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Transcript of Philip Botham, Ph.D.

Date: September 19, 2024

Case: Paraquat Products Liability Litigation, In Re:

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Case ID: 220300429

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Transcript of Philip Botham, Ph.D.
Conducted on September 19, 2024

1 (1 to 4)

1 PHILADELPHIA COUNTY COURT OF COMMON PLEAS 2 TRIAL DIVISION 3 -----) 4 IN RE: PARAQUAT PRODUCTS) 5 LIABILITY LITIGATION,) 6) Case No. 7 This Document Relates to All) 220500559 8 Actions) 9 -----) 10 **CONFIDENTIAL** 11 Videotaped deposition of 12 DR. PHILIP BOTHAM 13 (in his individual capacity) 14 15 London, England 16 United Kingdom 17 18 Thursday, September 19, 2024 19 20 21 22 23 Job No. 553166 24 Reported stenographically by: 25 LEAH M. WILLERSDORF, RMR, CRR, FBIVR, ACR, QRR2, CLR	1 A P P E A R A N C E S 2 3 On behalf of Plaintiffs: 4 THE MILLER FIRM LLC 5 The Sherman Building 6 108 Railroad Avenue 7 Orange, VA 22960 8 (540) 882 2525 9 10 BY: DAVID J. DICKENS, ESQ. 11 JEFFREY TRAVERS, ESQ. 12 ddickens@millerfirmllc.com 13 jtravers@millerfirmllc.com 14 15 On behalf of Defendant Syngenta and the witness: 16 KIRKLAND & ELLIS LLC 17 1301 Pennsylvania Avenue, N.W. 18 Washington, D.C. 20004 19 (202) 389 5000 20 21 BY: RAGAN NARESH, ESQ. 22 ragan.naresh@kirkland.com 23 24 25 On behalf of Defendant Chevron: 26 JONES DAY 27 250 Vesey Street 28 New York, NY 10281-1047 29 (212) 326 3939 30 31 BY: EMILY A. CAREY, ESQ. (via Zoom) 32 ecarey@jonesday.com 33 34 35
1 2 Thursday, September 19, 2024 3 4 09:00 a.m. to 12:27 p.m. 5 (British Summer Time) 6 7 Videotaped deposition of DR. PHILIP BOTHAM 8 held at the offices of Kirkland & Ellis LLP, 9 30 St. Mary Axe, London EC3A 8AF, England, United 10 Kingdom, before Leah M. Willersdorf, Registered Merit 11 Reporter and Certified Realtime Reporter, both with 12 the US National Court Reporters Association, and 13 Fellow of the British Institute of Verbatim Reporters, 14 Accredited Court Reporter, Qualified Realtime Reporter 15 (Level 2), and Certified LiveNote Reporter. 16 17 18 19 20 21 22 23 24 25	1 A P P E A R A N C E S 2 (continued) 3 On behalf of Defendant FMC Corporation: 4 TROUTMAN PEPPER LLP 5 3000 Two Logan Square 6 Eighteenth and Arch Streets 7 Philadelphia, PA 19103 8 (215) 981 4000 9 10 BY: ANDREW E. KANTRA, ESQ. (via Zoom) 11 andrew.kantra@troutman.com 12 13 ALSO PRESENT 14 Mark Smith, Esq. - Syngenta 15 Barry Boise - Troutman Pepper 16 (via Zoom) 17 18 Randi Ellis - Special Master 19 Jeremy Dineen - Videographer 20 Linda Fleet - Remote technician 21 22 23 24 25

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9 1 EXHIBITS INDEX 2 Exhibit No. Description Page 3 Exhibit 111 Email from Kersten Mewes to 95 4 Phil Botham, et al., dated 5 October 20, 2011 6 (SYNG-PQ-03734833) 7 Exhibit 112 Document entitled "Paraquat 95 8 dichloride - PP148 - SynCRA 9 proposal," with an issue 10 date of September 2011, and 11 attached to the email that 12 is Exhibit 111 13 (SYNG-PQ-PA-03734877 - 905) 14 Exhibit 113 Email string, with the most 106 15 recent being from Andy Cook 16 to Dick Lewis, et al., dated 17 November 7, 2011 18 (SYNG-PQ-06726007 - 010) 19 [Confidential - Paraquat 20 Litigation] 21 Exhibit 114 Document entitled "Notes 111 22 from PS/GPR meeting on 10 23 July, 2008" 24 (SYNG-PQ-01640485 - 487) 25 Exhibit 115 Email string, with the most 114 recent being from Jon Parr to Karsten Neuffer, dated June 9, 2017 (SYNG-PQ-19796305 - 307) EXHIBIT PREVIOUSLY MARKED Exhibit 93 Printout from the 65 paraquat.com website, entitled "Paraquat Information Center - Paraquat and Parkinson's disease" (11 pages, no Bates)	11 1 THE VIDEOGRAPHER: The court reporter 2 today is Leah Willersdorf, representing Planet Depos. 3 Would the reporter please swear in the witness. 4 THE STENOGRAPHER: Good morning. My name 5 is Leah Willersdorf and I am a Registered Merit 6 Reporter and a Certified Realtime Reporter. 7 Will counsel please stipulate that, in 8 lieu of formally swearing in the witness, the reporter 9 will instead ask the witness to acknowledge that their 10 testimony will be true under the penalties of perjury, 11 that counsel will not object to the admissibility of 12 the transcript based on proceeding in this way, and 13 that the witness has verified that he is, in fact, 14 Dr. Philip Botham. 15 MR. DICKENS: Agreed. 16 THE STENOGRAPHER: Thank you. 17 MR. NARESH: Agreed here as well. And -- 18 MR. DICKENS: Yes. 19 MR. NARESH: -- Dave, do we have the 20 agreement that objections do not need to be resolved 21 off the record? 22 MR. DICKENS: Agreed. 23 MR. NARESH: Okay. 24 MR. KANTRA: And also that a stipulation 25 as to one is a stipulation as to all?
10 1 (On the record at 09:00 a.m.) 2 THE VIDEOGRAPHER: Here begins Media No. 1 3 in the videotaped deposition of Dr. Philip Botham in 4 his personal capacity, In Re: Paraquat Products 5 Liability Litigation, in the Philadelphia County Court 6 of Common Pleas, case number 220500559. 7 Today's date is September 19, 2024. 8 The time on the video monitor is 09:00 a.m. 9 The videographer today is Jeremy Dineen 10 representing Planet Depos. This video deposition is 11 taking place at the offices of Kirkland & Ellis in 12 London, England. 13 Would counsel please voice-identify 14 themselves and state whom they represent. 15 MR. DICKENS: David Dickens on behalf of 16 the plaintiffs. 17 MR. TRAVERS: Jeffrey Travers on behalf of 18 plaintiffs. 19 MR. NARESH: Ragan Naresh on behalf of 20 Syngenta. 21 MR. SMITH: Mark Smith on behalf of 22 Syngenta. 23 MR. KANTRA: Andy Kantra on behalf of FMC. 24 MS. CAREY: Emily Carey on behalf of 25 Chevron.	12 1 MR. DICKENS: Agreed. 2 MS. CAREY: Agreed from here as well. 3 THE STENOGRAPHER: Dr. Botham, do you 4 hereby acknowledge that your testimony will be true 5 under the penalties of perjury? 6 THE WITNESS: I do. 7 THE STENOGRAPHER: Thank you. 8 Thank you. 9 DR. PHILIP BOTHAM, 10 having first agreed to tell the truth 11 under penalty of perjury, was examined 12 and testified as follows: 13 EXAMINATION ON BEHALF OF PLAINTIFFS 14 BY MR. DICKENS: 15 Q. Good morning, Dr. Botham. 16 A. Good morning. 17 Q. We're here today to depose you in your 18 individual capacity with respect to your own 19 individual knowledge with respect to paraquat and 20 paraquat and Parkinson's disease. 21 Do you understand that? 22 A. Yes, that's my understanding. 23 Q. And I'll ask that the same instructions 24 apply: If I ask you something that you don't 25 understand, please let me know.

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4 (13 to 16)

13 1 Is that fair? 2 A. It is. 3 Q. Okay. 4 I understand you began working at -- 5 for Syngenta in 1980; is that right? 6 A. Yes. For one of the legacy companies of 7 Syngenta, yes. 8 Q. Okay. And which legacy company was that? 9 A. That was ICI. 10 Q. And so you began with ICI in 1980. 11 When did you first have any involvement 12 with paraquat? 13 A. Well, significant involvement was not 14 until around 2007/2008, but I'd had interactions in 15 various ways with issues related to paraquat before 16 then in my role as a senior leader in product safety. 17 Q. As a senior leader in product safety, 18 before 2007/2008 did you have any role or involvement 19 in the issue of Parkinson's disease? 20 A. No, not directly. 21 Q. When you say "not directly," what do you 22 mean? 23 A. Well, there were people who were either 24 indirectly reporting to me or were in the same part of 25 the organization who were involved in some of that	15 1 there are many other functions at that site, including 2 Product Safety. 3 MR. DICKENS: I'm going to hand you -- 4 we'll continue. This will be Exhibit 95. 5 MR. NARESH: Do you want to start -- you 6 don't want to start over with -- 7 MR. DICKENS: I mean, I don't know. I 8 don't care. Do you want to start over? 9 MR. NARESH: It's a different deposition, 10 so... 11 MR. DICKENS: Okay. 12 MR. NARESH: Whatever; it's your depo. 13 Whatever you want to do, right? I had assumed you 14 were starting over, but I don't really care. 15 MR. DICKENS: We already have the exhibit 16 numbers written out, correct? 17 THE STENOGRAPHER: Yes. 18 MR. DICKENS: We'll go ahead and mark it 19 as 95. 20 (Exhibit 95 marked for identification.) 21 BY MR. DICKENS: 22 Q. Dr. Botham, I've handed you an exhibit 23 that has been marked as 95 which is a cover page and 24 an agenda from November 2004. 25 Do you see that?
14 1 Parkinson's research. But I was not directly involved 2 in the work that was being done in designing or 3 reviewing it. 4 Q. And you mentioned you were senior leader 5 for product safety in the 2007/2008 time frame? 6 A. Yes, yes. So I had a variety of roles as 7 a leader. So around about 2007/8, I was European head 8 of product safety; subsequently became the global head 9 of product safety. 10 Q. And when did you become global head of 11 product safety? 12 A. I think that was 2011. 13 Q. Did you have a different position prior to 14 2007/2008? 15 A. I had a number of positions prior to that. 16 2007 is when I relocated to the Jealott's Hill site of 17 Syngenta. Before that, I was at the Central 18 Toxicology Laboratory, where I had a different kind of 19 leadership role but in toxicology. 20 Q. What is Jealott's Hill? 21 A. Jealott's Hill is an international 22 research center for Syngenta and was also that for 23 ICI, and its research is in the discovery of new and 24 effective pesticides, and there is actually an 25 emphasis on herbicide research at Jealott's Hill, and	16 1 A. I do. 2 Q. And it appears to be an agenda for a 3 meeting, a Tech-Reg Meeting, right? 4 A. That's right. 5 Q. And there are some required attendees 6 listed, of which you are one of the required 7 attendees, right? 8 A. That's correct. 9 Q. And this was a Techno-Regulatory Review 10 meeting. What was the Techno-Regulatory Review? 11 Was there a team at ICI, or Syngenta at this time? 12 MR. NARESH: Form. 13 THE WITNESS: There was -- and this was 14 what I was referring to earlier. There was a team 15 which I wasn't directly involved in, a technical team, 16 which was beginning to look at issues around 17 Parkinson's disease at this time. And this meeting 18 here was a meeting of members of that technical team 19 with some regulatory people from other parts of 20 the company. And as a senior leader, I was invited to 21 that meeting. 22 BY MR. DICKENS: 23 Q. Okay. So you were a senior leader for 24 product safety at this time? 25 A. Yes.

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17 1 Q. And you weren't only invited; you were 2 a required attendee, right? 3 A. Yes. 4 Q. And on the second page, this meeting was 5 dealing specifically with Parkinson's disease, right? 6 A. It was, yes. 7 Q. And there's a limited group of individuals 8 from Syngenta who were at this meeting, were required 9 attendees at this meeting, right? 10 A. Yes. 11 Q. And it includes some of the items which 12 would have been on the agenda, right? 13 A. It does. 14 Q. Do you recall this meeting? 15 A. To be honest with you, I have a very poor 16 recollection of this -- of the details of this 17 meeting. 18 Q. Okay. 19 One of the objectives was to: 20 "Confirm [...] the RDT definition of the 21 issue/threat." 22 What is RDT referring to, if you know? 23 A. I think it was regulatory development 24 team. 25 Q. And so was that team involved with	19 1 brought into that meeting because I was a toxicologist 2 as well; so it was just to allow me to provide any 3 expertise that I might have for this discussion. 4 Q. Okay. And there was a discussion as to 5 the way forward, and that says, next to it, "All." 6 So that was a discussion for all of the 7 attendees; is that your understanding? 8 A. Yes. 9 Q. And one of the discussion points at that 10 meeting was what actions would be necessary: 11 "... to enhance [Syngenta's] monitoring, 12 understanding and influence of ongoing academic 13 Parkinson's disease research." 14 Correct? 15 A. Yes. 16 Q. And there's that word once again: 17 "influence," right? 18 A. Yes, it's a word which we discussed 19 several times in the last couple of days, I agree. 20 Q. And there was actually an external 21 influencing team at Syngenta, right? 22 MR. NARESH: Foundation. 23 THE STENOGRAPHER: Sorry. Did you say 24 "external" or "internal"? 25 ///
18 1 decisions on how to deal with regulatory issues? 2 MR. NARESH: Objection; foundation. 3 THE WITNESS: That would have been its 4 principal purpose. 5 BY MR. DICKENS: 6 Q. And how to determine how regulatory 7 agencies would define the issue and threat of 8 Parkinson's disease? 9 MR. NARESH: Foundation. 10 THE WITNESS: That would, indeed, be one 11 possibility. 12 BY MR. DICKENS: 13 Q. And there's other individuals at this 14 meeting which includes toxicologists who were working 15 with paraquat at this time? 16 A. Yes. As I just mentioned, there was a 17 small technical team who had already started to work 18 on the alleged association between paraquat and 19 Parkinson's disease. 20 Q. And were you -- did those individuals 21 report to you as product -- project leader? 22 A. I was not project leader. 23 Q. Okay. What was your role at this meeting? 24 A. As I said, at that time I was a senior 25 leader in toxicology at CTL and I believe I was	20 1 MR. DICKENS: External -- 2 THE STENOGRAPHER: Thank you. 3 MR. DICKENS: -- influencing team. 4 MR. NARESH: Foundation. 5 THE WITNESS: I would need to be reminded 6 exactly what that team was and who they were. 7 BY MR. DICKENS: 8 Q. Do you recall ever serving as a member of 9 an external influencing team at Syngenta? 10 A. I don't immediately remember that, but 11 perhaps you can give me something that might remind 12 me. 13 Q. Now, from time to time, Syngenta would 14 discuss influencing strategies, right? 15 A. Yes. And by "influencing," it was in 16 order to be able to understand what was going on in 17 the outside world and, wherever possible, to engage 18 with that, to work with that outside world, the 19 outside science that may be going on. That's what 20 "influence" was meant to convey. 21 Q. Okay. Intending to influence 22 publications, scientists around the world with respect 23 to paraquat and Parkinson's disease? 24 A. Positively influence, so to cooperate, 25 to collaborate, to understand and hopefully then to

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6 (21 to 24)

