NARESH: Objection to form.

467

THE WITNESS: It's to allow it to continue, yes.
BY MR. DICKENS:
Q. And not shift the focus away from paraquat of that Parkinson's disease research?
MR. NARESH: Same objection.
THE WITNESS: What we were trying to do here, when it says "shift the focus to other environmental factors," is, as I said before, to see if there were other possible environmental contributors to Parkinson's disease. Then you can do, again, a weight of the evidence: Is it likely that other environmental factors, because we're exposed to more -- you know, the risk is higher, would they likely be a more rational explanation than paraquat.
BY MR. DICKENS:
Q. If you didn't know that there was -- whether or not there was a risk and whether or not it was real, wouldn't the appropriate timing for undertaking neurotoxicity studies be then and now, at this point in December 2003?
A. That's exactly when we did re-embark on a major research program.
Q. Okay. And you embarked on that program at this stage in 2003, but the risk, as we saw in the

468

last document, was in existence in 2001, right?
A. We --
MR. NARESH: Object to the form.
Go ahead.
THE WITNESS: Yeah. And we had started looking at that risk/hazard even before then, 1996. So it wasn't that suddenly in 2001/2003 we were looking at this issue; it would have been on our agenda, if you wish, for seven or eight years.
BY MR. DICKENS:
Q. So Widdowson and Naylor told the company, "Okay, we've answered it. There is no risk, we know..."
MR. NARESH: I'll object to the form.
BY MR. DICKENS:
Q. "... no further studies are necessary"?
MR. NARESH: Same objection.
THE WITNESS: They never said that, as far as I know, but -- I never heard them say that, put it that way.
BY MR. DICKENS:
Q. It didn't generate -- Syngenta did not undertake any neurotoxicity studies between Widdowson and the first Marks study in 2004?
A. I don't believe so. Again, I would need

469

to check the record, but the significant research -- Peter Widdowson left the organization, so there was a period when we didn't have any -- have a neurotoxicologist to do such research, and we employed Louise Marks to reenergize our research effort.
Q. There was no one at Syngenta that could have undertaken neurotoxicity studies between 1986 and 2004 --
MR. NARESH: You said --
BY MR. DICKENS:
Q. Sorry, 1996 and 2004?
A. We had people who could do certain types of studies, but, increasingly, it was evident that those sort of studies required specialized technical knowledge and understanding, and that's why we -- Louise Marks was engaged.
Q. You engaged and hired Louise Marks in 2004 specific to figuring out whether or not there was a real risk of neurotoxicity associated with paraquat?
MR. NARESH: I'll object to the form. I don't think -- well, I don't want to speak.
Go ahead, if you can answer.
THE WITNESS: We wanted to see, as I said earlier, if the findings that were being published early in the 2000s showing an effect in mice of

470

intraperitoneal injection of paraquat, requiring you to do some pretty specialized pathology in the brain, the stereology included, we wanted to see if that effect was real, replicable, and hence whether it may be relevant to human risk.
MR. DICKENS: We can put this aside. Why don't we take a break.
THE VIDEOGRAPHER: We are going off the record at 11:58.
(Lunch break taken.)
THE VIDEOGRAPHER: We are back on the record at 12:51.
BY MR. DICKENS:
Q. Welcome back, Dr. Botham. I've handed you -- well, before we get there, the last document we were looking at was in December 2003. As we were discussing, Syngenta at that stage were still trying to determine whether or not the risk related to neurotoxicity was real, right?
A. Yes.
MR. DICKENS: I've handed you Exhibits 66 and 67.
(Exhibit 66 marked for identification.)
(Exhibit 67 marked for identification.)
MR. DICKENS: 66 is the cover page to

471

a PowerPoint presentation.
BY MR. DICKENS:
Q. Do you see that?
A. I do.
Q. And what's the date?
A. The original email was 5 March 2007.
Q. Okay. So in 2007, there was a PowerPoint presentation titled "Parkinson's Disease: What can Syngenta say about the issue?"
Right?
A. That's right.
Q. And you've seen this document before, correct?
A. I have, yes.
Q. I'm going to actually turn to the pages that are a little larger for us to read, which begin on 2235.
A. Right.
Q. And then -- it's the same presentation, and then two pages later, there's a slide here, "What we cannot say."
A. Yep.
Q. Right. So, in 2007, Syngenta could not say that "paraquat does not enter the brain," correct?
A. Correct.

472

Q. Syngenta could not say "paraquat does not cause any changes in the brain," correct?
A. Correct.
Q. Syngenta could not say "paraquat only causes effects in the mouse," correct?
A. Correct.
Q. Syngenta could not say "the mouse data on paraquat are not relevant to humans," correct?
A. Correct.
Q. Syngenta could not say "people are not exposed to paraquat," correct?
A. Correct.
Q. Syngenta could not say "there are no data reporting that paraquat may be associated with Parkinson's disease in humans," correct?
A. Correct.
Q. And Syngenta could not say "the data show that paraquat does not cause Parkinson's disease in humans," correct?
A. Correct.
Q. Now, we can put this aside.
Are you aware of any instances where Syngenta said publicly in the 2007, or after, that paraquat -- the data shows that paraquat does not cause Parkinson's disease in humans?

473

A. I --
MR. NARESH: I'll object on the foundation and the scope.
If you can recall.
THE WITNESS: Yeah. I mean, I don't recall that such a definitive statement may have been -- had been made, but maybe there is something in the record which I would need to be reminded of.
MR. DICKENS: I'll hand you a document, Exhibit 68.
(Exhibit 68 marked for identification.)
MR. NARESH: Which topic was 66 and 67, and 68?
MR. DICKENS: 68 is topic 26, and the previous two were 68.
MR. NARESH: Thank you.
BY MR. DICKENS:
Q. Exhibit 68 is another regulatory options document, dated September 28, 2007, right?
A. That's right.
Q. So this is roughly four years after the last regulatory document that we looked at, correct?
A. Yeah, I think the last one we looked at was 2003.
Q. Okay. And this is a little bit after the

474

"What we cannot say" document, correct?
A. So March, and this was September; yes, correct.
Q. Okay. This is deemed confidential, right?
A. Yes.
Q. And included names on this are the global product registration herbicide lead and global product registration manager for Syngenta, right?
A. Yeah, that's correct.
Q. And then turn to page 4.
At the very top, it lists some countries in which paraquat is formally banned, right?
A. It does, yes.
Q. Okay. And included in this is Sweden, which we've discussed, right?
A. Yes.
Q. As well as some others?
A. Yes.
Q. Then there's:
"Paraquat is no longer registered in..."
Right?
A. Yes.
Q. And Switzerland is included there?
A. That's right.
Q. What's your understanding of the

475

distinction between "no longer registered in" and formally banned?
A. I'm not a regulatory expert, but I guess one interpretation would be that we -- the second category is that we either -- we had registrations but chose not to continue with them.
Q. And in your Exhibit 1, you generated a list of countries in which paraquat's no longer sold in; is that right?
A. Yes, that's right.
Q. Is that a current list?
A. That's the current list as provided to me, yeah.
Q. Okay. As provided to you or did you generate that list?
A. No, I was given some assistance with this because this is regulatory and commercial.
Q. Okay. And that is something that you brought with you here today as preparation for today's deposition?
A. It is, yeah.
Q. And did you confirm the information on this document was correct or accurate?
A. I took that the information was accurate because of the people who helped put it together.

476

Q. Okay. But, once again, that's not a document that you yourself generated?
A. No. I wouldn't have had the know-with-all to do that.
Q. Okay. Now, you mentioned there are certain countries in which paraquat's no longer registered in and the company decided not to seek re-registration, right?
A. Yes.
Q. And that was a strategy undertaken by Syngenta, right, to choose not to re-register or seek re-registration in particular countries?
A. That's right.
Q. And that's, in part, in a way to prevent negative information or a negative association with paraquat?
MR. NARESH: I'll object on the foundation and scope.
THE WITNESS: I would have said that that was, in the vast majority of the cases, not true. I think many of these would have been based on commercial reasons.
BY MR. DICKENS:
Q. Well, certainly Syngenta made a tactical decision with respect to whether or not to seek

477

re-registration based on toxicity issues, right?
MR. NARESH: Same question -- same objections.
THE WITNESS: I think we'd need to get into some specific examples of that.
BY MR. DICKENS:
Q. Did you, in your preparation for today's deposition, see any examples of that?
A. The only specific example which we may be coming on to talk about is the consequence of the CFI, the Court of First Instance, ruling in the European Union, which wasn't based on an assessment of safety, but subsequently we did look at the safety profile and its impact on the potential for continuing registration in Europe.
So that's the one example that I've been looking at.
Q. The Court of First Instance's ruling in the European Union did consider safety issues related to paraquat, right?
A. The Court of First Instance obviously had, as part of this documentation, some of the issues that have been raised, for example by Sweden, but the decision to overrule the Commission's recommendation that paraquat could be re-registered was a

478

procedural -- based on a procedural -- the wrong use of procedures.
Q. And that included consideration of studies that were not submitted by Syngenta, right, for consideration?
MR. NARESH: Objection to form and foundation.
THE WITNESS: Which studies would that...
BY MR. DICKENS:
Q. Are you aware of the Court of First Instance in the European Union making reference to the fact that studies were not submitted at the time of registration of paraquat in which they were considering whether or not the procedures were followed?
A. I don't immediately remember that, and it would be helpful to see which studies they were referring to.
Q. You don't recall any discussion as to the failure to submit neurotoxicity studies as one of the procedural issues?
A. That is something which I don't immediately remember.
Q. Turn to page 930. Under 5, there's a "Regulatory Options." The first bullet point, "For

479

paraquat," it mentions:
"... defense of registrations and avoidance of bans is key for potential growth."
Right?
A. It does say that, yes.
Q. And that's referring to business growth for the company, correct?
A. It is.
Q. And certainly, bans and other restrictions on registration would affect the commercial growth of the company in its sale of paraquat; you'd agree with that?
MR. NARESH: Objection; foundation, scope.
THE WITNESS: Yes.
BY MR. DICKENS:
Q. It states:
"Bans in commercially small but influencing regions or countries like EU may strongly impact registrations in other regions or countries - either directly or indirectly via pressure from NGOs."
Right?
A. Yes.
Q. And in response -- well, those bans in those commercially small, influencing countries, one of the tactics that was used by Syngenta was not to

480

seek re-registration there so that a ban never occurred, right?
MR. NARESH: Objection; scope, foundation.
THE WITNESS: Well, you're talking about what might have been part of the regulatory strategy. I was never involved in that, so I can't say, yes, of course, that's what happened, I don't -- because I don't know.
BY MR. DICKENS:
Q. Okay. And you're here today to speak on behalf of Syngenta, correct?
A. Yes.
Q. And you don't know whether or not Syngenta tactically made decisions to not seek re-registration in order to prevent bans or other restrictions on their registrations in influencing countries?
MR. NARESH: And let me just make -- before you answer, let me just make my record.
Again, this is another example where we asked counsel if they had specific questions, given the volume of documents in the notice. If they had specific questions that they'd like to ask about documents, to identify those.
Those questions that were just asked were not identified as questions that counsel intended

481

to ask, and so, therefore, we view this particular question as outside of the scope.
If Dr. Botham has an answer to the questions, he can, of course, answer them, but this is another example where our view is this is outside of the scope of the notice.
THE WITNESS: And I can only agree with that. I was not asked to do any particular work on that particular question, so I can't answer it, I'm afraid.
BY MR. DICKENS:
Q. You did review this document in preparation for today's deposition?
A. I read through this document, yes.
Q. And you read the particular paragraph that we're looking at now?
A. Yes.
Q. Okay. Now, this document, you'd agree, when it says, "Such registrations must be kept tactically," that that's referring to the prevention of bans in commercially small but influencing regions, right?
MR. NARESH: Same objections as before.
BY MR. DICKENS:
Q. Is that your understanding?

482

A. As I say, I don't know exactly what the implication of being written in that way may have been. I would need to ask further questions of my regulatory specialists and I didn't do that.
Q. Well, certainly not seeking registrations tactically to avoid negative information with respect to paraquat, that was a long-standing tactic or regulatory strategy implemented by Syngenta for years at this stage, right?
MR. NARESH: Scope, foundation.
THE WITNESS: Again, I cannot comment on that. I have not investigated that in the level of detail that would be required to answer that question.
MR. DICKENS: Keep that close to you. I'm going to go ahead and mark Exhibit 69 for the record.
(Exhibit 69 marked for identification.)
MR. NARESH: What's the topic? Do you have the topic number handy?
MR. DICKENS: Yes, sorry. 24.
MR. NARESH: Thank you.
BY MR. DICKENS:
Q. I've handed you this exhibit, and the second page actually identifies what it is. It's a "Paraquat Vision Workshop," in April of 2000.

483

Do you see that?
A. I do.
Q. And it includes an attendees workbook, right?
A. It does.
Q. And this is a document you reviewed in preparation for today's deposition, right?
A. I did look at this one, yes.
Q. And there's a list of delegates that are included on the page ending in 998.
Do you see that?
A. Yes, I do.
Q. And these were employees of, and I'll use it broadly, Syngenta, correct?
A. So we're in 2000, so, yes, we are talking about Syngenta.
Q. And we've talked about some of these individuals who were delegates. Ian Wheals, Geoff Willis, Clive Campbell, those are individuals you recognize, right?
A. They are.
Q. I want to turn your attention to the page ending 9015. Once again, this document was created in the year 2000, right?
A. Yes.

484

Q. This is "Paraquat Improvement Projects Review - Regulatory Strategy."
Right?
A. Yes.
Q. Number one:
"Defend all existing registrations in important markets (commercial or strategic in terms of possible regional or global regulatory influence)."
A. Yes.
Q. Now, the second one states:
"Strategically withdraw on a proactive basis from commercially/strategically unimportant markets where paraquat registrations are under threat and voluntary withdrawal can be achieved without resulting in notification under PIC."
Right?
A. Yes.
Q. And that is the same sentiment that was stated in the previous exhibit from 2007, correct?
A. There's certainly some similarity in that.
Q. That Syngenta would withdraw on their own, proactively, if paraquat registrations were under threat so that they wouldn't end up on the PIC list or have other issues occur, right?
A. That's what that says.

485

Q. Okay. And, essentially, it's akin to resigning from a job before being fired, right?
MR. NARESH: Objection to the form.
THE WITNESS: Well, that's your phrase. It wouldn't be mine. But, again, I'd have to say, you know, regulatory strategy at the next level of detail beyond what it says here is not something that I believe that I needed to ask more questions about.
BY MR. DICKENS:
Q. Well, certainly, the company decided not to seek re-registration in the EU because of various concerns, including toxicity concerns, right?
A. No, that was much more complicated than that. So, that, I do know because I did have a look at that. There was a lot of work done on whether we should seek re-registration in the EU post the CFI ruling, and a lot of detail about what we would need to do to achieve that registration and whether it was the right thing to do, that was thought through very carefully.
Q. Okay. And one of those issues with seeking re-registration is additional toxicity data would need to be -- or would be required for submission in that re-registration request, right?
A. Yes, that's correct. The record certainly

486

shows that. Some of that would be because the requirements of the EU for registration of a -- or re-registration of a pesticide had changed over a period of time, so some studies would need to be updated and additional studies may be required.
And that -- those studies are listed in some of the documents that I did read.
Q. And one of the concerns with seeking re-registration would be the threat of generating critical data on paraquat?
A. Whenever you generate data on toxicology studies, or even environmental studies, there's always the danger that you will find unexpected findings because one of the principles, as we said before, of doing especially toxicology testing is that the guidelines often ask you to do these at very high doses.
So you may find things that you didn't find before. They may not be of relevance to human health, but they can have implications for regulatory status.
Q. And one of the strengths or pros of not seeking re-registration in the EU was there was no threat of generating that critical data on paraquat?
A. If we didn't go for re-registration?

487

Q. Correct.
A. Of course, yes.
Q. And so the -- now, did the US EPA -- the US EPA did not require Syngenta to conduct new toxicology studies required in Europe, did they?
A. At that --
MR. NARESH: Objection --
THE WITNESS: Sorry.
MR. NARESH: Objection to the scope and foundation.
THE WITNESS: Yeah. No, not at that time.
BY MR. DICKENS:
Q. Or at the time of re-registration?
A. Yes, yes, you're right. Yes.
Q. Okay. So Europe would have been -- Europe, as a regulatory agency, would have required additional toxicology or toxicity studies in order to get the product re-registered in the EU, right?
A. That was the view and that was presumably based on a proper analysis by the specialists as to what -- whether they would be needed and what they would be.
Q. And that's different from the United States, who did not require that data?
A. Correct.

488

Q. So there was no threat in generating negative critical data in seeking re-registration in the United States, correct?
A. Any data which are generated in one region -- and, again, especially toxicology data, which always have, if you like, potential global implications, there's always the danger that if you get findings which are of the sort that I just described, that they could have an implication for registrations elsewhere in the world.
Q. I'm going to ask, can we go back to the previous document. Keep that other one near you. I'm sorry for jumping around.
But the prior exhibit, if we can turn to page ending in 931. At the very bottom of the page, there's:
"Growth potential through strategic or tactical registrations (Strategy, outcome and SWOT analysis)."
Do you know what SWOT is referring to?
A. Strengths, Weaknesses, Opportunities and Threats.
Q. And:
"A re-registration of paraquat in Switzerland recognized as strategic and possibly

489

influential..."
Because the headquarters of Syngenta was located there.
Right?
A. That's what it says.
Q. Did Syngenta ultimately seek re-registration of paraquat in Switzerland?
A. I don't believe it did.
Q. Okay. Did -- CTL's laboratories were in the UK?
A. Yes.
Q. Can Syngenta sell paraquat in the UK?
A. Not --
MR. NARESH: Scope, foundation.
Go ahead.
THE WITNESS: Not now, no.
BY MR. DICKENS:
Q. Turn the page, ending in 932. The first bullet point on that page:
"Re-submission of paraquat in EU after annulment of the Annex I inclusion directive by the European Court of First Instances on July 11, 2007."
And that's the court decision we've been discussing, right?
A. It is, yeah.

490

Q. And then there is:
"Submit paraquat as new a.i. ..."
And that's "active ingredient"?
A. Yes.
Q. "... one representative tractor and knapsack use each."
Is stated there, right?
A. Yes. Now we are talking about detailed regulatory approaches to registration and re-registration, so this was one option: to submit as if it was a new active ingredient and, hence, what studies would be needed.
Q. And then there are some probable requirements listed, right?
A. Yes.
Q. And one of those is a full review of the Parkinson's issue?
A. Correct.
Q. And then "require neurotoxicity studies" is listed there?
A. Yes, that's right, because neurotox studies were now becoming more a part of regulatory requirements worldwide, actually.
Q. Okay. And then for this consideration of "submit paraquat as a new active ingredient,"

491

underneath this chart they list some strengths and weaknesses, right?
A. Yes.
Q. And one of the weaknesses that Syngenta lists is:
"New OPEX data on knapsack use need to be included - very unlikely that knapsack will be accepted."
Right?
A. Yes.
Q. Okay. And do you know whether or not knapsack use is currently permitted in the United States?
MR. NARESH: Scope, foundation.
THE WITNESS: I think it is, yes.
BY MR. DICKENS:
Q. Under "Threats," one of the threats for seeking to submit paraquat as a new AI and seek re-registration, or registration of paraquat in the EU, was:
"Any new study may generate data potentially leading to more critical endpoints (tox) - will also need to be considered in RoW."
Right?
A. Yes.

492

Q. And that's what you were discussing before, is new studies could always potentially lead to new toxicity endpoints?
A. That's exactly what I was saying.
Q. And that is a threat to paraquat if they were to submit that to the EU?
A. That is right, yes. Yes.
Q. And that will also need to be considered in RoW. Can you tell me what RoW is referring to?
A. Rest of the World.
Q. So that will also need to be considered -- do you know, when they say "will also need to be considered in the rest of the world," what that's referring to?
A. I think it means that it's the new study data which generates those kind of unexpected effects would be -- could potentially have implications, not just to registration in Europe but to continued registration elsewhere in the world.
Q. So it would be a threat not only to the EU but possibly a threat to all other locations in the rest of the world, right?
A. That's what that says.
Q. Now turn to page ending 934.
Now, there's some Strengths, Weaknesses,

493

Opportunities and Threats if Syngenta were to "Give up paraquat in EU - no resubmission of paraquat as a new AI," right?
A. Yes.
Q. And that's ultimately what Syngenta decided to do, correct?
A. It is.
Q. And one of the strengths for not seeking registration of paraquat in the EU was there was no threat of generating critical data, right?
A. That's correct.
Q. And one of the weaknesses was:
"Communication of a non-defense of paraquat [would need] to be carefully phrased."
Right?
A. Yes. And that was to ensure that we were not doing this because -- for example, we felt that we were insecure about our position on the safety of paraquat, because this is nothing to do with thinking that paraquat is not safe and shouldn't be registered.
Q. Now, not wanting to generate critical or new toxicity endpoints, Syngenta undertook efforts to design studies in a way in which they would not need to be reported to regulatory agencies, correct?

494

A. That is generally not the case. I know that their records shows, because I've been reminded of this in the last couple of months, that people said we need to be cognizant of the fact that findings may need to be reported, and for example under 6(A)(2) as we were talking about.
But in my experience, the science always -- and the needs of trying to understand the scientific issue would nearly always prevail.
Q. Well, Syngenta certainly elected not to conduct certain studies out of concern or fear that it would generate negative information, right?
MR. NARESH: Scope, foundation.
THE WITNESS: I know that the record suggests that, but I think if you take some of those statements and then look in a broader context, it's generally true that we still continued to pursue the line of research that was being talked about.
MR. NARESH: Are you done with 68 and 69?
MR. DICKENS: We are, yeah.
I'll hand you Exhibit 70 for the record.
(Exhibit 70 marked for identification.)
MR. DICKENS: This is topic 35.
MR. NARESH: Thank you. I've trained you.
MR. DICKENS: Yeah, I'm getting there.

