IN THE CIRCUIT COURT
TWENTIETH JUDICIAL CIRCUIT
ST. CLAIR COUNTY, ILLINOIS

- -

DIANA HOFFMANN, individually and as Independent Administrator of the Estate of THOMAS R. HOFFMANN, Deceased, et al.,
Plaintiffs,

v.

SYNGENTA CROP PROTECTION, LLC, et al.,
Defendants.

Case No.: 17-L-517

- -

February 25, 2020
8:59 a.m.

VIDEO DEPOSITION of DR. PHILIP BOTHAM, held at the offices of Kirkland & Ellis LLP, located at 30 St. Mary Axe, London EC3A 8AF, United Kingdom, before Chanelle Malliff, Accredited Court Reporter of the United Kingdom and Europe.

C O N F I D E N T I A L

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PROCEEDINGS

THE VIDEOGRAPHER: Good morning. We are going on the record at 8:59 a.m. on February 25, 2020. This is media unit one of the video recorded deposition of Philip Botham in the matter of Diana Hoffmann et al versus Syngenta LLC et al filed in the Circuit Court, Twentieth Judicial Circuit, St. Claire County, Illinois. This deposition is being held at Kirkland & Ellis, 30 St Mary Axe, London, United Kingdom.

My name is Joseph Viner from Veritext. I'm the videographer. The court reporter today is Chanelle Malliff from the firm Veritext.

Will the court reporter please swear in the witness.

PHILIP BOTHAM

having been sworn testified as follows:

MR. TILLERY: And before we begin, this is Steve Tillery on behalf of the plaintiffs, announcing that the parties have reached an agreement stipulation that there is no requirement for strict compliance with Illinois Supreme Court Rule 206 and the reading by the videographer for that compliance, is that correct, for Syngenta entities?

MR. NARESH: Ragan Naresh, on behalf of Syngenta. That is fine, with the understanding that

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this deposition complies with both the Illinois rules as well as the California rules of civil procedure.

MR. TILLERY: And we do stipulate to that as well.

MR. ORLET: Yes, that's fine on behalf of Chevron with the same stipulation.

MR. TILLERY: For the record, I'll note that this is a deposition of an adverse party or agent taken in a representative capacity, so I'll be conducting in accordance with section 2-1102 of the Illinois Code of Civil Procedure, 735 ILCS 5/2-1102.

EXAMINATION BY MR. TILLERY:

Q. Good morning, sir.

A. Good morning.

Q. My name is Steve Tillery. I'll be asking you questions on behalf of Plaintiffs. If you don't have -- sorry, excuse me. If you have questions or problems with any of my inquiries of you, if you'd stop me and clarify, so I can make sure that you understand my question.

A. Okay.

Q. For the record, can you state your name?

A. Dr. Philip Botham.

Q. And what is your home address?

A. 255 St. Leonard's Road, Windsor in Berkshire

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in the United Kingdom.

Q. What is your business address?

A. Jealott's Hill, International Research Centre of Syngenta, Bracknell in Berkshire.

Q. What is Jealott's Hill?

A. Jealott's Hill is a research park, and Syngenta is the sole occupant of that research park.

Q. How long has that facility been in existence?

A. 90 years.

Q. What is your employment history before you were first employed by a Syngenta entity?

A. I joined what is a Syngenta entity back in 1980. Prior to that I had two years post-doctoral research at the University of Hull, which followed my PhD which I obtained at the University of Hull.

Q. And what was the name of the entity, the predecessor entity of Syngenta that you first joined?

A. It was ICI.

Q. Was there a specific entity of ICI or just ICI Limited?

A. It was ICI Limited in the United Kingdom, and the specific part of ICI that I joined was called the central toxicology laboratory.

Q. Have you worked for an ICI/Syngenta related entities your entire career?

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A. Apart from those two years of post-doctoral research, yes.

Q. Did you have any connection with paraquat prior to joining a Syngenta entity?

A. No, I did not.

Q. And when you joined Syngenta what was the first year that you had a connection with paraquat?

A. I would imagine that would be in the early '90s. I mean, I can't give you an exact date but when I became familiar with some of the research work that some of my colleagues were doing at that time.

Q. Can you take me through your career in terms of jobs and responsibilities at Syngenta? And when I say "Syngenta", I mean any of the predecessor entities like ICI.

A. So starting with in 1980 when I joined?

Q. Correct.

A. So in 1980 I was employed at the central toxicology laboratory as an expert in actually in allergy because I had some expertise in that kind of disease and at that point in time ICI had a number of issues associated with people becoming allergic to what they were using or producing in manufacturing plants. But over the next three to four years I started to broaden my expertise into other areas of toxicology.

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And in the 1990s, in 1991 to be specific, I was appointed to be what we called a section head, a leader of a significant number of people in the organization, in the central toxicology laboratory who were looking again across a broad range of toxicology issues, mainly doing regulatory toxicology. So I'd moved away from the research toxicology I was originally doing.

Q. What is regulatory toxicology?

A. Regulatory toxicology is -- are the studies and the assessments that we need to conduct in order to register or re-register our products with regulatory authorities around the world.

Q. Before you go further -- and pardon me for interrupting -- can you describe the CTL facility?

A. Of course, yes. CTL is, or was, a laboratory where toxicology studies were conducted. So it comprised a large number of laboratories and also animal facilities, animal -- laboratory animal facilities, because laboratory animals are required for many of those regulatory toxicology studies I was describing.

It had approximately 300 employees, and their experience was across the whole range of scientific disciplines that are needed in toxicology.

And it started on that site in the late 1950s

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but eventually closed when a decision was taken to change the way in which we did our toxicology, starting in 2007. That was when we announced the closure and that's when I moved actually from that laboratory down to where I currently am in Jealott's Hill.

Q. Now when you were at CTL how many scientists were there?

A. If you want to describe scientists as people who had, for example, higher education qualifications, PhDs and so on, at the time of those 300 or so employees that I talked about around about 75 to 80 of those people had PhDs. A significant number more, I can't give you an exact number, would have first degree, BSc Bachelor of Science degrees. Others would have technical qualifications, laboratory animal and husbandry qualifications, for example.

Q. And how many different laboratories? You said there were multiple laboratories.

A. Mm-hmm.

Q. How many?

A. I couldn't give you an exact number but we would be talking about 20 to 30 I would estimate.

Q. And you had an entire laboratory animal production facility there, right?

A. We didn't produce, i.e. we didn't breed our

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animals. They were brought in from in some cases from another facility at the same site. In other cases they were brought on to site from animal suppliers. We housed those animals whilst we were conducting the regulatory toxicology tests in specific animal environments. And we're talking here about rats, mice, guinea pigs and dogs.

Q. And how many different laboratory or scientific facilities has Syngenta or its predecessors had besides CTL?

A. The other main facility is the one where I'm working now, which is at Jealott's Hill. That had a laboratories to conduct another branch of regulatory safety studies that need to be conducted which is environmental safety. Again around about 2007 as part of that same decision those laboratories were closed and so much of what we now have in Jealott's Hill is not laboratory accommodation.

Q. You indicated that the way Syngenta did toxicology changed, and that led to CTL closing?

A. That's correct.

Q. What was the way that CTL -- strike that. What was the way that Syngenta did business that altered -- that caused CTL to close; explain that to me?

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A. The decision was that we wanted to enable us to actually meet with the increasing challenges that regulatory toxicology and also the toxicology that we wanted to do as part of our research invention of finding new chemicals, new pesticides, that that was changing and required us to get access to an even wider area of -- to wider areas of science. Science was progressing and moving on and we realized that the best way we could do that was to outsource our practical safety studies, our toxicology studies and our environmental safety studies to a number of different research organizations outside the company. So they became partners and suppliers of our toxicology environmental safety.

Q. You basically out-sourced a lot of the science?

A. It was basically an outsourcing strategy; correct.

Q. Would you continue on with your jobs, assignments and responsibilities?

A. Okay, so I've reached the point of the early 1990s where I'd taken on leadership responsibilities within toxicology, specifically regulatory toxicology. During the 1990s up until the formation of Syngenta in the year 2000 I had several different leadership roles

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at CTL at the Central Toxicology Laboratory. They were mostly in regulatory toxicology. I also did a spell back in research toxicology, so leading the investigative toxicology team, for example. Then in the year 2000 when we formed Syngenta, between then and 2007 when I moved down to Jealott's Hill, it was a similar pattern of having two or three different leadership roles. Then of a product safety organization as we were then describing it, which included staff not just at CTL but also elsewhere in this new Syngenta organization. That included people in Switzerland and also North America.

And then in 2007 moved down to Jealott's Hill. I was initially appointed to be the European head of human safety, specifically toxicology in human safety. Then product safety European head, which meant both the human safety and the environmental safety. And then in 2013 I was appointed to be global head of product safety for Syngenta, which meant that I had responsibility for teams around the world as it were involved in that discipline.

Q. Moving back to CTL for a moment. Was there any concern over finances, that is saving money by outsourcing as opposed to keeping that laboratory open?

MR. NARESH: I'll object to scope. Go ahead.

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A. The cost of doing our work was clearly one factor. It was not actually the most important factor.

BY MR. TILLERY:

Q. But it was a factor?

A. But it was one factor.

Q. Thank you. When did you start working with paraquat?

A. I first had, if you like, a clear and formal role with paraquat in 2008 when I joined the paraquat health scientist team.

Q. But you knew about it before then, didn't you?

A. Obviously, yes, I'd been not only aware but I was responsible for in my leadership role for other scientists who were directly involved with paraquat but I was still -- I had indirect involvement. My direct involvement started in 2008.

Q. Including supervision of some of the scientists who had direct involvement?

A. That is correct.

Q. When would that have started?

A. So not in 1991, because the team I was leading then was not involved in that activity, but later in the 1990s/early 2000s that would have included such people.

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Q. Do you understand that you're testifying today as a corporate designee of Syngenta AG and Syngenta Crop Protection LLC?

A. I do.

Q. Can we agree to refer to both Syngenta AG and Syngenta Crop Protection LLC as "Syngenta" for purposes of this deposition?

A. I'm fine with that.

Q. Okay. What do you understand your role to be here as a corporate designee for Syngenta?

A. To help --

MR. NARESH: To the extent you can answer without divulging privileged communications, communications you and I have had about legal issues, please feel free to answer.

A. I believe that I'm here to answer a number of specific questions regarding the company's work on the safety of paraquat.

BY MR. TILLERY:

Q. You understand Syngenta's designated you to testify for them on certain topics?

A. I do.

Q. Now if we can mark these.

(Exhibit 1 marked for identification.)

(Exhibit 2 marked for identification.)

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Have you seen Exhibits 1 and 2 before, sir?

A. I'm not sure that I've seen specifically this document.

Q. But if you look at the Topics sections in the back. Have you looked at those topics before?

A. Yes as you get towards the back, so I agree, so under Appendix 2 I can see some familiarity of the document I've seen before.

Q. So you were given the topics, right?

A. Yes. Yes.

Q. So can we refer to those as the designated topics throughout this deposition?

A. Yes. Now that I've seen that this is the topics that I've seen previously, that is fine.

MR. NARESH: So to be clear, Dr. Botham is not testifying with respect to all the topics.

MR. TILLERY: Correct. And if you want to announce on the record the ones, but otherwise we can I think by agreement from your notice and answer to us we have an understanding as to which topics.

MR. NARESH: That's fine. Just so we're on the same page that it's not every topic in here.

BY MR. TILLERY:

Q. Right. Do you understand that in testifying for Syngenta on the designated topics, you're required

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to answer not based on the information known or available to you personally but also based on information known or reasonably available to Syngenta?
A. Yes.
Q. And did you take that into account when you were preparing to testify on the designated topics?
A. Yes.
Q. Are you prepared today to testify for Syngenta on the designated topics based on information known or reasonably available to Syngenta?
A. I am.
Q. Do you believe your preparation has given you sufficient information to testify for Syngenta on each of the designated topics that you've been designated to speak to?
A. As far as is practical. There is clearly a lot of information and it may be that I don't have absolutely all of that at my immediate fingertips.
Q. Other than in conversations with your attorneys representing you here, can you describe for me what you did to prepare for this deposition?
A. So to clarify, you're saying other than conversations I've had with attorneys?
Q. You can tell me you had conversations with attorneys but not the specific content of those

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conversations.
A. Indeed.
Q. So what did you do to prepare?
A. So I have reminded myself of many of the activities that have taken place over the period in which we have been conducting our research on paraquat, and specifically on the alleged association with Parkinson's disease. So I've refreshed my memory of that, reading appropriate documents and papers which in some cases were brought back to me by my attorneys, in other cases documents which I already had in my possession in our company files.
Q. And how many hours have you spent reminding yourself of these events?
A. Well, this has been an activity that has really been mostly in the last two to three weeks and I wouldn't have an exact count of the number of hours but certainly most work days during the last two to three weeks I've been spending a significant amount of time.
Q. Was there anything new to you?
A. There were certainly some aspects because the areas that you wish to explore today were so broad there were some areas where I never had any direct involvement in the past and therefore some of the

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information, some of the documents were -- I don't recall having seen previously. But the majority I did, I had seen before.
Q. And these documents are stored at Syngenta as well, aren't they?
A. They are.
Q. And how is that that they're stored?
A. Do you mean in what manner are they stored?
Q. Yes. In other words, for a person at your level in the company, you have access to most of those documents?
A. I do have access. They are in some cases stored electronically, and in other cases there are paper copies which are stored in various archives.
Q. And as you move in and out of different projects to educate yourself of projects, you might look at those for historical reference as well; is that correct?
A. That is correct, yes.
Q. So would you agree that none of the topics that you understand you are to address today provide a problem for you to speak to? You're able to answer all of them?
A. I'm able to answer all of them and I think I would be able to answer some better than others

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because that familiarity. So clearly there's a range of in-built knowledge across all of those topics.
Q. How did you familiarize yourself with matters concerning ICI preceding your employment there?
A. Most of the pre-1980 work was -- in fact all of the pre-1980 work on paraquat was not related to Parkinson's disease, so it was related to other toxicology issues regarding paraquat so that I was not, I felt, relevant to what we were discussing today.
Q. When was the first time that you understood that there was a claim being made of a connection between paraquat and Parkinson's disease?
A. I don't recall exactly the year but at some point after I joined the paraquat health science team in 2008 then that potential was certainly made evident to us.
Q. So it would have been 2008 do you think or after that period?
A. At some point after 2008.
Q. After 2008?
A. Yes. Yes.
Q. How did you familiarize yourself with ICI work on neurotoxicity?
A. Through my own knowledge of what had been done during the time when I had that responsibility

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from 2008 together with reading the appropriate documentation that we've been talking about which was a mixture of internal reports, publications and other correspondence and information that was shared.

Q. How did you familiarize yourself with ICI's work in terms of neurotoxicity of paraquat prior to 1980?

A. I don't believe that there was any work of significance prior to 1980 on neurotoxicity. There were certainly one or two early research studies but they were really -- this was not a main part of our activity. That came later on.

Q. But whether there was or there wasn't, you're able to answer those questions today?

A. Yes.

Q. Correct?

A. Yes.

Q. You have to say "yes" or "no" on the record.

A. Yes.

Q. Have you given a deposition before?

A. I have not.

Q. Have you testified at a trial or hearing before?

A. I have not.

Q. Do you understand that in testifying for

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Syngenta on the designated topics the matters on which you're required to testify are not limited to the period since the formation of Syngenta but cover the entire period of time from the discovery of the herbicidal effect of paraquat in the 1950s through the present time?

A. Yes.

Q. Did you take that into account when you were preparing?

A. As I said, I didn't focus as much on the period really prior to the late 1980s, early 1990s.

Q. I will assure you you're going to get a lot of questions for me -- strike that. You're going to get a lot of questions today from me that precede 1980. So are you prepared to answer those?

A. Well I'm prepared to see if I am able to answer them.

Q. Do you understand that in testifying for Syngenta on the designated topics, the matters on which you're required to testify are not limited to the knowledge and actions of Syngenta but also include the knowledge and actions with respect to paraquat of their corporate predecessors?

A. Yes.

Q. You took that into account when you were

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preparing?

A. Yes, I did, yes.

Q. Were you aware that the matters on which you would be required to testify for Syngenta on the designated topics would include the knowledge and actions with respect to paraquat of Syngenta AG's predecessors in the paraquat business including AstraZeneca Plc, Zeneca Group Plc, Imperial Chemical Industries Plc, Imperial Chemical Industries Limited, and their subsidiaries?

A. Yes.

Q. And you're prepared to testify on the designated topics about the knowledge and actions with respect to paraquat of all of those entities?

A. Yes.

Q. If I refer to Syngenta AG's -- strike that. If I refer to Syngenta AG's predecessors will you understand that to mean with respect to the paraquat business AstraZeneca Plc, Zeneca group Plc, Imperial Chemical Industries Plc, Imperial Chemical Industries Limited and their subsidiaries?

A. Yes.

Q. Now in preparing to testify for Syngenta AG and Syngenta Crop Protection LLC, were you aware that the matters on which you would be required to testify

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would would include the knowledge and actions with respect to Zeneca AG Products Inc., Zeneca Inc., ICI Americas Inc., ICI United States Inc. and ICI America Inc.?