21 1 get the best possible science. 2 Q. The last bullet point: 3 "Actions necessary to better support 4 regulatory authorities in dismissing the hypothesis 5 that paraquat is a risk factor for Parkinson's disease 6 in humans." 7 That was a way forward that was being 8 discussed at this meeting, right? 9 A. I'm sure that this reflects that some 10 people may have had that ambition at the time, but 11 I can reassure you that I know that in 2004 we 12 were not saying, amongst the scientific team that 13 I was working alongside, that this was all about 14 dismissing; it was understanding. 15 Q. Where in this document does it say that, 16 what you just said? 17 A. It doesn't. I've just described how I saw 18 what was going on in work that was being conducted in 19 the laboratory where I was a senior leader. 20 Q. Well, certainly somebody at Syngenta 21 believed that there would be actions necessary to 22 support regulatory agencies for dismissing the 23 hypothesis at this point in 2004, right? 24 MR. NARESH: Form, foundation. 25 THE WITNESS: As written, as I've just	23 1 in the research in this area to understand and develop 2 further that hypothesis. 3 BY MR. DICKENS: 4 Q. So it would certainly be inappropriate to 5 try to have regulatory agencies dismiss the hypothesis 6 if Syngenta itself didn't know whether or not that 7 hypothesis was real, right? 8 MR. NARESH: Form. 9 THE WITNESS: I can't speak on the behalf 10 of people who wrote this agenda if they chose to use 11 that word. It is not a reflection of what was 12 actually happening. 13 BY MR. DICKENS: 14 Q. But you were there at that meeting, right? 15 A. I was. 16 Q. And you received this agenda? 17 A. Yes. 18 Q. And you never voiced your concern with the 19 word "dismissing"? 20 MR. NARESH: Mischaracterizes. 21 THE WITNESS: I wouldn't necessarily have 22 objected to it and I don't think I needed to object to 23 it because we were talking about how we would move 24 forward with an experimental program, and, indeed, as 25 you see in the program -- in the agenda, we already
22 1 said, it -- clearly, somebody or some people thought 2 it would be a good idea if that hypothesis could be 3 dismissed, but the technical team, and certainly some 4 of the regulatory team that worked with the technical 5 team, would not have used the word "dismissed." 6 That is, I think, shown by the amount of 7 time and effort and resource that we put in to 8 understand the hypothesis. 9 BY MR. DICKENS: 10 Q. Did you ever send any correspondence to 11 individuals on this team and say, "I don't agree with 12 this way forward. I don't agree with this agenda to 13 say 'dismissed'"? 14 MR. NARESH: Objection; form. 15 THE WITNESS: I don't remember saying -- 16 doing such a thing. 17 BY MR. DICKENS: 18 Q. At this time in 2004, Syngenta could not 19 say that there was not data supporting that paraquat 20 may be associated with Parkinson's disease, right? 21 MR. NARESH: Form, foundation, and 22 personal capacity deposition. 23 THE WITNESS: Well, absolutely, I agree, 24 and I think that just reinforces what I've said, that 25 we were getting engaged in, actually getting engaged	24 1 had started and there was an update on the experiments 2 we'd done to date. 3 BY MR. DICKENS: 4 Q. And part of that -- 5 MR. NARESH: Can you just adjust your tie 6 so it doesn't look crooked on the video. Yeah, okay, 7 great. 8 MR. DICKENS: Is my hair all right? 9 MR. NARESH: You look fine. 10 BY MR. DICKENS: 11 Q. Part of that agenda undertaken by Syngenta 12 was to "create an international scientific consensus 13 against the hypothesis that paraquat is a risk 14 factor," right? 15 A. I don't recognize that that was the 16 purpose. It was to get -- hopefully to get an 17 international consensus on whether there was any link 18 between the exposure to paraquat and Parkinson's 19 disease. 20 Q. Because at this time in 2004 you didn't 21 know, right? 22 A. We didn't know and the experiments that we 23 were looking at said that that was a plausible 24 hypothesis and that's why we wanted to engage further 25 in that work.

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7 (25 to 28)

25 1 Q. If we could turn to the last page of this 2 document. The second-to-last bullet point, a way 3 forward was: 4 "Actions necessary to create an 5 international scientific consensus against the 6 hypothesis that paraquat is a risk factor for 7 Parkinson's disease in humans." 8 That's what was included on this agenda, 9 right? 10 A. It was. 11 Q. And you don't agree that that would be 12 appropriate as written, right? 13 A. Look, this was not my meeting, not my 14 agenda. You know, people chose to express it in that 15 way; all I can describe is how we were actually 16 tackling this, as I have just been saying. 17 Q. How you personally were tackling this, 18 right? 19 MR. NARESH: Objection; form. 20 THE WITNESS: Personally, at this time, 21 no, I was not directly involved in this. 22 BY MR. DICKENS: 23 Q. But when you say this is how "we" were 24 actually tackling this, you're speaking on behalf of 25 yourself, right?	27 1 BY MR. DICKENS: 2 Q. And that doesn't even include those 3 countries in which paraquat was never able to be sold, 4 right? 5 MR. NARESH: Foundation. 6 THE WITNESS: I assume so. 7 BY MR. DICKENS: 8 Q. And there have been reviews in the 9 countries where paraquat is no longer sold that have 10 looked at whether or not the lack of sale in paraquat 11 affected farmers or affected crop yields. 12 You're aware of that, right? 13 MR. NARESH: Foundation. 14 THE WITNESS: Yes. 15 BY MR. DICKENS: 16 Q. And you're aware of studies that have 17 found that, indeed, the ban or withdraw of paraquat 18 from those markets have not affected any type of crop 19 yield, right? 20 MR. NARESH: Foundation. 21 THE WITNESS: I'm aware of some 22 publications which suggest that, and there -- but 23 there are other -- there's other information which 24 suggests that, without paraquat, that farmers and 25 growers would be unable to do things that they
26 1 A. And -- well, I'm now describing what the 2 Central Toxicology Laboratory technical team was 3 doing. 4 Q. Well, you can't speak with respect to 5 everyone, including the person who put this agenda 6 together, right? 7 MR. NARESH: Form. 8 THE WITNESS: And I don't believe that 9 that's what I'm here to be discussing. 10 MR. DICKENS: You can put that aside. 11 BY MR. DICKENS: 12 Q. Now, Dr. Botham, you understand that there 13 are now over 140 countries in which paraquat was 14 previously registered that Syngenta is no longer able 15 to sell paraquat, correct? 16 MR. NARESH: Foundation, form. 17 THE WITNESS: That was a -- I don't have 18 140 to hand, but I've seen a list of countries, 19 certainly. 20 BY MR. DICKENS: 21 Q. And does that number seem roughly accurate 22 to you? 23 MR. NARESH: Foundation. 24 THE WITNESS: Yes, it seems reasonable. 25 ///	28 1 currently do. 2 (Exhibit 96 marked for identification.) 3 MR. DICKENS: I'll hand you what we'll 4 mark as 96. 5 BY MR. DICKENS: 6 Q. Exhibit 96 is an email that was sent to 7 you last year, January 10, 2023, right? 8 A. Yes, that's correct. 9 Q. And from a Kathryn Schlee? 10 A. Yes. 11 Q. Who is that? 12 A. Kathryn is in the United States, in our 13 Greensboro office, and she is an information 14 specialist. 15 Q. And the Subject line is "FYI on 16 Eddleston." 17 Right? 18 A. Correct. 19 Q. And she's sending you an article because 20 she has "a feeling that it will be one that is cited 21 often," right? 22 A. Yes. 23 Q. It's one in which a Eddleston appears to 24 be the author, correct? 25 A. Yes. Michael is one of the authors, yes.

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8 (29 to 32)

29 1 Q. Okay. And you say "Michael." Do you know 2 Michael Eddleston? 3 A. Not personally, no, but I know of his 4 work. 5 Q. Do you know why Kathryn Schlee sent you 6 the email with the subject specifically referencing 7 Michael Eddleston from this particular publication? 8 A. Well, the context of this is that Kathryn 9 provides us with a monthly list of potentially 10 relevant publications on paraquat, and not just on 11 paraquat and Parkinson's disease but on paraquat 12 toxicity issues generally. 13 And Dr. Eddleston, Michael Eddleston, 14 is particularly concerned with actually the acute 15 toxicity-related issues with paraquat, and she decided 16 on this occasion that she'd just found this one and 17 thought we would like to see it ahead of her normal 18 monthly search. 19 Q. And sent it to you specifically because 20 you were aware of Dr. Eddleston and his work? 21 A. Well, sent to Andy and myself because we 22 were the -- well, the two lead people, I guess you 23 would say, at that time in what was called our 24 Paraquat Health Science Team. 25 Q. Michael Eddleston has collaborated with	31 1 A. He did. 2 Q. And he was involved in that study and any 3 reports related to that study, right? 4 MR. NARESH: Form. 5 THE WITNESS: He was. 6 BY MR. DICKENS: 7 Q. And so Syngenta certainly believed he was 8 capable in order to assist in studies and 9 publications, right? 10 MR. NARESH: Form. 11 THE WITNESS: Again, I was not directly 12 involved in forming that relationship, so I wouldn't 13 want to comment on that question. 14 BY MR. DICKENS: 15 Q. Do you know, there's a C.N. Merfield. 16 Are you aware of Merfield? 17 A. No, I don't know C.N. Merfield. 18 Q. So you don't know whether or not he works 19 for Defra? 20 A. No, I've got no idea. 21 Q. Now, this study is titled "Agriculture 22 without paraquat is feasible without loss of 23 productivity - lessons learned from phasing out a 24 highly hazardous herbicide." 25 Right?
30 1 Syngenta on studies in the past, correct? 2 A. He has. 3 Q. And studies with respect to paraquat? 4 A. That is correct. 5 Q. And in what capacity did Michael Eddleston 6 collaborate with Syngenta on paraquat studies? 7 MR. NARESH: Foundation. 8 To the extent you know. 9 THE WITNESS: I think you may be referring 10 to the study of survivors of poisoning in, for 11 example, Sri Lanka, and the analysis that Michael 12 Eddleston and others were involved in with, working 13 with ourselves, to see whether there was any 14 improvement in survival when we introduced the 15 formulation called paraquat Inteon. 16 BY MR. DICKENS: 17 Q. So Syngenta specifically reached out to 18 Dr. Eddleston to contract and work with you to 19 evaluate those survivors in that Sri Lanka study, 20 right? 21 A. Again, I was not directly involved in the 22 commissioning of that work, so I can't comment on 23 exactly how that relationship was started. 24 Q. But you can agree he did work with 25 Syngenta in that -- on that issue?	32 1 A. That's correct. 2 Q. And you've reviewed this publication in 3 the past, correct? 4 A. It's certainly one of the papers that we 5 have looked at on this theme. 6 Q. And you say "we." You've personally 7 looked at it, right? 8 A. Yes. 9 MR. DICKENS: I'll hand you Exhibit 97 for 10 the record. 11 (Exhibit 97 marked for identification.) 12 BY MR. DICKENS: 13 Q. Exhibit 97 is a copy of that article that 14 we were just discussing, right? 15 A. Yes, it's the same one. 16 Q. And the same article that you reviewed 17 last year in your role with Syngenta, correct? 18 A. I think the word would better be described 19 as "read." "Reviewed" suggests that I did a thorough 20 analysis of it, which I certainly didn't. 21 Q. If you can turn to the second page, ending 22 6180. 23 MR. NARESH: And, Dr. Botham, to the 24 extent counsel is going to ask you questions about 25 this rather lengthy article, you're obviously free to

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33 1 read as much of it as you'd like to. So, you know, 2 maybe let him ask his question, but to the extent you 3 want to read some of the contextual pieces, you're 4 certainly entitled to do so. 5 THE WITNESS: Thank you. 6 BY MR. DICKENS: 7 Q. And on the first column, the last full 8 paragraph that begins "Cases of..." 9 Do you see that? 10 A. Yes. 11 Q. Okay. And so that references the 12 intentional and unintentional poisonings and notes 13 that those are "severely under-reported." 14 Do you see that? 15 MR. NARESH: Well, I'll object on the rule 16 of completeness. 17 THE WITNESS: That's what it says. 18 BY MR. DICKENS: 19 Q. And then the article also references at 20 the end, that last sentence, some chronic health 21 effects associated with paraquat, right? 22 A. It does. 23 Q. And one of those that's specifically noted 24 is paraquat and Parkinson's disease, correct? 25 A. Correct.	35 1 That is, indeed, an argument that's been 2 made by Syngenta in the past, right? 3 MR. NARESH: Objection; form, foundation. 4 THE WITNESS: Well, you're asking me here 5 in my personal capacity and perhaps it's worth saying 6 at this stage, I'm not somebody who was involved in 7 the agricultural use of paraquat, in the agronomic 8 aspects of it. I'm a toxicologist, I'm a safety 9 scientist, so this is certainly not in my area of 10 expertise. 11 BY MR. DICKENS: 12 Q. So you don't know if that's an argument 13 that's been made by Syngenta publicly? 14 A. I wouldn't be able to comment specifically 15 about that. 16 Q. Okay. It references a Sethi article which 17 was looking at the effects of crop yields in Kerala, 18 India. 19 Have you reviewed that particular study? 20 A. No, again, because this is outside of the 21 area of expertise that I'm responsible for. 22 Q. This was an article that was sent 23 specifically to you by others within Syngenta, right? 24 MR. NARESH: Asked and answered. 25 THE WITNESS: Yes, it was sent to us by --
34 1 Q. Now, if we turn to 6182, the section 2 entitled "Effects of paraquat bans on agricultural 3 production." 4 Do you see that? 5 A. Yes. 6 Q. And your understanding of this article is 7 it was meant to look at the effect of whether paraquat 8 bans have affected agricultural production in those 9 countries that have indeed banned the use of paraquat? 10 MR. NARESH: Form. 11 THE WITNESS: Yes, in 67 countries. 12 BY MR. DICKENS: 13 Q. Do you have an understanding that there's 14 actually more countries that have either banned or in 15 which paraquat used to be registered and are no longer 16 registered? 17 MR. NARESH: Foundation. 18 THE WITNESS: Yes. I think we've just 19 talked about that. 20 BY MR. DICKENS: 21 Q. It states: 22 "A common argument against banning 23 paraquat from use in agriculture is that there will be 24 a negative effect on crop yield, which will in turn 25 reduce farmers' livelihoods and affect food security."	36 1 as part of the normal submission of publications on 2 paraquat. 3 BY MR. DICKENS: 4 Q. Okay. Don't you have to make assessments 5 of risks versus benefits in your role with Syngenta? 6 A. It's not my role to do a risk-benefit 7 analysis. That is not -- I'm a toxicologist. I'm 8 responsible for people doing toxicology. My role, and 9 those around me, is to understand safety. 10 Q. Well, you do appear on Syngenta's website 11 currently in a video speaking of the risks and 12 benefits of paraquat; isn't that right? 13 A. I appear in a video talking about the 14 allegations of the risk from exposure to paraquat 15 in terms of developing Parkinson's disease. I don't 16 recall talking about benefits. 17 Q. Turn to page 6184, and it lists some 18 "Alternative methods for weed management." 19 Do you see that? 20 A. I do. 21 Q. There's "Integrated weed management," 22 right? 23 A. Yes. 24 Q. And then there's "Herbicide alternatives 25 to paraquat," correct?

