



Planet Depos®
We Make It Happen™

CONFIDENTIAL

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

Date: September 17, 2024

Case: Paraquat Products Liability Litigation, In Re:

Planet Depos

Phone: 888.433.3767 | **Email:** transcripts@planetdepos.com

www.planetdepos.com

Michigan #8598 | Nevada #089F | New Mexico #566

WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Case ID: 220300429
Control No.: 26064959

Transcript of Philip Botham, Ph.D., Corporate Designee
Conducted on September 17, 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 DEFENDANT SYNGENTA 13 by and through its corporate representative 14 DR. PHILIP BOTHAM 15 Volume I 16 (pages 1 - 338) 17 London, England 18 United Kingdom 19 Tuesday, September 17, 2024 20 21 22 23 Job No. 553162 24 Reported stenographically by: 25 LEAH M. WILLERSDORF, RMR, CRR, FBIVR, ACR, QRR2, CLR	1 APPEARANCES 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 18 1301 Pennsylvania Avenue, N.W. 19 Washington, D.C. 20004 20 (202) 389 5000 21 22 BY: RAGAN NARESH, ESQ. 23 ragan.naresh@kirkland.com 24 25 On behalf of Defendant Chevron: 26 JONES DAY 27 28 4655 Executive Drive 29 Suite 1500 30 San Diego, CA 92121-3134 31 (858) 314 1200 32 33 BY: KRISTIN LAHASZOW, ESQ. (via Zoom) 34 klahaszow@jonesday.com 35
1 2 Tuesday, September 17, 2024 3 4 09:24 a.m. to 5:59 p.m. 5 (British Summer Time) 6 7 VOLUME I of the videotaped deposition of 8 SYNGENTA, by and through its corporate representative 9 DR. PHILIP BOTHAM, held at the offices of Kirkland & 10 Ellis LLP, 30 St. Mary Axe, London EC3A 8AF, England, 11 United Kingdom, before Leah M. Willersdorf, Registered 12 Merit Reporter and Certified Realtime Reporter, both 13 with the US National Court Reporters Association, and 14 Fellow of the British Institute of Verbatim Reporters, 15 Accredited Court Reporter, Qualified Realtime Reporter 16 (Level 2), and Certified LiveNote Reporter. 17 18 19 20 21 22 23 24 25	1 APPEARANCES 2 (continued) 3 4 On behalf of Defendant FMC Corporation: 5 TROUTMAN PEPPER LLP 6 3000 Two Logan Square 7 Eighteenth and Arch Streets 8 Philadelphia, PA 19103 9 (215) 981 4000 10 11 BY: CHRISTINA M. BOSTON, ESQ. (via Zoom) 12 christina.boston@troutman.com 13 14 ALSO PRESENT 15 16 Mark Smith, Esq. - Syngenta 17 18 Brian Brake - The Miller Firm 19 (via Zoom) 20 Special Master 21 22 Randi Ellis - Videographer 23 24 Linda Fleet - Remote technician 25

2 (5 to 8)

Case ID: 220300429
Control No.: 26064959

Transcript of Philip Botham, Ph.D., Corporate Designee
Conducted on September 17, 2024

3 (9 to 12)

9			11		
EXHIBITS INDEX			EXHIBITS INDEX		
Exhibit No.	Description	Page	Exhibit No.	Description	Page
Exhibit 17	ICI and IHRL document entitled "Toxicity Tests on Gramoxone (LTS) for registration in the USSR," by Dr. K. Fletcher, dated April 1967 (SYNG-PQ-ATR-15058108 - 112)	146	Exhibit 26	Zeneca Central Toxicology Laboratory document entitled "Potentially Referable Findings Standing Committee - Minutes of Meeting held on 18 July 2000" (SYNG-PQ-03894019 - 020)	193
Exhibit 18	Letter from A. Calderbank to Mr. T. Frears, dated May 26, 2972, titled "Paraquat Strategy" (SYNG-PQ-02514156) [Confidential - Paraquat Litigation]	154	Exhibit 27	Document entitled "RAD Strategy Meeting Minutes - Paraquat 200 g/l SL formulation: Inhalation toxicity" (SYNG-PQ-02095590)	198
Exhibit 19	A collection of correspondence with the top one being from J.N. Ospenson to D.B. Barlow, dated May 21, 1975, with attachments (SYNG-PQ-01845630 - 635) [Confidential - Paraquat Litigation]	160	Exhibit 28	Document entitled "Minutes and actions from Bipyridyl Inhalation Exposure meeting at CTL on 12th April 2001" (SYNG-PQ-02105188 - 190)	211
Exhibit 20	Document headed "Paraquat Formulations: Methods for Assessing Relative Hazards of Skin Contact," signed by Paul Dugard and dated July 22, 1982 (SYNG-PQ-02451442) [Confidential - Paraquat Litigation]	167	Exhibit 29	Document entitled "Minutes and actions from Bipyridyl Inhalation Exposure meeting at CTL on 15th August 2001" (SYNG-PQ-02108056 - 059)	214
Exhibit 21	Letter from P. Slade of ICI to Mr. J.M. Winchester, et al., with the topic "Safer Gramoxone," dated June 20, 1973 (SYNG-PQ-02470011 - 012) [Confidential - Paraquat Litigation]	170	Exhibit 30	Coroner's report, dated January 19, 1973, regarding the death of an individual exposed to paraquat (SYNG-PQ-13109793 - 797)	219
			Exhibit 31	Plant Protection Limited document entitled "Visit to Ireland - 28 February 1973," authored by A.W. Waitt, dated March 1973 (SYNG-PQ-02450303 - 306) [Confidential - Paraquat Litigation]	219

4 (13 to 16)

Case ID: 220300429
Control No.: 26064959

Conducted on September 17, 2024

17 1 THE STENOGRAPHER: Dr. Botham -- oh, 2 sorry, before I do that. 3 Good morning. My name is Leah 4 Willersdorf. I am a Registered Merit Reporter and a 5 Certified Realtime Reporter. 6 Will counsel please stipulate that, in 7 lieu of formally swearing in the witness, the reporter 8 will instead ask the witness to acknowledge that their 9 testimony will be true under the penalties of perjury, 10 that counsel will not object to the admissibility of 11 the transcript based on proceeding in this way, and 12 that the witness has verified that he is, in fact, 13 Dr. Botham. 14 MR. DICKENS: So stipulate. 15 MR. NARESH: Agreed. 16 THE STENOGRAPHER: Thank you. 17 Dr. Botham, do you hereby acknowledge that 18 your testimony will be true under the penalties of 19 perjury? 20 THE WITNESS: I do. 21 THE STENOGRAPHER: Thank you. Thank you, 22 Counsel. 23 /// 24 /// 25 ///	19 1 to answer not based on information known to you 2 personally, but also based on information known or 3 reasonably available to Syngenta as a corporation? 4 A. That's my understanding, yes. 5 Q. And you understand that the matters you'll 6 be testifying to for Syngenta includes actions and 7 knowledge of Syngenta corporation as well as its 8 predecessors, including AstraZeneca, Zeneca, 9 Ciba-Geigy, Imperial Chemical Industries and its 10 predecessors? 11 A. Yes, I do understand. 12 Q. And did you take that into account when 13 preparing to testify today? 14 A. Yes, I did. 15 Q. What did you do to prepare for today's 16 deposition? 17 A. Well, starting back in July, I've had a 18 number of discussions with external counsel, 19 Mr. Naresh and his colleagues, with also Mr. Smith, 20 and looked at a large range of documents, which 21 I think have provided the topics that are of interest 22 to yourselves in this case, and I've also had some 23 conversations with some other internal colleagues to 24 help with making sure that I understand some of that 25 information.
18 1 DR. PHILIP BOTHAM, 2 having first agreed to tell the truth 3 under penalty of perjury, was examined 4 and testified as follows: 5 EXAMINATION ON BEHALF OF PLAINTIFFS 6 BY MR. DICKENS: 7 Q. Good morning, Dr. Botham. 8 A. Good morning. 9 Q. Can you please state your name for the 10 record. 11 A. Philip Botham. 12 Q. And who is your current employer? 13 A. Syngenta. 14 Q. And I understand you've been put forward 15 today as a witness to testify on behalf of Syngenta; 16 is that your understanding? 17 A. That's correct. 18 Q. And to testify with respect to specific 19 topics? 20 A. Yes. 21 Q. Have you had an opportunity to review 22 those topics prior to today's deposition? 23 A. Yes, I have. 24 Q. And do you understand that in testifying 25 for Syngenta on the designated topics, you're required	20 1 Q. Do you have an understanding of what these 2 lawsuits are about? 3 A. I think I do. 4 Q. Okay. What's your understanding? 5 A. Well, the -- my understanding is that 6 these lawsuits are to represent individuals who have 7 unfortunately developed Parkinson's disease and where 8 it is believed that that disease may have been caused 9 by their prior exposure to paraquat. 10 Q. Do you believe that your preparation has 11 given you sufficient information to testify on behalf 12 of Syngenta here today? 13 A. As much as I possibly can. 14 Q. You mentioned a review of documents. 15 Were those documents that were specifically identified 16 in the Notice of Deposition? 17 A. Yes. 18 Q. Did you review any additional documents 19 outside of what was specified in that notice? 20 A. A few, but the majority were those that 21 were provided in the notice. 22 Q. Now, you mentioned, other than counsel, 23 you spoke to some colleagues. Which colleagues did 24 you speak with? 25 A. I spoke to my colleague in the United

Conducted on September 17, 2024

21 1 States, Monty Dixon; a colleague in Basel, Ian Wheals; 2 and another colleague in Basel, Clive Campbell. 3 That's the list. 4 Q. And what was the purpose of reaching out 5 to Monty Dixon? 6 A. There were some specific questions about 7 the company's interactions in the past with the 8 US Environmental Protection Agency and I needed to 9 understand, because he's been involved in those 10 interactions, a little more about that. There were 11 some issues around the formulations of paraquat that 12 were marketed in the United States; I needed to know a 13 little bit more about that. 14 With regard to -- yes, and I think that 15 was the majority of what I spoke to Monty about. 16 Q. With respect to the regulations or 17 regulatory matters with respect to the Environmental 18 Protection Agency, what specifically did you discuss 19 with Monty Dixon? 20 A. Well, we had a broad discussion about our, 21 I guess you would say our philosophy of the way in 22 which we've interacted with the US EPA over the years, 23 and one or two specific discussions. But it was 24 mostly so that I could be reassured, if you like, 25 about the way in which we had had that relationship	23 1 was the main thing. There were, again, one or two 2 other smaller items. 3 Q. And those were the only three colleagues 4 you spoke with for preparation for today's deposition? 5 A. Yes, I believe that's right. 6 Q. Now, you mentioned you reviewed some other 7 documents other than what was included in the 8 deposition notice. What documents in particular did 9 you review? 10 A. Mainly for my own memory, I went back and 11 looked at a few publications on paraquat and 12 Parkinson's disease. I wouldn't be able to name all 13 of them, but, as an example, I looked at a report from 14 an organization called Exponent, and -- because 15 I needed to recall the detail of that. So it was 16 mainly scientific documents and publications. 17 Q. What document in particular related to 18 Exponent did you review? 19 A. It was their report of a contract that 20 they were involved in, sponsored by the UK government. 21 Q. Defra? 22 A. Yes, Defra. 23 Q. Now, I understand you've been deposed 24 multiple times, correct? 25 A. I have.
22 1 with the regulatory agencies. 2 Q. And what was the purpose of reaching out 3 to Ian Wheals? 4 A. Ian Wheals was, 20 years ago or more now, 5 the global regulatory manager and also the European 6 regulatory manager for paraquat, and so there were, 7 again, a few very specific documents where his name 8 was on -- and I didn't really know as much about those 9 as I needed to; so I think there were only two or 10 three documents where we just needed to check the 11 detail. 12 Q. And those were specific documents Ian 13 Wheals was mentioned in or -- 14 A. Yes. 15 Q. Is Ian Wheals still an employee at 16 Syngenta? 17 A. He is. 18 Q. What was the purpose of reaching out to 19 Clive Campbell? 20 A. Clive Campbell is the chief medical 21 officer for Syngenta and has been for a number of 22 years. So I wanted to discuss with him some detail 23 about one or two documents with respect to the 24 manufacture of paraquat and issues around the safety 25 of the people involved in that manufacture. So that	24 1 Q. And deposed multiple times as a 2 representative for Syngenta, correct? 3 A. That's correct. 4 Q. Did you review your prior deposition 5 testimony in preparation for today's deposition? 6 A. No, I did not. 7 Q. No deposition transcripts from previous 8 depositions at all? 9 A. Not of my own. I believe on one occasion 10 I was reminded of one or two little sections of my 11 deposition, but I did not systematically review my own 12 depositions. 13 Q. Did you review deposition transcripts of 14 any other Syngenta employees or any other witnesses in 15 this litigation? 16 A. I was given access to the depositions of 17 two former Syngenta employees: Dr. Lewis Smith and 18 Dr. Bob Scott. 19 Q. Any other depositions? 20 A. No, I don't believe so. 21 Q. And you reviewed those depositions 22 specifically for preparation for today's deposition? 23 A. That's correct. 24 Q. Now, I see you brought something here with 25 you today. What did you bring?

Conducted on September 17, 2024

25 1 A. These are some documents which we have put 2 together as, essentially, aide-memoire information 3 that relates to some of the topics that you were 4 interested in. So it's just as an enabler of some of 5 the detailed information that we may require. 6 Q. And are those notes that you specifically 7 put together? 8 A. I've contributed to some of these. Others 9 have been prepared, for example, by my colleague, 10 Monty Dixon. So subject-matter experts have been 11 involved. 12 Q. Okay. 13 MR. DICKENS: And we'll ask for a copy to 14 mark those as an exhibit to today's deposition. 15 You're one step ahead of us. We'll go 16 ahead and mark your notes as exhibit -- 17 MR. TRAVERS: Is there another copy or is 18 that it? 19 MR. NARESH: We just have that one. 20 MR. DICKENS: Exhibit 1 to today's 21 deposition, and we'll just do the whole compendium. 22 (Exhibit 1 marked for identification.) 23 BY MR. DICKENS: 24 Q. In total, how long -- oh, I'm sorry. 25 THE STENOGRAPHER: It's okay.	27 1 I ask a question you don't understand, please let me 2 know and I'll rephrase; is that fair? 3 A. Mmm-hmm. Sorry. 4 Q. That's a yes? 5 A. Yes. 6 Q. Okay. And, therefore, if you go ahead and 7 answer, I'll understand that you understood the 8 question and answered fully and truthfully; is that 9 fair? 10 A. That's fine. 11 Q. Now, scientists at ICI carried out a 12 program of field testing on paraquat in the 1950s 13 before putting paraquat on the market, right? 14 MR. NARESH: Objection to scope. 15 What topic? 16 MR. DICKENS: Topic 4. 17 MR. NARESH: Do you have the document? 18 MR. DICKENS: We do. 19 MR. NARESH: Oh, and can we have the 20 stipulation I think we've done previously, that we 21 don't have to go off the record to resolve objections 22 in order to preserve them? 23 MR. DICKENS: That's correct, yes. 24 MR. NARESH: Okay. 25 MR. DICKENS: I'll go ahead and mark
26 1 BY MR. DICKENS: 2 Q. In total, how long did you prepare for 3 today's deposition? 4 A. I started around July 10 and have had 5 regular meetings since then, so two months. 6 Q. Do you know roughly how many hours? 7 A. I would have to do a mental calculation. 8 I would say 25, 30 hours. 9 Q. Now, is your current role at Syngenta 10 still principal science advisor? 11 A. It is, yes. 12 Q. And you started in that position in 2017, 13 correct? 14 A. That's right. 15 Q. Has there been any change in your role or 16 job responsibilities as principal science advisor 17 since your last deposition? 18 A. No. 19 Q. Now, paraquat's herbicidal properties were 20 discovered in 1954; is that right? 21 A. Yes. 22 Q. And the discovery was made by scientists 23 at ICI, or Imperial Chemical Industries? 24 A. That's correct. 25 Q. And I will just ask, as we go forward, if	28 1 Exhibit 2 for the record. 2 (Exhibit 2 marked for identification.) 3 BY MR. DICKENS: 4 Q. Dr. Botham, I've handed you Exhibit 2 for 5 the record. Is this a document you've seen before? 6 A. Yes, I have seen this document. 7 Q. And a document you reviewed in preparation 8 for today's deposition? 9 A. This is one of the documents that 10 I reviewed, yes. 11 Q. And the title of this document is "The 12 Story of Gramoxone from 1947 to 1992," right? 13 A. That's correct. 14 Q. If you can turn to page 5 of this 15 document -- it actually might be 4 but it looks like a 16 5 on the bottom there, but it's "History of Paraquat - 17 Part 2 - Recognition" on the top. 18 Do you see that? 19 A. Ah, okay, right. Yeah, I'm there. 20 Q. Okay. 21 Now, this document discusses the history 22 of paraquat, including prior to its coming onto the 23 market, right? 24 A. It does. 25 Q. Okay. Now, it refers to field testing

Conducted on September 17, 2024

29 1 undertaken on paraquat before introducing paraquat to 2 the market, not only in the United States but 3 worldwide, right? 4 A. It does, yes. 5 Q. Okay. Now, you'd agree that during the 6 time of the initial field tests on paraquat, very 7 little was known about the properties of paraquat, 8 including its toxicity and irritant effects, right? 9 A. The majority of the safety tests were 10 certainly conducted shortly after that period. 11 Q. During the field tests in the 1950s, the 12 earlier researchers experienced nosebleeds, lost 13 fingernails, irritation to the eyes, right? 14 A. That's what the document says, certainly. 15 Q. Do you have any reason to dispute that 16 that is correct? 17 A. No. It seems plausible. 18 Q. Did you do anything to confirm whether or 19 not that was the case? 20 A. I did not. 21 Q. Do you have any reason to doubt the 22 information mentioned here in this particular 23 document? 24 A. I have no reason to doubt it. 25 Q. This document states:	31 1 was the case, until I read this document. 2 Q. Do you know of other documents or 3 experience where Syngenta researchers have found that 4 paraquat is corrosive to metal airplane wings? 5 A. I have no other background on that subject 6 at all. 7 Q. As you said, it doesn't surprise you that 8 that is the case, correct? 9 A. Because paraquat does have corrosive 10 properties, so, yes, it is plausible. 11 Q. You can put that document aside. 12 Syngenta's always known that paraquat is 13 an acutely toxic compound, right? 14 A. Since the early 1960s, certainly, yes. 15 Q. Syngenta knew paraquat was acutely toxic, 16 both from the findings in the field as well as animal 17 studies that the company conducted? 18 A. Yes. 19 Q. Paraquat's capable of causing toxicity 20 through the generation of reactive oxygen species? 21 MR. NARESH: Objection; scope. 22 What's the topic? 23 THE WITNESS: That is its mode of 24 action -- 25 MR. NARESH: Just wait.
30 1 "The full extent of its toxicity and 2 irritant effects were not known." 3 Do you see that? 4 A. Yes. 5 Q. "The early researchers had nosebleeds, 6 lost fingernails, suffered conjunctivitis in their 7 eyes before they learned to take the proper 8 precautions." 9 Right? 10 A. That's what it says, yes. 11 Q. Now, in the early researching and testing 12 of paraquat, the researchers also found the wings of 13 airplanes used to spray paraquat in the field test 14 being conducted on paraquat in Africa started to 15 crumble away, right? 16 MR. NARESH: Objection to form. 17 THE WITNESS: Yes. 18 BY MR. DICKENS: 19 Q. And the airplane wings were crumbling 20 because of the corrosive properties of paraquat, 21 right? 22 A. That would be my assumption. 23 Q. Well, you have an understanding, right, 24 that paraquat is corrosive to airplane wings, right? 25 A. I had no understanding of that, that that	32 1 THE WITNESS: I'm sorry. 2 MR. NARESH: What's the topic? 3 I'll also note the last three questions 4 are identical in substance to questions that 5 Dr. Botham has previously been asked at depositions, 6 to which plaintiffs' counsel have access to, which 7 I don't think is consistent with our understanding of 8 this deposition, which was that this deposition 9 would be limited to new questions, not questions 10 previously asked and answered by this witness on the 11 same topics. 12 MR. DICKENS: Topic 17, I will state for 13 the record, which is stating a foundation or laying a 14 foundation for the questions I will be asking, but 15 I can move on from there. 16 BY MR. DICKENS: 17 Q. We can agree that investigation field 18 studies of paraquat began in the 1950s but wasn't sold 19 for commercial use in the United States until 1965, 20 correct? 21 A. That's right. 22 Q. Early animal studies showed paraquat could 23 have an effect on the central nervous system, right? 24 A. There were some documents which suggested 25 that, but I think the interpretation of those studies

Conducted on September 17, 2024

33 1 is not clear when you look at the actual wording of 2 the documents. 3 Q. Are you aware of any early research 4 showing paraquat having an effect on the central 5 nervous system? 6 MR. NARESH: Objection; scope. 7 What's the topic? 8 MR. DICKENS: Topic 5. 9 I'll go ahead and mark Exhibit 3 for the 10 record. 11 (Exhibit 3 marked for identification.) 12 MR. NARESH: This is 5B? 13 MR. DICKENS: 5B. 14 BY MR. DICKENS: 15 Q. I've handed you Exhibit 3. For the 16 record, this is a study produced in Syngenta's 17 production of documents in this litigation. 18 It's a study that you've seen before, 19 correct, Doctor? 20 A. I don't recall having seen this one 21 before. 22 Q. It's not a document you recall seeing in 23 preparation for today's deposition? 24 A. It certainly, as far as I remember, is not 25 part of the documentation that I was -- have been	35 1 central nervous system effects, right? 2 A. "Possible" is the right word, but these 3 were studies done at very high doses, and so it's 4 possible that the interpretation of effects on the 5 central nervous system was incorrect. 6 Q. Now, in this particular study -- and do 7 you understand this to be a study conducted by outside 8 researchers? 9 A. I assume so. I don't recognize the 10 authors. 11 Q. And it's a document that appears to 12 have been published in a journal, right? 13 A. Yes. 14 MR. NARESH: And, Dr. Botham, if you need 15 a minute with the document, if you don't remember 16 having looked at it, obviously take a minute to look 17 at it, if you'd like to. 18 THE WITNESS: Okay. 19 BY MR. DICKENS: 20 Q. Now, the first paragraph in this study 21 states that: 22 "The toxic influence of Gramoxone on the 23 activity of the central nervous system is investigated 24 in this work." 25 Correct?
34 1 looking at over the last two months. 2 Q. Okay. Did you review all documents that 3 were cited in the Notice of Deposition in preparation 4 for today's deposition? 5 A. I believed I did. 6 Q. But this document, you don't recall 7 seeing? 8 A. I don't think it was actually part of 9 that, unless I have forgotten that. But I -- no, 10 I don't think I've seen this. 11 Q. This study, titled "The effect of 12 Gramoxone on the activity of the nervous system of 13 laboratory animals." 14 Do you see that? 15 A. I do. 16 Q. A study from 1971? 17 A. Yes. 18 Q. Now, you mentioned earlier the studies 19 or early studies with respect to paraquat and the 20 central nervous system. Are the studies that you did 21 review internal Syngenta studies? 22 A. No, not always. Some of them are external 23 publications. 24 Q. And you're aware that those studies, or 25 early studies in animals, did show signs of possible	36 1 A. That's correct. 2 Q. If we can turn to page ending 7815 on the 3 bottom right-hand corner, there's a "Discussion of 4 results." 5 In the second paragraph, it states: 6 "It follows from the above results that 7 Gramoxone acts on the central nervous system in two 8 phases." 9 Do you see that? 10 A. I do. 11 Q. And it reports: 12 "In small doses, it amplifies processes of 13 stimulation and inhibition in the central nervous 14 system. In larger doses, it acts in the opposite way, 15 weakening these processes." 16 Right? 17 A. That's what it says, yes. 18 Q. And it's specifically reporting that 19 Gramoxone, in this study, according to the authors, 20 does have an effect on the central nervous system, 21 right? 22 A. As assessed with the methodology here, 23 which I'm certainly not familiar with. 24 Q. Is the methodology any different than the 25 methodology conducted by Syngenta in their early

Conducted on September 17, 2024

37 1 studies on the central nervous system effects? 2 MR. NARESH: Objection to form. 3 THE WITNESS: It looks different to me. 4 It talks about methods which I have never really come 5 across and I am, therefore, not sure about the 6 suitability of these methods, even, for assessing the 7 effects on the central nervous system. I'm not 8 qualified to comment on that. 9 But certainly ICI, as far as I remember, 10 didn't ever use this kind of methodology. 11 BY MR. DICKENS: 12 Q. Does Syngenta believe that the methodology 13 used by the authors or researchers in this study is 14 inappropriate to test the central nervous 15 system effects on animals? 16 A. I would say that that would need to be 17 reviewed by someone who is more expert in these 18 matters than me. 19 Q. But I have you here today. Do you know 20 whether or not Syngenta believes it's inappropriate, 21 the methodology or research undertaken to test the 22 central nervous effects in these animals? 23 A. I really have not been able to make a 24 comment on that. I have never seen any other study 25 using this methodology. So it's unusual.	39 1 particular authors, right? 2 A. That's right. 3 Q. And is it your understanding that Syngenta 4 would have received a copy of this document if it was 5 in its records and produced in this litigation? 6 A. Yes. 7 Q. Now, Syngenta knew, by the time of this 8 study in 1971, that paraquat could get into the brain 9 of humans, right? 10 A. There was certainly evidence that paraquat 11 can get into the brain, yes, and there were some 12 studies, postmortem studies, I believe, where -- 13 from humans, where paraquat was measured. 14 Q. Okay. Postmortem studies being autopsies 15 of individuals who died after ingestion -- 16 A. Yes. 17 Q. -- of paraquat, right? 18 A. Yes. 19 Q. And Syngenta knew from the autopsies of 20 those individuals who died after paraquat ingestion 21 that paraquat could bypass the blood-brain barrier? 22 A. I don't -- they certainly didn't know that 23 because of the evidence from the autopsies. I think 24 the weight of evidence generally suggested that 25 paraquat can get into the brain and that might include
38 1 Q. Now, your familiarity with methodology in 2 animal testing, is that from your experience with 3 Syngenta? 4 A. It is. 5 Q. You're not a toxicologist? 6 A. I am a toxicologist. 7 Q. Okay. By your role with Syngenta, though, 8 correct? 9 A. Yes. 10 Q. Is all of your experience with respect to 11 toxicology involving animal studies based on your time 12 and experience with Syngenta? 13 A. And its legacy companies, yes. 14 (Stenographer clarification.) 15 THE WITNESS: And its legacy companies. 16 THE STENOGRAPHER: "Legacy," thank you. 17 BY MR. DICKENS: 18 Q. The very last section of this page goes 19 on: 20 "... it can be assumed that the observed 21 changes in the activity of the nervous system can be 22 ascribed to the dipyrldyl component of Gramoxone." 23 Correct? 24 A. That's what it says, yes. 25 Q. And those were the findings of these	40 1 across the blood-brain barrier, but there were many 2 other studies which addressed that point in more 3 detail. 4 Q. Many other animal studies? 5 A. Mostly animal studies. 6 Q. And when you say many other animal studies 7 that address that point, what animal studies are you 8 referring to specifically? 9 A. Just as an example, some studies that were 10 done in the 1990s by ICI as it was, Zeneca, were 11 looking specifically at the ability of paraquat to be 12 transported into the brain. 13 Q. Were those the Widdowson and Naylor 14 studies? 15 A. That's correct. 16 Q. And those were undertaken in the 1990s, 17 you said? 18 A. Those were in the 1990s, yes. 19 Q. Roughly 30 years after paraquat was in 20 the market in the United States? 21 A. That would be right, yes. 22 Q. Were there any other studies prior to that 23 time that was investigating the issue of whether or 24 not paraquat could get into the brain? 25 A. I'm sure there were, yes. I'm afraid

Conducted on September 17, 2024

41 1 I don't have an encyclopedic knowledge of every study, 2 but, yes, Widdowson was not the first -- the very 3 first observation of that. 4 Q. And the other studies prior to Widdowson 5 and Naylor, those were studies undertaken by Syngenta? 6 A. Some. Not all. 7 Q. Can you recall any studies undertaken by 8 Syngenta prior to Widdowson and Naylor investigating 9 whether or not paraquat could get into the brain of 10 animals? 11 A. No, I don't recall specific examples right 12 now. 13 Q. And we'll note for the record, Exhibit 3, 14 "The effect of Gramoxone on the activity of the 15 nervous system of laboratory animals," was identified 16 in the Notice of Deposition at 5B. 17 Do you have any reason to dispute that? 18 MR. NARESH: I'll also note for the record 19 that Dr. Botham answered all your questions on 5B. 20 MR. DICKENS: I'll go ahead and hand you 21 Exhibit 4 for the record. 22 (Exhibit 4 marked for identification.) 23 BY MR. DICKENS: 24 Q. I've handed you Exhibit 4 for the record, 25 which is a document identified in the Notice of	43 1 Q. And then the next page, there's some 2 histology listed, correct? 3 A. That's correct. 4 Q. And in this particular individual, there 5 were effects on the brain that were listed, right? 6 A. There were. 7 Q. And those effects included degenerative 8 changes in the cells in the substantia nigra, the 9 Purkinje cells of the cerebellum, right? 10 A. That's correct. 11 Q. Substantia nigra, that's a structure of 12 the brain that plays a role in controlling movement, 13 mood, and other brain functions? 14 A. That's correct. 15 Q. Substantia nigra is a critical brain 16 region for the production of dopamine? 17 MR. NARESH: Objection to the extent it 18 calls for expert testimony. 19 THE WITNESS: It is correct, yes. 20 BY MR. DICKENS: 21 Q. Parkinson's disease is a progressive 22 disorder caused by degeneration of nerve cells in the 23 brain called the substantia nigra? 24 MR. NARESH: Same objection. Also, these 25 are questions that Dr. Botham has been asked and
42 1 Deposition, topic 5. 2 Is this a document you reviewed 3 previously, Dr. Botham? 4 A. Yes, it is. 5 Q. And this is an autopsy of a poisoning 6 victim; is that right? 7 A. That's correct. 8 Q. This is one of the postmortem studies that 9 you were referring to in your earlier testimony, 10 correct? 11 A. That's correct. 12 Q. This is an autopsy of an individual who 13 was a farm worker, correct? 14 A. Yes, that's correct. 15 Q. And the autopsy took place in October of 16 1976, right? 17 A. That's right. 18 Q. Turn to page 2. The bottom of the page, 19 there's an opinion on the cause of death. 20 Do you see that? 21 A. I do. 22 Q. The cause of death is related to paraquat 23 ingestion. 24 Do you see that? 25 A. I do.	44 1 answered previously as a corporate representative in 2 prior deposition as to which plaintiffs' counsel have 3 access. 4 (Stenographer clarification.) 5 MR. NARESH: ...previously as a corporate 6 representative of Syngenta and that plaintiffs' 7 counsel have access to. 8 THE STENOGRAPHER: Thanks. 9 BY MR. DICKENS: 10 Q. Is that correct? 11 A. Yes, correct. 12 Q. Now, "degenerative" means a continuous 13 process where cells are damaged over time, correct? 14 A. That would normally be assumed from that 15 phrase, yes. 16 Q. Do you know whether the findings of this 17 autopsy were ever published in a scientific or medical 18 journal? 19 A. I don't know. 20 Q. Did you do anything to determine whether 21 or not the results of this autopsy were published in 22 any way? 23 A. I don't recall looking for that. 24 Q. Do you know whether or not this autopsy or 25 the other postmortem studies that you referred to were

Conducted on September 17, 2024

45 1 ever submitted to the United States Environmental 2 Protection Agency? 3 MR. NARESH: Objection; scope. 4 THE WITNESS: I have no knowledge of that. 5 BY MR. DICKENS: 6 Q. There were findings of autopsies of 7 paraquat poisoning cases that were published, though, 8 weren't there? 9 A. Yes, there were. 10 Q. And almost all of them showed effects of 11 paraquat on the brain, didn't they? 12 A. Certainly some did, yes. 13 Q. And when you say "some," the majority, 14 right? 15 A. I take your word for it. I've not added 16 them up. 17 (Exhibit 5 marked for identification.) 18 MR. DICKENS: I'll go ahead and hand you 19 Exhibit 5 for the record. 20 Exhibit 5 is another document identifying 21 topic 5 in the Notice of Deposition. 22 BY MR. DICKENS: 23 Q. Is this a document you've seen before, 24 Doctor? 25 A. Yes, I believe so.	47 1 Q. Okay. It goes on to list 14 particular 2 publications where effects on the brain and CNS were 3 seen, right? 4 A. Well, again, I haven't added them up, but, 5 yes, I'm sure that looks like approximately the right 6 number. 7 Q. And some of these, as on page 3, the 8 Russell publication involves multiple cases where CNS 9 and brain effects were seen, right? 10 A. Yes. 11 Q. Then on the page ending 9336, there's a 12 section "Bibliography of references where details of 13 postmortem paraquat brain concentrations were given." 14 Do you see that? 15 A. Yes, I do. 16 Q. And it goes on to list 14 more 17 publications where brain concentrations of paraquat 18 were given. 19 A. Yes, indeed, consistent with the answer 20 I gave earlier. 21 Q. And those -- when it says "paraquat brain 22 concentrations were given," these are instances, 23 in fact, where paraquat was found in the brain of the 24 individuals who died after ingesting paraquat? 25 A. Yes, that's correct.
46 1 Q. And this is a document that was prepared 2 by Syngenta, correct? 3 A. Yes, I understand so. 4 Q. It's titled "Effects of Paraquat on the 5 Brain - an annotated bibliography in three parts." 6 Right? 7 A. Correct. 8 Q. Now, this particular document identifies 9 references in published literature where brain and 10 the CNS were examined. 11 Is that your understanding? 12 A. That's correct. 13 Q. And there's a section here on the first 14 page "Bibliography of references where the brain/CNS 15 was examined and no effects were seen." 16 Right? 17 A. Yes. 18 Q. And there are three particular references 19 in that section, right? 20 A. There are. 21 Q. Then there's, on the same page, a 22 "Bibliography of references where the brain/CNS were 23 examined and effects were seen." 24 Do you see that? 25 A. I do.	48 1 Q. Now, Syngenta would have known from at 2 least the 1990s that a farmer spraying crops with 3 paraquat was going to end up with paraquat in their 4 brain, right? 5 MR. NARESH: Objection to form, 6 foundation, scope. 7 THE WITNESS: What Syngenta knew is 8 that -- as this report actually does also say, is that 9 the paraquat poisoning results in a lot of different 10 pathologies, and paraquat does enter a number of 11 tissues. But it does include the brain, certainly. 12 BY MR. DICKENS: 13 Q. You mentioned other pathologies, but 14 I think, as you just said, that does include effects 15 on the brain as well, right? 16 MR. NARESH: Same objections as before. 17 THE WITNESS: Yeah, and the focus of this 18 is on the brain, but certainly in many of these cases, 19 other pathology was seen. 20 BY MR. DICKENS: 21 Q. Turn back to that page we had you on, the 22 9336, the "Bibliography of references where details of 23 postmortem brain concentrations were given." 24 And specifically refer to the last 25 publication on the document, by Cravey, "Poisoning by

Conducted on September 17, 2024

49 1 paraquat." 2 Do you see that? 3 A. Yes. 4 Q. That's a publication from 1978, right? 5 A. Yes. 6 Q. And it's referring to three human cases of 7 fatal post-paraquat ingestion, right? 8 A. Correct. 9 Q. And these were deaths 22, 21 days, and 10 8 hours post ingestion, correct? 11 A. Correct. 12 Q. Now, it gives the actual postmortem 13 paraquat concentrations for those three individuals, 14 correct? 15 A. Correct. 16 Q. And they include 0.09, 6.3, 1.5, ug/grams 17 respectively. 18 Can you tell us what that means in your 19 understanding? 20 A. These are the concentrations expressed as 21 micrograms per gram of brain tissue. So the brain 22 would have been weighed, it would then have been 23 analyzed for paraquat, and then the concentration of 24 paraquat is expressed, as I've just indicated, 25 micrograms of the pesticide per gram of brain tissue.	51 1 that in a little bit more detail; so, work that we've 2 done in the last 10, 20 years has tried to understand 3 exactly how much and how long paraquat may get into 4 the brain. 5 Q. Well, you knew from this particular study 6 published in 1978 that paraquat could stay in the 7 brain at least 22 days after exposure, didn't you? 8 A. Yes, yes. 9 Q. And that was known back in 1978 that 10 paraquat could stay in the brain for weeks after 11 exposure to paraquat? 12 A. Yes. 13 MR. NARESH: Objection; asked and 14 answered. 15 THE WITNESS: Sorry. 16 MR. DICKENS: I'll have marked Exhibit 6 17 for the record. 18 (Exhibit 6 marked for identification.) 19 MR. NARESH: Do you have a topic number 20 handy? 21 MR. DICKENS: Exhibit -- sorry. Topic 42. 22 I've handed you Exhibit 6, which is from 23 topic 42 in the Notice of Deposition, a document 24 titled "Xenobiotics linked to paraquat disease," dated 25 January 18, 2000, by a Ms. E.R.A. Ralph.
50 1 Q. So these brain tissues, then, were 2 reviewed, analyzed for paraquat post death, right? 3 A. That's right. 4 Q. And in these cases, it shows that paraquat 5 remained in the brain 22 days and 21 days after 6 ingestion, correct? 7 A. Yes. 8 Q. So paraquat remained in the brain 22 to 9 21 days after any exposure to paraquat in those 10 particular cases? 11 MR. NARESH: Object to the form. 12 THE WITNESS: It did. 13 BY MR. DICKENS: 14 Q. And you understand that paraquat can 15 accumulate in the brain, right? 16 A. We -- 17 MR. NARESH: Objection to form, scope. 18 THE WITNESS: Yes, we do understand a 19 little more now about, if you like, the kinetics of 20 brain, of paraquat entry into the brain, yes. 21 BY MR. DICKENS: 22 Q. You say we know now. You would have known 23 that back in 1978, right? 24 A. Well, I think we knew less then. I think 25 we now have done more experiments to try to understand	52 1 BY MR. DICKENS: 2 Q. Do you see that? 3 A. I do. 4 Q. And this is a internal report from Central 5 Toxicology Laboratory, right? 6 A. It is. 7 Q. And what is Central Toxicology Laboratory? 8 A. It is the toxicology laboratory which was 9 owned by ICI and then Zeneca, and which closed in 2007 10 to 2010. 11 Q. At this time in 2000, it was the main 12 research arm of what is now Syngenta, right? 13 A. It was the main toxicology safety 14 assessment lab of Syngenta. 15 Q. And at this point in 2000, that lab 16 undertook a report specific to xenobiotics and whether 17 or not it's linked to Parkinson's disease, right? 18 A. Correct. 19 Q. And what's your understanding of what 20 xenobiotics means? 21 A. Xenobiotics are -- they are external 22 agents, such as chemicals, which can interact with the 23 body, with the biology of a human being or with an 24 animal. 25 Q. And this is Elizabeth Ralph. Do you know

Conducted on September 17, 2024

53 1 Elizabeth Ralph? 2 A. I don't know who Elizabeth Ralph was. 3 I would be -- I've looked at this document before and 4 I would be -- I would speculate that she may have been 5 a temporary student at the Central Toxicology 6 Laboratory. 7 MR. DICKENS: Okay. I'll move to strike 8 everything after "I don't know who Elizabeth Ralph 9 [is]." 10 MR. NARESH: I'll object to that motion as 11 frivolous as part of the answer to the question. 12 BY MR. DICKENS: 13 Q. This was approved for issue by an 14 A.R. Soames. 15 Do you see that? 16 A. I do. 17 Q. Do you know who that is? 18 A. Yes. Tony Soames was a pathology 19 technician. 20 Q. And a circulation list here; do you see 21 that? 22 A. I do. 23 Q. With individuals from the pathology 24 department? 25 A. They were all from pathology, yes.	55 1 Right? 2 A. That's right. 3 Q. And it specifically cites to a reference 4 of a study by Barbeau, "Ecogenetics of Parkinson's 5 disease: prevalence and environmental aspects in rural 6 cases." 7 Right? 8 A. It does, that's correct. 9 Q. You're certainly aware of that particular 10 study? 11 A. I am. 12 Q. From 1987? 13 A. I am. 14 Q. Based on that study, Syngenta was aware 15 that epidemiologists had linked paraquat to 16 Parkinson's disease, right? 17 A. Yes. 1985 was the first epidemiological 18 study which suggested that that -- there could be 19 a link. 20 Q. Now, prior to that time, Syngenta itself 21 did not undertake any epidemiological studies on 22 paraquat and neurotoxicity, did they? 23 MR. NARESH: Objection to form. Can you 24 define "epidemiological"? 25 ///
54 1 Q. Okay. Now, there's a report number listed 2 here, right? 3 A. That's correct. 4 Q. And report numbers show up on various 5 Syngenta documents. What do the report numbers mean? 6 A. Well, the notation R, the R stands for 7 "research" and the numbering is just the numbering 8 which started at 1; so by the time it gets to 1463, 9 that's the 1,463rd document under the research 10 category. 11 Q. Okay. So these are officially 12 commissioned reports or research for individuals at 13 Syngenta to undertake, right? 14 A. They are reports of the research 15 activities, which were very broad, conducted by many 16 people at Central Toxicology Laboratory. 17 Q. Turn to page 8 of this document. 18 In the second paragraph, under 19 "2.5 Epidemiology," it states: 20 "Soon after, epidemiological studies 21 showed there to be a link between an increased 22 incidence of Parkinson's disease and an agricultural 23 lifestyle. Some reports directly link the increase in 24 Parkinson's disease to herbicides and pesticides, and 25 in particular paraquat."	56 1 BY MR. DICKENS: 2 Q. Did Syngenta undertake any human studies 3 to test whether or not paraquat was linked to 4 neurotoxicity in humans? 5 A. I think the answer to that is yes. They 6 were, strictly, not epidemiological studies, but there 7 were certainly investigations of, as we've been 8 discussing earlier, individuals exposed to paraquat, 9 in some cases high concentrations of paraquat, and 10 clinical observations were made on those individuals 11 to see -- and that would include looking at the 12 effects on the central nervous system. 13 So some of that work was published. 14 Q. What studies are you referring to? 15 A. Some of the worker -- so-called "worker 16 exposure studies" from people using paraquat in the 17 field, in parts of the Far East. 18 Q. So biomonitoring studies? 19 A. You could describe them as 20 "biomonitoring," yes. I call -- I think they're 21 better called "worker monitoring." 22 Q. Do you have an understanding -- in this 23 document, for example, it references a category 24 "epidemiology." Do you have an understanding what 25 "epidemiology" means?