A. Yes.

Q. And are you prepared to testify with respect to that understanding?

A. Yes.

Q. And again, if I later refer to Syngenta AG's predecessors, will you understand that to mean with respect to their paraquat business Zeneca AG Products Inc., Zeneca Inc., ICI Americas Inc., ICI United States Inc. and ICI America Inc.?

MR. NARESH: Stephen, I think you misspoke. I think you asked about Syngenta AG and meant to ask --

BY MR. TILLERY:

Q. Yes, I'm Sorry, I did. Thank you very much, I'm going to correct it. I'll withdraw that question, sir.

If I later refer to Syngenta Crop Protection LLC's predecessors, will you understand that to mean with respect to their paraquat business Zeneca AG Products Inc., Zeneca Inc., ICI Americas Inc., ICI United States Inc., and ICI America Inc.?

A. Yes.

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Q. And you're ready to do that as well?
A. Yes.
Q. What documents or data was available to you personally to help you prepare for the deposition?
A. A wide range of documents of the sort that I mentioned earlier. So the publications, reports, correspondence, and other related matters.
Q. And was that included within what you refer to as your reliance group of documents?
A. Could you expand on what you mean by the reliance --
Q. Yes. What that means is that your counsel gave to us, roughly one week ago today, a group of documents that were listed as responsive to our request for information on which you were to rely in answering my questions.
A. Yes. Yes, I believe that those were the documents that --
Q. You picked those out?
A. Yes. Yes.
Q. And you did that by looking at those documents and making decisions that those were relevant to your information, education to answer questions about the designated topics?
A. I did, but also with discussions with my

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attorneys to also guide me on particularly what might be appropriate to answer the specific questions that may arise.
Q. So they may have added some as well is what you're saying?
A. They certainly directed me to some of the documents which may have been more useful.
Q. Understood. Did you talk to anybody else besides lawyers in preparing for the deposition?
A. I talked to one particular colleague, Andy Cook who is the regulatory manager for paraquat with whom I've worked closely for many years.
Q. And what is his employment as Syngenta?
A. He is also at Jealott's Hill. He is the global regulatory manager for paraquat.
Q. Did you speak to anyone else?
A. Not specifically about this topic, these topics and the process that we're undergoing today. I talk to other colleagues regularly as part of my normal duties of leading the paraquat health science team. That process has continued, so I have spoken to other colleagues about paraquat, but that was part of my normal business.
Q. What did you speak specifically to Mr. Cook about?

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A. To engage with him in some of the areas where I had not had that direct interaction myself. So there were certain aspects of the work that had been conducted on for example understanding exposure to paraquat where Andy Cook had more background, if. you wish, in that area.
Q. And where did those conversations take place?
A. In a room in Jealott's Hill.
Q. And for how long did you discuss these topics with Mr. Cook?
A. Just a few hours.
Q. Did you speak to anyone else besides lawyers and Mr. Cook?
A. Not about the process that we are talking about now. Just, as I said, about normal business regarding me leading the paraquat health science team.
Q. Did you speak to anybody in America for example, any of the scientists from Syngenta Crop Protection employees in America?
A. So I've certainly had a -- have been on a phone call where a Syngenta U.S.A. employee has again been providing some input to the process, not directly to me, and this would be Monty Dixon.
Q. Did you speak with any, let's refer to them as outside scientists? Do you know what I mean when

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I use that word "outside"? What does it mean for you, just to make sure we're on the same page.
A. I assume you mean collaborators or suppliers?
Q. A person who collaborates with you who isn't an employee of Syngenta?
A. During this process of preparation I have not spoken as far as I remember to any external collaborators or similar people.
Q. How about retired Syngenta employees or ICI employees?
A. I have spoken to some external retired -- sorry, some retired Syngenta employees but not in the last few weeks.
Q. Okay. Well about these topics?
A. Again, this would be a part of our normal business where we sometimes confer with ex-employees who have had experience and expertise working with paraquat.
Q. Who are those people?
A. Professor Lewis Smith for example. Dr. Nick Sturgess. But I've not had discussions with either of those two individuals for several months.
Q. Did you talk about any of the related topics, whether or not they came to you in the form of a deposition notice but at least the subject matter with

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either Dr. Smith or Dr. Sturgess in the last two years?
A. Yes, indeed, I've had conversations with them in the last two years about paraquat and its safety studies.
Q. And are they affiliated with the company now?
A. No. Dr. Sturgess is not affiliated. Professor Smith does have, though, a consultancy contract.
Q. With Syngenta?
A. With Syngenta.
Q. So he's still connected to the company?
A. In that sense, yes.
Q. And can you explain that consultancy contract that he has?
A. It is a contract that where we -- it asks that we are able to consult with Dr. Smith on aspects related to paraquat toxicity. It's a fairly broad remit. But the number of consultations that we've had with Dr. Smith over the last year or two has been relatively small.
Q. What does that mean, "relatively small"?
A. Perhaps it may be only two or three times in the last year or two from my recollection.
Q. What about Dr. Sturgess, how many times have you talked to him?

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A. I have not spoken to Dr. Sturgess from memory for at least a year. But in the previous year I would have spoken to him, in the period shortly after he left.
Q. When did he leave?
A. I believe that that was 2018.
Q. And what were the conversations about paraquat that you had with Dr. Sturgess or Dr. Smith?
A. They were largely conversations of clarifying on some of the issues and work that they were, if you like, more familiar with than either Andy Cook or myself were. So it was to check some details of the work.
Q. What details were those? There has to be something you were thinking about? You went to a phone, picked it up, called them, you had a question in mind. What was it?
A. In the case of Dr. Smith the conversations have actually been in recent times more around other issues related to paraquat safety and some of the history of how we developed paraquat as a product, as a formulated product, and how we were making sure that we make best efforts to what we call safen that product because it's one of the other issues with paraquat of course is that it is acutely toxic, and so we were

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discussing that aspect with Dr. Smith.
Q. What about Dr. Sturgess?
A. With Dr. Sturgess it was, and this is not as clear in my mind, that was mostly to do with ensuring that we knew where some of his historic information was so that we had got that properly archived. So it was simply to make sure that we had recovered and had available the information that he specifically had in his files. We didn't discuss any specific science matter if you wish.
Q. Have you talked to Dr. Louise Marks?
A. I have.
Q. When did you talk to her recently?
A. I talked to her in the last two to three months when she let us know that she had been contacted by yourself or by your colleagues and that was -- there were two or three phone calls with her when I was trying to make sure that she had a little background as to how those contacts, where they came from, what the purpose of them was.
Q. How many conversations have you had with Dr. Louise Marks? And let's say in the last year.
A. I would say no more than four.
Q. Okay, how long did these conversations last?
A. No more than 15 minutes.

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Q. And did she have specific questions?
A. She was asking some -- for some clarification of what the process was that she was being asked to consider taking part in in terms of deposition.
Q. When was the last time Louise Marks was employed by Syngenta under any capacity, either a direct employment or by contract?
MR. NARESH: I object on foundation. If you know, please go ahead and answer.
A. I believe that she left Syngenta around 2006.
BY MR. TILLERY:
Q. Was that the last time she had a financial connection to Syngenta either as an employee or as an independent contractor?
MR. NARESH: Same objection.
A. She did act for us at a time after that in helping us with our understanding of a particular technique, the technique of stereology because of the experience that she'd had when she was doing other research. I don't recall if we did that under a consultancy contract but we certainly had that one occasion when we reconnected with her specifically on the technology of stereology.
BY MR. TILLERY:
Q. Did you consider her to be the leading

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scientist in your group on stereology?
A. At the time of her work in the period of 2002 to 2006 she certainly became the most knowledgeable person about stereology within the company but there were certainly other experts outside of the company who had greater knowledge than Louise.
Q. And did you avail yourselves of the expertise of those outside scientists in stereology?
A. We did.
Q. And who are they?
A. They would include -- this is not an exclusive list -- Professor Neingaard from Scandinavia University. And Dr. Mark Butt who was from ToxPath, one of our contract research organizations who provided his knowledge of stereology. And Dr. Jeff Wolff from another contract research organization who also had experience in that area. And we also consulted with people at the Parkinson's Institute in North America.
Q. Which institute?
A. The Parkinson's Institute.
Q. And where is that?
A. That is in California.
Q. Sunnyvale?
A. Yes.
Q. And that would be Dr. Dino DiMonte?

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A. That's correct.
Q. When you had these conversations with Dr. Marks, were you discussing her work at Syngenta?
A. In the conversations recently?
Q. Yes.
A. We did have a brief conversations about the work that she did on one of the calls that I referred to, yes.
Q. Which call, when?
A. Well I think I said that there were probably four calls and it would be either on the first or the second call that we had a conversation about the work that she did when she was with us.
Q. And you've said repeatedly that it was "we". Who else was on the call besides you and Dr. Marks?
A. When I say "we" it was myself and Dr. Marks.
Q. Was there anybody else on the call?
A. There was nobody else on those calls.
Q. And she told you about her work at Syngenta?
A. She certainly spent a little bit of the time on one call talking to me about her work at --
Q. You were familiar with it though anyway, weren't you?
A. I had familiarity with it, yes.
Q. And you had familiarity with all of her

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studies, didn't you?
A. Yes, I did. Yes.
Q. Actually you were probably a head of that at that point, head of that division?
A. I was one of the senior leaders in that organization. I didn't directly at that time manage the team that Dr. Marks was in but obviously I had indirect understanding of the team.
Q. Who do you report to in the company today?
A. To Mr. David French.
Q. And what is his role at the company?
A. He is the head of global regulatory and product safety.
Q. And how many people report to you?
A. None.
Q. I thought you said you supervised sections?
A. I did until -- I didn't probably finish my CV correctly. So in 2017 I decided to step down from being global head of product safety, and from 2017 until today I'm actually principal science adviser which is a stand-alone role.
Q. And what is the job or duty responsibility of principal science adviser to Syngenta?
A. It is specifically providing advice on science matters, whatever -- wherever I can to the

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product safety organization.
Q. And what specific entity are you employed by?
A. I'm employed by Syngenta Limited in the U.K.
Q. And who employs David French?
MR. NARESH: Objection: foundation. If you know.
A. He reports to Syngenta AG.
BY MR. TILLERY:
Q. Is he on the Syngenta executive committee?
A. He is not.
Q. Are there any other people you talked to in preparation for this deposition other than lawyers that you haven't told me about?
A. I did have a brief conversation this morning with Dr. Clive Campbell who was here in the offices today. That's the only other person I can recall.
Q. You spoke to him just today?
A. Yes.
Q. When you told me about your conversations with Louise Marks you indicated that she asked you about the process. What did you tell her?
A. I told her as much as I knew, which is what I had been informed of by my lawyers, by my attorneys, and that there was not necessarily an obligation for her to take part in the process. So as I understood it

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at the time of me having those conversations she had, if you wish, a choice as to whether she would take part in the process. That was my understanding at the time.
Q. And you told her what in response to that?
A. I told her that she should give that some thought and decide what she would like to do.
Q. And what did she tell you she was going to do?
A. Initially she didn't decide what she wanted to do. So this is why -- one reason why there was more than one phone call. So in the last phone call by that time she had decided that she did wish to come forward and to describe her research work.
Q. Did anyone ask you to contact her?
A. I was asked to certainly on one occasion to contact her, yes.
Q. Who asked you to contact her?
A. That was something that one of my attorneys, my internal --
Q. One of the lawyers asked you to reach out to her?
A. Yes.
Q. Who was it?
A. I think that was Mark Smith.
Q. When was it that you contacted her the first

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time?
A. I don't have a date in my head I'm afraid.
Q. Have we now covered everybody that you spoke to in preparation for this deposition?
A. As far as my memory will allow, yes.
(Exhibit 3 marked for identification.)
Q. Please take a look at Exhibit 3, sir. Tell me if you can identify it?
A. Okay.
Q. This is the disclosure that was given to us last week, I'll represent that to you, by your counsel, okay. Take a look at the first page and you see the designated topics?
A. Yes.
Q. "For the February 25, 2020 deposition, Philip Botham will cover topics 31(a)-(c), (e)-(g), (k), (n)-(o); 32-35; 36(a), (c)-(i), (k)-(n); 37-39; 53-58; 61-62; and 63 (except for EPA) ..."
Do you see that?
A. Yes, I do.
Q. And you're prepared to testify on those topics?
A. Yes.
Q. The document contains a number of designated documents. Unfortunately for you they don't describe

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them, they just have Syngenta Bates range numbers. Do these include the documents that you selected for purposes of reliance for these deposition topics?
A. So you're referring to that list of --
Q. Yes.
A. I don't obviously, just with having numbers, I can't relate to what they are specifically.
Q. But it's your understanding that you gave these documents to counsel as documents that you relied on, they gave some as well and provided them, and this list would include the documents you relied upon, as far as you understand?
A. Well I guess I have to accept what you say. I mean, I don't understand the designation of these documents of the numbers. I take it that you're telling me that they refer to the documents that I have been looking at with my attorneys over recent weeks.
Q. The Syngenta numbers, the SYN numbers, are Bates range numbers for documents that were produced to us in discovery.
A. Okay.
Q. I'll represent that to you.
A. Okay.
Q. Okay. And these refer to those specific Bates range numbers. That's all we were given.

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A. Yes.
Q. We then go back to a database, so for documents supplied to us in discovery, and pull those documents out. Now I know you don't have a specific reference to documents here at this point but as far as you know it was your intention that the documents you relied upon be included along with this compliance?
A. That certainly is my understanding, yes.
Q. All right. Thank you. Has Syngenta ever intentionally withheld information about the neurotoxicity of paraquat?
A. I don't believe that it has.
Q. Okay. And you certainly researched that question, didn't you?
A. Yes.
Q. And you've never found evidence of that, right?
A. I have not found evidence that suggests that we have deliberately withheld information, certainly not. We have always made sure that any information that we provide has been based on the best scientific opinion of the information.
Q. And have you strived to be transparent in your scientific endeavors about paraquat?
A. We have certainly done so and I think that

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our publication record and our interaction with regulatory authorities illustrates that.
Q. Does that include, that specific answer to my question, the corporate predecessors of Syngenta as well?
A. Yes.
Q. Is paraquat the active ingredient not a formulated product a chemical compound?
A. Paraquat is as the active ingredient is a chemical compound.
Q. Paraquat is a synthetic chemical compound, meaning it's man-made; correct?
A. That is correct.
Q. It doesn't exist in nature but has to be made in a laboratory or a chemical manufacturing plant; correct?
A. That is correct.
Q. Is paraquat also known as paraquat dichloride?
A. That is the salt of paraquat, yes.
Q. Are methyl viologen dichloride and methyl viologen also names that are used to refer to paraquat?
A. I don't remember if that's the case.
Q. Do you know what viologen means, do you know what that is?

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A. No.
Q. Is your background in chemistry?
A. It is not.
Q. What is it?
A. My PhD was in biochemistry and then my post-doctoral research took me into immunology.
Q. So you have a PhD in biochemistry?
A. Yes.
Q. Okay. Is paraquat a type of compound that chemists call a salt?
A. Paraquat dichloride is a salt.
Q. A salt is a chemical compound composed of one or more cations and one or more anions; correct?
A. Correct.
Q. Is a cation an atom or a group of atoms called a molecule with a net positive electric charge?
MR. NARESH: Object to the form.
A. It is, yes.
BY MR. TILLERY:
Q. And an anion is an atom or molecule with a net negative electric charge; correct?
MR. NARESH: Same objection.
A. It is.
MR. TILLERY: What was your --
MR. NARESH: Form.

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MR. TILLERY: You know counsel, it was taken under 1102.
MR. NARESH: I understand.
MR. TILLERY: So you're aware of that.
BY MR. TILLERY:
Q. In a salt do the charges contributed by the cations and anions balance out such that the salt has a net charge of zero, or no net charge?
MR. NARESH: Same objection. Can I just -- I don't mean to interrupt your flow. Can I have a standing objection to this line?
MR. TILLERY: Absolutely. Just for the record, though, it is taken under 2-1102.
MR. NARESH: I'm just cognizant of the fact that we're taking it under two jurisdiction rules at the same time so I don't want to make --
MR. TILLERY: Then I'll agree to a continuing objection on that ground.
BY MR. TILLERY:
Q. Would you read back the question, please, or do you want me to restate it? Let me start over. Is a cation an atom or a group of atoms -- sorry. And an anion is an atom or molecule with a net negative charge?
A. That's right.