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10 (37 to 40)

37 1 A. Correct. 2 Q. Some of those other herbicides, or at 3 least the ones most commonly used: diquat, glufosinate 4 and glyphosate. 5 Do you see those? 6 A. That's correct, yes. 7 Q. And those are all alternatives to 8 paraquat? 9 A. They can be, but they actually don't all 10 work in the same way, that much I do know, so they're 11 not direct alternatives. 12 Q. And those are other pesticides that 13 have been on the market since at least the 1970s? 14 MR. NARESH: Foundation. 15 THE WITNESS: Again, I don't know exact 16 dates. 17 BY MR. DICKENS: 18 Q. You know the exact dates for diquat at 19 least, right? 20 MR. NARESH: Foundation. 21 THE WITNESS: No, I don't have that date 22 to hand. 23 BY MR. DICKENS: 24 Q. Have you ever worked with diquat in any 25 manner in your role with Syngenta?	39 1 A. Okay, yes. 2 Q. And you recognize those as alternatives to 3 paraquat that don't include the spraying of pesticides 4 or chemicals? 5 MR. NARESH: Foundation. 6 THE WITNESS: Yes, indeed, but, again, 7 this is outside of my area of expertise, so I can't 8 comment in detail on it, I'm afraid. 9 MR. DICKENS: Why don't we put that aside. 10 I'll hand you what we'll mark as 98 and 11 99. 12 (Exhibit 98 marked for identification.) 13 (Exhibit 99 marked for identification.) 14 BY MR. DICKENS: 15 Q. Let me know when you're ready, Dr. Botham. 16 A. Okay, yes, go ahead. 17 Q. So Exhibit 98 is an email from you to 18 Jonathan Sullivan attaching a slide from June 2010. 19 Do you see that? 20 A. Yes, I do. 21 Q. And Jonathan Sullivan, once again, he's an 22 attorney at Syngenta, right? 23 A. That's correct. 24 Q. Okay. And you're sending him the slide, 25 noting that it's correct but too complicated because
38 1 A. Only, again, with respect to some -- 2 any safety studies that may have been done on diquat 3 would have been done by people in the organization in 4 which I was -- had a leadership role. 5 Q. Okay. And were you personally involved in 6 analyzing any safety data related to diquat? 7 A. I may have been because I would have 8 reviewed a number of safety studies, toxicology 9 studies over a long period of time, and some of those 10 may have been on diquat or been on diquat 11 formulations. 12 Q. Do you recall any work you may have done 13 analyzing safety-related data on diquat? 14 A. Not immediately. If you wish to point to 15 a particular example that you'd like to discuss, I'd 16 be happy to do that. 17 Q. Okay. There's also "Non-herbicide 18 alternatives to paraquat." 19 You recognize that that's true, correct? 20 MR. NARESH: Foundation. 21 THE WITNESS: Indeed, yes. 22 BY MR. DICKENS: 23 Q. And then it lists on -- two pages after 24 the chart, some of those non-herbicidal alternatives, 25 right?	40 1 "It's illustrating what happens both at the 2 blood-brain barrier and into and out of the brain 3 cells. We've simplified in attached slides." 4 Right? 5 A. That's what it says, yes. 6 Q. And you've attached those slides to this 7 email, right? 8 A. Well, I can't -- yes, I assume I did, 9 although the cover page you've given me doesn't have 10 the attachment. 11 Q. And do you recognize what is in the next 12 exhibit, Exhibit 99, as slides that you would have 13 seen and prepared? 14 A. Yes, that's correct. 15 Q. Okay. Now, is there a -- what was the 16 purpose of sending these slides to the attorney at 17 Syngenta? 18 A. Well, the -- 19 MR. NARESH: Foundation. 20 If you remember. 21 THE WITNESS: Sorry. The attorney, 22 Jonathan Sullivan, was responsible for ensuring that 23 the PILT, which is the Paraquat Issues Leadership 24 Team -- which I was not always a member of but I would 25 sometimes be asked to make presentations to. The

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11 (41 to 44)

41 1 Paraquat Issues Leadership Team had asked if they 2 could get a better understanding of similarities or 3 differences between paraquat and diquat. 4 BY MR. DICKENS: 5 Q. So was this slide prepared specifically 6 for the Paraquat Issues Leadership Team? 7 A. Well, I believe so. A version may have 8 been produced for other purposes as well but this one 9 clearly was for the Paraquat Issues Leadership Team. 10 Q. Did you present this slide to the Paraquat 11 Issues Leadership Team? 12 A. I may have done but I don't recall that 13 I definitely did. I certainly made a number of 14 presentations to the Paraquat Issues Leadership Team. 15 Q. Okay. You said "We've simplified the 16 slides" in what you sent to Jonathan Sullivan. 17 Was this individuals in addition to 18 yourself that worked on these slides? 19 A. Undoubtedly. We've talked about the 20 Paraquat Health Science Team already and now we've 21 moved forward to June 2010, so there were -- there was 22 a small team of scientists who worked in that Health 23 Science Team and they would have provided some 24 specific expertise in, for example, trying to 25 understand this question.	43 1 are different, and is that based on the terminal 2 half-life, which is included next to it? 3 A. It is. It shows a difference in the 4 kinetics between paraquat and diquat. 5 Q. Okay. So diquat -- when it says "terminal 6 half-life," that means how much or how quickly 7 paraquat or diquat is removed from the brain? 8 A. That's correct. 9 Q. Okay. So for diquat, any diquat that goes 10 to the brain of -- in the mouse in this particular 11 case, correct? 12 A. That's correct. 13 Q. -- is excreted quickly, right? 14 A. It's rapidly eliminated, yes. 15 Q. Okay. So in diquat, any paraquat reaching 16 the brain is rapidly removed in 11 hours, right, or 17 eliminated? 18 A. Yeah, the half-life. Half of -- yes, is 19 11 hours. That's -- half-life is a kinetic term, but, 20 yes, for the purposes of -- you can say, yes, that's 21 as you've described it. 22 Q. Okay. 23 Now, for paraquat, paraquat is not rapidly 24 eliminated from the brain, right? 25 A. It's not as rapidly, yes, that's right.
42 1 Q. So not just you but other scientists on 2 the Paraquat Health Science Team collaborated in 3 completing these particular slides to be presented to 4 the Paraquat Issues Leadership Team; is that fair? 5 A. Yes, I certainly wouldn't have done this, 6 put this together entirely by myself. 7 Q. I want to look at those slides, which is 8 Exhibit 99. The slide is "Diquat: completed work and 9 potential further action." 10 Right? Is that correct? 11 A. Yes, that's the title. 12 Q. Okay. And then the second page, there's 13 a comparison of how diquat would work in the brain of 14 the mouse in comparison to paraquat, right? 15 A. That's correct. 16 Q. Okay. There is paraquat; it shows an 17 arrow going from the blood to the brain, and then a 18 arrow going back to the blood, right? 19 A. That's correct. 20 Q. Okay. And then there's diquat, and it 21 shows the same, right? 22 A. Yes, but the arrows are represented 23 somewhat differently for reasons you may want to come 24 on to. 25 Q. Okay. And you beat me to it. The arrows	44 1 Q. Okay. It's roughly 20.5 days more, right? 2 A. Yes. 3 Q. Okay. So the paraquat that gets into the 4 brain of the mouse will -- the half-life is at least 5 21 days? 6 A. The half-life is approximately 21 days in 7 the mouse. 8 Q. And half-life meaning only half of the 9 paraquat that reaches the brain is eliminated within 10 21 days, right? 11 A. Yes, it's the half-life of the presence of 12 paraquat, or diquat, in the brain. 13 Q. Okay. And certainly at this time in 2010, 14 Syngenta and the product health team knew that 15 paraquat that reached the brain in humans, in certain 16 situations, was also there for 21 days in certain 17 instances, right? 18 MR. NARESH: Form, foundation. 19 THE WITNESS: There was evidence that 20 paraquat could, indeed, still be present in the brain 21 for a period that is not -- certainly not 11 hours, 22 but certainly longer than that. 23 BY MR. DICKENS: 24 Q. And specifically for humans, there was 25 evidence that paraquat could still remain in the brain

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12 (45 to 48)

45 1 three weeks or 21 days after last exposure, right? 2 MR. NARESH: Form, foundation. 3 THE WITNESS: There is some evidence, but 4 obviously, being humans, that's fairly limited 5 evidence. 6 BY MR. DICKENS: 7 Q. So there's some conclusions, and these are 8 conclusions of the Paraquat Health Science Team; is 9 that right? 10 A. If you're still on the same slide, yes, 11 this would be the conclusions of the team. 12 Q. Those conclusions are both diquat and 13 paraquat rapidly enter the brain, right? 14 A. Yes, that's right. 15 Q. But "unlike paraquat, diquat is rapidly 16 eliminated from the brain," right? 17 A. That is the big -- that is the major 18 difference, yes. 19 Q. And so: 20 "If the persistence of paraquat in 21 the mouse brain is the major factor in producing 22 neuronal cell loss..." 23 Now, that is referring to neuronal cell 24 loss in the substantia nigra, correct? 25 A. That would have been the representation,	47 1 that actually showed diquat causing neuronal cell 2 loss, right? 3 A. We were not aware of any studies at that 4 time. 5 Q. That's quite different than paraquat, in 6 which there were numerous studies at this point in 7 time in 2010, right? 8 A. Absolutely and, as I've just said, that 9 was precisely why we were engaged in looking at that 10 mouse model ourselves. 11 MR. DICKENS: I'll hand you Exhibit 100. 12 (Exhibit 100 marked for identification.) 13 BY MR. DICKENS: 14 Q. Okay. Doctor, Exhibit 100 is an email 15 chain on which you're included, from 2022, right? 16 A. That's correct. 17 Q. And this is, once again, the individual in 18 charge of publications sending a copy of an article, 19 right? 20 A. That's right. 21 Q. And it states specifically: 22 "I wonder if this is what you have been 23 waiting for." 24 Right? 25 A. Yes, because we were following with
46 1 yes, that's right. 2 Q. Okay. The data, therefore, would reduce 3 the likelihood that diquat would cause that. And is 4 that because of the fact that it's rapidly eliminated? 5 A. That was the hypothesis. You can never be 6 sure that that would totally eliminate that 7 possibility, but it's suggested that there would be 8 less diquat in the brain for the period of time that 9 we're now talking about. 10 Q. So the Health Science Team is considering 11 that the length of time that paraquat remained in the 12 brain would be a major factor for why it is causing 13 cell loss in the substantia nigra; is that fair? 14 MR. NARESH: Form, foundation. 15 THE WITNESS: So we're talking about 2010 16 here, where we were still very much starting our 17 research program. Assuming that the work that others 18 had done and we'd started to do ourselves, that 19 paraquat can cause neuronal cell loss in the 20 substantia nigra, it's a correct hypothesis. 21 So we were saying there are many factors 22 that might contribute to that, and one of them could 23 be how long and how much paraquat is in the brain. 24 BY MR. DICKENS: 25 Q. And, indeed, there were no publications	48 1 interest the research that Michael Eddleston was 2 engaged in, and we -- this was, again, in Sri Lanka, 3 as we have been describing earlier, and we knew that 4 he was -- because he'd actually been collaborating 5 with people who we knew, including Dr. Tomenson, who 6 also is a consultant for Syngenta, and so we knew that 7 such a paper was in preparation, so it was good to see 8 that we were able to now read that paper. 9 Q. And you indeed note that, yes, this is 10 indeed the document you were waiting for, right? 11 A. That's right. 12 Q. Okay. You knew that this paper was being 13 worked on, right? 14 A. We had been given that information, yes. 15 Q. And this is not the study that Syngenta 16 was collaborating with Dr. Eddleston on, correct? 17 A. No, no. This is ten years or more later. 18 Q. Okay. So ten years or more later, and the 19 actual article was "Dose ingested, vomiting, and 20 outcome in patients ingesting a standard paraquat 20SL 21 formulation." 22 What's a "paraquat 20SL formulation"? 23 MR. NARESH: Foundation. 24 BY MR. DICKENS: 25 Q. If you know.

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13 (49 to 52)

49 1 A. I can't give you detailed technical 2 information but it was one of the formulations sold in 3 Sri Lanka. 4 Q. Do you know when it was sold in Sri Lanka? 5 A. No, I don't have dates to -- available, 6 I'm sorry. 7 Q. Okay. You noted Dr. Tomenson was a 8 consultant for Syngenta, right? 9 A. Yes. 10 Q. There's an M.F. Wilks also listed, right? 11 A. That's right. 12 Q. That's Martin Wilks? 13 A. That is Martin Wilks. 14 Q. Okay. Martin Wilks is a former employee 15 of Syngenta, right? 16 A. That's correct. 17 Q. You worked with Martin Wilks for a long 18 time? 19 A. I did. 20 Q. At this point, was Martin Wilks still with 21 Syngenta? 22 A. No. By this time, he had been working for 23 several years at the University of Basel. 24 Q. Do you know, did he retire from Syngenta? 25 A. No, he left to take up an academic post.	51 1 THE WITNESS: That's what it says, yes. 2 BY MR. DICKENS: 3 Q. Okay. In your understanding, the paraquat 4 formulation would have included the emetic, right? 5 A. It did. 6 Q. Okay. And that's what they were looking 7 at in this particular case? 8 A. Yes. This was the focus of 9 Dr. Eddleston's research at the time; how effective is 10 that emetic. 11 Q. And how long had the paraquat formulations 12 included an emetic, if you know? 13 MR. NARESH: Form, foundation. 14 THE WITNESS: For many years. Thirty 15 years or so. I wouldn't like to guess precisely how 16 long. 17 BY MR. DICKENS: 18 Q. And the emetic, that was something that 19 was added to paraquat in order to help with respect to 20 the acute toxicity issues? 21 A. An emetic is a substance which will elicit 22 nausea and vomiting and would therefore help, if a 23 person accidentally or deliberately ingested paraquat, 24 to get rid of that paraquat from their stomach through 25 vomiting and hopefully improve their chances of having
50 1 Q. Do you know when he left? 2 A. I don't have that date to hand, I'm sorry. 3 Q. I'm going to direct your attention to -- 4 and this is an abstract, right? 5 A. Yes, yes. 6 Q. And this is the abstract that was sent to 7 you and you reviewed it, right? 8 A. We read it, yes. 9 Q. Okay. And there was a conclusion, and it 10 notes some vomiting occurred within "30 minutes for 11 68.5% of patients, exceeding the characteristics for 12 a purported effective emetic in the FAO 13 specifications." 14 Right? 15 A. Yes. 16 MR. NARESH: Form, foundation. 17 BY MR. DICKENS: 18 Q. And the authors in here, including 19 Dr. Wilks, Dr. Tomenson, was that: 20 "... vomiting within 30 minutes was 21 associated with approximately double the risk of death 22 compared to those who did not vomit, larger paraquat 23 ingestions, and higher blood-paraquat concentrations." 24 Right? 25 MR. NARESH: Same objections.	52 1 a better chance of survival. 2 Q. So the purpose, then, was -- to add the 3 emetic was to make paraquat safer, right? 4 A. It was one of several safening agents, 5 yes. 6 Q. The conclusion in this study was that they 7 found no evidence of a benefit from the incorporation 8 of the emetic and that it was not effective at 9 preventing deaths following ingestion, right? 10 MR. NARESH: Form, foundation. 11 THE WITNESS: Right. And let me say at 12 this point, this is exactly why we were interested in 13 this work and why we wanted to see Dr. Eddleston's 14 findings because, you know, as part of our stewardship 15 of paraquat, we really needed to understand if there 16 were data that suggested that the emetic was not as 17 effective as it ideally should be, we might -- we 18 might need to do something about it. 19 BY MR. DICKENS: 20 Q. You say "we might." Is there still emetic 21 in paraquat being sold today? 22 A. There is. 23 Q. Is there still emetic in paraquat being 24 sold in the United States? 25 A. There is.