Conducted on September 17, 2024

57 1 A. I do, yes. 2 Q. And what is your definition of 3 "epidemiology"? 4 A. It's the study of -- in human populations, 5 generally in human populations, of the potential for 6 a relationship between an exposure to, for example, 7 an environmental agent or an agent in the diet to the 8 development of a disease state. 9 Q. And there's different type of epidemiology 10 studies, right? 11 A. There are. 12 Q. Cohort, case control studies, as examples? 13 A. That's correct. 14 Q. What category did those biomonitoring or 15 worker exposure studies fall into from an 16 epidemiological standpoint? 17 A. I'm not an epidemiologist, but I think 18 that they would probably be described as observational 19 studies. 20 Q. Now, you mentioned those studies taken in 21 the Far East, those are studies that took place in 22 Malaysia? 23 A. That's one of the countries, yes. 24 Q. And some other countries as well, right? 25 A. Yes.	59 1 MR. NARESH: Well -- 2 MR. DICKENS: The topic is -- 3 MR. NARESH: -- hang on. 4 MR. DICKENS: -- exposure studies and 5 assessments. 6 MR. NARESH: I'm sorry, I don't want to 7 speak over you. We have had extensive back-and-forth 8 on a subpart-by-subpart basis and reached a number of 9 agreements on what is and what is not at issue. And 10 so it does matter because half of the ones in 17 are, 11 by agreement of counsel, not at issue in this 12 deposition, so please tell me which one. 13 MR. DICKENS: So we could say -- once 14 again, I don't believe it's necessary. We can ask 15 whatever we want, but I don't have the numbers here. 16 There are studies of Dunlop estate worker exposure to 17 paraquat in Malaysia -- 18 MR. NARESH: Okay. If you have specific 19 questions, then you can ask those questions, but some 20 of these -- you know, for example, we have an 21 agreement that 17D, which is the Swan study from 1969, 22 per a July 30 email from you-all, is not at issue in 23 this deposition, right. 24 And so that's what I'm talking about, that 25 a number of these you have said are not at issue in
58 1 Q. What specifically did Syngenta do in those 2 studies to figure out whether or not there were any 3 central nervous system effects? 4 MR. NARESH: Object to scope. 5 What's the topic? 6 THE WITNESS: We -- 7 MR. NARESH: Wait. Sorry. 8 THE WITNESS: Sorry. 9 MR. NARESH: What's the topic? I do 10 believe these -- 11 MR. DICKENS: It's topic 17. 12 MR. NARESH: -- questions have been asked 13 previously of Dr. Botham, including in depos- -- well, 14 in depositions that you have access to. 15 And which part of 17? There's -- 16 MR. DICKENS: The actual subject of 17, 17 which is "paraquat exposure studies and assessments 18 including findings and information." 19 MR. NARESH: Well, that's not -- no, no, 20 that's -- you've identified something like 60 or 70 21 different subparts to 17 and so, surely, it's one of 22 those; so just tell me which one and then we can -- 23 because there's a number of -- 24 MR. DICKENS: It's not a requirement to 25 tell you exactly which one.	60 1 this deposition, and so if you have specific questions 2 about studies that you've -- that, by agreement, are 3 at issue here, I'm more than happy to let it go 4 forward. 5 But, for example, a number of the ones on 6 Malaysia you have said are not going to be questioned 7 here, and I'm happy to show you the email if you'd 8 like. It's from July 30 from Mr. Travers. 9 MR. DICKENS: Well, I don't think anything 10 in our agreements prevents follow-up questions to 11 answers given by the witness in this particular case, 12 and so we're going to continue to ask follow-up 13 questions as deemed appropriate. If he mentions his 14 reliance on particular studies for his answers to any 15 of the questions that we ask, nothing that we've 16 talked about would preclude us from following up on 17 those. 18 I'll continue to do so, unless I'm 19 prevented by the Special Master or the Court. If you 20 want to jump off and contact Randi Ellis, I'm happy to 21 do so. 22 MR. NARESH: Look, let's see where this 23 goes, but this is exactly the concern that I raised 24 with you multiple times, that you're going to retread 25 ground that has been asked and answered over the

Conducted on September 17, 2024

61 1 course of seven days of depositions with Dr. Botham. 2 (Stenographer interjection.) 3 MR. NARESH: This is exactly the concern 4 that I've raised multiple times, that the subjects 5 that you're asking about are exactly what was asked 6 and answered of Dr. Botham in his seven prior days of 7 deposition. This line of questioning has been asked 8 of Dr. Botham repeatedly by multiple previous lawyers, 9 as a corporate representative. 10 Let's see where it goes, but this is 11 precisely what the point of incorporating prior 12 depositions was intended to avoid, was answering these 13 questions for a second or a third time just because 14 you didn't like the prior answers, okay. 15 So let's see where this goes, but we will 16 probably have to get Ms. Ellis on the phone once it is 17 daylight in the Central Time Zone, and I need to make 18 my record on this, so let's go for a while and then 19 we'll call her at a break. 20 MS. ELLIS: You guys, I'm here. 21 MR. DICKENS: Hey, Randi. 22 MR. NARESH: I'm sorry. 23 MS. ELLIS: I'm listening. 24 MR. DICKENS: It's bright and early. 25 MS. ELLIS: I'm here. Yes, it is. Keep	63 1 system. 2 Q. Was there any long-term follow-up of those 3 individuals? 4 A. There was some follow-up. So it wasn't 5 just a one-off in some cases. There were -- there was 6 follow-up. It depends on your definition of 7 "long-term." 8 Q. Well, tell me how long the follow-up, to 9 your understanding, was in the studies that you're 10 specifically relying on? 11 A. I don't recall exactly what that length of 12 follow-up was. I seem to remember that it was 13 certainly more than a year in one or two cases, but 14 certainly not a decade; so it was -- it depends what 15 your definition of "long-term" is. 16 Q. So not ten years, right? 17 A. No. 18 Q. Not five years, correct? 19 A. I don't think so, no. 20 Q. Dr. Botham, based on your understanding, 21 you'd agree it would take far longer than a year for 22 Parkinson's disease to develop, right? 23 MR. NARESH: Objection to form, vague. 24 THE WITNESS: Yes. 25 ///
62 1 going. 2 MR. DICKENS: Okay. 3 BY MR. DICKENS: 4 Q. Doctor, what specifically did Syngenta do 5 in the worker exposure studies to figure out whether 6 or not there were any central nervous system effects? 7 MR. NARESH: Which studies are you talking 8 about? 9 MR. DICKENS: I am talking about... 10 BY MR. DICKENS: 11 Q. You mentioned the biomonitoring exposure 12 studies in the Far East, I believe you said, right? 13 A. Yes, yes. 14 Q. Okay. And so were you -- when you 15 mentioned those studies in the Far East, were there 16 any particular studies that you were referring to in 17 your previous answer? 18 A. Yes. And, if I might, this is where, for 19 example, I'm referring to my document folder that we 20 mentioned at the beginning. So studies such as those 21 authored by Howard and others. They indicate that 22 there were clinical observations of those individuals 23 which looked at a number of -- the health generally of 24 those individuals, and that did include an assessment 25 of any potential effects on the central nervous	64 1 BY MR. DICKENS: 2 Q. Last sentence of that paragraph: 3 "These conflicting reports suggest that a 4 gene/environment interaction may well be very 5 important in the etiology of Parkinson's disease. 6 Purely genetic factors seem to be significant only in 7 juvenile onset PD..." 8 Do you see that? 9 A. I do. 10 Q. And do you agree with that statement? 11 A. It's still generally true. Certainly, 12 genetic factors are more prevalent in early onset 13 Parkinson's disease. I wouldn't, today, describe it 14 as "juvenile." 15 The gene/environment interaction is still 16 very much an open book. It's not clear yet what -- 17 how genes and environment may interact. 18 Q. And on the next page, under "Genetic 19 factors," it states: 20 "Current understanding of the etiology of 21 Parkinson's disease indicates purely genetic 22 Parkinson's is rare, and causes early onset of the 23 disease (before the age of 50)." 24 And that's what you were just referencing, 25 right?

Conducted on September 17, 2024

65 1 A. That's correct. 2 Q. Under "Non-genetic factors": 3 "Oxidative damage caused by free radicals 4 is currently held to be the main pathogenic factor in 5 idiopathic Parkinson's disease." 6 For non-genetic factors. Right? 7 A. That's what it says. I wouldn't 8 necessarily agree with that statement. 9 Q. Okay. What don't you agree with? 10 A. I don't think there's any evidence to say 11 that in idiopathic Parkinson's disease that that is 12 caused by the mechanism of oxidative damage. 13 Idiopathic Parkinson's disease, by definition, means 14 the mechanism, the origin of that Parkinson's disease 15 is unknown. 16 Q. Will you agree that oxidative damage 17 caused by free radicals is held to be the main 18 pathogenic factor in environmental-caused Parkinson's 19 disease? 20 MR. NARESH: Object to the form. 21 THE WITNESS: Even that, I would disagree 22 with. It is one possible mode of action, but 23 I would not agree with the view that it is the only 24 one. 25 ///	67 1 That's something you agree with, right? 2 A. I do. 3 Q. And you've testified to that in prior 4 depositions, correct? 5 A. Correct. 6 Q. It states later: 7 "... paraquat produces reactive oxygen 8 species which [is] the classical theory of the 9 etiology of Parkinson's disease..." 10 You agree with that statement, don't you? 11 A. Sorry, could you just repeat that? 12 Q. Yes. 13 "... paraquat produces reactive oxygen 14 species which [is] the classical theory of the 15 etiology of Parkinson's disease..." 16 MR. NARESH: I'm sorry, where? I'm not 17 seeing it. 18 BY MR. DICKENS: 19 Q. It is the bottom section "4.2.3 Mechanisms 20 of paraquat-induced cytotoxicity." Halfway in that 21 paragraph. 22 MR. NARESH: Oh, do you see it? 23 THE WITNESS: Yes, I see it. But I don't 24 agree -- I think as I explained, I don't agree with 25 that. I think it is one possible mechanism but it
66 1 BY MR. DICKENS: 2 Q. Now, this report in 2000 I think you 3 mentioned was, to your understanding, by a research 4 student with the pathology department? 5 A. I'm afraid that is speculation because 6 I don't -- I'm not able to find any direct evidence 7 for that. 8 Q. Was there ever any officially commissioned 9 reports from Syngenta that was conducted by a 10 neurologist on xenobiotics and the link to Parkinson's 11 disease, to your understanding? 12 A. Not by a neurologist, no. We certainly 13 employed external experts on epidemiology, for 14 example, to look at the effect of -- the influence of 15 xenobiotics and other factors that could be involved 16 in Parkinson's disease. 17 Q. Turn to page 17. Section "Mechanisms of 18 paraquat-induced cytotoxicity." 19 Do you see that? 20 A. I do. 21 Q. Do you know what "cytotoxicity" means? 22 A. It's the death of cells. 23 Q. It starts off: 24 "Once within a cell, paraquat cyclically 25 reduced and reoxidized."	68 1 certainly is not the classical theory of the etiology 2 of Parkinson's disease. I think that is a 3 misrepresentation. 4 BY MR. DICKENS: 5 Q. Now, you do agree paraquat produces 6 reactive oxygen species, though, right? 7 A. Yes, I do. 8 Q. Okay. So it's the second part of that 9 paragraph you don't agree with? 10 A. I agree, yes. 11 Q. Okay. 12 Turn to page 18. In the paragraph right 13 before "The blood/brain barrier and paraquat," it 14 begins: 15 "Paraquat can localize to neurones where 16 neuromelanin is produced..." 17 Do you see that? 18 A. I do. 19 Q. And you agree with that? 20 A. Yes, it can. 21 Q. Turn to page 22 now. 22 At the top of that page, and this is 23 referring to the Brooks study, which is discussed in 24 the page earlier, but it states: 25 "The data seemed quite compelling;

Conducted on September 17, 2024

69 1 however, a few questions remain unanswered." 2 Right? 3 A. Yes. 4 MR. NARESH: Object on completeness. 5 BY MR. DICKENS: 6 Q. And then later on in "The future for 7 paraquat research," the last sentence: 8 "Further studies must be done in different 9 species to investigate the permeability of the 10 blood/brain barrier to paraquat, and the role of 11 genetics in determining susceptibility." 12 Right? 13 MR. NARESH: Object on completeness 14 again -- 15 THE WITNESS: Yes -- 16 THE STENOGRAPHER: I'm sorry, I didn't 17 hear that. 18 MR. NARESH: I'm objecting on 19 completeness. It's missing the surrounding context. 20 THE WITNESS: Yes, some of these 21 statements are actually what led me to speculate that 22 this was written by a student because there are some 23 very broad statements which I think -- you would 24 expect a student who has perhaps not been an expert in 25 this area for some time to write.	71 1 literature. 2 Q. And specifically approved by a Syngenta 3 employee, right? 4 A. Yes. 5 Q. Did you see anything in your review of 6 documents to suggest that anyone at the time in 2000 7 within Syngenta disagreed with any of the statements 8 in this document? 9 A. I don't have direct evidence that they 10 were criticizing any of the content of this report. 11 I think, like I've been doing, in 2000 I'm sure that 12 if other people had read this, they may have had some 13 questions about whether everything was actually fully 14 accurate. 15 Q. Is it your understanding that individuals 16 within Syngenta did not read this particular report? 17 A. I suspect it was read by a small number of 18 people and maybe only the people who are on the 19 circulation list. 20 Q. What did Syngenta do after 2000? What 21 different studies in different species did Syngenta 22 conduct to investigate the permeability of the 23 blood-brain barrier? 24 A. Well, by then we had already done studies 25 in rodents -- rats and mice -- and we didn't directly
70 1 So I think that some of these statements 2 are too general and are not necessarily completely 3 accurate. 4 MR. DICKENS: I move to strike. 5 BY MR. DICKENS: 6 Q. Doctor, my question specifically was all 7 it does is state: 8 "Further studies must be done in different 9 species to investigate the permeability of the 10 blood/brain barrier to paraquat, and the role of 11 genetics in determining susceptibility." 12 That's what it states, right? 13 A. Yes. That's an opinion, yes. 14 Q. Now, this report, this was commissioned by 15 Syngenta specifically, right? 16 A. I really don't know how it was 17 commissioned. 18 Q. It was given a report number, right? 19 A. It was certainly written up and issued as 20 a report, yes. 21 Q. A report from Syngenta? 22 A. It was a report from the author as a -- 23 I'm assuming, as the product of this lady's time in 24 Central Toxicology Laboratory and the work that she 25 clearly seemed to do mainly with reviewing the	72 1 address the question of the permeability of the 2 blood-brain barrier, but, subsequently, there were 3 certainly studies done, for example, in the nonhuman 4 primate, and now we're talking much later, where we 5 were looking at the distribution of paraquat in the 6 body of the nonhuman primate, including the brain. 7 Q. When were those nonhuman primate studies 8 undertaken? 9 A. They were done in the time period of 10 around 2016 to 2019, so published in 2019. 11 Q. So 19 years after this particular report? 12 A. That's correct. 13 Q. That was the Stevens study? 14 A. That's correct. 15 Q. You didn't measure paraquat in the brain 16 in the Stevens study, right? 17 A. We did model the amount of paraquat that 18 we expected to be in the brain, yes. 19 Q. Now, the earlier studies that were taken 20 prior to this time, Widdowson and Naylor, those were 21 in rats? 22 A. Yes. 23 Q. Rats lack neuromelanin? 24 A. I believe that's true, yes. 25 Q. Nonhuman primates possess neuromelanin?

Conducted on September 17, 2024

73 1 A. Yes, that's right. 2 Q. Humans do as well? 3 A. Yes. 4 Q. Now, with respect to Stevens, you 5 mentioned there was modeling done. Modeling is not 6 the same as directly measuring the amount of paraquat 7 in the brain, right? 8 A. It's not, but today, in today's science, 9 mathematical modeling is often as accurate as actually 10 directly measuring substances, and we were using very 11 modern modeling techniques. 12 Q. What are you relying on for your statement 13 that mathematical modeling is often as accurate as 14 actually measuring the amount of paraquat in the 15 brain? 16 A. Well, we collaborated with people in the 17 United States who were experts in this field, so it 18 wasn't just Syngenta scientists that would be saying 19 that. So we were working with a state-of-the-art 20 research organization in mathematical modeling. 21 Q. So those individuals working in 22 mathematical modeling told you that mathematical 23 modeling is as accurate as actually measuring how much 24 is in the brain? 25 A. It can be. You have to calibrate your	75 1 would have been meaningless without actually doing a 2 proper, what I call a kinetic study and that would 3 have required more animals. 4 BY MR. DICKENS: 5 Q. Now, do you understand that all the 6 monkeys in the Stevens study were killed? 7 A. They were, yes. 8 MR. NARESH: Are you moving to a new 9 document? 10 MR. DICKENS: I am, yeah. We can put that 11 away. 12 MR. NARESH: We've been going for about an 13 hour and 15. 14 MR. DICKENS: Yeah. 15 MR. NARESH: Take five, ten? 16 MR. DICKENS: Perfect. Whatever you need. 17 THE VIDEOGRAPHER: We are going off the 18 record at 10:39. 19 (Break taken.) 20 THE VIDEOGRAPHER: We are back on the 21 record at 10:52. 22 MR. DICKENS: Welcome back, Doctor. I'm 23 going to hand you Exhibit 7 for the record. 24 (Exhibit 7 marked for identification.) 25 MR. NARESH: Which topic?
74 1 mathematical model against actual data, so we -- 2 and that is part of coming to the conclusion about the 3 relative accuracy, and that's exactly what we did do. 4 Q. You could have directly measured the 5 amount of paraquat in the brain in the Stevens study, 6 right? 7 A. Yeah. In theory, yes. In practice, that 8 would have been a very difficult experiment to do. 9 Nonhuman primates are, of course, a highly protected 10 species in laboratory animal experiments, and in order 11 to do the ideal experiment, to answer your question, 12 we would have had to have used significantly more 13 nonhuman primates than we did and it would have not 14 been possible -- we know it would not have been 15 possible to get ethical approval to do those studies. 16 MR. DICKENS: I'll move to strike. 17 BY MR. DICKENS: 18 Q. Doctor, I didn't ask you whether or not it 19 would be difficult to do so. I just simply asked, you 20 could have directly measured the amount of paraquat in 21 the brain in the Stevens study, right? 22 MR. NARESH: I'll object to that. 23 Go ahead. 24 THE WITNESS: I stick by my answer. We 25 could have looked for paraquat in the brain, but it	76 1 MR. DICKENS: Topic No. 6. 2 MR. NARESH: Oh, it's 6GG? 3 MR. DICKENS: Yeah, I should have had 4 those numbered -- or lettered. 5 BY MR. DICKENS: 6 Q. Doctor, I've handed you -- 7 MR. NARESH: Wait, not GG. I'm still 8 looking for it. Let me withdraw that for the record. 9 BY MR. DICKENS: 10 Q. -- Exhibit 7, which is a document 11 identified in topic 6 of the Notice of Deposition, 12 dated February 1, 1976. 13 Do you see that? 14 A. I do. 15 MR. NARESH: I'm sorry if I'm being dense, 16 but where is this in topic 6? 17 MR. DICKENS: Q. 18 MR. NARESH: I have Q as a Syngenta 19 Bates-numbered document, not a CUSA document. 20 MR. DICKENS: I don't know. It's the last 21 one. 22 MR. NARESH: Let's go off the record for 23 a second. 24 MR. DICKENS: We can go off the record. 25 THE VIDEOGRAPHER: We are going off the

Conducted on September 17, 2024

77 1 record at 10:54. 2 (Off the record.) 3 THE VIDEOGRAPHER: We are back on the 4 record at 10:56. 5 BY MR. DICKENS: 6 Q. Okay. Doctor, I handed you a document 7 dated February 1, two thousand -- sorry, 1976, 8 relating to a paraquat toxicology meeting. 9 Do you see that? 10 A. I do. 11 Q. And this is a document you've reviewed 12 before? 13 A. I've certainly looked at this in the last 14 couple of months, yes. 15 Q. Okay. And this is actually a letter which 16 was signed off by a Dr. Cavalli. 17 Do you see that? 18 A. That's correct. 19 Q. And do you understand Dr. Cavalli to be 20 with Chevron? 21 A. Yes, he was. 22 Q. And Syngenta and Chevron had a contract or 23 agreement with respect to the sale of paraquat in the 24 United States? 25 A. Yes, that's correct.	79 1 Ken Fletcher of CTL, right? 2 A. Correct. 3 Q. "In fact, the cause of death from chronic 4 exposure to paraquat could not be determined from 5 these studies." 6 Right? 7 A. That's what it says. 8 Q. And that's an example of the studies being 9 poorly done with respect to Dr. Cavalli, as he reports 10 on this date, right? 11 MR. NARESH: Objection to form. 12 THE WITNESS: Yes. I don't know 13 specifically which studies Dr. Cavalli is referring 14 to, but that's what the record shows. 15 BY MR. DICKENS: 16 Q. Now, the documents -- or, sorry, the 17 studies were old and poorly done, in part -- strike 18 that. 19 The studies that were old and poorly done 20 are referring to studies that were initially submitted 21 by Syngenta and Chevron to the EPA in order to obtain 22 registration, right? 23 MR. NARESH: Objection; foundation. 24 THE WITNESS: That's my assumption. 25 ///
78 1 Q. And this states: 2 "The following is a summary of meetings 3 between [himself]," Dr Cavalli, "and Ken Fletcher of 4 CTL..." 5 Right? 6 A. Yes, that's right. 7 Q. And do you know who Ken Fletcher at CTL 8 is? 9 A. He left before I joined CTL, but, yes, he 10 was -- I can't remember whether he was medically 11 qualified but he was certainly in the toxicology 12 organization. 13 Q. If we can look at number 3 within this 14 letter, it states: 15 "We discussed at some length the gaps in 16 our knowledge of the chronic effects of paraquat 17 exposure." 18 Do you see that? 19 A. Yes. 20 Q. "The animal studies available are old and 21 do not meet the current standards. [...] Some are 22 poorly done." 23 That's what's stated here, right? 24 A. That's what it says, yes. 25 Q. As a summary of a conversation held with	80 1 BY MR. DICKENS: 2 Q. Before we move on from this document, if 3 we can turn to number 10. It states: 4 "Dr. Fletcher described an unpublished 5 case of paraquat poisoning by dermal absorption. An 6 individual in Yugoslavia sprayed waist-high weeds and 7 soaked his clothing." 8 Do you see that? 9 A. I do. 10 Q. And this is being reported by 11 Dr. Fletcher, correct? 12 A. That's right. 13 Q. At the end of that paragraph: 14 "This individual died an unknown time 15 later from what sounds like a typical paraquat death." 16 MR. NARESH: Object on the rule of 17 completeness. 18 BY MR. DICKENS: 19 Q. "The case has not been published and no 20 more details are available at present." 21 Do you see that? 22 MR. NARESH: Sorry, I didn't mean to cut 23 you off. I'll object on completeness; it leaves out 24 the middle sentences. 25 (Stenographer clarification.)

Conducted on September 17, 2024

81 1 MR. NARESH: I'm sorry, okay. I'll object 2 on completeness; it leaves out the middle sentences. 3 THE STENOGRAPHER: Thanks. 4 THE WITNESS: So do you have a question? 5 BY MR. DICKENS: 6 Q. Yeah. That's what it says, correct? 7 A. Yes, it does. 8 Q. Now, at this time in 1976, Syngenta was 9 aware of paraquat poisoning by dermal absorption, 10 right? 11 A. Yes, it was. 12 Q. And death could occur by dermal absorption 13 of paraquat, and that was known by Syngenta by 1976? 14 A. Yes. It would require a very extensive 15 exposure by the dermal route, but it was certainly 16 known. 17 Q. Okay. Now, this individual soaked his 18 clothing while spraying. The clothes were not changed 19 for two days, right? 20 A. That's right. That's what it says. 21 Q. "At this time, he was seen at the hospital 22 for a skin rash. The following day he sprayed again, 23 [...] resulting in severe chemical burns." 24 Correct? 25 A. Correct.	83 1 and invalid. 2 Correct? 3 MR. NARESH: What's the topic? 4 MR. DICKENS: Topic 8. Sorry, not topic 5 8. 86. 6 MR. TRAVERS: And 85. 7 MR. DICKENS: And 85. 8 BY MR. DICKENS: 9 Q. I'll ask again. Doctor, the EPA found 10 that IBT tests to support the registration of 11 pesticides were deficient and invalid, right? 12 A. I believe that was the case, yes. 13 Q. Those tests relied on fraudulent data, 14 right? 15 A. I've seen that phrase "fraudulent data." 16 I've never actually understood or looked at, in 17 detail, what the basis for that accusation of fraud 18 is. 19 Q. Did you look at that issue in detail for 20 preparation for today's deposition? 21 A. No, I did not. 22 Q. Did you look at any document specific to 23 IBT in preparation for today's deposition? 24 A. No. Again, only through sort of 25 tangential mention of the IBT studies. We did not go
82 1 Q. And is that an instance that you would say 2 or consider as extreme exposure enough to cause death 3 by dermal absorption? 4 A. Exactly. I think this is an example of 5 what I've just been saying. You would not normally 6 expect somebody to have such exposure as is described 7 here. 8 Q. It appears he sprayed on two days, right? 9 A. Yes. 10 Q. Now, the case was not published and no 11 more details were available. 12 Do you know whether or not this instance 13 or death was reported to the United States 14 Environmental Protection Agency? 15 A. I don't know that. 16 Q. Now, going back to the first page and the 17 animal studies that are referenced as "old," "do not 18 meet current standards" and "are poorly done," for 19 those early animal studies, Syngenta contracted with a 20 company Industrial Bio-Test Laboratories to conduct 21 paraquat toxicity studies for the purposes of EPA 22 registration, correct? 23 A. I understand that to be true, yes. 24 Q. And the EPA found that IBT tests to 25 support the registration of pesticides were deficient	84 1 into that in any detail. 2 Q. Were you aware that IBT's president and 3 founder, Joseph Calandra, along with other IBT 4 employees, were found criminally responsible for their 5 fraud in the role in falsifying scientific data? 6 A. I don't remember the name, but I do 7 remember the incident being described to me in the 8 past. 9 Q. The past; while you were working for 10 Syngenta? 11 A. Yes. I'm not talking about in the last 12 two months. I remember it being said in the more 13 distant past. 14 MR. DICKENS: I'm going to hand you what 15 we'll mark as Exhibit 8 for the record. 16 (Exhibit 8 marked for identification.) 17 BY MR. DICKENS: 18 Q. Doctor, I've handed you Exhibit 8, which 19 is a document from the United States Environmental 20 Protection Agency, "Summary of the IBT review program, 21 from the office of pesticide programs," dated July 22 1983. 23 Right? 24 A. Correct. 25 Q. And this was -- report was approximately

Conducted on September 17, 2024

85 1 seven years after the last document we looked at where 2 Syngenta and Chevron were discussing the fact that 3 Syngenta studies were old and poorly done, right? 4 A. Yes. 5 Q. If you can turn to the first page. "The 6 IBT Review Process" states: 7 "This report summarizes the findings of 8 the joint program conducted by Environmental 9 Protection Agency and the Health Protection Branch of 10 Health and Welfare Canada to re-examine the health 11 effects studies on pesticides tested by Industrial 12 Bio-Test Laboratories (IBT)." 13 Right? 14 A. Yes. 15 Q. And that review: 16 "... revealed serious deficiencies in IBT 17 tests [...] to support the registration of numerous 18 pesticides." 19 Right? 20 A. Yes. 21 Q. Then it states: 22 "Exhibit A shows how many IBT and non-IBT 23 tests are available to EPA in each testing category 24 for the pesticide chemicals having some IBT-conducted 25 studies in their database."	87 1 A. Yes, that's right. 2 Q. And that's an O, correct? 3 A. That's right. 4 Q. So that means that the neurotoxicity study 5 submitted by Syngenta was conducted by IBT, right? 6 A. That's what that suggests, yes. 7 Q. And there were no other studies in EPA's 8 database on neurotoxicity as of the date of this 9 document in 1983, right? 10 A. I don't know that. This document doesn't 11 show me that, so I can't comment. 12 Q. Well, we just looked, Doctor, at the part 13 for section A, that describes what letter O and letter 14 X mean, right? 15 A. Yes. 16 Q. It says: 17 "The IBT studies are designated by the 18 letter O." 19 And: 20 "Studies in the EPA data base done by 21 [other] labs [...] are designated by the letter X." 22 A. Okay, sorry. I misunderstood the 23 question. Yes, that's true, I agree. 24 Q. So, for example, the other chronic effects 25 for paraquat, there's an IBT study but some --
86 1 Right? 2 A. Right. 3 Q. Now, if we can turn to Exhibit A, which 4 begins on page 10. Page 10, it just states "Exhibit A 5 - The Data Base for Industrial Bio-Test Chemicals" and 6 then the very next page kind of gives a summary of 7 Exhibit A. It states: 8 "The IBT studies are designated by the 9 letter O. Studies in the EPA data base done by labs 10 other than IBT are designated by the letter X." 11 Do you see that? 12 A. I do. 13 Q. Now, if we can find paraquat, it's 14 alphabetical -- 15 A. Yes. 16 Q. -- but there are no page numbers. 17 A. Yes. 18 Q. Let me know when you're there. 19 A. I'm there. 20 Q. Okay. 21 So there's paraquat listed and then 22 there's various categories of studies, correct? 23 A. Yes, that's right. 24 Q. And if you can look in the column for 25 neurotoxicity, there's one study presented, right?	88 1 A. Yes. 2 Q. -- other studies, right? 3 A. Now I understand. Yes, I agree. 4 Q. For neurotoxicity, however, there are no 5 other studies other than the IBT, right? 6 A. That's what that suggests, yes. 7 Q. So the EPA's approval of paraquat in the 8 1960s was done with respect to one neurotoxicity study 9 that was submitted in support of registration, right? 10 MR. NARESH: Object to the foundation and 11 the form. 12 THE WITNESS: That's what that suggests, 13 I agree. 14 BY MR. DICKENS: 15 Q. And that one study was conducted by IBT? 16 A. Right. 17 Q. The laboratory whose studies were found to 18 be invalidated and relied on by fraudulent data by the 19 EPA, right? 20 MR. NARESH: Objection; form, foundation. 21 THE WITNESS: That's what I understand, 22 yes. 23 BY MR. DICKENS: 24 Q. So as of 1983, there were no valid 25 neurotoxicity studies in the EPA's database supporting

Conducted on September 17, 2024

1 paraquat? 2 MR. NARESH: Objection to form and 3 foundation. 4 THE WITNESS: That's what this would 5 indicate. 6 BY MR. DICKENS: 7 Q. Now, Syngenta knew, even before the EPA's 8 report, that there were issues in IBT's tests being 9 conducted on behalf of Syngenta, right? 10 A. I don't -- I'm not familiar with the 11 detail of that history. I'm sorry. 12 MR. DICKENS: I'll go ahead and hand you 13 what we'll mark as Exhibit 9. 14 (Exhibit 9 marked for identification.) 15 BY MR. DICKENS: 16 Q. Exhibit 9 is a letter from an A.A.B. Swan 17 to a J.C. Calandra, director of Industrial Bio-Test 18 Labs, dated February 12, 1964. 19 Do you see that? 20 A. Yes. 21 Q. And it's regarding urinary estimation in 22 dogs, right? 23 A. Yes. 24 Q. Now, was paraquat on the market in the 25 United States in February 1964?	1 doubts on the method of paraquat estimation have been 2 resolved." 3 That's what is being reported to the 4 director of IBT, right? 5 A. Yes. 6 Q. And you'd agree that it would be unusual 7 for the paraquat intakes -- or, sorry, for the levels 8 of urinary excretion to be the same for paraquat 9 intakes that are tenfold different, right? 10 A. I would -- yes, I would agree. 11 Q. Do you know whether or not IBT did defer 12 on killing the animals until they resolved or 13 satisfied all doubts on the methods of paraquat 14 estimation? 15 A. I don't immediately recall having seen any 16 evidence for that, but perhaps you've got some 17 documents which would substantiate that. 18 Q. You can put that to the side. 19 MR. DICKENS: I'll go ahead and hand you 20 Exhibit 10 for the record. 21 (Exhibit 10 marked for identification.) 22 BY MR. DICKENS: 23 Q. I've handed you the exhibit dated May 11, 24 1966, correspondence from, once again, the director of 25 CTL, A.A.B. Swan, to an R.A. Hamilton, and W.
1 A. I think -- isn't that shortly before? 2 Q. To the best of your knowledge. 3 A. Yeah, I think it was shortly before. 4 Q. And do you know who A.A.B. Swan is? 5 A. Yes. He was the director of the Central 6 Toxicology Laboratory at that time. 7 Q. So the director of the Central Toxicology 8 Laboratory is writing to the director of IBT, right? 9 A. Yes. 10 Q. And he's writing with respect to a dog 11 study where they're testing urinary excretion of 12 paraquat? 13 A. Yes. 14 Q. In the very last couple sentences in the 15 third paragraph, the sentence beginning, "It is 16 difficult to understand..." 17 Do you see that? 18 A. Yes. 19 Q. And so the director of Central Toxicology 20 Laboratory writes: 21 "It is difficult to understand why dogs on 22 such widely varying paraquat intakes (up to tenfold) 23 should show no difference in the levels of urinary 24 excretion, and I think it would be wise to defer 25 killing the animals until we are satisfied that all	1 Johnston, or Johnstone, of Plant Protection Limited. 2 Do you see that? 3 A. Yes, I do. 4 Q. And what was Plant Protection Limited? 5 A. That was the division of ICI that was 6 involved in crop protection chemicals. 7 Q. So both CTL and ICI, those are now what is 8 known as Syngenta, right? 9 A. Yes. 10 Q. And so there's internal correspondence 11 here specific to Chevron and the paraquat petition, 12 right? 13 A. Yes. 14 Q. And in your understanding, this would be 15 the petition to the United States to register 16 paraquat? 17 A. That's correct. 18 Q. I direct your attention the third 19 paragraph, beginning "In the petition..." 20 In this paragraph, the director of CTL 21 notes that: 22 "In the petition for temporary tolerances 23 presented in January 1965..." 24 Do you know what temporary tolerances he's 25 referring to?