495

BY MR. DICKENS:
Q. Before we get to this document, Doctor, is Syngenta currently undertaking any neurotoxicity studies on paraquat?
MR. NARESH: Scope, foundation.
THE WITNESS: No.
BY MR. DICKENS:
Q. All right. What I've handed you is an email chain from 2001.
Do you see that?
A. Yes.
Q. And I want to start on the email that begins on the bottom of page 2, titled "Paraquat PPE Issues, Conference Call" --
A. Yes.
Q. -- "April 25, 2001 Notes."
Right?
A. Yes.
Q. Okay. On the next page, page 291, in the first bullet point, it notes:
"California is uncomfortable with our paraquat inhalation exposure facts, and perhaps after things are settled with EPA on the dust mist filter PPE requirements we can address California issues."
Do you see that?

496

A. Yes.
Q. And that's, once again, something we discussed about as there were some concerns over inhalation and that ultimately led to adding a respirator on the labeling, correct?
A. That's right.
Q. And that labeling was suggested by both California and the EPA, right?
A. Yes.
Q. And Syngenta fought against the inclusion of that labeling, right?
A. I think that they -- the view was that that was not necessary, but the concerns of California over nosebleeds meant that a decision was taken that a need for a respirator would be put back on the label.
Q. Okay. And then up above that, there's reference to a 28-day inhalation study, right?
A. Yes.
Q. Okay. And then if you can turn to the email on the previous page, it's an email from an Andreas Stehli, May 3, 2001, right?
A. Yes.
Q. And it asks:
"Is the 28-day inhalation to be scheduled ex Basel (i.e., by me)? What's the target date?"

497

Right?
A. Yes.
Q. Now if we can turn back to the first page, Ian Wheals responds:
"Equally, I would strongly resist ever doing such a study."
Right?
A. Yes.
Q. The last sentence:
"We do not want to do anything to weaken EPA resolve in the conclusion they reached in the EPA RED about the lack of relevance of this route of exposure for Gramoxone."
Correct?
A. Yes, yes.
Q. So Ian Wheals is saying, "I would urge the company not to do this study because we don't want the EPA looking at inhalation toxicity again," right?
A. I think this is saying that to do something like a 28-day inhalation study would be a great example of what we've been talking about, where you may find effects which, again, because of the nature of the study, repeat exposure, high doses and so on, which are effectively not really relevant to the existing position of the EPA and ourselves on the

498

risk of paraquat from inhalation.
Q. Doing a 28-day inhalation study would risk generating critical tox data, right?
A. It's an example of what we've been talking about. And it may not have been needed in order to continue to maintain our understanding of the safety of paraquat.
Q. In your notes, Exhibit 1, that you brought with you today, under tab 1 you actually list out inhalation studies on paraquat, and that's on page 5.
A. Yep.
Q. Okay. And you list three inhalation studies, right?
A. Yes.
Q. All would have been done by this point of this email in 2001, correct?
A. That's right.
Q. Those are the only inhalation studies that you were able to identify in your review?
MR. NARESH: That's a mischaracterization.
MR. DICKENS: Okay.
BY MR. DICKENS:
Q. How did you generate this document with respect to these inhalation studies?
A. These were some of -- some -- some of the

499

other studies, representative examples of the key studies. We've done more than 1200 safety studies on paraquat altogether, so this is not an exhaustive list. There are many more inhalation studies, for example, that have actually been done.

Q. Okay. So why did you -- what was the purpose of identifying these three inhalation studies?

A. Well, as I say, it's mainly as a prompt for me for this purpose, to be -- to allow me to identify some of the key studies. Not all of them; some of the key studies that we've done over a period of time.

Q. So you determined that these were the key inhalation studies on paraquat?

A. They are key, but there are others.

Q. Okay. And two of the three key studies you identified were undertaken by Industrial Bio-Test, right?

A. Yes, and they're included to help me to remember that the inhalation studies were part of that IBT set of studies, the few studies that they did, which had this controversy we described. Not to say that they were key, if you like, in terms of our assessment of the risk of paraquat from inhalation exposure.

500

Q. Okay. Did Syngenta ever undertake the 28-day inhalation study in 2001, to your knowledge?

MR. NARESH: Scope, foundation.

THE WITNESS: I've not got evidence of such a study.

MR. DICKENS: You can put that aside.

MR. NARESH: And just so you have the record on this, tab 1 was an exhibit in his prior deposition.

MR. DICKENS: Okay.

MR. NARESH: It was a deposition -- it was marked in his prior deposition, just tab 1 of Exhibit 1, so it will be in the record twice.

MR. DICKENS: Okay, understood, thank you.

(Exhibit 71 marked for identification.)

MR. DICKENS: Go ahead and mark Exhibit 71 for the record. Topic 58 in the Notice of Deposition.

BY MR. DICKENS:

Q. And Exhibit 71 is an email from a David Ray to Bruce Woollen, copying Nick Sturgess, regarding a paraquat analysis, right?

A. Yes.

Q. This is in April -- on April 7, 2003, right?

A. That's right.

501

Q. And Dr. Ray is writing to notify those at the company that he would like to be able to assay paraquat in brain tissue, right?

A. Yes, that's correct.

Q. Okay. And he is asking for some information about analytical model, right?

A. That's right.

Q. And he mentions some work that one of his workers, or postdoctoral workers had already done in paraquat, right?

A. That's right, yes. From Thailand, yes.

Q. And he's reporting that there's "some very clear positive neurochemical and neurobehavioral results with paraquat" within those studies.

A. And these were animal studies, yes.

Q. And in those studies, the neurochemical effects were seen in neocortex, hypothalamus, striatum but not elsewhere, right?

A. Yes.

Q. They were dose-dependent, right?

A. Yes.

Q. They occurred after a single dose, correct?

A. Yes.

Q. He writes in the next paragraph --

502

MR. NARESH: Complete -- objection on completeness.

BY MR. DICKENS:

Q. He goes on to say:

"I am well aware that such results are not the sort of thing Syngenta wants to see."

Right?

A. His phrase. Yes.

Q. And the understanding is that's his phrase because they are showing neurochemical and neurobehavioral results in animal studies, correct?

A. Indeed, and -- but that's fine, we don't have a problem with getting this. He may think that we may not want to see it, see these kind of studies, but, actually, in practice we did like to see this because, again, we were trying to build up an understanding of what effects paraquat may have.

Q. So you wanted Dr. Ray to be successful in his studies in order to identify the brain concentration of paraquat in order to produce these particular effects, right?

MR. NARESH: Form.

THE WITNESS: We were open to the idea that we could contribute to this particular bit of research by using our expertise in analyzing paraquat,

503

again as part of checking the robustness of the findings, I guess you would say.
BY MR. DICKENS:
Q. Dr. Ray says:
"When we know what the brain concentration of paraquat needs to be to produce these effects, then we will be better placed to decide on whether such findings are relevant to man or whether they are a peculiarity of leaky-brained rodents."
Right?
A. Absolutely. There are a number of explanations is what he is suggesting there.
Q. So part of the reason of why Dr. Ray stated to Syngenta he's undertaking these studies is in order to determine what their relevance is to man; you'd agree with that?
A. Yes.
Q. And he states at the last paragraph:
"... the best solution for us would be to have access to radiolabeled paraquat."
Right?
A. Yes.
Q. And you'd agree that radiolabeled paraquat would allow and would be the best analytical method in order to determine how much paraquat is getting to the

504

brain?
A. It's a more straightforward way of trying to understand that question. There are other methods, but it's certainly one which is -- has got probably the best utility in this situation.
MR. DICKENS: I'll hand you Exhibit 72.
(Exhibit 72 marked for identification.)
BY MR. DICKENS:
Q. Exhibit 72 is some internal correspondence responding to David Ray's request, sent on April 7, 2003, right?
A. Yes.
Q. Nick Sturgess says at the top of the email:
"This is a worrying development since they have clearly generated a lot of data already in the rat."
Right?
A. Well, referring, I assume, to what we've just been looking at.
Q. Correct, and, actually, that email is the first email in this particular email chain on page 2, right --
A. Yes.
Q. -- the one we just looked at?

505

A. That's right.
Q. And so Dr. Sturgess is responding to Dr. Ray's request and saying this is a worrying development; and a worrying development for Syngenta, right?
A. Look, I mean, when Nick Sturgess uses phrases like "worrying development," it's, again, part of what scientists think. When a hypothesis is being explored, if there's more evidence that suggests that the hypothesis might be correct, the phrase "worrying" can be used, but that's really what is meant here: These data could have been suggesting that there's further evidence that paraquat has an effect on the brain.
Q. Well, when you say it's what scientists think, scientists with the company involved with the actual pesticide or other chemical that's being tested, right?
MR. NARESH: Form.
THE WITNESS: I know where you're going and I have to say that working in the environment, the same environment that Nick Sturgess did, it was very rare, very rare indeed, for us to have conversations about the commercial importance of, in this case, paraquat.

506

The discussions that we had were always about the science and whether the science was actually going to be moving more towards -- remember that phrase "freedom to sell"? Our role was to understand is there a real health effect, and so "worrying" in that sense is not saying, "well, we're worried about sales on paraquat." That wasn't on Nick's mind, I don't think. It would be that maybe this is another bit of evidence that could eventually, with other evidence, lead to that weight of evidence changing.
BY MR. DICKENS:
Q. Okay. It's worrying to the consideration that paraquat may be associated with Parkinson's disease?
A. Of course. That's what -- the hypothesis that was being tested.
Q. And so the data that's been generated by that outside lab, David Ray, could be worrying to the extent that it found an association between paraquat and concentrations within the brain?
MR. NARESH: Form.
THE WITNESS: Yes. I mean, that's obviously one part of the information that was being asked for to be able to understand what concentrations of paraquat were found in the brain that may have been

507

linked to the effects that have been described.
BY MR. DICKENS:
Q. And scientific literature linking paraquat to neurochemical or neurobehavioral effects could affect Syngenta's freedom to sell?
A. Mmm, and this was not the first time that such effects that you've just described had been seen in the scientific literature. So some of those early studies that we talked about of the mouse model using IP dosing, they weren't just looking at the pathology in the brain; they were also looking at dopamine levels, effect on movement and coordination in the animal.
So, of course, these are all bits of evidence that were being looked at and reviewed to understand their significance.
Q. And so, with that said, then, the negative neurotoxicity data linking paraquat to neurotoxicity, that would, in turn, result in a -- in issues with the freedom to sell?
MR. NARESH: Form.
THE WITNESS: It would continue to ask questions about how strong that weight of evidence is that could at some point say we no longer feel happy about our freedom to sell, that there may be a genuine

508

effect on human health.
These -- at this stage, we were way away from that. These were very preliminary studies in animal models. And so worrying they may have been, but worrying to the extent that, you know, we're down here and we need a lot more evidence to get there.
BY MR. DICKENS:
Q. But freedom to sell within the company, that's also affected by outsiders outside of Syngenta, right?
A. Well, that's what I'm saying, yes, I mean -- and that's why we had a very open process for understanding that outside science. And, as you can see here, always a willingness, if we could, to help and to collaborate.
Q. But you did not ultimately, openly, willingly collaborate and assist Dr. Ray, did Syngenta?
A. Well, I don't know exactly what happened with these -- with this, and the whole interaction with David Ray, I think that became a little bit less obvious to me over time, I think as Dr. Ray was beginning to retire, so not everything was finally pursued to what may have been the intended end.
Q. You didn't provide David Ray with the

509

radiolabeled paraquat that he was requesting?
A. I just -- I would need to be reminded of whether that is -- there's documentation of that, but that's quite possible.
MR. DICKENS: I'll hand you 73. Still topic 58.
(Exhibit 73 marked for identification.)
THE WITNESS: Okay. Now I'm reminded. Thank you.
BY MR. DICKENS:
Q. Okay. So you understand that Syngenta did not ultimately provide Dr. Ray with the radiolabeled paraquat he was requesting?
A. Right. Thank you for reminding me because I thought this was what the case was: It was not that we were wanting to stop that line of research, as it says here. We were still very keen to collaborate, exactly as I was saying before. There was a very practical reason, which is, essentially, we didn't really have enough of that material, radiolabeled material available.
Q. Okay. Now, the basis for telling Dr. Ray that you could not provide him with radiolabeled paraquat is there wasn't a sufficient amount in stock, right?

510

A. That's right.
Q. And what is radiolabeled paraquat?
A. It is the attachment to one of the carbon atoms in paraquat of a radiolabeled carbon atom so that you can detect where the paraquat goes to.
Q. Okay. So it's a process of attaching a carbon atom to paraquat, right?
A. It's a bit more complicated than that, but, yes, that's basically it.
Q. And that was done internally at Syngenta, right?
A. We did produce our own radiolabel compounds in some cases, yes.
Q. So, certainly, Syngenta had the capability to produce more radiolabeled paraquat had it chosen to do so?
A. Yeah, and I don't know what the constraints were on this at the time. I mean, there are many radiolabel compounds that are produced all the time for -- not just on paraquat, and therefore there is always a capacity constraint, and it may be that it was something as simple as that.
That's, again, a level of detail which I don't have at my fingertips.
Q. Are you familiar with a Dr. Ted Lock?

511

A. I am.
Q. Are you aware that Dr. Ted Lock told Dr. Ray that they could not provide radiolabeled paraquat because paraquat was "too business sensitive"?
A. I don't know -- I didn't know or don't know that Dr. Lock said that.
MR. DICKENS: Move on to 74.
(Exhibit 74 marked for identification.)
MR. DICKENS: Which is topic 64.
BY MR. DICKENS:
Q. This document is an email from Louise Marks to Mike Clapp on April 6, 2004.
Do you see that?
A. I do.
Q. And she's discussing a new paraquat study, right?
A. That's right. So this was at the start of the studies that we were talking about earlier.
Q. She says, first full paragraph:
"As Nick mentioned to you, we decided not to include a 3 times a week paraquat group as this has [...] previously been reported in the literature so could therefore lead to a PRF if effects were observed."

512

Right?
A. Yes.
Q. And PRF is what we discussed before, Potentially Referable Finding, correct?
A. Yes.
Q. That's where information is submitted to a regulatory agency, right?
A. That's correct.
Q. And so the company decided to not include a particular group in the study because if negative effects were observed, they would not have to submit it through a PRF?
A. And there were two other reasons why this was the case. One is, I articulated here. The more paraquat you gave to these animals three times a week, rather than once or twice a week, the higher the likelihood that you may get nonspecific effects. That's what the systemic toxicity could result in. And, secondly, in order to -- as trying to understand, which is what we were doing here, if we can replicate the findings of others, it wasn't necessary to do it three times a week; so let's do a study where everything works in order to answer our question.
Q. Okay. In this particular study, if effects were observed, it therefore would have led to a PRF, right?
A. It's a kind of technical point, but, yes, it was one of the considerations. We didn't need to do that whilst we were still in the investigation phase. It wasn't compromising the scientific approach that we were trying to take.
Q. You'd agree that certainly nothing would have prevented Syngenta from providing an explanation in a report to the regulatory agency as to a belief that the amount of paraquat that was used in the study led to toxic effects versus a true effect, if you will?
MR. NARESH: Objection to form, scope, foundation.
THE WITNESS: I'm not quite sure I understand the question.
BY MR. DICKENS:
Q. Yeah, let me ask it a different way.
There was nothing that would have precluded Syngenta from providing its own explanation as to the results in a PRF to the regulatory agency?
A. Had we done the study, you mean?
Q. Correct.
A. Of course. But if you -- it seemed to make sense to us, as we've discussed quite a few times, actually, that especially when you're doing scientific research and not a regulatory study, do a study that is going to give you as clear an answer to your question as possible and don't compromise that, in this case, by paraquat's toxicity leading to findings which may be nothing to do with neurotoxicity.
MR. DICKENS: Let's look at another example. I'll hand you Exhibit 76.
THE STENOGRAPHER: 75.
MR. NARESH: 75.
MR. DICKENS: 75 it is, and this is topic 64.
(Exhibit 75 marked for identification.)
BY MR. DICKENS:
Q. I'm going to start on the email that begins at the very bottom from Barry Elliott to Ian Wheals, September 11, 2006, and goes on to the second page.
Do you see that?
A. I do.
Q. And this is an email chain that you reviewed in preparation for the deposition?
A. It is.
Q. And the subject of the email is "Paraquat

515

and lit claims of neuronal effects in the rat."
Right?
A. Right.
Q. And at this point, there were claims in the literature that there were neuronal effects seen in not only the mouse but the rat as well?
(Stenographer clarification.)
BY MR. DICKENS:
Q. At this time, in 2006, there were claims in the literature showing neuronal effects not only in the mouse but also in the rat?
A. The majority of findings were in the mouse, but, yes, but there were some in the rat.
Q. The email starts:
"Ian, regarding previous correspondence on this issue and concerns over PRF status."
Right?
A. Yes.
Q. It says:
"There is now a literature claim of effects of paraquat that allow us to undertake a repeat such as to make a finding, not a new finding (unless of course we have a greater magnitude of effect)."
Right?

516

A. Yes. So, again, what we're trying to do here is to say what is the basis for wanting to do this study, and the basis of trying to do the study was part of that issue we discussed several times now, which is this effect, whether it's in the mouse or the rat, replicable, does it happen in a different lab.
So the scientific question can be addressed by doing a study in exactly the same way as it was done by another lab.
Q. It states:
"The study examined [the] neuronal cell count only and not the usual accompanying parameter of striatal dopamine levels. We would normally measure this in order to examine the consequences of any cell loss."
That's what's being said here, right?
A. It does say that, yes.
Q. Okay. And so Syngenta, as a company, if conducting these studies, the typical way they would do it would be to measure the striatal dopamine levels in order to determine whether or not there's a consequence of cell loss?
A. Right. But the decision was taken here that the first key question was do we -- are we able, or not, to replicate the finding of neuronal cell

517

loss. Effects on dopamine would then become, if you like, a downstream consequence of that.
In experiments, sometimes you say let's make sure we focus on the key issue, and the key issue was substantia nigra neuronal cell loss.
Q. If Syngenta did measure striatal dopamine levels and there was a decrease, that would result in the PRF. You'd agree?
A. It may have done. I mean, we'd have to look -- again, look at what was already in the literature at that time.
Q. Well, the authors of this study, Barry Elliott specifically, says if we do this and then find a decrease, it would be a PRF, right?
A. Well, that was their view. I mean, I would -- they -- I don't remember because this is, again, quite some time ago. I mean, I assume that they did actually make that statement in the light of what the existing literature was saying, yes.
Q. And, in fact, they say:
"Scientifically, we should measure both parameters."
Right?
A. Well, yes, you could argue that, but I think that, again, when you're trying to do any kind

518

of scientific experiment, it's always best to take one step at a time because if there is no -- if a finding can't be replicated and we don't see neuronal cell loss, then, you know, it's highly unlikely there would have been an effect on dopamine.
So, you know, you do the study that gets to the key question.
Q. Okay. You say you could argue that. It's not an argument. That's Barry Elliott who says we should measure both parameters scientifically, right?
A. There are always arguments about what -- you know, there are many other things which you could do scientifically. I mean, you could have argued, I'm sure, if we'd wanted to, you should -- we should also look at the behavior of those animals, you know, are they -- is there movement being affected, as people have done in rodent models before.
But we decided to stick with the key parameter of neuronal cell loss in the brain.
Q. Barry Elliott was the one responsible for coming up, in some part, with the design of this particular study, right?
A. No, Barry Elliott was the project manager. He wasn't the key scientist. So that would be the responsibility of Nick and Louise -- Nick Sturgess and

519

Louise Marks.
Q. And then Barry writes to Louise Marks, in the email on the first page:
"Please take all steps to ensure no PRF except re the cell count magnitude aspect."
Right?
A. Yep. It's basically saying, look, we agree we should do this, this study. Let's stick to the cell counting, the assessment of nigra striatal dopamine -- dopaminergic cell loss, and recognizing, as had been said earlier, that of course if there is a greater degree of change in that, or any, then that could be potentially referable.
So it's not that we stopped doing it because we were afraid of all eventualities of a PRF.
Q. It's saying don't do something scientifically we believe we should do because we don't want a PRF to report to the regulatory agencies?
A. No. I'll say it again, it's not -- if you can do a study which meets the scientific need and doesn't create data which you then have to spend a lot of time trying to explain unnecessarily because it actually has no bearing on human health, then why do it?
You can answer the question scientifically

520

in the way in which, ultimately, it was done.
Q. So are you saying that EPA and other regulatory agencies don't have the capacity to review and interpret scientific information?
MR. NARESH: Scope --
THE WITNESS: No, I'm not saying that.
MR. NARESH: Scope, foundation.
Go ahead.
THE WITNESS: Yeah. No, I'm not saying that, of course. Absolutely not. I'm just saying that we wanted to have, ourselves, a study which gave a clear answer to a clear question.
BY MR. DICKENS:
Q. In a way that wouldn't have to be reported to regulatory agencies?
MR. NARESH: Asked and answered multiple times.
THE WITNESS: And I've said, indeed, we were aware that it may have to be referred, depending on the outcome, even of that simple answer to a simple question.
(Exhibit 76 marked for identification.)
MR. DICKENS: Exhibit 76. This is topic 28.
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521

BY MR. DICKENS:
Q. Exhibit 76, emails from July 2015, related to ICAMA, correct?
A. Yes.
Q. And that is the regulatory agency in China?
A. It is.
Q. Is paraquat permitted to be sold in China?
A. It is not.
Could I just ask, was this in my documents?
Q. It should have been, and specifically identified in topic 28.
A. It may have been and I just don't recall this one, but I just thought I'd double-check.
MR. NARESH: It's listed in there --
THE WITNESS: Yeah.
MR. NARESH: -- so it was probably in your --
THE WITNESS: Yeah. Okay, that's fine.
MR. NARESH: -- materials.
THE WITNESS: No problem.
MR. NARESH: If you don't remember -- I know it's been two months --
THE WITNESS: Yeah, I mean --

522

MR. NARESH: -- in reviewing documents. For any document that you don't have a specific recollection of --
THE WITNESS: Mmm.
MR. NARESH: -- take your time, review it so that you can answer questions.
THE WITNESS: Yeah, well, thanks for that advice, because this wasn't one that I immediately remembered. That's why I was asking the question, thank you.
BY MR. DICKENS:
Q. Let me know when you're ready.
A. Yeah, I just wanted to have a look as a consequence, thank you.
Q. Yeah.
A. Yes, okay, go ahead.
Q. It's the email beginning on the bottom of page 1 into page 2. Notice that:
"... ICAMA started a 'risky AI re-evaluation' program' about 2-3 years ago."
Right?
A. Yes.
Q. And that's someone from Syngenta referring to it as "risky AI re-evaluation," right?
A. Indeed, this is James Duan, who was the

523

product manager for paraquat.
Q. Okay. And under that program, certain risky active ingredients were selected and certain studies were carried out, right?
A. That's right. That's what it says.
Q. And the regulatory agency in China does undertake its own toxicity studies from time to time, right?
A. It does.
Q. And it actually undertook some studies on paraquat, right?
A. So it would seem, yes.
Q. And those included dermal and inhalation toxicity studies, right?
A. That seems to be what is being suggested here, yes.
Q. And these dermal and inhalation toxicity studies, these would have actually been undertaken by the regulatory agency in China itself, right?
A. Right.
Q. And those toxicity studies "will most likely reclassify paraquat as highly toxic pesticide."
A. Right. So this was -- as I understand it, this was an intention that those tests would be done.
Q. Now, as far as you know, the regulatory

524

agency in the United States has not conducted its own dermal or inhalation toxicity studies on paraquat, right?
A. Not in this kind of -- no, no, the agencies themselves have not done it. No, absolutely not.
Q. In this case, there are some comments listed there and it says:
"The ICAMA 'risky AI re-evaluation program' comes as a surprise. The fact that it has been running for 2-3 years without our [...] knowledge is alarming."
Right?
A. Mmm-hmm, yes.
Q. So Syngenta had no idea that this was ongoing by the regulatory agency in China, right?
A. That's right.
Q. And:
"... 'unilateral, stealth nature' of the program is rather concerning..."
Concerning to Syngenta, right?
A. Mmm-hmm, yes.
Q. Because:
"... it eliminates any opportunity for Syngenta to influence its decision before it is made."