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Q. In a salt do the charges contributed by the cations and anions balance out such that the salt has a net charge of zero, or no net charge?
A. If you have got in the case of paraquat the dichloride then that would be the case, yes.
Q. A table salt is a chemical salt composed of one sodium cation with a charge of positive 1 or plus 1, and one chloride anion with a charge of negative 1 or minus 1, which together net out to zero or no net charge on the molecule as a whole. Is that a correct statement?
A. That's correct.
Q. When we talk about an atom or molecule having a charge of 1 or 2, whether positive or negative, we're talking about the strength of the charge; correct?
A. Yes. Yes.
Q. And the charge of negative 1 isn't less than but it's the opposite of a charge of positive 1 like the negative and positive into a magnet; correct?
A. That's right.
Q. A paraquat molecule has 1 cation and two anions, doesn't it?
A. Yes.
Q. Does the cation in a paraquat molecule, the paraquat in paraquat dichloride have a charge of plus

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2?
A. Yes.
Q. Is the paraquat in paraquat dichloride sometimes referred to as paraquat cation or paraquat di-cation?
A. Yes.
Q. Does the "di" in di-cation refer to the charge of 2?
A. Yes.
Q. For simplicity sake, can we agree when we use the term "paraquat cation" today, we're referring to the paraquat di-cation that has a charge of plus 2?
A. Yes.
Q. In addition to 1 paraquat cation does paraquat have 2 chloride anions?
A. That's right.
Q. The 2 chloride anions are the dichloride part of paraquat dichloride; correct?
A. Correct.
Q. Does each of the chloride ions have a charge of minus 1?
A. Yes.
Q. So paraquat dichloride, or paraquat as we're referring to it, is composed of 1 paraquat cation with a charge of plus 2 and 2 chloride ions each with a

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charge of minus 1 which together net out to zero or no net charge on the molecule as a whole?
A. That's correct.
Q. Have I got that right?
A. You have.
Q. Is paraquat a solid at room temperature?
A. You know I don't know the answer to that question.
Q. I'll give you the answer. It's yes.
A. I thought it was.
Q. You agree with that?
A. Yes.
Q. Is paraquat, like table salt, a crystalline solid?
A. I don't know.
Q. Is paraquat, like table salt, highly soluble in water?
A. Yes.
Q. Water dissolves paraquat by breaking the ionic bonds between the paraquat cation and the two chloride anions; correct?
A. I think that's correct.
Q. You would agree -- you don't have any reason to disagree?
A. I don't have any reason to say no to that,

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no.
Q. Were paraquat's herbicidal properties first discovered in 1955?
MR. NARESH: Steve, are you changing topics?
MR. TILLERY: We're going through it chronologically. There will be back and forth on the topics.
MR. NARESH: Can we take a quick break?
MR. TILLERY: Sure.
MR. NARESH: 5 minutes?
THE VIDEOGRAPHER: Going off the record. The time is 10:04.
(Break taken.)
THE VIDEOGRAPHER: Back on the record. The time is 10:15 a.m.
BY MR. TILLERY:
Q. Are you ready, sir?
A. I am.
Q. Were paraquat's herbicidal properties discovered in 1955 as far as you know?
A. That's what I remember, yes.
Q. That discovery was made by scientists in England at Jealott's Hill laboratories of Imperial Chemical Industries Limited; correct?
A. That is correct.

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Q. Imperial Chemical Industries Limited is a mouthful. Can I refer to it as "ICI" which we've been using up until this time of the dep?
A. I'm fine with that.
Q. You'll know what I mean which I say "ICI"?
A. I will.
Q. Is saying that paraquat has herbicidal properties just a fancy way of saying that paraquat can kill plants?
A. Yes, that's right, yes.
Q. In April 1956 did ICI apply in Great Britain for a patent on the use of paraquat as a herbicide?
A. I have no knowledge of that.
Q. That's something you didn't research?
A. No.
Q. Didn't talk to anybody?
A. No.
Q. Let me show you Exhibit 4.
(Exhibit 4 marked for identification.)
And in 1961 ICI was awarded a United States patent of the use of paraquat as a herbicide, wasn't it, by reference to Exhibit 4?
A. This looks to be what that says.
Q. Okay. Exhibit 4 is U.S. patent reference number US 2,972,528. And it has a patent number of

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2,972,528; correct?
A. I'm not familiar with patent numbers but I see that number here.
Q. Is that dated February 21, 1961?
A. It is.
Q. And the patent is titled "Dipyridyl Derivatives and Herbicidal Methods in Compositions Containing the Same"; correct?
A. Correct.
Q. And the inventors assigned that patent to Imperial Chemical Industries Limited --
A. Correct.
Q. -- London, right?
A. (Deponent nods).
Q. That's the company that you started your job with?
A. Yes.
Q. Did you know any of these inventors?
A. No.
Q. Had you ever heard of any of them?
A. If they are the people in dark type at the beginning of this document --
Q. Yes, correct.
A. -- then no, I don't, no.
Q. And this U.S. patent, claimed priority to the

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date of a patent application in Great Britain dated April 4, 1956, didn't it?
A. Yes.
Q. I'd like to direct your attention to the first page, left column, third paragraph, where it says "We are aware". Do you see that?
A. Yes.
Q. "We are aware that certain of the compounds of the above stated formula are known compounds for example 4,4'-dipyridyl dimethiodide, dimethochloride ..."
Do you see that one?
A. Yes.
Q. Okay. Is 4,4'-dipyridyl dimethochloride another name for paraquat dichloride?
A. I don't know. I'm not such a deep technical expert in the chemistry to be able to answer that question.
Q. Do you have any reason to dispute the statement I made?
A. I have no reason to dispute it.
Q. Just so we're clear, you've been designated to talk about these topics about a chemical, primarily paraquat; right?
A. Hm-hmm.

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Q. You're the principal scientific adviser in your job, you're the former head of the paraquat division and you can't tell me if you can answer that question?
A. I'm a principal science adviser in product safety, which is not the same as being a principal science adviser on all aspects regarding paraquat, including its chemistry.
Q. Well let me ask you something. Do you think as the head of the scientific division on product safety for a product you'd want to know everything about the chemical aspects of that product?
A. First of all you used the term "division" and there is no such thing as a division as you describe it. So I was heading the health science research team, which is specifically about the safety of paraquat. And I did not at any time get into the history or the detailed chemistry of paraquat and its invention.
Q. In that job or responsibility did you think it might be necessary to understand the detailed chemistry of the product to know how it works?
MR. NARESH: Object to the scope.
A. The important thing was for me to understand what it's mechanism of action is.
BY MR. TILLERY:

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Q. You mean redox cycling?
A. I do.
Q. And you'd consider yourself an expert in that area?
A. I'm not an expert of redox cycling. I talk to people who are more expert and understand that it is that redox cycling that leads to its effect.
Q. Let's say it this way. Can you answer my questions on redox cycling?
A. It depends how detail they become.
Q. So in other words when it gets to a point where you don't want to answer my question, you're going to tell me you don't know the answer; right?
MR. NARESH: Objection: argumentative.
A. No, I'm not going to do that. I will not necessarily know the answer to the questions.
BY MR. TILLERY:
Q. All right, let's put it this way. Will you do your best in this deposition to try to answer all my questions if they're in the realm of areas that you prepared for and you should have knowledge of?
A. Well I think you're suggesting that I should have perhaps more knowledge of the chemistry than I actually do.
Q. Do you have a PhD in biochemistry?

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A. Yes. That is not the same as chemistry, so.
Q. It has the word "chemistry" in there though, biochemistry, so you studied some chemistry, didn't you to get your PhD?
A. Really I think in terms of the kind of chemistry that we're talking about here, the answer is: no.
Q. The statement in that, if you go back to that patent -- sorry, strike that. If you go back to that patent on Exhibit 4, the statement in the patent that paraquat was a "known compound". Do you see that?
A. Could you just clarify where this is, please?
Q. Where I directed you. Okay?
A. Yes. Yes okay, I'm on that paragraph.
Q. Means it wasn't a new compound created from scratch; is that correct?
A. That's my understanding of what's written there.
Q. Doesn't the patent describe separately the known compounds mentioned in the left column, and some new compounds that are mentioned in the right column, second paragraph from the bottom, if you look at that?
MR. NARESH: Objection: scope.
BY MR. TILLERY:
Q. See the thing where it says:

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"Thus according to a further feature of the invention we provide new compounds" of the formula?
A. Yes, I see that.
BY MR. TILLERY:
Q. That reads:
"Thus according to a further feature of the invention we provide new compounds ..."
Followed by a formula.
A. Yes.
Q. Paraquat was first synthesized, meaning made, in a laboratory in the 19 -- sorry, in the 1880s, wasn't it?
A. I don't know.
MR. NARESH: Objection to scope.
BY MR. TILLERY:
Q. In preparing to testify for Syngenta on the designated topics, did you make any attempt to obtain information that would answer that question?
A. No.
Q. Did you search any documents or data to -- that was available to you for information that might answer that question?
A. No.
Q. Did you ask anybody for information, documents or data that might help you answer that

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question?
A. No.
Q. Are you aware of any documents at Syngenta that would help you answer that question?
A. Not off the top of my head, no.
Q. Let me ask you, are you aware of any other person at Syngenta who could tell us when it was first synthesized?
A. I would have to give that some thought as to whether there were people in our chemistry department who may be able to do that.
Q. Does Syngenta have a library?
A. Not a physical library, no.
Q. It has one electronically, right?
A. Yes.
Q. And it's massive, isn't it?
A. I would -- yes it is, yes.
Q. And you have access to it?
A. I have access to some aspects of it, yes, not all.
Q. The science part of it?
A. Sure.
Q. Did you consult that library to answer these questions?
A. I did not consult with regard to the specific

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questions that you're now addressing.
Q. Paraquat in its chemical properties had been known to the scientific community for decades before ICI began investigating its potential for use as a herbicide; is that correct?
MR. NARESH: Objection to scope.
A. I'm not able to answer that question accurately.
BY MR. TILLERY:
Q. You just don't know the answer?
A. I just don't know, no.
Q. Do you know of anybody at Syngenta who could answer it?
A. Not off the top of my head. I would have to give that some thought.
Q. Well, would you be able to answer this question. Chemists knew of paraquat and its chemical properties long before the 1950s?
MR. NARESH: Objection to scope.
A. Could you -- what was the specific question for me there?
BY MR. TILLERY:
Q. Chemists knew about paraquat and its chemical properties long before the mid-1950s, didn't they?
A. Well that's evident, yes, yes.

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Q. Biological chemists knew it too?
A. I don't know.
Q. Did plant biologists know that?
A. I don't know.
Q. Did animal biologists know that?
A. I don't know.
Q. Plant physiologists?
A. I don't know.
Q. For what purposes did scientists use paraquat before ICI began investigating its potential as a herbicide?
MR. NARESH: Objection to scope.
A. I don't know.
BY MR. TILLERY:
Q. Were you aware that scientists had used paraquat to catalyze the formation of reactive oxygen species before ICI began investigating its potential for use as a herbicide?
MR. NARESH: Objection to scope.
A. I only have some very broad and vague recollections of people telling me about that kind of history.
BY MR. TILLERY:
Q. Go ahead and try to give us that answer?
A. I'm not able to. It is so vague that I don't

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think any answer would be useful.
Q. What does the term "reactive oxygen species" mean?
A. It means a generation of oxygen radicals which have the potential to create biological damage.
Q. Do you know of the features of paraquat in terms of reactive oxygen species?
A. Paraquat because of its redox cycling capability can in turn generate reactive oxygen species.
Q. In what kinds of experiments did scientists use paraquat to catalyze the formation of reactive oxygen species?
A. I don't know.
Q. Do you know anybody at Syngenta -- the whole operation, how many people are there: 28,000?
A. Today there are 28,000 in Syngenta.
Q. And how many scientists?
A. I couldn't give you a number.
Q. Do you have an estimate?
A. It depends how you define scientist.
Q. Well you make the definition and then answer it?
A. If you're talking about people who are in chemistry for example, which may be most appropriate

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here, then it would be probably 1,000 or 2,000.
Q. 2,000 chemists and you were the person they selected to answer my questions about chemistry. So you have 2,000 of you, and how many PhDs?
A. I couldn't answer that question.
Q. And you're telling me that you can't answer these questions, right?
A. I was given no preparation or indication that I needed to get into the detail of the chemistry of paraquat.
Q. So you know the lawsuit has been going on two years or so, two and a half years. And have you read the complaint?
A. Yes.
Q. Okay. You know that we went through in great detail the chemical properties of paraquat in the complaint, didn't we?
A. Yes.
Q. You read about the redox cycling, you read about all the chemical principles, you understood that this case involved those issues, didn't you?
A. I certainly did, yeah.
Q. Before you got here today, didn't you?
A. Yes.
Q. And yet you tell me you as the head of the

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science team globally cannot answer these preliminary questions about chemistry?
MR. NARESH: Objection: argumentative.
BY MR. TILLERY:
Q. Is that correct?
A. Well that's correct because I don't have -- I was not involved in that history and a knowledge of that history was not in its entirety relevant to the product safety issues that I was responsible for.
Q. So you think because you don't know the answer it's not relevant to product safety?
A. No, I said that not all aspects that you're exploring with me, other than its mode of toxicity if you like, its mode of action which includes what we were exploring a moment ago about reactive oxygen species.
Q. Let me ask you. When you're in the business of manufacturing a chemical like paraquat do you think it's the duty or obligation of the manufacturer and its global head of science research to understand every facet of the chemical properties of that product?
MR. NARESH: Objection to scope.
A. The company and its research group as a whole did that. But individual scientists have pockets of knowledge within that greater scope.

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BY MR. TILLERY:
Q. Do you even know if the answers to these questions I'm asking you right now relate to the health science aspects of paraquat?
A. I know that its ability for example to cause toxicity through the generation of reactive oxygen species is pertinent to what we're talking about today.
Q. Do you understand that what ICI knew about the mode of action of the chemical -- strike that.
Do you understand when ICI knew about the mode of action of the chemical?
A. I don't know when, no.
Q. Do you know the kinds of experiments scientists used -- strike that. In what kind of experiments did scientists use paraquat as an oxidation reduction indicator before ICI began investigating its use as a herbicide?
MR. NARESH: Objection to scope.
A. I don't know that.
BY MR. TILLERY:
Q. Is oxidation reduction a type of chemical reaction?
A. It is.
Q. Is redox commonly used as a shorthand for oxidation reduction?

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A. That's one definition, yes.
(Exhibit 5 marked for identification.)
Q. I've handed you Exhibit 5. Can you identify it?
A. This is a publication entitled "The Viologen Indicators".
Q. Have you ever read this before?
A. I have not.
Q. Do you know what it even is?
A. I do not and I'm afraid I've not ever read it before.
Q. Did you just tell me less than 5 minutes before that you read and researched the mode of action of paraquat?
A. No, I said that I was aware of the relevance of its properties to redox cycle and generate reactive oxygen species to its potential toxicity.
Q. And were you aware that this scientific article published in 1933?
A. No, I was not aware of that.
Q. Did you know that this dealt directly with redox cycling?
A. No, I did not.
Q. Would you think that going back and researching and analyzing how the scientific community

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first recognized the redox cycling properties of paraquat would be useful and important to you to understand its safety?
MR. NARESH: Objection to form and scope.
A. It was never evident to me that it was important to go back into the history of how that was first understood. We were using the knowledge of that as part of our research, not the history of how that was discovered.
BY MR. TILLERY:
Q. Let me just ask the questions a different way. Because you're going to tell me you have no idea about the content of the study or this publication, right?
A. Correct.
Q. The first publication ever of paraquat in a scientific journal or article in 1933 you have no idea about it, right?
A. No, I have not.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. And it's not in their library, or at least if it is in the Syngenta library you've never looked for it?
A. I absolutely have not looked for it.

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Q. And you've never had a discussion with any other of the 2,000 chemists about this article, this paper, right?
A. No.
Q. Let me represent to you that the -- we refer to as the Michaelis, because that's the author, by L Michaelis and Edgar S. Hill, do you see that?
A. I do.
Q. Accepted for publication April 7, 1933?
A. (Deponent nods).
Q. And that was in the Journal of General Physiology. Let me just represent to you, sir, that the Michaelis paper reported the results of studies measuring the redox potential and determining the optical properties of the compounds it referred to as viologen indicators?
A. Mm-hmm.
Q. What is a viologen indicator?
A. It's a term that I'm very vaguely familiar with. I couldn't define it.
Q. Do you know whether an understanding what a viologen indicator is would be important to understanding the health science components of paraquat?
A. I would not really believe that understanding

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as specific of what viologen indicators relevance was, as I've said, understanding that the property in terms of redox cycling is important.
Q. What's an indicator in chemistry?
A. It's a re-agent that is able to demonstrate that a chemical reaction has occurred.
Q. And what's a viologen?
A. I'm not sure what a viologen is actually.
Q. Can you take a look at the paper for a second, sir, and see at least the scope of what the study was. Have you glanced through it at least?
A. Yeah.
Q. I know this hasn't given you a time to study it, but you've glanced through it enough to understand what it's about?
A. In very, very broad terms. But this a detailed chemistry publication and I repeat I'm not a chemist.
Q. Was ICI aware of this paper when it was investigating paraquat for use as a herbicide?
MR. NARESH: Objection to scope.
A. I don't know.
BY MR. TILLERY:
Q. Should it have been?
MR. NARESH: Objection to scope.