Conducted on September 17, 2024

93 1 A. I think it's a kind of interim step in 2 the registration. 3 Q. Registration in the United States? 4 A. Yes, yes. 5 Q. In order to sell paraquat? 6 A. Yes. 7 Q. And it mentions work being done on 8 inhalation toxicity by IBT. 9 Right? 10 A. That's right. 11 Q. And those were inhalation studies that 12 were submitted to the United States for the 13 registration in the United States to sell paraquat? 14 A. Right. 15 Q. He goes on at a subsequent "examination at 16 IHRL..." 17 And what is that referring to? 18 A. That was the Industrial Hygiene Research 19 Laboratory, which is what Central Toxicology used to 20 be called. 21 Q. So that is kind of the predecessor of CTL? 22 A. That's correct. 23 Q. Is it in the same location in the UK? 24 A. It actually was in the south of England 25 and then it moved to the north of England.	95 1 Q. So it was IBT, then, that did the 2 additional work, correct? 3 A. This is what this suggests, yes. 4 Q. Okay. And they apparently issued revised 5 reports in 1966, correct? 6 A. Right. 7 Q. Now turn the page. Now, at the bottom of 8 that first paragraph, "In the event..." 9 Do you see that? 10 A. Yes. 11 Q. "In the event the old, unrevised Bio-Test 12 work [was] submitted in the petition, together with 13 the first half of the paper I presented at the 14 Development Conference, as evidence for the proposed 15 threshold limit value for respirable aerosol 16 concentration. Thus, the greatest apparent 17 discrepancy in results has been presented, and this 18 could so easily have been avoided." 19 Right? 20 A. Yes. 21 Q. So what this is saying, from the director 22 of Central -- or IHRL at the time, Dr. Swan, is the 23 actual old IBT work that underestimated inhalation 24 toxicity was actually submitted to the EPA, right? 25 A. Yes.
94 1 Q. And so there was an examination of the IBT 2 studies at IHRL -- sorry. 3 Examination of a sample of equipment that 4 was used by IBT, and that led the scientists at 5 Syngenta to believe that the work actually 6 "underestimated the inhalation toxicity" of paraquat. 7 Right? 8 A. Yes, that's what it says. 9 Q. And that was actually confirmed by results 10 of experimental work at IHRL in 1965, right? 11 A. Yes, I believe so. Yes. 12 Q. So Syngenta actually re-examined work by 13 IBT and found that the studies they ran underestimated 14 the amount of inhalation toxicity from paraquat? 15 A. That would appear to be the case, yes. 16 Q. And if we can turn the page -- 17 MR. NARESH: I'll object on completeness; 18 you left out the last sentence. 19 BY MR. DICKENS: 20 Q. Okay. It says: 21 "[IBT] were informed and agreed to do 22 further work, in the light of which they issued 23 revised reports..." 24 Right? 25 A. Yes.	96 1 Q. Instead of the new revised reports that 2 were done at the request of Syngenta? 3 A. That would appear to be the case, yes. 4 Q. You can put that aside. 5 MR. DICKENS: I'll hand you Exhibit 11. 6 (Exhibit 11 marked for identification.) 7 BY MR. DICKENS: 8 Q. I'm actually going to direct your 9 attention to what is the fifth page, ending 6541. 10 A. Yes. 11 Q. These are minutes from a Chevron/ICI 12 meeting on October -- sorry, on August 31, 1977, 13 right? 14 A. That's right. 15 Q. It includes various individuals from CTL 16 and ICI, and then Chevron, right? 17 A. Yes. 18 Q. And it begins with a discussion of 19 Industrial Bio-Test Laboratory, two-year rat and dog 20 studies, correct? 21 A. Correct. 22 Q. "Dr. Cavalli..." 23 He's with Chevron, right? 24 A. Yes, he was at that time. 25 Q. And he told the meeting:

Conducted on September 17, 2024

97 1 "... IBT had severe problems at all levels 2 within the organization apart from right at the top, 3 during the '60s until mid '70s." 4 Right? 5 A. Yes. 6 Q. That was the very time that IBT was 7 conducting testing and research for Syngenta in order 8 to submit paraquat for registration in the United 9 States? 10 A. Yes. 11 Q. And as we looked at before, this was the 12 time that the only neurotoxicity study submitted with 13 paraquat for registration in the United States would 14 have been conducted by IBT? 15 (Stenographer clarification.) 16 MR. DICKENS: Yes. 17 BY MR. DICKENS: 18 Q. And as we looked at before, this was the 19 time that the only neurotoxicity study that was 20 submitted for registration in the United States for 21 paraquat was conducted by IBT? 22 A. Yes. 23 Q. It goes on: 24 "This [has] led to a loss in faith in IBT 25 by the FDA/EPA."	99 1 A. Yes. 2 Q. There was a poor identification of animals 3 in the IBT studies, right? 4 A. Yes. 5 Q. One animal actually died four times in 6 their study, correct? 7 A. Yes. 8 Q. And: 9 "Two-thirds of the experiment were 10 individually housed and one-third had 5 per cage - 11 no explanation and all data handled in the same 12 manner..." 13 Right? 14 A. Yes. 15 Q. These are serious concerns that would 16 invalidate the toxicology studies conducted by IBT, 17 right? 18 A. They would certainly seriously question 19 the quality of the study, yes. 20 Q. Well, one animal dying four times, I mean, 21 that goes beyond questioning the study; it invalidates 22 it, doesn't it? 23 A. I think certainly in terms of good 24 laboratory practice and so on, yes, it would. 25 Q. I mean, just common sense says that an
98 1 Right? 2 A. Yes. 3 Q. Now, at the time paraquat was submitted 4 for registration in the United States, the EPA did not 5 exist, right? 6 A. I don't have that detailed history, so 7 I can't comment on that. 8 Q. Anyway, FDA/EPA was asking, "a complete 9 review of all IBT studies which supported petitions." 10 Right? 11 A. Yes. 12 Q. And Chevron actually conducted a review of 13 those IBT studies? 14 A. Correct. 15 Q. And they reported at this meeting some of 16 their findings, correct? 17 A. That's written down here, yes. 18 Q. And some of those findings from the 19 two-year rat and dog studies were that the IBT study 20 had no concept of recording of data? 21 A. Yes. 22 Q. It reported, based on Chevron's review, 23 that no dates were recorded in the IBT studies, only 24 month numbers. 25 Right?	100 1 animal can't die four times? 2 A. Of course. 3 Q. And these two-year rat and dog studies, 4 these were studies that would have been submitted to 5 the EPA for registration of paraquat? 6 MR. NARESH: Objection; asked and 7 answered. 8 THE WITNESS: Yes, I believe so. 9 BY MR. DICKENS: 10 Q. If we can turn to the next page. The 11 second paragraph: 12 "As far as Chevron could ascertain, the 13 raw data for both the rat and dog paraquat studies had 14 been destroyed." 15 Right? 16 A. Yes. 17 Q. No longer existed? 18 A. Correct. 19 Q. All right. We can put that aside. 20 MR. DICKENS: I'll hand you Exhibit 12. 21 (Exhibit 12 marked for identification.) 22 MR. DICKENS: I've handed you Exhibit 12, 23 which, for the record, is topic 109 of the Notice of 24 Deposition. 25 ///

Conducted on September 17, 2024

101 1 BY MR. DICKENS: 2 Q. These are notes on another ICI/Chevron 3 meeting; this time in July 16, 1979, correct? 4 A. That's correct. 5 Q. Is this a document you reviewed in 6 preparation for today's deposition? 7 A. It is. 8 Q. And this includes, once again, individuals 9 from ICI as well as Chevron, right? 10 A. Yes, it does. 11 Q. Now, starting off on page 1, there's 12 a discussion on "Toxicology - Dermal Trigger." 13 Do you see that? 14 A. Yes, I do. 15 Q. And the second sentence begins, 16 "Dr. Rose," and that's a Dr. Michael Rose? 17 A. That's right, yes. 18 Q. He was with Syngenta? 19 A. He was at the Central Toxicology 20 Laboratory, yes. 21 Q. And what was his role with the Central 22 Toxicology Laboratory? 23 A. He was a biochemical toxicologist. He was 24 a section head of that -- of biochemical toxicology in 25 CLT.	103 1 A. No, I don't. 2 Q. Do you know whether or not those strengths 3 or equipment were contraindicated by Syngenta in any 4 way? 5 MR. NARESH: I'll object to that. You 6 just used a different word then, "contraindicated." 7 THE WITNESS: This suggests -- 8 MR. NARESH: Let him rephrase. 9 MR. DICKENS: Let me ask it again. 10 BY MR. DICKENS: 11 Q. Were the strengths or equipment -- strike 12 that. 13 Did Syngenta -- do you know whether or not 14 these deaths were at strengths, or equipment, that 15 Syngenta had warned should not be used in the spraying 16 of paraquat? 17 A. Well, I think that is -- this suggests 18 that the equipment and strengths that were used 19 were not those recommended by Syngenta. 20 Q. There's a difference between recommended 21 and telling someone not to use something, right? 22 A. Yes, but it is assumed that in saying "You 23 should use paraquat in this way, this strength, this 24 equipment," that is effectively an instruction for 25 safe use.
102 1 Q. It says: 2 "Dr. Rose drew attention to the ten known 3 incidents of death arising from dermal exposure to 4 paraquat." 5 Do you see that? 6 A. Yes. 7 Q. And we looked at the one case from 8 Yugoslavia earlier that we discussed, right? 9 A. Yes. 10 Q. Dr. Rose is reporting here there was at 11 least ten known incidents at this point in 1979 of 12 deaths from dermal exposure, correct? 13 A. Yes, that's right. 14 Q. Several of those were accidents with the 15 concentrate followed by inadequate remedial measures, 16 right? 17 A. Yes. 18 Q. Then he goes on that: 19 "... three published incidents relate to 20 spraying paraquat low volume at strengths, or with 21 equipment, not recommended." 22 Right? 23 A. Yes. 24 Q. Do you know what strengths or equipment 25 were being used in those particular cases?	104 1 Q. That you should use something is directing 2 them, while a recommendation is different; you'd agree 3 with that? 4 A. The purpose of a product label is to give 5 instruction as to how to best use a product, yes. 6 Q. And so that's a fair point. Do you know 7 whether or not the strengths or equipment being used 8 was specified on the label that it should not be used? 9 A. I can't comment on that. It will be 10 unusual to say, "Don't do it this way." Normally, 11 it's a positive statement saying to do it this way. 12 Q. All right. One worker, it mentions: 13 "... died following a leaking connection 14 from a backpack container to a herbicide applicator 15 and subsequent poor hygiene." 16 Do you see that? 17 A. Yes. 18 Q. A leaking backpack container would not be 19 against recommendations on the label, correct? 20 A. It would -- the label would probably say 21 that you should avoid that and what to do in the event 22 that it happens. 23 Q. Syngenta certainly was aware by this point 24 in 1979 of individuals wearing backpack containers 25 having leaking incidents, right?

Conducted on September 17, 2024

105 1 A. Yes. 2 Q. Do you know what poor hygiene is being 3 referred to here in this document? 4 A. I don't know specifically. You would -- 5 it would suggest that, for example, the individual 6 did not take action to decontaminate, to wash his 7 clothing or himself. 8 Q. If you go down to the bottom of that page, 9 under (ii) it says: 10 "Chevron have had up to a dozen cases in 11 their packaging plants of accidents where workers have 12 had quite severe dermal exposure and shown significant 13 paraquat levels in blood and urine." 14 Do you see that? 15 A. Yes. 16 Q. "Four or five [of them] were 17 hospitalized." 18 Right? 19 A. Yes. 20 Q. Were the Chevron workers, to your 21 knowledge, exposed to paraquat in ways that were not 22 recommended? 23 A. I can't comment on the working practices 24 in Chevron packing plants, I'm afraid. I've no 25 evidence to understand that.	107 1 A. I understand that there -- as you referred 2 earlier, that there were some incidents, for example 3 occasional nosebleeds. That's something that I've 4 been told about, yes. 5 Q. But there were other incidents you are 6 aware of of skin issues, such as keratosis, in the 7 manufacturing plants of paraquat? 8 A. Where there was significant exposure in 9 the early days of paraquat manufacture. 10 Q. Turn the page. It begins on top: 11 "[Syngenta] agreed to send details of 12 these cases to Dr. Rose." 13 Do you see that? 14 A. Yes. 15 Q. Do you know whether that was done? 16 A. I do not. 17 MR. NARESH: Did you say "Syngenta agreed 18 to..."? 19 MR. DICKENS: Oh, I might have. Let me 20 ask again. 21 BY MR. DICKENS: 22 Q. It says: 23 "Chevron agreed to send details of these 24 cases to Dr. Rose." 25 A. Yes. I'm sorry, I misheard you as well.
106 1 Q. Nonetheless, those individuals did have 2 paraquat in their blood and their urine, right? 3 A. Yes. I mean, the assumption must be that 4 there was some bad practice going on. 5 Q. And the assumption being the fact that 6 there was paraquat in their blood and urine? 7 A. The fact that they were exposed at all to 8 paraquat would be something you wouldn't expect in a 9 packaging plant. 10 Q. Syngenta, by this point in 1979, had 11 individuals working within their packaging plants who 12 experienced adverse health effects from exposure to 13 paraquat, such as severe nosebleeds, right? 14 A. Yes. 15 Q. Including dermal incidents as well, right? 16 A. I can't give you chapter and verse on that 17 as regards packaging, but there were certainly 18 incidents of dermal toxicity, yes. 19 Q. Including incidents of keratosis or skin 20 issues? 21 A. That's different. So the keratosis 22 was not in packaging plants; that was in manufacture. 23 Q. That's fair. So do you know whether or 24 not there were any issues of dermal incidents in the 25 actual packaging plants?	108 1 Yes, correct. 2 Q. Do you know whether or not Chevron did 3 send those to Dr. Rose? 4 A. No, I don't. 5 Q. Do you know whether or not Dr. Rose 6 reviewed those cases and drafted a report in any way? 7 A. I don't recall that. 8 Q. Do you know whether or not Syngenta ever 9 notified the United States EPA that Chevron workers in 10 packaging plants had quite severe dermal exposure and 11 ended up with paraquat in their blood and urine? 12 A. I don't know, but, in any case, that 13 would be the responsibility of Chevron. 14 Q. In the next section, "Inhalation," there's 15 a section here that's bracketed. It says: 16 "Irritation to mucus membrane and 17 nosebleed has always been associated with exposure of 18 workers to spray mist as a clear warning of exposure." 19 Right? 20 A. Yes. 21 Q. And you'd agree with that statement? 22 A. Yes. 23 Q. Turn two more pages to a section towards 24 the bottom, "Other Paraquat Studies." 25 Do you see that?

Conducted on September 17, 2024

109 1 A. Yes. 2 Q. It mentions: 3 "According to Chevron, IBT dog studies 4 tended to be well done and the only IBT study they 5 have so far succeeded in validating is a dog study." 6 Right? 7 A. Yes. 8 Q. Now, we looked at earlier that the IBT dog 9 studies were included in the group that was criticized 10 in the Chevron/ICI meeting, right? 11 A. Right. 12 Q. So not all the dog studies were well done; 13 we can agree on that? 14 A. Okay. 15 Q. Is that -- 16 A. Yeah, I don't -- sorry, I would need to go 17 back to just double-check that in that report, but 18 yes. 19 Right. So this -- well, the report that 20 we talked about earlier from the US EPA doesn't appear 21 to specify dog studies. 22 Q. I was actually referring to Exhibit 11, 23 and I'll put that back up here. It's hard to keep 24 track of all these. 25 A. Yes, okay.	111 1 Q. What's your understanding of what the 2 Rebuttable Presumption Against Registration in the 3 United States meant? 4 A. So this is one of the questions I had of 5 Mr. -- of Monty Dixon because I wasn't sure myself, so 6 how he described that was that the EPA would start 7 from a position that a registration was not possible 8 until -- essentially until there was a rebuttal to 9 that and that rebuttal should be based on data, on 10 studies, in order for them to allow registration. 11 Q. And that's a review that was initiated by 12 EPA itself, right? 13 A. Yes. 14 Q. And it was initiated -- or they initiated 15 the review of paraquat under this process because of 16 concerns that paraquat may cause unreasonable adverse 17 effects on people and the environment? 18 A. Yes. 19 Q. And that review was ongoing at this 20 particular time, right, in 1979? 21 A. That's correct. 22 Q. And as discussed at this meeting between 23 Chevron and ICI: 24 "... no attempt to discuss label changes 25 should be made unless it became apparent that the
110 1 Q. This is the one of the minutes of a 2 meeting held August 31, 1977. 3 A. Yes. 4 Q. It's at page ending 6541. 5 A. Right. 6 Q. And the section we were looking at is 7 "IBT two-year rat and dog studies." 8 Right? 9 A. Ah, right, okay. Yes. Mmm-hmm. 10 Q. So the issues they were reporting here 11 relate to the two-year rat and the dog studies, 12 correct? 13 A. Okay, yes. 14 Q. So we can turn back now and turn to the 15 second-to-last page, page 6 of this document. There's 16 a section "Proposed Label Changes" a little more than 17 halfway down the page. 18 Do you see that? 19 A. Yes, I do. 20 Q. Now, at the time of the IBT scandal and 21 the invalidation of those studies, paraquat was 22 undergoing something known as a RPAR, or Rebuttable 23 Presumption Against Registration in the United States, 24 right? 25 A. Yes.	112 1 technical case to rebut any particular trigger was 2 failing to influence EPA and that otherwise the Agency 3 was likely to issue an RPAR of paraquat." 4 Right? 5 A. Right. 6 Q. So, "We won't be discussing any labeling 7 changes with the EPA until we know whether or not 8 they're going to actually issue a Rebuttable 9 Presumption Against Registration of paraquat in the 10 United States"? 11 A. That would be my understanding of what was 12 said here, yes. 13 Q. Okay. So at this time, then, based on 14 meeting notes in 1979, ICI and Chevron knew that 15 dermal exposure could result in significant paraquat 16 levels in the blood and urine of humans, right? 17 A. Yes, when, essentially, there was a misuse 18 of the product. 19 Q. Okay. It knew that once in the blood, 20 paraquat could pass through the blood-brain barrier? 21 MR. NARESH: Objection; form. 22 THE WITNESS: Yes. 23 BY MR. DICKENS: 24 Q. It could accumulate in the brain? 25 A. Yes.

Conducted on September 17, 2024

113 1 Q. And there were death in users from 2 exposure on the skin, as well as inhalation of 3 paraquat? 4 A. Correct. 5 Q. You can put that aside. 6 MR. DICKENS: I'll hand you Exhibit 13 for 7 the record. 8 (Exhibit 13 marked for identification.) 9 BY MR. DICKENS: 10 Q. I've handed you Exhibit 13, which is a 11 statement read by Michael Rose to the US House of 12 Representatives on June 28, 1979, right? 13 A. Yes. 14 Q. Michael Rose, once again, as you 15 mentioned, was, it says here, a toxicology -- or a 16 paraquat toxicology research manager in the Central 17 Toxicology Laboratory of ICI, right? 18 A. Yes. 19 Q. And this is a statement Dr. Rose made to 20 the US government? 21 A. To the House of Representatives, yes; a 22 select committee thereof. 23 Q. Shortly after the meeting minutes that we 24 just looked at between ICI and Chevron, right? 25 A. That's just before, yes.	115 1 in 1979? 2 A. Yes. It's not a complete description but 3 it's a reasonable one. 4 Q. And it's what was reported to US Congress, 5 right? 6 A. I'm sorry? 7 Q. It is what was reported to the US 8 Government? 9 A. Yes, yes. 10 Q. Michael Rose goes on: 11 "All of this data, both experimental and 12 epidemiological, confirm our view that there are no 13 significant health hazards associated with the normal 14 use of the product." 15 And that product being paraquat, right? 16 A. Yes. 17 Q. And that was the message, or public 18 message, by ICI, or Syngenta, at this point, in June 19 1979, right? 20 A. Yes. 21 Q. That there were no significant health 22 hazards associated with use of paraquat? 23 MR. NARESH: No, no. I'll object; 24 misstates the document. 25 THE WITNESS: The keyword there is
114 1 Q. Michael Rose tells the US Congress that 2 ICI: 3 "... is one of the largest," I believe 4 that should be, "companies in the world, with 145,000 5 employees and sales (in 1978) of around \$9 billion in 6 petrochemicals, plastics, fibers, dyes [...] as well 7 as agricultural chemicals." 8 Right? 9 A. Correct. 10 Q. CTL at the time was staffed by 300 trained 11 scientists; is that correct? 12 A. At the time, it was correct. 13 Q. How many trained scientists are in the 14 Syngenta research laboratories currently? 15 A. Well, we don't do laboratory toxicology 16 in-house anymore; that is outsourced. But the 17 internal teams of what we now call product safety are 18 around about 200 or so. 19 Q. And those scientists' job was to provide 20 the ICI group with safety evaluation of all chemicals 21 used by the company to ensure that both their 22 employees and customers are not exposed to hazards. 23 Right? 24 A. Yes. 25 Q. And that's an accurate description of CTL	116 1 "normal use," by which we mean when it's used 2 according to the label instructions. So that -- in 3 other words, if you avoid the kind of exposures that 4 we've been talking about, if you breathe in an 5 aerosol, if you get it on your skin, of course there 6 can be health effects. 7 But if used normally -- what it means 8 by here is "normally" means as according to the 9 instructions, there should be no health hazards. That 10 was his intent, I think, in making this statement. 11 BY MR. DICKENS: 12 Q. You can put that aside. 13 Now, we talked about the Rebuttable 14 Presumption Against Registration earlier. The EPA 15 ultimately decided -- or ultimately issued its 16 decision in 1982 that the data did not support a 17 Rebuttable Presumption Against Registration for 18 paraquat, didn't it? 19 A. I'm sorry, I don't have that date to hand 20 so I'll take that as accurate. 21 Q. Do you understand whether or not, an RPAR, 22 as they say, was -- ended up being issued by the EPA? 23 A. I don't know whether that happened. 24 MR. NARESH: I'll do a belated scope 25 objection on that.

Conducted on September 17, 2024

117 1 (Exhibit 14 marked for identification.) 2 MR. DICKENS: I'm going to go ahead and 3 hand you Exhibit 14 for the record. 4 MR. NARESH: Can you give me the topic 5 number on this one? 6 MR. DICKENS: 105. 7 MR. NARESH: 105. 8 BY MR. DICKENS: 9 Q. I've handed you a document which is 10 identified in topic 105 of the Notice of Deposition, 11 a letter from a Maurice Green to a Dr. Braunholtz at 12 ICI/Plant Protection Division dated June 3, 1980. 13 Do you see that? 14 A. I do. 15 Q. And is this a document you reviewed prior 16 to this deposition? 17 A. Yes. 18 Q. And do you understand that Maurice Green 19 was a former employee of ICI? 20 A. Yes. I've confirmed that that is the 21 case. 22 Q. At this point in 1980, or June 3, 1980, 23 he was no longer an employee with ICI, right? 24 A. That's correct. 25 Q. But he is writing to a former colleague of	119 1 [...] [including] toxic substances, hazards to 2 consumers..." 3 Right? 4 A. Yes. 5 Q. Now, at this time in June 1980, Syngenta 6 was having problems with government authorities as 7 they were undergoing a Rebuttable Presumption Against 8 Registration, right? 9 A. Yes; so you indicated. 10 Q. He goes on: 11 "We independently assess the size of the 12 problem and make recommendations on what should be 13 done about it, and we also handle all the negotiations 14 with the government departments for our clients as we 15 know all the protocol and the right form in which to 16 present evidence and we also have an inside track to 17 EPA." 18 Right? 19 A. That's what it says. 20 Q. So he's reporting to an old colleague at 21 ICI that his new company assists chemical and 22 pesticide manufacturers in issues they're having with 23 the EPA, right? 24 A. Yes. And it says elsewhere that he also 25 works directly for the EPA as well, so he had a -- his
118 1 his, a Dr. Braunholtz, right? 2 A. Yes. 3 Q. Do you know who Dr. John Braunholtz is? 4 A. At that time, he would probably have been 5 the director of research -- of R&D, research and 6 development. 7 Q. Do you know what Maurice Green's role at 8 Syngenta was while he was working there? 9 A. I don't know what his role was. I know 10 that he was working in a part of ICI that was not the 11 pesticide, the agriculture business. I think he was 12 working in the chemicals business. 13 Q. He writes to John: 14 "I hope that you are well and that PPD is 15 flourishing." 16 That's Plant Protection Division, right? 17 A. Correct. 18 Q. Last paragraph: 19 "I greatly enjoy my new job in 20 Washington." 21 Right? 22 A. Yes. 23 Q. "My company exists to help any firms which 24 have problems with the government authorities such as 25 EPA, FDA, OSHA [...] over registration of products,	120 1 consultancy was -- had a number of different clients. 2 Q. And his inside track with the EPA, and 3 which he had from actual working with them as well, 4 and can be used to assist those manufacturers or 5 registrants with the problems that they were having; 6 that's what he's reporting, right? 7 A. My interpretation of this is that it would 8 help a company like ICI/Syngenta to understand how to 9 make representations and -- to the EPA in situations 10 that we're describing now. 11 Q. Representations to deal with situations 12 for the benefit of the registrants of pesticides such 13 as ICI with paraquat, right? 14 A. At the end of the day, in order to make 15 sure, I guess, that the EPA has the right information 16 in the right form at the right time. 17 Q. It goes on: 18 "EPA also use us to assess the risks of 19 products, effluents [...] from firms they suspect 20 because they have neither the money nor the staff to 21 do all the work themselves." 22 Right? So he's reporting the EPA doesn't 23 have the work or staff to do the assessment of risks 24 of pesticides? 25 A. Yes.

Conducted on September 17, 2024

121 1 Q. And that's why they call in his new 2 company to assist in that process? 3 A. Yes. 4 Q. Another field Maurice Green is getting 5 into is re-registration of pesticides, right? 6 A. Indeed. 7 Q. And he reports: 8 "They therefore settled," they being the 9 EPA, "for reconsideration of the active ingredients 10 only and issue of generalized registrations for 11 these." 12 Right? 13 A. Yes, and this is part of that other role 14 I was describing where the EPA are asking his agency 15 to do some work. 16 Q. And it's your understanding that the EPA, 17 in consideration of pesticides, considers the active 18 ingredient and the registration of the active 19 ingredient in the product, right? 20 A. They do, yes. 21 Q. So their concern for paraquat, for 22 example, is -- or for Gramoxone, would be looking at 23 the active ingredient being paraquat? 24 A. Yes, but regulatory authorities, including 25 US EPA, also look at the formulated product as well as	123 1 the risk assessments for 78 existing pesticides. [...] 2 the first one that EPA sent us was paraquat." 3 Right? 4 A. Yes. 5 Q. And so Maurice Green, then, would be 6 handling the analysis and re-review of paraquat at 7 Clement & Associates. 8 A. That seems to be the case, yes. 9 Q. So the former employee of ICI is reviewing 10 whether or not paraquat should be re-registered based 11 on the scientific information presented to the EPA? 12 A. Yes. 13 Q. And the last sentence on the last 14 page says: 15 "We have already had the toxicological 16 expertise in Clement to deal with the risk 17 assessment..." 18 Correct? 19 A. Yes. 20 Q. And that's being Clement Associates have 21 the toxicological expertise? 22 A. Yes. 23 Q. And he says: 24 "... I shall build up the facilities here 25 to do the benefit assessment and the risk-benefit
122 1 part of their registration process. 2 Q. Okay. And so the formulated product being 3 what's actually in the container -- 4 A. Yes. 5 Q. -- that's being sold to consumers? 6 A. Yes. 7 Q. And any of the ingredients within the 8 actual container itself, right? 9 A. That would be part of their assessment of 10 the formulated product, yes. 11 Q. Now, the reconsideration of the active 12 ingredients, that proved to be beyond the scope of the 13 present staff at EPA, according to Maurice Green, 14 right? 15 A. That's what it says. 16 Q. So they handed the whole job over to 17 Clement Associates, right? 18 MR. NARESH: Objection to foundation. 19 THE WITNESS: That's what it says. 20 BY MR. DICKENS: 21 Q. And do you have any reason to dispute that 22 that was the case? 23 A. No. 24 Q. Clement Associates: 25 "... have a \$5 million contract to develop	124 1 analysis." 2 Right? 3 A. Yes. 4 Q. So Maurice Green, the former employee of 5 ICI, was going to do the risk-benefit analysis on 6 paraquat for the EPA? 7 A. Yes. And, through today's lens, this all 8 looks a little strange, that you would describe this, 9 perhaps, today as a conflict of interest. But I can 10 assume that, at the time, this was recognized by the 11 EPA to be appropriate. 12 Q. Do you know whether or not the EPA knew 13 that Maurice Green was a former employee of ICI? 14 A. I don't know, no. 15 Q. Did you see any evidence in your review or 16 preparation for today's deposition that the EPA knew 17 that a former employee of ICI would be doing the 18 risk-benefit analysis for paraquat? 19 A. No, I've not seen that. 20 Q. And this risk-benefit analysis, this was 21 specific to the Rebuttal Presumption Against 22 Registration for the EPA, right? 23 A. Yes, and that, again, still now is normal 24 practice. It's -- there always is a balance between 25 what the benefit of a product is versus the potential

Conducted on September 17, 2024

125 1 risks. 2 MR. DICKENS: I'll hand you Exhibit 15. 3 (Exhibit 15 marked for identification.) 4 BY MR. DICKENS: 5 Q. I've handed you Exhibit 15 which, for the 6 record, is topic 105 of the Notice of Deposition, 7 which are minutes from a meeting of Chevron and ICI, 8 June 30 to July 2 of 1980. 9 Do you see that? 10 A. I do. 11 Q. And there's a Summary section beginning 12 with "Chevron," and this is less than 30 days from the 13 initial correspondence from Maurice Green on June 3, 14 1980, right? 15 A. Yes, that's right. 16 Q. So within a month's time: 17 "Chevron now confidently learned that an 18 RPAR will not issue on paraquat before early 1981 19 (latest date published by EPA is October 1980), and 20 the chances of an RPAR being issued at all seems to be 21 declining." 22 That's what they're discussing at this 23 meeting, right? 24 A. Yes. 25 Q. "As we already know, Clement Associates	127 1 Right? 2 A. Yes. 3 Q. Once again, they reference the fact that 4 the review of paraquat data has been turned over to 5 Clement Associates. 6 Right? 7 A. Yes, correct. 8 Q. And it was discussed between ICI and 9 Chevron that they learned of this independently 10 through contact of one of their former employees, 11 Maurice Green. 12 Right? 13 A. Yes. 14 Q. If we can go down underneath the Roman 15 numerals: 16 "Reports received from Chevron, and 17 independently through contacts at the Downing town 18 Conference, are that Clement Associates are making a 19 poor job of the reviews undertaken under contract from 20 EPA." 21 Right? 22 A. Yeah. Sorry, where are you reading that? 23 I'm just -- 24 Q. It's that same page, under Roman numeral 25 -- for paragraph (iv).
126 1 have been assigned the job of reviewing the database 2 on paraquat for EPA." 3 Right? 4 A. Correct. 5 Q. So at this point in June -- or June 30 or 6 July 2 of 1980, less than 30 months after Maurice 7 Green reaches out, Chevron/ICI now don't expect that a 8 Rebuttable Presumption Against Registration will not 9 issue for paraquat, correct? 10 A. Yes. Sorry, just to correct you. I think 11 you said "months" there; I think you meant to say 12 "days." But, yes, that is correct. 13 Q. And Chevron and ICI, within these minutes, 14 specify the fact that Clement & Associates have been 15 assigned to the job, right? 16 A. Yes. 17 Q. Now, one of the issues the EPA initially 18 started the process of the RPAR for was concerns of 19 the chronic toxicity of paraquat, right? 20 A. I believe so. 21 Q. If you can turn to page 6, the second 22 paragraph: 23 "Messages received from Don Dye (Chevron's 24 representative in Washington) are that pressures on 25 paraquat seem to have relaxed somewhat."	128 1 A. Oh, yes. Yes, I see it. Yes, indeed. 2 Q. So what's being discussed with ICI and 3 Chevron is not only does -- Clement & Associates 4 reviewing the paraquat data, but they're not doing a 5 very good job of it, right? 6 A. That's what that suggests. 7 Q. And it's your understanding that 8 Clement Associates continued to undertake the paraquat 9 review for the RPAR until the final decision was 10 issued by the EPA, right? 11 A. I am not sure that I do know that. 12 Q. You're not sure you know that or you do? 13 A. No, I don't know for how long the company 14 Clement actually did continue with that work. I can't 15 remember seeing any dates. 16 Q. The next paragraph: 17 "It was agreed that neither ICI nor 18 Chevron would supply Clement Associates with the data 19 which had not been first sent to EPA. There seemed 20 little value to be gained from discussions with the 21 EPA paraquat RPAR manager until after Clement 22 Associates had completed its reviews." 23 Right? 24 A. Okay. 25 Q. That's what it says?

Conducted on September 17, 2024

129 1 A. That's what it says. 2 Q. So ICI and Chevron wouldn't discuss with 3 the actual EPA employee responsible for the Rebuttable 4 Presumption Against Registration until Clement 5 Associates completed its review of the risk-benefit 6 analysis for paraquat, right? 7 A. Which seems very reasonable, until the EPA 8 were able to be given full and complete information. 9 Q. Until -- EPA giving full and complete 10 information as presented from Clement Associates, 11 right, that's what you mean? 12 A. That's what that suggests, yes. 13 Q. So there would be no discussions with EPA 14 related to paraquat until they knew how Clement 15 Associates were going to come out on the side of 16 paraquat? 17 MR. NARESH: Objection; form, foundation. 18 THE WITNESS: That's certainly an 19 interpretation of what's said here. 20 BY MR. DICKENS: 21 Q. And as we saw on the first page: 22 "The chances of the RPAR being issued 23 seems to be declining." 24 That was the understanding of ICI and 25 Chevron at this point in 1980, right?	131 1 deposition with respect to dermal absorption of 2 paraquat. Now, absorption of paraquat through the 3 skin is greatly increased in the presence of damaged 4 or irritated skin, right? 5 A. That's correct. 6 Q. And that includes skin with cuts, rashes, 7 sores or other irritation? 8 A. Yes, mmm-hmm. 9 Q. And skin absorption's also greatly 10 increased if the user wears the same clothing or PPE 11 on multiple days, right? 12 A. Yes, and I think that we touched on some 13 of the cases earlier which may have been -- where the 14 toxicity may have been caused by that, so yes. 15 Q. Now, paraquat is a moderately strong 16 irritant of the skin, is it not? 17 A. It is. 18 Q. Meaning that exposure to paraquat itself 19 will irritate the skin, right? 20 A. Yes. 21 MR. DICKENS: I'll hand you what we'll 22 mark as Exhibit 16. 23 (Exhibit 16 marked for identification.) 24 BY MR. DICKENS: 25 Q. I've handed you Exhibit 16, for the
130 1 A. Yes. 2 MR. NARESH: Objection; asked and 3 answered. 4 THE WITNESS: And it gave some reasons for 5 that further up on this same page, on page 6. 6 BY MR. DICKENS: 7 Q. And, indeed, an RPAR was not issued, 8 right? 9 A. I believe that was true, yes. 10 Q. And it was not issued based on the review 11 and risk-benefit analysis undertaken by Clement? 12 A. Indeed, and with a more complete and 13 up to date set of studies and assessments. 14 MR. DICKENS: Do you want to take a quick 15 break? 16 MR. NARESH: Sure. 17 THE VIDEOGRAPHER: We are going off the 18 record at 12:06. 19 (Lunch break taken.) 20 THE VIDEOGRAPHER: We are back on the 21 record at 12:46. 22 BY MR. DICKENS: 23 Q. Welcome back, Dr. Botham. 24 A. Thank you. 25 Q. We talked a little earlier in the	132 1 record, which is topic 17 in the Notice of Deposition, 2 which is a memo dated June 29, 1977, "Paraquat 3 Dichloride - Short-term dermal study in more than one 4 specie." 5 Do you see that? 6 A. Yes, I do. 7 Q. And it's from a I. Pratt to Michael Rose, 8 correct? 9 A. That's correct. 10 Q. And this is a document you've seen prior 11 to today? 12 A. Yes, it is. 13 Q. There's a "Results" section midway and it 14 includes "Epidermal effects," right? 15 A. Yes. 16 Q. And "epidermal" meaning skin? 17 A. The epidermis is the layer just below the 18 surface of the skin. 19 Q. And in that layer just below the skin: 20 "Paraquat produced changes typical of a 21 moderately strong chemical irritant." 22 Right? 23 A. That's what the report says, yes. 24 Q. And, once again, this is in multiple 25 species, right?