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14 (53 to 56)

53 1 Q. Now, you say this is a topic you were 2 interested in at this time, but there were certainly 3 those within Product Safety at Syngenta who held this 4 position long before this article was ever published, 5 right? 6 MR. NARESH: Can we go off the record for 7 a minute? 8 THE WITNESS: Sure. 9 MR. NARESH: Are you -- 10 THE VIDEOGRAPHER: We are going off the 11 record at 09:53. 12 (Break taken.) 13 THE VIDEOGRAPHER: We are back on the 14 record at 10:11. 15 MR. DICKENS: Dr. Botham, I'm going to 16 hand you what we'll mark as Exhibit 101. 17 (Exhibit 101 marked for identification.) 18 BY MR. DICKENS: 19 Q. Let me know when you're ready. 20 A. Okay, I'm ready. 21 Q. This is an email correspondence in April 22 of 2019 in which Martin Wilks is forwarding you an 23 email he sent to Jon Heylings, correct? 24 A. That's correct. 25 Q. And Martin Wilks was not at Syngenta at	55 1 opinion and had forwarded that on to you, right? 2 A. That's right. 3 Q. And Martin Wilks's position, as indicated 4 in his email, is that he believes that the emetic 5 provides no benefit, right? 6 A. Martin Wilks was saying that this is still 7 a topic which -- "dispute" is not the right word. 8 It's not absolutely clear whether or not the emetic 9 provides benefit, and, if it does, how much benefit it 10 might give. 11 So I think this is a reflection of the 12 scientific discussion that had been going on for some 13 time about the effectiveness of the emetic. 14 Q. Martin Wilks notes that: 15 "... emesis nowadays has practically no 16 role in the treatment of poisoning..." 17 And: 18 "... most clinicians would argue that it 19 is contraindicated, as it removes very little poison 20 but has the potential to seriously harm the patient." 21 Right? 22 A. That's right. He's stepping back from the 23 specifics of paraquat in making that comment, and 24 that's the conversation that I'd had with him as well, 25 to say that, today, clinical toxicologists, which
54 1 this time in 2019? 2 A. No, he was at the University of Basel, as 3 his email address suggests here. 4 Q. And the email that he is forwarding is 5 a response to Jon Heylings, with respect to the 6 emetic, right? 7 A. That's correct. 8 Q. And Jon Heylings, he's also a former 9 employee of Syngenta? 10 A. Yes, he is. 11 Q. And do you know why Martin Wilks forwarded 12 this email to you and Andy Cook? 13 MR. NARESH: Foundation. 14 THE WITNESS: Yes, because -- I mentioned 15 that, for example, I'd had some conversations with 16 John Tomenson, that we knew that Professor Eddleston 17 was engaged in further work on the effectiveness of 18 the emetic. When I saw Martin Wilks at around about 19 this time, he also indicated that he was involved in 20 that but also that he had been in correspondence with 21 Jon Heylings, and I said would it be possible to 22 understand what the nature of the discussion was; he 23 was happy to forward that. 24 BY MR. DICKENS: 25 Q. Okay. And Martin Wilks does provide his	56 1 Martin Wilks would feel he was part of that community, 2 would not be necessarily supportive of adding emetic 3 to substances like paraquat that have high acute 4 toxicity, because of that -- it's still very much an 5 open question whether there's a benefit or not. 6 People had different views on it and Martin was 7 expressing his. 8 Q. He notes that it was the view of many 9 clinicians in the 1990s but it's more or less 10 universally accepted today, right? 11 A. And we did take steps to ask other 12 clinical toxicologists, medical toxicologists about 13 that, and absolutely understood that there were a 14 variety of opinions and we found -- we spoke to one or 15 two other medical toxicologists who also wondered 16 whether it was now an effective component of any toxic 17 substance. 18 Q. His, Martin Wilks's, position did not 19 shift much in the last 25+ years, right? 20 MR. NARESH: Foundation. 21 THE WITNESS: I'm not sure about "shift." 22 I think he -- when the Sri Lanka study was first done, 23 I think that this is reflected here, he was saying 24 there was some improvement, but, again, he would say 25 that there was never any absolute knowledge about

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15 (57 to 60)

57 1 whether that modest improvement, which we talked about 2 earlier in the sessions this week, was down to the 3 emetic or whether it was down to other factors. 4 BY MR. DICKENS: 5 Q. Okay. That improvement that you just 6 mentioned, that was an improvement in the Inteon 7 formulation? 8 A. Yes, the modest improvement in survival of 9 people who had ingested Inteon. 10 Q. Are you aware of Martin Wilks voicing his, 11 or a, opinion that the emetic in a paraquat 12 formulation would not be helpful for acute toxicity 13 issues -- 14 MR. NARESH: Foundation. 15 BY MR. DICKENS: 16 Q. -- while he was working for Syngenta? 17 A. I don't know that Martin -- I don't 18 remember Martin saying that it would be not a very 19 good idea. It was certainly, at the time that Martin 20 was with us, something which we still felt was 21 important to add because it indeed may provide some 22 benefit. 23 BY MR. DICKENS: 24 Q. And Dr. Wilks says he is no more convinced 25 today than he was at the time, and:	59 1 BY MR. DICKENS: 2 Q. Now, that article that you just referenced 3 by Dr. Eddleston and Dr. Wilks, that concluded that 4 the current level of emetic within the paraquat was 5 also ineffective, right? 6 THE STENOGRAPHER: "Ineffective," did you 7 say? 8 MR. DICKENS: "Ineffective," right. 9 THE WITNESS: That was the conclusion -- 10 MR. NARESH: I'll object to the form. 11 Ineffective of what? 12 THE WITNESS: Yes, that was one conclusion 13 or inference from the work -- from the analysis that 14 Dr. Eddleston and others had done. 15 MR. DICKENS: Okay. You can put that 16 aside. 17 I'll hand you what we'll mark as 18 Exhibit 102. 19 (Exhibit 102 marked for identification.) 20 BY MR. DICKENS: 21 Q. Let me know when you're ready. 22 A. Okay, I'm ready. 23 Q. This is email correspondence of you and 24 Jonathan Sullivan in February of 2011, right? 25 A. That's correct.
58 1 "... increasing the emetic level would 2 lead to a significantly improved outcome." 3 Is it your understanding when he says 4 "at the time," that's at the time he was working for 5 Syngenta? 6 MR. NARESH: Foundation. 7 THE WITNESS: So you're saying that -- 8 just tell me where in the document you're pointing to? 9 BY MR. DICKENS: 10 Q. Yeah, sorry. It is the last paragraph, 11 if you will, before his signature line. 12 A. Oh, okay, right. So, yes: 13 "... I am no more convinced now than I was 14 at the time that increasing the emetic level..." 15 Yes, and the word "increasing" is the key 16 word there. You mentioned Dr. Heylings a little 17 earlier. I mean, Dr. Heylings's view, even at this 18 time, we understand, was that survival could be 19 improved by increasing the level of emetic. 20 And, actually, you passed me, as the 21 previous exhibit, the paper that was published in 22 2022, including by Michael Eddleston and other 23 authors, and that suggested that, if anything, 24 increasing the emetic would be contraindicated. 25 ///	60 1 Q. And Jonathan Sullivan's asking you what 2 your concerns were with citing from Firestone 2005 or 3 2010, right? 4 A. Yes. 5 Q. And when he says "citing" to, do you know 6 what he's referring to? Citing where? 7 MR. NARESH: Foundation. 8 THE WITNESS: Well, quoting from two 9 publications by Firestone. I don't recall at this 10 time where we were intending to cite, so I would need 11 to see other documents to be reminded of that. 12 BY MR. DICKENS: 13 Q. Okay. And you provide the basis for your 14 concerns with citing to Firestone, right? 15 A. That's right. 16 Q. You're essentially identifying limitations 17 of the Firestone study itself, right? 18 MR. NARESH: Form. 19 THE WITNESS: Yes, and specifically that 20 it was a very small study, a very small number of 21 cases which, in our opinion, was -- meant that it was 22 not really possible to draw any conclusions. 23 BY MR. DICKENS: 24 Q. Okay. So, as you said, your opinion was 25 that you couldn't really draw any possible conclusions

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16 (61 to 64)

61 1 from both the Firestone studies; is that right? 2 A. Both of them, yes. 3 Q. Okay. And that's due to the bases for the 4 reasons you lay out to your email to Jonathan 5 Sullivan, right? 6 A. That's right. 7 Q. Now, you'd agree that the Firestone 8 studies are relied upon heavily by Syngenta in its 9 public communications, right? 10 MR. NARESH: Foundation, form. 11 THE WITNESS: There are many publications, 12 epidemiological publications, which we use in trying 13 to understand what the overall epidemiology literature 14 has been telling us. 15 BY MR. DICKENS: 16 Q. You're aware that the Breckenridge 17 meta-analysis cites to Firestone as the highest tier 18 or best epidemiological studies on the question of 19 paraquat and Parkinson's disease, right? 20 MR. NARESH: Foundation, form. 21 THE WITNESS: Yes, that was a paper which 22 subsequently was produced when we were, indeed, 23 reviewing those -- that range of epidemiology studies. 24 BY MR. DICKENS: 25 Q. Okay. You disagree with that conclusion	63 1 epidemiological studies in that. 2 BY MR. DICKENS: 3 Q. And you'd agree that on -- well, you're 4 aware of paraquat.com, right? 5 MR. NARESH: Asked and answered. 6 THE WITNESS: Yes. 7 MR. DICKENS: As long as you don't object 8 to foundation on these type of issues, I can avoid 9 setting that here, if we can rely on past testimony. 10 But if you're going to make a foundation that 11 I haven't laid the ground for what paraquat.com is, 12 then I will continue to ask those foundation 13 questions. 14 MR. NARESH: I'll make the objections as 15 I see fit. 16 BY MR. DICKENS: 17 Q. So you're aware of paraquat.com, right? 18 MR. NARESH: Asked and answered, again. 19 THE WITNESS: Yes. 20 BY MR. DICKENS: 21 Q. And that is -- was a website that was used 22 to communicate safety information to the public? 23 MR. NARESH: Asked and answered. 24 THE WITNESS: It was used to communicate 25 information about paraquat, including aspects of
62 1 that it's the highest tier or best study on the 2 question of paraquat and Parkinson's disease? 3 MR. NARESH: Form, foundation. 4 THE WITNESS: No, I can't disagree. 5 I think we need to get, again, a sense of context 6 here. So I'm not an epidemiologist and, therefore, 7 that's why I was not directly involved in the 8 publication that you just described by Breckenridge 9 where we did involve epidemiologists. 10 So this was a personal view, probably, or 11 having discussed it with colleagues, without the kind 12 of, if you like, knowledge or experience that an 13 epidemiologist might have, so others may come to 14 a different conclusion. 15 BY MR. DICKENS: 16 Q. Once again, you are on Syngenta's website 17 discussing the epidemiology on paraquat and 18 Parkinson's disease, right? 19 A. Some epidemiology studies, yes. 20 Q. So you're the individual that is the 21 public face on the website to discuss the issues of 22 epidemiology? 23 A. I -- 24 MR. NARESH: Asked and answered. 25 THE WITNESS: I included reference to some	64 1 safety. 2 BY MR. DICKENS: 3 Q. Okay. And you're aware that there was 4 information on paraquat.com related to the 5 epidemiological studies on paraquat and Parkinson's 6 disease? 7 MR. NARESH: Asked and answered. 8 THE WITNESS: Yes. 9 BY MR. DICKENS: 10 Q. Okay. And you're aware that in those 11 studies that are cited on the website included 12 Firestone, both 2005 and 2010, right? 13 A. Well, I take your word for it because, 14 obviously, this paraquat.com and the content on that 15 has been produced over a large number of years and 16 modified and edited as we went along. 17 So Firestone may well have been included 18 at some point in time. 19 Q. Okay. 20 MR. DICKENS: I'll hand you what we'll 21 mark as Exhibit 103. I have one copy. 22 MR. NARESH: This has already been 23 introduced in this deposition. It was -- 24 MR. DICKENS: It has -- this is 93, right? 25 Okay. I'll hand you what's been previously marked as

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17 (65 to 68)

65 1 Exhibit 93. 2 (Exhibit 93 previously marked for 3 identification.) 4 BY MR. DICKENS: 5 Q. And this was the printout from the 6 paraquat.com website that counsel for Syngenta handed 7 you at the deposition yesterday, right? 8 A. I'm just checking whether it's the same 9 date. It's always difficult to see that, but, yes, it 10 looks like it's exactly the same one as yesterday. 11 Q. Okay. I'm going to turn your attention 12 to -- I believe it's the sixth page. It's the 13 page right before "Conclusion." 14 There's a section here dealing with 15 Bradford Hill's criteria, right? 16 A. Yes. 17 Q. And it's widely accepted as investigating 18 causality in epidemiological studies, right? 19 A. That's right. That's correct. 20 Q. It cites to Breckenridge? 21 A. The paper you were just describing, yes. 22 Q. It notes they evaluated all published 23 epidemiological studies on paraquat and reached 24 a conclusion there was no increased risk, right? 25 A. Correct.	67 1 A. It doesn't, but it will be one reason why 2 statistical significance could not be achieved. 3 Q. Nor does it mention that the power of the 4 study, particularly to detect an association between 5 exposure to paraquat and development of Parkinson's 6 disease, is inadequate, does it? 7 A. It doesn't, but it still comes to 8 a conclusion that the -- that there was no 9 relationship between exposure to paraquat and 10 Parkinson's disease. 11 Q. You can put those aside. 12 MR. DICKENS: I'll hand you what we'll 13 mark as Exhibit 103. 14 (Exhibit 103 marked for identification.) 15 BY MR. DICKENS: 16 Q. This is an email from Martin Wilks in 2007 17 to you and others, correct -- 18 A. That's right. 19 Q. -- reporting on a meeting he had with 20 Michael Alavanja, correct? 21 A. Correct. 22 Q. Michael Alavanja is the coordinator of the 23 Agricultural Health Study, right? 24 A. That's correct. 25 Q. And you've mentioned the Agricultural
66 1 Q. And it specifically cites to specifically 2 two studies, right? 3 A. It cites a number of studies. 4 Q. But in this paragraph, it specifically 5 references Firestone 2005 and Firestone 2010? 6 A. In this paragraph, that's correct. 7 Q. And it gives a conclusion: The 8 association between exposure to paraquat and the 9 diagnosis of Parkinson's disease was not statistically 10 significant. 11 Right? 12 A. That was the conclusion, yes. 13 Q. What's not included in here are any of 14 your concerns expressed in the email to Jonathan 15 Sullivan with respect to the limitations of Firestone, 16 right? 17 A. That's because, by now, we're talking 18 about Breckenridge, et al., 2016 with the professional 19 epidemiological input coming to a conclusion which 20 doesn't surprise me. It might be somewhat different 21 to what I said, but, overall, I think they're not that 22 different from each other. 23 Q. Nowhere in this paragraph does it note 24 that, Firestone 2010, the number of cases and controls 25 remained low, correct?	68 1 Health Study in the past, right? 2 A. I have. 3 Q. And do you know what the purpose of 4 Martin Wilks's meeting with Michael Alavanja was? 5 A. I need a little time to read this, if I 6 can. 7 Q. Yeah, take your time. 8 A. Yes, okay, thank you. 9 Q. Okay. And so my question was: Do you 10 know what the purpose of Martin Wilks's meeting with 11 Michael Alavanja was? 12 A. Well, my -- 13 MR. NARESH: Foundation. 14 Go ahead. 15 THE WITNESS: Sorry. 16 MR. NARESH: Go ahead. 17 Foundation. 18 Go ahead. 19 THE WITNESS: Okay. My understanding of 20 this is that they, the two of them, happened to be at 21 the same scientific meeting, a biomonitoring symposium 22 in Beijing, China. It may have been a chance 23 encounter. I don't know that it was a planned 24 encounter, but because of the nature of what 25 Dr. Alavanja was talking about, namely the