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A. It certainly should have been and I imagine it was, but I have no direct evidence that that was the case.
BY MR. TILLERY:
Q. Would you agree with me before you started selling this product as a herbicide you would want to know about that paper?
A. I think that that is very likely to have been the case.
Q. You would agree with me then that that would be important, right?
A. I think it's obviously part of the -- an important part of the history of the molecule, certainly.
Q. Right. So paraquat, or methyl viologen as Michaelis refers to it in this paper, was one of the viologen indicators whose redox potential and optical properties he studied and reported on in this 1933 paper; correct?
MR. NARESH: Objection: foundation; scope.
A. That's what I've quickly ascertained, yes.
BY MR. TILLERY:
Q. And Michaelis measured and reported the results of studies measuring paraquat's redox potential so scientists could use it as a yardstick in studies to measure the redox potential of other chemical compounds, didn't he?
MR. NARESH: Same objections.
A. That's again my understanding from that brief.
BY MR. TILLERY:
Q. And he determined and reported on its optical properties so scientists could use it as an indicator of redox reactions, didn't he?
MR. NARESH: Same objections.
A. Again that's my understanding, yes.
BY MR. TILLERY:
Q. And if you would look at Exhibit 5, the same exhibit, at 859, the very first sentence. Could you read that into the record?
A. "The quaternary bases derived from y,y'-dipyridyl have proven to be useful as oxidation-reduction indicators of properties very desirable for biological purposes, especially because their potential range is very negative, under certain conditions more negative than that of any member of the series of indicators worked out by W.M. Clark and his associates (1) and supplemented by various other authors."
Q. Okay, what does that mean to you?

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MR. NARESH: Objection: scope; foundation.
A. That these bases have interesting properties that would be of value in the way in which you described a few moments ago.
BY MR. TILLERY:
Q. "For biological purposes", do you see that?
A. Yes.
Q. What does that mean?
MR. NARESH: Objection: foundation; scope.
A. I don't know specifically what they had in mind by saying that at this point in the paper.
BY MR. TILLERY:
Q. What does it generally mean biological purposes? "Very desirable for biological purposes", what does that mean?
A. Well that would normally mean that it would have utility in some way in understanding biological processes or helping to understand biological mechanism.
Q. The viologen indicators Michaelis studied are the same as "The quaternary basis derived in y,y'-dipyridyl" that this sentence refers to, aren't they?
MR. NARESH: Objection: foundation; scope.
A. Yes.

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BY MR. TILLERY:
Q. And one of them is paraquat?
A. Yes.
Q. And "their potential range is very negative", that quote in the sentence means the viologen indicators Michaelis studied, including paraquat, have a very high potential to undergo, doesn't it?
MR. NARESH: Can I have a standing objection to this line of questioning on scope and foundation?
MR. TILLERY: Of course.
BY MR. TILLERY:
Q. I can restate it because of the question?
A. Please do. Please restate.
Q. I will. I'll restate it. The quote is:
"Their potential range is very negative" in this sentence means the viologen indicators Michaelis studied, including paraquat, have a very high potential to undergo redox cycling, doesn't it?
A. That's my understanding, correct.
Q. Paraquat has a very high potential to participate in redox reactions, doesn't it?
A. It does.
Q. What color is paraquat?
A. I don't know. Again I'm sure it depends on whether it's salt or the cation. I actually can't give

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you an answer off the top of my head.
Q. You think there's anybody in the company, the 28,000-member company that could tell me what color the product of paraquat is? And by the way, how long have you been working with this? Since 1955, the company has?
A. Yes.
Q. Is there anybody there you could think of that could answer that question?
A. There would be. Again, I wouldn't be able to give you a name off the top of my head.
Q. Okay. And paraquat can undergo a redox reaction in which the charge on the paraquat cation is reduced from plus 2 to plus 1, can't it?
A. Yes.
Q. Paraquat's very high redox potential means that this reaction occurs very readily and very quickly if a suitable re-agent is present, doesn't it.
A. That's correct, yes.
Q. The result of reducing the charge on the paraquat cation from plus 2 to plus 1 is the paraquat monocation; correct?
A. Yes.
Q. And does the "mono" in monocation refer to the charge of 1?

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A. It does.
Q. Is paraquat monocation also known as paraquat radical?
A. That's correct, yes.
Q. For simplicity and consistency sake, can we agree to refer to paraquat monocation as paraquat radical for purposes of this deposition?
A. Yes.
Q. What happens to the color of paraquat when paraquat cation is reduced to paraquat radical?
MR. NARESH: Objection: foundation.
A. I don't know.
BY MR. TILLERY:
Q. If I told you it changed to a violet or deep blue color would you have any reason to dispute my basic chemistry understanding?
MR. NARESH: Objection: scope.
A. No reason to dispute that.
BY MR. TILLERY:
Q. So far have I been okay, as far as you know about your chemistry background and my chemistry questions?
A. As I said before, I'm not an expert in chemistry or even in the specifics of this chemistry, so I'm not able to dispute what you've said so far.

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Q. Is this change in color how paraquat got the name methyl viologen?
A. I don't know but from what I describe it, it would suggest that may be the case.
Q. Is paraquat radical what is sometimes referred to as a free radical?
A. Yes.
Q. Free radicals are unstable highly reactive molecules, aren't they?
A. They are.
Q. Can paraquat react -- strike that. Can paraquat radical undergo a redox reaction in which it's oxidized back to paraquat cation?
A. Yes.
Q. What happens to the color of paraquat when paraquat radical is oxidized back to paraquat cation?
MR. NARESH: Objection: foundation; scope.
A. Again, I don't know. I'm not an expert in that.
BY MR. TILLERY:
Q. If I told you it went back to its original color, colorless, white or offwhite, would you have any reason to dispute any statement?
MR. NARESH: Objection: same objections.
A. No reason to dispute that.

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BY MR. TILLERY:
Q. All right. Can paraquat radical undergo a redox reaction in which it's further reduced to an uncharged state?
A. Yes.
Q. What color is paraquat that's been reduced to an uncharged state?
MR. NARESH: Same objections.
A. Again, I don't know.
BY MR. TILLERY:
Q. If I told you it was yellow would you have any reason to dispute that?
A. No.
Q. That paraquat changes color depending on whether it has a charge of 2, 1 or zero is one of the properties that makes it useful as a redox indicator, isn't it?
A. That's right, yes.
Q. When paraquat undergoes a redox reaction in which paraquat cation is reduced to paraquat radical, the reduction refers to the decrease in charge from plus 2 to plus 1; correct?
A. Correct.
Q. That decrease in charge from plus 2 to plus 1 occurs because paraquat gains an electron in that redox

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reaction, doesn't it?
A. Yes.
Q. And because an electron has a charge of minus 1, gaining an electron reduces the charge on the paraquat ion from plus 2 to plus 1; correct?
A. Yes.
Q. The electron paraquat gains when it's reduced in a redox reaction is taken from another molecule; correct?
A. Yes.
Q. In taking an electron from another molecule in a redox reaction, is paraquat acting as what chemists and biologists refer to as an oxidant?
A. Yes.
Q. And the other molecule, the one losing an electron to paraquat, is acting as a reductant?
A. That's right.
Q. So an oxidation reduction, or redox reaction, is a reaction where an electron is transferred from a reductant to an oxidant?
A. Yes.
Q. And we say that an oxidant is reduced and the reductant -- strike that. And we say that the oxidant is reduced and the reductant is oxidized?
A. Yes.

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Q. In the presence of molecular oxygen, or O2, does paraquat radical undergo a redox reaction in which its oxidized back to paraquat cation?
A. Yes.
Q. In that reaction O2 is the oxidant that takes an electron and paraquat radical is the reductant that loses one?
A. Yes.
Q. So one of the products of a redox reaction between paraquat radical and O2 is paraquat cation?
A. Yes.
Q. And the other product of that reaction, the result of the reduction of O2 is O2 minus; correct?
A. Yes.
Q. Is O2 minus also known as superoxide and superoxide radical?
A. It is.
Q. Is superoxide a free radical?
A. Yes.
Q. Is superoxide a reactive oxygen species?
A. That's my understanding that they're synonymous.
Q. And you described what a reactive oxygen species is. Can you give me the definition that you would use for that?

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A. It's reactive oxygen species are not radical. That sort is an entity which has the capability of interacting with other chemicals or with biological systems in a very active manner.
Q. What other reactive oxygen species are you aware of that are important in biological systems?
A. I couldn't give you an answer to that. That's not my area of expertise.
Q. The difference between the redox potentials of paraquat radical and O2 means that the redox reaction between paraquat radical and O2 that produces paraquat cation and O2 minus occurs very readily and very quickly, doesn't it?
A. It does.
Q. Is OH minus a reactive species?
MR. NARESH: Objection: foundation; scope.
A. I'm not able to answer that.
BY MR. TILLERY:
Q. I should have said a reactive oxygen species. Would your answer be the same?
A. It would be the same, yes.
Q. And would H2O2 be a reactive oxygen specie?
MR. NARESH: Same objection.
A. Well H2O2 is hydrogen peroxide, and that in itself is not a reactive oxygen entity.

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BY MR. TILLERY:
Q. Can the paraquat cation the results from a redox reaction between paraquat radical and O2 undergo again the first redox reaction we discussed in which its reduced to paraquat radical?
A. Yes.
Q. The cycle of the reduction of paraquat cation to paraquat radical in one redox reaction and the oxidation of paraquat radical back to paraquat cation in a second redox reaction will continue forever if both a reductant to participate in the first reaction and O2 -- withdraw the question. [Asked to repeat.]
Let me start over. We'll withdraw the question. The cycle of reduction of paraquat cation to paraquat radical in one redox reaction and the oxidation of paraquat radical back to paraquat cation in a second redox reaction will continue forever if both a reductant to participate in the first reaction and O2 to participate in the second reaction are present, one?
A. I believe that's correct, yes.
Q. Is the sequence of redox reactions that transforms paraquat cation to paraquat radical and paraquat radical back to paraquat cation an example of what's called redox cycling?

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A. It is.
Q. Paraquat has a very high potential to undergo redox cycling in the presence of a suitable reductant and oxygen, doesn't it?
A. It does.
Q. Going back to the beginning of the introduction of Michaelis paper. Does viologen indicators being useful as redox indicators, quote - referring to that article -- "of properties very desirable for biological purposes" mean they were useful as indicators in the kinds of studies scientists did in the early to mid-20th century?
MR. NARESH: Objection: scope; foundation.
A. Can you define by what you mean by scientists in the early 20th century for me?
BY MR. TILLERY:
Q. Scientists who were working in the early to mid-20th centuries who were chemists, biochemists, was it important to them?
A. Well, I assume it was, yes.
MR. NARESH: Just for the record, same objection to the question.
BY MR. TILLERY:
Q. Were these same features useful as indicators in studies chemists did?

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MR. NARESH: Same objections.
A. I imagine that the case.
BY MR. TILLERY:
Q. Biological chemists as well?
A. I'm sure that would be the case.
Q. Plant biologists as well?
A. Clearly it became something of importance to plant, yes, to plant biologists.
Q. And animal biologists?
A. I don't know whether at the time you're describing that that was something that was brought to the attention of animal biologists.
Q. Would it be important to plant physiologists?
A. It would be important to, if one were trying to invent herbicides to interfere with the normal functioning of plants.
Q. What kinds of studies did scientists do between the 1930s and the 1950s for which paraquat was useful as a redox indicator?
MR. NARESH: Objection: scope and foundation.
A. I don't.
MR. TILLERY: I'll agree to a continued objection.
MR. NARESH: Okay, that's fine.
MR. TILLERY: I'm just concerned about the

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overlap.
MR. NARESH: I don't want to talk over you. So maybe if you just give me a moment to chime in with an objection if necessary. But I'll accept your offer of a standing objection and I'll only object if I have a different ground for this line of questioning.
BY MR. TILLERY:
Q. Did ICI scientists do studies between the 1930s and the 1950s in which paraquat was useful as a redox indicator?
A. I don't know.
Q. Do you know if paraquat was used before the 1950s to catalyze the formation of reactive oxygen species including superoxide radical?
A. I don't have a knowledge of that history.
Q. Do you know if it was useful for that purpose because of its high potential to undergo redox cycling?
A. As I don't know the history, it would be an assumption in answering that question.
Q. Paraquat is highly toxic to plants, isn't it?
A. It is.
Q. Did ICI screen chemical compounds at Jealott's Hill to identify compounds that were potentially useful as herbicides?
A. They did and they still do.

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Q. How many years have they been doing that at Jealott's Hill, CTL or any other place?
A. At Jealott's Hill. Not at CTL. And I don't know -- I can't give you a date when that herbicide discovery process started. I don't have that date in my head.
Q. How long has Jealott's Hill been in existence?
A. 90 years.
Q. Weren't there tens of thousands of chemical compounds known to the scientific community by the 1950s?
A. Yes.
Q. Screening chemical compounds to investigate their potential usefulness as herbicides took time and cost a lot of money, didn't it?
A. Yes.
Q. Given the time and expense that must have been involved, how did ICI decide which chemical compounds to screen for in terms of identifying compounds that might be useful to kill plants?
A. Again, I don't have a history of that so I couldn't give you a definitive list of criterion.
Q. What characteristics or properties did paraquat have that led ICI to investigate whether it

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might kill plants effectively and otherwise be useful as a herbicide?
MR. NARESH: I'll object on scope to this line of questioning as well. A standing objection okay?
MR. TILLERY: Yes.
A. Well again I would speculate only on that. So its properties clearly would have some relevance in terms of the way in which plants rely on oxygen and so on and rely on that mechanism, and therefore there was the potential it could interfere with normal physiology of plants.
BY MR. TILLERY:
Q. Any more?
A. I don't have any more detail on that.
Q. Did ICI investigate paraquat's potential use as a herbicide because of its very high potential to repeatedly undergo redox cycling and produce large amounts of superoxide radical?
A. I don't know whether that was a specific issue.
Q. Are you aware of whether or not they knew that?
A. I'm sure they were aware of it, yes.
Q. They knew that that's how it worked?

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A. Yes.
Q. You understood that was included in this mode of action?
A. Yes.
Q. And you studied that?
A. I was aware of this mode of action in order to understand its potential relevance to human biology.
Q. ICI knew before it decided to investigate paraquat's potential use as a herbicide that oxygen is plentiful in plant cells, didn't it?
A. Yes.
Q. ICI knew before it decided to investigate paraquat's potential use as a herbicide that green plant cells take energy from sunlight and store it by transforming carbon dioxide and water into food; didn't it?
MR. NARESH: Objection: scope; foundation.
A. Yes.
BY MR. TILLERY:
Q. Is this process called photosynthesis?
A. It is.
Q. Oxygen is a byproduct of photosynthesis, isn't it?
A. It is.
Q. Does photosynthesis occur in a part of green

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plant cells called chloroplast?
A. It does.
Q. Is photosynthesis a series of electron transfer reactions?
A. It is.
Q. Is a series of electron transfer reactions in photosynthesis referred to as the electron transport system?
A. That's right.
Q. ICI knew how photosynthesis worked before it decided to investigate paraquat's potential use as a herbicide, didn't it?
A. I'm sure it did.
Q. Does paraquat inhibit photosynthesis in plant cells?
A. It does.
Q. Paraquat inhibits photosynthesis in plant cells through redox cycling, doesn't it?
A. It does.
Q. The redox cycling of paraquat in plant cells produces superoxide radical, doesn't it?
A. Yes.
Q. ICI knew paraquat was likely to undergo redox cycling and produce superoxide radical in plant cells before it decided to investigate paraquat's potential

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use as a herbicide, didn't it?
MR. NARESH: Objection: scope; foundation.
A. Again I would assume that it did, but no direct evidence of that.
BY MR. TILLERY:
Q. But that's perfectly logical that they would have known it?
A. It's very logical, I agree.
Q. It knew, that is ICI knew, that paraquat was likely to undergo redox cycling and produce superoxide radical in plant cells because: 1) it knew about paraquat's very high potential to undergo redox cycling in the presence of molecular oxygen and a suitable reductant; and 2) because it knew that photosynthesis works through an electron transport chain that involves a reductant and generates oxygen, right?
MR. NARESH: Same objections.
A. Yes, correct.
BY MR. TILLERY:
Q. If you wouldn't mind. He spoke -- he made the objection. And the answer is "yes"?
A. Right. Yes it is, yes.
MR. NARESH: And I don't want to speak over either of you, so if you would just give me one second so that if I have an objection I can make it.

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BY MR. TILLERY:
Q. In summary, ICI knew in the mid-1950s before it decided to investigate paraquat's potential use as a herbicide that all of the conditions for paraquat to undergo redox cycling and produce superoxide radical were present in green plant cells; correct?
MR. NARESH: Same objections.
A. Yes.
BY MR. TILLERY:
Q. Is part of the electron transport chain in photosynthesis the transfer of an electron from something called Photosystem I to a compound called ferredoxin?
A. I think that is correct, yes.
Q. The way the electron transport chain in photosynthesis normally works, ferredoxin would then pass that electron on to the next link in the chain NADP+; correct?
A. Yes.
Q. What is NADP+?
A. It's a biological molecule, nicotinamide adenine phosphate.
Q. But paraquat cation intercepts that electron by taking it from ferredoxin; doesn't it?
A. I think that's correct, yes.