Conducted on September 17, 2024

133 1 A. Yes. 2 Q. And it says: 3 "Effects were more severe in occluded than 4 in non-occluded skin." 5 That's what's being reported here, right? 6 A. That's correct. 7 Q. And "occluded" meaning covered, right? 8 A. Yes, that's right. 9 Q. So the effects when the skin was covered 10 after -- well, strike that. 11 So in these studies, paraquat would be 12 applied to the animal, right? 13 A. Mmm. 14 Q. And then there would be a measurement or 15 a observation as to the effects on the epidermis in 16 this instance, right? 17 A. Yes. So this was a pathological study, 18 so the skin would be investigated under the 19 microscope. 20 Q. And so in some of the animals, they 21 covered the skin after applying paraquat; in some they 22 did not, right? 23 A. That's right. 24 Q. And in the animals in which the skin was 25 covered, the epidermal effects were more severe,	135 1 second page, number (3) lists some follicular effects, 2 right? 3 A. That's correct, yes. 4 Q. And this is reporting on damage to hair 5 follicles, right? 6 A. That's right. 7 Q. And damage to the hair follicles, that was 8 seen in all species, right? 9 A. Yes. 10 Q. The effect being: 11 "... particularly marked in the hair bulb 12 and dermal papilla, the growing point of the hair." 13 Right? 14 A. Correct. 15 Q. And in some species, follicular effects 16 were seen at lower dose levels, particularly when that 17 skin was covered. 18 Right? 19 A. Yes, and there are probably -- the 20 explanation for that is that the hair follicle is an 21 easy route for substances to enter the skin. 22 Q. In fact, on the next page, under "Points 23 of interest," number 2, it says just that, right? 24 A. Mmm. 25 Q. "... the early changes in the follicles
134 1 right? 2 A. That seems to be the case, yes. 3 Q. And that's the case and has been the case 4 with respect to all species studied in the dermal 5 studies with paraquat by ICI or Syngenta, right? 6 A. Yes, yes. 7 MR. NARESH: Objection; form. 8 THE WITNESS: Excuse me, can I just take 9 one minute. I forgot to switch my phone off, which 10 was very bad of me. 11 MR. NARESH: Go right ahead. 12 THE WITNESS: I don't want to be causing 13 a disturbance. So apologies for that. 14 MR. NARESH: Could you just do your 15 last -- I think he was checking his phone. Could you 16 just do your last Q&A again, please. 17 THE WITNESS: Yeah, just give me a second, 18 Ragan, please. 19 Okay, ready to go. 20 BY MR. DICKENS: 21 Q. And in ICI or Syngenta dermal studies, ICI 22 and Syngenta have found that effects are more severe 23 in occluded rather than non-occluded skin? 24 A. Yes, yes. 25 Q. Okay. If you can turn the page, the	136 1 indicate a very rapid penetration of the chemical by 2 this route." 3 Right? 4 A. Yes, that's correct. 5 Q. And that is true with respect to all 6 species tested by ICI or Syngenta in dermal studies, 7 right? 8 A. Right. 9 Q. And the same would be true with respect to 10 humans, correct? 11 A. Yes. I mean, there obviously is a big 12 difference between humans and some of these species. 13 Humans have far fewer hair follicles. We're not, 14 basically, a hairy species, whereas a guinea pig and 15 a rat are. 16 Q. But it's true that in the areas where 17 there are hair follicles, those would be the areas 18 that would be more prone to greater dermal absorption 19 in humans when exposed to paraquat? 20 A. That is certainly plausible, yes. 21 Q. It goes on: 22 "[The] pattern of damage does not appear 23 to have been seen frequently with chemical irritants, 24 and the selective [section] of the hair bulb and 25 dermal papilla, leaving the upper part of the follicle

Conducted on September 17, 2024

1 untouched, is unusual as far as I know." 2 Right? 3 A. Yes. 4 Q. And there's a statement that this may 5 explain the nail bed effects that were known. 6 Right? 7 A. Yes. 8 Q. And so it's reporting that while there's 9 very rapid penetration through the hair follicles, 10 paraquat is acting differently than other chemical 11 irritants, right? 12 A. That's what Dr. Pratt has suggested, yes. 13 Q. And who was Dr. Pratt? 14 A. Dr. Pratt was a pathologist, a senior 15 pathologist. 16 Q. And he would have been the one responsible 17 for this particular study? 18 A. It was a she, but yes. 19 Q. Oh, okay. 20 A. Yes. 21 Q. Thanks. 22 Now, dermal absorption through damaged 23 skin, that will happen virtually immediately after 24 exposure to paraquat, right? 25 A. It depends on the nature of the damage,	137 139 1 the case of a drug, to enable that drug to -- if it's 2 a topical substance, to penetrate the skin to do its 3 job. 4 Q. Surfactants are also known as or referred 5 to as "wettters"? 6 A. They're called "wettters," yes; 7 particularly in the agrochemical world they are, yes. 8 Q. And farmers and other users of paraquat in 9 the United States have always been instructed to mix 10 paraquat with surfactants prior to spraying? 11 A. That's right, and the instruction has been 12 to use a non-ionic surfactant. 13 Q. And prior to spraying, paraquat users in 14 the United States would have to manually mix paraquat, 15 surfactants and water in a tank prior to spraying? 16 A. Just say that again. 17 Q. Yeah. Prior to spraying, in the United 18 States paraquat users would have to manually -- 19 A. Ah, right. 20 Q. -- mix paraquat, surfactants and water? 21 A. Yes, essentially and, of course, that's 22 again meant to be done according to strict instruction 23 on how you do that, where you do it and how you should 24 protect yourself whilst doing that. 25 Q. The paraquat formulations sold in the
138 1 how deep the damage is, so you can't generalize, but, 2 obviously, a damaged skin will impact the amount and 3 the time it takes for paraquat to get through. 4 Q. And so, say, a large opening or lesion on 5 the skin, that penetration would occur rapidly? 6 A. It could do. 7 Q. Almost immediately? 8 A. Yes, it could do. 9 While less-damaged skin but still damaged 10 would be more than intact skin? 11 A. Yes, because skin is actually a very 12 effective barrier to paraquat. So intact skin, 13 paraquat does not easily get across that barrier; the 14 skin is a very effective barrier. 15 Q. And that was seen in studies conducted on 16 paraquat, right? 17 A. Yes. 18 Q. And paraquat alone? 19 A. Yes. 20 Q. What's a non-ionic surfactant? 21 A. It's the kind of substance which is used 22 in many different products, including pharmaceuticals 23 as well as agrochemicals, other kinds of products, 24 too, usually to improve what you might call the 25 bioavailability of a substance; so it will help, in	140 1 United States, have they ever contained a non-ionic 2 surfactant in the formulation itself? 3 A. In the United States, some of the products 4 that have been sold have small amounts of non-ionic 5 surfactant, and -- but they also come with the 6 recommendation or instruction to then add further 7 non-ionic surfactant in order to produce the substance 8 that is then suitable for spraying. 9 Q. So regardless, the formulation of 10 non-ionic surfactant would always need to be added? 11 A. That's really the only way in which it can 12 effectively do its job as a herbicide. 13 Q. Which formulations in the United States 14 have contained small amounts of non-ionic surfactant? 15 (Stenographer clarification.) 16 MR. DICKENS: Yeah. 17 BY MR. DICKENS: 18 Q. Which products in the United -- or which 19 formulations in the United States have included small 20 amounts of non-ionic surfactants? 21 A. It was one of the questions that I was 22 discussing with Monty Dixon. I don't have that 23 information to hand, but it's certainly true that we 24 know what those products are. 25 Q. You know them from the statement of

Conducted on September 17, 2024

1 formulas for those particular -- 2 A. I know them because Monty Dixon has 3 confirmed that. 4 Q. Okay. But you don't know the names of 5 those as you sit here today? 6 A. I've not got them immediately to hand. 7 There are many different trade names that are used. 8 Q. Okay. Now, the purpose -- you mentioned 9 the purpose of surfactants in things like 10 pharmaceuticals. The purpose of adding surfactants 11 with paraquat is to enhance the amount of paraquat 12 that can penetrate into the plant or weed that you're 13 trying to kill, right? 14 A. Yes. It's needed, really, to be an 15 effective herbicide. 16 Q. And whilst surfactants increase the 17 absorption in plants, it also has the same effect on 18 humans, right? 19 A. Potentially, it could, but non-ionic 20 surfactants are specifically recommended because that 21 enhancing effect is not as significant as it would be 22 with other types of surfactant. 23 Q. But you do agree that non-ionic 24 surfactants will increase the dermal absorption of 25 paraquat?	141 1 BY MR. DICKENS: 2 Q. Non-ionic surfactants, added to paraquat, 3 will require less paraquat exposure to result in 4 toxicity, right? 5 A. In -- 6 MR. NARESH: Objection to form. 7 THE WITNESS: In theory, yes. 8 BY MR. DICKENS: 9 Q. And Syngenta has known that since the 10 1960s, that paraquat with surfactant would be more 11 toxic than paraquat alone? 12 MR. NARESH: Objection to form. 13 THE WITNESS: And since the 1960s, we've 14 done toxicity studies on formulated product as well as 15 the active ingredient. 16 BY MR. DICKENS: 17 Q. Now, the studies on paraquat with 18 surfactants, those have not been submitted to the 19 United States Environmental Protection Agency, have 20 they? 21 MR. NARESH: Objection to scope. 22 THE WITNESS: Studies of paraquat with 23 surfactant added, yes, absolutely. It's a requirement 24 that certain types of toxicity studies are submitted 25 to the EPA.
142 1 A. There will be some degree of increase, 2 yes. 3 Q. Now, non-ionic surfactants will also 4 increase the speed by which paraquat can reach peak 5 concentration in the blood, in humans, of paraquat? 6 A. They may have that. I'm not sure that 7 I can immediately bring to mind a sort of, if you 8 like, a systematic analysis of that, but, yes, 9 theoretically, if you get faster or greater 10 penetration of paraquat across the skin, that, in 11 turn, could change the kinetics in the blood. 12 Q. And, in turn, that addition of non-ionic 13 surfactants will also increase the toxicity of 14 paraquat, right? 15 MR. NARESH: Object to the form. 16 THE WITNESS: Well, it might. It depends 17 on the actual amount that gets across. I think you 18 would still need a significant exposure to paraquat, 19 with or without surfactants, in order to see toxicity. 20 As we've said this morning, the toxicity is generally 21 seen when there is poor hygiene or, as you said 22 earlier, where people have been using it with cuts and 23 abrasions and so on. So under normal use, you don't 24 see that toxicity. 25 ///	143 1 BY MR. DICKENS: 2 Q. Okay. What toxicity studies have been 3 submitted to the EPA comparing paraquat versus 4 paraquat with a surfactant? 5 MR. NARESH: Objection to scope. 6 Which topic is this? 7 MR. DICKENS: Topic 17. 8 MR. NARESH: Where does it talk about EPA 9 in topic 17? 10 My understanding is that topic 84 is 11 about -- 12 MR. DICKENS: Sorry. 13 MR. NARESH: -- submitting studies to the 14 EPA. 15 MR. DICKENS: Probably topic 6, sorry. 16 MR. NARESH: Where is -- 17 MR. DICKENS: "Communications to the EPA 18 about the effect of surfactants on the absorption of 19 paraquat into mammals." 20 MR. NARESH: Are you asking about one of 21 these specific studies or just generally? 22 MR. DICKENS: I'm asking about the general 23 topic that's listed in topic 6 that specifically says 24 we'll be asking the witness about: 25 "Communications to the EPA about the

Conducted on September 17, 2024

145 1 effect of surfactants on the absorption of paraquat 2 into mammals." 3 MR. NARESH: I'll maintain my scope 4 objection. 5 If you know the answer to any of these, 6 it's obviously -- answer truthfully whatever you know, 7 but if you don't, then you don't. 8 THE WITNESS: What I know is that studies 9 were submitted to the EPA on paraquat as paraquat, and 10 some studies were submitted to the EPA of paraquat as 11 a formulated product and, largely speaking, those were 12 studies that are required under regulatory guidelines. 13 BY MR. DICKENS: 14 Q. So do you agree that studies comparing 15 paraquat and paraquat with the surfactant should 16 have been submitted to the EPA? 17 A. Those that are required, certainly, yes. 18 Q. Has Syngenta submitted dermal absorption 19 studies to the EPA comparing the absorption rates of 20 paraquat versus paraquat with a surfactant? 21 MR. NARESH: Same objection as before as 22 to scope. 23 THE WITNESS: I know that dermal 24 absorption studies have been done and that includes, 25 again, studies with the active ingredient and with	147 1 that out? 2 A. Where would you go? 3 Q. Yeah. 4 A. I guess that information should be 5 available from the EPA database. 6 Q. All right. Exhibit 17 is a document 7 identified in topic 6 of the Notice of Deposition, 8 "Toxicity tests on Gramoxone for registration in the 9 USSR," dated April 1967. 10 Do you see that? 11 A. Yes. 12 Q. And the report is authored by K. Fletcher. 13 We discussed Dr. Fletcher previously, right? 14 A. We did. 15 Q. It's the same doctor? 16 A. It's the same person. 17 Q. Turn to page 2. It says: 18 "The Russian authorities require the 19 following additional information on the toxicology of 20 Gramoxone or paraquat." 21 Right? 22 A. Yes. 23 Q. And one of the things required is a 24 cutaneous LD50. 25 Right?
146 1 formulated product. I am not able right now to be 2 able to say what studies have been submitted to the 3 EPA. 4 MR. DICKENS: Go ahead and mark Exhibit 17 5 for the record. 6 (Exhibit 17 marked for identification.) 7 BY MR. DICKENS: 8 Q. Before you take Exhibit 17, are there -- 9 in other countries in which Syngenta sold paraquat 10 formulations, have there been paraquat formulations 11 that did not require the addition of a non-ionic 12 surfactant prior to spraying? 13 MR. NARESH: Objection; foundation. 14 Answer if you know. 15 THE WITNESS: Again, there have been many, 16 many formulations of paraquat. My understanding is 17 that the majority, if not all, the recommendation 18 has been either to add surfactant, or they've been 19 sold with non-ionic surfactant already part of the 20 formulation. 21 BY MR. DICKENS: 22 Q. Okay. Do you know, if we wanted to find 23 out what studies have been submitted to the EPA 24 involving a comparison of paraquat with paraquat and 25 surfactant formulations, where would we go to find	148 1 A. Yes. 2 Q. "Cutaneous" meaning skin? 3 A. I assume that means a dermal LD50, yes. 4 Skin. 5 Q. And LD50 is the median lethal dose? 6 A. That's right. 7 Q. And that's the dose required to kill half 8 of the animals in a tested study or a tested 9 population? 10 A. Yes, that's right. 11 Q. And LD50 is used to estimate the potential 12 hazards of a chemical on humans? 13 A. Yes. 14 Q. And so this test was to determine in LD50 15 the amount of paraquat that would cause an effect or 16 hazard to humans, right? 17 A. That's right. 18 Q. If you can turn to page 3. 19 Now, in this study, the cutaneous LD50, 20 three solutions were tested, right? 21 A. It is the salt -- are you referring to -- 22 yes, the dichloride and the dimethosulfate. Is that 23 what you're referring to? 24 Q. So on the top of page 3 -- 25 A. Oh, 3, I'm sorry. I'm sorry.

Conducted on September 17, 2024

149 1 Q. -- there's a section "Cutaneous LD50." 2 A. Yeah, okay. Yes, okay, got it. 3 Q. And it says three solutions were used: (1) 4 Gramoxone, containing no wetter. 5 Right? 6 A. Right. 7 Q. And so that is just paraquat with no 8 surfactant? 9 A. That's right. 10 Q. Paraquat with 5% wetting agent, right? 11 A. Yes. 12 Q. And it lists which surfactants are 13 included: Ethomeen and Lissapol, right? 14 A. Yes. 15 Q. Those are both non-ionic surfactants? 16 A. I don't know. I'm not - unfortunately, 17 I'm not a chemist with deep knowledge of surfactant 18 chemistry. So I suspect so, but I don't know. 19 Q. And then Gramoxone with 10 percent wetting 20 agent, right? 21 A. Right. 22 Q. And the study was run with each of these 23 solutions on the backs of rabbits, right? 24 A. That's right. 25 Q. And there was steps taken to reduce the	151 1 A. Yes. 2 Q. And there were deaths with the rabbits 3 that were exposed to both surfactant -- or both 4 paraquat and the surfactants, right? 5 A. That's correct. 6 Q. Now, these animals, they followed for four 7 weeks, right? 8 A. Right. 9 Q. And there were deaths with surfactants at 10 a dose of 100 mg/kg? 11 A. With the 5 percent wetter only, 12 interestingly, yes. 13 Q. Okay. And then deaths in the 5 percent 14 wetter with 200 mg/kg, correct? 15 A. Yes. 16 Q. Deaths for both in 300 and 400 mg/kg, 17 right? 18 A. That's right. 19 Q. And therefore the approximate dermal LD50 20 to rabbits of paraquat with wetter is therefore 21 200 mg/kg, right? 22 A. That's right. I don't know whether 23 they've combined the 5 percent and 10 percent data to 24 get that, but that's -- yes, that looks approximately 25 right.
150 1 possibility of oral ingestion, right? 2 A. That's right. 3 Q. In (a), it gives the results of 400 4 mg/kg of paraquat with no surfactant was left on the 5 skin for 24 hours, right? 6 A. Yes. 7 Q. And what were the results when no 8 surfactant was added? 9 A. So it said on the fifth day, one animal 10 died, although it says the cause of death wasn't 11 discovered, and there was no obvious effects on the 12 skin apart from mild erythema. 13 Q. So no surfactants, there's no observable 14 effects on the skin of those animals, right? 15 A. Mild erythema, that's mild reddening of 16 the skin. 17 Q. And one animal died on the fifth day; 18 no cause of death was discovered, right? 19 A. That's right. 20 Q. Then they did the experiment using the 21 surfactants with -- I mean, sorry, paraquat with the 22 surfactants, right? 23 A. Yes. 24 Q. And it gives us information with respect 25 to what occurred in those animals, right?	152 1 Q. And that is a lower LD50 than it would be 2 for Gramoxone alone -- I mean, Gramoxone being 3 paraquat without the wetter? 4 A. Yeah, yeah. Well, strictly speaking, 5 Gram- -- well, today, Gramoxone would actually be a 6 description of a formulated product rather than the 7 active ingredient, but I take that what's meant here 8 is that "Gramoxone" meant pure -- essentially, pure 9 paraquat. 10 Q. So I should ask better. The 200 mg/kg of 11 the paraquat with the surfactant is lower than the 12 LD50 would be for paraquat alone? 13 A. Right. 14 Q. Now, do you know whether or not this 15 toxicity test was submitted to the EPA? 16 MR. NARESH: Objection to the scope. 17 This was specifically agreed not part of 18 Dr. Botham's testimony and this question was asked of 19 Mr. Dixon for whom this topic was designated. 20 THE WITNESS: Yeah, so I don't know the 21 answer to that question. 22 BY MR. DICKENS: 23 Q. Paraquat never got approved in the USSR, 24 right? 25 MR. NARESH: Objection to scope.

Conducted on September 17, 2024

153 1 THE WITNESS: I really don't know. 2 I mean, this, again, we're going back a long time 3 here, 1967, so I'm afraid I don't carry that 4 historical record. 5 BY MR. DICKENS: 6 Q. At least from the time -- well, you began 7 working on paraquat in 2008? 8 A. Thereabouts. 9 Q. From the time you began working on 10 paraquat, has paraquat ever been registered in the 11 USSR? 12 A. Well, I've got a list of where paraquat 13 was and wasn't registered with me, so I can certainly 14 check that point. 15 Q. Sure. 16 A. Yeah, so there's no mention here of the 17 USSR. 18 Q. No mention of paraquat being registered? 19 A. No, it's not in the list of countries that 20 I've got. 21 Q. Now, the study we just looked at was a 22 study involving rabbits, right? 23 A. Yes. 24 Q. Now, paraquat with surfactants have been 25 shown to have a lower LD50 in other species as well,	155 1 Do you see that? 2 A. I do. 3 Q. And it's from an A. Calderbank to a 4 T.C. Frears, right? 5 A. Yes. 6 Q. Both are ICI employees at this time? 7 A. They are in the Plant Protection Division. 8 Q. And in this correspondence, they're 9 talking about new marketing plans, right? 10 A. Yes. 11 Q. It says: 12 "You may be aware of fairly recent work at 13 IHRL which has demonstrated that paraquat is much more 14 toxic to some species when administered as 15 'Gramoxone,' with wetter than as the pure chemical." 16 Right? 17 A. Yes. Interestingly, making the point 18 I was making earlier: "Gramoxone" is normally meant 19 with wetter. 20 Q. But we can agree that as of 1972, ICI knew 21 that paraquat with wetter was more toxic in some 22 species than paraquat alone? 23 A. Indeed, and we've just recognized that in 24 some of the studies that have been done, yes. 25 Q. And:
154 1 right? 2 A. Yes, I believe that's true. 3 Q. And that includes rats? 4 A. Yes. 5 Q. Monkeys? 6 A. That's right, yes. 7 Q. Cats? 8 A. I think so. 9 Q. Dogs? 10 A. Yes. 11 Q. Has Syngenta ever conducted a study 12 testing absorption in man in paraquat versus paraquat 13 and surfactants? 14 A. It will have done work in -- using human 15 skin, certainly. 16 MR. DICKENS: I'll hand you what we'll 17 mark as Exhibit 18 for the record. 18 (Exhibit 18 marked for identification.) 19 MR. NARESH: Is this within topic 6? 20 MR. DICKENS: It is, yes. 21 MR. NARESH: Yeah. 22 BY MR. DICKENS: 23 Q. Doctor, I've handed you Exhibit 18, which 24 is a correspondence dated May 26, 1972, titled 25 "Paraquat Strategy."	156 1 "... we cannot be sure that the presence 2 of wetters significantly increases the toxicity of 3 paraquat to man - but at least it seems probable that 4 the toxicity would be increased to a certain extent." 5 Right? 6 A. Yes, and that was, I guess, their 7 hypothesis to say that the same could apply to man. 8 Q. And they said it is probable, in light of 9 the information we have at this point in 1972, that it 10 would be more toxic in man, right? 11 A. As I said, that was their hypothesis, yes. 12 Q. At no point prior to 1972 had Syngenta 13 informed any consumers that the addition of a 14 surfactant would make paraquat more toxic, right? 15 MR. NARESH: Objection; scope, foundation. 16 THE WITNESS: I don't know what -- by 17 "consumers," I assume you mean farmers who were using 18 the product. I can't comment on what kind of 19 communications may have been made. 20 BY MR. DICKENS: 21 Q. Has Syngenta ever publicly stated in any 22 form that the paraquat with a surfactant would be more 23 toxic than paraquat alone? 24 MR. NARESH: Same objections. 25 THE WITNESS: Well, we've obviously

Conducted on September 17, 2024

157 1 disclosed the studies we've done, which have been 2 comparing the toxicities, so, in that sense, that 3 information is in the public domain. 4 BY MR. DICKENS: 5 Q. When you say "disclosed," do you mean 6 published? 7 A. Published, submitted to the regulatory 8 authorities; both. 9 Q. It goes on: 10 "Thus, it could be argued we are making a 11 toxic product even more toxic by [re]formulating it 12 with wetter." 13 Right? 14 A. Yeah, that's what it said. 15 Q. There were discussions and considerations 16 of marketing a formulation of paraquat with a 17 non-ionic surfactant in the United States that 18 would not require the addition of more, right? 19 A. Yes. 20 Q. And that was in response to products like 21 Roundup, including glyphosate, which had a non-ionic 22 surfactant already mixed in? 23 MR. NARESH: Objection; scope, foundation. 24 THE WITNESS: I don't think that you can 25 make a connection with Roundup; I don't think that	159 1 surfactant at a quantity sufficient where you didn't 2 need to add more in. The reason why they didn't move 3 forward was because of the potential toxic effect to 4 humans? 5 A. I don't believe that that was the reason. 6 I mean, certainly in the United States, as we said 7 earlier, what has been sold and what is still sold 8 today, generally, is a product which contains small 9 quantities of surfactant to which you then have to add 10 surfactant in order to be able to provide the product 11 that works. 12 Q. And my question was a little different. 13 Just with respect to, was ICI and Syngenta considering 14 marketing a product where you would not need to add 15 more non-ionic surfactant in? It would already be 16 included. 17 A. Well, the challenge was obviously being 18 thrown down in this memo, that's for sure. I don't 19 know what -- whether any specific action was taken of 20 that nature. I can only describe to you what actually 21 was being sold and what is still being sold today. 22 Q. And the determination as to whether or not 23 to market that product or continue with a product that 24 you would not need to add more non-ionic surfactant 25 would be a risk-benefit analysis?
158 1 this was in response to that. 2 BY MR. DICKENS: 3 Q. But nonetheless, ICI and Syngenta was 4 considering a product that would not require the 5 addition of a non-ionic surfactant? 6 A. That was one of the considerations, but, 7 of course, you have to weigh up the benefit, does it 8 do the job versus the potential increased risk. 9 Q. And that increased risk being that it 10 would be more toxic to man with the surfactant? 11 A. It has the potential to be more toxic, 12 yes. 13 Q. And so that was the risk on why 14 the company decided not to move forward with that 15 product, right? 16 MR. NARESH: Objection to form. 17 THE WITNESS: Because to move forward with 18 a product that didn't contain surfactant or... 19 MR. NARESH: There was a "that" in your 20 question that was a little confusing. 21 MR. DICKENS: Okay. 22 BY MR. DICKENS: 23 Q. So the question was specific to the reason 24 why the company decided to not move forward with 25 a product including paraquat and a non-ionic	160 1 A. Undoubtedly, and if marketing a product 2 which did not contain surfactant in the hands of a 3 farmer and grower didn't do the job that they were 4 expecting, then the benefit is clearly not -- no 5 longer available to the farmer. 6 Q. Okay. And, as discussed in this memo in 7 1972, the adding of a wetter or a surfactant could be 8 said that you were making a toxic product, paraquat, 9 even more toxic, right? 10 MR. NARESH: Objection; asked and 11 answered. 12 THE WITNESS: Yes, that's a true 13 statement, that there is a higher hazard. 14 (Exhibit 19 marked for identification.) 15 MR. DICKENS: I'll hand you what we'll 16 mark as Exhibit 19 for the record. 17 BY MR. DICKENS: 18 Q. Let me know when you're ready, Doctor. 19 A. Okay, yes. 20 Q. I've handed you an exhibit which was 21 produced by Syngenta in this litigation, which is a 22 group of correspondence, and this is a document you've 23 reviewed in preparation for today's deposition? 24 A. I've certainly seen some of this document, 25 yes.

Conducted on September 17, 2024

1 Q. And there was multiple correspondence with 2 dates. I'm going to start on the very back page, 3 which appears to be one of the earlier dates, but this 4 is a letter written from a Stelzer to an Oспенson. 5 Do you see that? 6 A. Yes. 7 Q. And it's dated May 13, 1975 and titled 8 "Paraquat plus surfactant." 9 Right? 10 A. Yes. 11 Q. And this is a correspondence from Chevron; 12 is that right? 13 A. I think this is probably a correspondence 14 within Chevron. 15 Q. Okay. They state: 16 "Our initial approach has been to work 17 with PPD..." 18 And that's the Plant Protection Division? 19 A. That's right. 20 Q. That's an ICI division? 21 A. That's right. 22 Q. "... collecting the data necessary to 23 register their export formula (JF1682), which contains 24 10% surface active agents." 25 First of all, "surface active agents"	1 Q. And that included information on the 2 dermal LD50 that we discussed earlier, right? 3 A. Yes. 4 Q. As well as skin irritation and eye 5 irritation, correct? 6 A. Yes. 7 Q. He says: 8 "... a red flag concerning oral toxicity 9 has come to light and I recommend we defer all plans 10 to register and market a paraquat + surfactant 11 product." 12 Correct? 13 A. Yes. 14 Q. Last sentence of the second paragraph: 15 "... R. Cavalli has informed me that 16 CTL..." 17 That's Central Toxicology Laboratories, 18 right? 19 A. It is, yes. 20 Q. "... has unpublished data on dogs showing 21 that the addition of surfactant to paraquat increases 22 the rate of, and degree of, absorption from the gut 23 into the blood; mortality is also increased." 24 Right? 25 A. Yes.
1 referring to surfactants? 2 A. Yes. 3 Q. And what is export formula JF1682? 4 MR. NARESH: Objection; foundation. 5 THE WITNESS: I assume it's a formulation 6 which is available for export to other countries. 7 BY MR. DICKENS: 8 Q. And PPD or ICI at the time had formulas of 9 -- or paraquat formulations that included as much as 10 10 percent surfactants, right? 11 A. Okay, mmm-hmm. 12 Q. And formulations that contained 10 percent 13 surfactants with paraquat, would those be formulations 14 where you would not be required to add more non-ionic 15 surfactant prior to spraying? 16 A. Possibly so, yes. I mean, again, I'm not 17 an expert in formulation technology, but that's -- 18 certainly, there are formulations that have been 19 produced which, indeed, do not require the addition of 20 a further surfactant. 21 Q. And those formulations have been marketed 22 and sold by Syngenta in other places around the world? 23 A. That's correct. 24 Q. And PPD supplied that information, right? 25 A. Yes.	1 Q. And you've reviewed that data specifically 2 with respect to the dogs, right? 3 A. We talked about that earlier, yes. 4 Q. And that data -- you mentioned that data 5 on paraquat-plus-surfactant toxicity would be 6 available through publication or submission to the 7 EPA, right? 8 A. It normally would be the case. 9 Q. It would not be the case for unpublished 10 data; we can agree on that? 11 A. Correct. 12 Q. And this study specifically was 13 unpublished, right? 14 A. It's certainly suggestive of that, yes. 15 Q. Last sentence of the last paragraph: 16 "The addition of surfactant appears to 17 make a bad situation worse." 18 Right? 19 A. Yes. 20 Q. "Unless PPD can produce data to contradict 21 the above, I strongly recommend we discontinue the 22 exercise toward registering a product with built-in 23 surfactant." 24 Right? 25 A. Yes.

Conducted on September 17, 2024

165 1 Q. PPD never produced additional data to 2 Chevron in order to register a product in the United 3 States with built-in surfactant, correct? 4 MR. NARESH: Objection; foundation, scope. 5 THE WITNESS: I can't comment on that. 6 BY MR. DICKENS: 7 Q. Well, certainly, neither ICI, Syngenta or 8 Chevron attempted to register a product in the United 9 States that included paraquat and 10 percent wetter or 10 surfactant? 11 A. I believe that's the case. 12 Q. And that's the case due to concerns about 13 toxicity? 14 MR. NARESH: Objection to form, 15 foundation, scope. 16 THE WITNESS: I think that will have been 17 one factor but probably not the only one. 18 BY MR. DICKENS: 19 Q. The surfactant made the bad situation 20 worse, right? 21 MR. NARESH: Same objections. 22 THE WITNESS: In theory, it could, yes. 23 And let me reiterate, this is about hazard and not 24 necessarily risk. You can still use a substance which 25 has got built-in wetter safely, but obviously it	167 1 MR. NARESH: Same objections. 2 MR. DICKENS: I'll go ahead and hand you 3 Exhibit 20 for the record. 4 (Exhibit 20 marked for identification.) 5 BY MR. DICKENS: 6 Q. Showing you Exhibit 20. Once again, 7 a document from topic 6 in the Notice of Deposition, 8 a memo from a Paul Dugard, July 22, 1982, "Paraquat 9 Formulations: Methods for assessing relative hazards 10 of skin contact." 11 This is a document you've seen before, 12 correct, Doctor? 13 A. It is. 14 Q. And there is a section here, "Skin 15 Absorption: Human in vitro," right? 16 A. Yes. 17 Q. And it references previous permeability 18 experiments with surfactants and non-surfactants. 19 Right? 20 A. Yes. 21 Q. Permeability being absorption studies? 22 A. That's right. Permeability -- it would 23 generally mean permeability across a biological 24 surface, either the gut or the skin. 25 Q. Okay. And the studies he's referring to
166 1 increases -- because the hazard is increased under 2 situations of bad practice, bad use, you can make 3 the toxicity worse. That's true. 4 BY MR. DICKENS: 5 Q. You agree that surfactant with paraquat 6 increases the hazard at least with respect to 7 toxicity? 8 A. Yes. 9 Q. And that's true with respect to humans? 10 A. It is, yes. 11 Q. You agree, in the United States farmers 12 and other users of paraquat mix the surfactant in with 13 the paraquat, right? 14 A. That's my understanding. 15 Q. So you'd agree that the end-use product 16 being sprayed by farmers is more toxic than the 17 paraquat they're pouring out of the jug that they 18 purchase in the United States? 19 MR. NARESH: Object to form, foundation, 20 and scope. 21 THE WITNESS: It has greater hazard 22 potential. 23 BY MR. DICKENS: 24 Q. It's more toxic? 25 A. Yeah.	168 1 here, do you know whether or not they're referring 2 to -- or the previous permeability experiments 3 involved human skin? 4 A. I don't know whether the previous studies 5 included human skin at that time. He's obviously now 6 proposing that human skin could be used, and that's 7 what I was referring to earlier in terms of the data 8 that we did have available. 9 Q. Do you know whether or not there had been, 10 by this point in July of 1982, dermal absorption 11 studies using human skin? 12 A. No. That, I'm not absolutely sure about. 13 Q. He states that those previous studies 14 show: 15 "... that surfactants alter stratum 16 corneum permeability to paraquat without intervention 17 of a biological response." 18 That's what he's saying in 1982, right? 19 A. Yes, that's correct. 20 Q. And who is Paul Dugard? 21 A. Paul Dugard was a toxicologist and he 22 specialized in acute toxicity, short-term toxicity, 23 and also, as this suggests, skin absorption. So this 24 was his wheelhouse, this area. 25 Q. So this is his particular wheelhouse of

Conducted on September 17, 2024

169	171
1 skin absorption studies for ICI?	1 the problem of minimizing the hazards of Gramoxone..."
2 A. Yes.	2 Right?
3 Q. Now, stratum corneum, that's the outermost	3 A. Yes.
4 layer of the skin, right?	4 Q. The second paragraph:
5 A. It is.	5 "... we have insufficient toxicological
6 Q. And it's the part of the skin that	6 information at present to make a firm decision about
7 protects the body from the outside environment?	7 the effect of replacing the existing wetting agents in
8 A. That's right.	8 Gramoxone with an alternative."
9 Q. And what Paul Dugard is saying here is	9 Right?
10 that surfactants themselves will alter the	10 A. Yes.
11 permeability of the stratum corneum.	11 Q. What he can say is that:
12 Correct?	12 "... the LD50 of Gramoxone is about
13 A. Yes.	13 5-10 times greater than pure paraquat..."
14 Q. So surfactants themselves allow more of	14 Right?
15 the chemical or product to be absorbed into the skin	15 A. Yes. As he says, in some species but not
16 through that alteration?	16 all.
17 MR. NARESH: Objection to form,	17 Q. And as you said earlier, the Gramoxone
18 foundation.	18 reference, that would be paraquat with the surfactant?
19 THE WITNESS: That's right. It's one	19 A. That's correct.
20 explanation for the phenomenon that we have just been	20 Q. So Gramoxone with surfactant in some
21 discussing.	21 species are five times -- sorry, the LD50, or the
22 BY MR. DICKENS:	22 median lethal dose of paraquat with the surfactant is
23 Q. So that's without intervention of a	23 about five to ten times greater than paraquat alone?
24 biological response; so, at the end of the day, it's	24 A. Yes.
25 saying surfactants will allow more paraquat to absorb	25 MR. NARESH: I'll object on the rule of
170	172
1 into the skin, right?	1 completeness grounds.
2 A. That's correct.	2 But go ahead.
3 MR. DICKENS: I'll hand you Exhibit 21 for	3 BY MR. DICKENS:
4 the record.	4 Q. And he says "the extent of [...] of
5 (Exhibit 21 marked for identification.)	5 paraquat from paraquat/wetter solutions in the dog..."
6 BY MR. DICKENS:	6 and that's judged by both urinary and blood levels,
7 Q. This is a document from a P. Slade, dated	7 right?
8 June 20, 1973, the topic "Safer Gramoxone."	8 A. That's correct.
9 Do you see that?	9 Q. And that would depend on the nature of the
10 A. Yes, I do.	10 wetting agent present, right?
11 Q. Is this, once again, a document you've	11 A. Yes.
12 reviewed in preparation for today's deposition?	12 Q. And he says:
13 A. Yes, I do recall this one.	13 "With several wetting agents, the amount
14 MR. NARESH: Can you just remind me,	14 of paraquat absorbed is very much less than occurs
15 I don't see it within 6. Is it within a different	15 when the normal Gramoxone wetters are used."
16 one?	16 Right?
17 MR. DICKENS: It is in 6.	17 A. Yes.
18 MR. NARESH: It is. Oh, there it is.	18 Q. "... the effect of these alternative
19 It's in a double. I got it, thank you. 6D.	19 wetters on the acute toxicity of paraquat has not been
20 BY MR. DICKENS:	20 measured."
21 Q. And this document's marked "Confidential,"	21 Right?
22 right?	22 A. That's what it says.
23 A. Yes, it is.	23 Q. Now, the normal Gramoxone wetters being
24 Q. It begins:	24 referred to at this point are non-ionic surfactants,
25 "Following our recent correspondence about	25 right?