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18 (69 to 72)

69 1 Agricultural Health Study, which was still -- fairly 2 on in its progress, and the mention of substances, 3 including paraquat, as would often happen in a 4 scientific meeting, it looks like Dr. Wilks and 5 Dr. Alavanja had a conversation. 6 BY MR. DICKENS: 7 Q. Okay. And the Agricultural Health Study 8 was fairly early on in its progress, but you were 9 aware at this time that Parkinson's disease was going 10 to be considered with respect to its evaluation, 11 right? 12 A. We did, yes. 13 MR. NARESH: Form. 14 BY MR. DICKENS: 15 Q. There's a mention of possible partial 16 sponsorship through industry. 17 Do you see that? 18 A. Yes. 19 Q. Do you know whether or not Syngenta was 20 attempting to have some type of sponsorship through 21 the AHS in any way? 22 MR. NARESH: Form. 23 THE WITNESS: I don't know whether this 24 was a personal idea or thought from Dr. Wilks. 25 I don't recall, if you wish, having had a discussion	71 1 BY MR. DICKENS: 2 Q. And you understand that when it mentions 3 neurodegenerative disorders, that includes Parkinson's 4 disease? 5 A. Indeed. 6 Q. It's reported that if one were to consider 7 further work, such as a nested case-control, it would 8 need to be done more objectively, including a 9 "specialist diagnosis according to defined criteria." 10 Right? 11 A. In order to improve the assessment of the 12 diagnosis, yes. 13 Q. And what's your understanding of 14 "specialist diagnosis according to defined criteria"? 15 A. Well, that would mean that it would at 16 least be -- require a neurologist to assess 17 individuals who had Parkinson's disease. Even more 18 ideally, a specialist called a movement disorder 19 specialist. 20 Q. And you understand that a nested 21 case-control ultimately did occur for Parkinson's 22 disease within the Agricultural Health Study? 23 A. Yes, it did. 24 Q. And that was a study that is sometimes 25 referred to as the Tanner study; you're aware of that?
70 1 with him ahead of this meeting to say why don't we try 2 and sponsor the study or collaborate more formally. 3 That may have occurred, but it could have been 4 a personal initiative by Dr. Wilks. 5 BY MR. DICKENS: 6 Q. He notes the scientific review body of the 7 AHS is chaired by Bede Ritz from California, right? 8 A. That's right. 9 Q. She's an epidemiologist, as far as you 10 know? 11 A. She is. 12 Q. And then there is some talk about 13 neurodegenerative disorders being considered within 14 AHS, right? 15 A. Yes. 16 Q. And that case ascertainment would be 17 critical, and currently AHS is relying on 18 self-reported diagnoses, right? 19 A. That's what it says, yes. 20 Q. And you understand that the self-reported 21 diagnosis would be with respect to the cohort study 22 that was being conducted? 23 MR. NARESH: Foundation. 24 THE WITNESS: That's correct. 25 ///	72 1 A. Yes. 2 Q. And that was a nested case-control within 3 the Agricultural Health Study cohort? 4 A. Yes. 5 Q. And that did include a specialist 6 diagnosis who reviewed the cases and confirmed 7 Parkinson's disease, right? 8 A. That's -- 9 MR. NARESH: Foundation. 10 THE WITNESS: That is my recollection. 11 BY MR. DICKENS: 12 Q. Okay. 13 Now, Syngenta has criticized the Tanner 14 study, right? 15 MR. NARESH: Foundation. 16 THE WITNESS: In some respects, yes. 17 BY MR. DICKENS: 18 Q. And Syngenta has undertaken attempts to 19 access additional information from the authors and 20 from the Agricultural Health Study related to its 21 methodology and procedures in finalizing their nested 22 case-control, right? 23 A. Yeah. And could I explain why? So when 24 the first publication on -- within the Agricultural 25 Health Workers Study was published, and we are talking

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19 (73 to 76)

73 1 about 2007, that was a paper by Kamel, et al., and in 2 that paper, another important factor in epidemiology 3 studies was taken into consideration, namely to 4 distinguish between what are called incidence cases 5 and prevalence cases. And we probably don't have time 6 right now in this answer to go into the detail of 7 that. But, essentially, incidence cases are by -- in 8 the epidemiology world believed to be more accurate 9 than prevalence. 10 When the Tanner study was published, there 11 didn't -- there was no distinction made between 12 incidence and prevalence; the two were put together. 13 So what we were trying to understand is, first of all, 14 why was that, and, secondly, if you were to dissociate 15 the two, would that give you a different answer. 16 So that was why we were interested in 17 Tanner. 18 Q. Okay. And you brought in Exponent and 19 Dr. Mandel in order to assist with that review, right? 20 A. Yes, Dr. Mandel is one of the professional 21 epidemiologists that I referred -- really was 22 referring to earlier on, one of the people who we 23 collaborated with. 24 MR. DICKENS: Okay. I'm going to start 25 off by handing you the next exhibit, which is 104.	75 1 to Tanner specifically, right? 2 A. That's right. So, as this letter 3 illustrates -- I mean, I previously talked about 4 distinguishing between incidence and prevalence cases. 5 Our epidemiologists were saying it would be great if 6 we could also get some other information. 7 So there's more than that simple fact that 8 we were trying to get information on. 9 Q. Your epidemiologists, would that be 10 Jack Mandel or Charles Breckenridge? 11 A. It would be Jack Mandel, but obviously, 12 internally, Charles Breckenridge was the lead for 13 Syngenta on that. So that's why the letter went back 14 to Charles. 15 Q. Okay. And you ultimately did get more 16 information with respect to the prevalence and 17 incident cases, right? 18 A. Yes. There was -- it was quite difficult 19 to get the level of detail of data that Jack Mandel 20 was looking for, and we did go through the Freedom of 21 Information Act route to get some of those data, which 22 we did eventually get. 23 Q. And Jack Mandel actually prepared a report 24 commissioned by Syngenta analyzing those prevalent -- 25 or the additional information on the prevalent and
74 1 (Exhibit 104 marked for identification.) 2 BY MR. DICKENS: 3 Q. And let me know when you're ready. 4 A. Okay. 5 Q. So the first page is an email in which 6 Dr. Breckenridge is sending you a letter in March of 7 2011, correct? 8 A. That's right. 9 Q. And that's a letter received by the NIEHS, 10 or the National Institute of Health [sic] and Human 11 Services, right? 12 A. It was from the NIEHS, that's right, who 13 were sponsoring funding the Agricultural Health 14 Workers Study. 15 Q. Okay. And that study -- I mean, the 16 letter was actually signed by Dr. Kamel, right? 17 A. Yes. 18 Q. Dr. Kamel, she's also the author of the 19 cohort study on paraquat and Parkinson's disease, 20 right? 21 A. It's the same Dr. Kamel I was referring 22 to with respect to the 2007 paper, which is cited in 23 this letter. 24 Q. Okay. And this is in response to a 25 request by Syngenta for additional information related	76 1 incident cases, right? 2 A. That's correct. 3 Q. And he found, after analyzing that, that 4 there was still a significantly -- a statistically 5 significant increased risk of paraquat and Parkinson's 6 disease when considering the prevalent and incident 7 cases? 8 A. That's correct. 9 Q. Okay. Now, Dr. Kamel also gives some 10 additional information with respect to the verified 11 cases and exposure data within Tanner, right? In the, 12 I guess, third paragraph, beginning "Your request 13 analyses..., " right? 14 A. Yes. 15 Q. And what Dr. Kamel is suggesting here is 16 that the Tanner study has much better exposure data 17 than the cohort study published by Kamel, right? 18 MR. NARESH: Form. 19 THE WITNESS: That's what she's suggesting 20 or proposing, yes. 21 BY MR. DICKENS: 22 Q. And certainly she would know as she had 23 involvement in both of those studies? 24 MR. NARESH: Foundation. 25 THE WITNESS: Yes.

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20 (77 to 80)

77 1 BY MR. DICKENS: 2 Q. And, in fact, they had established a data 3 diagnoses for all of the cases in Tanner, right? 4 MR. NARESH: Form. 5 THE WITNESS: That's right. 6 BY MR. DICKENS: 7 Q. And that wasn't true with respect to the 8 cohort study, right? 9 A. There was certainly more -- I mean, this 10 gets quite complex. We are not denying that there was 11 more data in Tanner on various aspects of both 12 disease, exposure, and so on, and we are now not 13 denying that, having looked at all those data, that 14 increased odds ratio appeared to be correct. 15 So, at that time, we said, okay, that 16 seems to be potentially showing that there may be an 17 association between paraquat and Parkinson's disease. 18 We weren't in denial mode. We had satisfied 19 ourselves, we'd got as much information as we could 20 get. 21 Q. And it would have been, then, 22 inappropriate to suggest that the prevalent and 23 incident cases would have affected the odds ratio or 24 is a significant limitation to the Tanner study, 25 right?	79 1 paraquat leadership team, right? 2 A. That's correct. 3 Q. And your name's there. You were the one 4 who drafted these slides? 5 A. I was a contributor to drafting them and 6 I certainly was the presenter. 7 Q. And the second bullet point notes that 8 FAME's data "had finally been received," right? 9 A. Yes. 10 Q. And that's the FAME data requested for the 11 incident and prevalent cases? 12 A. Yes, what we've just been talking about. 13 Q. And Mandel, that's referring to Jack 14 Mandel, right? 15 A. That's correct. 16 Q. And he reviewed that and found the study 17 did include both incident and prevalence cases. Odds 18 ratio for both was 2.5, right? 19 A. Yes, and thank -- I mean, I think it's 20 very helpful for you to show me this slide, because if 21 you read the third paragraph as well, that actually 22 tells me that I hadn't got it wrong when I said 23 earlier that Dr. Mandel did actually do some 24 re-analysis reallocating individuals, as it said 25 there, so the odds ratio, for instance, did drop down
78 1 MR. NARESH: Form. 2 THE WITNESS: It reduced. I mean, there 3 was a difference between prevalence and incidence. If 4 we get down to details, the incidence data was lower 5 than the prevalence but it was still not as low as the 6 1.0 that we had seen in 2007. 7 BY MR. DICKENS: 8 Q. Now, you indicated that the incidence was 9 lower than the prevalence, but it was not actually 10 lower, was it? 11 A. You might have those data to hand. Sorry, 12 I may have got them mixed in my mind, but there were 13 certainly differences between -- when we looked 14 ourselves at the data, there was a difference between 15 incidence and prevalence and I can't -- maybe it was 16 the other way round. If so, I apologize. 17 MR. DICKENS: I'll hand you Exhibit 105 so 18 we can clear up any confusion. 19 (Exhibit 105 marked for identification.) 20 BY MR. DICKENS: 21 Q. I'm going to direct your attention 22 eventually to page 14. 23 A. Yes, I've got that. 24 Q. And so, first of all, this is PowerPoint 25 slides from a Health Science Team Update to the	80 1 somewhat from 2.3 but there was a range. So that's 2 what I was remembering. 3 Q. Okay. And that's referring to that -- 4 in that third paragraph, the section that said it 5 still showed statistically significant odds ratios for 6 incidents in the range 1.9 to 2.7, right? 7 A. That's right. 8 Q. So the 1.9 is lower, the 2.7 actually went 9 up. 10 A. Yeah, yeah. 11 Q. Okay. 12 A. That's correct, yes. 13 MR. DICKENS: Okay. We can put that 14 aside. 15 Why don't we go ahead and take a 16 five-minute break. 17 THE VIDEOGRAPHER: We are going off the 18 record at 10:53. 19 (Break taken.) 20 THE VIDEOGRAPHER: We are back on the 21 record at 11:03. 22 BY MR. DICKENS: 23 Q. Dr. Botham, you've testified previously 24 with respect to the Defra study, correct? 25 A. I did.

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21 (81 to 84)

81 1 MR. DICKENS: I'll hand you what we'll 2 mark as Exhibit 106. 3 (Exhibit 106 marked for identification.) 4 BY MR. DICKENS: 5 Q. You can let me know when you're ready. 6 A. Okay, that's fine. 7 Q. This is an email that you sent to 8 a Kim Travis and Doug Brown, April 14, 2008? 9 A. That's correct. 10 Q. Related to cost of paraquat and 11 Parkinson's disease study, is that your understanding? 12 A. That's correct. 13 Q. And it mentions Lewis making a request. 14 Is that Lewis Smith? 15 A. That would be Lewis Smith, yes. 16 Q. To provide an estimate of costs for 17 Parkinson's disease work, and that would be costs for 18 the toxicology department? 19 A. It would be costs for the project in all 20 its aspects. 21 Q. Specific to paraquat and Parkinson's 22 disease? 23 A. That's correct. 24 Q. In the third paragraph, you note that you 25 spoke with Kim, and that's Kim Travis, correct?	83 1 putting in this proposal, could have done an 2 intranasal exposure with the studies, right? 3 MR. NARESH: Form. 4 THE WITNESS: Yes, it was one of the 5 possible avenues of research. 6 BY MR. DICKENS: 7 Q. Okay. You mention in the next paragraph, 8 for the 28- and 90-day studies. 9 What are those referring to? 10 A. Yes. So these, at this time we were 11 beginning to think about another research issue, 12 which, again, we've touched on before, which is the IP 13 mouse model, and we wanted to look at not just the 14 potential effects in the brain on the substantia nigra 15 but also at the kinetics of paraquat. So this was 16 specifically, I believe, looking at the kinetic 17 options. 18 Q. And you, once again, suggest that you may 19 want to add inhalation and postnasal exposure to one 20 or both of those studies. 21 And that is in response to the poster from 22 Defra; is that right? 23 A. Yes, because they were not only thinking 24 about different routes of exposure; they were also 25 thinking about different ages of mice. So, again, as
82 1 A. That's correct. 2 Q. And that it references a poster 3 information from Defra, and that's the Defra study 4 related to paraquat and its effect on the brains of 5 mice, right? 6 A. Yes. So we're now in 2008 and what that 7 poster was showing was the scope of the project that 8 was being proposed funded by Defra. 9 Q. And you actually recommend that you should 10 provide an option for using intranasal exposure, 11 right? 12 A. What we saw in that poster was that there 13 was either an intent or a possible plan for the Defra 14 project to include a number of routes of exposure: 15 oral, dermal, inhalation, possibly intranasal as well. 16 This was at the time when Lewis was 17 saying, "Look, there are many thing -- many 18 experiments we could do ourselves. We really need to 19 make sure we understand what the scope of that 20 would be and what the costs would be." 21 This wasn't a commitment of saying we will 22 do that. This was to try and get the -- to assemble 23 the information about what that would mean if we were 24 to go forward and do it. 25 Q. So certainly you, as you recommended in	84 1 a plan, as a provision, if we were to go ahead with 2 any toxicity studies ourselves by different routes of 3 exposure, it would make a lot of sense to also 4 understand the kinetics that would occur via those 5 routes of exposure. 6 Q. Okay. And did you ultimately get the cost 7 option or how much those costs for an intranasal 8 exposure study would have been through either the 9 kinetics or just generally? 10 A. Yes. I remember in my preparation for my 11 corporate deposition that I looked at some documents 12 that were created at the time with a number of cost 13 estimates for these studies, yes. 14 Q. And did you ultimately move forward with 15 those inhalation or postnatal exposure studies? 16 A. No, we didn't. 17 Q. Was the basis the cost as to why you 18 did not move forward with those studies? 19 A. No, no. In fact, never at any time was 20 the cost or potential cost of this kind of work the 21 most important consideration. I mean, another 22 consideration was there didn't seem necessarily any 23 point in absolutely replicating studies that appeared 24 to be either planned or in progress via another lab. 25 We wanted, if possible, to let them do that work,