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Q. Paraquat cation taking an electron from ferredoxin is the first type of redox reaction we discussed earlier with paraquat cation as the oxidant and ferredoxin as the reductant; correct?
A. Right, yes, that's correct.
Q. That reaction, the transfer of an electron from ferredoxin to paraquat cation reduces paraquat cation to paraquat radical?
A. Right.
Q. And this happens in a chloroplast where oxygen is present, doesn't it?
A. Right.
Q. So paraquat radical then losses an electron to oxygen doesn't it?
A. Yes.
Q. Paraquat radical losing an electron to oxygen is the second type of redox reaction we discussed earlier where oxygen is the oxidant and paraquat radical is the reductant; correct?
A. Yes.
Q. And as we discussed earlier, the products of that reaction are paraquat cation and superoxide radical, aren't they?
A. Yes.
Q. The regenerated paraquat cation this reaction

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produces is then able to react with ferredoxin again in the same way it did before; correct?
A. Right.
Q. So in plant cells paraquat can cycle from cation to radical and back to cation indefinitely as long as photosynthesis is occurring; correct?
A. Yes.
Q. And every time paraquat cycles from cation to radical, and back to cation, it both interferes with photosynthesis by taking an electron from Photosystem I and produces the reactive oxygen species superoxide radical, doesn't it?
A. Yes.
Q. The production of superoxide radical begins a cascade of reactions that create other reactive species, like hydrogen peroxide and hydroxyl radical; correct?
A. I believe so, yes. But, again, this -- we're now getting into fine detail, which I'm not an expert in.
Q. That makes sense though, doesn't it, from your understanding?
A. It makes sense, I agree, yes.
Q. Superoxide and other reactive species damage parts of the plant cells including the cell membrane,

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don't they?
A. Yes.
Q. And they destroy biological membranes?
A. Yes.
Q. Including DNA, the plant DNA?
A. Yes. Yes.
Q. Interferes with enzymes in the biological system?
A. Yes.
Q. So paraquat kills plant cells by interfering with photosynthesis, and producing reactive oxygen species, oxygen-free radicals that damage cell membranes and other parts of the cells; correct?
A. Yes.
Q. Result is that paraquat is a very effective killer of plants; correct?
A. It's a very effective herbicide, yes.
Q. And that's a molecule designed to kill plants, right?
A. It is.
Q. How long have these principles of paraquat redox cycling been known to Syngenta or its corporate predecessors?
MR. NARESH: Objection: scope.
A. Well in terms of the -- its effectiveness as

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a herbicide, again I can't give you an accurate date but clearly it is in some time in the 1950s I believe. But I'm not -- I couldn't give you a precise date.
BY MR. TILLERY:
Q. As a result of redox cycling paraquat is also highly toxic to animals, isn't it?
A. It is.
Q. Paraquat will undergo redox cycling in vivo being reduced by an electron donor, such as NADPH, before being oxidized by an electron receptor such as di-oxygen to produce superoxide, a major reactive --
A. Yes.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. Let me restate the question. Paraquat will undergo redox cycling in vivo being reduced by an electron donor, such as NADPH, before being oxidized by an electron receptor, such as di-oxygen, to produce superoxide, a major reactive oxygen species?
A. Yes.
Q. In vivo means what, sir?
A. Literally within a body, within an organism.
Q. Living --
A. A living organism, yes.
Q. Paraquat is highly poisonous in even very

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small doses, isn't it?
A. It is an acutely toxic compound, yes.
Q. An estimated 1.5 teaspoons can be lethal if ingested; correct?
A. I think it's -- I'm not sure whether that particular figure is accurate, but certainly I can express it in different ways, but it is -- yes, it is acutely toxic certainly.
Q. Is there an antidote once it's taken?
A. There is no antidote as such but there is effective treatment, yes.
Q. You said that you could express it a different way. How would you express it?
A. Well we usually express, in toxicology, as an LD50, a lethal dose, would in an experimental animal result in 50 percent of the animals dying. So we note that it has an LD50 value, which is quite low.
Q. Paraquat is involved in a disproportionately high number of adverse incidents, including accidental ingestions, as well as skin and eye contact due to occupational spills, splashes and leaks which can result in damaging and often severe acute injuries; would you agree with that?
MR. NARESH: Objection to form and scope.
A. It has the potential to do that, yes.

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BY MR. TILLERY:
Q. In biological systems, metabolism inside cells, both synthesis and breakdown, use energy; correct?
A. Yes.
Q. NAD -- and you said it better than me because I had a heck of a time pronouncing it?
A. Let's stay with "NAD".
Q. Okay. Do we know what we're talking about?
A. Yes.
Q. Let me take a shot at it, okay.
A. Right.
Q. Nicotinamide adenine dinucleotide.
A. Yes. Yes.
Q. So we'll both just stick with "NAD"
A. Yeah.
Q. All right. Is found in all living cells, right?
A. Yes.
Q. This energy required for cellular life is partially provided by NAD, NADPH, differing by a single phosphate group which can donate and accept electrons as an energy source, right?
A. Yes.
Q. Examples are electron transport chain in

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photosynthesis, right?
A. Yes.
Q. Electro -- strike that. Electron transport chain occurs in cellular respiration?
A. Yes.
Q. Those are two fundamental biological processes upon which all life is supported; is that correct?
A. It is.
Q. So NADPH can donate an electron to an acceptor, correct?
A. Correct.
Q. This acceptor, a diaphorase, then becomes the donor and can pass the electron to another acceptor; correct?
A. Correct.
Q. Paraquat is an efficient electron acceptor in animals?
A. It does, yes.
Q. Paraquat is particularly potent because as a redox cycler one molecule of paraquat can undergo hundreds, maybe thousands of rounds of taking electrons from NAPDH and transferring them to oxygen and create superoxide; correct?
A. It certainly can engage in redox cycling.

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I wouldn't be able to quantify how many cycles there, so.
Q. So the hundreds or thousands is what caused you to "you don't know"?
A. I don't know whether it's hundreds.
Q. But if I said it did hundreds of thousands you wouldn't have any basis to dispute that?
A. I have no basis to dispute that, no.
Q. The same is true for NAPDH oxidase in microglia in the human midbrain to molecular oxygen creating hundreds, maybe thousands of molecules of damaging reactive oxygen species; correct?
A. That's got potential certainly, yes.
Q. You don't disagree with that?
A. I don't disagree.
Q. Aside from passing electrons to oxygen and creating superoxide, paraquat is stealing these electrons from NADPH?
MR. NARESH: Objection to form.
A. That's another way of describing it, yes.
BY MR. TILLERY:
Q. And that's correct as well?
A. Yes.
Q. It's fundamental?
A. Yes.

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Q. Glutathione -- we'll refer to it as "GSH" okay -- is an antioxidant found in all life forms; correct?
A. Yeah, it is.
Q. Those electrons would have been used to replenish the supply of glutathione antioxidant; correct?
A. Yes.
Q. GSH would help mitigate the damages from superoxide; correct?
A. Correct.
Q. In stealing electrons, paraquat is diminishing the cell's ability to perform basic survival functions, metabolism, and protect itself from damages depleting antioxidants while continuously producing more and more superoxide; is that correct?
A. That's correct, yeah.
Q. This process of stealing electrons also diminishings the supply of NAPDH which is crucial for the normal system functions described here.
A. Yes.
Q. So by the time paraquat was sold in the U.K. in 1962, is that the first year it was sold?
A. I believe that's right, yes.
Q. And subsequently in the United States in

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1965?
A. I believe that's correct.
Q. ICI should have known that paraquat would redox cycle upon entry into oxygen-rich human lungs; correct?
MR. NARESH: Objection: scope; foundation.
A. I don't know whether at that time in 1962, 1965 that it was specifically known that it would damage the lung.
BY MR. TILLERY:
Q. Let me ask you. Is there anything about the process that you and I have discussed leading to an understanding of it being -- because we know now, scientists know, that certainly at this stage that that happens, correct?
A. Yes.
Q. Is there anything that would preclude them from knowing that? Was there any advancement in science or understanding or change in the chemical or anything else that would have precluded them from understanding those scientific concepts by the time they introduced the product in 1962 and '65?
A. In 1962 and 1965 I imagine that what we now call the regulatory toxicology studies -- well I know that they had not been conducted because these were

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studies that were done much later, and so that's why I say I don't know at that time if the potential to cause lung toxicity was recognized.

Q. I guess what I'm saying or asking you is this. Is there anything about the scientific concept that had they done the studies they couldn't have learned?

A. Had they done the studies they could have discovered that.

Q. Easily would have known this because the studies would have generated the results, whether in 2020, 1962 would have been the same results?

A. Yes.

Q. Did ICI test paraquat's toxicity and mode of action in animals before it sold it?

A. I don't know what precisely the panoply of studies was done in the 1960s because at that time the regulatory requirements were different to those that were in place in the 1970s and beyond.

Q. But they could have, couldn't they. The technology was there?

A. Some technology was there but don't forget many of the animal models used in toxicology were not developed at that time.

Q. But -- strike that. Did they at that time

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ICI and then later Syngenta only study what the regulators required?

A. I can't comment on that. I don't know.

Q. Are you aware, from your experience of working at both entities, whether that they did studies only generated by a request from a regulatory body?

A. As a general answer to that ICI would conduct studies not just for regulatory requirements, it would also do so in order for it to understand itself the toxicological properties of a molecule, any molecule.

Q. And that includes the safety of the product?

A. It does.

Q. And to the extent that the product has the potential because of its known characteristics of redox cycling to cause a cycle in an oxygen-rich environment, and they knew that certainly in plants didn't they?

A. Yes.

Q. They could have surmised from that information that oxygen-rich environments in animals should be investigated?

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

A. They could have but I don't know what questions were being asked at that point in time.

BY MR. TILLERY:

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Q. When was CTL first established?

A. It was I think around about 1957.

Q. How many employees did it have during those periods?

A. I don't know. Less than 100 I think but I can't give you a figure.

Q. So by the time paraquat was sold in the U.K. in 1962 and subsequently in the United States in 1965, ICI should have known that paraquat would redox cycle with human tissue as well; correct?

MR. NARESH: Objection to form.

A. Yes.

BY MR. TILLERY:

Q. And that would include the brain; correct?

A. It potentially could include any tissue. It could involve any tissue.

Q. Especially one or a section of the brain or a section of the body that was oxygen-rich; correct?

A. In theory, yes.

Q. How did ICI decide what studies to do about paraquat toxicology and exposure?

A. I can't give you the detail. If we're talking about the 1960s I was not there at the time and I've not investigated the historical record of that period.

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Q. How did ICI decide what methodologies to use?

A. Again, I can only answer in very general terms. They would've used the methodologies that were developed at that time, which I said earlier would be quite different to the ones that were used today.

Q. Before paraquat was released on to the U.S. market in 1965 what testing did ICI do with regard to animal and human toxicity?

MR. NARESH: Objection to scope.

A. Again, that history is not something that I've actually reminded or looked at as part of my preparation.

BY MR. TILLERY:

Q. Do you know if any tests were done on mice, rats, sheep, cows, humans to measure potential for animal or human toxicity before the product was sold in 1965?

A. I can't answer that question because I don't know.

Q. What methodologies were available at the time paraquat was introduced into the market in 1965?

A. Well there were some basic tests that could be done at that time, like I mentioned LD50 testing. That was certainly a test that was introduced well before that time so it was possible to understand how

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acutely toxic the compound was, as one example.
Q. Any other tests?
A. Again, in terms of exactly which tests were utilized at that time, I can't answer that.
Q. Could they have done lifetime feeding tests?
A. I think it's very unlikely that they would have done that in the 1960s.
Q. What standards did ICI use for establishing the testing protocol for paraquat?
MR. NARESH: Objection to the scope.
A. Again, I can't comment on that because I don't know.
BY MR. TILLERY:
Q. Do you know what a neurotoxicity study is?
A. I do.
Q. What is that for the record, please?
A. Well today a neurotoxicity study is, in my world of regulatory toxicology, one in which usually rodents are given the chemical and an investigation is done of the nervous system, pathology and function.
Q. Was there any reason why neurotoxicity studies couldn't be done at the time of the release of paraquat into the American market?
A. Again I can't be definitive but I would think it unlikely that neurotoxicity was seen at that time to

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be part of the specific tests that would be done.
Q. Is there a difference between regulatory toxicity -- strike that. Is there a difference between regulatory toxicology and any other form of toxicology?
A. Well fundamentally there isn't. It's about the investigation of potential adverse effects on at the end of the day the human body using -- usually normally using animal models. Regular toxicology is defined as what regulatory authorities require. That doesn't mean that's all that is done.
Q. Okay. And who makes the decision about doing other types of toxicology studies besides those required by regulators?
A. Scientists in the company in our case.
Q. And what percentage of the studies would fall under the category of regulatory toxicology studies?
MR. NARESH: Just for clarification, can you clarify the time period? You're talking then or now?
MR. TILLERY: He can answer it any way he wants, then and now if you wish.
A. I was going to ask the same question. If you're talking about now then regulatory toxicology is probably slightly more than half of the work that we do.
BY MR. TILLERY:

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Q. And what is the other?
A. It's investigative toxicology. So once you've done regulatory studies there may be findings that you need to understand better, go into more detail, so you'd actually do research studies. And you also do toxicology studies as part of discovery, to predict whether a potential new molecule might have certain properties.
Q. And what about during the time period of the release of the chemicals in 1965?
A. Again I can't tell you the detail of what might have been thought about at that time. But it would've been less than we're -- we do today.
Q. Were neurotoxicity studies feasible to do? In other words, was the scientific knowledge, know-how, laboratory capability available in the '60s?
A. Not entirely.
Q. What -- I'm sorry, I interrupted your answer. Go ahead.
A. Not entirely because some of the measurements that we now do in neurotoxicology studies, the methodologies were not available at that time.
Q. What was missing at that time that would be available today?
A. One example would be the detailed

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neuropathology that we conduct.
Q. Explain that, sir?
A. Looking at the aspects of the nervous system, the neurons under a microscope to see if there's any evidence of damage.
Q. Is a regulatory neurotoxicity study a screening study as opposed to say a method of action study?
A. A neurotoxicology study can include a regulatory study, i.e. it's required by a regulatory authority. It can also mean an investigative study, as I have indicated.
Q. Were any studies conducted with regard to dermal exposure to paraquat and what systemic impact they may have at the time of the release of the product in 1965?
MR. NARESH: Objection to scope; foundation.
A. Again, I don't know the answer to that question.
BY MR. TILLERY:
Q. Were any studies conducted with regard to inhalation exposure to paraquat and what impact it may have on the respiratory system at the time the product was first sold in 1965?
MR. NARESH: Same objections.

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A. I don't know.
BY MR. TILLERY:
Q. Did any studies at that time indicate that exposure to paraquat spray mist might result in pulmonary fibrosis?
MR. NARESH: Same objections.
A. I don't believe so at that early time period.
BY MR. TILLERY:
Q. Were any studies at that time period, and the time period again we're referring to is the mid-1960s when the product was first sold in America. Were any studies conducted with regard to how paraquat can enter the circulatory system and be transmitted to internal organs, including the human brain?
A. I'm not aware of whether such studies were done in the mid-1960s.
Q. Did any human injuries or deaths, either ICI employees or third-party consultants or test subjects, occur in any testing or exposure to paraquat in that period of time?
A. I don't believe that there was any deliberate testing in human beings. But whether -- and I'm not able to comment on whether any adverse effects were seen in people who might have been using paraquat at that time.

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Q. Was ICI aware of any adverse effect of paraquat before deciding to market it in the United States?
MR. NARESH: Objection to the form.
A. I don't know exactly what it was aware of at that time in 1965.
BY MR. TILLERY:
Q. Is there anybody in the organization or anybody who used to be in the organization who is still around who could answer those questions?
A. Yes. There will certainly be at least one person that I can think of.
Q. Lewis Smith?
A. Lewis Smith.
Q. What agency in the United Kingdom was responsible for initially authorising the sale and use of paraquat in the U.K.?
A. Well that's going back again in history where I don't know exactly the names of the government departments that were in place at that time. I mean I know what the departments are called today but that may not be helpful to your question.
Q. Do you know what ICI told that agency about the toxicity of paraquat?
A. Not at that point in history, no.

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Q. Do you know what agency of the United States Government was responsible for initially authorizing the sale and use of paraquat in the United States in 1965?
A. I don't know because I don't have that history either.
Q. Was Chevron Chemical Company the initial registrant of paraquat in the United States?
A. I don't know if it was the initial registrant.
Q. You think ICI may have been?
A. It could have been. Again, I don't have that detail.
Q. Did ICI work with Chevron on the initial U.S. registration?
A. Again I don't know precisely the answer to that question. I know that there was some collaborative work, but I don't have the detail.
MR. NARESH: And I'll just object and make the point that there is a different designee on the U.S. regulatory issues.
BY MR. TILLERY:
Q. Do you know what information ICI provided about the toxicity of paraquat in support of its initial application registration in the United States?