525

Right?
A. Yes, that's what it says.
Q. And we looked at that term "influencing" in the past with respect to regulatory agencies, right?
A. Yes, and I don't know what it -- as I say, I'm still kind of re-thinking this email through. I mean, I don't know what it meant by "decision" here, whether it's decision to do the testing or whether it's to influence the interpretation of studies once they were completed. That's still not very clear to me.
Q. We weren't able to influence the regulatory agency with respect to the program or, ultimately, its conclusions from the program?
A. That's highly likely to be the case, yes.
Q. It says:
"It is very unusual for authorities to conduct standard toxicity studies themselves or to sponsor the conduct of those studies."
Right?
A. It's unusual but not unknown.
Q. So it does happen from time to time?
A. It does.
Q. And in this case, China ultimately elected

526

to do so on certain pesticides it deemed the more risky ones, right?
A. Yes.
Q. All right. And then the email on the bottom of this page that goes on to the next states:
"... paraquat will [be] reclassified due to trial result shown its dermal and inhalation toxicity is higher than it was [...] in [the] current dossier."
Right?
A. Well, the English, if I may say it, here is a little bit tricky. Where it says "but paraquat will reclassified due to trial result shown its dermal and inhalation toxicity is higher..."
I mean, that's a bit of an ambiguous statement as written.
Q. Yeah, and probably unnecessary: It's pretty much the same statement that we looked at on the email before that says:
"Paraquat will most likely reclassify..."
Or:
"Paraquat will most likely be reclassified as 'highly toxic pesticide.'"
Right?
A. I assume that that was meant by it -- if

527

this -- if these studies were to be done, that could be a consequence.

MR. DICKENS: Okay. I'll hand you 77.

(Exhibit 77 marked for identification.)

MR. DICKENS: This is an email from August 5, 2015. Once again, this is topic 28 within the Notice of Deposition.

BY MR. DICKENS:

Q. It's relating to "National Pesticide Registration Review Committee," right?

A. It is.

Q. Okay. It includes meeting minutes and its English translation, right?

A. Yes.

Q. According to the minutes:

"... paraquat will be reclassified as 'highly toxic pesticide' based on the results of acute oral, dermal and inhalation toxicity studies (conducted by ICAMA or under ICAMA's directions, not mentioned in the text)."

Right?

A. Yes, that's correct.

Q. It goes on, that although:

"... the debate of the alternative paraquat formulations registration was not conclusive,

528

the majority of committee members were in favor of withdrawing the existing registrations."

Right?

A. Yes.

Q. And, therefore, those within Syngenta were going to look into what the implications of being deemed a "highly toxic pesticide" classification ultimately were, right?

A. That's correct.

Q. And so China had, from their own studies of oral, dermal and inhalation on paraquat, enough to withdraw the existing registrations and deem this a highly toxic pesticide?

A. That's what that says.

MR. NARESH: Form, foundation.

THE WITNESS: Incidentally, I don't think I've ever seen those studies.

MR. DICKENS: Okay. Let's look at why.

(Exhibit 78 marked for identification.)

MR. DICKENS: I'll hand you Exhibit 78.

BY MR. DICKENS:

Q. I'm going to start at the very back, which is the first email.

MR. NARESH: Dr. Botham, if you need a minute to refamiliarize yourself with the document, please feel free.

529

THE WITNESS: Yeah, I'm still checking this out, thank you.

Yes, okay. Good to go.

BY MR. DICKENS:

Q. The email on the back, which is the first email in this chain, is dated July 29, 2015, right?

A. That's right.

Q. And additional information was received by Syngenta from the Chinese regulatory agency, right?

A. Yes.

Q. And it turns out they actually asked a CN CRO.

Do you know what that refers to?

A. A Chinese contract research lab, so a tox lab in China.

Q. Okay. So an outside tox lab conducted "acute tox studies on dermal and inhalation using PDC for 2-3 years."

Right?

A. Yes.

Q. And "PDC" is referring to the paraquat compound that was on the market in China?

A. PDC is paraquat dichloride, yes.

Q. Okay. So that is just straight paraquat?

530

A. Yes.

Q. And so this outside organization undertook tox studies which showed extreme toxicity on both acute dermal and inhalation, right?

A. Yes.

Q. And those studies were apparently accepted by the regulatory agency as valid, correct?

A. They were.

Q. And they were -- we know that because the regulatory agency is going to change the classification of paraquat from moderate toxicity to extreme toxicity?

A. That's the email we were previously looking at, the recommendation of the Pesticide Registration Review Committee.

Q. Okay. Then Andy Cook -- and you're familiar with Andy Cook, right?

A. Yes, I am. Yes.

Q. We've discussed him in the past.

A. Mmm-hmm.

Q. He writes an email. In the second paragraph:

"It is interesting to see that ICAMA apparently commissioned their own studies on the dermal inhalation toxicity of paraquat."

531

Right?
A. Yes.
Q. It states:
"However, the source of the test substance is unlikely to have had a major impact on the test result."
Right?
A. Right.
Q. Okay. So regardless of where the paraquat chloride came from, that probably didn't affect the results?
A. Yeah, so the test design is much more significant, yes.
Q. Okay. And so he asks, and bolded:
"Is it possible to have access to the study results and/or the study reports themselves? Do we know which CRO conducted the studies?"
Right?
A. Yeah. And going back to what I was just saying, yes.
Q. It's a reasonable request?
A. Mmm.
Q. That's a yes, right?
A. Yes, yes.
Q. And that's -- certainly, Syngenta would be

532

interested in receiving study results or study reports that show paraquat having extreme dermal or inhalation toxicity, right?
A. Yes, and that's -- Andy Cook is reflecting that request or inquiry.
Q. Okay.
The email right before that starts on the first page and goes to the second. It's from a James Duan.
Do you see that?
A. I do.
Q. Do you know who that is?
A. Yeah. I think, as I said before, James was the product manager for -- the commercial product manager for paraquat at that time.
Q. For all of Syngenta?
A. For paraquat.
Q. Okay. But he's with Syngenta, commercial manager --
A. Yeah.
Q. -- for paraquat, right?
A. Yes. Yes.
Q. And he instructs those on the email chain:
"... please," in bolded letters and capitalized, "DO NOT approach and ask for test results

533

from ICAMA until further notice."
Right?
A. He does say that, yes.
Q. Now, part of the reason -- well, first of all, you indicated you have never seen the test results, right?
A. I don't think I've ever seen those studies.
Q. And, as far as you know, those studies have never been requested by Syngenta, right?
A. Well, that would be one reason why I'd never seen them.
Q. If Syngenta had received them, you would likely have seen them, right?
A. Most likely, yes.
Q. So as far as you know, they've never been received?
A. That would be my estimate, yes.
Q. And do you know whether or not they've ever been requested?
A. I don't know. I've not -- I have never received any information with that -- to that question.
Q. And, certainly, had Syngenta received toxicity studies conducted by the Chinese regulatory

534

agency showing extreme toxicity on acute dermal and inhalation, that would have potentially generated a PRF, right?
A. It's new information. I mean -- but the reason why you'd need to see a study report is that the devil is in the detail; you'd need to know exactly what do they mean by "extreme toxicity." We don't even know that.
Q. And so as new information showing extreme toxicity, that potentially could have led to a PRF in which the US EPA would have had to have been notified of those results, right?
A. If that information was not otherwise in the public domain.
Q. Did China ban the use of paraquat or did Syngenta choose not to seek a registration?
A. I believe China -- well, this is where we go back to the list of countries, so...
It says here, countries that disallowed paraquat sales because of concerns about acute toxicity, and that includes China.
Q. And you have no idea, as you sit here today, whether or not those toxicity concerns involved neurotoxicity in any way, right?
A. I think that it was to do, as it suggests

535

here -- much more to do with acute toxicity, including things like suicide.

Q. You've never seen those studies, right?

MR. NARESH: Objection; asked and answered.

THE WITNESS: The acute studies, I don't believe I've ever seen.

MR. DICKENS: We can put that aside. Why don't we take a break.

THE VIDEOGRAPHER: We are going off the record at 14:14.

(Break taken.)

THE VIDEOGRAPHER: We are back on the record at 14:27.

BY MR. DICKENS:

Q. Dr. Botham, throughout the course of the deposition, we've discussed the research on paraquat and Parkinson's disease representing a threat to the company, right?

A. It's posing a potential threat if it were ever proven that there were a causative link.

Q. And that would potentially affect the freedom to sell, correct?

A. It would -- the freedom to sell is actually, as I was describing earlier, the judgment on

536

the safety; is it safe -- is it the right thing for us to be doing.

So the implication, actually, is our license to sell, our ability to do that, to get permission to do that through regulatory authorities.

Q. And, from time to time, Syngenta would consult with outside researchers and scientists with respect to the data and information related to paraquat and Parkinson's disease?

A. Yes. Nearly all the time we would be doing that.

MR. DICKENS: I'll hand you Exhibit 79.

(Exhibit 79 marked for identification.)

MR. DICKENS: This is topic 49.

BY MR. DICKENS:

Q. This is an email from back in 2002 with respect to epidemiology review for Syngenta, right?

A. That's the title of the email, yes.

Q. Okay. And Syngenta, at this time, consulted with a Nancy Pedersen.

Do you see that?

A. Yes, I do.

Q. Do you know who Nancy Pedersen is?

A. I believe that she was a scientist epidemiologist from Sweden.

537

Q. Okay. And on the very last email which goes on to the second page, Syngenta had retained her to undertake a review concerning Parkinson's disease, right?

A. Yes.

Q. Okay. And that was a review in -- which she completed and sent to Syngenta, right?

A. Yes, that's right.

Q. And Nick Sturgess -- and, once again, he's the neurotoxicologist, right?

A. Nick, yes, that's right.

Q. And he gave some comments after reading the Pedersen report, right?

A. He did.

Q. He says:

"... they don't really give us much scope to dismiss the claimed pesticide links on the basis of fundamental flaws in the study design or analysis."

And that's what Syngenta was hoping for, right, is that her report would give them evidence or some support to dismiss that there was any link between pesticides and Parkinson's disease?

A. I'd position it somewhat differently. I think that this is actually a great example of where we were reaching out to people knowing that they

538

would not necessarily be giving the answer that we wanted. So, you know, this was meant to be an objective, outside view on the state of the science at that time, specifically here on the epidemiology.

Q. So you specifically reached out to -- do you know if Nancy Pedersen is an epidemiologist?

A. You know, I don't, sitting here, know exactly what her qualification is, but I think she certainly has some epidemiological expertise.

Q. Okay. And Syngenta reached out and said, "Help us evaluate this information so we can determine what to do with it," right?

A. Yeah. And this is 2002, so there were certainly a number of epidemiology studies that had been published by them.

Q. Have you asked Dr. -- or, sorry, Professor Pedersen to undertake a re-evaluation of the epidemiology in any way, to your knowledge?

A. No.

Q. And you said, "Okay, you review the information so we can get your input," right?

A. Yes.

Q. And, obviously, if you asked her to do so, you would have considered Nancy Pedersen to be an expert in the field?

539

A. Yes.
Q. And she gave you her review?
A. She did.
Q. And she gave some comments on the Liou study, right?
A. She did.
Q. And you're familiar with that study?
A. I am.
Q. And that study concluded there was a positive association between paraquat and Parkinson's disease, right?
A. Yes.
Q. And Professor Pedersen found that it was not flawed and the authors' conclusions were reasonable, right?
A. That was her view, yes.
Q. So overall, based on her entire report, she found there was:
"... good epidemiological evidence for environmental factors (such as pesticides) playing a significant role in the etiology of paraquat, and that exposure to..."
Or:
"... Parkinson's disease, and exposure to paraquat may be one component of this."

540

Right?
A. Yeah.
MR. NARESH: Object on completeness.
THE WITNESS: So, yes, she wasn't saying, "Look, my review of this literature says paraquat is clearly causative in Parkinson's disease." That's not -- wasn't her conclusion, but that she felt that there was evidence that was suggestive of some form of link.
BY MR. DICKENS:
Q. Okay. And at this time -- well, you'd agree that not one single epidemiological study could be conclusive as to whether or not something caused Parkinson's?
A. Indeed, that's very rarely the case.
Q. Okay. And so she says, you know, it's suggestive, more research needs to be done, essentially, right?
A. Yeah, yeah. Yes.
Q. Okay. And did Syngenta go do any epidemiological studies --
A. It did.
Q. -- in any way following this?
A. Yes, it did.
Q. Okay. And when was that?
A. So the studies that we specifically did were on our own workforce. We talked about that, I think, briefly yesterday; so the studies that appeared under the Tomenson and Campbell authorship. We also asked an external expert to look at the survivors of paraquat poisoning and whether they had developed any Parkinsonism signs.

541

Q. Okay. So those were the two studies undertaken by Syngenta --
A. Yeah.
Q. -- right?
A. And the first one was two -- essentially, two publications because we looked initially at that population, then again in ten years following; so it was a two-part study.
Q. Okay. Did Syngenta, at any point, inform its customers or farmers as to Professor Pederson's opinions or the information she provided to you in her report?
A. I don't know that we mentioned Professor Pederson, but we certainly, in the time period that we're now moving into, not necessarily 2002 but not that long after, we did start to put into the public domain, through our website, the emerging information, if you like, on the possible link between paraquat exposure and Parkinson's.

542

Q. Okay. And that's paraquat.com?
A. That's paraquat.com.
Q. And so is it your testimony that paraquat.com contained a statement that said there's good epidemiological evidence for environmental factors such as pesticides playing a significant role in the etiology of Parkinson's disease and exposure to paraquat might be a component to this?
MR. NARESH: Objection; form.
THE WITNESS: Yeah, I mean, I'd need to go back and read the detail, but what we were putting into paraquat.com were some of the key studies, and not just back in 2002, you know, certainly beyond that.
But, again, it was put in terms of the weight of evidence. So we were also talking about the animal studies and what we believed that weight of evidence was telling us and, hence, communicating that to those who wished to know.
BY MR. DICKENS:
Q. And that was in the context of there is no link between paraquat and Parkinson's disease?
A. The conclusion was, and still is, that that weight of evidence says there's no evidence -- insufficient evidence, no evidence, whichever phrase

543

you'd prefer, for a causative link.

Q. Did, to your knowledge, Syngenta ever inform the United States Environmental Protection Agency of the existence of Professor Pedersen's report?

A. I don't know whether that was made available.

MR. NARESH: Scope. Scope and foundation.

BY MR. DICKENS:

Q. Dr. Botham, you're familiar with the product Gramoxone Inteon; is that right?

A. I am.

Q. And Gramoxone Inteon was put on the market in the United States?

MR. NARESH: Is this 71?

MR. DICKENS: It is.

MR. NARESH: As you know, we have a pending objection on 71. Dr. Botham is free to answer any questions in his personal capacity on this, but we would object to corporate representative testimony, as we have articulated for the last several months.

MR. DICKENS: Okay. Well, I'm not aware of any protective order or anything preventing -- are you putting up another witness to speak on these issues?

544

MR. NARESH: We are not. We object to the topic. We have made that clear for over -- for three months now and you have not taken any action to progress that either. He's here, he can answer any questions that he knows in his personal capacity, but he's not here as a corporate representative on 71.

MR. DICKENS: We can address that with the Court later.

BY MR. DICKENS:

Q. Doctor, do you agree that Gramoxone Inteon was the only product on the market for a specific time in the United States?

MR. NARESH: Objection; form, foundation, scope.

THE WITNESS: I don't know whether it was the only product.

MR. DICKENS: Go ahead and mark Exhibit 80 for the record.

(Exhibit 80 marked for identification.)

BY MR. DICKENS:

Q. Doctor, I've handed you a PowerPoint, "Paraquat US Regulatory," dated December 7, 2012. Do you see that?

MR. NARESH: Can I have a standing objection on scope and foundation?

545

MR. DICKENS: You can have an objection.

MR. NARESH: Can I have a standing objection?

MR. DICKENS: That's correct.

THE WITNESS: I'm pretty sure, by the way, that I have not read this as part of my preparation.

BY MR. DICKENS:

Q. Okay. And this document, though, is December 7, 2012. Monty Dixon is included on the cover, right?

A. He is.

Q. Okay. Now, what was Gramoxone Inteon?

A. Gramoxone Inteon was a formulation of paraquat which contained another, what we called a safening agent in the form of alginate. Alginate is something that's found in, for example, indigestion medicine.

It is -- it comes from seaweed. It was added because there was a hypothesis that in having alginate, it would reduce the possibility of paraquat being absorbed from the stomach and causing its acute toxicity.

Q. And Syngenta had respected that Gramoxone Inteon with that alginate formula was a safer version of paraquat formulation, right?

546

A. On the basis of the -- some of what you might call preclinical toxicology studies that had been done, yes.

Q. Well, it was represented as safer to both regulatory agencies as well as end users and farmers, right?

A. It was, yes.

Q. It was represented as having less dermal exposure or dermal absorption than the prior paraquat formulations on the market?

A. I believe that was also the case, yes.

Q. Okay. Created less risk of acute toxicity as well?

A. That was the aim, yes, and mainly particularly to avoid accidental poisoning.

Q. And you're aware Inteon -- a registration for the application of Inteon was submitted to the United States?

A. Yes, I know that, certainly.

Q. And you know it was approved in the United States, right?

A. I believe it was, yes.

Q. And it was approved on the basis and representations that it was a safer formulation, correct?

547

MR. NARESH: Objection; form.
THE WITNESS: That was clearly one of the positive attributes of the formulation, yes.
BY MR. DICKENS:
Q. And you're aware that Syngenta undertook efforts to get other companies' paraquat-containing formulations removed from the market, right?
A. Well, you're now again into questions of detailed regulatory strategy, which I wouldn't be able to accurately answer.
Q. No one -- you weren't informed of that before today?
A. I mean, I may have been but I can't recall exactly if and how I was informed.
Q. And you don't know whether or not the company moved to withdraw all other registrations other than Gramoxone Inteon, right?
A. Again, that's the level of detail I said I wasn't -- I didn't have at my fingertips.
Q. Okay.
If we can turn to page 2 of this document, it shows that the Inteon application was submitted to the United States in September 2004 with some oral tox dog studies, right?
A. Yes, we -- so the basis of those

548

preclinical studies that I was talking about is that they were done in the dog because the dog is a vomiting species and so is the closest we could get to an animal model that may be -- reflect a human -- the way in which a human could be -- could suffer toxicity from paraquat.
Q. Okay. And did Gramoxone Inteon include an emetic?
A. Yes. There was -- as was the case with other formulations, there was an emetic and, indeed, certainly at some point there was an increased level of emetic.
Q. Increased at the time of Inteon, before or after that?
A. Well, again, the detailed timing, I can't comment on, but I do know that the level of emetic in some formulations, including Inteon, I think went up by three-fold or two- -- it was certainly increased.
Q. The next page in this timeline, August 2005, Gramoxone Inteon registration was approved, right?
A. Yes.
Q. And then September 2005, Syngenta requests voluntary cancelation of Gramoxone Max.
Right?

549

A. That's what it says.
Q. Do you know what Gramoxone Max is?
A. Well, that was the formulation we were talking about earlier, so it would certainly be one of the formulations that was commercialized in the United States.
Q. Next page of the timeline, October 2006, the EPA places a two year conditional registration of generic paraquat requiring an increased level of emetic, right?
A. Yes.
Q. That expires in 2008 unless the registrant proves the product would not increase the risk of adverse effects, correct?
A. Okay, yes.
Q. And then in November 2006, the EPA issues a cancellation order for Gramoxone Max?
A. Okay.
Q. What does it mean when the EPA issues a cancellation order, to your knowledge?
A. This is language which is not language that I -- was in my day-to-day work. I don't know whether that means that they canceled the registration of Gramoxone Max or whether they're canceling the idea that it should be. So, I'm sorry, this is not clear

550

to me.
Q. You have no idea?
A. No, I mean, I wouldn't be able to give you an accurate interpretation of what that meant.
MR. DICKENS: I'll hand you what we'll mark 81.
(Exhibit 81 marked for identification.)
MR. DICKENS: This remains topic 71.
MR. NARESH: Same standing objection as to this document?
MR. DICKENS: Same standing objection.
THE WITNESS: I mean, let me also raise an objection because, quite frankly, you know, you're now showing me documents that I certainly haven't read as part of the preparation for this meeting.
BY MR. DICKENS:
Q. Okay. And did you pull the documents yourself for preparation in this --
A. No, no, I was provided them.
Q. Okay. Now, this document is "Gramoxone 'AWT key message toolkit," right?
A. Yes.
Q. And what does AWT refer to?
A. Well, it's --
Q. Is that the alginate?