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22 (85 to 88)

85 1 see what it found, and then we could do some 2 comparisons with our own work. 3 Q. Okay. And after you received that work 4 from Defra, you still did not move forward with the 5 intranasal or post -- inhalation or postnasal exposure 6 studies? 7 A. No, we focused on the replicability of the 8 intraperitoneal model and the kinetics involved in 9 that. What we did do, again, as part of the relevance 10 question, was to use the oral route, so we certainly 11 did a second route apart from IP, and that was 12 subsequently done and published. 13 Q. Okay. And as the -- we looked at or as 14 you testified previously with respect to the Defra 15 study, oral dietary exposure had a lower percentage of 16 paraquat in the brain than intranasal, right? 17 A. The kinetics study showed that, certainly, 18 yes. But, regardless of that, we believed that oral 19 exposure was certainly a more -- potentially relevant 20 to human exposure. And so if that meant there was a 21 lower amount of paraquat getting into the brain, that 22 would be a relevant finding in and of itself. 23 Q. And oral exposure being more relevant 24 specific to the question of effects on the brain? 25 A. Relevance is about relevance to how humans	87 1 THE WITNESS: Okay. 2 BY MR. DICKENS: 3 Q. This document, email chain with you, 4 Andy Cook, Dan Minnema, correct? 5 A. Yes. 6 Q. Is this relating to a dietary study that 7 was conducted by Syngenta? 8 A. Yes. This is the oral study that I was 9 talking about, so oral in this case was administering 10 a substance in the diet. 11 Q. Okay. So this is the particular oral 12 study that Syngenta did that it focused on instead of 13 doing an intranasal or inhalation study, right? 14 A. It was done as a representation of a more 15 relevant route of exposure for humans. 16 Q. Okay. And this was ultimately submitted 17 to the United States EPA? 18 A. It was. 19 Q. And, upon their review, they deemed this 20 study unacceptable; is that right? 21 A. Well, yes, I think -- and it was a rather 22 frustrating technicality because they were -- this was 23 about the analysis of the diet and the -- what they 24 call here the stability and homogeneity of that diet. 25 And in -- as this email chain suggests,
86 1 are exposed and you can ascertain that in different 2 ways. The paradigm of toxicology is largely built on 3 saying that you -- oral exposure is perhaps the best 4 way of understanding hazard, which you then translate 5 into a risk. It can also, like IP, be exaggerated in 6 the toxicology that you see and in the kinetics that 7 you see, but it has an acceptability, if you like, as 8 a -- of a route of exposure, which IP dosing really 9 doesn't. That's too exaggerated. 10 Q. But you'd agree that farmers out in the 11 fields, exposure to paraquat would more likely be from 12 dermal or inhalation exposure than oral, correct? 13 A. Again, a paradigm would be that -- and 14 this is often done -- that oral exposure, to some 15 extent, would cover those possibilities because you 16 don't always have to do every route of exposure. 17 Inhalation, for example, means that 18 a substance will get into the bloodstream by -- 19 through the process of breathing it in and oral 20 exposure will also get into -- the substance will also 21 get into the bloodstream. Dermal exposure, likewise. 22 So that's why oral exposure can be 23 a surrogate of all of those human routes of exposure. 24 MR. DICKENS: I'll hand you Exhibit 107. 25 (Exhibit 107 marked for identification.)	88 1 and, for example, the email at the top of page 2, in 2 reality, we did not feel that this should have been a 3 reason to compromise the study. It's not that 4 paraquat was not in that diet. It certainly isn't the 5 case that the levels of paraquat that we said in the 6 diet were not there. 7 It was that, if you like, the way in which 8 the analysis of the diet had been done was not deemed 9 to be as the EPA would have preferred it to be. 10 Q. And so the EPA disagreed and, once again, 11 deemed it as an unacceptable study, right? 12 MR. NARESH: Asked and answered. 13 THE WITNESS: Yes, and I would say this 14 was a technicality. This -- you know, this is not 15 a fraudulent study. This is not a study which, in any 16 sense, was not fulfilling the objectives of what we 17 were trying to achieve. 18 BY MR. DICKENS: 19 Q. Okay. 20 A. And the study was published and accepted 21 for publication. 22 Q. The regulatory agency in Brazil also had 23 criticisms of the dietary study that was submitted as 24 well, right? 25 A. They -- you would need to remind me

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23 (89 to 92)

89 1 exactly what the Brazilian authority said, whether it 2 was simply based on what the EPA had said or whether 3 they had other reasons. 4 Q. Now, you ultimately -- well, you have 5 testified with respect to the findings of the Defra 6 study, correct? 7 A. Yes. 8 Q. And you actually had received the Defra 9 study and provided comments to the authors, right? 10 A. Yes. I received a copy circa 2010/2011, 11 which was a draft report, yes. 12 Q. And so you received that draft report and 13 then made comments based on your review? 14 A. That's right. 15 Q. And submitted those to the authors of that 16 Defra study? 17 A. It was to Defra, if I remember rightly, 18 yes. 19 MR. DICKENS: I'll hand you Exhibit 108 20 for the record. 21 (Exhibit 108 marked for identification.) 22 THE WITNESS: Yes, okay. Thank you. 23 BY MR. DICKENS: 24 Q. And do you recognize these as the comments 25 that you submitted to Defra in 2011?	91 1 humans? 2 A. Yes. I think, again, as we said earlier 3 this week, they set the dose levels, the bottom dose 4 and the mid dose, using different models predicting 5 human exposure. 6 Q. You end by saying how likely it would be 7 the effect is "real" and whether, for example, it 8 "would require confirmation in another study to see if 9 the effect is repeatable." 10 Right? 11 A. Absolutely, and, again, consistent with 12 what I've been saying: If it doesn't achieve 13 statistical significance, especially in a technique 14 which is technically very tricky to do, and there were 15 some -- number 3 talks about some of the technical 16 issues which can lead to getting incorrect or other 17 data which is not necessarily correct, and so that's 18 why I was suggesting that that needed to be looked at 19 in detail. 20 Q. Okay. And the authors ultimately did note 21 that confirmation would be necessary in the final 22 report? 23 A. They did. 24 Q. Okay. And you serve as peer reviewer for 25 other journals who publish publications, right?
90 1 A. Yes, they were. 2 Q. And in your first paragraph, you note and 3 identify what you deemed as "the most significant 4 finding in this study." 5 Right? 6 A. That's correct. 7 Q. And the most significant finding was the: 8 "... reduction of TH-positive cells in the 9 substantia nigra of male [rats] after 16 months, not 10 just in the high dose but also in the more relevant 11 [...] mid dose." 12 Right? 13 A. Indeed. I think we discussed that 14 yesterday. 15 Q. Okay. And so at the time you reviewed 16 this draft report, you deemed that as the most 17 significant finding within Defra? 18 A. Yes, which is why I went on to say that it 19 was very important to understand the statistics 20 because -- and let me reinforce, this was a draft 21 report and I think the final report has confirmed that 22 the statistics showed that those effects did not -- 23 were not statistically significant. 24 Q. Okay. And you note "more relevant mid 25 dose" and that's because it would be more relevant to	92 1 A. From time to time I have done that. 2 Q. For those other journals, would it be 3 deemed a conflict of interest for you to provide 4 peer-review comments on papers involving paraquat? 5 A. I've tried to be careful about not 6 creating a conflict of interest, but if you've got 7 examples of where I've done that and you think it 8 might be, I'd be happy to explain. 9 Q. I didn't mean to suggest that you had. 10 A. Right. 11 Q. I'm just asking, if it was a journal 12 considering a publication on paraquat would you deem 13 it as a conflict of interest to review and peer review 14 in those particular cases? 15 A. As I've just said, it could be, and 16 I think, actually, editors in many cases wouldn't 17 approach me in the first place for that reason. 18 Q. Okay. 19 MR. DICKENS: I'm going to hand you 20 Exhibit 109 and 110. 21 (Exhibit 109 marked for identification.) 22 (Exhibit 110 marked for identification.) 23 BY MR. DICKENS: 24 Q. If it helps in your review of the second 25 document, I'm just going to ask you questions about

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24 (93 to 96)

93 1 page 14. 2 A. Okay. Well, I could spend a lot of time 3 reading through this because it's been a long time 4 since I looked at this stuff, so please go ahead. 5 Q. Okay. So turning to the first exhibit, 6 which is the actual email attaching the PowerPoint. 7 This was sent to you by a Neil Lister. 8 Is that a Syngenta employee? 9 A. Yes. 10 Q. Okay. And he's sending you a presentation 11 that Dick sent containing a SynCRA project update; is 12 that right? 13 A. That's correct, yes. 14 Q. Okay. And Neil Lister is a technical 15 manager for operator and consumer safety at Syngenta? 16 A. That was his role at that time, yes. 17 Q. And when he's referring to Dick, do you 18 know who he's referring to? 19 A. Yes, that would probably be Dick Lewis who 20 was a senior toxicologist. 21 Q. And there was a SynCRA project. Can you 22 briefly describe what the SynCRA project was? 23 A. It was meant to be a project that would 24 improve our efficiency in our ability to do risk 25 assessments.	95 1 Q. And that is what Syngenta found with 2 respect to SynCRAs, is that the information that was 3 generated from them would be reliable and informative? 4 MR. NARESH: Form, foundation. 5 THE WITNESS: Yes, and I think that this 6 is at a stage in a project to develop and use SynCRAs 7 where, as it said at the top, some case studies had 8 been looked at, and I think those are illustrated over 9 the page. 10 BY MR. DICKENS: 11 Q. Okay. And there was actually a case study 12 that was done specific to paraquat, right? 13 A. So where are you looking, please? 14 Q. Do you recall offhand? 15 A. No. 16 MR. DICKENS: Well, let's go ahead and 17 mark Exhibits 111 and 112. 18 (Exhibit 111 marked for identification.) 19 (Exhibit 112 marked for identification.) 20 THE WITNESS: Yeah, I think we should 21 press on with this. 22 MR. DICKENS: Okay. 23 BY MR. DICKENS: 24 Q. So Exhibit 111 is the email where 25 Kersten Mewes is sending you a copy of a SynCRA
94 1 Q. Risk assessment for the users and farmers 2 spraying paraquat specifically? 3 A. For a whole range of scenarios, dietary 4 exposure, you know, exposure in the food, as well as 5 occupational exposure. 6 Q. Okay. And just -- but for humans and not 7 some type of risk to animals during the studies? 8 A. Well, I can't remember, actually, whether 9 SynCRA were also covering environmental risk 10 assessments, so -- but for the purpose of today, it's 11 covering human risk assessments. 12 Q. Okay. And then on the PowerPoint, which 13 is the next exhibit, and this is, once again, a 14 PowerPoint that was created by Syngenta, right? 15 A. It was. 16 Q. And this is the PowerPoint that you would 17 have received in September of 2011? 18 A. If it was attached to this email, yes. 19 Q. Okay. And the "SynCRA proposal" notes 20 that: 21 "We were able to demonstrate that SynCRAs 22 can be produced very efficiently and that the results 23 are reliable and informative." 24 Correct? 25 A. That's what it says.	96 1 project for paraquat, right? 2 A. That's correct. 3 Q. And Kersten Mewes being the global 4 regulatory herbicides lead for Syngenta? 5 A. That's what he was at that time, yes. 6 Q. Okay. He sent you two proposals, and one 7 of those was paraquat, right? 8 A. That's correct. 9 Q. Okay. So Exhibit 112 is the SynCRA for 10 paraquat specifically, right? 11 A. Yes. The important word here is 12 "proposal," so this was, I guess you would say, a 13 first pass at how such an assessment should be done. 14 Q. Okay. And a first pass, a specific -- and 15 that pass was run on data with paraquat specifically? 16 A. Indeed, yes. 17 Q. Okay. On the third page, they like to 18 make the writing small for us, but there's a summary? 19 A. Yeah. 20 Q. And specifically notes this is a "Syngenta 21 Core Risk Analysis for paraquat." 22 Right? 23 A. That's correct. 24 Q. And the analyses were "based on typical 25 and worst-case GAPs."

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25 (97 to 100)

97 1 Do you know what GAPs is referring to? 2 A. It's good agricultural practice. It's the 3 -- assuming that a substance is used in the field, 4 a product is used in the field, according to label. 5 Q. Okay. So this analysis is going to give 6 information for the typical as well as a worst-case 7 good agricultural practice for farmers actually 8 spraying paraquat, right? 9 A. Yeah, but the important thing here is that 10 these -- and this is language which isn't immediately 11 obvious. So they talk about Tier 1 here and they also 12 talk about Tier 1 groundwater analysis further down. 13 If I remember correctly, these were meant 14 to be to do assessments which did not have what is 15 sometimes required to do what are called higher-tier 16 studies. This is something which we do all the time, 17 that you refine risk assessment by adding more data. 18 So part of the efficiency was to say, 19 well, at a Tier 1 level, what does it look like in 20 order for us to say, well, if there are concerns, we 21 may need to do more. 22 Q. Okay. And one of the higher-tier studies 23 that was conducted or that was used was conducted by 24 the Hamner Institute, right? 25 A. Well, now you've skipped from what I've	99 1 to create some degree of efficiency, but, in doing so, 2 if it highlighted that either those simplified 3 assessments didn't make sense, they conflicted with 4 what we knew before or it's flagging up some concerns, 5 it would -- they would then say we need to do more. 6 Q. Turn to the page ending with Bates number 7 881. Section 4.2, which is "OPEX." 8 Do you see that? 9 A. Yes. 10 Q. The operator exposure for the SynCRA was 11 assessed using the US EPA PHED. And you understand 12 that to be Pesticide Handler Exposure Database? 13 A. Yes, that was one of the operator exposure 14 models in this case used by the US EPA. 15 Q. Okay. And the German model, right? 16 A. Yes. 17 Q. Okay. So operator exposure for SynCRA was 18 using the operator exposure model that the US EPA 19 actually uses? 20 A. Yes, in combination, as it says in the 21 second line, with "worst-case GAPs." 22 In other words, because this is a first 23 tier, it was using a lot of worst-case assumptions, 24 conservative assumptions. 25 Q. It used both worst-case as well as typical
98 1 just said to something which I don't know what the 2 direct link is between that. 3 Q. Okay. 4 But certainly prior to receiving this 5 paraquat proposal, Syngenta had deemed the results 6 reliable and informative, right? 7 MR. NARESH: Form, foundation. 8 THE WITNESS: At that level, yes. It does 9 not necessarily mean that they -- that the exceedance 10 in this particular case, the exceedance of the AOEL, 11 was necessarily what was going to happen out in the 12 field because that's why you would need higher-tier 13 data. 14 BY MR. DICKENS: 15 Q. And that operator risk analysis, Tier 1, 16 there's an operator exposure analysis and you 17 mentioned the AOEL. Once again, that's Acceptable 18 Operator Exposure Level? 19 A. That's right. 20 Q. And it was exceeded -- it exceeds 21 100 percent for almost all typical and worst-case good 22 agricultural health practices, right? 23 A. And let me stress again, this was a 24 project to look at the value of doing, I guess you 25 would say, almost simplified risk assessments in order	100 1 GAPs, right? 2 A. There were some typical ones as well, yes. 3 Q. So now let's turn to the page ending 885. 4 And this actually includes the results of the operator 5 exposure estimations, right? 6 A. Yes. 7 Q. And that's the operator exposure 8 estimations for -- or, sorry, using the US EPA and 9 German model? 10 A. Yes. 11 Q. And it provides total systemic exposure in 12 various categories, right? 13 A. That's correct. 14 Q. There's a worst case, which you mentioned 15 before, as well as a typical use of good agricultural 16 practices, right? 17 A. Okay. 18 Q. And it notes the type of PPA [sic] that 19 would have been done with the PPE+, right? 20 A. Yes. 21 Q. And that's: 22 "Long clothes, gloves for MVL and 23 application." 24 Or "m/l and application," right? 25 A. Mmm-hmm, yes.