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A. No, I don't.
Q. When did ICI first learn that paraquat enters the brains of mammals?
A. Well, from my understanding of the work that was done there was some understanding of that emerging certainly in the 1980s and '90s, so we were beginning to explore that issue there.
Q. Do all mammals have something called a blood-brain barrier?
A. I believe all mammals do. Again, I couldn't say absolutely all mammals, but certainly the human being does.
Q. Would it be accurate to describe the blood-brain barrier as a highly selective semi-permeable border separating the contents of the capillaries, the bloodstream from the brain and extra cellular fluid in the central nervous system?
A. Yes.
Q. So the brain side of the blood-brain barrier are the brain and other parts of the central nervous system and fluid that isn't contained within the cells of the central nervous system?
A. That's correct.
Q. And the blood side of the blood-brain barrier are the blood and everything else that is circulating

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in the bloodstream?
A. That's correct.
Q. Does the blood-brain barrier protect the brain by preventing certain molecules and toxins from moving from the blood side of the brain to the brain side -- sorry, I misspoke. Start over. I'll withdraw the question and strike that.
Does the blood-brain barrier protect the brain by preventing certain molecules and toxins from moving from the blood side to the brain side of the blood-brain barrier?
A. Yes.
Q. Do molecules pass through the blood-brain barrier by a process called passive diffusion?
A. That's one way in which they can pass.
Q. Is passive diffusion a process where molecules in solution move from areas where they're more concentrated to areas where they're less concentrated?
A. Yes.
Q. Generally speaking do hydrophobic molecules, meaning molecules that tend to repel or not mix with water like O2, CO2, hormones and small polar molecules tend to pass through the blood-brain barrier by passive diffusion?

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A. Again, I'm not a deep expert in that area. So certainly I think that's true as a generalization, yes.
Q. It makes sense; you wouldn't have a reason to dispute that?
A. No. No.
Q. And molecules like blood-born pathogens and large -- let me start over.
And molecules like blood-born pathogens and large or hydrophilic meaning water soluble molecules tend not to pass through the blood-brain barrier by passive diffusion?
A. That's correct.
Q. Can some molecules, such as glucose and certain amino acids pass through the blood-brain barrier by a process called active transport?
A. Yes.
Q. Is active -- strike that. In active transport the cells of the blood-brain transport -- strike that.
In active transport, the cells of the blood-brain barrier transport -- use specialized -- I'm sorry. Let me start over.
In active transport the cells of the blood-brain barrier used specialized transport proteins

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to move molecules through the blood-brain barrier; correct?
A. That's correct.
Q. Is the permeability of the blood-brain barrier constant, or does it vary with conditions and over time?
A. Again, I'm not an expert in that field. I believe that there is some variability but I couldn't quantify that.
Q. I believe you were listed as the person who responds to our blood-brain barrier questions?
A. Well again in broad terms I understand the -- what this --
Q. And you've done some research, haven't you, to answer my questions on blood-brain barrier. This is very important to understanding this. You remember in the complaint we set out this very clearly two and a half years ago about the blood-brain barrier because it was very important?
A. Yes.
Q. And you know that on your website you indicate and have indicated for many years that the reason paraquat is not really a concern for farmers is because of the blood-brain barrier. Did you know that?
MR. NARESH: Objection to form.

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A. I was aware of that, yes.
BY MR. TILLERY:
Q. And did you have any part in putting that on the website?
A. Not at all. No, I have no personal involvement in that. And we do not now say that paraquat is unable to cross the blood-brain barrier.
Q. Okay, you've changed that statement?
A. That statement has been modified in the light of new information as it has arisen.
Q. So let's talk about the blood-brain barrier, okay?
A. Mm-hmm.
Q. I'm asking you this generally. Are there matters or issues or conditions of a human being which alter the permeability of the blood brain barrier?
A. Again, I'm not an expert in blood-brain barrier physiology but I certainly believe that there are such conditions, yes.
Q. When the statement that I referred to about the blood-brain barrier on the paraquat -- strike that. When the statement on the website relating to the blood-brain barrier and paraquat was first put on the website, what grounds did you have for that statement when you made it?

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MR. NARESH: Objection to the form. Foundation.
A. When I look at the history of what we knew at what time, I think that we were aware in the first instance that the blood-brain barrier was certainly a genuine barrier to paraquat getting into the brain. Not an entire barrier but one which certainly reduced the likelihood of paraquat getting into the brain. But as we've produced more evidence then we have understood that it is possible that paraquat can get into the brain.
BY MR. TILLERY:
Q. You know now that the statements that were made earlier on the website were not totally accurate; correct?
A. I would say that with new knowledge then one should redefine what one means when you're talking about the effect of the blood-brain barrier.
Q. Is that another way of saying that I'm right in my question?
MR. NARESH: Objection to form.
A. Yes. New scientific information has allowed us to change our view.
BY MR. TILLERY:
Q. Are you saying that you don't know whether

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Syngenta or any of its predecessors knew before the 1980s or 1990s that paraquat could enter the brains of mammals?
A. I'm not aware of any experimental work that was done prior to that period.
Q. That would indicate that paraquat could enter the brains of mammals?
A. Correct.
Q. Do you know whether the blood-brain barrier tends to become more permeable as a person or other mammal ages?
A. I actually don't know the answer to that question.
Q. Okay. Has that ever been investigated to your knowledge at Syngenta or by any of its corporate predecessors?
A. I don't have any recollection of that kind of a study being done, no.
Q. Does the blood-brain barrier tend to become more permeable in the presence of inflammation?
A. That I believe is one of the conditions that can cause a change in that, yes.
Q. And how does it cause a change? What change?
A. It can change the effectiveness of, for example, those active transporters that you described.

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Q. And it creates a situation where the blood-brain barrier is not as effective at protecting the components of the brain. Would you agree with that?
A. That is my understanding, yes.
Q. Does the tendency to increase permeability occur whether the inflammation is on the blood side or the brain side, or the blood-brain barrier itself?
A. I don't know the answer to that question.
Q. Do you know what other factors tend to increase the permeability of the blood-brain barrier?
A. No again, as I say, I'm not an expert in the -- a deep technical expert in this.
Q. Do you know if there are illnesses that increase the permeability of the blood-brain barrier?
A. I don't -- I couldn't specify diseases.
Q. So the official position through this corporate deposition, you understand for all intents and purposes today you're speaking on behalf of the two Syngenta entities I indicated?
A. Right.
Q. Syngenta AG and Syngenta Crop Protection LLC. The official position today is that you don't know if there's any specific illness that creates increased permeability of the blood-brain barrier; is that

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correct?
MR. NARESH: Object to the form --
A. I can't answer that question, no.
MR. NARESH: Do you want to re-ask? I spoke over the witness. I didn't mean to. I'll object to form.
BY MR. TILLERY:
Q. Do you know whether working in heat and humidity increases the permeability of the blood-brain barrier?
A. No.
Q. Do you know if head injury increases the permeability of the blood-brain barrier?
A. No.
Q. Does infection increase the permeability of the blood-brain barrier?
A. I understand that that is one factor, yes.
Q. Does stress cause increased permeability of the blood-brain barrier?
A. I don't know.
Q. Does the blood-brain barrier protect the entire brain?
A. No, there are parts of the brain that are not covered by the blood-brain barrier.
Q. What parts?

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A. For example the upper part of the nasal cavity is not protected. So there is an entry -- a direct entry into the brain through here.
Q. The old factory bulb?
A. The old factory bulb, correct.
Q. What else?
A. There is another part of the brain which I again --
Q. The pineal gland?
A. Yeah, that's true. Yes, there are.
Q. Pituitary gland?
A. Yes, you're right, yeah.
Q. Can molecules that can't or tend not to pass through the blood-brain barrier enter the brain through the posterior pituitary gland?
A. I don't know if that -- again that would be a potential question. I don't know whether that's actually happened.
Q. You understand the posterior pituitary gland is not protected by the blood-brain barrier?
A. That is true, yes.
Q. So if it gets into the cerebral -- you understand that these parts that are not protected by the blood-brain barrier are bathed by cerebral spinal fluid?

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A. Yes.
Q. And if it gets into the cerebral spinal fluid, it gets into those parts of the brain, you understood that?
A. That's -- yeah, yeah.
Q. So the blood-brain barrier is not protecting the pineal gland either?
A. No.
Q. Molecules that can't or tend not to pass through the blood-brain barrier enter the brain through the pineal gland; they might?
A. They could.
Q. The blood-brain barrier does not protect the hypothalamus; correct?
A. I'm not sure about that.
Q. Let me ask you this. Do you have any reason to dispute what I'm saying?
A. No, I don't.
Q. So molecules that can't or tend not to pass through the blood-brain barrier could enter the brain through the hypothalamus, couldn't they?
A. Theoretically, yes.
Q. Do you know what the postrema is in the brain?
A. No.

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Q. The organ system -- let me just suggest to you that there's a part of the brain called the postrema that's not protected by the blood-brain barrier. Assuming that you believe what I'm saying, okay, if it's not protected by the blood-brain barrier and it gets into the portion of the brain not protected it can pass right straight through that area, can't it?
MR. NARESH: Objection to form.
A. Theoretically, yes.
BY MR. TILLERY:
Q. And practically yes. Do you have any reason to understand, any practical reason why that's not possible?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. In terms of Syngenta's understanding of human physiology?
A. If in general terms, no. If you're asking specifically about paraquat that's another question.
Q. Well, we will. You've indicated that you understand that the blood-brain barrier does not protect the olfactory bulb, right?
A. Yes.
Q. Now let's talk about the olfactory bulb for a minute. Where is it located?

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A. Above the nasal cavity here.
Q. Right here, right between your eyes?
A. Correct.
Q. And what's the method by which when you breath things in the transport occurs to the olfactory bulb? Can you walk me through that?
A. No, I'm not an expert in that mechanism.
Q. Okay. If I told you that when you breath things in through your nose, that that or some of those materials can go straight to the olfactory bulb would you disagree with that?
A. I wouldn't dispute it.
Q. And would you dispute the fact that from the olfactory bulb and straight to the substantia nigra portion of the midbrain there is a direct pathway, would you dispute that?
MR. NARESH: Objection to the form.
A. I can't dispute that.
BY MR. TILLERY:
Q. Do you know what the substantia nigra portion of the brain is?
A. Yes.
Q. What is it?
A. It's an area which is rich in neurons which we called dopaminergic neurons which is believed to be,

n to be the principal site of damage in
disease.
dopaminergic neurons produce what?
amine. [Asked to repeat.]
aminergic. I apologize. Let's start over
re this is clear on the record, okay. The
rgic neurons in the substantia nigra portion of
the brain produce what?
A. Dopamine.
Q. What is dopamine used for by the human body?
A. It's called a neurotransmitter, so it's actually chemical, which helps the transmission of signals through the nervous system.
MR. TILLERY: Off the record for a second.
THE VIDEOGRAPHER: Going off the record. The time is 11:47 a.m.
(Break taken.)
THE VIDEOGRAPHER: Back on the record. The time is 12:03 p.m.
BY MR. TILLERY:
Q. Sir, has the olfactory bulb been identified as an initial site of Parkinson's disease pathology?
A. It is believed to be at the site of one of what's called the prodromal symptoms of Parkinson's disease.

Q. And has it been identified as an avenue by which toxins can find their way to the substantia nigra pars compacta?
A. It is certainly in theory one way in which that could happen.
Q. Does the blood-brain barrier protect the ventricles of the brain?
A. Again, I'm not an expert, a deep expert. I believe it does but I'm not sure -- I'm not secure about that.
Q. Would you agree that any toxin that enters the cerebral spinal fluid can freely enter the brain?
A. I'm not sure that I can say that it would be able to freely enter the brain because again I'm sure there are circumstances where there could be mitigation, but I'm not an expert in that field.
Q. Do you know what the enteric nervous system is?
A. The enteric nervous system is that which is associated with the gut.
Q. And have you become aware, as Syngenta, that the enteric nervous system has been implicated as a transport system by which paraquat enters the gut can find its way to the brain?
A. We're aware of the research papers that have

explored that hypothesis.
Q. And what is your understanding of that transport system that you've become aware of?
A. Well the hypothesis that has been generated is that molecules can be transported through the nerves that are present around the gut, the enteric nervous system you describe it, and can go through the nervous system towards the brain.
Q. And go to the base of the brain?
A. Yes.
Q. And then freely enter into the substantia nigra portion of the brain?
A. That is still hypothesis.
Q. Who is it that has done that research you are referring to?
A. Yeah, and apologies, it's a research group which we have actually got some familiarity with. Right off the top of my head I've forgotten the name, but they're in the north east of the U.S.
Q. Does paraquat cross the blood-brain barrier?
A. To a small degree we now know it does, yes.
Q. And what does "a small degree" mean?
A. The majority of paraquat that may get into the circulation actually does not get across the blood-brain barrier, but it is possible for small

concentrations of paraquat to move across.
Q. And when you use words like "small" or whatever, do you have any other way of quantifying those amounts?
A. Well for example in the studies that we have done we are talking about less than 1 percent.
Q. Is that your understanding of the amount that gets through?
A. That's our understanding from experimental work, yes.
Q. Is that Syngenta's position today that roughly 1 percent gets in?
A. Less than 1 percent.
Q. Less than 1 percent?
A. (Nods).
Q. Whether it's by passive diffusion or whatever it's however you think -- or active transport, it doesn't matter, less than 1 percent of the paraquat in a person's system gets into the brain?
A. That's what our experimental evidence suggests, yes.
Q. Is that your official position of the company?
A. It's based on the science that we have done. So it is the best scientific view the company can

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provide --
Q. Today.
A. -- today.
Q. Okay. And earlier, perhaps 10 years ago or so, you took the position on your website that it didn't readily pass through the blood-brain barrier. What did that term "readily" mean?
A. Well I wasn't involved in coming up with that wording so I can't precisely answer that question.
Q. Do you know from a scientific standpoint what the word "readily cross" the blood-brain barrier means in that context?
A. Well the term "readily" doesn't necessarily have an immediate scientific interpretation. It's open to a number of interpretations I would suggest.
Q. That actually is what I was going to ask you. What is the scientific determination of the word "readily"?
A. Well the closest I could give would be: something that readily crosses would be something to which there's no significant barrier.
Q. Okay. But the word "readily" doesn't lend itself towards any kind of percentage quantification, does it?
A. It doesn't -- in itself it doesn't provide

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that quantification.
Q. So what is the difference in scientific terms between "not crossing the blood-brain barrier" and "not readily crossing the blood-brain barrier"?
A. One is an absolute term. So "not crossing" the blood-brain barrier would indicate nothing gets across. "Not readily" would indicate some gets across.
Q. Less than 1 percent?
A. Well now we know that that is less than 1 percent.
Q. And what studies are you relying on to support the position that less than 1 percent of paraquat in the body gets into the brain?
A. Well we've done studies in the rodent, in the mouse, for example, and also the rat. We call these pharmacokinetic studies. So we've actually measured this in animal studies.
Q. Can you tell us the names of those studies and when they were conducted?
A. Well one of the studies, as an example, would be the one that's included in the Breckenridge 2013 paper. So that would be the kinetic study that's described in that paper.
Q. There's one study there, right?
A. There's one study in that paper, yes.

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Q. That is one, and what else?
A. There's another study in the Minnema paper that we published, which is the one where we gave paraquat through the diet. We also did a kinetic study in that as part of that program.
Q. Okay. Are those the two studies upon which you base that official statement of Syngenta?
A. Those are the published studies and those form the basis, one of the bases of my statement, yes.
Q. That less than 1 percent?
A. Correct.
Q. Are there any other studies besides those that you can think of?
A. Well we've also conducted a study in the non-human primate, which is a Macaque. Again it was a study which is trying to -- which is to understand how much paraquat gets into that particular animal model.
Q. When did you do that study?
A. That study was started around about three or four years ago.
Q. And has it been published?
A. It has not yet been published.
Q. Okay, who's conducting that study?
A. That study was conducted by a contract research organization in the United States.

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Q. Who are the people?
A. Battelle.
Q. Who?
A. Battelle.
Q. Could you spell that for the reporter?
A. B-A-T-T-E-L-L-E.
Q. And could you give me the methodology used in the study, please?
A. So this is a study where we were administering paraquat to the Macaque and looking for where that -- how much paraquat gets into the animal, and also measuring how much gets out and how quickly, so measuring paraquat in the urine for example, and therefore understanding its kinetic behavior.
Q. How many animals in the study?
A. Less than 10. I can't remember exactly how many.
Q. Was it -- strike that. Was the paraquat administered to the animals in their food?
A. No.
Q. It was -- how was it administered to them?
A. This was given intravenously.
Q. Where is the study being conducted?
A. In the location I described.
Q. Where is that?