Conducted on September 17, 2024

173 1 A. That was my understanding, yes. 2 Q. And so there were other wetting agents 3 available which would be -- have a lower dermal 4 absorption than the non-ionic surfactants with the 5 paraquat, right? 6 A. Indeed. 7 Q. Okay. And those alternative wetters 8 had not been tested or studied by Syngenta or ICI? 9 A. That would appear to be the case. 10 Q. And at no point in the United States was 11 there ever a recommendation other than to use paraquat 12 with a non-ionic surfactant? 13 A. Correct. 14 Q. Do you know how much -- or what percentage 15 of surfactant is to be mixed in the United States by 16 farmers and other users prior to spraying? 17 A. I'm afraid I don't have that information 18 to hand, no. 19 MR. DICKENS: I'm going to hand you 20 Exhibit 22 for the record. 21 (Exhibit 22 marked for identification.) 22 BY MR. DICKENS: 23 Q. I've handed you Exhibit 22, which is a 24 PSAC Toxicity Working Group Minutes, July 2, 1986. 25 Do you see that?	175 1 Right? 2 A. Yeah. I mean, I just want to point out 3 that we've actually switched the area of attention 4 here because I believe this is to do with GI tract 5 absorption, so this is not to do with skin absorption. 6 Q. Okay. Do you have any reason to believe 7 that skin absorp- -- or that GI absorption would be 8 any different than absorption into other organs within 9 the body? 10 A. Absolutely. It's quite conceivable that 11 there would be differences in the -- well, obviously 12 differences in the amount that could be absorbed but 13 also differences in the effect that a surfactant could 14 have because these are biologically very different 15 barriers. 16 Q. Okay. The skin and the GI tract, right? 17 A. Yes, yes. 18 Q. Would you agree that surfactants can 19 increase the absorption into the brain? 20 A. In theory, but I don't know that I have 21 got direct evidence for that. 22 Q. Has Syngenta ever studied the amount of 23 paraquat getting into the brain of paraquat versus 24 paraquat with surfactants? 25 A. I don't recall seeing such data.
174 1 A. I do. 2 Q. What's the PSAC refer to? 3 A. I can't remember what PSAC stands for, 4 I'm sorry. 5 Q. There's individuals who were at that 6 meeting, right? 7 A. Yes. 8 Q. Lewis Smith who you talk -- or read his 9 deposition prior to today's deposition, correct? 10 A. Yes. 11 Q. He was with CTL? 12 A. Correct. 13 Q. He was a toxicologist with CTL? 14 A. That's right. 15 Q. Number 1 there, "Effect of wetters on 16 paraquat toxicity," right? 17 A. Yes. 18 Q. The last two sentences state: 19 "Recent CTL studies using undiluted doses 20 to rats suggest an approximate 2x increase..." 21 And then it gives a conclusion, right? 22 "CTL conclude that for man the elimination 23 of wetters from the standard formulation would lead at 24 least to a 2x reduction in toxicity, i.e., a 2x 25 increase in minimum lethal dose."	176 1 Q. So, as far as you know, no study like that 2 has ever taken place? 3 MR. NARESH: Object to the scope. 4 THE WITNESS: I don't believe so. 5 BY MR. DICKENS: 6 Q. Do you agree that the end-use product 7 being used by farmers and other paraquat users in the 8 United States includes paraquat plus a surfactant, 9 right? 10 A. Yes. 11 MR. DICKENS: I'll go ahead and hand you 12 Exhibit 23 for the record. 13 (Exhibit 23 marked for identification.) 14 MR. NARESH: What's the topic number? 15 MR. DICKENS: Topic 6. 16 BY MR. DICKENS: 17 Q. Sir, I've handed you a document which is 18 identified in topic 6 of the Notice of Deposition, 19 which is a study, "The Blood-Brain Barrier: Bottleneck 20 in Brain Drug Development," by William Pardridge. 21 Do you see that? 22 A. Yes. 23 Q. And this is a document that you would have 24 reviewed in preparation for today's deposition? 25 A. I think it was -- yes, I think it was part

Conducted on September 17, 2024

177 1 of that. I'm -- yes, I think so, yeah. 2 MR. NARESH: And, Dr. Botham, if counsel 3 is going to ask you questions about it, feel free 4 to -- I know it's been a long couple of months -- 5 THE WITNESS: It has, yes, so -- 6 MR. NARESH: -- so if you want to refresh 7 yourself on it, take your time. 8 THE WITNESS: I am doing. Thank you. 9 Yeah, okay, I understand the gist of this. 10 BY MR. DICKENS: 11 Q. And this is a document produced by 12 Syngenta in this litigation, with the date of January 13 2005. 14 Do you see that? At the bottom. 15 A. Yeah, yeah, at the bottom, yes. Got it. 16 Mmm-hmm. 17 Q. Turn your attention to the page ending 18 7147. 19 There's a section here, "Blood-Brain 20 Barrier Disruption," and then a subtopic, 21 "Solvent/adjuvant-mediated BBB disruption." 22 Correct? 23 A. Yes. 24 Q. "BBB" being blood-brain barrier, correct? 25 A. Correct.	179 1 "bypass." I think it can affect the ability of 2 another agent to cross the blood-brain barrier. 3 Q. Okay. 4 A. I'm sure the mechanisms are more 5 complicated than simply bypass. 6 Q. And Syngenta certainly had the 7 capability -- or has the capability to undertake a 8 study to determine whether or not the non-ionic 9 surfactant added to paraquat would allow paraquat to 10 by- -- or to cross the blood-brain barrier? 11 MR. NARESH: Object to the form, 12 foundation. 13 THE WITNESS: Well, we had no reason to 14 want to do such an experiment. The concern that we've 15 been talking about up until this point has been the 16 increased toxicity that might come from skin 17 penetration or gut penetration. 18 To look at the blood-brain barrier would 19 mean that we felt there was a hypothesis that the 20 brain could be damaged and we still to this day, 21 of course, do not believe that that is the case. 22 BY MR. DICKENS: 23 Q. Syngenta does not know how much paraquat 24 with a surfactant will end up in the brain of humans, 25 correct?
178 1 Q. It states: 2 "The blood-brain barrier, like cell 3 membranes in general, is subject to solvent-mediated 4 disruption with chemicals [...] [including] tween 80, 5 also known as polysorbate 80." 6 Right? 7 A. Yes. 8 Q. Tween 80 is a non-ionic surfactant? 9 A. It is, yes. 10 Q. And so there are studies that were done 11 with chemicals and a non-ionic surfactant to determine 12 whether or not those chemicals could bypass the 13 blood-brain barrier, right? 14 A. Well, yes, I think that this is one of the 15 mechanisms that was being either hypothesized or where 16 there was maybe some evidence that adding a surfactant 17 or a solvent might increase the ability of a drug to 18 cross the blood-brain barrier in order to effect its 19 disease treatment. 20 Q. And, in fact, for various, as indicated in 21 this article, there have been studies which have 22 suggested that the addition of a non-ionic surfactant 23 does allow chemicals to bypass the blood-brain 24 barrier, right? 25 A. I don't know whether the right word is	180 1 MR. NARESH: Objection; scope, foundation. 2 THE WITNESS: We've not done differential 3 experiments comparing paraquat with and without 4 a surfactant in terms of how much may get into the 5 brain. 6 BY MR. DICKENS: 7 Q. And those mathematical modeling that you 8 referred to earlier, that was done with pure paraquat, 9 right? 10 A. That was on the basis of the properties of 11 the paraquat molecule itself. 12 Q. This document, in the second column on the 13 same page, page 7, it's closer to the bottom but 14 there's a sentence beginning "Tween 80..." 15 A. Yes. 16 Q. "Tween 80, also known as polysorbate 80, 17 is frequently administered in CNS drug formulations." 18 That's central nervous system, right? 19 A. It is. 20 Q. "A dose of [the non-ionic surfactant] will 21 cause blood-brain barrier disruption in mice." 22 Right? 23 A. Right. 24 MR. NARESH: Rule of completeness. 25 ///

Conducted on September 17, 2024

181 1 BY MR. DICKENS: 2 Q. It gives as an example: oligopeptide 3 normally does not cross the blood-brain barrier, but 4 it's possible, following the co-administration of the 5 non-ionic surfactant. 6 Right? 7 A. Yes, it's possible, but, I mean, I don't 8 know whether they actually demonstrated that for real, 9 but it's possible. 10 Q. Do you have any reason to dispute what is 11 said in this particular article? 12 A. No, not at all. I mean, it's a reasonable 13 hypothesis. 14 Q. So would you agree, then, that Syngenta 15 knows paraquat can enter the brain of humans, right? 16 A. Yes. 17 Q. That the addition of the non-ionic 18 surfactant will allow more paraquat to enter the brain 19 of humans? 20 MR. NARESH: Objection to form, foundation 21 and scope. 22 THE WITNESS: Again, that would be a 23 hypothesis and we don't actually know whether that is 24 the case because -- 25 ///	183 1 THE VIDEOGRAPHER: We are back on the 2 record at 14:07. 3 BY MR. DICKENS: 4 Q. Doctor, we were discussing the effect of 5 surfactants on dermal absorption and toxicity, but 6 surfactants also increase the risk of inhalation 7 toxicity with paraquat, right? 8 A. In a similar way, yes, because of the 9 effect on membranes. 10 Q. And it would increase the absorption and 11 toxicity of both the respirable particles as well as 12 toxicity of larger particles that may not reach the 13 lungs? 14 A. Yes, that's true. 15 Q. And the surfactants can facilitate 16 transport across mucus membranes in the upper 17 respiratory tract? 18 A. Yes, because it's another membrane, as 19 I've just been saying. 20 Q. And that's true with respect to humans as 21 well, right? 22 A. Yes, indeed. Yes. 23 MR. DICKENS: I'm going to hand you 24 Exhibit 24 for the record. 25 (Exhibit 24 marked for identification.)
182 1 BY MR. DICKENS: 2 Q. Because -- 3 A. -- don't forget, humans, especially when 4 we are talking about farmers who are using the 5 product, will be exposed to very -- relatively low -- 6 you know, very low concentrations of paraquat and 7 surfactant. Here, you're -- this is -- you're talking 8 about drug delivery, so you're talking about very high 9 concentrations of both the surfactant and the 10 pharmaceutical. 11 Q. And we don't know whether or not that's 12 the case because Syngenta has never undertaken such a 13 study, right? 14 MR. NARESH: Objection; asked and 15 answered. 16 THE WITNESS: We have certainly not done 17 that, for the reasons that I indicated: that we didn't 18 believe that there was a hypothesis that required 19 testing. 20 MR. DICKENS: I'm going to move -- why 21 don't we take a five-, ten-minute break. 22 THE WITNESS: Okay. 23 THE VIDEOGRAPHER: We are going off the 24 record at 13:55. 25 (Break taken.)	184 1 BY MR. DICKENS: 2 Q. Exhibit 24 is another document identified 3 in topic 6 of the Notice of Deposition, which is a 4 summary report of a four-hour acute inhalation 5 toxicity study conducted by Syngenta in the rat; is 6 that right? 7 A. Yes, that's right. 8 Q. And is this a document you reviewed in 9 preparation for today's deposition? 10 A. It is, yes. 11 Q. And the report, on page 2, the author is a 12 Joanne Kilgour; is that right? 13 A. Yes. 14 Q. She was an inhalation toxicologist at 15 Syngenta? 16 A. That's right. 17 Q. She's the author and study director of 18 this particular study, correct? 19 A. Correct. 20 Q. On the next page, page 2, in the 21 Introduction it identifies the purpose of the study, 22 and that was: 23 "... to expose rats to a spray strength 24 paraquat under conditions simulating potential 25 worst-case operator exposure."

Conducted on September 17, 2024

1 Right? 2 A. Yes. 3 Q. And "spray strength paraquat," that 4 would be the strength of the paraquat that's actually 5 being sprayed by operators, farmers, users of 6 paraquat, right? 7 A. That's right, yes. So it's a diluted 8 paraquat as a consequence, yes. 9 Q. And it's meant to simulate the worst-case 10 operator exposure from an inhalation standpoint, 11 right? 12 A. Yes. 13 Q. It mentions Agral 90 was mixed with the 14 formulation. 15 Do you see that? 16 A. I do. 17 Q. Agral 90 is a surfactant, right? 18 A. It is. 19 Q. And a non-ionic surfactant? 20 A. Correct. 21 Q. And it was added to the formulation since 22 it may be included in tank mixes for tractor 23 operation, right? 24 A. That's right. 25 Q. And it may be included with the	185 1 sense it was completed but it was not -- it was done 2 at a single concentration, for example, so it was 3 decided that this was sufficient information that was 4 required at the time. 5 Q. And then the conclusion, there was the 6 death of an animal in this study that was deemed by 7 the inhalation toxicologist, Dr. Kilgour, to be 8 unexpected. 9 Right? 10 A. Yes. 11 Q. And that's because previous regulatory 12 studies had shown the MLC -- what does MLC stand for? 13 A. Median lethal concentration. It's the 14 equivalent to the ML -- the median lethal dose that 15 we've been talking about for oral and dermal studies. 16 Q. And it was at a concentration of 1 17 microgram per liter, right? 18 A. Yes. 19 Q. And so that was significantly below what 20 that LD50 or median lethal concentration would be, 21 right? 22 A. Yes, but it goes on to suggest that this 23 may not actually have been associated with paraquat, 24 actually. So it could have been a spontaneous finding 25 for other reasons.
186 1 formulation in the United States as well, right? 2 A. Yes, potentially. 3 Q. So this study is testing the end-use 4 product that would be sprayed by users in the United 5 States, right? 6 A. If it was used in the United States, yes. 7 Q. Turn to the next page. Under "Study 8 Design": 9 "A group of five male and five female 10 [...] rats were exposed in a manner designed to 11 simulate 'downwind' exposure to a commercial spray 12 head operating in its normal mode." 13 Right? 14 A. Right. 15 Q. And the results include an achieved test 16 atmosphere and has analyzed paraquat ion 17 concentration. 18 Do you see that? 19 A. Yes, I do. 20 Q. And what was that "analyzed paraquat ion 21 concentration" in this study? 22 A. 0.15 +/- 0.07 micrograms per liter. 23 Q. Now, this study was never completed, was 24 it? 25 A. It's a preliminary study, so, yes, in that	187 1 Q. Okay. Based on this study, the company 2 did not know whether or not it was because of paraquat 3 with surfactant, right? 4 A. I think what this suggests, that it's 5 actually unlikely to have been caused by paraquat. 6 The weight of evidence would say that would have been 7 very surprising to see paraquat toxicity at that 8 concentration. 9 Q. And so this finding was unexpected. It 10 was also a new finding for Syngenta due to the 11 unexpected death at such a low concentration, right? 12 MR. NARESH: Objection to form and 13 foundation. 14 THE WITNESS: Yes. 15 BY MR. DICKENS: 16 Q. Are you aware of any inhalation studies on 17 paraquat and with a surfactant prior to this study, 18 dated December 18, 2002? 19 A. There were, yes, I think a number of 20 inhalation studies done prior to this date. 21 Q. Inhalation studies with paraquat and a 22 surfactant as used to simulate spray conditions of a 23 user or farmer? 24 A. Well, this was the unique feature here, so 25 this was really trying to make it even more relevant

Conducted on September 17, 2024

189 1 to the farmer by generating the atmosphere in a way 2 that might be the case when it's used in the field. 3 Q. And this was the first of that type of 4 study that would have been more relevant to the 5 farmer, in your words? 6 A. It -- 7 MR. NARESH: Objection; foundation, and 8 scope. 9 THE WITNESS: That was the intention. 10 BY MR. DICKENS: 11 Q. And it was the first study, correct? 12 MR. NARESH: Same objections. Asked and 13 answered as well. 14 THE WITNESS: I have not seen any other 15 studies of this type. 16 BY MR. DICKENS: 17 Q. Okay. 18 Second paragraph in the Conclusion: 19 "Since Agral is known to be a severe eye 20 irritant and, by inference, may have exacerbated the 21 known effects of paraquat in this study, no further 22 work was done pending clarification on the use of 23 Agral in the field." 24 Do you see that? 25 A. Yes.	191 1 Q. Do you know whether or not Syngenta 2 manufactures Agral? 3 MR. NARESH: Objection; scope, foundation. 4 THE WITNESS: I don't know, but I would 5 doubt it. 6 MR. DICKENS: I'll go ahead and hand you 7 Exhibit 25 for the record. 8 (Exhibit 25 marked for identification.) 9 MR. NARESH: What's the topic number? 10 MR. DICKENS: Topic 6, still. 11 MR. NARESH: Is it specifically referenced 12 in 6? 13 MR. DICKENS: I believe so. 14 MR. TRAVERS: 6. 15 MR. NARESH: I'm not seeing it, but maybe 16 I'm missing it. 17 MR. TRAVERS: It's another combined one on 18 6Y. It's the second one. 19 MR. NARESH: Got it, thank you. 20 BY MR. DICKENS: 21 Q. Doctor, the findings of the last study, 22 the four-hour inhalation study with Agral that we 23 looked at, that was referred to Syngenta's Potentially 24 Referable Findings Committee, correct? 25 A. That's right.
190 1 Q. Now, at any point in time did Syngenta, or 2 ICI, instruct farmers to stop using Agral while 3 spraying paraquat? 4 MR. NARESH: Objection; foundation, scope, 5 form. 6 THE WITNESS: I don't know the answer to 7 that question. I would need to ask other colleagues 8 about that. 9 BY MR. DICKENS: 10 Q. Was there any other work done to clarify 11 the use of Agral in the field with paraquat? 12 MR. NARESH: Same objections. 13 THE WITNESS: Similarly, I would need to 14 be reminded if that was the case. I don't -- 15 I actually don't know. 16 BY MR. DICKENS: 17 Q. In your preparation for today's 18 deposition, did you see any documents that would have 19 been relevant to the use of Agral in inhalation 20 studies? 21 A. I've seen so many studies that I can't 22 remember particularly at the moment. 23 Q. But as this study says, no further work 24 was done, at least with respect to this study, right? 25 A. That's right.	192 1 Q. Also known as the PRF Committee? 2 A. Correct. 3 Q. There was also a committee in the United 4 States responsible for determining whether information 5 would need to be reported to the US EPA, right? 6 A. Yes. The document you have just handed me 7 is a minute of what's called the PRF Approach 8 Committee, so it was -- this committee would hand its 9 recommendations over to the US committee. 10 Q. And were you a member of the PRF Approach 11 Committee? 12 A. I was for a period of time, yes. 13 Q. Okay. Now, this document is titled "Data 14 submission for consideration by the CTL Potentially 15 Referable Findings (PRF) Committee," right? 16 A. Yes. 17 Q. And what is the purpose of this particular 18 document? 19 A. It's to summarize the findings in a study 20 and why they may -- those findings may meet the 21 criteria for referability under the US Regulation 22 6(A)(2). 23 Q. And this particular document was submitted 24 by Dr. Kilgour on June 29, 2000, right? 25 A. That's right, because it was the

Conducted on September 17, 2024

193 1 responsibility of the study director to flag these. 2 Q. And so this was particularly flagged by 3 Joanne Kilgour due to the death of an animal on day 3 4 post-exposure, right? 5 A. Yes. 6 Q. And you said it was an unusual finding. 7 I believe you said, right? 8 A. Yes. And I think, you know, the report -- 9 although it says here that the clinical observations 10 are consistent with known effects of paraquat, I think 11 the report itself doesn't actually come to that 12 conclusion. There are clearly effects but I think the 13 reason why Dr. Kilgour would have brought it to that 14 committee was because it was not clear whether the 15 effects were actually due to paraquat. 16 Q. And then, so from this data submission or 17 this referral, what happens next? 18 A. If it's agreed that it is potentially 19 referable, if the Approach Committee consider that it 20 may meet the criteria, it is then submitted to the 21 US PRF Committee, who is, if you like, the legally 22 constituted committee within the US organization. 23 MR. DICKENS: I'll hand you Exhibit 26 for 24 the record. 25 (Exhibit 26 marked for identification.)	195 1 Q. Thank you. 2 "...but was to investigate the acute 3 toxicity of the spray strength solution." 4 We discussed that earlier, right? 5 A. Yes, we did, yes. 6 Q. It goes on: 7 "It was further noted that this test 8 material had not previously been tested in an acute 9 inhalation study, and so the finding should be treated 10 as a 'new finding' under the CTL guidelines." 11 Right? 12 A. Yes. The CTL guidelines are what you 13 would call very precautionary. So if in doubt, in 14 other words, we're not -- in situations like this 15 where we're not absolutely sure about what was going 16 on, what was causing this effect, even in that 17 situation we would normally refer or pass on to the US 18 committee because, essentially, we feel that it's 19 better to be open about that rather than to say, well, 20 we can write this off. 21 Q. And are you aware of EPA guidelines that 22 say if you're in doubt you should submit them to the 23 EPA? 24 A. Well, it's not so much a guideline. 25 I mean, it certainly comes from discussions which my
194 1 MR. DICKENS: Which is still topic 6 of 2 the Notice of Deposition. 3 BY MR. DICKENS: 4 Q. Document 26 are minutes from the PRF 5 Standing Committee meeting, July 18, 2000, right? 6 A. Yes. 7 Q. And you were present at this particular 8 meeting? 9 A. Yes. 10 Q. As a member of the PRF Committee? 11 A. That's correct. 12 Q. As well as other toxicologists within 13 Syngenta? 14 A. Yes. It was the senior group of 15 toxicologists who comprised this committee. 16 Q. And the senior group of toxicologists at 17 Syngenta considered the acute inhalation study by 18 Dr. Kilgour that we just looked at, right? 19 A. It did. 20 Q. And it looked at that because of the 21 referral to the PRF Committee by Dr. Kilgour? 22 A. Yes. 23 Q. The minutes note that the purpose of the 24 study, once again, was to establish a meeting -- MLC? 25 A. The median lethal concentrate.	196 1 US colleagues have had with the EPA, which is to say 2 if you're in any doubt about whether you should 3 submit, please do send them, and we will ascertain 4 whether we feel it's something that is -- where we 5 need to take any action. 6 Q. Have you ever had a role on the US 7 committee determining whether something should be 8 submitted to the EPA? 9 A. No, I've not been on -- in that committee. 10 Q. And so the senior group of toxicologists 11 at Syngenta reviewed this and were unsure as to 12 whether or not it should be reported; is that right? 13 A. This is the UK-based committee, the 14 Approach Committee, that said that because it -- 15 essentially, it's a new finding because we'd never 16 even looked at this kind of formulation before, that 17 if -- again, with the "If in doubt, refer," we chose 18 to say to our US committee, "Consider referring." 19 Q. Consider referring to the EPA? 20 A. Yes. 21 Q. When you say "this formulation," that's 22 paraquat with Agral, right? 23 A. Correct, yes. 24 Q. And so the PRF Committee, you're saying, 25 "This is a new finding with paraquat plus Agral, so

Conducted on September 17, 2024

197 1 you should consider submitting to the EPA?" 2 A. Yes. 3 Q. And on the next page, top of the page, 4 it does lay that out: 5 "... the clinical effects noted were 6 treatment related..." 7 Do you see that? 8 A. Yes. 9 Q. So there was a determination by the senior 10 toxicologist at Syngenta that the death of the mouse 11 was indeed treatment related, right? 12 A. Yes. Which part of the treatment, if you 13 like, was actually responsible was where we didn't -- 14 we couldn't be sure. 15 Q. But it would have been the result of the 16 paraquat plus the surfactant -- 17 MR. NARESH: Objection -- 18 BY MR. DICKENS: 19 Q. -- in some measure? 20 MR. NARESH: Objection; foundation, scope. 21 THE WITNESS: We actually don't know as to 22 whether it was the paraquat or the Agral itself or the 23 combination of the two. I mean, this was a 24 preliminary experiment, as you've indicated, so you 25 would need to do more work to really tease apart, if	199 1 MR. NARESH: Is this the whole document? 2 MR. DICKENS: It is, yes. 3 MR. NARESH: Is there a family member, do 4 you know? 5 MR. DICKENS: I don't believe so. 6 MR. TRAVERS: I'll check. 7 MR. DICKENS: All right. 8 MR. NARESH: I suspect there's embedded 9 documents that will probably show up in the family. 10 MR. DICKENS: We don't know. 11 MR. TRAVERS: It just comes up as one 12 document when we search. 13 BY MR. DICKENS: 14 Q. I've handed you a document identified in 15 topic 6 of Plaintiffs' Notice of Deposition, and this 16 is a document you've reviewed prior to today; is that 17 right? 18 A. You know, when I saw this just now 19 I wasn't sure that I had seen this. I may have done, 20 but, anyway, I can understand where it comes from. 21 Q. It mentions "RAD Strategy Meeting 22 Minutes." 23 Do you know what RAD refers to? 24 A. Regulatory affairs department. 25 Q. And what is the regulator [sic] affairs
198 1 it really is treatment related, which -- that's what 2 I meant by which part of the treatment may have caused 3 the effect. 4 BY MR. DICKENS: 5 Q. Syngenta never did that additional work, 6 did they? 7 MR. NARESH: Objection; scope, foundation. 8 THE WITNESS: I don't believe they did, 9 no. 10 BY MR. DICKENS: 11 Q. And, as you said, then, the precautionary 12 or the safer approach would be to refer this 13 information so that it could be considered, right? 14 A. That's right. 15 MR. NARESH: Objection; asked and 16 answered. 17 BY MR. DICKENS: 18 Q. It notes the death of one animal, a very 19 low concentration and, because of that, the study 20 should be referred. 21 We just discussed that, right? 22 A. Yes. 23 Q. We can put that aside. 24 MR. DICKENS: I'll hand you Exhibit 27. 25 (Exhibit 27 marked for identification.)	200 1 department at Syngenta? 2 A. As it says on the tin, it's a department 3 that deals with regulatory issues. 4 Q. Is that global regulatory issues? 5 A. I'm not quite sure at this particular time 6 because we're talking about 2000, so it's just after 7 Syngenta was formed, whether this was the European 8 regulatory affairs department or whether it was the 9 US one. 10 This is -- I'm not absolutely clear about 11 that. 12 Q. You mentioned there was a separate 13 committee in the United States to determine whether or 14 not information should be submitted to the US 15 regulatory agencies. Was the same true with respect 16 to other countries? 17 A. Yes, that's right. So there was 18 certainly, and still is, a process, which can be via 19 committee, to look at referability in other countries. 20 Q. Okay. Now, the RAD, regulatory affairs 21 department, strategy minutes, did consider the 22 four-hour inhalation study that we've been discussing, 23 right? 24 A. Yes. 25 Q. And it begins:

Conducted on September 17, 2024

1 "Europe would like to develop a 2 reduced-strength formulation [...] to avoid labeling 3 as toxic or very toxic based on long-term effects." 4 Right? 5 A. Yes. 6 Q. And you're aware of that? 7 A. Yes. 8 Q. Later on, it notes -- the study says that: 9 "It should be noted that the 200..." 10 Is that grams per liter? 11 A. It is. 12 Q. "... SL formulation contains surfactants 13 (Agral)." 14 So that's a formulation of paraquat with 15 surfactants, right? 16 A. Yes. 17 Q. "... and these may have a bearing on the 18 tox profile." 19 "These" being the surfactants, right? 20 A. Yes. 21 Q. Now, the regulatory affairs department, is 22 that made up of regulatory people within the United 23 States? 24 A. Largely, yes. 25 Q. Are there toxicologists on the regulatory	201 1 about. 2 Q. The one that the senior group of 3 scientists at Syngenta said was treatment related, 4 right? 5 A. Treatment related, yes. This is actually 6 specifically saying is it related to paraquat, and 7 I think I've just answered that question: that this 8 study itself, it wasn't really possible to determine 9 whether those effects were due to paraquat or Agral, 10 or a combination of the two, or to some other reason. 11 So this committee obviously thought you 12 can't say this is down to paraquat. 13 Q. The study's purpose was to determine 14 inhalation toxicity of the end-use product being 15 sprayed by farmers, right? 16 A. Yes. 17 Q. And that treatment, the end-use product is 18 what resulted in the related effect of the death of an 19 animal at a low concentration, right? 20 A. That's correct, but essentially for 21 unknown reasons. We still don't understand that 22 study. 23 Q. And no efforts were undertaken further to 24 understand that study? 25 A. I don't believe so, and that's potentially 203
1 affairs department? 2 A. There certainly were at some point in 3 time, yes. 4 Q. Were you on the regulatory affairs 5 department at this time? 6 A. No. 7 Q. Do you know whether or not the senior 8 scientists who were on the PRF Committee were on the 9 regulatory affairs department? 10 MR. NARESH: At the time? 11 BY MR. DICKENS: 12 Q. At the time. 13 A. I don't know who exactly was on the -- 14 I mean, let's assume that this was actually a US 15 committee. I can't tell you, in 2000, exactly who 16 those people were but there would certainly be some 17 senior people in the regulatory affairs department. 18 Q. And the third paragraph states: 19 "The meeting considered that the study did 20 not provide clear evidence of a paraquat-related 21 effect." 22 Right? 23 A. Yes. 24 Q. That being the four-hour inhalation study? 25 A. That's the one we've just been talking 202	1 because that particular formulation was not actually 2 further developed. But I don't know precisely if 3 that's true. 4 Q. Was the 200 gram per liter SL formulation 5 different in any way than the formulation on the 6 market in the United States at this time? 7 MR. NARESH: Objection; foundation, scope. 8 THE WITNESS: I don't know. I'd have to 9 look at more detailed information to make -- to answer 10 that question. 11 BY MR. DICKENS: 12 Q. It says: 13 "It does not appear that the findings meet 14 the criteria for submission as a PRF given that the 15 single mortality at one exposure concentration of 16 0.15 microgram per liter does not alter the existing 17 classification of this formulation." 18 A. Mmm. Yeah. 19 Q. Do you see that? 20 A. Yes. 21 Q. Now, this is in direct contradiction to 22 the findings of the PRF committee, right? 23 A. No, not really, because the -- when you 24 actually translate what we've just been talking about 25 into what the US committee does, and, actually, more 204

Conducted on September 17, 2024

205 1 importantly, what the US EPA does, what the US EPA 2 wants these referable findings for largely is does 3 this information have a bearing on our assessment of 4 -- risk assessment of a substance, of a product. And 5 that could include things like classification, and 6 that will be true of other legislation, including 7 Europe. 8 So I think the judgment here is that in 9 spite of that, and in spite of not knowing whether 10 it's due to paraquat or not, it wouldn't change, if 11 you like, the risk profile of that formulation. 12 Q. That was a decision that the regulatory 13 affairs department at Syngenta made, right? 14 A. That's right, yes. 15 Q. The EPA was not afforded the ability to 16 make that determination on its own? 17 A. If it was not submitted, that would be the 18 case. 19 Q. Do you know whether or not it was 20 submitted? 21 MR. NARESH: Again, scope. 22 I believe these questions were asked of 23 Mr. Dixon. 24 MR. TRAVERS: We might want to go off the 25 record because we did a supplemental Notice of Dep.	207 1 actually the minute of their discussion or whether 2 this is a minute of the European equivalent of that 3 committee. That's not entirely clear to me. 4 Q. Okay. This committee found that: 5 "... the findings would not be referred to 6 either in the US or Europe..." 7 Right? 8 A. Yes. 9 Q. So that was a determination by some 10 committee that not only would it not be referred in 11 the US, but it also wouldn't be referred in Europe, 12 right? 13 A. Yes. 14 Q. Would that be a finding that the US 15 6(A)(2) or PRF Committee would make as to whether or 16 not it would be referred in Europe? 17 MR. NARESH: Objection to scope, 18 foundation. 19 THE WITNESS: No. The way in which this 20 worked, as I understood it, was, and certainly during 21 most of the time that I was on the PRF Committee, is 22 that the US committee, PRF Committee, would 23 essentially make their own decision based on their -- 24 on the 682 regulations in the US. 25 There will be a separate process to look
206 1 MR. DICKENS: Okay. 2 MR. NARESH: Well, his answer may be 3 "I don't know," so -- 4 MR. DICKENS: Okay. 5 MR. NARESH: -- I don't know what -- 6 MR. DICKENS: Right. 7 MR. NARESH: -- his answer is on this, so 8 we -- why don't -- 9 MR. DICKENS: Yes. 10 MR. NARESH: -- you ask your question 11 again, answer it, and then we'll see where we are. 12 BY MR. DICKENS: 13 Q. Do you know whether or not the study was 14 submitted to the US EPA? 15 A. I don't know personally. 16 Q. The PRF Committee did find that it met the 17 criteria for submission as a PRF? 18 MR. NARESH: Objection; asked and 19 answered. 20 THE WITNESS: The Approach Committee did, 21 yes. 22 BY MR. DICKENS: 23 Q. Do you know whether or not the US 6(A)(2) 24 or PRF Committee considered this study? 25 A. Well, I'm saying, I'm wondering if this is	208 1 at referability elsewhere in the world. This almost 2 looks like it's been mixed up, which I -- is somewhat 3 unusual. 4 BY MR. DICKENS: 5 Q. Unusual in the process in which this 6 particular issue was handled? 7 A. Well, unusual in the way in which it's 8 been dealt with, because RAD does sound to me like 9 it's the European regulatory affairs department, but 10 I don't know for sure. And to actually say "it 11 would not be referred either in the USA or Europe at 12 this time," that's not what I've -- that's not been my 13 experience generally, that they would be separate 14 decisions. 15 Q. It says: 16 "CTL will be informed of this 17 conclusion..." 18 That's the toxicologists? 19 A. Yes, we would always get feedback from 20 these committees in order to -- just out of courtesy, 21 just so we know what's happened to our recommendation. 22 Q. So feedback from the regulatory people? 23 A. Feedback from the -- yeah, from the PRF 24 committees, mostly in the United States. 25 Q. So the committee who made this ultimate

Conducted on September 17, 2024

209 1 decision, whether it's the RAD or the PRF Committee, 2 they would give feedback as to the design of the study 3 to the inhalation toxicologists who conducted the 4 study? 5 A. No, they would give feedback on whether or 6 not they decided it, in their view, met the applicable 7 reporting criteria in whatever region we're talking 8 about and the reasons for that. 9 In the vast majority of cases, they agreed 10 with the recommendation. In some, they might 11 disagree, and here is an example of the latter. 12 Q. They did more in this instance, though, 13 didn't they? They indicated that "further work to 14 better understand the finding" would be needed and 15 expressed concern about the study design." 16 Right? 17 MR. NARESH: Objection to form. 18 THE WITNESS: Sure, there's a much more 19 detailed commentary on this than would normally have 20 happened. 21 BY MR. DICKENS: 22 Q. So the regulatory department's making or 23 expressing concerns about Dr. Kilgour's study design 24 for inhalation toxicology study? 25 A. Well, you could interpret it that way and	211 1 MR. DICKENS: I'll go ahead and mark 2 Exhibit 28 for the record. 3 (Exhibit 28 marked for identification.) 4 BY MR. DICKENS: 5 Q. Doctor, these are minutes and actions from 6 an inhalation exposure meeting at CTL on April 12, 7 2001. 8 Do you see that? 9 A. Yes. 10 Q. Joanne Kilgour is in attendance? 11 A. Yes. 12 Q. The others are other toxicologists at 13 Syngenta, correct? 14 A. They are. Apart from Sonia Ellis, 15 I should say, by the way. Excuse me. Sonia Ellis was 16 in the regulatory department. 17 Q. Okay. Okay. If we can turn to page 6 -- 18 sorry, page 2, number 6. 19 Number 5, first of all, is "Review of 20 spray strength data to check consistency." 21 Do you see that? 22 A. Yes. 23 Q. And there were studies done on diquat, 24 right? 25 A. Yes.
210 1 I don't think Dr. Kilgour would disagree because it 2 was a preliminary study and, under normal 3 circumstances, that might lead to another study where 4 some of those issues would be addressed. 5 Q. You can put that away. 6 MR. NARESH: Can you make a representation 7 about any of the metadata surrounding Exhibit 27: 8 dates, custodians, anything like that? 9 MR. TRAVERS: Give me a second. 10 MR. NARESH: Just so we have something on 11 the record on that. 12 MR. TRAVERS: Yeah. 13 MR. NARESH: I suspect the dates because 14 -- 15 MR. TRAVERS: July 24, 2001, Andy Cook's 16 the custodian -- 17 (Stenographer clarification.) 18 MR. TRAVERS: The document's metadata says 19 it's dated July 24, 2001 and the custodian is Andy 20 Cook. 21 THE STENOGRAPHER: Thanks. 22 THE WITNESS: We're talking about that 23 document? 24 MR. NARESH: This one. 25 THE WITNESS: Right.	212 1 Q. And the study design, the same as 2 paraquat, "although in this case a Reglone formulation 3 was used." 4 Right? 5 A. Reglone is diquat. 6 Q. Okay. And Agral was added, correct? 7 A. That seems to be the case. 8 Q. And it says "What are the consequences for 9 paraquat?" 10 Right? 11 A. Yes. 12 Q. And then, in the second action item, it's: 13 "... evaluate risk of doing a study to 14 reinforce arguments." 15 Do you see that? 16 A. Yes. 17 Q. It states: 18 "It was agreed at the previous meeting 19 that Agral is likely to have an adverse effect on any 20 testing and [won't] be included." 21 Right? 22 A. Yes. 23 Q. So any further testing with respect to 24 inhalation toxicity with paraquat would not include 25 Agral because it would increase the adverse effects?