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26 (101 to 104)

101 1 Q. "m/l" being mixing and loading? 2 A. Yes. 3 Q. All right. And so long clothes and gloves 4 for application, that would be consistent with the 5 labeling for paraquat, as far as you know? 6 A. Yeah. Look, I think we need to step back 7 from this because the -- this was a project -- let me 8 -- let's go back to what was trying to be done here. 9 This was a project to determine if it 10 would be possible to provide easy access to risk 11 assessments all around the world on a range of active 12 ingredients. It was not meant to replace what I would 13 call the real risk assessment, and we were talking 14 about some of those yesterday based on the operator 15 exposure studies. 16 So all of this is theoretical, high-level 17 data and not necessarily reflective of the situation 18 in reality in the field. 19 Q. Data specifically requested by Syngenta in 20 order to get reliable and informative data, right? 21 A. I repeat: This was a project to determine 22 if it was possible to get adequate high-tier data 23 quickly and efficiently that may be of value, not just 24 for paraquat but for other chemicals, and it was not 25 the definitive position on risk assessment of any	103 1 understanding, unless I've got this wrong, is that 2 this is all based on models. So, yes, these are 3 models, in the case of PHED, used by the US EPA and 4 the German model, and they are modeled exposures that 5 come from those models that we've just been talking 6 about, with and without PPE. 7 But what our risk assessments actually 8 did, the ones that we have been discussing earlier 9 today, was to do them based on actual measurements of 10 exposure, actual use in the field, including the 11 biomonitoring. 12 So that's what -- that is one example of 13 the use of biomonitoring data of higher-tier data 14 which would refine these risk assessments and make 15 them more applicable to what actually happens in the 16 field. 17 Q. And we looked at -- or you've testified in 18 the past with respect to the Hamner Institute's 19 assessment of biomonitoring, right? 20 A. Let's not confuse things here. That's why 21 I was wondering what the link was. 22 No. The Hamner was actually to develop 23 a kinetic model that could be used to interpret the 24 animal work that we were doing and the relevance of 25 the exposures there to potential exposures of humans
102 1 particular active ingredient. 2 Q. The data included here provides total 3 systemic exposure with percentage of the AOEL, right? 4 A. It does. 5 Q. So if we look at the typical use, good 6 agricultural practices that include spraying by 7 tractor boom sprayer as well as backpack sprayer, 8 right? 9 A. Yes. 10 Q. If you look at the tractor boom sprayer 11 for total systemic exposure under typical good 12 agricultural practices -- 13 (Stenographer interjection.) 14 MR. DICKENS: Yeah, sorry. 15 BY MR. DICKENS: 16 Q. If you look at the typical use, good 17 agricultural practices for the tractor boom sprayer 18 for the PPE+, it came out as exceeding the Acceptable 19 Operator Exposure Level; it was 310 percent, right? 20 A. Right. 21 Q. So three hundred -- or three times the 22 Acceptable Operator Exposure Level? 23 A. And, I'm sorry, I think it's important 24 that we try it again -- just keep stepping back here 25 as to what this is -- what has been done. I mean, my	104 1 in the field. 2 Q. Heading back to this document, do you 3 agree, based on this modeling, for a tractor boom 4 sprayer, typical use, good agricultural practices, 5 with the PPE on the labeling for paraquat, according 6 to this data, it would exceed the Acceptable Operator 7 Exposure Level by three times, right? We can -- 8 MR. NARESH: Asked and answered. 9 THE WITNESS: Yeah, I think it's important 10 that I keep answering the same way because I think 11 you -- this is all a theoretical model-based 12 calculation, and it's not necessarily the reflective 13 reality. 14 This is how the world of risk assessment 15 is done. You start with model data because it's just 16 too difficult or expensive to go out and measure 17 everybody in every situation, so you use models, and 18 the US EPA and others accept that. But the US EPA, 19 and Germany, if you were to ask them, would say what 20 I was saying: Okay, that's fine, but what's actually 21 happening out in the field. And if you've got 22 higher-tiered data to tell us something differently, 23 that's the data we would be prepared to look at. 24 BY MR. DICKENS: 25 Q. Okay. So the data from this SynCRA

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27 (105 to 108)

105 1 project would have been reliable and informative 2 before you got the results, but now that you have the 3 results, it's no longer informative or reliable; is 4 that your testimony? 5 MR. NARESH: Form. 6 THE WITNESS: I'm not saying it's not 7 reliable. It's probably -- because I wasn't involved 8 in the generation. It's probably the result of people 9 accurately using those theoretical models to calculate 10 potential exposure, and so we can't say that it's 11 wrong in terms of its calculation. What we can say is 12 that that -- it doesn't reflect what happens in the 13 field. 14 BY MR. DICKENS: 15 Q. For those spraying by a tractor just 16 wearing clothes, how much does the exposure in this 17 model exceed the AOEL? 18 A. Well, I don't know why you would want to 19 pursue this. I've tried to explain, because you're 20 asking these questions about exceedances of AOEL 21 I guess with an inference that that's a problem. 22 I'm telling you why -- you've got to understand why 23 those exceedances of AOEL are described as they are, 24 that they're based on models. 25 Q. There was also information included with	107 1 right? 2 A. That's right. 3 Q. And Andy Cook, at this stage, had received 4 the SynCRA results that we just looked at? 5 A. That's right. 6 Q. And Andy notes he was never informed of 7 the intent to produce a SynCRA for paraquat, neither 8 did anyone from GPR. 9 And what is GPR refer -- 10 A. Global Product Registration. 11 Q. So no one within -- and that's what Andy 12 Cook was in? 13 A. Andy was in that department, yes. 14 Q. So no one within Global Product 15 Registration was ever informed, prior to receiving the 16 SynCRA project results, that this was actually 17 ongoing, right? 18 A. That was his allegation, yes. 19 Q. Andy Cook was concerned that the company 20 at this point in 2011 was already in pre-litigation, 21 "must consider any document not created under legal 22 privilege to be subject to external scrutiny in a 23 Court of Law." 24 Right? 25 A. Yeah. If I may, before we get into that
106 1 respect to the worst-case good agricultural practices, 2 right? 3 A. Yes. 4 Q. All of those greatly exceed the AOEL in 5 this model? 6 A. See my answer to the question several 7 times already. 8 Q. Okay. But these -- receiving this data, 9 that certainly was a concern within Syngenta as to 10 what these results from the SynCRA project actually 11 showed, right? 12 MR. NARESH: Form, foundation. 13 THE WITNESS: "Concern" is not always the 14 right word. It says, okay, we've flagged this from 15 these models. Let's now explore, if we need to, if 16 that is something which is telling us more about the 17 reality in the field or not. 18 MR. DICKENS: I'll hand you Exhibit 113 19 for the record. 20 (Exhibit 113 marked for identification.) 21 THE WITNESS: Okay. Thank you, that's 22 helpful. 23 BY MR. DICKENS: 24 Q. This is an email from Andy Cook to 25 Dick Lewis, copying you, with respect to the SynCRA,	108 1 point, which I'm sure you do want to explore more, 2 I'd like to point out that this document actually does 3 say almost exactly what I've been saying to you. 4 So it -- Andy was really confirming that point about 5 higher-tier data tell you a very different story to 6 lower-tier data, so hence his concern. 7 Q. And, certainly, he was concerned that 8 exactly what we're here with is that these results 9 from this particular result, that were deemed reliable 10 and informative before receiving them, would be used 11 against the company in litigation, right? 12 A. Well, in some respects, I guess that's 13 what you're doing today. I mean, you're suggesting 14 that we had data that might have suggested that 15 exposure to paraquat was higher than, in reality, it 16 is, and that's -- you know, it's understandable you 17 would do that. You would look at that document and 18 say, hey, what's going on. 19 So that was the date -- that was Andy's 20 view that producing data, which were not a reflection 21 of real life, was not going to be potentially helpful 22 to anybody. 23 Q. Andy Cook's memo on the higher-tiered 24 biomonitoring studies also showed exceedances of the 25 Acceptable Operator Exposure Level, right?

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28 (109 to 112)

109 1 A. And we've been through this this week, 2 that there are some events, that's right. 3 Q. And it would also be understandable for 4 a company to criticize the SynCRA project results once 5 receiving them in which they are negative for the 6 compound manufactured by the company, right? 7 MR. NARESH: Form, foundation. 8 THE WITNESS: No, I really don't think 9 that that's the right way to position this at all. 10 I mean, this is a criticism of the approach that's 11 been taken. Essentially, it's being too simplistic. 12 It was a good idea to try and do simpler risk 13 assessments, going back to what the purpose of this 14 project was -- more efficiently, simpler -- but if it 15 results in creating data which are actually not far 16 from being close to reality, maybe they're not as 17 helpful as people hoped. 18 BY MR. DICKENS: 19 Q. It states: 20 "I do not believe global or US litigation 21 teams [...] would have agreed to or sanctioned the 22 creation of such a document by the GRTMs..." 23 And what does that refer to? 24 A. Right. So these SynCRA documents, as I 25 understand it, and this seems to suggest I was right,	111 1 Q. Using paraquat as an example showed that 2 the data was indeed reliable and informative, didn't 3 it? 4 MR. NARESH: Asked and answered, form, 5 foundation. 6 THE WITNESS: Yes. So let me repeat what 7 I said earlier slightly differently. I'm not, and 8 nobody ever was, criticizing the way in which these 9 data were created because they were using models that 10 were recognized, for example, like PHED in the US EPA. 11 What we're saying is that they were such high-tier -- 12 sorry, such low-tier data, conservative data, that 13 they were not relevant to human exposure. 14 MR. DICKENS: Why don't we take a break 15 and see where I'm at. I think we're almost finished. 16 THE VIDEOGRAPHER: We are going off the 17 record at 11:52. 18 (Break taken.) 19 THE VIDEOGRAPHER: We are back on the 20 record at 12:02. 21 (Exhibit 114 marked for identification.) 22 MR. DICKENS: Dr. Botham, I'm going to 23 hand you what's been marked as Exhibit 114. 24 BY MR. DICKENS: 25 Q. Feel free to read the whole document.
110 1 were created by people called global regulatory 2 toxicology managers, GRTMs, who are based in Basel, 3 were general, relatively inexperienced toxicologists 4 who've been asked to do this work. 5 Q. But they were toxicologists with the 6 company, right? 7 A. They were. 8 Q. And they made a determination to move 9 forward and receive this information in order to 10 analyze risk assessment for paraquat, right? 11 A. No. No. No, let's be clear: This 12 was not -- this was not intended to do a risk 13 assessment of paraquat. It was to say, using paraquat 14 as an example, is this a whole approach to simplifying 15 risk assessments, something that's useful to do. 16 Q. Okay. But using it as an example did 17 provide information that would be used for risk 18 assessments with paraquat? 19 A. No, no, not at all. No. As we've seen 20 and as we've just indicated, let's call it "the real 21 risk assessments" are done utilizing a variety of 22 higher-tier -- let's call them higher-tier data, 23 biomonitoring included, and we've discussed that and 24 that was a much more realistic representation of the 25 situation with paraquat.	112 1 I will be asking you about the information included in 2 number 2 on page 2. 3 A. Okay. 4 Q. Okay. So these are notes from a PS/GPR 5 meeting, July 10, 2008, in which you were in 6 attendance; is that right? 7 A. That's correct. 8 Q. Okay. And on page 2, there was a 9 discussion with respect to preliminary regulatory 10 assessment, right? 11 A. Correct. 12 Q. And there was some discussion, as we've 13 been talking about, AOELs. And your previous 14 testimony, we were discussing AOELs kind of generally, 15 right? 16 A. Right. 17 Q. And the general number I think we 18 discussed was 0.0005. 19 A. Okay. 20 Q. There's some discussion here with respect 21 to AOELs specific to neurotoxicity, right? 22 A. Yes. 23 Q. And, ultimately, it notes that regulators 24 would use additional safety factors in determining 25 what an acceptable operator exposure level would be

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29 (113 to 116)

113 1 for neurotoxic events, right? 2 A. I think what this says is that, yes, there 3 was precedent for certain types of toxicity, including 4 neurotoxicity. Some regulators might add an 5 additional safety factor. 6 Q. Okay. And that would be the case -- in 7 the numbers presented, that would be the case for 8 paraquat, right, and neurotoxicity? 9 A. If it was deemed to be neurotoxic. 10 Q. So if it were deemed to be neurotoxic, the 11 Acceptable Operator Exposure Level for those 12 neurotoxic events would actually be lower than the 13 general AOEL; is that right? 14 A. Yeah, and I guess you would say this was 15 a worst case of what they could do, but I think the 16 rest of the document says, look, this is preliminary, 17 regulators may not necessarily do that because they, 18 too, would see this was very preliminary data. 19 Q. Okay. But just -- it is a possibility, 20 based on past experience, that if a regulator was to 21 deem it neurotoxic, that the AOEL for those neurotoxic 22 events would likely -- or could be lower than 0.0005? 23 A. Prudent planning for, I guess, worst-case 24 eventuality. 25 Q. Talking about the operator exposure	115 1 A. Yes. So David French is the -- was the -- 2 just let me try to do -- check that. Yes, David 3 French, who was the head of global regulatory affairs. 4 Q. And David French suggested potential new 5 studies to satisfy Brazil, right? 6 A. There had been -- I mean, again, to get 7 a context of this, there had been discussions over 8 quite a long period of time about what new studies 9 Brazil seemed to feel were important in order to 10 maintain the registration of paraquat. 11 Q. Jon Parr stated: 12 "We are not doing new studies that don't 13 make sense and risk spurious adverse results that put 14 us at risk, both outside of Brazil and with 50 years 15 of past sales." 16 Right? 17 A. Right, and I think specifically here, 18 because it's referred to on that email on page 2, the 19 concern was about Brazil requesting additional 20 mutagenicity studies because they had a concern about 21 mutagenicity, which nobody else in the world had 22 really ever expressed. 23 Q. Brazil said they were quite convinced, 24 right, that paraquat was mutagenic, and you disagreed 25 with that?
114 1 studies, you're aware that Brazil, following their 2 review of the data, ultimately requested a new 3 operator exposure study, right? 4 A. They did, yes. 5 Q. That operator exposure study was never 6 done, correct? 7 A. That's right. 8 MR. DICKENS: I'll hand you 115. 9 (Exhibit 115 marked for identification.) 10 THE WITNESS: Yes, okay. 11 BY MR. DICKENS: 12 Q. Okay. And so this is an email chain in 13 2017 in which you're a part of, correct? 14 A. Yes. I was copied into some of these 15 emails, not all of them. 16 Q. Okay. And you were copied into an email, 17 at the bottom of the first page, by Jon Parr, right? 18 A. Yes, that's right. 19 Q. Can you remind me who Jon Parr was again 20 within Syngenta? 21 A. So he was the president, the head of the 22 crop protection business for Syngenta. 23 Q. And the head of crop protection for 24 Syngenta wrote to a Karsten, saying to take the lead 25 from David. And is that a David French?	116 1 A. We fundamentally disagreed with that, yes. 2 Q. And no additional studies were done by 3 Syngenta in response to Brazil's request; is that 4 right? 5 A. Again, a complex story. We had a number 6 of discussions over a period of several years, 7 actually, about what the concern was with Brazil. 8 They actually had a concern for a particular type of 9 mutagenicity, which is what's called somatic cell 10 mutagenicity, in other words mutagenicity of the 11 reproductive cells, and that is a test which we felt 12 was in no way needed because if a compound has an 13 effect on somatic cells, it would also have an effect 14 on other cells. 15 We have tested the effect, mutagenicity 16 effect, on other cells and we, and other regulatory 17 authorities, say there's no -- there's no clear 18 mutagenicity. 19 Q. It states that: 20 "Given that Anvisa seems to have rejected 21 any new evidence based on existing studies and is 22 demanding new study work, we seem to have limited 23 options to advance the weight of evidence type of 24 arguments." 25 Now, additional information was submitted