551

A. It's alginate wetter -- I can't remember. Yes.
Q. Okay.
A. You're now illustrating my point. I've not been able to prepare on this.
Q. The toolkit includes key messages for regulators, medical community, NGOs, growers, internal, right?
A. Yeah.
Q. If you can turn to 7094.
Again, small writing.
A. Yeah.
Q. Under benefit -- well, first of all, the stakeholder here are "Growers."
Do you see that?
A. I'm still navigating my way around this.
Q. At the very top left-hand corner.
A. Oh, yes, okay, right.
Q. Okay. And "growers," that would be the farmers and other end users?
A. Yes, I assume so.
Q. "The bottom-line message" is:
"Gramoxone AWT is a breakthrough."
Right?
A. That's what it says.

552

Q. And benefits to stakeholders includes it improves activities on key weeds, and improved efficacy.
You're aware that that is a message for Gramoxone Inteon during the time that it was marketed, right?
A. Well, this is what that says.
Q. Okay. Did you know that independently of seeing this document?
A. I know that there were discussions about the relative efficacy of the alginate-containing formulation versus the previously marketed ones. I mean, it was a detail which, again, was not in my wheelhouse, if you wish, so -- but, clearly, this suggests that there would have been some efficacy benefit.
Q. It also says there's a breakthrough in safety, correct?
A. Which is -- was in my wheelhouse, absolutely, as I was describing, yes.
Q. Okay. So the safety aspects of Inteon's within your wheelhouse?
A. Yes.
Q. Okay. So you know that it was marketed as less toxic, right?

553

A. On the basis of those dog studies, yes.
Q. Okay. And easy to use safely, right?
A. Yes.
Q. And, in fact, in the bottom left-hand corner, "What you must not say" and that -- it won't have an impact on safety, right?
A. Okay.
Q. So Syngenta would tell the growers and other users this is more safe, based once again on those dog studies that they had at the time, correct?
A. That was true at the time.
Q. Okay.
And you know, as being in the safety wheelhouse, that that same message of this being safer was also represented to regulatory agencies?
A. It was, yes.
Q. To the United States as well?
A. Yes.
Q. Are you aware that Gramoxone Inteon was represented as lowering plasma paraquat levels compared to the previous paraquat formulations across a 16-fold increase in dose?
A. Yes, I was very familiar with those studies.
Q. And reduced skin irritancy compared to the

554

Gramoxone formulations on the market?
A. Yes, I was aware of that, too.
Q. All things that were represented to the regulatory agencies, right?
A. I believe that they were all included in what were submitted to the agencies, yes.
Q. Now, Gramoxone Inteon is no longer on the market in the United States, correct?
A. Correct.
Q. Syngenta made a determination or decision to replace Gramoxone Inteon, right?
A. They did.
Q. And were you involved in those decisions to remove Gramoxone Inteon from the market?
A. No, I wasn't involved in the decisions. I was certainly part of the provision of information that would have led to that.
Q. Do you know when Gramoxone Inteon was removed from the market in the United States?
A. No, I don't have that date to hand, I'm sorry.
MR. DICKENS: I'll go ahead and hand you Exhibit 82.
(Exhibit 82 marked for identification.)
MR. DICKENS: You can have a standing

555

objection to this document.
MR. NARESH: Thank you.
BY MR. DICKENS:
Q. Exhibit 72 --
THE STENOGRAPHER: 82.
BY MR. DICKENS:
Q. -- 82 begins with an email from a Jonathan Sullivan on March 11, 2008, for "Paraquat Issue Leadership Team Meeting on March 13, 2008," right?
A. Indeed.
Q. And subjects "need to address" is listed as Inteon, right?
A. Yes.
Q. The third bullet point:
"Commercial options to replace Inteon with low concentrate and/or high emetic Gramoxone."
Correct?
A. Correct.
Q. So there were discussions going on within Syngenta of replacing Inteon with another product either at a lower concentration or with a higher emetic, right?
A. There were.
Q. And you were aware there were conversations going on while you were working for

556

Syngenta?
A. Indeed, yes.
Q. And who was Jonathan Sullivan?
A. He was a general counsel based in Basel.
Q. It says:
"I would ask you to limit any paper or slide materials which you produce for the meeting to the practicable minimum and send me in draft form for review any materials which you propose to use."
Correct?
A. Yes.
Q. That's what he says?
A. That's what he said, yes.
Q. He mentions a note of a "third bullet point item," right?
A. Yes.
Q. And turning -- Syngenta says:
"... I would make you aware that by switching to a non-Inteon formulation in those countries where Inteon has been sold (and conceivably those countries where Inteon registrations and requests for safety standards are pending) we increase our exposure in any future litigation relating to ingestion unless we are able to show that the safening effect of the replacement formulation in at least the

557

equivalent to that of Inteon product."
Right?
A. That's what it says.
Q. So if we're going to go ahead and replace Inteon, we need to show that what we are putting on the market is just as safe, right?
A. Indeed, and that's what we actually did proceed to do.
MR. DICKENS: I'll go ahead and hand you Exhibit 73.
THE STENOGRAPHER: 83.
MR. DICKENS: 83. I want to go back.
(Exhibit 83 marked for identification.)
BY MR. DICKENS:
Q. I've handed you a document, according to the production, by Syngenta. It is April 10, 2010, "Proposal to move to a non-Inteon paraquat formulation in the USA."
Do you see that?
A. I do. And can I just continue to state --
Q. Yes.
A. -- that these are documents that I have not been prepared for ahead of this discussion today. But the general theme, I am aware of.
Q. Okay. And the general theme, including an

558

objective in moving to a non-Inteon formulation to maintain the current business and grow in the glyphosate-resistant burn down market while differentiating paraquat from its generic competitors.
Right? That was a consideration?
A. To try to maintain the degree of improved safety that we thought Inteon was providing.
Q. And the company did undertake a analysis as to how moving to a non-Inteon formulation would affect business, right?
A. It did, yes, mmm-hmm.
Q. And by moving to a non-Inteon formulation, there would be an increase in net sales and volume, right, from 58 million to 75 million?
A. Yeah. Well, again, this is -- I mean, I don't think I ever did see that kind of information before, but it's what it says here.
Q. So you weren't aware that a "do nothing" and keep Inteon on the market, there would be a forecast of loss of sales from 58 million to 35 million?
A. No. I mean, all I know is that there were a number of issues with Inteon, including the fact that, actually, it wasn't as stable in the field as we thought it would be and there were also questions

559

about whether -- how much safer it really was.
Q. Okay. So how much safer it really was than the formulation it replaced, right?
A. Yeah. I mean, I don't know where you want to go with this, but, I mean, the whole question about the improved safety of Inteon was originally built on dog studies, but then, also, we were looking at information in other parts of the world, like Sri Lanka, on whether, in practice, we were seeing a reduced safety -- an improved safety of paraquat Inteon.
Q. So despite the representations to the regulatory agency that this would be a safer product, Syngenta determined, ultimately, that it was not, right?
MR. NARESH: Form.
THE WITNESS: And this, again, I think is -- should be seen in a very positive light. I mean, this was doing post-marketing surveillance, almost, if you like, in Sri Lanka and other countries. We were not entirely relying on those dog studies saying this is definitely a safer product.
BY MR. DICKENS:
Q. And what aspect of the safety did you ultimately determine was not actually safer than the

560

product it replaced?
A. The degree of improved safety, which was -- when we first started doing those, those dog studies, there were proposals that the data were telling us it could be five times, or even greater, less toxic, acutely toxic than the original formulation.
The post-marketing surveillance, the work that was done in, for example, Sri Lanka said that was certainly an overestimate, maybe, at best, two-fold.
Q. Okay. So Inteon was safer than the product it replaced; it just wasn't as safe as represented?
A. And even whether that it was definitely more safe was in doubt. That post-marketing surveillance data, as would be true of any human data, it's always more difficult to interpret, but, certainly, it was not providing anywhere near the degree of additional safety that we hoped it would do.
Q. Okay. It did provide some additional safety?
A. It was very modest.
Q. But it did provide some?
A. Yeah. But also, as I said, it wasn't just about safety; it was about, well, how is this working

561

in the field.
And certainly in some places, and I don't know whether it was actually also in the US -- again, a bit outside of my wheelhouse -- the Inteon formulation was giving a few technical problems.
Q. Okay. And what technical problems was it causing?
A. Again, outside of my wheelhouse, but I think it included the stability of the formulation, whether it was blocking nozzles, that kind of thing.
Q. Okay. So Inteon, the decision ultimately to remove Inteon from the market was on the basis that while it was a little safer, that increased safety was modest as well as performance issues?
A. That's right.
Q. So the combination of the two led Syngenta to decide we're going to replace Inteon, right?
A. That's right.
Q. Okay. And there was an understanding at the time that, by doing so, there would also be an increase in sales, right?
A. Right.
MR. DICKENS: I'll hand you Exhibit 84.
(Exhibit 84 marked for identification.)
MR. NARESH: And just -- did you make

562

a representation earlier about Inteon being the only Gramoxone product available for sale in the United States for a period of time?
MR. DICKENS: I'm not sure it was a representation --
MR. NARESH: Okay.
MR. DICKENS: -- as much as a question.
MR. NARESH: Okay.
BY MR. DICKENS:
Q. Dr. Botham, I've handed you a document which is an email chain from February of 2010, regarding Inteon in the USA.
Do you see that?
A. Yes.
Q. And, once again, it's from -- the middle email is from Jonathan Sullivan to a David Scott.
Do you see that?
A. I do.
Q. And who was David Scott within Syngenta?
A. David Scott at that time, I think, was the product manager for paraquat.
Q. Okay. Jonathan Sullivan had concerns about the content of a slide which would be discoverable, and you understand that to be discoverable in litigation?

563

A. I assume that was what he was referring to here.
Q. "... if we determine to replace 'Inteon' and market an alternative formulation, to mean that 'Inteon' was withdrawn (against the [backdrop] of previous claims of superior safening) amongst other things to preserve a dominant market share and contain manufacturing costs."
Right?
A. Right.
Q. We don't want this to look like our decision was based on sales, right?
A. Right.
Q. Now, you mentioned that there were issues with Inteon and clogging nozzles; is that right?
A. Well, I believe that was the case, yes.
Q. And, ultimately, the company did replace Inteon with another Gramoxone, right?
A. Yes, it did.
Q. And that was true in the United States?
A. It was.
Q. After doing so, that did not improve the clogging of nozzles, did it?
A. That, I'm not so sure about.
MR. DICKENS: I'll hand you Exhibit 85.

564

(Exhibit 85 marked for identification.)
BY MR. DICKENS:
Q. Doctor, I have handed you "Gramoxone 2.0 SL in USA."
Do you see that?
A. Yes.
Q. Okay. This is dated May 25, 2012, right?
A. Right. And, again, I did not look at this in preparation for today.
Q. It says:
"Current state: significant mixing complaints, high level of customer dissatisfaction."
Right?
A. Right.
Q. The situation first is:
"70+ recorded calls year to date on Gramoxone SL mixing complaints."
Do you understand Gramoxone SL to be the product that replaced Inteon in the United States?
A. Yeah, that would make sense.
Q. Okay. And there were mixing complaints of 14 per million pounds of paraquat sold, right?
A. That's what it says, yes.
Q. Okay. And it notes that there were mixing complaints with Gramoxone Inteon between 2007 and

565

2011, and is that roughly your understanding of when Inteon was on the market?
A. That sounds about right.
Q. And that was 13 per million pounds of paraquat sold, right?
A. Right.
Q. So less mixing complaints with Inteon than its replacement, Gramoxone SL?
A. Right.
Q. So the problems that were being experienced by the consumers didn't cease after Inteon was removed from the market, right?
A. Right.
Q. Was Gramoxone SL withdrawn from the market?
A. I don't know. I mean, this is, again, an area -- this is outside of my expertise.
Q. Were you aware that there continued to be mixing complaints and clogged nozzles with Gramoxone SL?
A. I may have done. I don't -- it's not something that I thought, "Yeah, I definitely knew that," but -- I was more aware of the ones with Inteon.
Q. Okay. Let's turn to page ending in 734.

566

There's a proposal and a recommendation to pursue registration and a launch at 360 grams per liter, 5x emetic replacement product.
Right?
A. Right.
Q. And what is the 360 grams per liter, 5x emetic product? Can you describe what that is referring to?
A. Well, that would be a Gramoxone paraquat formulation with a higher concentration of the active ingredient of paraquat, because that was previously 240 grams per liter; now we're talking about 360 grams per liter. And in order to try to maintain an equivalent safening through the presence of an emetic, to give an equivalent increase in the level of emetic.
Q. Okay.
There's an implementation plan and it says "Submission of Gramoxone Max."
Do you see that?
A. Yes.
Q. And Gramoxone Max was the product on the market in the United States prior to Inteon, right?
MR. NARESH: Foundation.
THE WITNESS: Yes, it was.
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567

BY MR. DICKENS:
Q. Okay. And, as we can see on that previous slide that we looked at, there was only a 0.2 per million pounds of paraquat sold for complaints regarding Gramoxone Max mixing?
A. That's what it says, yes.
Q. So Gramoxone Max, the previous version, wasn't having the mixing or clogged nozzle complaints?
A. The data seemed to suggest that, yes.
Q. And so there was a consideration or decision to potentially return to Gramoxone Max with some modifications; is that fair?
A. That's fair.
Q. And then:
"Alternatively, in the absence of a clear path to return to a commercially sustainable position, prepare an exit strategy (likely divestiture) for the USA paraquat assets."
Right?
A. Well, that was the bottom line on this slide, yes.
Q. Okay. So if we can't get to a commercially sustainable position, we can consider just removing paraquat from the US market completely?
A. That was clearly being considered at

568

the time.
Q. Okay.
Now, turn to page 737 and section "Reputation/Credibility," it says:
"There has not been an accidental death from US Inteon or the newer US SL 2.0 formulations."
Do you see that?
A. Yes.
Q. And that was your understanding?
A. Yes. Indeed, yes, it was.
Q. And is that -- and that's limited to the United States, right?
A. Yeah. This is very much a US perspective where accidental death was, fortunately, quite low.
Q. Okay. Were there accidental deaths in the United States from the pre-Inteon Gramoxone on the market?
A. I'm aware that there were some unfortunate accidental deaths in the US and -- yes, but they were relatively, fortunately, very -- relatively infrequent.
Q. Then it says commercializing a product with increased emetic with a safety oral toxicity determination is inconsistent with a regulatory position.

569

Right?
A. Indeed, yes, that's correct.
Q. And inconsistent with the position previously taken in the registrations of the earlier paraquat versions, right?
A. Yes.
MR. DICKENS: We can put those aside.
I'll hand you 86 for the record. This is topic 69.
(Exhibit 86 marked for identification.)
BY MR. DICKENS:
Q. Sir, I've handed you a document. It has a last updated date of January 2014, with the risk title "10.2 Paraquat," and this is a document you have seen before, correct?
A. Yes, I have seen this one.
Q. Okay. And you've reviewed this document in preparation for the deposition?
A. I have, yes. We're back into my area that I've reviewed.
Q. As well as other documents that are similar to this, right?
A. I've seen more than one document of this type.
Q. Okay. And do you know what this document

570

represents?
A. Well, I did discuss that with colleagues and this seems to be, again, a document which is used quite generically with our products to try to understand the risks associated with the manufacture, sales, and registration of products.
Q. Okay. And the risk owner includes James Duan and Jonathan Sullivan, both of who we had talked about in the past, right?
A. That's right.
Q. And they give a description and rationale of the risk and some main scenarios that are identified, right?
A. Yes.
Q. And, at this point, it includes regulatory bans or restrictions in key countries, correct?
A. Yes.
Q. Alleged neurotoxicity?
A. Yes.
Q. And there's a concern of alleged neurotoxicity leading to additional legal liabilities, right?
A. Yes.
Q. It says:
"Unknown resolution of Chinese

571

government's request for an alternative to liquid formulations."

Do you know what that's referring to?

A. Yes. There was -- I remember at the time there were -- whether there was going to be a request, for example, to move to a solid formulation in China.

Q. Okay. Was that request ever made?

A. There was certainly some active discussion about it. I'm not quite sure of the status of the formal request from China, but it was certainly something that was debated internally.

Q. Okay. And then there's some triggers/drivers of risk, right?

A. Yes.

Q. And that includes scientific publications on alleged paraquat neurotoxicity?

A. It does.

Q. And regulatory bans increasing the likelihood of restrictions in other locations as well as notification to the Rotterdam Convention, right?

A. That's right.

Q. And that's -- sorry, the Rotterdam Convention, that's also the PIC that we looked at earlier?

A. That's right, yeah, Prior Informed

572

Consent, yes.

Q. Okay. And what is Prior Informed Consent for the Rotterdam Convention?

A. Right. So this would mean that paraquat -- actually, more specifically, a formulation of paraquat, so the Prior Informed Consent didn't apply to the active ingredient; it applies to a formulation. That would be on a list, I think it's called Annex 3 of the Prior Informed Consent, where certain -- which would mean other actions would be needed in order to allow the export and use of paraquat.

Q. And the concern was that if it was included in that Prior Informed Consent, then that would have an effect on other countries considering paraquat registrations, right?

A. Yes, PIC listing would undoubtedly have some implications.

Q. And then the paraquat issues leadership team would meet to provide oversight to the management of the license to operate for paraquat, right?

A. This was the purpose of the team, yes.

Q. Okay. And they would complete a document similar to what you have here in front of you, right?

A. I don't know that this was a paraquat issue leadership team document, but they certainly

573

were involved in reviewing it.

Q. And there's "Consequences of risk" and "People's health and safety," and a 4 is circled there, right?

A. Right. Sorry, we're dotting around about here. We're -- yes, okay. On the right-hand side. Got it, yeah.

Q. Okay. And the consequences of the risk are the consequences of those risks that are outlined earlier in the report, right?

A. Yes.

Q. And these are consequences of risk to various entities, correct?

A. Yes.

Q. One being people's health and their safety, right?

A. Yes.

Q. And this is at the highest risk for the people health and safety?

A. Yes.

Q. Then there's a financial impact as to what those risks are and that would be a financial impact to the company of roughly $410 million, right?

A. Yes.

MR. DICKENS: You can put that aside.

574

Why don't we take a -- if we can take, like, a ten-minute break, I'll see where I'm at.

THE VIDEOGRAPHER: We are going off the record at 15:20.

(Break taken.)

THE VIDEOGRAPHER: We are back on the record at 15:42.

MR. DICKENS: I'll hand you one big one, Exhibit 87 for the record.

(Exhibit 87 marked for identification.)

MR. NARESH: It's 72, right?

BY MR. DICKENS:

Q. Dr. Botham, I've handed you a document which is the "Final Report - the World Bank on Paraquat and Possible Alternatives," dated March 1994.

This is a report you've reviewed previously?

A. Yes, I've looked at this.

Q. Okay. And this report was specific to identify paraquat and alternatives. Do you know why this report was prepared?

A. No, I have asked that -- excuse me, I'll just finish my biscuit.

No, I did ask that question, why was this produced, who commissioned it. I've never received an

575

answer to those questions.
Q. Okay. And you asked colleagues within Syngenta?
A. I also asked my external counsel if they could find any documents that would help to answer that question, and nothing was apparent.
Q. Okay. If we can turn first to page 9378, the Appendix 2 includes "Discussions with Knowledgeable Persons."
Right?
A. Yes.
Q. And it notes:
"... the consultant visited the UK for discussions with Zeneca [...], the principal manufacturer of paraquat, in September and October 1993."
Right?
A. Yes.
Q. "... also visited Director of Medical Research Council's toxicology unit."
Do you know who that was?
A. So we're talking about 1993. So was that the time when Lewis Smith was director of that?
Q. Yeah, I believe if you turn -- I think it's -- yep, page 386.