Conducted on September 17, 2024

213 1 A. Yes. And I-- what I don't know, but one 2 would normally expect, is that that might therefore 3 mean that Agral would not necessarily therefore be 4 appearing in commercialized product. 5 Q. Yet it wouldn't appear in commercialized 6 product because of the increased toxicity, so we'll 7 just have the farmers add it in later, right? 8 MR. NARESH: Objection to form, 9 foundation. 10 THE WITNESS: Well, I think that's a kind 11 of an information trail which I would need more 12 information on. I honestly don't know what has 13 happened, or what happened and what has ever happened 14 to the addition of Agral. 15 BY MR. DICKENS: 16 Q. Do you have any reason to believe Agral 17 would act any different than any other non-ionic 18 surfactant? 19 A. Well, non-ionic surfactants are not all 20 the same, so inevitably you might expect there to be 21 differences in their ability to do their job to act as 22 a surfactant and, potentially, therefore in the effect 23 they may have on toxicity. 24 Q. Has Syngenta ever conducted toxicity 25 studies on multiple surfactants to determine which is	215 1 as other toxicologists, are present? 2 A. That's right. 3 Q. And then there's a section towards the end 4 of page 1 that begins "Agral." 5 Do you see that? 6 A. I do. 7 Q. And it was judged that: 8 "... Agral (a wetter) is very likely to 9 contribute to enhanced inhalation toxicity of 10 paraquat..." 11 Do you see that? 12 A. Yes. To be clear, the second clause is 13 important. So that wasn't based on that study that we 14 were talking about earlier; it's a read-across from 15 the fact that it has got greater irritancy to the eye. 16 Q. Certainly, Joanne Kilgour and the others 17 would have been aware of the previous study, right? 18 Sorry, the four-hour inhalation study conducted with 19 paraquat and Agral? 20 A. Of course. 21 Q. "Its surfactant properties may also 22 contribute directly to increased absorption." 23 Right? 24 A. Indeed. That's as we've been saying 25 throughout this afternoon.
214 1 the safest of the non-ionic surfactants when added 2 with paraquat? 3 A. I'm not aware of, if you like, almost a 4 systematic study which says, you know, here's a big 5 bunch of non-ionic surfactants and here's what they 6 all do. I think it's been much more directed towards 7 we believe that we would like to add this to a 8 formulation and we need to do an assessment of 9 toxicity. 10 (Background interruption.) 11 MR. DICKENS: Brian, can you go on mute? 12 MR. NARESH: Let's go off the record. 13 Let's go off the record for a minute. 14 MR. DICKENS: I think he got it. 15 All right. We'll go ahead and mark 29 for 16 the record. 17 (Exhibit 29 marked for identification.) 18 MR. DICKENS: 29 is still within topic 6 19 of the Notice of Deposition. These are minutes from 20 an inhalation exposure meeting, August 15, 2001, so 21 several months after the last one. 22 BY MR. DICKENS: 23 Q. Do you see that? 24 A. Yes. 25 Q. And, once again, Joanne Kilgour, as well	216 1 Q. So the toxicologists at Syngenta believed 2 that Agral, or the non-ionic surfactant, will enhance 3 both the absorption as well as the inhalation toxicity 4 of paraquat, based on the information that they had at 5 the time? 6 A. Yeah, they've done a weight of the 7 evidence to come to that conclusion. 8 Q. The next section's with respect to 9 additional tests, and the last sentence: 10 "Given the high risk of doing further 11 testing..." 12 And this is high risk of doing further 13 testing with paraquat and Agral, right? 14 A. Right. 15 Q. "... it was agreed that the present 16 strategy..." 17 Is that the Pauluhn approach? 18 A. Pauluhn, yes. 19 Q. What is the Pauluhn approach, if you know? 20 A. All I know is that Pauluhn was a very 21 well-respected inhalation toxicologist and he had 22 approaches for assessing the safety of materials. 23 I'm not a deep technical expert in that 24 area. 25 Q. "... the present strategy ([using] Pauluhn

Conducted on September 17, 2024

217 1 approach [...] should be pursued in the first 2 instance." 3 Right? 4 A. Yes. 5 Q. Let me turn to the next page, at the very 6 bottom, "Draft Presentation on Classification for 7 Inhalation Toxicity." 8 Right? 9 A. Yes. 10 Q. The second paragraph mentions the weakness 11 for the Pauluhn approach, right? 12 A. Yeah. 13 Q. And that's cases where a.i. -- do you know 14 what a.i. is referring to? 15 A. The active ingredient, so paraquat in this 16 case. 17 Q. So where paraquat "exerts its toxic effect 18 systemically." 19 What do you understand exerting toxic 20 effects systemically is referring to? 21 MR. NARESH: Objection to form. 22 THE WITNESS: It means that the principal 23 toxicity is one which comes from exposure through, 24 essentially, the blood supply, so hence affecting 25 other organs, whereas in the case I think what Pauluhn	219 1 Agral. 2 MR. DICKENS: Can we go off the record for 3 a minute. 4 THE VIDEOGRAPHER: We are going off the 5 record at 14:53. 6 (Off the record.) 7 THE VIDEOGRAPHER: We are back on the 8 record at 14:57. 9 BY MR. DICKENS: 10 Q. Now, by the time of the four-hour acute 11 inhalation study with paraquat and Agral we looked at, 12 Syngenta was aware of reports of deaths following 13 inhalation exposure to paraquat, right? 14 A. There were some reports, yes. 15 Q. And those reports included autopsies or 16 postmortem reports as well, right? 17 A. Yes. 18 Q. And there were individuals -- or strike 19 that. 20 MR. DICKENS: Why don't we just go ahead 21 and mark Exhibit 30 for the record and I'll do 31 22 right behind it. 23 (Exhibit 30 marked for identification.) 24 (Exhibit 31 marked for identification.) 25 ///
218 1 was talking about was substances which only had 2 toxicity locally in the respiratory tract. 3 BY MR. DICKENS: 4 Q. Paraquat exerts its toxic effect 5 systemically, right? 6 A. Yes, and locally. 7 Q. And so the Pauluhn theory would not be 8 used in -- where the active ingredient, paraquat in 9 this instance, would incur -- 10 (Stenographer interjection.) 11 BY MR. DICKENS: 12 Q. Yeah. The Pauluhn theory would not be 13 used for active ingredients like paraquat which exert 14 its toxic effect systemically, right? 15 A. That's what they were recommending, yes. 16 Q. Do you know whether or not they used the 17 Pauluhn approach for paraquat for inhalation toxicity? 18 A. I've not seen anything one way or the 19 other on that. No, I don't know. 20 Q. Well, do you know whether or not a 21 four-hour acute inhalation study was conducted by 22 Syngenta on paraquat without Agral? 23 A. There were, you know, quite a number of 24 four-hour acute inhalation studies done on paraquat 25 formulations, and many of them would not have had	220 1 BY MR. DICKENS: 2 Q. Let me know when you're ready. 3 A. Do you want me to look at both documents? 4 Q. I can start with 30 and then we'll move on 5 to 31. 6 Exhibit 30 is a coroner's report, dated 7 January 19, 1973 involving the death of an individual 8 exposed to paraquat, right? 9 A. Yes, that's correct. 10 Q. Okay. And there was a premortem urine 11 sample as well as a postmortem urine sample, correct? 12 A. Yes, that's right. 13 Q. And both of those urine samples showed 14 paraquat in the urine of this particular individual? 15 A. Yes. 16 Q. And the death in the opinion was secondary 17 to paraquat poisoning, at the bottom of page 1? 18 A. Yes, that's right. 19 Q. And that was signed by the coroner, a 20 P.J. Bofin, right? 21 A. Correct. 22 Q. P.J. Bofin, the coroner, determined that 23 the death was the result of inhalation exposure of 24 paraquat? 25 A. Yes.

Conducted on September 17, 2024

221 1 MR. NARESH: I'm sorry to interrupt. 2 Which topic are we in? 3 MR. DICKENS: 17. 4 THE WITNESS: Actually, just to correct 5 myself, if I may, I'm just looking for where the 6 coroner said it was definitely due to inhalation 7 exposure to paraquat. He certainly says it was due to 8 paraquat poisoning. 9 BY MR. DICKENS: 10 Q. Okay. Why don't we look at Exhibit 31. 11 That might be able to help. 31 is a report from a 12 visit to Ireland, February 28, 1973, right? 13 A. Yes. 14 Q. And it's A.W., is that Waitt? 15 A. A.W. Waitt, I -- yes, I don't know 16 A.W. Waitt, but that's probably how it's pronounced. 17 Q. The visit was on February 28, 1973 but the 18 report was drafted in March of 1973, right? 19 A. Yes. 20 Q. It was circulated to individuals, 21 including Dr. Swan who we discussed earlier, right? 22 A. Yes. Yes. 23 (Stenographer interjection.) 24 BY MR. DICKENS: 25 Q. The purpose of the visit to Ireland was	223 1 use of paraquat and encouraged ICI to do more work." 2 Do you see that? 3 A. Yes. 4 Q. And the purpose of sending someone out was 5 to discuss paraquat with Dr. Bofin and Dr. Woodcock 6 in an attempt to convince them that deaths could not 7 result from paraquat inhalation, right? 8 A. I think it was rather like I'm doing now, 9 to try and understand the strength of evidence that 10 that was the cause of death. 11 Q. If you can turn to the next page, 12 page 305, there's a meeting with Dr. Bofin. 13 Do you see that? 14 A. Yes. 15 Q. Dr. Swan explains -- so Dr. Swan 16 accompanied or was on this visit from ICI, right? 17 A. Yes. 18 Q. And he explained the background of the 19 visit and their intention "to carry out a 20 demonstration to confirm earlier work that paraquat 21 sprays were of no significant hazard." 22 Do you see that? 23 A. Yes. 24 Q. Was it Syngenta's position at this time in 25 1973 that paraquat sprays presented no significant
222 1 specific to the report of the death in the individual 2 we looked at in Exhibit 30, correct? 3 A. Yes, it was. 4 Q. And the introduction states: 5 "... a verdict of paraquat poisoning as a 6 result of inhaling the spray solution was brought by 7 Dr. Bofin, the coroner in Dublin." 8 Right? 9 A. Yes, and I do remember that from reading 10 these documents before and the reason for my 11 correcting myself is that I'm still not sure from the 12 autopsy report as to whether he was convinced that it 13 was due to inhalation exposure. But that's what the 14 record shows. 15 Q. Now, the purpose of this visit, 16 ICI/Syngenta informed the coroner, as well as the head 17 of the Poisons Information Centre in Ireland, that 18 deaths could not result from inhalation of paraquat 19 spray, right? 20 A. I think that there was a surprise in -- if 21 that was the explanation, yes. 22 Q. "Dr. Woodcock," it mentions, "was not 23 convinced that death could not result from the 24 inhalation of paraquat spray and [...] expressed 25 persisting doubts about the safety of the agricultural	224 1 hazard to users or farmers? 2 A. The view at this time was because of the 3 size of the particles that are produced during 4 paraquat spraying were very unlikely to achieve the 5 systemic exposure that will be required to cause, in 6 this case, a tragic death. 7 Q. And so that's referring to the respirable 8 particles, right? 9 A. That's correct, yes. 10 Q. And so Syngenta's position was that 11 because the particles were too large, they could not 12 reach the lungs? 13 A. That was the position, yes. 14 Q. There's a difference between the 15 respirable particles and particles that can be 16 breathed in either intranasally or through the mouth, 17 correct? 18 A. Yes, and those are described as inhalable. 19 Q. And those inhalable particles can cause 20 toxic effects even if they don't reach the lungs? 21 A. They can cause local toxicity, yes. 22 Q. Nosebleeds and the such? 23 A. That's right. 24 Q. Now, do you have an understanding that 25 intranasal or inhalable particles of paraquat can

Conducted on September 17, 2024

225 1 reach the brain in areas outside of the blood-brain 2 barrier? 3 A. Well, we are now into the hypothetical 4 because, again, theoretically, yes, because there is 5 a direct route from the nose into the olfactory bulb 6 in the brain, but, again, in terms of causing 7 toxicity, that would depend on how much and for how 8 long and so on. 9 So it's theoretically possible, but there 10 was no direct evidence that it actually happened in 11 practice with people who were using paraquat in its -- 12 in the normal agronomic way. 13 Q. We've looked at the first page, 14 Dr. Woodcock expressed doubts and encouraged ICI to do 15 more work. 16 Do you know whether or not ICI did any 17 work with respect to inhalation toxicity as a result 18 of this report of a death in 1973? 19 A. I can't give you a direct link, as I sit 20 here, between this incident and any further studies 21 that were done. All I can say is that we continued to 22 look at the toxicity of paraquat, including by the 23 inhalation route, over a period of time beyond this. 24 Q. Now, regulatory agencies have expressed 25 concerns about toxicity of exposure to the larger	227 1 the head of reassessment division; do you see that? 2 A. That's right, yes, Dr. Riedel. 3 Q. And you understand this is the regulatory 4 agency for Canada? 5 A. Yes. 6 Q. And at this time, paraquat formulations 7 were registered for market and sale in Canada? 8 A. Yes. 9 Q. And in the first section, it references 10 some acute and short-term inhalation studies. 11 Do you see that? 12 A. I do. 13 Q. And those studies that are listed, do you 14 understand those studies to have been done on paraquat 15 itself without a surfactant? 16 A. Yes, I think so. 17 Q. Now, it mentions: 18 "... Chipman submitted an acute inhalation 19 toxicity study in the rat, May 30, 1988." 20 Right? 21 A. Yes. 22 Q. Do you know what they're referring to for 23 "Chipman," as submitting an acute inhalation toxicity 24 study? 25 A. Do you mean --
226 1 non-respirable particles of paraquat, right? 2 MR. NARESH: Objection; form, scope, 3 foundation. 4 THE WITNESS: Yes. 5 BY MR. DICKENS: 6 Q. And that includes the US EPA? 7 A. Questions have been asked, yes. 8 Q. And you saw documents to that effect in 9 preparation for today's deposition, right? 10 A. Yes, indeed. 11 Q. And you saw statements from the US EPA 12 concerned that those non-respirable particles could 13 result in chronic toxicity? 14 A. I'd need to be reminded exactly how they 15 put that, so maybe you can help me with a document. 16 MR. DICKENS: Why don't I start with an 17 earlier report. I'll go ahead and mark Exhibit 32 for 18 the record. 19 (Exhibit 32 marked for identification.) 20 MR. DICKENS: For the record, this is 21 identified in topic 5 of the Notice of Deposition. 22 BY MR. DICKENS: 23 Q. Dr. Botham, this is a document from the -- 24 Health and Welfare Canada, dated October 23, 1989. 25 And do you understand specifically it is	228 1 Q. Like, who is Chipman -- 2 A. Yeah. Well -- 3 Q. -- I guess is the easy way to ask it? 4 A. -- I think my understanding is that 5 Chipman was, essentially, the ICI Canada commercial 6 organization. 7 Q. And the second page in the middle, there's 8 a paragraph beginning, "The above comments..." 9 Do you see that? 10 A. Yes. 11 Q. "The above comments indicate that toxic 12 effects resulting from an acute exposure may be 13 underestimated from this study. However, signs of 14 respiratory distress, neurotoxicity and damage to lung 15 tissue were evident in the rats exposed to the low 16 nominal exposure level of 0.185 micrograms per liter 17 [in the] air." 18 Do you see that? 19 A. I do. 20 Q. Now, Health Canada is reporting -- 21 Syngenta, first of all, would have received a copy of 22 this letter back in the 1989 time frame, right? 23 A. Yes. 24 Q. And it's being reported that inhalation 25 toxicity study -- and this was an inhalation toxicity

Conducted on September 17, 2024

229 1 that was submitted by another company or ICI? 2 A. Right, yes. 3 Q. Is it ICI? 4 A. It is I -- it's another comp- -- I don't 5 know whether it was owned by ICI, but, yeah, certainly 6 very closely associated with ICI. 7 Q. It's within the Syngenta realm? 8 A. Exactly, yeah, yeah, yeah. 9 Q. So Syngenta submitted an inhalation study 10 and the Health Canada regulatory agencies are saying 11 there were signs of neurotoxicity in the rats with a 12 low nominal exposure level, right? 13 A. That's what they said, yes. 14 Q. And that exposure level is right around 15 what we saw in the four-hour acute inhalation study, 16 correct? 17 A. Yes, and just to point out that this acute 18 inhalation study was not, if you like, a standard 19 acute inhalation study. So on the first page it says 20 that this study was done to simulate practical use 21 exposure level, so it wasn't trying to stress the 22 system to do a medium lethal concentration as you 23 would normally do. 24 Q. And even at that practical-use exposure 25 levels, there were signs of neurotoxicity, right?	231 1 Right? 2 A. Well, that was in the repeat-dose study, 3 I assume, was it? It occurred over 14 days in one 4 group of rats -- oh, no, after single exposure, excuse 5 me. 6 No, sorry, it was a delayed toxicity. 7 Right. 8 Q. "Delayed toxicity" meaning toxicity that 9 occurs after some time? 10 A. Yes. 11 Q. And paraquat is known to result in delayed 12 toxicity, correct? 13 A. Yes. 14 Q. "The above information indicates that very 15 low concentrations of paraquat aerosols may result in 16 irritation and damage to the lungs, and that 17 respiratory protective equipment should be worn when 18 paraquat is applied in the form of sprays." 19 Do you see that? 20 A. I do. 21 Q. Now, in 1989, Syngenta was not warning 22 farmers or other users to wear respiratory protective 23 equipment, right? 24 A. Well, this is something that I discussed 25 with Mr. Dixon, and I don't -- I've not got
230 1 A. Yes. I would need to have a look again at 2 the report to see precisely what they meant by that 3 because neurotoxicity can mean many different things. 4 Q. But certainly someone within Syngenta 5 underlined neurotoxicity in this particular document, 6 right? 7 MR. NARESH: Objection; foundation. 8 THE WITNESS: I don't know if it was 9 somebody from Syngenta, but somebody's underlined it. 10 BY MR. DICKENS: 11 Q. This document actually refers to the 12 "invalidated IBT studies," right? 13 A. Yes. 14 Q. Turn to the next page. 15 A. Mmm-hmm. 16 Q. Health Canada mentions: 17 "These studies are not considered adequate 18 by present standards..." 19 And there's a toxicology data gap for 20 short-term inhalation toxicity. 21 Right? 22 A. Yes. 23 Q. It mention that there was an 80 percent 24 mortality over 14 days in one group of rats after a 25 single exposure to 1 microgram per liter in the air.	232 1 immediately to hand here, but there were certainly 2 periods of time when we were recommending respiratory 3 protection. I just don't have that date window at my 4 fingertips. 5 Q. And when you say "respiratory protection," 6 does that include a dust mask or a fabric mask? 7 A. An appropriate NIOSH-approved mask. 8 Q. And that could just be a fabric mask, 9 right? 10 A. I'm not an expert in that, so I wouldn't 11 know exactly what the constitution would be. 12 MR. DICKENS: I'll hand you what we will 13 mark as Exhibit 33. 14 (Exhibit 33 marked for identification.) 15 MR. DICKENS: 33 is a memorandum from 16 the EPA to Syngenta. 17 BY MR. DICKENS: 18 Q. Is that right? 19 A. Yeah -- this was from the Health Effects 20 Division branch to another person in Health Effects 21 Division, so this looks more like an internal memo. 22 Q. You're right and I apologize for that. 23 So this is an internal memo on a review of paraquat 24 incident reports for inhalation, right? 25 A. That's correct.

Conducted on September 17, 2024

233 1 Q. And Syngenta would have received a copy of 2 this report that was internal, this memorandum 3 prepared by the EPA at some point in time, correct? 4 A. That would seem to be the case, yes. 5 Q. And the date of the report is August 10, 6 2000? 7 A. Yes. 8 Q. If we can turn to the last page, page 8. 9 MR. NARESH: This is topic 17? 10 MR. DICKENS: Sorry. This is 17, correct. 11 BY MR. DICKENS: 12 Q. And in the conclusion, the EPA, after 13 their review of paraquat incident reports and 14 inhalation, note that: 15 "... Wessling and NIOSH reports suggest 16 that large droplets that could get into the nasal 17 mucosa may pose a serious hazard." 18 That's what the EPA is finding, right? 19 A. That's right, that's what it says. 20 Q. And: 21 "These droplets may be swallowed or 22 absorbed across the nasal membrane." 23 Correct? 24 A. Yes. 25 Q. "Nasal exposure to non-respirable droplets	235 1 BY MR. DICKENS: 2 Q. This is a multiple email chain produced by 3 Syngenta in the litigation. I will start at the 4 bottom, from Barry Elliott to Nick Sturgess, dated 5 August 5, 2005. 6 Do you see that? 7 A. Yeah. 8 Q. And this is referencing Defra, correct? 9 A. That's right. 10 Q. And that's the report that you mentioned 11 earlier in the deposition, that you had reached out to 12 someone for further information; is that correct? 13 A. That's right, yes. 14 Q. And Defra had conducted a study 15 investigating paraquat? 16 A. Yes. To be accurate, and this was 17 probably true at this time, 2005, they were looking to 18 place a contract which could include doing some 19 studies which would involve exposing animals to 20 paraquat, including by the intranasal route. 21 Q. Now, at this point in 2005, Defra was 22 proposing this work. Had Syngenta ever undertaken 23 studies to investigate the effect of paraquat through 24 the intranasal route? 25 A. Not of -- no, we had not, no.
234 1 could cause serious and perhaps fatal poisoning by 2 paraquat." 3 Do you see that? 4 A. Yes. 5 Q. And this was reported to Syngenta in the 6 year 2000, correct? 7 A. Yes. 8 Q. And is that a statement that Syngenta 9 agrees with, that non-respirable droplets of paraquat 10 could cause serious and perhaps fatal poisoning? 11 A. I think it was -- really, the data speaks 12 for itself. The evidence is that in relatively rare 13 cases this can happen and so it was a reinforcement of 14 the need for further personal protective equipment, 15 this tied to the respiratory tract. 16 Q. And that respiratory equipment was meant 17 to prevent exposure from inhalation to farmers and 18 other users of paraquat? 19 A. Yes. 20 MR. DICKENS: Keep going. I'll hand you 21 Exhibit 34 for the record. 22 (Exhibit 34 marked for identification.) 23 MR. DICKENS: For the record, this is on 24 topic 63 within the Notice of Deposition. 25 ///	236 1 Q. Certainly, Syngenta had the capabilities 2 prior to 2005 to have undertaken a study investigating 3 paraquat through the intranasal route? 4 A. We had the technical capability, yes. 5 Q. And there's a highlighted section from 6 Defra related to possible entry into the brain via the 7 olfactory bulb. 8 Do you see that? 9 A. Yes. 10 Q. And the olfactory bulb, that's the upper 11 part of the nasal cavity? 12 A. Yes, and it is, as I said earlier, a 13 potential route of entry into the brain which doesn't 14 involve going through the blood-brain barrier. 15 Q. As Defra states: 16 "Chemicals could [...] enter the brain 17 without having to cross the blood-brain barrier." 18 Right? 19 A. Yes. 20 Q. And then on the top of the page, Nick 21 Sturgess responds on that same day, and Nick 22 Sturgess -- who is Nick Sturgess? 23 A. Nick Sturgess was our neurotoxicologist. 24 Q. So you say he is the neuro- -- was he the 25 only neurotoxicologist with Syngenta at the time?

Conducted on September 17, 2024

237 1 A. At the time, I think yes, because the 2 previous neurotoxicologist was Dr. Widdowson. I think 3 Dr. Widdowson had left by that time. 4 Q. The second paragraph begins -- in the 5 second paragraph: 6 "Having read through some of the 7 information provided by Paul..." 8 And you understand that to be Paul Hext? 9 A. Yes, Paul Hext. 10 Q. And Paul Hext is an inhalation 11 toxicologist? 12 A. Yes, he was the senior inhalation 13 toxicologist. 14 Q. The neurotoxicologist, Nick Sturgess, at 15 Syngenta, said: 16 "... my opinion is that there certainly is 17 a potential for paraquat to be transported to the 18 olfactory bulb if the nasal mucosal epithelium comes 19 into contact with paraquat." 20 Right? 21 A. Yes. 22 Q. And the way the nasal mucosal epithelium 23 would come into contact with paraquat is through 24 intranasal exposure? 25 A. Yes.	239 1 When we learned that Defra might be doing 2 this, we -- it was another reason to say, well, let's 3 see what they find. I mean, we -- there's no point in 4 duplicating that kind of work. 5 Q. Okay. And do you know what they did find, 6 Defra? 7 A. I don't believe they ever did such a study 8 and that's why I looked at the record that I was 9 telling you about before. So they ended up doing a 10 lot of kinetic modeling and predicting what might 11 happen had they done such a study, but from what I can 12 gather, they never actually commissioned or did an 13 intranasal toxicity study. 14 Q. Didn't you say earlier in the deposition 15 that kinetic modeling could be as accurate if not more 16 accurate than direct measurements? 17 A. It can be, yes. Yes. 18 Q. So you understand -- do you know what the 19 kinetic modeling undertaken by Defra found with 20 respect to intranasal exposure to paraquat? 21 A. I've got their report, certainly, yes. 22 Q. What did they find? 23 A. I'd need to -- I've not brought the report 24 into the -- it's a very thick report, actually, so 25 we'd need to look at that outside.
238 1 Q. Breathing it in? 2 A. Right, although let me just clarify there. 3 When -- for example, here, there's a description of 4 intranasal administration; again, that is an 5 exaggerated way of applying a substance. It's not 6 like you're asking the animals to breathe in naturally 7 into the nose. You're actually, essentially, pushing 8 a substance intranasally, so it gives exaggerated 9 exposure compared to what human beings might be 10 exposed to. 11 Q. But that is the accepted method of 12 undertaking an intranasal exposure study, right? 13 A. It is, but it's rather like things like 14 intraperitoneal exposure; it's accepted but it's also 15 accepted to be not a physiological mechanism of 16 exposure, if you like. It's an exaggerated exposure. 17 Q. And is it on that basis why Syngenta has 18 never undertaken an intranasal exposure study 19 involving paraquat? 20 A. I would say it was one reason, in that we 21 didn't feel that an intranasal study was going to give 22 any further information about actual human risk from 23 exposure to paraquat and, also, you know, we were 24 beginning at that time to do experiments using other 25 routes of exposure.	240 1 Q. You've reviewed that in preparation for 2 today's deposition? 3 A. I did. 4 Q. Later on, Nick Sturgess says: 5 "The mechanism involved seems to be the 6 transfer along the olfactory nerve pathway via some 7 form of axonal transport, directly to the olfactory 8 bulb in the brain, thereby circumventing the 9 blood-brain barrier." 10 Right? 11 A. Yes. 12 Q. That's what the neurotoxicologist at 13 Syngenta is reporting as of August 2005, correct? 14 A. And I think it was -- that was really 15 taking the example of manganese, so he was saying this 16 is how manganese may actually reach the brain. 17 Because he says whether the same would have happened 18 -- could happen with paraquat is open to debate. 19 Q. And the kinetics of this transport process 20 would be quite rapid, within minutes following 21 introduction into the nasal cavity. 22 Right? That's what's being reported? 23 A. Yes, again, but this is all built on the 24 experience or understanding of what happened with 25 manganese, so it's not known what could happen with

Conducted on September 17, 2024

241 1 paraquat. 2 Q. And not known because no studies had been 3 done at this point in August -- 4 A. Not at this site, no -- not of this sort, 5 no. 6 Q. And, in fact, Nick Sturgess refers to: 7 "... the lack of definitive quantitative 8 experimental data measuring olfactory bulb 9 concentrations of paraquat following nasal exposure." 10 Right? 11 A. Yes. 12 Q. You can put that aside. 13 MR. DICKENS: I'll hand you Exhibit 35 for 14 the record. 15 (Exhibit 35 marked for identification.) 16 MR. DICKENS: Exhibit 35 is more email 17 correspondence produced by Syngenta in this 18 litigation. For the record, it's topic 63 in the 19 Notice of Deposition. 20 BY MR. DICKENS: 21 Q. Once again, this is an email chain that 22 you reviewed prior to today's deposition, right, 23 Doctor? 24 A. It is, yes. 25 Q. And beginning once again on the bottom	243 1 into the nasal cavity. Syngenta does not know that, 2 however, because they'd never conducted a test as to 3 how much would need to be ingested intranasally in 4 order to lead to affects on the brain? 5 A. Well, absolute -- yes, we -- but, equally, 6 we do know that the amount of paraquat that is inhaled 7 is, generally speaking, very low. 8 So I think it was a reasonable hypothesis 9 that there would be a very big margin of safety, if 10 you wish, from the likely volumes or amount of 11 paraquat that somebody spraying the product would be 12 exposed to versus that that would actually kind of 13 generate the transport of paraquat in the way in which 14 is being described. 15 Q. You agree that intranasal exposure does 16 occur? 17 A. Nasal exposure, yes, that's right. 18 Q. We began the deposition talking about the 19 nosebleeds in the very early research studies, right? 20 A. Indeed. 21 Q. And nosebleeds are the most common adverse 22 effect that have been reported with respect to 23 paraquat? 24 A. I don't know if it's the most common, but 25 it's certainly common.
242 1 email, this is from a Matthew Jacobsen to Nick 2 Sturgess, subject "Olfactory lobe and paraquat entry," 3 dated September 5, 2005, right? 4 A. Yes. 5 Q. Okay. It states: 6 "Nick, I've been thinking about this one." 7 Specifically olfactory lobe and paraquat 8 entry, right? 9 A. Yes. 10 Q. And he discusses, at the very bottom, 11 axonal transport of paraquat, right, and he says that 12 it is possible in his opinion -- or if it's possible, 13 sorry? 14 A. Yeah. Look, I mean, my reading of this 15 email from Matt is, essentially, it's Matt thinking 16 aloud or contemplating a number of different scenarios 17 that could be possible and, you know, you also have to 18 read it in the context of what Nick had said in the 19 previous email, that when you then try and do the 20 translation to whether this could happen with 21 paraquat, as against manganese, you're talking about 22 massive volumes of paraquat needing to be -- if you 23 like, to enter through the nasal cavity. 24 So it was a theoretical discussion. 25 Q. You say massive amounts would need to go	244 1 Q. And the evidence of nosebleeds itself is 2 evidence that individuals, farmers and other users of 3 paraquat are getting paraquat into the nasal regions, 4 right? 5 A. Yes, but we're talking about the lower -- 6 I mean, the nosebleeds are coming from the lower part 7 of the nose, so they're not coming from up here into 8 the olfactory bulb, so it's exposure to -- you know, 9 basically where you can feel yourself. 10 Q. You can't say how much paraquat is getting 11 into the upper regions or the olfactory bulb in a 12 farmer or individual who has experienced a nosebleed, 13 right? 14 A. I can't sit here and give you a number, 15 certainly. 16 Q. It says: 17 "If axonal transport of paraquat is 18 possible, then it could enter from cuts in the skin 19 and reach the CNS." 20 Central nervous system, right? 21 A. It's what I said before: This is thinking 22 aloud; it's highly speculative thoughts, the kind of 23 things that researchers do when they're talking to 24 each other. So I don't think this is based on Matt 25 saying "I know that this could definitely happen,"

Conducted on September 17, 2024

245 1 particularly when we're talking about axonal 2 transport. 3 Q. Who is Matt Jacobsen? 4 A. He's a pathologist. 5 Q. And he's a pathologist discussing paraquat 6 entry through the olfactory lobe -- 7 A. Yes. 8 (Stenographer clarification.) 9 MR. DICKENS: Sorry. 10 BY MR. DICKENS: 11 Q. He is a pathologist at Syngenta discussing 12 paraquat entry into the olfactory lobe with the 13 neurotoxicologist? 14 A. Yes. 15 Q. "... then it could enter from cuts in the 16 skin and, and reach the CNS [...] via the peripheral 17 nerves, or from the ophthalmic nerve from a splash in 18 the eye. I [may] have a little dig on anatomy, time 19 permitting." 20 Right? That's what he's reporting at this 21 point? 22 A. Right. But all of this, to repeat, highly 23 speculative to imagine that you would get the 24 transport of paraquat through nerves in the way in 25 which it's been described into the brain.	247 1 I believe at this time that Matt Jacobsen may have 2 been on a technical team, together with Nick Sturgess 3 and Barry Elliott, who were focused on paraquat. 4 So it probably happened within the context 5 of the discussions within that team. 6 Q. And you mention -- he said it's 7 theoretical, correct? 8 A. Yes. 9 Q. But he said: 10 "If we are worried about our position on 11 this, then it is possible to do some experiments as 12 Matt describes." 13 Right? 14 A. I think that's an off-the-cuff view on how 15 easy it would be to do such experiments, particularly 16 if we're talking about transmission through the 17 nervous system. I think they would be extremely 18 difficult to do, in practice. 19 Q. Well, he doesn't say anything in his email 20 about the ease of doing those experiments, right? 21 A. No. 22 Q. Or the cost of doing those experiments? 23 A. No. 24 Q. He does mention that the problem with 25 doing such an experiment is that any positive finding
246 1 Q. And you're saying it would be speculative. 2 Nick Sturgess responds -- or, sorry, forwards Matt 3 Jacobsen's email to Barry Elliott, right? 4 A. Yes. 5 Q. And who is Barry Elliott again? 6 A. Barry at that time was the project manager 7 in CTL for paraquat. 8 Q. Okay. It says: 9 "Barry, I have the attached response from 10 Matt re the olfactory transport to the brain issue." 11 Do you see that? 12 A. Yes, and he said "theoretically possible." 13 I suppose he's saying, like me, of course all things 14 are theoretically possible, but, I mean, my reading of 15 this is that it's highly theoretical. 16 Q. He says "I have the attached response from 17 Matt...", indicating that Matt was responding to an 18 inquiry with respect to olfactory lobe and paraquat 19 entry, right? 20 A. Yes, yes. 21 Q. So the neurotoxicologist and Barry Elliott 22 specifically reached out to Matt Jacobsen for his 23 viewpoint as to this particular issue? 24 A. I don't know exactly how it went, how that 25 conversation or inquiry was made, but I can imagine --	248 1 would be reportable. 2 Right? 3 A. Of course, yes. 4 Q. And that's reportable to the regulatory 5 agencies? 6 A. Yes. 7 Q. So Nick Sturgess doesn't say, "This 8 would be such a hard study," or "I don't know what the 9 results would show." He's saying, "If we do get a 10 finding, we have to tell regulatory agencies?" 11 A. Yeah, sure. 12 MR. NARESH: Objection to form. 13 Go ahead. 14 THE WITNESS: Look, this is something 15 which, again, you've got to have a sense of the 16 context of why these discussions go on. Of course 17 people were concerned about generating data which were 18 potentially referable. But they also were having, at 19 the same time, conversations about are these 20 experiments really going to tell us about the risk 21 from paraquat. 22 So reporting is just one element of that 23 decision about whether it makes any sense whatsoever 24 to invest in doing studies of this sort. 25 ///

Conducted on September 17, 2024

249 1 BY MR. DICKENS: 2 Q. It says: 3 "... do we really want to go there?" 4 Right? 5 A. Mmm. 6 Q. "A negative, however, would put it to bed 7 pretty well." 8 So Nick Sturgess is saying, "If we did do 9 this study and it was negative, we wouldn't have to be 10 worried about this issue," right? 11 A. Well, sure, but then of course you can 12 never prove a negative, so even that might be an 13 exaggerated statement. 14 MR. DICKENS: I'll move to strike 15 everything after "Well, sure." 16 BY MR. DICKENS: 17 Q. Isn't the question of paraquat entry 18 through the olfactory lobe a question that Syngenta 19 would want answered? 20 A. I think that we are starting -- were 21 starting, and continue now to this day, to say that 22 that might be relevant if we really thought that 23 paraquat does cause, under the conditions of exposure 24 that farmers and growers are subjected to in their 25 work, that that could be causative in Parkinson's	251 1 Q. And price estimates to run the exact 2 intranasal study to determine the amount of paraquat 3 entry through the olfactory lobe, right? 4 A. The kinetic component was part of that, 5 yes. 6 Q. And that was through WIL Research? 7 A. That would have been an option for us, 8 yes. That's where we got one of the price estimates. 9 MR. DICKENS: I'll hand you Exhibit 36 for 10 the record. 11 (Exhibit 36 marked for identification.) 12 MR. NARESH: What's the topic number? 13 MR. DICKENS: Good question. Topic 35. 14 MR. NARESH: Thank you. 15 BY MR. DICKENS: 16 Q. Doctor, I've handed you a document from 17 Syngenta's production, dated July 17, 2008. "Study 18 Title: Evaluation of the effect of intranasal 19 administration of paraquat in the C57B16 mice." 20 Right? 21 A. Yes. 22 Q. And this is a quotation for a study by 23 WIL Research Laboratories, right? 24 A. It is. 25 Q. And the objective:
250 1 disease. 2 We do not believe that to be the case, and 3 so these kind of experiments are really not necessary 4 in that situation. 5 Q. But as Nick Sturgess says, you could run 6 a study and get the answer pretty easily, right? 7 A. You could do many studies and get the 8 answer easily, but let me just -- although you struck 9 the previous one, I would say, you know, you can do 10 many experiments and you don't see an effect and 11 people will say, yes, but you didn't do this, you 12 didn't have a high enough concentration, you didn't 13 use the right species. 14 So it's very difficult to know when you 15 get a definitive negative answer. 16 Q. Has a intranasal study ever been done by 17 Syngenta -- 18 MR. NARESH: Objection; asked and 19 answered. 20 BY MR. DICKENS: 21 Q. -- on paraquat? 22 A. No. 23 Q. Syngenta did, though, however, get price 24 estimates for an intranasal study, right? 25 A. We did.	252 1 "To evaluate the neurochemical and 2 histological effects of paraquat on male and female 3 [mice] following intranasal administration." 4 Right? 5 A. Correct. 6 Q. And under this study, there would be some 7 brain neurochemistry, correct? 8 A. Yes. 9 Q. And in this study, WIL Research gave a 10 price quote of \$667,000 to run this study, right? 11 A. Yes. 12 Q. At no point did they ever say, "We can't 13 do this particular study"? 14 A. No, they didn't, no. 15 Q. This study would have included sectioning 16 of the brains for striatum and substantia nigra -- 17 A. Yeah -- 18 Q. -- and review -- 19 A. -- the histology, yes. 20 Q. Okay. So there would have been stereology 21 as to the effect of paraquat on the substantia nigra 22 within the mouse brains? 23 A. That was the intention, yes. 24 Q. Following intranasal administration? 25 A. That's right.