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30 (117 to 120)

117 1 by Syngenta and others to the Brazilian regulatory 2 agencies for consideration? 3 A. Right. I just want to correct something 4 I said in the previous answer. I used the wrong term 5 in the wrong place. 6 They were asking for germ cell 7 mutagenicity studies, I do beg your pardon, which is 8 what I was referring to of a mutagenicity in 9 reproductive cells. It was the somatic cell 10 mutagenicity studies that had been done. 11 So I just wanted to correct the record 12 there. I got that wrong. 13 So, I'm sorry, would you mind just 14 repeating the question? 15 Q. Yes. Additional information was submitted 16 by Syngenta and others to the Brazilian regulatory 17 agencies for consideration after this date? 18 A. I don't have dates to hand, but we were -- 19 yes, we continued to provide them with that, the 20 phrase "weight of evidence" about mutagenicity and the 21 fact that the somatic cell mutagenicity data was 22 showing no effect. 23 Q. Okay. 24 And you're aware that those within 25 Syngenta, prior to receiving the Brazilian regulatory	119 1 did -- has any conclusion been reached by those within 2 Syngenta as to whether or not TCE causes Parkinson's 3 disease? 4 MR. NARESH: Form, foundation, personal 5 capacity. 6 THE WITNESS: So, yes, in my personal 7 capacity, I would say that that is still something 8 which is unclear. There are data which suggest there 9 might be an association, but I don't think that data 10 is robust enough to make a conclusion on causation. 11 BY MR. DICKENS: 12 Q. Now, in your personal capacity, you have 13 been involved in the review and analysis of TCE and 14 other compounds with respect to Parkinson's disease, 15 right? 16 MR. NARESH: Asked and answered. 17 THE WITNESS: But in no way to the degree 18 of thoroughness that we have been talking about with 19 paraquat. 20 BY MR. DICKENS: 21 Q. So is it based on your experience and 22 knowledge and what you've been doing on this project, 23 you haven't reached an assessment yet or you have, 24 if you know? 25 MR. NARESH: Asked and answered.
118 1 agency's final conclusion, had deemed that their 2 assessment was "very robust" and "independent"? 3 MR. NARESH: Foundation. 4 THE WITNESS: Yes. I'm aware of that, 5 yes. 6 BY MR. DICKENS: 7 Q. Now, at some point, you were involved in 8 Syngenta's evaluation as to the neurotoxicity of other 9 pesticides, right? 10 A. Would you like to give more detail about 11 that? 12 Q. You undertook an evaluation as to whether 13 certain pesticides, such as chlorpyrifos and 14 trichloroethylene, or TCE, were linked to Parkinson's 15 disease, correct? 16 A. I certainly remember trichloroethylene; 17 that's still something that we are, if you like, 18 monitoring the literature on trichloroethylene and 19 Parkinson's. 20 Q. Okay. And do you recall also monitoring 21 literature as to chlorpyrifos? 22 A. I may have done. I don't recall the 23 specifics, but there may have been a publication that 24 we were having a look at. 25 Q. Okay. With respect to, and limit to TCE,	120 1 THE WITNESS: Yeah, no, I've not -- I've 2 reached an assessment, as I said, that when we look at 3 the publications that are appearing from time to time 4 on trichloroethylene, there are suggestions that there 5 could be an association, but it looks to me that the 6 evidence is not, as yet, pointing to any causative 7 link. 8 BY MR. DICKENS: 9 Q. Okay. 10 And are you aware that ICI previously 11 manufactured trichloroethylene? 12 A. Yes. So I reminded myself of this as part 13 of my preparation as the corporate representative, 14 and, indeed, when ICI had a division called Mond 15 Division or chemicals and polymers division, 16 trichloroethylene I believe -- I believe -- was one of 17 their products. 18 Q. And it was sold by ICI as an anesthetic; 19 is that right? 20 MR. NARESH: Foundation. 21 BY MR. DICKENS: 22 Q. If you know. 23 A. That, I don't know. 24 MR. DICKENS: I have no further questions. 25 MR. NARESH: Chevron or FMC, do you have

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31 (121 to 124)

121 1 any questions? 2 MR. KANTRA: For FMC, I do not have 3 questions. 4 THE STENOGRAPHER: Sorry. 5 MR. DICKENS: I think that's FMC. 6 MR. NARESH: Andy, did you say you do not 7 or you do? 8 MR. KANTRA: I'm sorry. If I wasn't 9 clear, I said I do not have questions. 10 MR. NARESH: Okay. Chevron? 11 MS. CAREY: Nor does Chevron, thank you. 12 No. 13 MR. NARESH: All right. 14 EXAMINATION ON BEHALF OF SYNGENTA 15 BY MR. NARESH: 16 Q. I just have a couple of follow-ups for 17 you, Dr. Botham. Could you pull out Exhibits 98 and 18 99, or really just 99. 19 A. Oh, the slides? 20 Q. The slides, exactly. And so, Dr. Botham, 21 I'd like to ask you a couple of questions about 22 Exhibit 99 which related to the subject matter of 23 diquat. 24 Do you remember being asked questions 25 about that?	123 1 understand that mouse model. We've also done kinetic 2 studies in other species, including the nonhuman 3 primate. 4 Q. And having done that work, has -- do you, 5 as the, I guess, former head of product safety, have 6 concerns about paraquat causing Parkinson's disease? 7 A. No, I really do not have any concerns 8 because you've got to put that information that, yes, 9 paraquat can get into the brain, and it will stay 10 there for a while, then come out again, but that does 11 not appear to produce reproducible toxicity findings 12 in the models that have been looked at. 13 Q. I'm going to shift gears a little bit and 14 ask you a couple of follow-up questions about the 15 emetic issue. 16 Again, what does the presence of an emetic 17 in paraquat have to do with the allegation in this 18 case, that paraquat causes Parkinson's disease? 19 A. I'm really not sure that it has any 20 relationship to Parkinson's disease. 21 Q. Okay. And there was one thread that I was 22 just trying to follow. So there's two former 23 employees, one named Dr. Heylings and one named 24 Dr. Wilks? 25 A. Correct.
122 1 A. Yes, I do. 2 Q. And we were looking at a presentation 3 which discussed findings that paraquat rapidly enters 4 the brain and has a half-life of 21 days in the brain. 5 Do you remember that? 6 A. Well, we -- yes, when the word "rapidly" 7 is used in the conclusions, yes. 8 Q. Right. And so my question is: From a 9 product safety perspective, what does a finding like 10 the ones discussed in Exhibit 99 tell you? 11 A. Well, it -- at this stage, it doesn't tell 12 us anything because lots of substances can enter the 13 brain, and presence of a substance in a tissue does 14 not necessarily mean that that will lead to a 15 toxicity. So kinetics is something that we need to 16 understand, but, in and of itself, it is not an 17 assessment of hazard or risk. 18 Q. And this presentation that we looked at 19 earlier was from the 2010 time period? 20 A. That's right. 21 Q. Since 2010, has -- have you been involved 22 in any efforts to better understand the kinetics of 23 paraquat in the brain? 24 A. Yes. We've done extensive work looking at 25 the kinetics, not just in the mouse, to better	124 1 Q. Who have weighed in on the emetic issue; 2 is that right? 3 A. That's right. 4 Q. And Dr. Heylings's position is that there 5 should be more emetic in paraquat? 6 A. He's held that view for a number of years, 7 yes. He felt that there should be, or based on some 8 research that he did many years ago. 9 Q. And Dr. Wilks, his position is that there 10 should be less emetic in paraquat formulations; is 11 that right? 12 A. Well, as we saw earlier from that paper 13 that had Dr. Eddleston as an author, and Dr. Wilks was 14 also on that paper, that re-analysis of the data from 15 Sri Lanka was suggesting that you certainly don't need 16 more emetic; it's possible that you don't need the 17 emetic at all. 18 Q. You received some questions about SynCRA, 19 so let's shift gears and talk about SynCRA. 20 Can you pull out Exhibit 113. 21 You were asked about some of the bullets 22 in this email from Andy Cook to Dick Lewis and others, 23 but I'd like to ask you about the paragraph that 24 precedes the bullets, the paragraph beginning, 25 "I believe..."

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32 (125 to 128)

125 1 A. Yes. 2 Q. So the second sentence of that sentence 3 [sic] says: 4 "Nevertheless the 'generic' approach to 5 SynCRA production ignores the higher tier data we have 6 supporting our current regulatory position. In the 7 absence of that refinement of the risk assessments, 8 the document could be misinterpreted." 9 Do you see that? 10 A. I do. 11 Q. And how does that relate to the testimony 12 that you were providing in response to the questioning 13 from plaintiffs' counsel about the utility of this 14 SynCRA preliminary assessment for paraquat? 15 A. It pretty much says the same as I was 16 saying, actually. So I was saying that the lower-tier 17 data that are in the SynCRA, based purely on very 18 conservative models, suggesting that there could be 19 exceedances of the AOEL, they don't reflect what 20 happens when you put more real data, real-life data, 21 in there on exposure of, for example, higher-tier 22 data, which help you to refine the risk assessment and 23 make it more relevant to what happens in the field. 24 Q. And you received some extensive 25 questioning about the SynCRA preliminary assessment,	127 1 right? 2 A. That's right. 3 Q. And you're relying on those Syngenta 4 studies that were published for the idea that this 5 information between paraquat and diquat has no 6 relevance at this stage, right? 7 MR. NARESH: Form, foundation. 8 THE WITNESS: I don't say -- I wouldn't 9 say we're relying on that information, no. 10 BY MR. DICKENS: 11 Q. So you're not relying on -- 12 A. Well, there's a huge weight of evidence, 13 body of evidence which we use in our assessment. 14 Q. And you'd agree that there are important 15 differences in outcomes based on studies undertaken by 16 those such as Syngenta who have an interest in 17 paraquat remaining on the market versus independent 18 researchers, right? 19 MR. NARESH: Scope. 20 THE WITNESS: Are you referring to 21 toxicology studies here? The mouse model studies, 22 for example? 23 BY MR. DICKENS: 24 Q. Correct. 25 A. We don't position it as a different view.
126 1 right? 2 A. Correct. 3 Q. Do you believe that Mr. Cook accurately 4 predicted that those preliminary findings would be 5 misinterpreted? 6 MR. DICKENS: Object to form. 7 THE WITNESS: I think he was very accurate 8 in his prediction. 9 BY MR. NARESH: 10 Q. And why do you say that? 11 A. Well, I think the discussions we've been 12 having today with our colleague, perhaps 13 understandably we needed to explain why those were not 14 a reflection of reality. 15 MR. NARESH: I have no further questions. 16 Thank you, Dr. Botham 17 FURTHER EXAMINATION ON BEHALF OF PLAINTIFFS 18 BY MR. DICKENS: 19 Q. I do have some follow-ups. With respect 20 to the diquat slides, you were asked whether or not 21 additional studies have been undertaken by Syngenta 22 and you indicated they had, right? 23 A. Yes. 24 Q. And, in fact, you mentioned additional 25 kinetic data in nonhuman primates and other animals,	128 1 We actually position it as confirmed by working with 2 one of those external researchers, Richard Smeyne, as 3 the model, the mouse model in particular, is not a 4 reproducible and reliable model to determine that 5 effect is real. 6 Q. Richard Smeyne was paid by Syngenta for 7 the study in which he co-authored? 8 MR. NARESH: Scope. 9 THE WITNESS: I'm not quite sure of the 10 detail of the payments made, but, you know, 11 Richard Smeyne was largely collaborating with us 12 because he wished to understand himself the robustness 13 of that mouse model. Because his intent -- and it's 14 important to understand this. His intent was to know 15 whether that mouse model could continue to be used in 16 the search for treatments for Parkinson's disease. 17 He told us that after the work he did with 18 us, that he felt that that model was no longer 19 reliable. 20 BY MR. DICKENS: 21 Q. You're aware that the United States 22 National Toxicology Program deemed that 23 Syngenta-sponsored studies were of a duration that 24 were too short and too infrequent to reliably cause 25 observable adverse effects?

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33 (129 to 132)

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1 MR. NARESH: Scope. 2 THE WITNESS: You can always criticize any 3 toxicology study for not testing every possible 4 parameter that you could look at. Yes, of course, you 5 could argue, therefore, why not dose animals for an 6 awful lot longer and see what happens. 7 But, look, that's what Defra did. 8 That's what Exponent did on behalf of Defra and they, 9 too, did not see a statistically significant effect. 10 BY MR. DICKENS: 11 Q. My question was specific to were you aware 12 that the US National Toxicology Program deemed 13 Syngenta-sponsored studies too short and too 14 infrequent to reliably cause observable adverse 15 effects, yes or no? 16 MR. NARESH: Scope, foundation, form. 17 THE WITNESS: Yes, but we -- our weight of 18 evidence involves more than those studies, so that's 19 why I stand by what I say. 20 MR. DICKENS: I have no further questions. 21 MR. NARESH: All right. We'll read and 22 sign, and designate as provisionally confidential, 23 consistent with the protective order. 24 THE VIDEOGRAPHER: We are going off the 25 record at 12:27.	1 CERTIFICATE OF WITNESS 2 3 I, PHILIP BOTHAM, declare that I have read the entire 4 transcript of deposition, or the same has been read to 5 me, and certify that it is a true, correct and 6 complete transcript of my deposition given on 7 Thursday, September 19, 2024, save and except for 8 changes and/or corrections, if any, as indicated by me 9 on the attached Errata Sheet, with the understanding 10 that I offer these changes and/or corrections as if 11 still being questioned. 12 13 14 15 Signed _____ 16 Philip Botham 17 18 19 20 Dated this.....day of.....20... 21 22 23 24 25
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1 (Whereupon, the deposition concluded 2 at 12:27 p.m.) 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 CERTIFICATE OF STENOGRAPHER 2 3 I, LEAH M. WILLERSDORF, Registered Merit 4 Reporter, Certified Realtime Reporter, Fellow of the 5 British Institute of Verbatim Reporters, Qualified 6 Realtime Reporter Level 2, and Certified LiveNote 7 Reporter, do hereby certify that: 8 PHILIP BOTHAM appeared before me on Thursday, 9 September 19, 2024, agreed to tell the truth under the 10 penalties of perjury, and was thereupon examined by 11 counsel; the testimony of said witness was taken by me 12 stenographically; the foregoing is a true and accurate 13 record to the best of my knowledge, skill and ability; 14 I am neither a relative nor employee of any party to 15 the action in which this testimony was taken; I am 16 neither relative nor employee of any attorney or 17 counsel employed by any party thereto; and, further, 18 I am not financially or otherwise interested in the 19 outcome of the action. 20 21 22  23 LEAH M. WILLERSDORF 24 RMR, CRR, FBIVR, ACR, QRR2, CLR 25 (September 27, 2024)

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