576

A. Yes, that's right, and that's confirmed it.
Q. Okay. So that would have been Dr. Lewis Smith at this time, right?
A. That's right, yes.
Q. Okay. So the consultant who prepared this report had discussions with those within Zeneca, which is now Syngenta, right?
A. Yes.
Q. As well as Dr Smith, right?
A. Yes.
Q. And those discussions involved paraquat toxicology and poisoning, right?
A. That's right.
Q. And this report would have been received by Syngenta after it was prepared in 1994, correct?
A. Yes. That's my assumption.
Q. Did Syngenta ever write to the consultants or anyone who prepared this report and inform them that anything included in their opinion was inaccurate or incorrect?
A. I've had written -- had no documents that surround this, if you wish, in terms of, you know, either how it was commissioned or the consequences of it having been published. It's a standalone document

577

in the preparation that I've been through.
Q. If you turn back to the beginning, but page 9258. At the very top of page 2, the document states:
"The use of elaborate protective clothing and equipment is unnecessary in routine application of paraquat, provided proper application practice is followed."
And is that a statement that Zeneca and Syngenta provided to the World Bank with respect to paraquat application measures?
MR. NARESH: Foundation.
THE WITNESS: Well, I think, again, we'd have to go back and re-read again this document as to whether that was reflecting an opinion given by somebody else or whether it was a conclusion that the -- Mr. -- Dr. Black had made himself.
BY MR. DICKENS:
Q. Okay. So it sounds like you don't know, right?
A. No.
Q. Okay.
A. No.
Q. Do you agree with that statement, that the use of elaborate protective clothing and equipment is

578

unnecessary in routine application of paraquat, provided proper application practice is followed?
A. I mean, that gives the impression that it is not necessary to wear personal protective equipment, and I certainly wouldn't agree with that.
Q. Page 4 includes a listing of some of the alternatives that were available in 1994. Diquat's listed, right?
A. Yes.
Q. That is a pesticide manufactured by Syngenta?
A. Yes.
Q. Okay. It notes:
"From an occupational health viewpoint, diquat is less hazardous than paraquat."
Right.
A. From an acute toxicity perspective, it is not as toxic.
Q. Is it as toxic or more toxic from a chronic toxicity standpoint?
A. There are no, sort of, major concerns about chronic toxicity with diquat; so I think it's equivalent in that sense.
Q. So equivalent from a chronic toxicity standpoint and diquat is less acutely toxic; is that

579

right?
A. Yes. Yeah, I mean, diquat, as it indicates here, for example it tends to -- in chronic toxicity studies, it tends to affect the kidney, whereas paraquat affects the lung. But, you know, there are no other significant differences.
Q. And diquat has been found not to accumulate in the brain, right?
A. There's nowhere near the kind of extent of database for me to give a kind of definitive position on that.
Q. Okay. Glyphosate is also listed. We've discussed that. That's the active ingredient in Roundup and other glyphosate products, right?
A. Yes.
Q. Okay. And I believe you mentioned that, from an acute toxicity standpoint, glyphosate is also less hazardous than paraquat, right?
A. Yeah, and, yes, quite a bit more -- quite a bit less hazardous from an acute toxicity perspective.
Q. Okay. And --
THE STENOGRAPHER: Sorry. One second, please.
Could you say that answer again, please.

580

THE WITNESS: Yeah, it's quite a bit -- it's certainly significantly less hazardous than paraquat from an acute toxicity perspective.
THE STENOGRAPHER: Thanks.
BY MR. DICKENS:
Q. Glyphosate was also -- I mean was already an established alternative to paraquat in many situations as of 1994?
A. Yes. By then, it was.
Q. And glufosinate's listed. That has a low acute and chronic toxicity; that was an alternative available in 1994?
A. Yes, indeed. Yes.
(Stenographer interjection.)
MR. DICKENS: Yes. Sorry.
BY MR. DICKENS:
Q. Turn to page 9341.
There's a "Comparison of Glyphosate to Paraquat" listed here, right?
A. Yes, that's right.
Q. Okay. It notes glyphosate:
"... has little dermal irritancy and is not corrosive, unlike paraquat concentrate."
Right?
A. Right.

581

Q. And that's your understanding of glyphosate as well?
A. It is.
Q. "Nonetheless, its concentrate formulation can represent a significant hazard when ingested."
Right?
A. Yes.
Q. "This may be attributed to the relatively high concentration of the [...] surfactant used in the glyphosate concentrate which is more toxic than glyphosate itself."
Right?
A. Yeah. It says that there. I mean, I don't know, because glyphosate isn't a compound that I have looked at in great detail, but, I mean, I -- I don't know if that's a hypothesis or whether it's actually got proven data.
Q. You know that glyphosate formulations sold, at least in the United States, contain a surfactant?
A. I don't know that, but -- no, I don't know that.
Q. All right.
Turn to page 96, which is on the very top of the page. The third paragraph on this page states:

582

"The use of traditional protective clothing and apparatus is impractical in tropical climates."
And that is something Syngenta knew at this point in 1994, right?
A. "Impractical" is, as we've discussed in the past -- I mean, the practicality of -- in tropical climates can mean, for example, the use of such protective equipment may be more difficult in very hot climate. It doesn't mean to say that it isn't still Syngenta's view that such a PPE should be worn.
Q. Syngenta clearly knew from its habitual biomonitoring studies that individuals living in tropical climates were not following the PPE recommendations, right?
A. In some cases but not all.
Q. In all of -- are you aware of any habitual biomonitoring study undertaken by Syngenta in which all applicators complied with the PPE requirements?
A. I think I would need to go back and look at all the detail of the study.
Q. Certainly, the Malaysian biomonitoring studies we looked at, there was not a following of the PPE, right?
A. There were examples of that, yes. But,

583

equally, we know from the people who are in that part of the world that those studies certainly do show that not everybody wore PPE, but, you know, there has continued to be ongoing training for people in those parts of the world and, you know, PPE is generally worn.

Q. If we can turn to page 147, which is on the top of the page.

Specifically, that includes an appendix, "A Farm-Level Framework for Pesticide Training," right?

A. Right.

Q. And this is based on a paper prepared by M.J. Whittaker at ICI?

A. Yes, that's right.

Q. Do you know M.J. Whittaker?

A. No, I don't.

Q. And this farm-level framework for pesticide training, if we can turn to page 30 of this report, so a couple pages back --

MR. NARESH: Sorry, you're mixing different numbers.

MR. DICKENS: Yeah, I think -- I keep jumping. On the bottom now, so ending in Bates number 9407.

584

THE WITNESS: I'm there.

BY MR. DICKENS:

Q. Okay. The second paragraph begins:

"However, one cannot simply rely on labels, even with improvements to bring about significant changes of standards-in-use."

And earlier, it lists some various ways of education of individuals about information on the labeling, right?

A. Right.

Q. All of these on-pack leaflets, wall posters, mass media, videos, aids, these were available means by which to get information to consumers of paraquat, right?

A. To users of paraquat.

Q. That's right.

A. Mmm.

Q. And that includes users in the United States?

A. Yes, but -- and this was, I think, broader than paraquat, isn't it? So this is about agrochemical use generally.

Q. That's right. But it's true with respect to paraquat that those methods were available, right?

A. Yeah, but it looks like the focus of this

585

is particularly for people who were in countries outside of the Western world, if you like, who may require additional mechanisms in order to make sure that they understand what they need to do and how to use the product safely.

Q. Okay. We can put that aside.

Dr. Botham, you, in your notes, Exhibit 1 to this deposition, there is a list of ILSI/HESI payments?

Do you see?

A. Yes.

Q. ILSI, I-L-S-I, slash, H-E-S-I.

Correct?

A. That's right.

Q. And ILSI/HESI is a group that is looking at risk assessments, right?

A. Yes.

Q. And risk assessments within the United States specifically?

A. Well, it has some focus in the United States, but, no, it's -- HESI -- let me explain. ILSI is the International Life Sciences Institute. HESI is the Health and Environmental Safety Institute. So HESI used to be on, if you like, a branch of ILSI, but now HESI is a separate organization.

586

Q. And --

A. Okay.

Q. I'm sorry.

A. Can I just finish?

Q. Yeah, yeah.

A. Yeah. So the work that is done by ILSI is certainly international, so there's an ILSI Europe, for example. HESI, on the other hand, although there are facets of global implications of what they do, a lot of their focus has been in the United States.

Q. And with respect to HESI and those operating within the United States, there's individuals from chemical companies, EPA, as well as other consultants, right?

A. Yes. This is not restricted to agrochemicals; it's chemicals as well.

Q. And in tab 5 of the notes that you brought here today, there's a list of payments, right?

A. Yes.

Q. And this just lists the date and the payment that was given, correct?

A. Correct.

Q. Did you prepare this?

A. No. I actually asked for it to be prepared because I knew that we were paying for

587

involvement in projects under HESI, as well as, if you like, an annual fee, so this was just to make sure that it was all to hand.

Q. Okay. And did you calculate the total amount of payments to HESI included here?

A. No, I have not done that.

Q. Okay. I'll represent, my quick addition, it's a little over 1.7 million from 1997 to 2023.

Is that fair?

A. I don't have any reason to dispute that.

Q. Do you know if there has been any other payments since November 29 of 2023?

A. Right. Well, the payments to HESI will take place, as this indicates, in November of -- or later on in the year, normally, so one would expect that there would be payments due later in 2024 because, yes, we are still involved with HESI.

Q. Okay. And some of these payments are for significantly more money, such as the payment on November 16, 2023 for $125,000.

Do you know what that payment is for specifically?

A. Well, the larger figures, generally, are for involvement in specific projects as against the membership fee, to put it simply. That is, therefore,

588

why those larger sums are variable, because we've been involved in projects that have then stopped or we've decided that project is no longer relevant for us.

Q. And do you know what project the payments were for in 2023?

A. No, I wouldn't be able to list those accurately, but, I mean, I -- there are certainly examples that I'm aware of. One example is the HESI project that's called Transforming the Evaluation of Agrochemicals and that's a project looking at how we can, in toxicology and environmental safety, bring in new methods to assess safety and eventually perhaps for those to become the new regulatory requirements.

Q. Now, Syngenta has employees who are on committees and subcommittees within HESI as well as ILSI, right?

A. Yes. More now HESI rather than ILSI, yes.

Q. And that includes being chairpersons of certain ILSI or HESI committees?

A. Yes.

Q. An example is Sue Yi is a co-chair of a committee; is that right?

A. She was. I don't know whether she still is.

Q. Is she still with the company?

589

A. I don't know because she's not with the company anymore.

Q. Who with the company is still on a committee or subcommittee of HESI or ILSI, if you know?

A. One example would be Richard Currie.

Q. Do you know of any others?

A. No. That's the one thing that I didn't -- I didn't get a chance to get the latest definitive list, and so I can't give you other names right now.

Q. That's fine. Are you familiar with the epidemiologist Douglas Weed?

A. Yes.

Q. Did you know him prior to preparing for the deposition?

A. Yes, but not -- I don't know him personally. I don't think I've ever met him but I'm certainly aware of the work that he's done.

Q. Okay. Douglas Weed is a member of HESI?

A. He was, yes. I don't know if he still is.

Q. Okay. And he was on the committee that was chaired by Sue Yi, right?

A. I think that's right, yes.

Q. And you've never had any personal conversations -- you didn't know Doug Weed beforehand?

590

A. No, no. No, indeed.

Q. Now, Syngenta manufactures other pesticides other than paraquat, correct?

A. Correct.

Q. Are any of the other pesticides manufactured by Syngenta associated or have been associated in the literature with neurotoxicity?

A. If you're talking neurotoxicity, which is, again, a very broad term, is that your intent or do you want to be specific?

MR. NARESH: Yeah, let me object on --

MR. DICKENS: Let me get to this.

MR. NARESH: -- scope and foundation.

I think your topic is specific to Parkinson's disease.

MR. DICKENS: Got it.

BY MR. DICKENS:

Q. Are any of Syngenta's other pesticide products linked or associated with Parkinson's disease in the literature?

A. Not as far as I'm aware.

Q. And that question, I'll expand it a little to are any of the other pesticides managed by Syngenta linked to neurotoxicity in humans --

MR. NARESH: I'll object on --

591

BY MR. DICKENS:
Q. -- to your knowledge?
MR. NARESH: -- scope and foundation.
THE WITNESS: Well, that's why that's a very broad question because you can, for example, say that there are insecticides which can affect the nervous system, like sheep dip is a great -- good example.
BY MR. DICKENS:
Q. Okay. But it's fair to say that none of Syngenta's other pesticides that they manufacture have been associated with Parkinson's disease in any way?
A. As far as I know, that's correct.
Q. And have any of the other pesticides manufactured by Syngenta been associated with Parkinson's disease based on any internal Syngenta studies?
MR. NARESH: Scope, foundation.
THE WITNESS: Not that I'm aware of.
BY MR. DICKENS:
Q. Has Syngenta ever undertaken an epidemiology study on any of its other pesticides to determine whether or not their pesticides are associated with Parkinson's disease?

592

MR. NARESH: Same objections.
THE WITNESS: Syngenta has not done that. There may be external epidemiology studies that have looked at -- well, there are. There are other -- there are external epidemiology studies that looked at a range of pesticides and some of those may well be in the Syngenta product list.
BY MR. DICKENS:
Q. So Syngenta's position is that none of the pesticides that it sells are -- or cause Parkinson's disease in any way?
A. Absolutely.
Q. You mentioned earlier in the deposition you weren't aware of Syngenta selling or marketing paraquat for residential use in the United States.
Do you know whether or not Syngenta ever sold or marketed paraquat for residential use in Taiwan?
A. I did ask that question and I have been -- I've been given no evidence that it did so.
Q. Okay. Have you been given any evidence that it did not so?
A. Yeah, I think --
Q. What a question.
A. As much as I can, all the indications from what I've been given is that we did not.
MR. DICKENS: Thank you very much. I have no further questions for today.
MR. NARESH: Counsel for FMC or Chevron, do you have any questions?
MS. SIMMS: No questions for Chevron. Thanks, Ragan.
MS. BOSTON: No questions for FMC.
EXAMINATION ON BEHALF OF SYNGENTA
BY MR. NARESH:
Q. All right. Okay. Dr. Botham, do you have -- is that list of exhibits --
A. This is in numerical order.
Q. Reverse numerical?
A. Yes.
Q. Okay.
Dr. Botham, I'd like to ask you some follow-up questions --
A. Sorry, Ragan, have we got --
Q. Yeah.
A. -- can I just move this out of the way --
Q. Please, yeah.
A. -- because I'd be fearful of looking for documents and spilling.
MR. NARESH: Yeah. Oh, you're still

593

594

connected.
THE WITNESS: Oh, sorry. I'm sorry.
MR. NARESH: You okay?
THE WITNESS: Never put me on TV. I think I've -- I'm sorry, I think I've lost the clip.
MR. NARESH: Let's go off the record. Let's just get -- let's get this sorted here.
MR. DICKENS: Okay.
THE VIDEOGRAPHER: We are going off the record at 16:09.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record at 16:10.
BY MR. NARESH:
Q. Dr. Botham, I'd like to ask you some follow-up questions, and I know it's been a long couple days, so I will go as quickly as I can.
But could you please pull out Exhibit 86, which is one of the later exhibits that were shown to you today.
A. Got it.
Q. And is Exhibit 6 [sic] the document with the "Risk Title: 10.2 paraquat"?
A. Yes, that's correct.
Q. I just had a couple of specific questions.

595

If you look at the right-hand side of the page, there is a box called "Managed trend."
Do you see that?
A. Right, yes.
Q. And the font is very, very small on that, right?
A. It is, yes.
Q. And then, below that, there's a box called "Consequences of Risk."
Right?
A. Yes, there is, yes.
Q. And the first bullet under Consequences of Risk said "People health and safety" and the number 4 --
A. Yeah.
Q. -- is circled, right?
A. Yes.
Q. And you were asked by plaintiffs' counsel whether or not that indicated the highest possible risk?
A. Right.
Q. And I think you said yes, right?
A. That was my assumption, certainly, but this is a very difficult document to read.
Q. And, Dr. Botham, I'm going to hand you

596

a magnifying glass that's on my phone.
A. Okay.
Q. I don't know if you've used one of these before.
A. No, never.
Q. If you hover it over the "Managed trend," do you see that on the bottom axis there is a numerical scoring of risks ---
A. Oh, right, okay. Yeah.
Q. -- of 1 being Catastrophic --
A. Yeah.
Q. -- to 4 being Marginal?
A. So there is.
Q. And is that -- having reviewed the matrix with the magnifying glass, does that help you understand what those numbers on Exhibit 86 in box 10 are intended to indicate?
A. Yes, it does.
Q. And what, then, is the risk to people health and safety reflected by Exhibit 86?
A. Right. Well, that makes a lot more sense now that I see that. Number 4 is Marginal.
Q. And why would the risk of people health and safety be listed as marginal in this document?
A. I think for many of the reasons we've been

597

exploring today, because we are aware of the hazards of paraquat mainly in terms of its acute toxicity. We aim to protect people from that toxicity, and, in terms of neurotoxicity, we believe that there is no causative link between paraquat and Parkinson's disease.
Q. Okay. I'd like to shift gears and I'm going to eventually, pretty soon, going to get to some of the earlier documents from yesterday, so if you need a moment to get sorted, just let me know.
But let me ask -- let me start it this way: Do you remember yesterday morning you were asked a number of questions about changes in the brains of paraquat-poisoning victims?
A. Yes.
Q. When someone dies from paraquat poisoning, how are they typically being exposed to paraquat?
A. Well, we're talking about either deliberate ingestion or accidental ingestion.
Q. Ingestion of paraquat concentrate?
A. Of paraquat concentrate. Sometimes paraquat formulation but usually paraquat concentrate.
Q. How is that different from how workers are exposed to paraquat in their fields and orchards?
A. Hugely different. You're swallowing

598

paraquat at high concentrations into the -- it gets into the stomach, rapidly absorbed at high concentrations. Someone out in the field is potentially being exposed through the skin or maybe by inhalation, but to dramatically lower concentrations of paraquat.
Q. Now, when that much paraquat gets into someone's system, are you familiar with what happens to the organs in the body?
A. Yes, yes. I mean that's something which we -- is much better understood. There are what you call target organs for paraquat's toxicity. So paraquat gets to certain organs in the body and particularly damages them, and the main one for paraquat is the lung.
Q. Okay. And are you familiar with a term called anoxia?
A. Yes, I am.
Q. What is anoxia?
A. It means a deficiency in oxygen.
Q. And if the lung is damaged, can that cause anoxia?
A. Indeed, because that's how you get oxygenation of the blood, through breathing of the air into the lungs and that gets transported into the

599

blood.
Q. Can anoxia affect the brain?
A. Absolutely, yes.
Q. How so?
A. Because if you are causing damage to the lungs, the blood becomes less oxygenated. That blood circulates to the brain and the brain is starved of oxygen, and the brain is a very susceptible organ to lack of oxygen.
Q. Now, you were shown yesterday morning a document that was marked as Exhibit 4.
Can you see if you can find it?
A. Yes, I've got it.
Q. This was the autopsy report of somebody who died of paraquat poisoning, right?
A. Yes, that's right.
Q. Plaintiffs' counsel showed you page 3 of the document, and at the top there's a title, "Histology."
Right?
A. Yes.
Q. And the first organ identified in the histology section is the brain --
A. Yes.
Q. -- right?

600

A. Yes.
Q. And plaintiffs' counsel asked you some questions about the degenerative changes listed in the brain, right?
A. Yes.
Q. But plaintiffs' counsel did not show you the next page, which is the summary, right?
MR. DICKENS: I'll object to the form.
THE WITNESS: Okay, yes, fine.
BY MR. NARESH:
Q. And here, in the summary, the first sentence says:
"The gross and microscopic findings in this case are consistent with those found following the ingestion of paraquat."
Right?
A. That's right, yes.
Q. So what does that tell you about how this person was exposed to paraquat?
A. It's as we've been saying before. I mean, the person obviously swallowed paraquat and that has shown up in the damage to the lung.
Q. Okay. And then it goes on to say:
"The lungs show extensive degeneration..."
And I can't read the next couple of words,

601

"alveolar"?
A. "Intra-alveolar fibrosis."
Q. Okay. And it goes on to say:
"This gravely diminished the capacity of the lungs to undertake gas exchange and during life the oxygen [something] in the blood reached very low levels..."
A. Oxygen -- I think that's probably "attention," yes.
Q. Okay. Is that describing anoxia?
A. Absolutely it is, yes.
Q. And then it goes on to say in the next sentence:
"This degree of anoxia probably [something] the degenerative changes in the brain."
A. Yeah.
Q. Can you read what that says?
A. Yeah, I think it says "produced."
Q. "Produced," okay. So what does this tell you about what caused the changes in the brain?
A. Right, so this says that the pathologist was pretty sure that, given the extensive damage to the lungs, that that damage to the brain was not actually due to the paraquat directly; it was because of the indirect effect of paraquat on the lung causing

602

a lack of oxygen getting to the brain and hence the damage.
Q. Does Exhibit 4 tell us anything about whether paraquat crossed the blood-brain barrier in this particular instance?
A. No, it doesn't tell you anything about that.
Q. You were also asked some questions, immediately after being shown this document, about whether autopsy reports showed that paraquat gets into the brains of farmers.
Do you remember that?
A. Yes, I do recall that being said.
Q. Do autopsy reports like Exhibit 4 tell us anything about whether paraquat is getting into the brains of farmers working in their fields and orchards?
MR. DICKENS: Object to form.
THE WITNESS: Well, although this is a farm worker, this is a farm worker who had ingested paraquat, and if we're talking about farm workers who were using paraquat, then their exposure to paraquat would be significantly lower, maybe even non-existent, in comparison.
So this does not in any way read across to

603

farmers using paraquat.
BY MR. NARESH:
Q. You were asked some questions about Industrial Biotech [sic].
Do you remember those questions?
A. Yes, yes.
Q. It's sometimes been referred to as IBT, right?
A. Yes, yes.
Q. Overall, to your knowledge, about how many safety studies would you say Syngenta has done related to paraquat?
A. Well, we have looked at that over the recent years and we estimate we've done something like 1200 studies.
Q. And what percentage of those would you say were conducted by IBT?
A. Well, we -- my list here suggests that, you know, we're talking about six -- six, seven studies at most.
Q. And we've been doing a lot of math on the fly, but is it fair to say that that is a vanishingly small percent of the studies?
A. It is, yeah.
MR. DICKENS: Object to form.

604

THE WITNESS: Absolutely; well less than 1 percent, yes.
BY MR. NARESH:
Q. Okay. Well, to cure the objection, let me ask it this way: Approximately, what percentage is 6 of 1,200?
A. Well, 6 over 1000 would be 0.6 percent.
Q. Okay. If you could please pull out Exhibit 11.
A. Got it.
Q. Now, Exhibit 11 was a document that you were shown in your examination yesterday that related to the subject of the IBT scandal, right?
A. Yes.
Q. And if you look at page 6 -- and by "6," I'm looking at the numbering at the very top of the document. If you're looking at the bottom, it's 6542.
A. Mmm-hmm, yeah, okay.
Q. And you were asked some questions about this page.
Do you remember those questions?
A. Yes, yes.
Q. And the subject matter of this section is the "Industrial Bio-Test Laboratory - 2-year rat and dog studies," right?