Conducted on September 17, 2024

253 1 Q. And this was specific to identify whether 2 or not intranasal exposure would have neurotoxic 3 risks, right? 4 A. Right. So, again, a sense of context 5 because I did look at this again myself. So this 6 quotation was asked for as a consequence of a -- 7 discussions we'd been having in what was then known as 8 the Health Science Team about a number of potential 9 experiments that we might do. 10 The reason why we asked for this is -- 11 I think pretty self-evident from the discussions we've 12 just been having, because it is a genuine experimental 13 option; however, we, again, at that particular time, 14 were still under the assumption that the Defra 15 contract would have requested such a study to be done. 16 So one reason -- not the only reason -- 17 why we didn't go ahead with this is because we thought 18 it might be duplicating what was being done somewhere 19 else. 20 Q. Now, Syngenta had communications with 21 Defra with respect to the study that they were doing 22 on paraquat, right? 23 A. As much as we were able, with 24 confidentiality and conflict of interest. 25 Q. And, certainly, Syngenta could have asked	255 1 called the Medical and Toxicological Panel, which 2 included people from industry. 3 That was the legitimate interaction that 4 we could have from industry with Defra and with the 5 advisory committee. So I was not involved at all in 6 the contract and the output of that contract from 7 Defra, other than knowing a little bit about it from 8 time to time in the Medical and Toxicological Panel 9 meetings. 10 Q. Okay. You provided peer-review comments 11 as to the Exponent study? 12 A. I was asked to comment on that, yes. 13 Q. And when was that? 14 A. I can't remember the date. It was around 15 about this kind of time. I don't have the exact year 16 to hand. 17 Q. Do you know whether it was before or after 18 July of 2008? 19 A. I'd need to be reminded. I know that 20 there is an email with my report on it. I just 21 haven't got the date to hand. 22 Q. And you gave peer-review comments. Did 23 that include peer-review comments specific to the 24 intranasal findings in the Defra study? 25 A. I don't think I did because I don't
254 1 Defra what type of intranasal study were they 2 contemplating, right? 3 A. We were very careful about the nature of 4 our communications. There were some communications 5 with them, but we were not having ongoing detailed 6 dialogue about the details of -- and, in fact, to be 7 fair, even Defra were -- when I had a discussion, a 8 little bit unclear exactly what was being done by the 9 successful winner of that contract, Exponent. 10 Q. No one at Syngenta ever asked anyone at 11 Exponent or with Defra as to what type of intranasal 12 administration study they were conducting? 13 A. I don't personally remember having that 14 kind of conversation and, to reiterate, we needed to 15 take some care about, you know, being perceived as 16 trying to have some influence over what Exponent were 17 doing because, you know, we may have been sitting here 18 today and you'd have been showing me emails to say, 19 you know, "Why did you have these discussions?" 20 Q. You were on the ACP panel at Defra 21 overseeing the study, were you not? 22 A. Not overseeing the study. No, I was not 23 on the ACP. That's the Advisory Committee on 24 Pesticides. That's the regulatory advisory committee. 25 I was on a group, a sort of shadow group to that,	256 1 think -- no, I think, again, I would just need to look 2 at that to remind myself. I think it was more to do 3 with the study that was done on some of the 4 stereological information. 5 Q. Syngenta notified WIL Research that they 6 would not be moving forward with the intranasal study 7 prior to Defra's study being made available, right? 8 A. This is the interesting thing here because 9 the Defra study, you might argue, was never really 10 made fully available. It was never properly 11 externally published, so I got hold of a report 12 because of the links that I was -- just described. 13 There were two presentations made, posters. That's 14 all that ever appeared from that project. 15 Q. Okay. And understanding it wasn't 16 publicly available, it certainly was available to 17 Syngenta, right? 18 A. Eventually, yes. 19 Q. And did Syngenta notify WIL Research they 20 would not be going forward with the intranasal 21 administration study before or after receiving the 22 report internally from Defra? 23 A. I can't remember. I would need to see the 24 chronology of this again. I didn't manage to put all 25 that chronology together as preparation, so I'm sorry

Conducted on September 17, 2024

257 1 I can't give you an answer today. 2 Q. Has Syngenta reached out to WIL Research 3 or any other contract research organization to do an 4 intranasal administration study after receiving the 5 Defra results? 6 A. Not that I'm aware of. 7 MR. DICKENS: Okay. Why don't we take 8 a break. 9 THE VIDEOGRAPHER: We are going off the 10 record at 15:48. 11 (Break taken.) 12 THE VIDEOGRAPHER: We are back on the 13 record at 16:05. 14 MR. DICKENS: Dr. Botham, I'm going to 15 hand you what we'll mark as Exhibit 37 for the record. 16 This is Topic No. 102 in the Notice of Deposition. 17 (Exhibit 37 marked for identification.) 18 BY MR. DICKENS: 19 Q. This document are minutes from a meeting 20 to discuss the possibility for a paraquat symposium at 21 IHRL, meeting taking place October 7, 1971. 22 Is that right? 23 A. It is. 24 Q. This is a document you reviewed in 25 preparation for today?	259 1 "IHRL had since heard that an outside body 2 was considering a paraquat symposium and thought it 3 would be far better if such a move came from within 4 ICI, and [...] would be a more effective means of 5 getting the paraquat information over to the 6 authorities." 7 Right? 8 A. Yes. 9 Q. So there was a discussion or consideration 10 as to whether or not ICI should have a meeting with 11 regulatory agencies to discuss paraquat? 12 A. Yes. 13 Q. And this was with respect to discussion as 14 to the toxicity risks as well as benefits of paraquat? 15 A. Yes, that's right. The document goes into 16 that further down. 17 Q. It notes: 18 "It has been requested by PPL..." 19 And that's -- who is that, PPL? 20 A. Plant Protection Limited. 21 Q. Okay. What was Plant Protection Limited's 22 role in the overall ICI in comparison to IHRL? 23 A. So Plant Protection Limited was the 24 commercial part of ICI involved in crop protection. 25 Q. So PPL was the marketing division, if you
258 1 A. It is. 2 Q. And it lists individuals who were present, 3 right? 4 A. Yes. 5 Q. Who are these individuals, just generally? 6 A. Well, they are people from various parts 7 of the ICI organization. Different divisions of ICI. 8 Q. Okay. And what type of divisions are 9 represented? 10 A. Well, it looks like we've got a 11 representation from what was then called Mond 12 Division, which is kind of the bulk chemicals business 13 of ICI, Plant Protection people from IHRL, the 14 predecessor of CTL, and possibly others as well. 15 I don't know everybody who was on this 16 list. 17 Q. And the meeting was called because, in the 18 next paragraph: 19 "Last year it [was] suggested that a 20 round-table discussion on paraquat should be held with 21 all registration authorities." 22 And is it your understanding that refers 23 to regulatory authorities? 24 A. Yes, indeed. 25 Q. And:	260 1 will? 2 A. Yes. It also had some regulatory and 3 other functions, but, yes, principally marketing. 4 Q. Okay. So PPL, the commercial component, 5 requested "the symposium be restricted to the European 6 sphere" because: 7 "... dealings with the Americas, Australia 8 and the Far East have been running smoothly to date." 9 Right? 10 A. Yes, that's what it says. 11 Q. And: 12 "Dr. Fletcher visualized the proceedings 13 as running along the lines of a scientific symposium." 14 Right? 15 A. Yes, that's right. 16 Q. Okay. And then there are some advantages 17 and disadvantages of having such a symposium, right? 18 A. Yes. 19 Q. I'll have you turn to the second page. On 20 the second page is listed some of the disadvantages of 21 actually having this symposium with the regulatory 22 agencies, right? 23 A. Yes. 24 Q. Number 1 -- and your understanding from 25 these minutes are these would have been disadvantages

Conducted on September 17, 2024

261 1 that would have been discussed at the minute -- or the 2 meeting of the ICI individuals, right? 3 A. That would be my assumption, yes. 4 Q. And the disadvantages, number 1: 5 "Too many facts may be unearthed..." 6 And: 7 "... we would have to be prepared to give 8 information freely and without reservation." 9 Do you see that? 10 A. I do. 11 Q. And that's what was reported as a 12 disadvantage for meeting with the regulatory agencies 13 in the symposium, correct? 14 A. Yes. 15 Q. Implication being that ICI would like to 16 hold some information back with respect to paraquat at 17 that point in time, right? 18 A. I really wouldn't like to say what the 19 specific issues are that might have been of concern at 20 that time. I think that would be very speculative. 21 Q. Number 3: 22 "In some cases, i.e., safer paraquat 23 formulations it is not economic to consider further 24 work in certain directions. If we are talking to 25 academic people and minutes are within the reach of	263 1 Q. And ICI was the company that was 2 responsible for the sale and marketing of paraquat in 3 the United States as of October 7, 1971? 4 A. Yeah. Those windows of when it was ICI 5 and when it was Chevron and when it was both, I just 6 don't have those dates to hand, so -- but yes. 7 MR. DICKENS: I'll hand you what we'll 8 mark as Exhibit 38. 9 (Exhibit 38 marked for identification.) 10 MR. DICKENS: This is topic 97 in the 11 Notice of Deposition. 12 BY MR. DICKENS: 13 Q. This is a document dated May 18, 1966, 14 from a Dr. Swan to a Dr. Toland at Chevron. 15 Do you see that? 16 A. Yes. 17 Q. And we've discussed Dr. Swan and his role, 18 correct? 19 A. Yes. 20 Q. There's other individuals listed on the 21 top, including a Dr. Boon? 22 A. Yes. I don't know these individuals, but, 23 yes, Dr. Boon and Mr. Cronshey are from Plant 24 Protection Limited that we were talking about before. 25 Q. And Dr. Swan, he's with ICI at this time,
262 1 the general public, will these people understand this 2 placing of economics before safety?" 3 Right? 4 A. Yes. 5 Q. That's what the minutes state as discussed 6 at this ICI meeting in 1971, correct? 7 A. Yes. 8 Q. Would the public and others understand us 9 as a company putting economics or profit over safety? 10 A. Yes, and it's -- I mean, I'm always, shall 11 I say, disappointed when I see statements like that, 12 recognizing that we are talking about more than 13 50 years ago now when we were in a different world. 14 It's not -- it's certainly not the kind of statement 15 that Syngenta would make today or would have made in 16 my -- most of my working lifetime. 17 Q. You weren't with Syngenta or ICI at this 18 point in time, correct? 19 A. I was not, no. 20 Q. And ICI was the predecessor of Syngenta, 21 correct? 22 A. Yes. 23 Q. And this was indeed a statement that was 24 in the minutes of a meeting from 1971? 25 A. Correct.	264 1 right? 2 A. That's correct. 3 Q. And he writes to Dr. Toland at Chevron and 4 states: 5 "We are puzzled and concerned that you are 6 considering changing the label for paraquat at this 7 moment, when the present label has been agreed with 8 the US authorities and in the petition which is filed 9 with the US F&DA is now presumably under 10 consideration." 11 Right? 12 A. Yes. 13 Q. "It seems to [ICI] that the introduction 14 of skull and crossbones implies [...] a greater hazard 15 than exists." 16 Correct? 17 A. Yes. 18 MR. NARESH: I'll just object to 19 completeness. 20 BY MR. DICKENS: 21 Q. And so -- 22 MR. NARESH: Go ahead. 23 BY MR. DICKENS: 24 Q. -- ICI, at this point in time, did not 25 agree with a proposal by Chevron to change the label

Conducted on September 17, 2024

265 1 to include, among other things, a skull and 2 crossbones, right? 3 A. Yeah, I mean, when I looked at this 4 document, I think I came to the conclusion, 5 particularly if you read it towards the end, so on 6 page 3 where you've got the words that are underlined, 7 Dr. Swan was not disagreeing that we shouldn't be 8 warning people who are using this product, and, 9 essentially, the language that's underlined is 10 effectively what the skull and crossbones tell you. 11 So for some reason he was objecting to 12 that pictogram of representing the hazard, and it may 13 have been because at that time paraquat could 14 have been out of line with other products. 15 I really don't know because this is way 16 before my time. 17 Q. Dr. Swan indicates that there is: 18 "... no reason to make a major point of 19 the oral toxicity of paraquat." 20 Right? 21 A. Well, he's saying that it's important that 22 we do make sure that people understand that it can be 23 fatal if swallowed. So I don't think that he's -- 24 that's what he's saying on the last page, on page 3, 25 so I don't think he's trying to dismiss oral toxicity.	267 1 MR. DICKENS: Exhibit 39 for the record. 2 (Exhibit 39 marked for identification.) 3 MR. DICKENS: This is topic 95 within the 4 Notice of Deposition. 5 BY MR. DICKENS: 6 Q. This is another letter from Dr. Swan, this 7 time dated February 12, 1969, to the manager of 8 research and development at Chevron. 9 A. Yes. 10 Q. Do you see that? 11 A. Yes. 12 Q. Now, it begins saying: 13 "[We have] learned from Dr. Dye..." 14 We have seen Dr. Dye's name before. He 15 was an individual at Chevron responsible for 16 regulatory matters, right? 17 A. Okay. 18 Q. It says: 19 "[We have] learned from Dr. Dye that our 20 discussion with Dr. Hayes was successful to the extent 21 that he has given up [a] threat to withdraw 22 registration of 'Gramoxone' in return for stronger 23 label warnings..." 24 Right? 25 A. Yes.
266 1 Q. On the last page, he does state his 2 concern about a possible consequence and he says: 3 "It appears to us that the possible 4 consequences of the step you are contemplating are 5 serious and could well prejudice the attitude of the 6 F&DA to the petition for paraquat which they are at 7 present reviewing." 8 Right? 9 A. Yes. 10 Q. And that's petition for registration, as 11 far as you know? 12 A. Well, I assume so, yes. My reading of 13 this is that, at the time, Dr. Swan may have been 14 advised or thought that the appearance of skull and 15 crossbones could actually affect that registration. 16 Q. And you didn't -- Dr. Swan didn't, and ICI 17 didn't, want to prejudice paraquat in the eyes of the 18 F&DA, correct? 19 A. Well, that's the way it's been written, 20 certainly. 21 Q. And you understand the F&DA at that time 22 was the regulatory agency that was responsible for 23 approving registrations for pesticides? 24 A. Yeah, because the EPA has not actually 25 come to pass at that time.	268 1 Q. And that would probably include the skull 2 and crossbones. 3 A. Yes. 4 Q. It notes that Hayes -- and your 5 understanding is Dr. Hayes is with the F&DA? 6 A. That was my assumption. 7 Q. "... had been strongly influenced by the 8 misrepresentations of the Cornell newsletter item." 9 Do you see that? 10 A. Yes. 11 Q. And then he goes on, at the bottom, to say 12 he had an opportunity to read copies of Chevron 13 releases on paraquat and diquat which were handed over 14 at a meeting. 15 Correct? 16 A. Yes. 17 Q. And those documents were handed over 18 July 25 and addressed to all marketing personnel, 19 right? 20 A. Yes. 21 Q. Now, Chevron at this time was in charge of 22 the marketing of paraquat within the United States? 23 A. Right. 24 Q. And, according to Dr. Swan, ICI did not 25 believe that those marketing documents adequately

Conducted on September 17, 2024

269 1 bring out considerable distinction on the toxicity of 2 paraquat and diquat. 3 Do you see that? 4 A. Yes, that's one of his concerns, yes. 5 Q. And one of those "grossly incorrect 6 statements," according to Dr. Swan, was that: 7 "... hazards of spray mist makes no 8 distinction between large particles which impact in 9 the nose and smaller 'respirable' particles which can 10 reach the lungs..." 11 A. Yes. 12 Q. "... and which are not produced by 13 low-pressure spray equipment." 14 Right? 15 A. Yes. 16 Q. And as we saw later on, years later, in 17 the year 2000, the EPA actually wrote a memorandum 18 saying that those larger particles could be serious 19 and indeed fatal, right? 20 A. Yes. 21 Q. Dr. Swan also takes issue with the 22 statement: 23 "Paraquat can be absorbed through the 24 skin and can cause delayed systemic reactions, 25 including damage to the lungs."	271 1 Q. And we can agree that paraquat can cause 2 delayed systemic reactions, right? 3 A. Yes, and those are the kind of things that 4 I've been describing, but it's because when you get 5 absorption from whatever route into the bloodstream, 6 that the lung is the target organ and that is a 7 delayed toxicity. 8 Q. And Dr. Swan takes issue with the 9 statement that: 10 "Diluted paraquat presents a greater 11 potential hazard than some herbicides in that [its] 12 toxic effects are cumulative and delayed." 13 Right? 14 A. Yes. 15 Q. Dr. Swan does not believe that that 16 information should be told to the public at this point 17 in time? 18 A. That was his view at the time. I presume 19 he was, as it says there, comparing with other 20 pesticides which must have had, in his view, a more 21 significant toxicological profile. 22 Q. Now, ICI knew at this time, or around this 23 time, that paraquat could cause cumulative and delayed 24 toxic effects, right? 25 A. That was the emerging information, yes.
270 1 Do you see that? 2 A. Yes. And again -- 3 Q. Now -- 4 A. -- for a sense of context, we have to 5 remember this was written in 1969 when, really, what 6 we now understand about how paraquat can cause 7 toxicity was not fully understood, so the damage to 8 the lung, for example, is a great example of that, 9 that the lung can be damaged because of systemic 10 exposure. There was, I think, a period of time when 11 people thought, well, that might happen because of 12 inhalation exposure. 13 And so I think some of this has to be 14 recognized as not being -- as being written at a time 15 when there was kind of an incomplete understanding. 16 Q. Well, Chevron obviously believed there was 17 enough information in order to arm its marketing 18 personnel with those statements to bring to users and 19 distributors of paraquat, right? 20 A. Mmm-hmm. 21 MR. NARESH: Objection to form, 22 foundation. 23 BY MR. DICKENS: 24 Q. That's a yes? 25 A. Yes.	272 1 Q. And not -- emerging as in right around 2 this time that he wrote this letter in February 12 of 3 1969? 4 A. Yes. 5 Q. Dr. Swan also knew at this time that 6 cumulative and delayed toxic effects were different 7 than other herbicides, right? 8 A. Yes, and that is what I was referring to 9 earlier, in that we now understand why -- what was 10 happening. 11 Q. Okay. But he understood that right around 12 this time, well, within a month of writing this letter 13 in 1969, right? 14 A. To some extent, yes, but, I mean, that, 15 I think, is really sort of making my point: You know, 16 it was still the -- what was happening with paraquat 17 was really just beginning to be fully understood and 18 making sure there was a shared understanding at around 19 about this time. 20 Q. Well, shared understanding not with anyone 21 outside of ICI or Chevron, as he's indicating that 22 these statements should not be included in the 23 documents handed to the marketing personnel 24 responsible for marketing paraquat within the United 25 States, correct?

Conducted on September 17, 2024

273 1 MR. NARESH: Objection; foundation, form. 2 THE WITNESS: I mean, look, again, we're 3 talking about 50 years -- well, yes, 50-odd years ago. 4 I can't comment on why that was seen to be the right 5 thing to do at that time. 6 BY MR. DICKENS: 7 Q. He ends that paragraph by saying: 8 "... I strongly suggest that this 9 particular document [...] not be given any further 10 circulation." 11 Right? 12 A. Yes. 13 MR. DICKENS: Moving to Exhibit 40. 14 (Exhibit 40 marked for identification.) 15 MR. DICKENS: For the record, this is 16 topic 18 within the deposition notice. 17 BY MR. DICKENS: 18 Q. This is an internal ICI document, dated 19 March 11, 1969, "ICI Pilkington-Sullivan Works: 20 Delayed Irritant Effects." 21 Do you see this? 22 A. I do. 23 Q. And this is, roughly, almost exactly one 24 month from Dr. Swan's letter to Chevron telling him 25 not to further circulate the marketing documents,	275 1 Q. So at this point in time in 1969, Chevron 2 and Syngenta did not have a full understanding as to 3 what amount of paraquat would cause toxic effects in 4 humans, right? 5 MR. NARESH: Objection; foundation. 6 THE WITNESS: Quantitatively, I guess the 7 answer to that is yes, but, obviously, I think it was 8 clear that, you know, the more you're exposed the more 9 likely it is you are to get exposure. We were talking 10 about this earlier on; so when you've got exaggerated 11 exposure because of wet clothing or your skin is 12 damaged, then, clearly, you get more toxicity. 13 So in that sense it was understood, but 14 there were still things of which we didn't know at 15 this time. 16 BY MR. DICKENS: 17 Q. Okay. And, as you mentioned, the 18 individuals who'd be working in the -- is it the 19 manufacturing plant? 20 A. Yes. Yes. 21 Q. Okay. There was specific guidelines 22 implemented for the individuals who would be exposed 23 to paraquat within those manufacturing plants, right? 24 A. Yes. 25 Q. And these would be all employees of ICI?
274 1 right? 2 A. Absolutely, yes. 3 Q. And one of those reasons he said don't 4 circulate it is the comparison to other herbicides and 5 the fact -- or the statement that paraquat's toxic 6 effects could be cumulative and delayed. 7 Right? 8 A. Yes. 9 Q. This document, internal ICI document, 10 states: 11 "Paraquat is, however, different from most 12 corrosive chemicals because its effects are not 13 immediate." 14 Right? 15 A. Yes. 16 Q. That's what ICI is telling each other in 17 this particular document, right? 18 A. Yes. 19 Q. Pretty much exactly what Chevron was 20 planning to tell individuals who would be purchasing 21 paraquat, right? 22 A. But a very different scenario. Here, 23 we've got people who are actually -- excuse me, are 24 involved in the production of paraquat, and so their 25 likely exposure would be significantly higher.	276 1 A. That, I presume, is correct, yes. They 2 are talking about apprentices, so they would be 3 employed. 4 Q. So all employees of ICI who would be 5 exposed to paraquat: 6 "... must undergo a medical examination at 7 Pilkington-Sullivan Works." 8 That's the manufacturing plant, right? 9 A. Yes. 10 Q. "... before they commence work." 11 Right? 12 A. Yes. 13 Q. And that was due to concerns about the 14 potential toxic effects of paraquat? 15 A. From my understanding of this, it was to 16 see if there might be people who could be more 17 susceptible to what were then the known toxicities of 18 paraquat because, for example, they had a tendency to 19 have compromised skin, skin irritation, or they had a 20 history of nosebleeds, because that might increase 21 their -- the exposure to paraquat. 22 Q. And, in fact, the apprentices had 23 experienced incidents of delayed irritant effects from 24 paraquat? 25 A. Yes.

Conducted on September 17, 2024

277 1 Q. And there was a concern that these 2 individuals may not recognize the risk because of the 3 fact that those effects were indeed delayed. 4 Right? 5 A. That's the concern, yes. 6 Q. So the concern is these individuals who 7 splashed themselves or may get paraquat on them may 8 not really know that there's a risk there because they 9 may not see an immediate reaction on their body to 10 paraquat? 11 A. Yeah, you don't get -- like you would do 12 from a caustic soda, you don't get the immediate 13 "Ouch, must wash that off" reaction, necessarily. 14 Q. So it's important, then, to warn those 15 individuals within ICI of those delayed irritant 16 effects? 17 A. Indeed. 18 Q. But according to ICI, it is not important 19 to warn the actual users or farmers of delayed 20 irritant effects, correct? 21 A. But, again, I don't know from the time, 22 but the exposure situations would be different, the 23 concentrations of paraquat would be different. 24 You know, here, we're talking about 25 concentrated paraquat and unfortunately, at that time,	279 1 Q. Did you undertake any review of documents 2 to confirm that? 3 A. I received a confirmatory document to that 4 effect, but I've not gone back and double-checked 5 that. 6 Q. Do you know whether or not Chevron did 7 stop the circulation of their documents provided to 8 marketing personnel? 9 A. I've got no idea, no. 10 MR. DICKENS: I'll hand you what we'll 11 mark as Exhibit 41. 12 (Exhibit 41 marked for identification.) 13 MR. DICKENS: This is a document produced 14 by Syngenta in this litigation, which is a letter from 15 Dr. -- or from a D.F. Dye to T.W. Reed, dated 16 April 23, 1969. 17 BY MR. DICKENS: 18 Q. Do you see that? 19 A. Yes. 20 Q. It's referencing Geigy. Correct? 21 A. Yes. 22 Q. Do you know what Geigy Agricultural 23 Chemicals's relationship with respect to paraquat 24 would have been at this time in 1969? 25 A. Sorry, I've got no idea, no.
278 1 of course, occupational hygiene standards which are 2 not the same as they are today. 3 Q. Well, we can agree that Chevron thought it 4 was important to warn users and farmers about the 5 delayed irritant effects of paraquat? 6 A. I agree there was clearly a debate going 7 on between Chevron and ICI about what should be done 8 about that, and the record shows that it wasn't -- 9 there wasn't an immediate agreement about that fact. 10 Q. Now, ICI also required anyone exposed to 11 paraquat to receive individual -- or receive special 12 individual instruction on the hazards of paraquat, 13 right? 14 A. Yes. 15 Q. Now, when paraquat was initially 16 registered in the United States, it could be sold for 17 residential use, right? 18 A. My understanding, again from discussions 19 with Monty Dixon, is that we've never actually sold a 20 product in the United States for residential use. So 21 there may have been a registration, but it was never 22 sold. 23 Q. Okay. And that's based on information 24 told to you by Monty Dixon? 25 A. Yes.	280 1 Q. Do you know whether or not Geigy was a 2 manufacturer of atrazine at this time? 3 A. I don't know. 4 Q. This is reporting: 5 "We [...] discussed Geigy's attitude 6 [towards] paraquat." 7 Do you see that? 8 A. Yes. 9 Q. "John said that Geigy felt that paraquat 10 was a potentially hazardous chemical and they were 11 not doing any research on this product." 12 Right? 13 A. Yes. 14 Q. "Their marketing people have been advised 15 to not promote or encourage the use of paraquat in any 16 way." 17 Right? 18 A. Yes. 19 Q. "He advised that Geigy is very 20 conservative with [respect] to highly toxic or 21 hazardous chemicals." 22 Correct? 23 A. Yes. 24 Q. And we agree, at this point in 1969, 25 paraquat would be considered a highly toxic and

Conducted on September 17, 2024

1 hazardous chemical, right? 2 A. We understand -- we understood its 3 toxicity, as we've just been describing, yes. 4 Q. In fact, the marketing people at Geigy 5 sent out a notice to their salesmen telling them not 6 to encourage the use of paraquat with any of Geigy's 7 products. 8 Correct? 9 MR. NARESH: Objection; foundation. 10 THE WITNESS: That's what this letter 11 says. 12 BY MR. DICKENS: 13 Q. Part of the reason is they didn't want to 14 increase their liability by having paraquat included 15 with their own products, right? 16 MR. NARESH: Can I have a standing 17 objection as to the whole questioning about this 18 document as to foundation? 19 (Stenographer clarification.) 20 MR. NARESH: Can I have a standing 21 objection as to foundation, as to any questioning 22 about this document, or do you want me to object each 23 time? 24 MR. DICKENS: That might be the last 25 question, but you can have a standing objection.	281 283 1 A. I believe this is the only one which 2 includes Geigy, yes. 3 Q. Now, in 1969, the FDA and USDA were 4 receiving letters from senators and congressmen making 5 inquiries as to why they permitted paraquat, right? 6 A. So I understand, yes. 7 Q. And it was a determination that, with that 8 bad publicity in 1969, that the paraquat would cost 9 more, right? 10 MR. NARESH: Objection to form. 11 THE WITNESS: I can't remember what the 12 evidence for that is, but there may be a document 13 which you can remind me of. 14 MR. DICKENS: Mark Exhibit 42 for the 15 record. 16 (Exhibit 42 marked for identification.) 17 MR. DICKENS: This document has been 18 identified in topic 90 and 106 of the Notice of 19 Deposition. 20 MR. NARESH: Very thorough of you to have 21 two topics on it. Thank you for that. 22 BY MR. DICKENS: 23 Q. This is a letter produced by Syngenta in 24 this litigation dated January 16, 1974, from a Warren 25 Lewis to a Gerry Jenkins at Plant Protection Limited.
282 1 MR. NARESH: Okay. 2 THE WITNESS: I mean, this is an internal 3 Chevron document. I can only say it is what it is. 4 I mean, I've got no kind of further information about 5 it. 6 BY MR. DICKENS: 7 Q. Did you undertake any efforts to discover 8 Geigy's relationship to ICI at this time in 1969 when 9 you reviewed this document in preparation for the 10 deposition? 11 A. No, I did not do that. 12 Q. Did you look for any additional 13 correspondence between Geigy and Syngenta with respect 14 to paraquat? 15 A. Well, my colleagues who were, you know, 16 helping with this may have tried to look for that. If 17 they did, nothing was passed my way. 18 Q. All right. And I don't want any 19 communications with counsel. When you say "my 20 colleagues," are you referring to attorneys? 21 A. I'm talking -- exactly, yes. 22 Q. Okay. And so the only document with 23 respect to Geigy that you reviewed for this deposition 24 is the document right here before you as it applies to 25 1969?	284 1 Do you see that? 2 A. I do. 3 Q. And Plant Protection Limited, once again, 4 was within ICI? 5 A. Yes. It's as we've discussed before, PPL, 6 yes. 7 Q. And they are the marketing or commercial 8 arm of ICI, right? 9 A. That's right. 10 Q. All right. And Chevron's writing to PPL 11 and saying: 12 "[I have attached] a memo from our Lemac 13 Hopkins to apprise you of the growing seriousness of 14 the paraquat health-hazard situation in the United 15 States." 16 Right? 17 A. Yes. Well, I believe this was 18 specifically a concern in California. 19 Q. Okay. 20 A. And I should say, by the way, that I did 21 ask if I could see a memo from Lemac Hopkins and no 22 such document was provided, so I don't even know who 23 or what Lemac Hopkins is. 24 Q. Were there any other documents that you 25 requested for your preparation for this deposition

Conducted on September 17, 2024

1 that could not or were not provided to you? 2 A. I can't -- no. Very, very few. I mean, 3 this was one that I particularly remember because of 4 my question about Lemac Hopkins, but mostly things 5 were made available. 6 Q. And at this point, he mentions: 7 "With glyphosate nearly on the scene and 8 facts of efficacy and health hazard extremely 9 widespread, we no longer have the usefulness and need 10 for paraquat as a defensive argument." 11 That's what Chevron's telling ICI at this 12 point, right? 13 A. It's certainly what Mr. Lewis's view was, 14 yes. 15 Q. And glyphosate at this point in 1974 16 was not yet on the market but close, correct? 17 A. I don't know. I don't know the history of 18 the dates of glyphosate, so I'll accept what you say. 19 Q. And glyphosate is the active ingredient 20 within Roundup and Roundup products, right? 21 A. It is, yes. 22 Q. Manufactured by Monsanto? 23 A. At that time. 24 Q. All right. Glyphosate and glyphosate 25 products are now the top-selling broad-spectrum	285 287 1 THE WITNESS: I mean, I certainly 2 remember, even after this date, that glyphosate was 3 seen to be a safer herbicide, certainly. Effective? 4 Different question. Paraquat and glyphosate have 5 different herbicidal properties, so they're not 6 equivalent. 7 BY MR. DICKENS: 8 Q. But we can agree it's considered safe? 9 A. It has got a very different safety profile 10 and certainly doesn't have some of the toxicity that 11 paraquat has. 12 Q. And Syngenta itself manufactures 13 glyphosate? 14 MR. NARESH: Objection; scope, foundation. 15 THE WITNESS: I don't know whether we 16 manufactured it. We certainly sold it. 17 BY MR. DICKENS: 18 Q. It goes on: 19 "Paraquat is in serious trouble, 20 particularly in California but also in other states. 21 Paraquat, as you know, is an extremely well-known 22 compound, and news of a hazardous nature travels 23 fast." 24 Right? 25 A. Right.
286 1 herbicides? 2 A. I -- 3 MR. NARESH: Objection; foundation and 4 scope. 5 BY MR. DICKENS: 6 Q. If you know. 7 A. I don't know. I mean, that's not 8 information that I've looked at. 9 Q. When it mentions "facts of efficacy and 10 health hazard extremely widespread," that's specific 11 to paraquat, right? 12 A. That's the context of this document, it 13 would seem, yes. 14 Q. And because of glyphosate coming -- and 15 you understand that glyphosate was considered as a 16 safer and more effective herbicide? 17 A. Could you repeat that, please, because 18 I was just -- my eye was caught by something which 19 I was wanting to look -- do say it again. 20 Q. Do you have an understanding that 21 glyphosate was considered, or generally considered, a 22 safer and more effective broad-spectrum herbicide? 23 A. Right. So -- 24 MR. NARESH: Objection to the form, 25 foundation and scope.	288 1 Q. Chevron tells ICI: 2 "If it sounds like we are alarmed, we 3 are." 4 Right? 5 A. Yes. 6 Q. And then Chevron details some of the 7 concerning information with respect to paraquat, 8 including: 9 "... the building up clash head-on with 10 previously held toxicological facts." 11 Right? 12 A. Yes. 13 Q. And some of those facts are that: 14 "Medics indicate that spray droplets are 15 being inhaled - in spite of data to the contrary, 16 because the claim is that conditions and methods of 17 application and resulting particle size do not 18 necessarily parallel those of previous studies." 19 Right? 20 A. I think Mr. Lewis, here, is not, clearly, 21 a sort of technical expert. He's a market development 22 individual. So I think he's not got a full 23 understanding of the sort of things we've been talking 24 about and the difference between inhalable and 25 respirable.

Conducted on September 17, 2024

289 1 Q. But what he is reporting is that medics 2 are reporting to Chevron that spray droplets are being 3 inhaled, right? That's what's being reported here? 4 A. Yes. 5 MR. NARESH: Objection to form. 6 BY MR. DICKENS: 7 Q. And when you hear "inhale," you're talking 8 about the respirable particles? 9 A. Well, it's difficult to know. When 10 "Medics say spray droplets are being inhaled," I don't 11 know if they mean getting into the lungs or whether 12 they just mean getting into the nose. 13 Because there's a tendency for casual 14 language sometimes to be used. 15 Q. Well, certainly, these medics aren't just 16 calling Chevron up for no reason. These are 17 individuals who are treating people who had been 18 injured after spraying paraquat, right? 19 MR. NARESH: Objection; foundation, form. 20 THE WITNESS: Well, I assume that these 21 were farmers, but he doesn't actually say so, yes. 22 BY MR. DICKENS: 23 Q. At least individuals exposed to paraquat, 24 we can agree? 25 A. Yes.	291 1 A. Yes, we've been through that, I agree. 2 MR. DICKENS: Exhibit 43 for the record. 3 (Exhibit 43 marked for identification.) 4 MR. DICKENS: And this is topic 17. 5 BY MR. DICKENS: 6 Q. This document is from a G.A. Willis, 7 manager of Product Safety and Registration Group at 8 ICI, dated February 14, 1983, deemed confidential, 9 subject "Paraquat labeling USA." 10 Do you see that? 11 A. I do. 12 Q. This reports that: 13 "Chevron has obtained EPA's approval for 14 detailed wording changes to the Ortho Paraquat CL 15 labeling." 16 Do you see that? 17 A. I do. 18 Q. And that would have been the paraquat that 19 was on the market in the United States at the time? 20 A. Yes, I assume that's what it would mean. 21 Q. And these detailed wording changes to the 22 paraquat labeling was in response to a lawsuit that 23 had been filed against Chevron, right? 24 A. That is my understanding of what this 25 says, yes.
290 1 MR. NARESH: Same objections. 2 BY MR. DICKENS: 3 Q. They're apparently seeing medics after 4 breathing in paraquat in spite of data and statements 5 to the contrary by Chevron and Syngenta -- or ICI at 6 this time? 7 A. By which you mean the warning labels to 8 avoid that? Is that what you're... 9 Q. I'm saying at this point in time, ICI and 10 Chevron were instructing farmers and other users of 11 paraquat that there was no risk of inhalation or 12 breathing in paraquat because of the particle size. 13 A. Yes, and that's why this is creating, 14 I'm sure at the time, some confusion over the 15 implications of particle size. 16 Q. And, in fact, as we discussed earlier, the 17 Chevron document for the marketing personnel had 18 specifically included information about spray mist and 19 the inhaling of paraquat causing severe irritation to 20 the nose and throat, right? 21 A. Yes. 22 MR. NARESH: Objection to form. 23 BY MR. DICKENS: 24 Q. And that's a statement that Dr. Swan at 25 ICI said, "We should not be providing"?	292 1 Q. Move to page 2. Towards the bottom of the 2 page, it says: 3 "As a result of these arguments and an 4 overall re-evaluation of their wording, Chevron 5 amended their labeling..." 6 And it gives how it was amended, right? 7 A. That's right. 8 Q. And it was arguments that were made within 9 the lawsuit filed by a user who had experience in 10 adverse effects that he alleged was from paraquat, 11 right? 12 A. That's correct. 13 Q. You can turn the page to the top of 14 page 3, ending in 20363. ICI claims that: 15 "The main driving forces for these changes 16 were the Chevron lawyers and the Chevron Environmental 17 Health Center." 18 Right? 19 A. Yes. 20 Q. And those lawyers had: 21 "... concerns for being able to defend 22 Chevron in law as well as possible and CEHC is called 23 upon to provide 'expert witnesses' for the 24 toxicological aspects of the defense." 25 Right?