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A. At Battelle in the United States.
Q. Who is the principal researcher?
A. I can't remember the name of the person in that organization off the top of my head.
Q. Has a final report been generated?
A. That is still being written up.
Q. So who is writing it up?
A. It's the contract research organization supported by some of my Syngenta colleagues.
Q. Who is the contract support organization?
A. It's Battelle, as we were describing.
Q. Do you know what city this was being done in?
A. Off the top of my head I can't remember that detail.
Q. And is the study itself concluded now?
A. The study itself is concluded in it, yes. We're now in the write up phase.
Q. And when was it initiated?
A. Around about three or four years ago.
Q. When you say three or four, was it in 2016 or 2017?
A. I don't remember exactly that as to which year it was.
Q. Was it in response to a threat of litigation?
A. No.

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Q. You had planned this before?
A. Yes.
Q. Who -- when was it planned to be done?
A. We had been talking about doing that study for a number of years prior to its conduct.
Q. And what is the study called?
A. It's a pharmacokinetic study in the non-human primate.
Q. And you have preliminary results?
A. Yes.
Q. But the study hasn't been published?
A. It has not.
Q. What are the results of the study?
A. What the results principally showed is that unlike a published study, which suggested that only around 60 percent of paraquat administered came out in the urine in a certain period of time, in other words was quickly excreted. We were able to show that more than 90 percent was excreted, which was a very important finding, so less paraquat remained in the body than was suggested in that publication.
Q. Is that the only finding?
A. No, we also were able to look at how much paraquat was present in the circulation so we measured how much paraquat was in the blood in the serum.

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Q. Is that the first non-human primate pharmacokinetic study conducted by Syngenta?
A. Conducted by Syngenta I believe it is, yes.
Q. Was it required by a regulator?
A. No.
Q. When is it going to be published?
A. We are close to finalizing not only the report but also a paper for publication, and it's difficult to predict exactly when it will go through the process. Perhaps later this year.
Q. And what -- strike that. What scientists at Syngenta are collaborators in the study?
A. The main collaborators on that study are Dr. Alex Stevens, who is still with the company, and also Dr. Kim Travis who left the company just over a year ago.
Q. And he has been with the study from the beginning?
A. Both of those individuals have been with the study since the beginning.
Q. You're not planning to retire soon, are you?
A. I am.
Q. When are you retiring?
A. In a few months time.
Q. Are there any other unpublished studies that

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you rely upon for the conclusion that less than 1 percent enters the brain?
A. Yes, we have done also further studies in the rodent which again with the same purpose of understanding exactly what the kinetics are in order for us to understand how paraquat behaves across a range of species.
Q. And who did these unpublished studies?
A. They were done by other again external contract organizations, and I can't give you details off the top of my head.
Q. How many studies are you referring to?
A. Just another couple of studies in the rodent, mouse and rat phase for example.
Q. When were those done?
A. Over the same timescale we've been talking about.
Q. So were these done in anticipation of litigation?
A. No.
Q. Were they done for regulatory purposes?
A. No.
Q. So you have no intention of giving these results to regulators?
A. We may well give these to regulators. We

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have no reason not to.
Q. Will these studies be published?
A. Yes.
Q. And have they already been submitted or are they waiting for finalization of the reports?
A. As with the non-human primate study, they -- we are finalizing the report and the external publication as we speak.
Q. For the mouse studies as well?
A. Yes. Yes.
Q. Who is involved from Syngenta in the mouse studies?
A. The same people I referred to previously.
Q. Any other studies that you've done on this subject?
A. No, I believe those are all the studies that are pertinent.
Q. And those are all the studies you're relying upon for your statement that less than 1 percent of paraquat enters the brain?
A. Not just the studies I've just referred to, but the ones that we've previously published where we've quantified that figure.
Q. When did Syngenta or any of its predecessors first undertake studies to determine if paraquat could

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pass the blood-brain barrier?
A. Well there was an initial research in that area in the 1980s by colleagues at CTL.
Q. Who was that?
A. Peter Widdowsen and his colleagues.
Q. And what was the study?
A. Well that was specifically looking at this question and where in that initial research there was a suggestion that the amount of paraquat that got into the brain was very low indeed.
Q. And then following that what was the next study?
A. Well the next studies really were those that I've been describing. So they were at a later -- a significantly later point in time in our research --
Q. The ones you're talking about now?
A. Yes, that's correct.
Q. So let's talk about the gap then. What would that be? You said the early '80s or late --
A. The late '80s.
Q. The late '80s was the first blood-brain barrier study?
A. I believe. Yes, I don't have the date to hand, but yeah.
Q. Okay and then after that there were none in

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the '90s?
A. Maybe if I could just correct the record. The Widdowsen paper, I'm not sure whether that was in the '80s or '90s, I may be confusing the decades, but it was certainly done prior to 2000.
Q. So it could have been in the '90s was the first one?
A. Yes I -- yes.
Q. And then in the ones you're talking about which were done around 2017?
A. The ones that I indicated are still in -- not yet been published were done in that period.
Q. Are the next ones. But the one you also mentioned they were referenced in a Charles Breckenridge 2013 study?
A. Yes.
Q. Or review. It was a review of studies?
A. Well, no, it was the neurotoxicology publication, the Breckenridge et al publication in 2013. The study that I'm talking about in there would have been conducted obviously in 2011, 2012.
Q. When did Syngenta or any of its predecessors first undertake studies to determine if paraquat can enter the brain through any route? Does that question change any of your prior answers?

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A. Not really, no, if the question is meant to not be specific to neurotoxicity or Parkinson's disease. So perhaps you could clarify?
Q. Yeah, what I'm saying is were there other routes explored through other tests, other than through transport by passive diffusion or active transport through the blood-brain barrier?
A. I'm not aware of any studies of that sort, no.
Q. Can you tell me all the ways an environmental toxicant like paraquat can enter the brain, gain access to the substantia nigra?
MR. NARESH: Object to the form.
A. I think we've probably already mentioned that.
BY MR. TILLERY:
Q. Mentioned them all?
A. I think if it could cross the blood-brain barrier then potentially there are other routes where theoretically it could gain entry, like olfactory bulb, as we mentioned before.
Q. Olfactory bulb, cerebral spinal fluid, the enteric system, the nervous system, the blood-brain barrier. Any others?
A. No, I'm not aware of any others that would be

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considered here, no.
MR. TILLERY: I'm starting, counsel, a whole new section right now. Just beginning it, a completely different section, getting off of this. Would this be a little earlier?
MR. NARESH: That's fine.
MR. TILLERY: We'll take our lunch break.
THE VIDEOGRAPHER: Going off the record. The time is 12:23.
MR. NARESH: Oh, I need to -- do you want me to say on the record that we'll read and sign and mark it confidential, or can we agree that --
MR. TILLERY: Absolutely, that's standard practice.
(Break taken.)
THE VIDEOGRAPHER: Back on the record. The time is 1:25.
BY MR. TILLERY:
Q. Sir, by the mid-1960s ICI knew or had reason to believe from toxicity studies that paraquat got into the brains of laboratory animals, didn't it?
A. I don't think I said it by the mid-1960s. I said that that was something that certainly became more evident into the 1990s.
Q. 1990s. So you have no understanding about

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this from the 1960s?
A. No.
Q. And by the mid-1960s ICI knew or had reason to believe from toxicity studies that paraquat caused neurological effects on the central nervous system of laboratory animals?
A. Not in the 1960s. Again, that is a line of evidence that was being explored much later than that.
Q. Like 30 years later?
A. Yes.
Q. Over 30 years later?
A. Yes.
Q. Could you please take a look at Exhibit 6.
(Exhibit 6 marked for identification.)
And for reference on the record this is a Chevron document which starts at Bates number 139117. Do you see that at the top, the front page in the lower right-hand corner?
A. Yes, I can.
Q. Now this is a study, if you look at the second page of this, it gives a description of the study?
MR. NARESH: Steve, I don't think we're all aligned on this.
A. No, this doesn't look like a study.

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MR. NARESH: I think the version you gave to the witness is different than the version you have.
BY MR. TILLERY:
Q. Oh, I'm sorry, would you look at the Bates number in the lower right-hand corner and look at 139477 of that document. That's a Chevron document, counsel. 139477.
A. Okay.
Q. Does this start at the top of the page that you're looking at with the statement "PARAQUAT DICHLORIDE"?
A. It does.
Q. And then it starts with "Dermal Toxicity"?
A. That's correct.
Q. Would you take a look at that study, please?
A. Would you like me to just look at the acute toxicity one or the full --
Q. Just familiarize yourself with the study. It speaks for itself. I'll ask you some questions, and you can of course look at it any time you need to to answer.
A. Okay.
Q. Exhibit 6 is a study from 1964 in which albino rabbits were given sub-acute dermal doses of paraquat on their shaved skin; correct?

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A. Correct.
Q. And that means that paraquat was applied to the rabbit's skin?
A. Yes.
Q. And that's what's referred to as dermal exposure?
A. That's right.
Q. And if you could verify that the statement I'm making from your reference to this study is correct: they were given a daily dose of 3.5 milligrams per kilogram for up to 21 days; is that correct?
A. I'm just checking that dose level. Yes, I can see that now. Yes. Well actually, excuse me. So in the sub-acute toxicity, now that I can orientate myself, they were given doses up to 50 milligrams per kilogram.
Q. For sub-acute?
A. For sub-acute, yes. For the sub-acute.
Q. And at a daily dose of 3.15 milligram per kilogram the dermal exposure was followed by weakness and unsteadiness, wasn't it. Do you see that?
A. I'm just looking at that information now. Yes, I can see that in the female animals.
Q. Weakness and unsteadiness are clinical signs of central nervous system effects, aren't they?

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A. Not necessarily. When you have significant systemic toxicity, general toxicity, that can express itself in a number of ways, including apparent weakness and unsteadiness.
Q. Well let me phrase it this way. Can weakness and unsteadiness be clinical signs of central nervous system effects?
A. They could be but I certainly would not say that was a clear conclusion from this study.
Q. But you're agreeing with me that they could be signs of neurotoxicity, couldn't they?
A. Well they could be, but I suspect that in this study that's less likely.
Q. And would you look at, continue and see whether or not at 12.5 milligrams per kilogram for up to 21 days this dermal exposure was followed by nervousness, increased salivation and tremors. Do you see that as well?
A. So we're now at which dose level?
Q. 12.5 milligrams per kilogram.
A. Right. Okay.
Q. Inco-ordination, weakness, and nervousness, increased salivation and tremors. Are those also or can those also be clinical signs of central nervous system effects?

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A. They could be. But again, I would restate I wouldn't necessarily say that that was clear evidence that it was the case in this study.
Q. Can you tell by looking at this study whether those are signs of central nervous system effects or from something else?
A. No, you can't be definitive about it. I would say, as I said, there are a number of explanations.
Q. And one of them is that it's a clinical sign of central nervous system effects; right?
A. It's one possible interpretation.
Q. And then there's another. At 6.25 milligrams per kilogram for 21 days this dermal exposure was followed by incoordination and decreased motor activity. Do you see that?
A. Yes.
Q. Incoordination and decreased motor activity can also be signs of central nervous system effects, can't they?
A. Again, that's possible.
Q. They can be. In this study in order to -- strike that.
In this study, if there were manifestations of central nervous system effects, to reach the

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rabbits' brains paraquat would have to be absorbed through the skin into the bloodstream and then cross the blood-brain barrier; correct?
A. Correct.
Q. As part of the study did ICI make any effort to measure the concentration of paraquat in the rabbits' blood?
MR. NARESH: Objection to form.
A. Well I cannot see any evidence in what I've got in front of me that that was done.
BY MR. TILLERY:
Q. So ICI, at least from the study, made no effort in that study to rule in or rule out systemic toxicity as a cause; is that correct?
MR. NARESH: Objection to the form.
A. I don't believe that the purpose of the study was to investigate that specifically, no.
BY MR. TILLERY:
Q. Is that something they would normally report if they measured it?
A. We're talking about 1964 here and this was what I would call a general toxicity study, how toxic is paraquat to the rabbit, so it would not have been a requirement of this study to look in any specific tissue or system.

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Q. So you're saying if you're studying general toxicity and that's the purpose of it you finish this entire study and don't report the findings of general toxicity, is that what you're telling me?
MR. NARESH: Objection to form.
A. No, I'm saying that the purpose of the study as I read it was to investigate general toxicity.
BY MR. TILLERY:
Q. As part of the study did ICI make any effort to detect or measure the concentration of paraquat in the rabbits' brains?
A. I can see no evidence for that.
Q. And why not?
A. Because that would have not -- that was not part of the study, I assume. But I was not involved in the design of the study so I'm -- I can only read what's in front of me.
Q. You agree with me though that the clinical observations in this study could have results from effects on the nervous system, the central nervous system, caused by dermal exposure to paraquat; correct?
A. They could but there are alternative explanations.
Q. Okay, on what scientific grounds can Syngenta rule out the possibility that the clinical observations

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in this study could have resulted from effects on the central nervous system caused by the dermal exposure to paraquat?

MR. NARESH: Objection: foundation and scope.

A. You can't rule out but you can estimate that at the kind of dose levels that were used here, which were approaching lethality, that you are likely to see non-specific effects.

BY MR. TILLERY:

Q. If it's a kind of dose level -- and that's what you're basing your opinion on -- that they didn't measure?

A. Internal dose level. So, yes, to clarify I'm talking about external dose. Dose actually administered.

Q. So you're relying upon a result from the administration of an amount, which you didn't measure, as a basis for explaining the clinical observations; correct?

A. I'm describing what ext -- in other words what administered dose was given to the animals which is normal practice and certainly at that time it would not have been a normal practice to measure internal exposure.

Q. What was a lethal dose by dermal exposure?

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A. Well I think that it indicates here. The conclusion was that -- I said earlier, I used the term LD50, so again I see that this is used here. And it said calculation of a sub-acute LD50 gives a figure of around 6.24 milligrams per kilogram per day.

(Exhibit 7 marked for identification.)

Q. We've handed you what's been marked Plaintiff's Exhibit 7. Can you read into the record the title of the document and the authors?

A. "The Toxicity of Paraquat", D. G. Clark, T. F. McElligott, and E. Weston Hurst.

Q. And it's from Imperial Chemical Industries Limited, Industrial Hygiene Research Laboratories, Alderley Park; right?

A. Yes.

Q. And what year was this published?

A. 1966.

Q. Who was D. G. Clark?

A. Well he is/was a toxicologist, a senior toxicologist in the laboratory at that time.

Q. In this study were rats and mice injected intraperitoneally with acute 30 to 75 milligram per kilogram doses of paraquat?

A. I'm reading this in the "Methods" to say paraquat was administered in the food and it was also

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applied to the skin.

Q. Well if you look at Syngenta number 0548879?

A. Yes. And in addition, intraperitoneal dosing. Yes, I can see that now.

Q. All right. Doesn't it say there signs of poisoning after intraperitoneal dosing?

A. Yes.

Q. And it says:

"After a single large intraperitoneal dose (30 to 75 mg. ion/kg.) in rats, the signs of poisoning varied somewhat from animal to animal."

Do you see that?

A. Yes.

Q. Read the next say two sentences?

A. "... most pointed to an action of the substance on the central nervous system. In the earlier stages, hyper-excitability, violent forced movements flinging the animal about the cage, or a stiff and incoordinate gait might be present. Spasms might recur, or the limbs might be widely splayed. A rolling gait might continue up to the time of death which, at the levels of dosage employed, usually occurred on or before the fifth day."

Q. What is an intraperitoneal injection?

A. It's an injection into the abdominal cavity.

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In other words, the space around the stomach and the intestines.

Q. And Clark and his colleagues, all people from Syngenta's predecessor, ICI, right?

A. Yes.

Q. Stated in most of the animals the injection "pointed to an effect on the central nervous system."

Didn't they?

A. That's what it says here.

Q. In this study the paraquat is systemically absorbed and needs only to cross the blood-brain barrier; correct?

A. If these effects are -- originate in the central nervous system.

Q. Okay. Do you have any reason today to dispute the findings of these scientists in 1966?

A. No, I do not.

Q. Okay, so if the scientists from your own laboratories were correct saying there were central nervous system effects from paraquat in 1966, you have no way today to dispute their findings, do you?

A. No, I don't.

Q. All right. So that would tell you that your labs didn't wait until the late '90s to do and find effects on the central nervous system, as you just told

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me 10, 15 minutes ago. In fact, they'd done studies one year after the release of this chemical into the U.S. market showing it had central nervous system effects; correct?

A. That's correct. And I have not seen this study previously.

(Exhibit 8 marked for identification.)

Q. We've handed you what's been marked as Plaintiff's Exhibit 8. As you did with number 7, would you mind reading the title of the document and the names of the people involved in the production of it?

A. "Paraquat and related bipyridyls", D.M. Conning, K. Fletcher, A.A.B. Swan.

Q. And who are these people?

A. Again, they were scientists in the laboratory which at that time was called the Industrial Hygiene Research Laboratory.

Q. And this is Syngenta's predecessor isn't it, ICI?

A. It is.

Q. And these people were all employed by the same company you started working for when you graduated from school; correct?

A. Yes.

Q. And they published this where?

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A. I'm not sure I can see a journal for this off the top of my first reading. I can't see a journal on the paper.