605

A. That's correct.
Q. If you look at page 6, I'd like to focus on a couple of the sections that plaintiffs' counsel did not ask you about, okay.
It says in the -- it looks like the second full paragraph, the one beginning "EPA have requested..."
Do you see that?
A. Yes.
Q. It says:
"EPA have requested that paraquat studies be reviewed. Since Chevron submitted the data to the EPA, it was agreed that they would review the studies, although PPD were the customer."
Do you see that?
A. Yes.
Q. And what is that -- what is your understanding of what that means?
A. So EPA have requested the paraquat studies be reviewed. I mean, I assume that means the paraquat studies that existed at the time, and so they are going to review those studies.
Q. And then it goes on, two paragraphs down, to say:
"In conclusion, there would be no new

606

registrations until the studies have been repeated and evaluated."
A. Exactly; so recognizing that there were deficiencies in those studies, investment was made in repeating those studies.
Q. And after repeating those studies, was paraquat registered for use in the United States?
A. It was.
Q. You were asked some questions about a gentleman named Maurice Green and his firm Clement & Associates.
Do you remember that?
A. I do.
Q. And the time period of those questions was about Mr. Green's role with regard to EPA registration in the early 1980s.
A. Right.
Q. Since the early 1980s, has the EPA studied paraquat's registration?
A. Yes. And on more than one occasion.
Q. And has it studied the paraquat/Parkinson's hypothesis?
A. It has. And, again, more than once.
Q. Did Mr. Green, or Clement & Associates, to your knowledge, have any involvement with any of those

607

reviews after the early 1980s?
A. I'm not aware that he would have been, no.
Q. Okay. Now let's look at Exhibit 15, please.
A. Got it.
Q. Okay. Exhibit 15 was a memo from 1980 that you looked at yesterday with plaintiffs' counsel, right?
A. Right.
Q. And the questioning -- you had some questioning on the first page, which was related to the sentences about the chances of an RPAR being issued at all seems to be declining, and the following sentence:
"As we already know Clement Associates have been assigned the job of reviewing the database on PQ for EPA."
A. Yes.
Q. Do you remember that question?
A. I do. I do remember that, yes.
Q. And Clement Associates is Mr. Green's firm, right?
A. That is correct.
Q. If you look at page 6, again I'm looking at the numbering at the top. It's page 6001 if you

608

look at the Bates number.
A. Yes.
Q. And you were asked some questions about this page as well, right?
A. Yes.
Q. You were asked about -- I think it's probably the second full paragraph, beginning "Messages received..."
Do you see that?
A. Yes.
Q. It says:
"Messages received from Don Dye (Chevron's representative in Washington) are that pressures on paraquat seem to have been relaxed somewhat."
A. Yes.
Q. You were asked about that and you were asked about the following sentence.
But at the bottom of that paragraph, it says:
"Some of the reasons for this more relaxed view are..."
And then it goes on to identify four specific reasons why the EPA no longer seems to be leaning towards issuing an RPAR, right?
A. Yes, that's correct.

609

Q. And you weren't asked about any of those, were you?
A. No, I wasn't.
Q. Well, let's go through those. First:
"The effect of Dr. Rose's input into the marijuana saga [...] which has received more favorable publicity."
Right?
A. Right.
Q. Second:
"Negligible accidents and few suicides in the USA and relative success in treatment of poisoning incidents..."
Right?
A. Correct.
Q. Third:
"No significant oncogenic concern regarding paraquat..."
A. Yes.
Q. "... (contrast most compounds in RPAR)."
Right?
A. Yes.
Q. And fourth, and last:
"The apparent receding in significance of the EPA-sponsored Californian epidemiological study."

610

Right?
A. Right.
(Stenographer interjection.)
BY MR. NARESH:
Q. None of the reasons identified in this document have anything to do with the fact that EPA was using Clement Associates; is that right?
A. Yes. No, not at all, no.
Q. Okay. You can put that one to the side.
You were asked earlier today about something called Inteon, right?
A. Yes.
Q. And you were asked about whether Inteon was a safer formulation of paraquat, right?
A. I was.
Q. And I believe you testified that Inteon was meant to protect against poisoning?
A. Acute toxicity, in other words, yes, that's right.
Q. And so that -- you anticipated my question. Poisoning, is that an issue of acute toxicity or chronic toxicity?
A. Yeah, it is acute toxicity. So if you accidentally swallow, where you get immediate or slightly delayed effects, yes.

611

Q. And you were asked about the term "emetic." Just so -- I don't think we ever defined that term. What does the term "emetic" mean?
A. Okay, right. So an emetic is a substance which induces nausea and then vomiting.
Q. And all that questioning about the addition of the emetic was to guard against what risk?
A. Well, that -- emetic is added to allow if a person does, particularly accidentally, consume paraquat, that they -- that emetic would help to remove that ingested paraquat from the stomach very quickly.
Q. And the allegation in this case is that paraquat allegedly caused plaintiffs' Parkinson's disease.
You understand that?
A. Yes, I do understand that.
Q. Now, is the question of whether paraquat is capable of causing Parkinson's disease one of acute toxicity or chronic toxicity?
A. Very much chronic toxicity. I mean, the assumption, quite rightly, I think here is that in order to -- for any environmental agent to be responsible for Parkinson's disease, it would have to happen over a long period of time.

612

Q. The questioning that you had about Inteon, now, did any of that have anything to do with paraquat's chronic toxicity?
A. No.
MR. DICKENS: Object to form.
THE WITNESS: Nothing, as far as I'm concerned, no.
BY MR. NARESH:
Q. Did it have anything to do with whether or not paraquat is capable of causing Parkinson's disease?
A. Absolutely nothing.
Q. Now, you mentioned, in response to some of the testimony, that the decision to withdraw Inteon was something that should be seen in a positive light.
Do you remember that testimony?
A. I do.
Q. And what did you mean by that?
A. Well, when we discovered through that post-marketing surveillance, I think was the phrase that I was using, that actually, perhaps, Inteon was not giving the improved -- or the degree of improved safety that we hoped for, together with the fact that there were some efficacy and application problems, we took a decision to say, right, this is not the product that we want on the market.

613

Q. I want to go back to yesterday's testimony about intranasal and inhalation studies.
Do you remember being asked some questions about that?
A. Yes, I do, yeah.
Q. And I don't think that we described what those studies are, so at a very high level, what is an intranasal study?
A. Right. So this is the administration -- and we're talking about experimental animal studies here, of course, not human studies. So this is the administration to animals, and these again would normally be rodents, directly into the nose of those animals. So you have to put a probe, a catheter, into those animals and almost force the material into the top of the nose.
I almost -- I sometimes describe it as being equivalent to the intraperitoneal injection into the abdomen. It's a very extreme way to expose an animal. It's not the way in which you get exposed -- a human would be exposed to something in practice.
Q. Okay. And then the other -- well, to your knowledge, what is the point of an intranasal study with respect to the blood-brain barrier?

614

A. Well, people believe that -- well, there is a direct route from the olfactory bulb, which is between the top of the nasal cavity and the brain, that, through intranasal administration, you can increase the availability of a substance.
And this is talking about the pharmaceutical use, for example, of -- in getting drugs to treat brain disease, so that will be one way in which you could actually achieve that.
Q. Now, by contrast, what is an inhalation study?
A. Right. So inhalation is very different. So, here, we're talking about -- and there are two types of inhalation study. There's what's called whole-body inhalation study. So, again, this is an experimental animal, not a human being. It's put into a chamber into which an atmosphere -- the atmosphere is filled with a concentration of the chemical. Not an atmosphere that's deficient in oxygen; so the animal can still breathe and so on, but it is able to inhale that atmosphere and therefore become exposed to it.
A more, I guess, directed way of doing that is through what's called nose-only exposure and that is where, let's put it this way, like a mask is

615

fitted to an animal, the animal is more restrained, unlike the previous situation, but it allows you to more directly allow that animal to breathe the atmosphere.

Q. Okay. Did Syngenta conduct any inhalation studies of paraquat?

A. Yes, it did.

Q. Why did Syngenta conduct inhalation studies, not intranasal studies, of paraquat?

A. Well, the main reason is that the inhalation studies are a somewhat better representation of the way in which humans could be exposed because you're breathing in air containing material.

Secondly, they are the regulatory-required protocols for such studies.

Q. I'd like to shift gears a little bit and ask you a little bit about labels. You were asked a number of questions about some memos discussing the paraquat labels, but we didn't look at a lot of labels over the last two days.

You can reference this if you'd like to, so you may want to go find Exhibit 38.

A. Okay, got it.

Q. And this was a memo from Dr. Swan in 1966

616

about whether or not to add skull and crossbones to the label of paraquat, right?

A. Yes, that's right.

Q. And there was some questioning yesterday about whether or not Dr. Swan liked the idea of a skull and crossbones on the label.

Do you remember that?

A. Yes, I do remember that, yeah.

Q. But we didn't look at the label.

MR. NARESH: So let's look at the label. Dr. Botham, I'm handing you what's been marked Exhibit 88.

(Exhibit 88 marked for identification.)

BY MR. NARESH:

Q. It's very small but we're not going to actually read any of the text. This is printed out to fit on one page.

THE STENOGRAPHER: Sorry, is that 88?

MR. NARESH: 88, yes.

THE STENOGRAPHER: Thanks.

BY MR. NARESH:

Q. And, Dr. Botham, does it look like, in fact, a skull and crossbones was added to the label in 1969?

A. Yeah, sure, there's a skull and crossbones

617

symbol just there. I can see that.

Q. So even though Dr. Swan wasn't enthusiastic about the idea of adding a skull and crossbones, a skull and crossbones was added anyway, right?

A. It was, yes, yes.

Q. Okay. You can put that down.

You were shown Exhibit 40.

A. Yep, got it.

Q. And this was a 1969 memo in which ICI discusses the fact that there can be delayed irritant effects of paraquat.

Do you remember that?

A. Yes.

Q. And you were also asked some questions yesterday about whether breathing spray mist can cause respiratory tract irritation.

Do you remember that questioning?

A. Okay, yes.

Q. But we didn't look at the labels from the time period, so let me hand you the label from the year before, which is 1968.

MR. NARESH: I'll mark that Exhibit 89.

(Exhibit 89 marked for identification.)

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618

BY MR. NARESH:

Q. This one's printed out over two pages and, again, Dr. Botham, if you'd like the magnifier, I'm happy to do it.

A. Okay.

Q. Just let me know when you've had a moment to familiarize yourself with it.

A. Yeah, okay, go ahead.

Q. And let's look at the last page of the document.

A. Mmm-hmm.

Q. There's a stop sign?

A. Yes.

Q. And the stop sign says:

"Do not inhale. Do not get on skin. Do not take internally."

Right?

A. That's correct.

Q. And that's what the label was saying in 1968, right?

A. That's correct.

Q. And below that, it says "Warning"?

A. Yes.

Q. And it says:

"May be fatal if swallowed, inhaled or

619

absorbed through the skin."
Right?
A. Yes.
Q. It says:
"Prolonged skin contact will cause severe irritation."
Right?
A. Yes.
Q. And it goes on to say:
"Do not get material on skin, eyes or clothing."
Right?
A. Yes.
Q. It says:
"Repeated contact with skin may increase danger of absorption."
Right?
A. Yes.
Q. And it says:
"Symptoms of injury may be delayed."
Right?
A. That's right.
Q. It also says, and we can read all of it, but to keep us moving, go down a line or two where it says:

620

"Do not breathe spray mist..."
Do you see that?
A. Mmm. Yes, indeed.
Q. It says:
"Do not breathe spray mist in order to avoid nasal, throat and respiratory tract irritation."
Right?
A. Yes.
Q. "When spraying or when contacting sprayed vegetation wet with spray, dew or rainwater, wear waterproof footwear and clothing."
Right?
A. Yes.
Q. And so this was all warned as early as 1968, right?
A. Okay, right.
Q. You can put that one down.
A. Mmm-hmm.
Q. Find Exhibit 43, please.
A. Okay, got it.
Q. Now, Exhibit 43 is another memo, and this was from 1983 and it related to a lawsuit, right?
A. Yes, that's right. This is the Mr. Ferebee --
Q. Right.

621

A. -- case, yes.
Q. And the Ferebee lawsuit, did that have anything to do with paraquat allegedly having a neurotoxic effect?
A. Absolutely nothing to do with that, no.
Q. Did the Ferebee lawsuit have anything to do with paraquat allegedly causing Parkinson's --
(Stenographer clarification.)
BY MR. NARESH:
Q. Did the Ferebee lawsuit have anything to do with the allegation that paraquat caused Parkinson's disease?
A. No, nothing at all.
Q. You were asked some questions about the memo suggesting that ICI did not want to warn that dermal exposure could be fatal, right?
A. Yes.
MR. DICKENS: Object to the form.
BY MR. NARESH:
Q. Do you remember that testimony?
A. Yes, I do remember that discussion.
Q. But, again, you were not shown the label from before or after this memo, were you?
A. No, I was not.
Q. So let's look at the label from 1982,

622

which is from before.
MR. NARESH: I'll mark that as Exhibit 90.
(Exhibit 90 marked for identification.)
BY MR. NARESH:
Q. And I'm just going to look at the first page. First, just familiarize yourself with it. You can look through as much as you'd like.
A. Okay.
Yeah, okay.
Q. Okay.
A. Please go ahead.
Q. And at the bottom of the first page, there's a box that says "Skin contamination," right?
A. That's correct.
Q. And it says:
"In case of contact, wash immediately with water. Remove clothing and wash skin where necessary. Prolonged contact will cause severe irritation. Repeated contact may increase danger of absorption."
Right?
A. That's what it says, yes.
Q. And so this particular label doesn't say that severe -- that prolonged contact or dermal exposure may be fatal, does it?
A. It does not say that --

623

Q. Okay.
A. -- no, that's true.
Q. And then the label changed, right?
A. Okay, yes.
MR. NARESH: So let's look at Exhibit 91, which is the label from 1984, so the year after that memo that you were shown, which was marked as Exhibit 43.
(Exhibit 91 marked for identification.)
BY MR. NARESH:
Q. And, again, familiarize yourself with as much of it as you like. I'm going to ask you mainly about the first page.
A. Okay, go ahead.
Q. And if you'll look at the first page, it says, under the skull and crossbones, it says:
"Onset of symptoms may be delayed for up to 3 days."
Right?
A. It does, yes.
Q. And it goes on to say:
"May be harmful or fatal if absorbed through the skin or inhaled."
Right?
A. It does say that, yes.

624

Q. And so even if ICI wasn't enthusiastic about the idea of saying that it can be fatal if absorbed through the skin, the label was changed to say that anyway, right?
MR. DICKENS: Object to form.
THE WITNESS: Indeed. Well, helpful to see that because I had not seen that label before, yeah.
BY MR. NARESH:
Q. Okay. Now -- well, let me ask it this way: After that memo from 1983, was the label changed to indicate that paraquat could be fatal if absorbed through the skin?
A. Well, the evidence I've just been presented with will say yes.
Q. Okay. Stick with Exhibit 91 for a moment because you were also asked some questions about PPE and you were asked whether the US label has ever warned about wearing anything other than long-sleeved clothes.
Do you remember that question?
A. Yes, I do, yes, yes.
Q. Let's look at the last page of the label here.
There's a section in big, bold text saying

625

"Worker Safety Rules."
Do you see that?
A. Yes, indeed. Yes.
Q. Under that, it has a number of guidelines saying:
"Use strictly in accordance with danger statements and directions..."
Then it says things like "Do not get on skin," etc., right?
A. Yes.
Q. And it says -- it gives some guidance for what to do if you're handling the concentrate, mixing it, for example?
A. It does, yes.
Q. And below that, it says:
"Wear waterproof footwear and clothing when spraying or when contacting vegetation wet with spray."
A. Yes.
Q. And then it also says:
"Do not enter treated areas without protective clothing until sprays have dried."
Right?
A. Yes.
Q. And it says:

626

"Avoid working in spray mist. If there is a risk of exposure, wear goggles and approved face mask capable of filtering spray droplets."
Right?
A. Yes.
Q. And you were also asked -- and I don't know, I can't remember if it was yesterday or today, to be honest -- if the label has ever stated that a filter should be used in a mask.
Do you remember that question?
A. Yes, I do. Yes.
Q. And so I pulled the label as it exists on the website today.
(Exhibit 92 marked for identification.)
BY MR. NARESH:
Q. And I'm handing that to you as Exhibit 92.
Again, look as much -- at as much as you'd like, but I'm going to focus on page 3, which is the Precautionary Statements section related to PPE.
Right?
A. Okay, yes.
Q. And in that section, there is some statements about what "applicators and other handlers (other than mixers and loaders) must wear," right?
A. Yes, it does say that, yes.

627

Q. And it identifies long-sleeved shirt and pants, shoes and socks, protective eyewear, chemical-resistant gloves.
Right?
A. Yes.
Q. And then below that, it says "NIOSH-approved particulate respirator" with certain kind of filters, right?
A. Yes.
Q. Okay. You can put the labels to the side.
I'd like to shift gears a little bit and ask you about operator exposure studies. You were asked a number of questions both yesterday and today about that.
Do you remember that?
A. I do, yes.
Q. And I'm going to ask about a couple of exhibits that are all in the mid 40s to low 50s, if you'd like to get those ready.
I'm going to ask, basically, between 44 and 50 for a little while, so you may want to grab all the low ones.
A. Okay. I'm ready when you are.
Q. Okay. You were shown Exhibit 45, which was an internal memo from 1997, right?

628

A. This is the one from Sonia Ellis, yes?
Q. Right.
A. That right? Mmm-hmm.
Q. And it references Andy Cook, right?
A. It does.
Q. And we've heard his name a fair bit over the last day or two, right?
A. Yes.
Q. I think you mentioned that you had spoken to him in advance of your prior -- in advance of your prior deposition but you didn't speak to him in advance of your deposition this time, right?
A. That's correct, I did not.
Q. Why didn't you speak to Mr. Cook this time?
A. Well, Andy Cook has now been retired for probably two years or so.
Q. Okay. Now, you were asked about the language on the first page under the section called "Operator Exposure."
A. Right.
Q. And there was a series of questions about whether or not the operator exposure studies represented EU conditions with respect to PPE because most workers wore shorts or a shirt, and it was

629

considered possible that the exposure may be greater if long trousers were worn.
Do you remember that?
A. Yes, I do now remember that, yes.
Q. And it goes on to say:
"It was proposed that Zeneca provides a new operator exposure study."
Right?
A. Okay.
Q. And that was in 1997.
And so if you would, please, grab Exhibit 46, which was the very next one. It's the big, thick --
A. Yeah, yeah, that's right. I just -- I saw it a minute ago. It seems to have got out of order. There we are, got it. Yeah.
Q. Yeah.
A. Okay, got it.
Q. And just remind the jury, please, what is this document?
A. So this is a review of operator exposure studies that was done by Andy Cook and a colleague, Graham Chester, in 2009. It wasn't of every operator exposure study but it was of the more significant ones.

630

Q. Okay. And then look at -- I'd like to ask you about one particular study --
A. Okay.
Q. -- which was -- it's summarized on page 4635.
A. Yeah, go ahead.
Q. And this is a summary of the Findlay study, right?
A. That's right.
Q. And you were asked some questions about the Findlay study.
A. Yes.
Q. You remember that?
A. Yes.
Q. And what was the year of the Findlay study?
A. 1998.
Q. So that's one year after that memo that we just looked at, right?
A. That's correct.
Q. Okay. And in the section entitled Method --
A. Mmm-hmm.
Q. -- there's a paragraph, it's the third one down, starting with "Workers wore..."

631

Do you see that?
A. Yeah.
Q. It says:
"Workers wore standardized clothing of long-sleeved cotton shirt, long cotton trousers and rubber boots."
Do you see that?
A. Yes.
Q. And so what does that tell us about whether or not Syngenta, or then Zeneca, did in fact do a worker exposure study at evaluating long-sleeved shirts and pants?
A. Well, this suggests that that was exactly the study, yes.
Q. Okay. And then you were also asked some questions, I think it was earlier today but it may have been yesterday, about the use of cotton --
A. Mmm.
Q. -- as opposed to other substances in PPE.
Do you remember that?
A. Yes, I do.
Q. Okay. And in this study, what was the material for the long-sleeved clothing?
A. Both for the shirt and the trousers, it was cotton.

632

Q. Okay. And you were asked about one of the findings of Findlay but you weren't asked about some of the others, so I would like to fill in the gaps there.
A. Okay.
Q. You were asked about the fact that, in Findlay, paraquat was found in the urine samples of 18 of the 20 workers, right?
A. Yes.
Q. Findlay goes on to say what happened to the paraquat in the urine.
A. Okay.
Q. And if you look at the next page, at the top of it -- so I'm at the top of page 4636.
A. Yes, I'm there.
Q. It says that:
"Paraquat was detected in urine samples of 18 of the 20 workers."
Right?
A. Yes.
Q. "No paraquat was detected in any of the urine samples collected prior to exposure."
Right?
A. Yes.
Q. Then it goes on to say what happened,

633

right?
A. Yes.
Q. And then in the final sentence of that paragraph, it says:
"Paraquat was only detected in the urine of one worker after day 5."
Right?
A. That's right, yes.
Q. And so what does a study like Findlay tell you about the safety of paraquat?
A. Well, it says that although we're talking here about cotton clothing, and there were some -- obviously there was some absorption of paraquat, exposure to paraquat, that that was, in the vast majority of cases, eliminated in the urine pretty quickly.
Q. Okay. The kidney was doing its job?
A. The kidney was doing its job, in other words, yes.
Q. Okay. Now, you were also asked some questions about manufacturing worker exposure earlier today.
Do you remember that?
A. Yeah, I think we may have been getting them mixed together a little bit, yes.