Conducted on September 17, 2024

293 1 A. Yes. 2 Q. And the defense of paraquat specifically? 3 A. Yes. 4 Q. Now, ICI provided some comments on the 5 proposed rewording to Chevron, right? 6 A. They did. 7 Q. And ICI was not very happy because they 8 did not believe there was a practical problem with 9 dermal or inhalation poisoning using the product? 10 A. I think it was specifically with regard to 11 the risk of fatality in that way, yes. 12 Q. At the very bottom of the page: 13 "One concern which has been expressed to 14 me relates to the possibility of adverse impacts of 15 Chevron's label." 16 And that's the label for paraquat in the 17 United States, right? 18 A. Yes. 19 Q. So the label shared by Chevron and ICI 20 with respect to being able to sell paraquat in the 21 United States? 22 A. Yes. 23 Q. And, according to ICI, they've lived with 24 the problem with US labeling being more severe than 25 other places in the world:	295 1 paraquat in the 1983 time frame? 2 A. Well, I guess so, yes. But, I mean, look, 3 I knew and know Mr. Willis. I mean, I think he was 4 really in no way saying that that change of wording, 5 or the subtlety that we're talking about, would, in 6 his view, take away the warning that would be required 7 by farmers and growers to use paraquat safely. 8 So, Mr. Willis always was, and still is as 9 far as I know, concerned about the health protection 10 of people using the product. 11 Q. And that's what you say now. At this 12 point in 1983, according to Mr. Willis's letter, he 13 actually advises Chevron not to circulate a letter to 14 distributors drawing attention to the label changes, 15 right? 16 A. Yes. 17 Q. He's telling Chevron, these won't be -- 18 these label changes would go unnoticed "unless we draw 19 attention to them." 20 A. Yes. 21 Q. So we should not draw attention to them, 22 right? 23 MR. NARESH: Objection to form. 24 THE WITNESS: Yes, and this is another one 25 of those emails where, I think, again, looking
294 1 "... and the recent changes will 2 accentuate the difference further." 3 Right? 4 A. That was clearly one of the concerns that 5 Mr. Willis was suggesting. 6 Q. ICI notes: 7 "[The] changes do not alter the overall 8 appearance of the label and they are likely to go 9 unnoticed by all but those who make a specific effort 10 to compare the old and new texts in detail." 11 Right? 12 A. I guess he was saying that these would be 13 subtle changes. 14 Q. Those changes so subtle that unless 15 someone held up the labels next to each other, they'd 16 go unnoticed, right? 17 MR. NARESH: Objection to form. 18 THE WITNESS: That's certainly the 19 inference from the way this was written. 20 BY MR. DICKENS: 21 Q. And written by a member of ICI, correct? 22 A. Yes. 23 Q. And those changes -- when it says the 24 changes would go unnoticed, that includes by farmers 25 or others who were spraying around -- spraying	296 1 through -- at this through today's lens, this is 2 certainly not the way in which we would tackle this 3 problem right now. 4 And I think also, as I said a few minutes 5 ago, it probably doesn't actually give, you know, 6 sufficient justice to the fact that Jeff Willis was 7 certainly concerned about safety. 8 BY MR. DICKENS: 9 Q. Another situation of putting economics 10 over safety? 11 MR. NARESH: Objection to form. 12 THE WITNESS: No, I don't think that -- 13 I mean, there's very little discussion, if any, of 14 economics in this. This was, really, whether the 15 proposed changes that Chevron wanted to do were 16 essentially an overreaction, that you didn't need to 17 actually put that -- the word "fatal" in, as they were 18 describing, in order to properly protect people. 19 BY MR. DICKENS: 20 Q. "I believe that without such a letter the 21 label changes would pass mainly unnoticed." 22 Right? 23 A. That's what I mean by that's not the kind 24 of wording that I think would be appropriate. 25 Q. Because that wording suggests that ICI and

Conducted on September 17, 2024

297 1 Jeff Willis did not want users and farmers to know 2 that a label change would be made, right? 3 A. That's what that suggests, yes. 4 Q. But Chevron lawyers deem that circulation 5 of the letter was mandatory to meet their legal 6 obligations, right? 7 A. Yes. 8 Q. "If we are to use senior level inputs to 9 modify Chevron's behavior pattern [...], I would place 10 a high priority in seeking to persuade them not to 11 circulate any such note." 12 Right? 13 A. Yes. 14 Q. Don't let people know a labeling change 15 has been made. 16 MR. NARESH: Objection; asked and 17 answered. 18 BY MR. DICKENS: 19 Q. Right? 20 A. Yes. 21 MR. DICKENS: Is now a good time for that 22 break before we... 23 MR. NARESH: Yeah. 24 THE VIDEOGRAPHER: We are going off the 25 record at 16:56.	299 1 BY MR. DICKENS: 2 Q. Is this the document you reviewed in 3 preparation for today's deposition? 4 A. It's a different version of a document 5 that I saw, I think. I've not seen one in this 6 format. 7 Q. So you saw it in a different format but it 8 has the same content and information? 9 A. Well, I would need to read this in more 10 detail to -- but, probably, from just a very, very 11 quick look at this. 12 Q. I just want to go over certain items that 13 I believe you brought up with respect to Defra, and 14 specifically on page 2 there's an "Executive Summary" 15 listed here. 16 Do you see that? 17 A. Yes. 18 Q. And then there's Study 1 and it identifies 19 a PBPK model, right? 20 A. Yes. 21 Q. And it says: 22 "Commercial Gramoxone, a paraquat 23 formulation, was spiked with radiolabeled paraquat at 24 a dose specific to the route of exposure and tested 25 for good detection in a pilot study."
298 1 (Break taken.) 2 THE VIDEOGRAPHER: We are back on the 3 record at 17:04. 4 BY MR. DICKENS: 5 Q. Dr. Botham, earlier in the deposition we 6 were discussing the Defra study. 7 Do you recall that? 8 A. Yes. 9 Q. And you indicated you had reviewed Defra 10 in preparation for today's deposition? 11 A. As much information as I could find. 12 MR. DICKENS: I'll go ahead and mark 13 Exhibit 44 for the record. 14 (Exhibit 44 marked for identification.) 15 MR. NARESH: What topic number? 16 MR. DICKENS: The document itself is not 17 specifically identified in the Notice of Deposition. 18 MR. NARESH: I'll do a standing scope, but 19 if Dr. Botham can answer questions -- 20 MR. DICKENS: You can have a standing 21 objection. 22 MR. NARESH: Okay. 23 MR. DICKENS: What I've handed you, 24 Exhibit 44, which -- is a document Evidence Project 25 Final Report, Defra.	300 1 Right? 2 A. Yes. 3 Q. And when it says "radiolabeled paraquat," 4 what's that referring to? 5 A. It means that it's -- on the molecule of 6 paraquat, it's got a radiotracer label on it so that 7 you can quantify -- you can see where it gets to and 8 quantify that. 9 Q. Okay. So you could see where -- you know, 10 if paraquat, for example, can get into the brain, 11 you'd be able to see that, right? 12 A. Yes. You would be able to measure it. 13 Q. And on the next page, that next line 14 notes: 15 "At a designated time after dosing, the 16 animals were sacrificed and the amount of paraquat in 17 blood and brain was measured." 18 Right? 19 A. Yes. 20 Q. And then the next page for Study 1, it 21 notes "Modeling Exposure"? 22 A. Yes. 23 Q. It says: 24 "The study was designed to generate data 25 on which to fit a PBPK model of human field exposures

Conducted on September 17, 2024

301 1 to paraquat, using the brain as the target organ." 2 Right? 3 A. Yes. 4 Q. But in this study: 5 "Adult mice were given single doses of 6 paraquat according to the three routes of exposure..." 7 A. Yes. 8 Q. Correct? 9 A. Yes. 10 Q. And so the purpose of this study was to 11 generate data in order to generate a PBPK model for 12 human field exposures to paraquat? 13 A. Yes, that's correct. 14 Q. And then two pages later, at the top of 15 the page, after the animals were dosed, they were: 16 "... sacrificed [...] to create a 24-hour 17 time course." 18 Right? 19 A. Yes. 20 Q. And then: 21 "After sacrifice, blood and brain samples 22 were taken and measured for paraquat radioactivity." 23 Right? 24 A. Yes. 25 Q. So they actually did take samples of the	303 1 amount of paraquat detected in the brain after 2 intranasal exposure was tenfold higher than the model 3 predicted based on systemic flow." 4 Right? 5 A. Yes. 6 Q. So the amount of paraquat that was found 7 in the brain of the animals after sacrifice was 8 actually ten times higher than what was expected 9 through their use of the PBPK model? 10 A. That's right. And if I could add at this 11 point, I mentioned earlier that there were a number of 12 reasons why an intranasal study was something that we, 13 in the end, didn't actually do, and there was -- one 14 other reason, which this reminds me of, is that rather 15 like with the intraperitoneal injection studies that 16 we see frequently, which we did ourselves, intranasal 17 administration of substances to animals was done in 18 the PBPK section of this, is a very exaggerated 19 mechanism of exposing the animals. 20 So it's not like a nasal drop. You know, 21 you're literally forcing it up into the top of the 22 nasal cavity, which is way exaggerating what would 23 come from a normal exposure of an operator in the 24 field, for example. 25 MR. DICKENS: I'll move to strike
302 1 brain in order to determine how much paraquat made it 2 to the brain in these particular studies. 3 A. Okay. 4 Q. And that's your understanding? 5 A. Yes. And I can see now, the more I read 6 this, there's actually more detail in this report than 7 the one that I saw. 8 Q. And then on page 13 of 17 -- 9 MR. NARESH: And, Dr. Botham, in light of 10 your comment just now, you know, read as much or as 11 little as you feel like you need to to be able to 12 answer the questions, given the length and density of 13 the document, in order to contextualize it as you need 14 to. 15 BY MR. DICKENS: 16 Q. And I'm going to ask you about the 17 paragraph "Future Work - Intranasal Transport," so if 18 you need time to read it, just let me know when you're 19 ready. 20 A. Okay, I've read that. 21 Q. What the study research scientists noted 22 in the intranasal transport side is that: 23 "... intranasal dosing in the PBPK model 24 portion of this study indicated a fast and extensive 25 circulation of paraquat in the brain tissue - the	304 1 everything after, "That's right." 2 MR. NARESH: I'll object to that. 3 BY MR. DICKENS: 4 Q. The study authors report that: 5 "To better understand the risk, a study 6 would be needed to examine the intranasal arterial 7 hypothesis, including the pattern of paraquat 8 distribution to the brain, and confirmation of the 9 amount in the brain regions after intranasal 10 administration." 11 Right? 12 A. Well, not unreasonable, yes. I mean, 13 so they're not saying -- they're saying here they 14 don't know how much got into the brain and where it 15 went to. 16 Q. All they know is what was actually in the 17 brain was tenfold higher than what was expected in 18 their model? 19 A. Yeah, yeah. 20 Q. And they're saying in order to better 21 understand the risk, additional studies would be 22 necessary? 23 A. Yes. 24 Q. Syngenta has never undertaken any 25 additional studies to investigate that risk?

Conducted on September 17, 2024

305 1 A. No. 2 Q. At this point in 2012, was Syngenta 3 undertaking its own studies or is that farmed out to 4 third parties? 5 A. In 2012, we were fully engaged in our very 6 significant study, large study, using that 7 intraperitoneal injection model, and the reason we 8 were doing that, even though it does, again, 9 exaggerate exposure, is because this was a study which 10 we, in part, were seeing whether the findings that 11 other scientists had made of an effect on the 12 substantia nigra in the brain, following an IP 13 administration of paraquat, whether that was something 14 that could be replicated and, if so, at what kind of 15 concentrations do you see that and are those 16 concentrations relevant to human exposure. 17 Q. In 2012, did Syngenta have the ability to 18 run a test through an inhalation chamber with animals? 19 A. It could have done, yes. 20 Q. It did not do that, right? 21 A. It did not do that. 22 Q. Page 4 once again of Defra, under 23 "Modeling Exposure," the adult mice were given single 24 doses of paraquat, three routes of exposure that were 25 meant to be "relevant to human field conditions for	307 1 BY MR. DICKENS: 2 Q. Okay. This is a document dated June 12, 3 1997, "Paraquat toxicology, ECCO meeting outcome." 4 Do you see that? 5 A. Yes. 6 Q. And it's provided on behalf of Andy Cook, 7 who was currently on holiday at that time. 8 Do you see that? 9 A. Yes. 10 Q. Andy Cook had some responsibilities for 11 paraquat? 12 A. Yes. So at this time he would have been 13 the regulatory manager in Europe for paraquat. 14 Q. And in your prior deposition, you had 15 spoken to Andy Cook in preparation for your deposition 16 on behalf of Syngenta, right? 17 A. Yes. 18 Q. You did not speak to him in preparation 19 for today's deposition? 20 A. I did not, no. 21 Q. And this document doesn't necessarily 22 specify what the ECCO refers to. This doesn't jog 23 your memory in any way, does it? 24 A. Well, you asked me what it stands for. 25 So I don't know what E-C-C-O means. I think EC
306 1 pesticides," including intranasal. 2 Right? 3 A. Yes. But the intranasal, as I said 4 earlier, nevertheless exaggerates the actual 5 likelihood of that dose, whatever it is, of getting 6 into the brain, for example. 7 Q. We can put that aside. 8 Dr. Botham, are you aware of a ECCO group 9 within the toxicology department of Syngenta, or ICI? 10 A. Is that E-C-C-O, ECCO? 11 Q. Correct. 12 A. Yes, I've seen a document recently which 13 had that on it. 14 Q. Okay. In preparation for today's 15 deposition? 16 A. Yes. 17 Q. Do you know what ECCO stands for? 18 A. I can't remember, actually, no. 19 Q. Okay. 20 MR. DICKENS: I'll hand you Exhibit 45 for 21 the record. 22 (Exhibit 45 marked for identification.) 23 MR. NARESH: What's the topic number, 24 please? 25 MR. DICKENS: 23.	308 1 probably is to do with European Community. I mean, 2 this is a group associated with the European 3 Commission, so it's the European regulatory 4 authorities and it was some kind of specialized 5 meeting, which our regulatory people had access to. 6 Q. And it's related to a meeting between 7 June 3 and 5 of 1997. 8 Do you see that? 9 A. Yes. 10 Q. And there's a PSD attendee, Ian Dewhurst. 11 Do you know who that is? 12 A. Yes, he was the toxicology lead in -- PSD 13 is the Pesticides Safety Directorate. That's the UK 14 regulatory authority for pesticides. 15 Q. Do you know whether or not Ian Dewhurst 16 was involved in Defra at all? 17 A. Yes. Ian Dewhurst was one of the people 18 who led on the project proposal, if you wish, or the 19 call for tender. 20 Q. And he was apparently an attendee at this 21 meeting with respect to the paraquat and toxicology 22 issues in Europe, right? 23 A. Yes. 24 Q. And there's a section midway down page 1 25 of "Operator Exposure."

Conducted on September 17, 2024

309 1 Do you see that? 2 A. Yes. 3 Q. And we discussed earlier just operator 4 exposure studies and you mentioned the ones that were 5 done in the Far East, right? 6 A. Mmm-hmm. 7 Q. That's a yes, sorry? 8 A. Yes. 9 Q. Okay. And those operator exposure studies 10 are designed to measure the amount of paraquat that 11 a user or a farmer or operator of paraquat would be 12 exposed to during spraying activities? 13 A. Yes. 14 Q. As well as mixing and loading, right? 15 A. Yes. 16 Q. Now, it mentions: 17 "NL raised a concern that the in vitro 18 skin absorption study was unoccluded." 19 And we discussed occluded versus 20 unoccluded with respect to dermal absorption studies, 21 right? 22 A. We did. 23 Q. And the occluded, or covering, of the 24 skin actually resulted in higher dermal absorption, 25 right?	311 1 exposure study was undertaken? 2 A. I'm not sure whether that study was done 3 specifically in response to that. It is 1997, so 4 I suspect the answer is probably no because it's very 5 close to the Court of First Instance judgment on 6 paraquat. 7 Q. And that was with respect to an action 8 brought by Sweden? 9 A. Yes. 10 Q. In which -- what did the -- what was your 11 understanding of the Court of First Instance judgment 12 on paraquat? 13 A. Well, this was Sweden leading on an 14 objection to the way in which the European Commission 15 had proceeded with regard to the re-registration of 16 paraquat in the European Union. So it was a 17 procedural objection. 18 Q. And the Court found that the procedure was 19 sufficient, right? 20 A. The Court found that -- found in favor of 21 Sweden and said that, really, the European Commission 22 had not acted appropriately. 23 Q. Had not acted inappropriately? 24 A. Had not used -- had not followed the 25 appropriate procedures.
310 1 A. Yes, and that was in the animal model that 2 we were discussing earlier. 3 Q. Right. And because of that: 4 "The meeting considered that the 5 absorption of paraquat through skin may increase if 6 occluded ([or] clothing was present)." 7 Right? 8 A. Yes. 9 Q. And: 10 "... operator exposure studies (in Sri 11 Lanka and USA) did not represent EU conditions [for] 12 personal protection equipment as most workers wore 13 shorts [and] shirt." 14 Right? 15 A. Right. 16 Q. And: 17 "It was considered possible that the 18 exposure may [actually] be greater if long trousers 19 were worn." 20 Right? 21 A. Yes. 22 Q. And so the ECCO group proposed that a new 23 operator exposure study be undertaken, right? 24 A. Yes. 25 Q. Do you know whether or not that operator	312 1 Q. We'll look at that probably tomorrow at 2 this point. 3 MR. DICKENS: I will go ahead and mark 4 Exhibit 46 for the record. Topic 17 on the Notice of 5 Deposition. 6 (Exhibit 46 marked for identification.) 7 BY MR. DICKENS: 8 Q. Okay. I've handed you a document titled 9 "Paraquat Operator Exposure - A review of operator 10 exposure studies" by Graham Chester and Andy Cook, 11 December 2009. 12 You've reviewed this document previously? 13 A. I did. 14 Q. Turn to page 3, Executive Summary. 15 It notes that: 16 "A total of 22 studies have been conducted 17 to determine operator exposure to paraquat during the 18 use of appropriate, recommended spray application 19 equipment. Eleven of these studies have been 20 published." 21 Right? 22 A. Yes. 23 Q. Now turn to the next page. In the 24 Introduction, it notes the purpose of the review, and 25 it was:

Conducted on September 17, 2024

1 "... intended to be a critical appraisal 2 for the paraquat operator exposure studies in the 3 published literature and those conducted by Syngenta 4 and its legacy companies with a particular emphasis on 5 scientific integrity and suitability for use in the 6 quantitative assessment of risk of exposure to 7 paraquat under typical conditions of use." 8 Right? 9 A. Yes. 10 Q. And then the summary, in the preamble, it 11 notes that: 12 "There are two types of study: pre- and 13 re-registration studies, and post-registration 14 surveillance studies." 15 Correct? 16 A. Yes. 17 Q. The pre- and re-registration studies would 18 have been "done in full compliance with the 19 requirements of the product label." 20 Correct? 21 A. Yes, yes. 22 Q. And that would have included "recommended 23 application rates, protective clothing and equipment," 24 right? 25 A. Yes.	313 315 1 recommendation for protective gloves and face shield 2 when mixing and loading. 3 Right? 4 A. Yes. 5 Q. And with the filing, the labeling 6 recommendations, paraquat was found in the urine of 7 18 of the 20 workers involved in that study. 8 Right? 9 A. Yes. 10 Q. So at this point, the personal protective 11 equipment worn by the workers in this study did not 12 completely protect them from exposure to paraquat. 13 We can agree on that? 14 A. And that is not -- was not a surprising 15 finding, yes. 16 Q. It then mentions: 17 "... a 2007 study in Martinique in 18 knapsack spray operators..." 19 Right? 20 A. Yes, yes. 21 Q. And that's a Brouwer 2007 (a) study? 22 A. Yes. 23 Q. And that operator is wearing a 24 standardized set of PPE on banana plantations, right? 25 A. Right.
314 1 Q. And the studies of the other type, or 2 post-registration surveillance studies, would 3 have been done according to those users' "typical or 4 habitual working practices," right? 5 A. Yes, that's the phrase, "habitual"; so 6 actually what happened in reality when they were -- 7 people were using the product. 8 Q. So Syngenta, or whoever the individuals 9 are who were conducting this study, would not 10 intercede and instruct the users to wear particular 11 types of clothing; it would be how they would normally 12 typically apply paraquat, right? 13 A. That's correct. This was to look at what 14 the reality was in the field. 15 Q. Turn to page 5. 16 Now, the second study here notes a recent 17 European regulatory study on knapsack spray operators. 18 Right? 19 A. Okay. 20 Q. And that was in Spain in 1997. 21 A. Okay, right. Yes. 22 Q. That was the Findlay study? 23 A. Yes. 24 Q. And in the Findlay study all workers 25 generally complied with the product label	316 1 Q. And the prototype PPE included PVC 2 trousers. 3 Do you know what PVC refers to? 4 A. Polyvinyl chloride; yeah, plasticized 5 trousers. 6 Q. And a PVC poncho, long-sleeved shirts and 7 a hat with a protective neck guard, right? 8 A. Yes. 9 Q. "In addition, gloves, long rubber boots 10 and [...] disposable respiratory mask were worn 11 throughout the three days..." 12 Right? 13 A. Yes. 14 Q. Okay. In that particular study, there 15 were ten operators whose paraquat was mostly completed 16 on the days of use after the last -- sorry, the 17 excretion of paraquat was mostly complete on the days 18 of use or within one day after the last of their three 19 days of use. 20 Right? 21 A. Yeah. 22 Q. But one operator continued to excrete 23 paraquat up to four days post application, right? 24 A. Okay. 25 Q. So one operator who was exposed to

Conducted on September 17, 2024

317 1 paraquat had paraquat in their body or in their system 2 four days after their last exposure to paraquat, 3 right? 4 A. That's right. 5 Q. Andy Cook and Graham Chester note: 6 "There was no clear explanation for this 7 other than an observed incident of contamination..." 8 Right? 9 A. Indeed, yes. 10 Q. Now, this Brouwer study was not the only 11 study undertaken by Brouwer for measuring the amount 12 of paraquat that operators were exposed to, right? 13 A. Yes, that's right, yes. Brouwer worked 14 for a contract research organization that was doing a 15 number of different operator exposure studies. 16 Q. Okay. And operator exposure studies on 17 behalf of Syngenta specifically, right? 18 A. That's right, yes. 19 Q. Page ending in -- oh. Page 7 of this 20 document. 21 At the very bottom, it notes: 22 "In 2006-7, a series of related, 23 habitual-use biological monitoring studies was done in 24 vines and bananas in mainland France and 25 Martinique..."	319 1 I suspect there was because it was called 2 an SL formulation, which suggests that there would be 3 surfactant in there. 4 Q. If you can turn to the next page, page 8. 5 Right above 3.3, it notes: 6 "The French and Martinique studies are the 7 most modern, guidance-compliant studies available and 8 are the ones of choice for assessment of absorbed dose 9 for risk assessment purposes under the specific 10 conditions of habitual use." 11 A. Yes. 12 Q. Right? 13 A. Yeah. 14 Q. And that's being used by operators how 15 they would typically apply paraquat? 16 A. That's what "habitual use" means, yes. 17 Q. And so these two studies were deemed to be 18 the best for risk assessment purposes for how users 19 were actually spraying paraquat, right? 20 A. Indeed, yes. 21 Q. And, once again, Graham Chester and Andy 22 Cook are employees of Syngenta? 23 A. Yes. Andy Cook we've talked about before. 24 Graham Chester was an employee of Syngenta up to 25 a certain point in time. I don't know exactly when,
318 1 Right? 2 A. Yes. 3 Q. And they were in compliance with the OECD 4 guidance and GLP, correct? 5 A. Correct. 6 Q. And what is the significance of being in 7 compliance with OECD and GLP? 8 A. Well, that it was, if you like, an 9 approved protocol; so the methodology that was used 10 would have -- would be acceptable as a good-quality 11 study and backed up by the fact that it was done to 12 good laboratory practice. 13 Q. The formulation used in those studies was 14 R-BIX containing 100 grams of paraquat. 15 Do you know what was in the formulation of 16 the R-BIX used in this particular study? 17 A. Do you mean what surfactants were in 18 there? 19 Q. What surfactants or other ingredients 20 other than the paraquat? 21 A. No, I can't tell you off the top of my 22 head what else was there. 23 Q. Do you know whether or not there was a 24 surfactant included in that study? 25 A. I don't.	320 1 but he was very much an expert in operator exposure 2 studies. 3 Q. All right. At the very top of the page -- 4 MR. NARESH: Still page 8? 5 MR. DICKENS: Page 8 still, yeah. 6 BY MR. DICKENS: 7 Q. -- it references the study involving a 8 single day's use of paraquat in vines in France, 9 right? 10 A. Yes. 11 Q. This is the French study that was part of 12 what was deemed as the most modern guidance compliance 13 studies for habitual use, right? 14 A. Yes. 15 Q. And the excretion of paraquat was 16 calculated to be a mean absorbed dose of 17 8.54 micrograms per kilogram, right? 18 A. Yes. 19 Q. And that would equal 0.0084 milligrams 20 per kilogram? 21 A. Yes. 22 Q. And what is the AOEL? What does that 23 refer to? 24 A. The AOEL is deemed to be -- it's called 25 a reference dose, so it's calculated from -- you start

Conducted on September 17, 2024

321 1 with a 'no effect' level in a toxicology study, a 2 toxicity study. You then divide that by a safety 3 factor, and that gives you an AOEL. 4 Q. And that is the acceptable amount that 5 a human could be exposed to paraquat without causing 6 adverse health effects, right? 7 A. Yes. 8 Q. And the AOEL for paraquat is 0.0005 -- 9 A. That's -- 10 Q. -- milligrams per kilogram, right? 11 A. That's correct, yes. 12 Q. So the excretion of paraquat in this study 13 and the mean absorbed dose as determined by the study 14 authors actually exceeded the AOEL, right? 15 A. Right. Now, my understanding is that that 16 exceedance of the AOEL was restricted to two 17 individuals; so not every individual had an exceedance 18 of that AOEL. 19 Q. But two individuals with habitual use of 20 paraquat exceeded the AOEL in this particular study, 21 right? 22 A. That's right, yes. 23 Q. Okay. The study that was deemed the best 24 choice for assessment of absorbed dose for risk 25 assessment purposes?	323 1 At the very bottom, it references, under 2 "Habitual Use Studies," a study in Sri Lanka in 1987 3 by Chester. 4 Right? 5 A. Yes. 6 Q. And is that Graham Chester who -- 7 A. It's the same one, yes. 8 Q. And this is the Sri Lanka study that was 9 referenced in that ECCO meeting that we looked at 10 earlier? 11 (Stenographer clarification.) 12 BY MR. DICKENS: 13 Q. Yeah. This is the same Sri Lanka study 14 that we looked at in that ECCO meeting? 15 A. Well, I assume it may have been. You 16 can't make a direct assumption of that, but let's -- 17 I think we can assume it probably was. 18 Q. And in that Sri Lanka study, blood samples 19 were also taken of the individuals who were exposed to 20 paraquat, right? 21 A. Yes. 22 Q. So this is a ICI, or Syngenta, operator 23 exposure study, right? 24 A. Yes. 25 Q. And so Syngenta actually not only took
322 1 A. Mmm-hmm. Yes. 2 But those exposures, by the way, just to 3 complete the answer, they did not exceed the 4 'no effect' level from the toxicity study. So there 5 is that margin of safety which I described. 6 Q. Looking back at that last line where it's 7 the 8.54, now, that indicates it's a geometric mean of 8 the nine operators with quantifiable paraquat in their 9 urine, right? 10 A. Yes. 11 Q. So it actually included all nine operators 12 who were deemed to have paraquat in their urine, not 13 just the two who exceeded the AOEL on their own, 14 right? 15 A. I mean, I'm now wondering whether we -- 16 I mean, there are so many different studies here. 17 Your calculation of 0. -- of 8.54 and then 18 comparing that with the AOEL, and, you're quite right, 19 it says the geometric mean. 20 My understanding was, and maybe it wasn't 21 this particular study, so I'm getting rather late in 22 the day here, was that there were only two individuals 23 in one of these studies where there was exceedance of 24 the AOEL. 25 Q. I actually want to turn back to page 6.	324 1 urine samples but took blood samples of those 2 individuals exposed to paraquat? 3 A. Yes. 4 Q. You can put that aside. 5 MR. DICKENS: I'll hand you 47. 6 (Exhibit 47 marked for identification.) 7 BY MR. DICKENS: 8 Q. This document refers to Dunlop Estate 9 worker exposure studies to paraquat in Malaysia, 10 right? 11 A. Yes. 12 Q. And the objective was: 13 "To obtain data on sprayman, carrier and 14 tapper dermal and respiratory exposure..." 15 Right? 16 A. That's right. 17 Q. Now, there's a "Determination of dermal 18 exposure," and it notes: 19 "Dermal exposure pads were attached to 20 clothing (or skin, if exposed)..." 21 Right? 22 A. Yes, indeed. 23 Q. And that was on various locations on the 24 individual? 25 A. Yes.

Conducted on September 17, 2024

325 1 Q. Now, they ran into some problems for 2 dermal exposure, at the bottom of the page, in that: 3 "... saturation of the exposure pads to 4 the lower leg and thigh..." 5 Or there was: 6 "... saturation to the exposure pads to 7 the lower leg and thigh [of paraquat] as the worker 8 walked through sprayed vegetation." 9 Right? 10 A. Yes. 11 Q. And so that: 12 "... necessitated removal of the pads 13 after a relatively short period of spraying - 14 sometimes as little as 30 minutes." 15 Right? 16 A. Mmm-hmm. 17 Q. So the legs and the pads within the legs 18 of those individuals became so saturated with paraquat 19 that they had to be removed, correct? 20 A. That's right. 21 MR. DICKENS: I want to look at another 22 Malaysian study. This is Exhibit 48. 23 (Exhibit 48 marked for identification.) 24 BY MR. DICKENS: 25 Q. This is a report from a B.H. Woollen,	327 1 end of the first paragraph: 2 "It's noteworthy that while paraquat 3 excretion declined rapidly at the end of the spraying 4 period between days 3 and 4, the decline was much 5 slower thereafter and paraquat was still detectable in 6 urine on day 10 for six of the subjects." 7 Right? 8 A. Yeah. Yes. 9 Q. So there were individuals in this study 10 who still had paraquat in their urine ten days after 11 their last exposure, right? 12 A. I assume it's after their last exposure 13 and that they weren't still subject to some form of 14 exposure at that period in time, which is another 15 alternative, of course. 16 Q. Now, with respect to plasma, it notes: 17 "Paraquat was detectable at low 18 concentrations in 12 out of 50 samples collected 19 during days 1 and 3 when spraying occurred, but not in 20 samples collected on day 5." 21 Right? 22 A. Okay. Yeah, indeed. 23 Q. This study specifically indicates that 24 paraquat was not only getting into the body and 25 excreted through the urine but paraquat was actually
326 1 "Paraquat: Analysis of urine and plasma samples from a 2 Malaysian operator exposure study," May 26, 1998. 3 Do you see that? 4 A. Yes, indeed. That's 1988, actually. 5 Q. I said -- 6 A. '98. 7 Q. -- '98? You're correct, 1988. And on the 8 next page, it notes that: 9 "In February 1988, an exposure study was 10 carried out in Malaysia involving knapsack spray 11 operators who were exposed to paraquat." 12 A. Yes. 13 Q. Right. Now, this actual study, this 14 was not included in the summary of operator exposure 15 studies that we looked at in the previous exhibit by 16 Graham Chester and Andy Cook, correct? 17 A. I would need to double-check that, but 18 let's assume that you're correct for now. 19 Q. And in this case, much like the Sri Lanka 20 study, they actually undertook both urine as well as 21 plasma samples from the individuals? 22 A. Yes. 23 Q. And plasma being blood? 24 A. It's a component of blood. 25 Q. If you can turn to page ending in 7570,	328 1 getting into the blood of users who were spraying 2 paraquat, right? 3 A. Well, indeed, in order to get into the 4 urine it's highly likely that it will have gone via 5 the circulation. 6 Q. And in this, they specifically measured 7 the plasma paraquat concentrations in order to 8 determine the total operator exposure to paraquat in 9 Malaysia at this point in time, right? 10 A. I would need to understand that in a 11 little bit more detail as to why they felt it was 12 important to look at the plasma as well as the urine. 13 I'm not sure that it was -- I wouldn't describe it in 14 the way in which you had done, so I wouldn't like to 15 say whether that was the intention and purpose here. 16 MR. DICKENS: Two last ones for today. 17 Get up to 50. I'll hand you Exhibit 49 for the 18 record. 19 (Exhibit 49 marked for identification.) 20 MR. DICKENS: For the record, this is 21 topic 17 in the Notice of Deposition. 22 BY MR. DICKENS: 23 Q. This is an email chain, "For your personal 24 information: Meetings in Malaysia," August of 2002, 25 from a Martin Wilks, bottom of the first page.

Conducted on September 17, 2024

329 1 Do you see that? 2 A. I do. 3 Q. And then on the bottom of the second page, 4 the first email in this email chain is from a 5 Bruce Woollen to Martin Wilks and Mike Clapp, right? 6 A. Yeah. 7 Q. And he's reporting on meetings he had in 8 Malaysia. Bruce Woollen, he was -- was he the 9 neurotoxicol- -- okay. 10 Who is Bruce Woollen? 11 A. Right. Well, as in the previous document, 12 which Bruce Woollen was an author on, he was our 13 analytical expert, analytical chemistry expert. 14 Q. And he's noting that he spoke to 15 individuals in Malaysia and they were wishing to carry 16 out a paraquat exposure study, right? 17 A. An individual in Malaysia was wishing to 18 do that and he was discussing this with other 19 scientists in Malaysia. 20 Q. And that's because the Pesticides Safety 21 Board were not prepared to accept previous ICI studies 22 on the basis that they were not considered to be 23 impartial, right? 24 A. That -- 25 MR. NARESH: Object to the form.	331 1 BY MR. DICKENS: 2 Q. Is that your understanding? 3 A. Indeed, and probably for the same reason 4 that I was saying it's not, to me, clear why plasma 5 was -- plasma paraquat levels were measured in that 6 previous study. The urine levels are the key 7 parameter. 8 Q. Okay. Part of the reason, on page 1, 9 email from Martin Wilks, the last paragraph on page 1: 10 "More importantly, there is a real danger 11 of generating data which could cause a great deal of 12 harm to the global paraquat position." 13 Right? 14 A. Yes. 15 Q. And paraquat being found in the blood or 16 plasma of users was considered data which would cause 17 great harm to Syngenta and its business with paraquat, 18 right? 19 MR. NARESH: Objection to form. 20 THE WITNESS: I don't know whether the 21 specific concern was about detecting paraquat in the 22 blood. I'm not able to make a judgment about 23 specifically Martin's concern. 24 BY MR. DICKENS: 25 Q. It states at the very end:
330 1 Go ahead. 2 THE WITNESS: Sorry. Yeah, that was the 3 reason given, yes. 4 BY MR. DICKENS: 5 Q. And: 6 "A key influencer was the man who visited 7 with Bala [...] 18 months ago. He had [...] taken a 8 strong position that if Syngenta did commission an 9 independent study, [...] paraquat measurements 10 should be done in blood plasma." 11 Right? 12 A. Yes. 13 Q. If you turn to the page -- to the last 14 page, the second paragraph: 15 "Having convinced Bala of these arguments, 16 he tried to arrange a meeting with the key influencer 17 in the hope that I could convince him that plasma 18 measurements would be futile." 19 Right? 20 A. Yes. 21 Q. Bruce Woollen is attempting to get the -- 22 any Malaysian exposure studies not to include a 23 measurement of paraquat within the blood or plasma? 24 MR. NARESH: Objection to the form. 25 ///	332 1 "If additional work is unavoidable, we 2 must try to maintain as much control as possible." 3 Right? 4 A. Yes. 5 Q. And that's in order to influence what is 6 happening, right? 7 MR. NARESH: Objection to form. 8 THE WITNESS: I think it's -- as is -- 9 has been the case in another -- a number of examples: 10 we wanted to -- I guess the better word would be to 11 collaborate in order to create -- if a study was to be 12 done, it would be done using the best possible 13 approach, using the best possible protocol. 14 MR. DICKENS: Let's look at the last of 15 the day, Exhibit 50, which is topic 17, still, in the 16 Notice of Deposition. 17 (Exhibit 50 marked for identification.) 18 BY MR. DICKENS: 19 Q. This is an email chain in May of 2007 20 which, once again, includes Bruce Woollen. 21 Do you see that? 22 A. Yes. 23 Q. Okay. Let's start on the first email, 24 which is on the second page. It's an email sent to 25 Bruce Woollen on May 30, 2007 and it appears that a

Conducted on September 17, 2024

333 1 group was planning to do an operator exposure with 2 samples of urine and plasma from plantation workers 3 for a chronic exposure study. 4 Right? 5 A. Yes. 6 Q. And this would have been an outside group 7 who would have been doing this operator exposure study 8 of chronic exposure to paraquat, right? 9 A. Yes. 10 Q. Turn back to page 1, Bruce Woollen writes 11 back, right? 12 A. Yes. 13 Q. And in the third paragraph, he states: 14 "Regarding operator exposure studies, 15 I would advise you against blood sampling." 16 Right? 17 A. Yes. And this actually says, in different 18 language, exactly what I've been saying in the last -- 19 with the last two exhibits: that the use of 20 measurements in plasma are less meaningful than 21 would be the case with urinary samples. 22 MR. DICKENS: I'll move to strike. 23 BY MR. DICKENS: 24 Q. Dr. Woollen notes, in the next paragraph: 25 "In all our biological monitoring studies	335 1 answered. 2 THE WITNESS: Well, it's inaccurate, but 3 I think he's also saying that, perhaps with the 4 benefit of hindsight, he now believes that the 5 measurement in urine is a much more robust way of 6 assessing exposure to paraquat. 7 BY MR. DICKENS: 8 Q. Well, he actually gives us the reason for 9 why he said that in his email to Martin Wilks on 10 May 30, 2007, right? 11 A. Yes. 12 Q. He says: 13 "My efforts to try and influence Teh..." 14 And that's the individual who had emailed 15 him, right? 16 A. Yes. 17 Q. "My efforts to try and influence Teh to 18 influence his supervisor continue, both technically 19 and to avoid a potential 'can of worms' from plasma 20 analysis results." 21 Right? 22 A. Yes. 23 Q. There was fear that plasma results of 24 paraquat in the blood would open up a can of worms? 25 MR. NARESH: Objection to form.
334 1 in the last 20 years [...], we have always used urine 2 and never blood sampling." 3 Right? 4 A. He said that, yes. 5 Q. That's not true, correct? 6 A. Well, when you look back and -- it's clear 7 that he'd forgotten the study that we were looking at 8 earlier, yes. 9 Q. He forgot both the Sri Lankan study as 10 well as the Malaysian study that we looked at, right? 11 A. That's what we were looking at, yes. The 12 Malaysian study I was -- is the one that I was 13 referring to, yes. 14 Q. And in the report or review that was done 15 by Chester and Cook, we looked at the fact that blood 16 samples were taken in the Sri Lankan study, right? 17 A. Okay, yes. 18 Q. So now there's two studies, biomonitoring 19 studies that were done by Syngenta prior to 2007 where 20 they have measured blood sampling, right? 21 A. Yes. 22 Q. And so the comment in this statement, 23 through Bruce Woollen, to this independent researcher, 24 simply isn't true, right? 25 MR. NARESH: Object to the form, asked and	336 1 THE WITNESS: Yes, because they are -- as 2 is said here, they are a snapshot in time and you can 3 -- they don't provide you with the robustness of 4 conclusion that urine samples over a period of time 5 provide. 6 MR. DICKENS: We can go ahead and end for 7 the day. 8 THE VIDEOGRAPHER: We are going off the 9 record at 17:59. 10 (Whereupon, the deposition concluded for 11 the day, to resume on Wednesday, 12 September 18, 2024 at 09:00 a.m.) 13 14 15 16 17 18 19 20 21 22 23 24 25

Conducted on September 17, 2024

1 CERTIFICATE OF WITNESS 2 3 I, PHILIP BOTHAM, declare that I have read the entire 4 transcript of Volume I of my Syngenta Corporate 5 Representative deposition, or the same has been read 6 to me, and certify that it is a true, correct and 7 complete transcript of my deposition given on Tuesday, 8 September 17, 2024, save and except for changes and/or 9 corrections, if any, as indicated by me on the 10 attached Errata Sheet, with the understanding that 11 I offer these changes and/or corrections as if still 12 being questioned. 13 14 15 16 Signed _____ 17 Philip Botham 18 19 20 21 Dated this.....day of.....20... 22 23 24 25	337
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 Tuesday, 9 September 17, 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)	338