634

Q. Okay. And what does the exposure -- we were going back and forth between --
A. Mmm.
Q. -- the manufacturing worker --
A. Mmm.
Q. -- and then workers in the fields using --
A. Yeah, we were, yeah.
Q. -- paraquat occupationally.
(Stenographer interjection.)
THE STENOGRAPHER: Thank you.
BY MR. NARESH:
Q. What does the exposure of a manufacturing worker handling paraquat concentrate on a daily basis --
A. Mmm.
Q. -- tell us about a farmer using paraquat occupationally?
A. Well, potentially very little because the exposure conditions, especially in the early days of manufacture of paraquat, were significantly higher than would be expected in the vast majority of cases with use of paraquat in the field. And, in any case, in manufacture you're talking about the neat active ingredient, and unless it's mixing and loading in the field, you're talking about spraying a diluted

635

product.
Q. Okay. Shift gears a little bit. There have been a lot of acronyms over the last couple of days and two of them that we've talked about are AEOL [sic] and NOEL.
A. Okay.
Q. Okay. What is an AEOL?
A. An AOEL --
Q. A-O-E-L, I'm sorry, yes.
A. Right, yes.
-- is an Acceptable Operator Exposure Level.
Q. What is that?
A. Right. So that is derived from a -- the most appropriate toxicity study to assess the risk from an exposure to a particular product, and you take the No Adverse Effect Level in that study, the dose at which no adverse effect was seen in that toxicity study, and you divide that dose by -- usually by a hundred and that gives you the AOEL.
Q. Okay. NOEL, what is that?
A. Yeah. So that's the No Adverse Effect Level, which is a toxicological parameter.
Q. Okay. So what's the difference between an NOEL and an AOEL?

636

A. Right. So an NOAEL, even that is a level of, in this case, paraquat that doesn't cause any effects in an animal study, but it is sometimes not that far away from a dose which may cause toxicity because you do a range of doses in a toxicity study.
But an AOEL is 100-fold less than even that dose, which does not cause effects in an animal toxicity study.
Q. You were asked some questions about the Brouwer study, or Bower study.
A. Brouwer, yeah, yeah.
Q. And in one of the studies, you were asked about two of the workers for whom the paraquat level exceeded the AOEL.
A. Right.
Q. First of all, does the Brouwer study/Brouwer study, tell us anything about neurotoxicity?
A. No. Absolutely not, no.
Q. Okay. And when plaintiffs' counsel asked you about those two particular workers, you made the comment that it didn't exceed the NOEL for any of the workers.
A. Yes. So there was -- because that 100-fold safety factor is still protected,

637

essentially, so those individuals were not being exposed to a dose that is likely to be acutely toxic.
Q. You were asked some questions about Defra. Do you remember that?
A. I do, yes.
Q. And it's -- you can look at it if you'd like to. I just have a couple of questions. It was Exhibit 44. Feel free to reference it if you'd like.
A. Okay.
Q. But my first question is: What, if anything, was Syngenta's involvement in conducting this study?
A. We had no involvement in the conduct of the study.
Q. What was the purpose of the study, as you understand it?
A. Defra, which is a UK government department and it includes the regulatory approval for pesticides and the governance thereof, they wanted to see -- they wanted to look at whether it will be possible to do a study on paraquat which would be, in their view, more relevant to the kind of exposures that humans might get to paraquat and as to whether that -- those levels of paraquat may cause the kinds of effects that we've been talking about today seen in mouse studies,

638

whether you'd see an effect on the substantia nigra in the brain.
But very much looking at the -- those -- the human relevance partly through the use of appropriate dose levels.
Q. What was the primary outcome of the study?
A. It was very interesting, because this was quite a comprehensive study. So they started off with some studies where paraquat was applied to animals using various dosing routes, including the intranasal that we were talking about before, in order to derive a mathematical model, something which, again, we've talked about before now, that could be used to extrapolate from human exposures to the kind -- to the levels of paraquat that would need to be in the brain of those mice in order, potentially, to do damage.
So that was -- and what they did, having established that, is to find that in order to achieve a relevant dose level, they -- that would include an extremely low dose level that was relevant to human exposure. We're talking about a thousand-fold or more lower than the kind of concentrations that had been used by other people using that mouse model.
But they used that very high dose level as well in the subsequent toxicity study. As well as

639

that very low dose level, there was another dose level which was added to, to be -- to give a more conservative view on human exposure.

And taking the totality of that study across that full range of doses, even the top dose, there was no statistically significant effect on the mice in that study.

Q. And what did that tell you, from a safety perspective, evaluating the safety of paraquat?

A. Well, it told me a number of things. First of all, it continued to tell me that the effect of paraquat on the substantia nigra of the brain of mice is a difficult phenomenon to replicate. So this study also found it difficult to replicate it, as did we.

And it also said that you can actually do some pretty clever experiments here to say that even if that had been seen, an effect had been seen, that it was highly unlikely it would be seen at doses which are relevant to those that a human would be exposed to.

Q. Okay. I'd like to shift gears and talk about the Malaysia worker studies.

A. Okay.

Q. And if you would, please, grab Exhibit 49.

640

I'm going to ask you about 49 and then 50.

A. Right, I've got both of those here.

Q. Okay.

So 49 was this email thread from 2002 involving Dr. Wilks and is it Mr. Woollen or --

A. It's Mr. Woollen, yes.

Q. Okay. Dr. Wilks and Mr. Woollen.

You were asked about, on the first page, the bottom paragraph, becoming -- beginning "More importantly..."

Do you see that?

A. Yes.

Q. And the subject matter of this, just to re-orient everybody, was whether or not to test paraquat in blood plasma in Malaysia, right?

A. Right, right.

Q. And you were asked about that first sentence and the last sentence but not the middle, so let's talk a little bit about the middle.

A. Okay.

Q. In the middle, there's a discussion beginning "Of course..."

Do you see that?

A. Yes.

Q. And in it, Dr. Wilks says:

641

"Of course I'm not against doing more work if it is justified..."

A. Mmm-hmm.

Q. "... after all, we're just funding a major study in Costa Rica."

A. Right.

Q. "I am also in favour of using biomonitoring as part of a surveillance strategy where appropriate. But we have done all this in Malaysia already - paraquat stewardship was practically invented there. Can you imagine what will happen if a badly thought-through study generates junk data because a completely unacceptable methodology was used?"

A. Right.

Q. So what does this tell us about the concerns that were animating Syngenta's desire not to conduct another blood plasma study at this time?

A. Right. Because, again, as I said earlier on, that would be -- wouldn't be the optimal way in which you would analyze exposure to paraquat. I mean, there are other reasons also why taking blood samples is not always a good idea, and it says so further down in this email chain. Like it's an invasive procedure and so on.

642

But, you know, you don't get the right -- best scientific information, more importantly, from looking at plasma levels compared to urine levels.

Q. Exhibit 50, please. So this is another thread between Mr. Woollen and Dr. Wilks but it's five years later --

A. Right.

Q. -- than the one that we just looked at, right?

And this, again, on the subject matter of whether to conduct blood plasma testing of paraquat in Malaysia, right?

A. Yes.

Q. And if you look at the email from Mr. Woollen to somebody named Teh, T-e-h, right?

A. Yes, yes.

Q. And there's a third paragraph, beginning "Regarding operator exposure studies..."?

A. Yeah.

Q. And you were asked about that first sentence but you weren't asked about the rest of the paragraph.

A. No.

Q. The first sentence says:

"Regarding operator exposure studies I

643

would advise you against doing blood sampling."
Right?
A. It does.
Q. But then it goes on to say:
"It is an invasive technique. It requires a centrifuge in the field and once the samples are collected, there are handling problems for staff because of potential risks of HIV..."
A. Mmm.
Q. "... Hep B, etc. Also the results are much more difficult to interpret than urine since the sample is just a snapshot."
And what does this tell us about the concerns that were animating Syngenta's desire not to conduct a blood plasma study at this time?
A. Right, so it's on the same theme, and I think I did very briefly mention yesterday when we were talking about this, that that issue of it being a snapshot, you know, a single point in time, it's not the way in which you get the best scientific answer to how much exposure there's been to paraquat.
So that was still a prime reason for saying urine is the better option, and then there were some other reasons about the biological hazards of blood.

644

Q. All right. Let's shift gears. Very briefly, I'd like to ask you about Exhibits 66 and 67.
All right.
A. All right.
Q. Do you have those in front of you?
A. Yes, I do.
Q. And this was the email thread and attachment from 2007, "Parkinson's Disease: What can Syngenta say about the issue?"
Right?
A. Right, yes, the slide set on 67, yes.
Q. And you were shown the third page of the slide, saying "What we cannot say," right?
A. Yes, that's right.
Q. You went through a couple of the things that cannot be said about the issue.
My question is, first, the regulatory training: What's the point of regulatory training like the ones being -- like the training being reflected in this document?
A. Well, whenever people -- particularly when people are new to the regulatory department or even people who have been in regulatory for a while, training is sometimes on general issues about how to interact with regulatory authorities. They're also to bring people up to date with some technical issues, and that was the case here.

645

Q. Why did you want to give them guidelines of what they should not be saying to regulators?
A. Because it's important that they don't make claims that are not -- that cannot be substantiated so the science doesn't back up.
Q. Let me shift gears a little bit and ask about surfactants, and specifically I'd like to ask you about the study that was discussed yesterday, about Agral 90.
A. Mmm-hmm.
Q. Do you remember that?
A. Mmm-hmm.
Q. It's Exhibit 24, if you're able to find that.
A. Yeah, got it.
Q. All right. So let's just walk through a couple questions. This was a rat inhalation study?
A. Yes, that's right.
Q. All right. Look at page 3, please, where it discusses the study design.
A. Okay.
Q. And the third sentence, which begins at the very end of the third line --

646

A. Yes.
Q. -- says:
"Any small droplets released by the spray head were drawn past the rats which were housed on an open mesh unit and restrained in polycarbonate tubes to facilitate nose-only exposure and to minimize pelt contamination."
A. Yes.
Q. Just to help the jury understand, when the rats were being exposed to this, were they able to move or turn their head away from the formulation being sprayed in their faces?
A. No, this is the nose-only method of application, so the animals are restrained.
Q. And so while the animals are being exposed in this way, how long are they being exposed to that?
A. Well, usually this would be four hours or so.
Q. Okay. And if you look down at the bottom of that paragraph, it even says that the exposure period was of four hours' duration, right?
A. Right.
Q. And so for four hours straight, rats were being held steady and paraquat with Agral was being sprayed directly in their face?

647

A. Yeah, that's an accurate way of describing it.
Q. How does that compare to what happens to farmers in their fields and orchards?
A. Well, as with many toxicology tests, it's clearly an exaggerated exposure. It's not only the time but also the fact that the animal had no alternative other than to continuously breathe in that paraquat-containing atmosphere for that full four-hour period, not something that would be happening to a sprayer in the field.
Q. Now, you also were asked some questions about what happened, and there were -- how many rats were studied in this?
A. So five male and five female altogether.
Q. Okay. And of the ten, one died unexpectedly, right?
A. Yeah, that's what we were discussing yesterday, I think, wasn't it?
Q. Now, in toxicological studies like this, what are the potential explanations for an unexpected death?
A. There are a variety. Sometimes it can be just simply the stress caused to the animal, because in these kind of conditions of restraint, an animal

648

can become distressed, that they may become sick and can even -- could even die.
And there are a variety of other conditions, but you would also include the fact that when you're giving a -- getting them to breathe in an atmosphere containing a chemical, that, actually, it's just that foreign atmosphere, if you like, that causes some nonspecific toxicities, not directly related to the chemical and, therefore, the animal could get sick or could even die.
Q. Does this study articulate any concerns about neurotoxicity or Parkinson's disease?
A. No, no, not at all.
Q. Were any neurotoxic symptoms reported at all?
A. No, no, not at all.
Q. And as for the other nine animals in the study, does Exhibit 24 say what happened to them?
A. It said they all survived. They gained weight by day 8, all animals had exceeded their starting weight and there were no treatment-related findings postmortem.
Q. Now find Exhibit 27, please.
A. Okay, got it.
Q. This was the RAD strategy meeting

649

minutes --
A. Yeah.
Q. -- from July of '21, right?
A. Got it.
Q. And there's -- and you were asked about this yesterday, right?
A. Yes, I was.
Q. And in the second paragraph, it says:
"The view of Product Safety is that the findings in this study..."
And that's discussing the study we just talked about, right?
A. Mmm.
Q. "... the findings of this study do not alter the company position, given that there have been no reports of toxicity by the inhalation route following normal use."
A. Yes.
Q. Right?
And then it goes on in the next paragraph to say:
"It does not appear that the findings meet the criteria for submission as a PRF, given that the single mortality at one exposure concentration of 0.15 micrograms per liter does not alter the existing

650

classification of this formulation."
A. Yeah.
Q. So in plain English, what's going on here?
A. Okay. So I was still questioning in my mind yesterday exactly who was involved in this meeting and whether, in fact, it was a meeting of people in the United States or in Europe. I think, with further thought, it looks like this is a meeting in the United States, so it would be, as we were discussing yesterday, the US PRF committee looking to see whether that finding, which had been referred by the Approach Committee based at CTL as potentially referable, whether it really was referable.
And there is some Product Safety input to those USA discussions, as this indicates. And because this committee has got experience of what the EPA does with this information, they said that this finding of a single mortality would not, in any way, change the EPA's assessment of the risk to paraquat.
Q. Okay. You can put that one down. Let's look at Exhibit 64, please.
A. 64?
Q. 64, yes.
A. Got it.
Q. This was the April 10, 2001 Gramoxone PLT

651

PowerPoint that you were shown earlier?
A. Yeah.
Q. And there were a couple of pages that were shown to you. I'd like to ask you about some of the things you were not asked about.
If you look at page 5, so it's ending 7797 in the Bates.
A. Yes.
Q. You were asked about the second bullet, about Parkinsonism being the issue of the day, so let me ask you about the first bullet.
A. Yes.
Q. And the first bullet says:
"We are being vigilant in taking the potential impact on Gramoxone seriously."
So what does that tell you about what was going on with Syngenta's research program in 2001?
A. Right. Yeah, so 2001, when further information was coming out into the public domain, that there was potentially a link between paraquat and Parkinson's disease, we wanted to make sure that we understood what that information was saying, so we would want to go to, for example, experimental meetings, toxicology meetings where that was being described. And the SOT is the Society of Toxicology

652

in the United States, so attending that meeting.
And then as we discussed yesterday also, a meeting in Colorado.
So we were taking it very seriously.
Q. The next slide, slide 6, ending in 7798, let me ask you about the first bullet there which you were not asked about.
A. Mmm-hmm.
Q. "Presentations are essentially based on good science but lack perspective on pesticide exposure..."
A. Right.
Q. "... and therefore emotive for the industry."
Help the jury understand what's being discussed there, please.
A. Right. So, yes, this, again, is consistent with I think what I've been saying, that, you know, we were not saying that what other people were doing was always bad science. We appreciated that people were doing some good science, but it was important for us, and potentially those researchers also, to understand the relevance of that good science to actual human risk, and that part of that is actually to understand, therefore, the exposure that

653

humans are subjected to to pesticides in order for the science -- the interpretation of the science not to be exaggerated.
Q. I'm going to shift gears a little bit. Over the course of yesterday and today, there have been a number of questions about whether Syngenta values profit and whether Syngenta was designing studies to avoid Potentially Referable Findings.
Do you remember that?
A. I do, yeah.
Q. And at one point you said creating a reportable finding might be an element but it was not the only element.
Do you remember that testimony?
A. I do remember saying that, yes.
Q. As the former head of Product Safety, what is the most important element for Syngenta when it comes to deciding whether to do or not to do a study?
A. Well, it's -- as the head -- former head of Product Safety, as you rightly say, and still for me today even in my current role, the most important thing is to actually make sure that any science that is applied to either the safety of humans or the environment is the best-quality science that we can either do ourselves or get access to from

654

collaborators or elsewhere.
So science for accurate risk assessment is the key to what we do.
Q. Okay. And you were asked questions earlier today about communications with farmers other than the label.
A. Okay.
Q. And you were also shown a pamphlet from, I think it was represented it was the mid-1980s or so.
A. Mmm.
Q. One of the questions you received was if Syngenta had ever indicated to farmers and the public that there was evidence of the paraquat/Parkinson's hypothesis --
A. Okay.
Q. -- and if Syngenta had ever told farmers, "This hypothesis exists; we just don't agree with it," right, and you couldn't remember.
A. Right.
Q. And then, later, you were asked some questions about paraquat.com.
A. Yes, that's right.
Q. What is paraquat.com?
A. Right. So there was a specific website which was set up by us to do exactly what you said, to

655

talk about paraquat, what it does, why it does it, and what are the things that we need to know about paraquat, including its safety. That -- it still exists but, actually, now, you know, it's incorporated into the general Syngenta website, but that was its purpose for quite a long time.

Q. And it was a website, so was it updated over time?

A. It was regularly updated, yes.

Q. Okay. And so I'm going to hand you one that was almost ironically previously marked as Exhibit 94 in one of your earlier depositions. Now I'm going to mark it 93. So it's not your first time dealing with this many documents.

(Exhibit 93 marked for identification.)

BY MR. NARESH:

Q. But does this look like an extract from paraquat.com from around 2016 or so?

A. Just give me a second.

Okay. Right. So, yeah, the most recent publication seems to be 2016. So, absolutely, yeah, this is from the Paraquat Information Center, the website we've been talking about, and 2016 looks like a reasonable guess on when it was from.

Q. And I recognize it was probably -- there

656

were some differences before and there are some differences after because that's how websites work, right?

A. Yeah, yeah. Yeah, yeah.

Q. Okay. And in this particular version that existed at that time, there's a section called "Paraquat and Parkinson's disease."

Right?

A. There is, yes.

Q. And in the introduction, it first explains what Parkinson's disease is, right?

A. Yeah.

Q. And then it goes on to explain that in the 1980s, the paraquat/Parkinson's hypothesis was born because of the experience with MPTP, right?

A. Yes, that's right.

Q. And to be clear, is MPTP paraquat?

A. No, it's not.

Q. Okay. And then it goes on to discuss animal studies, right?

A. Yes.

Q. And it explains that there are some animal studies finding that paraquat injections have led to the loss of dopaminergic neurons in the SNpc, at the top of page 2, right?

657

A. Yes, that's right.

Q. And then it goes on to explain how Syngenta interprets those animal studies --

A. Yes.

Q. -- right?

And then it goes on on the next page, page 3, to discuss epidemiology studies, right?

A. Yes.

Q. And it discusses, for example, the Kamel study from 2007 on page 4?

A. Right.

Q. And then it goes on, on page 5, to discuss the Tanner study, right?

A. Yes.

Q. And these were studies that reported on a potential link between paraquat and Parkinson's disease?

A. That's right, and the ones we've just been talking about are from the agricultural health study that we've been talking about today.

Q. And then you go on to identify Syngenta's own position with respect to those studies and other select studies from the literature, right?

A. Sure, yes.

Q. And was this attempting to canvas all,

658

what are the 1200 studies that Syngenta has done?

A. No, not at all.

Q. No?

A. No, this was focused on Parkinson's.

Q. And does this identify that Syngenta did disclose the existence of the paraquat/Parkinson's hypothesis?

A. Yes, absolutely. This is -- we've always been very open about that, as now illustrating on our website, but through our publications. So some of those have been referenced in here as well. Through our interaction with other scientists. Many ways in which we have been open.

Q. And does this explain that Syngenta disagreed with that hypothesis?

A. It said that we wanted to investigate that hypothesis, so we didn't start with a premise "We disagree with it." We said, "Okay, there's a plausible hypothesis. Let's start to see what the evidence really tells us."

Q. Now, and, Dr. Botham, if Syngenta were presented now or had been presented with reliable scientific evidence, whether generated by Syngenta or outsiders, that there's a substantial risk that paraquat causes Parkinson's disease, what would

659

Syngenta do with respect to paraquat?
A. If that was tipping the weight of the evidence to say that there was more likelihood of a causative link, then, you know, we have got a duty of care, initially as a product safety organization but then as a company, to say we should not be selling paraquat.
MR. NARESH: I have no further questions at this time.
MR. DICKENS: I will have follow-up. If I can have five minutes to get these documents in order --
MR. NARESH: Yeah.
MR. DICKENS: -- I'll be ready to go.
THE VIDEOGRAPHER: We are going off the record at 17:21.
(Break taken.)
THE VIDEOGRAPHER: We are back on the record at 17:30.
FURTHER EXAMINATION ON BEHALF OF PLAINTIFFS
BY MR. DICKENS:
Q. Dr. Botham, I do have some follow-up questions with respect to the questions you were just asked by counsel for Syngenta.
If we can start with Exhibit 4, which is

660

the autopsy of the farm worker, correct?
A. Okay. I think my counsel is going to make sure that I get quick access to these documents, thank you.
Q. And so you were shown a section where the coroner notes that there was anoxia, right?
A. Yes.
Q. And made a determination that that probably led to the degenerative changes in the brain, correct?
A. Yes, yes.
Q. Now, at this -- what was the date of this particular autopsy?
A. The 10th of the 5th 1976.
Q. And you'd agree that in 1976, it's unlikely that this coroner would have been aware of the fact that paraquat had any effect whatsoever or had been shown in animal studies or elsewhere to have effect in the brain, correct?
A. It's very likely that he would not have known that, yes.
Q. So it's unlikely that he would have attributed any degenerative changes in the substantia nigra to paraquat if he was unaware of any of those studies or results, correct?

661

A. Well, I think he probably had enough experience to determine that anoxia was the kind of thing that -- or that would be responsible for that because of the profound effect on the lungs.
Q. For the degenerative changes?
A. For any degenerative changes, in particular to the brain, which is dependent on having high levels of oxygen.
Q. Okay.
Now, you testified that the ingestion of paraquat would be far different from an exposure standpoint as someone who was spraying in the field, correct?
A. Right.
Q. That oral ingestion, the drinking of the paraquat, would far exceed any dermal absorption that would be experienced, right?
A. As a general statement, yes.
Q. Okay. And in the Defra study, they did provide calculations with respect to how much paraquat reached the brain from oral, IP, intranasal and dermal exposure, correct?
A. They did, yes.
Q. And what they found in the Defra study is that oral ingestion of paraquat actually resulted in

662

the least amount of paraquat reaching the brain, correct?
A. That's right, but it doesn't mean that it doesn't -- it isn't potentially getting there, that's true.
Q. Okay. So out of all of the different methods of exposure within Defra, the least amount was from the oral ingestion of the paraquat to those mice in that particular study, right?
A. Okay.
Q. Is that right?
A. Well, that's what the data show.
Q. Okay. You mentioned for IBT that you were shown a document and it was suggested that Syngenta conducted all of those studies again, correct?
A. It certainly conducted some of those studies again.
Q. Didn't conduct all of them, did they?
A. I know that it conducted some of them. Those are the ones that I've got evidence for in front of me.
Q. They did not conduct the neurotoxicity study, did they?
A. I still don't know what that neurotoxicity study was in the first place, what it covered.

663

Q. So you weren't able to figure out what the neurotoxicity study was?
A. No. I mean, given the time that we're talking about, I've got -- such a study would not normally have been a required study, so I do not know what that neurotoxicity study evaluated.
Q. And you agree that Syngenta did not conduct all of the studies that were conducted by IBT at the time of registration, correct?
A. It certainly repeated the really key studies, such as the long-term studies, the chronic studies in the rat and the mouse, and the longer-term study in the dog.
Q. Do you know whether or not they conducted the two inhalation studies conducted by IBT that are referenced in your Exhibit 1?
A. Well, what I know is that there were certainly a number of inhalation studies conducted after the IBT studies were done, so a series of acute inhalation studies were conducted.
Q. But were they done in the -- was the subacute aerosol inhalation toxicity of paraquat redone and resubmitted in the 1980s at the time?
A. Well, that, I don't know, that's -- a subacute would normally mean a 28-day inhalation

664

study and we've talked about that today --
(Stenographer interjection.)
THE WITNESS: A subacute study would normally mean something like a 28-day study, rather like we were discussing earlier today. I don't know that I've got any evidence that that study was done.
BY MR. DICKENS:
Q. And that was the study that Syngenta specifically said, "We will not conduct this study," right?
A. That we didn't --
MR. NARESH: Objection to form.
THE WITNESS: Yeah. That we didn't need to do, yes.
BY MR. DICKENS:
Q. You, in discussion about Inteon, mentioned that Inteon was concerned with acute toxicity, was your testimony, right?
A. That's correct.
Q. Now, Inteon was also represented to the regulatory agencies and users of paraquat as greatly reducing the amount of dermal absorption, correct?
MR. NARESH: Objection to form.
THE WITNESS: The Inteon was not as readily able to cross the skin.

665

BY MR. DICKENS:
Q. And that's because of the alginate, correct?
A. That was probably one reason, yes, that the alginate would form a barrier.
Q. So dermal absorption with Inteon would be substantially less than what it would be on the formulation that was on the market beforehand?
MR. NARESH: Form.
THE WITNESS: It would be less. I don't know -- I would need some quantification figures to hand to determine if it was substantial or not.
BY MR. DICKENS:
Q. And you'd agree that reduced dermal absorption does -- is relevant to chronic toxicity, correct?
A. I don't know why that would be more relevant to chronic toxicity than oral exposure.
Q. Well, I'm not asking about whether it's more, but you had mentioned that Inteon had nothing to do with chronic toxicity, I believe was your testimony, right?
A. It has got nothing to do with chronic toxicity.
Q. Okay.

666

A. We never made any claims that it altered the chronic toxicity of paraquat.
Q. Okay. You did make claims that it would reduce dermal absorption?
MR. NARESH: Asked and answered.
THE WITNESS: Yes, the dermal absorption is lower from Inteon than a non-Inteon paraquat.
BY MR. DICKENS:
Q. And prolonged dermal absorption would be relevant if paraquat was related to chronic illnesses; you'd agree with that?
MR. NARESH: Form.
THE WITNESS: It would have to be very prolonged. I think when we're talking about chronic illnesses, and that's not just Parkinson's but also things like cancer, you would normally say that that would be something that would occur after, you know, long periods of times of exposure, not the kind of dermal exposures in this case that we're talking about here.
BY MR. DICKENS:
Q. If less paraquat gets through the skin, less gets into the brain; you'd agree with that?
A. Well, clearly, that's self-evident.
Q. You mentioned, when talking about the

667

Defra study and its results, Defra found a decrease of 17 percent and 20 percent in TH-positive neurons in the substantia nigra for high- and mid-dose male mouse?

A. I didn't mention that, but that is what the report says. But the report says that those findings are not statistically significant.

Q. And what they found and instructed was that additional studies should be taken in order to make firm determinations as to what the implications of those dose levels were, correct?

MR. NARESH: And, Dr. Botham, if you'd like a copy of the document, I'm happy to supply it.

THE WITNESS: Yeah.

MR. NARESH: Can you give me 4 back just so we stay organized?

THE WITNESS: Sorry?

MR. NARESH: Hand me that one right there. I'm going to keep my set...

THE WITNESS: Oh, yeah, that's right.

MR. NARESH: There you go.

THE WITNESS: Thank you.

BY MR. DICKENS:

Q. Okay. If I can direct your attention to page 13.

668

A. Yes.

Q. And in the second paragraph for Study 2, in vivo mouse study, it states:

"The major findings of this study are related to the observed mortality in high dose males during adult dosing, and a decrease of 17%, 20%, in TH-positive neurons of the substantia nigra in high and mid dose males, respectively, that had been treated both as pups and as adults, and sacrificed at 16 months of age."

That's the significant finding in the in vivo mouse study, right?

A. Right. But you've failed to recognize that they also said in this report that 20 percent and 17 percent did not achieve statistical significance.

Q. Okay.

A. Because -- and we all -- anybody who's been involved in this area of research knows that you get very high confidence intervals when you're measuring TH-positive cells.

Q. Okay. And then there's possibilities for further work, right?

A. Right.

Q. And they actually give some recommendations for further work that could be done in order to investigate based on the findings in this particular study, correct?

A. Yes.

Q. The very last sentence:

"It will be important to repeat the in vivo study with 16-month-old males to determine if the reduced number of TH-positive neurons at the middle dose level is consistent. If so, there are implications at dose levels that are at the top range of human relevant doses."

And that's -- Syngenta was aware of this at the time that this Defra study was finalized, correct?

A. Well, yes. To be clear, this report, the final version of this report was never officially published. We were eventually able to get a copy of it, so, yes, we were aware of it.

Q. Okay. And has Syngenta undertaken any efforts to repeat the in vivo study with 16-month-old males?

A. No, not 16-month-old animals. We've not done animals as old as that.

Q. Has Syngenta undertaken any studies in response to the recommendations from the Defra authors after receiving a copy of this finalized report?

670

A. What we said about this study is that it adds to our own findings that this model, the mouse model, is not a robust model. You can do a study again, we could have done a study again, and it -- we know that -- and our collaboration with Dr. Smeyne confirmed this, that even somebody like Dr. Smeyne, who had previously seen an effect in the substantia nigra, was not able to see the effect when it was repeated.

Q. The authors of Defra certainly didn't conclude that the mouse model was not robust, correct?

A. That's certainly not what they wrote here, but I think the report itself says that it adds to that weight of evidence of lack of robustness.

Q. You were asked questions with respect to the intranasal study and you indicated that people believe that there's a possible route from the olfactory bulb to the brain, right?

A. Well, it's known that there is a possibility of that.

Q. And Syngenta agrees with that. We saw the emails --

A. Yes.

Q. -- suggesting it.

If you can bring up Exhibit 49 --

671

MR. NARESH: See, now mine are out of order.
MR. DICKENS: -- which is --
MR. NARESH: Is that one that we looked at --
MR. DICKENS: -- an email from a Martin Wilks.
THE WITNESS: Competition here to see who can find it first.
MR. NARESH: I'm at 47.
THE WITNESS: I've got it. I've got it. Yeah, I've got it, 49.
BY MR. DICKENS:
Q. Okay. And specifically was looking at the email from Martin Wilks at the bottom of the page, correct?
A. Okay, yes.
Q. And you were directed to some of the information in the middle of the last paragraph on that page, right?
A. That's correct.
Q. And it is some statements with respect to why plasma monitoring should not be included in biomonitoring, right?
A. Yes.

672

Q. Now, at this time, Martin Wilks knew nothing about the study design, right?
MR. NARESH: Objection to form, foundation.
THE WITNESS: I don't know what Martin Wilks knew precisely at this time.
BY MR. DICKENS:
Q. He didn't know how it would be done, what would be included, anything whatsoever to know that this would not be an appropriate study in order to test biomonitoring or exposure in operators, right?
MR. NARESH: Same objections.
THE WITNESS: Well, he had been copied into the email that's before this, 1 August, which was talking about elements of the study design, so I guess I have to disagree with you; he was aware of what was being proposed.
BY MR. DICKENS:
Q. And his only concern was the plasma monitoring within this biomonitoring study as an issue with respect to study design, right?
A. Both from a scientific robustness perspective and some of the practicalities and safety issues.
Q. Okay. And those practicality and safety issues, those were also practicality and safety issues at the time that Syngenta elected to undergo plasma testing in their own studies, right?
A. Of course, yes.
Q. Yet Syngenta itself decided it should move forward with plasma monitoring, right?
A. In some studies, but the majority of the studies that we were involved in said that urinary excretion levels of paraquat were likely to be the better measurement of exposure.
Q. Now, the experts that Syngenta retained to do the PBPK modeling in 2014, those experts found that the plasma calculations were important enough to include in their PBPK modeling, right?
A. And that's because they're being used for a totally different purpose. They're trying to -- the word is "parameterize" the mathematical model to make sure that the mathematical model is likely to be representative of what's happening in real life.
Q. I'm going to ask you questions about Exhibit 27, which is the RAD strategy meeting minutes.
A. Thank you.
Q. Now, you indicated that, after yesterday, you now believe that this was a meeting in the United States, right?

673

674

A. Yeah, I'm more inclined to think it was a USA meeting, yes.
Q. Okay. Did you go back to review any documents in order to determine that this was a meeting in the United States?
A. No, actually, to be quite open, I did discuss with my colleagues here today and they thought that was also -- they also thought that was most likely.
Q. Now, RAD, that's a different committee than the 6(A)(2) committee that was in place in the United States, correct?
A. Well, that was one of my questions. But whatever it was called, it's clear from this, the way this is written, now that we've ascertained this was very likely to be the United States, that that was fulfilling the same purpose as the PRF committee.
Q. Okay. And when you say "the PRF," you mean the one in the United States?
A. Yes, yes.
Q. And you, in fact, have received and reviewed United States PRF meeting minutes when they consider whether or not to submit something to the United States, right?
A. Yes.

675

Q. And they actually keep minutes that detail what they're determining and what their decision is?
A. Correct.
Q. This document before you is not the typical way in which a PRF would be considered in the United States, right?
A. Well, this is -- the content of this is very much the kind of content that I would have expected to see from the US PRF Committee that I became more familiar with. So that's why I think it was doing -- fulfilling the same purpose.
Q. But it was certainly not handled in the same way; you can agree on that?
A. I think it was handled in a very similar way by a group of people who happened to call themselves a different -- RAD strategy meeting.
Q. In the typical meeting minutes for the US PRF committee, it would give a list of attendees, right?
A. Yes.
Q. It would give -- and there's a specified form for those minutes that is typically used?
A. Yes.
Q. Have you seen a PRF form like that with respect to this particular study?

676

A. No, I have not.
Q. The PRF Committee that you were on determined that the death in the particular study was treatment related, right?
A. Yes. And you remember I did say yesterday that the Approach Committee, which is the one that I attend and you're just referring to, was always very precautionary. So there was some discussion about whether the effects seen in that animal were related to treatment, whether it related to paraquat, and we decided that whilst it was probably not the case, nevertheless we should actually suggest to the US PRF committee that they also review this.
Q. Whoever was in this meeting determined that, I believe you said, it would not change the EPA's decision, right?
A. That's right, and that's one of the expertises that the USA PRF Committee had which we only indirectly have had on the Approach Committee. So they knew what the EPA were really looking for when receiving Potentially Referable Findings and, again, to generalize, it would be information that would change the assessment of the risk from a substance by the EPA.
Q. You'd agree that the better determiner of whether or not it would change the EPA's decision would be the EPA, right?
A. Well, the committee that I'm talking about had come to that conclusion through long experience of submitting to and even having discussions with the US EPA.
Q. But that PRF Committee, we don't know if they were the ones who actually made this decision; is that fair?
A. Which? Sorry, which?
Q. They're the ones who actually made the determination? Because we don't know who was actually in attendance, right?
A. Well, we don't -- I don't have names in front of me, no.
Q. Now, the study that this was referring to was that study with Agral, correct?
A. That's right.
Q. And you were asked some questions and I believe your testimony was, essentially, this was far different than what individuals in the field would experience, right?
A. Of course, yes.
Q. However, this study was specifically designed so that the rats would be exposed "in a manner designed to stimulate exposure by those in the field," correct?
A. Well, that's what it says, but it's exaggerated exposure of what people might be exposed to in the field; so it's not -- people in the field would not have a mask over their nose with a paraquat formulation being sprayed through that mask for four hours.
Q. Syngenta designed this study?
A. Yes.
Q. And designed it in the best way that they knew to test animals in order to stimulate -- or to simulate exposure of those in the field by inhalation or intranasal, right?
A. Exactly, but it was still an exaggerated exposure.
Q. And Syngenta never undertook efforts to redo that study to see if those results or the death in that case was treatment related, correct?
A. That's right.
Q. I want you to look at Exhibit 93, which is the paraquat.com printout.
A. Yes.
Q. The bottom of page 1 is the animal studies.

677

678

679

A. Yes.
Q. And it notes the major research program, and then it says:
"The research work has been, and will continue to be, published in peer-reviewed scientific journals and the results communicated to relevant regulatory agencies."
Right?
A. Yes.
Q. And it says that suggests that the research work always has been either published or submitted to regulatory agencies, right?
MR. NARESH: Objection; form.
THE WITNESS: That is what we said, yes.
BY MR. DICKENS:
Q. Okay. And you testified at length in your previous depositions with respect to the Marks studies, right?
A. Indeed.
Q. Those Marks studies were not initially submitted to the EPA, were they?
A. Not as Potentially Referable Findings, no.
Q. Not at all until an attorney suggested that they should be submitted?
MR. NARESH: Objection;

680

mischaracterizes --
THE WITNESS: Yeah --
MR. NARESH: -- lots of things.
THE WITNESS: -- it was suggested, but much later, during a previous deposition to this, or trial -- potential trial to this, that it might be prudent to let the EPA see those studies.
They did receive them. The EPA said thank you. We didn't really need to see them because, as I said earlier, they had no bearing on our understanding of the risk from paraquat.
BY MR. DICKENS:
Q. When were they submitted to the EPA, if you can recall?
A. I think that was 20 --
MR. NARESH: Can we -- it's compound. If you're going to do that question, I think you have to break it down on each of the Marks studies.
MR. DICKENS: Okay.
MR. NARESH: Because there isn't a single author, obviously.
BY MR. DICKENS:
Q. There was one Marks study that was submitted earlier?
A. Yes, that's right.

681

Q. And then there were other Marks studies that were submitted at a later date?
A. Later on, yes.
Q. Okay. And those "later date," that was after 2016?
A. Yes.
Q. Okay. So after this statement on the paraquat.com website, right?
A. That's right, yes.
Q. So it's safe to say that the research work was not always either published and peer-reviewed in scientific journals or communicated to relevant regulatory agencies, right?
A. The vast majority of the work that we did was made available publicly through the publications and through things like the Paraquat Information Center.
Q. And the Marks studies, were those ever published?
A. No, they were not.
Q. Do you need EPA approval in order to make changes to the paraquat.com website?
A. No.
Q. Now, you were shown some labels for various periods of time, correct?

682

A. Yes.
Q. And you were shown a label in the '80s with suggestion that it instructed users of paraquat to wear waterproof clothing, correct?
A. That's one of the things I remember, yes.
Q. Okay. The latest label that you saw no longer has any requirement for waterproof clothing, right?
A. Okay. So you're now looking at number 92?
Q. That's right.
A. So I'm looking at the PPE. Right, okay. So it says long-sleeve shirt and long pants, shoes plus socks, respirator, chemical-resistant gloves, etc, yeah.
Q. Okay. Long-sleeved shirt and long pants, those are not waterproof, right?
A. Not necessarily, no.
Q. And that's not having long -- or waterproof clothing is consistent with the labeling information that I had shown you earlier in the deposition, right, the one label that was shown to you?
A. Okay.
Q. Is that right?
A. I would need to be re-shown that to...

683

Q. Okay. This latest label also does not require waterproof boots or shoes, right?
A. It certainly doesn't say "waterproof," no. It just says "shoes."
Q. Now, you were asked some questions about a 1966 document with respect to the skull and crossbones being added to the warning label, correct?
A. Yes.
Q. Now, that skull and crossbones, that was only added at the request of the EPA in lieu of withdrawing paraquat's registration from the market, right?
A. Again, I'd have -- you'd have to just remind me exactly what that -- how that was documented.
MR. DICKENS: I have no further questions, thank you.
MR. NARESH: I have two questions but I need to grab a document off the printer. Give me two minutes. Everybody can just stay here.
THE VIDEOGRAPHER: We are going off the record at 17:58.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record at 17:59.

684

FURTHER EXAMINATION ON BEHALF OF SYNGENTA
BY MR. NARESH:
Q. Dr. Botham, you were shown earlier Exhibit 27 and I just have one follow-up question -- well, one document to show you related to that.
Do you see in Exhibit 27 there are a couple of embedded documents at the top?
A. Yes.
(Exhibit 94 marked for identification.)
BY MR. NARESH:
Q. I'm handing you a document marked Exhibit 94.
A. Okay.
Q. And, Dr. Botham, it's my understanding that the version that you're looking at, Exhibit 27, the links aren't live, but it's my understanding that Exhibit 94 is the second of the two documents --
A. Yes, okay.
Q. -- embedded in Exhibit 27.
A. Mmm-hmm, all right.
Q. And if you look at it, the first page says, "Overview of paraquat inhalation toxicity in the rat."
A. Yes.
Q. And it discusses the acute toxicity and

685

subacute toxicity, certain findings related to that, right?
A. Yes.
Q. And then it goes on to talk about, on the second page, paraquat 200 grams per liter --
(Stenographer interjection.)
MR. NARESH: Yes.
BY MR. NARESH:
Q. The second page, it says "200 grams per liter spray strength solution"?
A. Yes.
Q. And then it discusses results, and it says:
"One female in a group of ten was killed in extremis on day 3 after a single 4-hour exposure to 0.15 micrograms per liter paraquat ion"?
A. Yes.
Q. And does this look like a description of the study that we've been looking at that we've referred to as the Agral study?
A. Yes, undoubtedly, yeah.
Q. And then it goes on to discuss EPA 6(A)(2) guidelines?
A. Yes.
Q. Those are the 6(A)(2) guidelines that

686

we've been talking about here today?
A. That's right.
Q. And does this document give you any clue about the context in which Exhibit 27 was created?
A. Yeah, I think -- yeah, this is helpful because it reinforces what those guidelines say, so acute toxicities in which the only change in toxicity is a numerical decrease in MLD/MLC, etc., are not reportable unless they would result in a more restrictive toxicity category for labeling --
(Stenographer interjection.)
THE WITNESS: So they describe the acute -- the EPA guidelines that acute toxicity studies in which the only change in toxicity is a numerical decrease in the median lethal dose or median lethal concentration are not reportable unless the results indicate a more restrictive toxicity category for labeling and also if, in the event, a use of a pesticide does not pose --
THE STENOGRAPHER: I'm sorry, Doctor, you're really going to have to slow down.
THE WITNESS: Right. It also says use of a pesticide does not pose any greater risk than previously believed or reported to the agency.
So, to summarize that, it's very similar

687

to what I said: that it would need to change thresholds of toxicity that have been used to assess hazard in the past, to put them into a different category of toxicity because of potential greater risk, and that was not the case here.
BY MR. NARESH:
Q. And the EPA 6(A)(2) guidelines referenced in Exhibit 94, does that provide you with context to understand whether Exhibit 27 was a document generated in conjunction with European reportability as opposed to US reportability?
A. Well, it seems to suggest this is more to do with US reportability, yes.
Q. Okay.
MR. NARESH: I have no further questions.
MR. DICKENS: Nothing further.
MR. NARESH: Anybody on the phone or on Zoom?
MS. BOSTON: No.
MS. SIMMS: Nothing here.
MR. NARESH: We'll read and sign, and we'll designate as provisionally confidential in accordance with the protective order.
THE VIDEOGRAPHER: We are going off the record at 18:03.

688

(Whereupon, the deposition concluded at 6:03 p.m.)

689

CERTIFICATE OF WITNESS

I, PHILIP BOTHAM, declare that I have read the entire transcript of Volume II of my Syngenta Corporate Representative deposition, or the same has been read to me, and certify that it is a true, correct and complete transcript of my deposition given on Wednesday, September 18, 2024, save and except for changes and/or corrections, if any, as indicated by me on the attached Errata Sheet, with the understanding that I offer these changes and/or corrections as if still being questioned.

Signed_____
Philip Botham

Dated this.....day of.....20...

690

CERTIFICATE OF STENOGRAPHER

I, LEAH M. WILLERSDORF, Registered Merit Reporter, Certified Realtime Reporter, Fellow of the British Institute of Verbatim Reporters, Qualified Realtime Reporter Level 2, and Certified LiveNote Reporter, do hereby certify that:
PHILIP BOTHAM appeared before me on Wednesday, September 18, 2024, agreed to tell the truth under the penalties of perjury, and was thereupon examined by counsel; the testimony of said witness was taken by me stenographically; the foregoing is a true and accurate record to the best of my knowledge, skill and ability; I am neither a relative nor employee of any party to the action in which this testimony was taken; I am neither relative nor employee of any attorney or counsel employed by any party thereto; and, further, I am not financially or otherwise interested in the outcome of the action.

LM Willersdorf
LEAH M. WILLERSDORF
RMR, CRR, FBIVR, ACR, QRR2, CLR
(September 27, 2024)