Q. What year?

A. Again, I'm struggling to find a date.

Q. 1969 I think if you look closely. It appears in that journal at page 245 doesn't it, and goes through page 249.

A. Yes I can now just see. It is obscured at the bottom of one of the pages. So British Medical Bulletin 1969, I can just read that.

Q. 1969. Okay. At page 248 of that, if you'd go to that page, the authors state:

"The delayed toxic effects of paraquat occurring after the excretion of virtually all of the material have caused it to be classed as a 'hit-and-run' compound ... that is a compound causing immediate damage, the consequences of which are not apparent until later."

Have I read that correctly?

MR. NARESH: Where are you?

BY MR. TILLERY:

Q. On page 248 under "Discussion" in the second or right-hand column, middle of the page?

A. Yes, okay, I've found that.

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Q. Do you want to read that part, the sentence that says "The delayed toxic effects"?

A. "The delayed toxic effects of paraquat occurring after the excretion of virtually all of the material have caused it to be classed as a 'hit-and-run' compound ... that is a compound causing immediate damage, the consequences of which are not apparent until later."

Q. Okay. That statement means paraquat has both immediate effects and effects that develop over time; correct?

A. Yes.

Q. The more time that passes after exposure, the more effects will be seen, according to these?

A. Yes.

Q. What steps did ICI undertake after the study to investigate the effects of paraquat that would develop over time?

A. Well they were largely based, as I understand it but again I stress that I was not involved, on particularly on the effects on the lung and kidney, as what we call principal target organs.

Q. Well look further down there in that same paragraph, where it says:

"Whilst each bipyridylium ..."

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Would you read that aloud in the record, please?

A. "Whilst each bipyridylium ion appears to be relatively organ-specific, there are indications that in all cases epithelial tissue is the major site of damage: for example, intestinal mucosa and lens (diquat), lung (paraquat) and the kidney tubular system (morfamquat)."

Q. And the next sentence, please?

A. "It must be admitted that non-epithelial tissues, such as liver, cardiac muscle and, with very large doses, brain, can show signs of damage, but in general these tend to be transitory.

"On the other hand, reported local effects of paraquat on lungs, corneal, epithelium, nasal mucosa, ... skin and fingernails ... reinforce the idea that epithelial tissue is the most affected."

Q. Is blood-brain barrier an epithelial tissue?

A. I am not sure. I would need to check that point.

Q. You don't know the answer?

A. No, I don't know the answer to that.

Q. If I told you it was, you wouldn't be able to dispute it, would you?

A. I wouldn't be able to dispute it as we sit

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here, no.
Q. Does the choroid plexus consist of cells in the ventricle of the brain that produce cerebral spinal fluid?
A. Again, that's an area of expertise that I don't -- doesn't enable me to answer that question.
Q. Well let's ask you to assume that the choroid plexus is a layer of epithelial cells. Okay? So paraquat could damage the choroid plexus if it were to reach that location couldn't it, if you assume that it is?
MR. NARESH: Object to the form.
A. Potentially, yes. Potentially, because of what we've read here, that is possible.
BY MR. TILLERY:
Q. The author of this ICI study also wrote:
"It must be admitted ..."
I'm sorry, strike that question. You read it already.
So ICI knew by this study no later than 1969 that paraquat could get into the brain, didn't it?
A. Well, I think it said here that with very large doses.
Q. Okay, but it still gets in the brain?
A. It has the potential to get into the brain,

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yes.
Q. In 1969 what did ICI consider to be a very large dose of paraquat?
A. Well, this, the studies that we've been talking about, as I said it about the previous paper, were doses which in some cases were approaching the LD50 so they would be doses that were very toxic.
Q. Is that what you thought the dose was here?
A. Well, I've not yet had time to read all of the detail of this paper, so I would need to check this one. I was certainly referring to the previous one.
Q. Do you know what ICI based its determination of what a very large dose of paraquat was?
A. No.
Q. Has Syngenta or any of its predecessors ever warned paraquat applicators or users that a very high dose of paraquat could cause brain damage?
MR. NARESH: Objection to the scope.
A. We have not specifically warned of that effect, of that potential, because we don't believe that at the kind of exposure concentrations that people would see that that was a likely outcome.
BY MR. TILLERY:
Q. I move to strike the answer as unresponsive. I'm going to ask your question again.

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Has Syngenta or any of its predecessors ever warned paraquat users that very high doses of paraquat could cause brain damage?
A. I'm not aware of that.
Q. Did ICI do any studies to investigate how much smaller than a very large dose would cause brain damage?
A. I'm not aware of that.
Q. ICI knew in 1969 that people who mixed, loaded or applied paraquat or who were nearby when it was applied would be exposed to it, didn't they?
A. That is true, yes.
Q. And in fact ICI knew that before it ever put paraquat on the market that these people would be exposed to it if they sold it?
A. That is true.
Q. Did ICI do any studies in or after 1969 to investigate how much brain damage could occur from exposure to paraquat when it was used as directed?
A. I don't know for sure but I don't believe that any such study was done.
Q. Did ICI do any studies in or after 1969 to investigate how much brain damage could occur from exposure to paraquat when it was used in ways other than as directed but that ICI would be aware would

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occur in the real world? In other words, were reasonably foreseeable?
MR. NARESH: Object to form.
BY MR. TILLERY:
Q. Do you want me to restate the question?
A. If you wouldn't mind.
Q. Did ICI do any studies in or after 1969 to investigate how much brain damage could occur from exposure to paraquat when it was used in ways that they reasonably anticipated farmers and applicators could apply it?
A. Well we were, in our much later research program in our mouse model were investigating potential effects on the brain. Here we're talking about in the years after 2003 so --
Q. Much later.
A. -- much later.
Q. So you're saying that at least 35 years after this study in 1969?
A. That's when the majority of our research work on this -- in this area was being done.
Q. Okay.
(Exhibit 9 marked for identification.)
Would you take a look at Plaintiff's Exhibit 9, sir.

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A. Yes.
Q. Could you tell me what this is?
A. It's a publication in the journal Toxicology entitled "The tissue distribution of the bipyridylium herbicides diquat and paraquat in rats and mice."
Q. And what year was this study?
A. 1973.
Q. And who was it undertaken by?
A. M. H. Litchfield, J. W. Daniel and Susan Longshaw.
Q. And by whom are they employed?
A. By ICI.
Q. Same laboratory?
A. Same laboratory, yes.
Q. Now in this 1973 report of a study by Litchfield, Daniel and Longshaw, they gave paraquat to mice by intravenous injection of 20 milligrams per kilogram of radio-labeled paraquat; correct?
A. Yes.
Q. What's radio-labeling mean?
A. It means that you attach a radioactive marker to the molecule such that you can then see where it gets to when it's for example when it's injected into animals.
Q. How does that happen? How do you do that in

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a laboratory?
A. You use normally, and I see that this was done here, a technique called autoradiography so when the animal is killed at the end of a study you can essentially detect that radioactivity in sections of the animal, you can see where it's located.
Q. Like taking an x-ray of the animal, isn't it?
A. It's --
Q. By following that chemical and tracing the chemical in the body?
A. That's correct.
Q. Did that radio-labeling allow them to detect paraquat in various tissues of the mice by taking x-rays and inspecting the x-ray film images?
A. Yes, that's clearly what's been done here.
Q. At various points in time after the paraquat was injected, they then killed the mice and took the films; right?
A. Yes, correct.
Q. In mice killed after 24 hours they detected paraquat in the brain and spinal cord, didn't they?
A. So --
Q. If you go to page 159 in the "RESULTS" section, middle of the page.
A. Okay. So I'm reading: "One significant

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feature in the 24-hour autoradiograms from paraquat-treated mice was the presence of radioactivity in the lung. This was in addition evidence of the presence of radioactivity in both the brain and spinal cord."
Q. So it was reaching the brain and the spinal cord and the lungs, right?
A. That's what that says.
Q. And what's common in terms of physiology, of a mammalian physiology, common to both rats, mice and humans about lungs and brain on this topic?
A. Are you referring to how well perfused they are?
Q. Or how about that it's a very highly oxygen-rich environment?
A. Which is really saying what I said in a different way.
Q. Exactly the same thing you said.
A. Yes.
Q. What does that mean? For people who are watching you later on this deposition, what does that mean?
A. It means they've got -- there's a very active blood supply feeding those tissues.
Q. And oxygen-rich means what?

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A. It means that there is literally the presence of oxygen as transported around with red blood cells.
Q. So if redox cycling were involved this would be a place to wind up, wouldn't it?
A. It obviously means that redox cycling could occur in the presence of oxygen, of course.
Q. And where would you look in terms of investigating oxygen-rich environments, wouldn't you?
MR. NARESH: Objection to form.
A. And that's why particularly the lung was investigated where there was a persistence of paraquat.
BY MR. TILLERY:
Q. That's home base for presence of oxygen, right, the lung. But the brain also generates an enormous amount, doesn't it?
A. Yes.
Q. And the production of dopamine in terms of human physiology generates a lot of oxygen, doesn't it?
A. I'm not sure that I'd necessarily say that dopamine itself produces --
Q. Not the dopamine, the process, the physiological process involved in that pot, taking place in that substantia nigra? Were you aware of that?
A. I'm not quite sure that I know precisely

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which biological process you're referring to?
Q. Well are you aware of the fact that the brain in terms of the substantia nigra is an oxygen-rich environment?
A. I didn't know that it was more oxygen-rich than other parts --
Q. Than any other part of the body, okay.
A. -- of parts of the brain even, no.
Q. What about dopamine metabolism?
A. Well dopamine metabolism certainly occurs in areas of the brain which are rich in dopamine clearly, of which substantia nigra is one but not the only one.
Q. What about dopamine metabolism in terms of generating oxygen? Do you know anything about that?
A. No I don't.
Q. So if I told you that what created -- the metabolism of dopamine created an oxygen-rich environment, you wouldn't be able to dispute that, would you?
A. I can't dispute that, no.
Q. And if it did create an oxygen-rich environment, that would really be a very good location for paraquat to undergo redox cycling, wouldn't it?
MR. NARESH: Objection to the form.
A. I can't dispute what you're saying.

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BY MR. TILLERY:
Q. Now let's go on. In that study we see one significant feature in the 24-hour test. Here it says "there was an additional evidence of the presence of radioactivity in both the brain and spinal cord". So it entered in the spinal cord, right?
A. I don't know whether it entered through the spinal cord.
Q. But it was there?
A. It was there.
Q. So it got into the brain, didn't it?
A. At that time period they could detect it in the brain.
Q. And if you go to the table, and that would be on page Syngenta 1980132, do you see that table?
A. Yes.
Q. And the table is entitled "The concentration of paraquat or diquat in tissue of male rats fed diets containing paraquat or diquat for 2, 4, and 8 weeks"; right?
A. Yes.
Q. And what do they see for the brain at 8 weeks? Concentrations in the brain, right? Do you see that?
A. Yes.

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Q. Paraquat was not detected in the bloodstream, was it?
A. No, it was not determined, which is different.
Q. What's the difference between "determined" and "detected"?
A. My understanding of that would be that measurements were not made, when we say "not determined", but that would be my interpretation.
Q. But you don't know why they didn't make measurements in the blood?
A. No, I don't know.
Q. This study tells us that paraquat can be accumulated in the brain when none is detectable in the blood, can it? Are you saying that because they didn't detect it --
A. No, I'm saying they didn't actually look for it is my interpretation of ND.
Q. Would you mind taking a look at the study and telling me where it says they didn't look at it, just to clarify the record?
A. Well --
Q. And are you saying "ND" means -- are you relying on the abbreviation "ND"?
A. No, I'm saying that in table 1 it says ND

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means not determined. I then look in the materials and methods.
Q. Point me the page, please?
A. Which is page 157, and it does say -- journal page 157. It says there:
"At 2, 4 and 8 weeks ten rats from each group and five controls were killed, and brain, lungs, liver, kidney, hind leg muscle, stomach, small and large intestines were analysed for paraquat and diquat". So that does not include blood.
Q. These rats, none of them died from the doses, did they?
A. The paper doesn't indicate that that was the case. It gives no indication that that happened.
Q. So they were dosed at 120 parts per million for 8 weeks and never showed signs of general toxicity, did they?
A. Well I would have to go away and calculate that in a way which I was able to relate it. But normally for this kind of experiment, where you're trying to detect where in this case paraquat goes, you would not use a toxic concentration of paraquat, you would use a lower concentration.
Q. And the paper says that at 250 parts per million no clear pattern likely because rats stopped

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eating the food?
A. Which suggests that they -- that that was heading towards being toxic.
Q. So they quit eating it when it would have made them sicker or probably killed them, they quit eating the food?
A. Yes.
Q. So this would tell you, the inference would be, that none of the rats died?
A. I don't have direct evidence from this paper but that's one inference.
Q. So this 1973 study is consistent with ICI's previous 1969 study in that it found paraquat in the brains of mice and rats; correct?
A. It did, but there is commentary elsewhere in this paper that that paraquat in the brain did not persist.
Q. I move to strike the answer as unresponsive. Let me start over.
So this 1973 study is consistent with ICI's previous 1969 study in that it found paraquat in the brains of mice and rats?
MR. NARESH: Object to the form.
A. Yes.
BY MR. TILLERY:

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Q. How much of our DNA do we share with mice and rats?
MR. NARESH: Objection: scope.
A. A significant proportion. More than 90 percent I understand.
BY MR. TILLERY:
Q. ICI knew about paraquat's very high redox cycling potential when it did these studies, didn't it?
A. It would have done, yes.
Q. ICI knew paraquat would undergo redox cycling in human tissues when it did these studies that it reported in 1969 and 1973, right?
A. It would have done.
Q. You didn't know about these studies until you walked in here, did you?
A. I certainly have not ever read these studies before.
Q. Did you even know that they existed?
A. I don't know that I did actually, no.
Q. So someone put you up to answer questions and didn't show you these studies?
A. I certainly was not shown these studies as part of the preparation.
Q. And in your preparation and your research at all the facilities and libraries and everything you had

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at your beck and call as worldwide director of science you didn't know about them, did you?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. Is that a fair statement?
A. Well let me clarify I'm not worldwide director of science. I'm an adviser to product safety specifically.
Q. All right.
A. And the scope of my research was around the more recent studies that we've done.
Q. And the statements you made about the late '90s being -- studying neurotoxic effects or finding neurotoxic effects earlier in this deposition were just flat wrong, weren't they?
MR. NARESH: Objection to form.
A. I'm not sure that I would agree with that. Would you like to be more specific?
BY MR. TILLERY:
Q. Well when you told me that, no, none of these studies were undertaken until the late '90s. These studies were clearly undertaken by ICI in the '60s, weren't they?
A. But they did not have as their purpose to specifically address neurotoxicity or Parkinson's

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disease specifically.
Q. So that's what you meant when you answered my questions?
A. That's correct.
Q. So you were telling me if they didn't have, despite their findings of neurotoxicity, if they didn't have that as a purpose then you could freely answer my question that they didn't undertake them until the late '90s, is that what you're telling me?
MR. NARESH: Objection to form.
A. I'm telling you that studies which were specifically directed to the hypothesis that paraquat might affect the region of the brain implicated in Parkinson's disease did not start until the late 1990s.
BY MR. TILLERY:
Q. ICI knew that paraquat could get into the human brain when it did these studies that it reported in 1969 and 1973 didn't it?
A. Well, I don't know that I would say into the human brain because there was no direct evidence for that.
Q. These mouse studies then are not studies that would allow you to draw conclusions about whether it can or cannot get into the human brain?
A. That is one reason why we increasingly wanted

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to do the kind of research that we did later to see whether there were -- was evidence for species differences.
Q. So you think the mouse studies are not predictive?
A. At the time that these were done it would be not possible to be sure that they were predictive of what happened in humans.
Q. And if you're not sure, what's the correct scientific approach to take?
A. As I've described this morning, we took the course of studying the pharmacokinetics of paraquat in a non-human primate model.
Q. But if you're not sure of neurotoxicity, you don't know and it's 1965, 1966, and you're about to launch a product into a market where farmers are not being told about neurotoxicity, what's the responsible, ethical course to take by a company?
MR. NARESH: Objection to scope and form.
A. I think it's worth saying at this point that toxicology, the discipline of toxicology frequently involves giving animals high doses of chemicals where you see effects on any tissues, not just the nervous system, and which you do not believe are of relevance to what humans will be exposed to. And that would be

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certainly true of some of the studies we've looked at just now.
BY MR. TILLERY:
Q. So irrespective of the findings, you don't have to do anything further? Because if it came back negative, you wouldn't do any more. If it came back positive, like it did here, you didn't do any more until the late '90s; right?
MR. NARESH: Same objections.
BY MR. TILLERY:
Q. Is that true?
A. These studies were, as I said earlier, were not specifically to address neurotoxicity. The finding of possible effects on the nervous system was one diagnosis of what went on in these high dose studies.
Q. But don't you do additional testing? Once you see evidence of this, isn't it a red flag that additional testing needs to be done because you know that real live human beings are being exposed to the potential neurotoxic effects of your product?
A. As I said, we see frequently in today's world of toxicology where we do a lot more studies we frequently see effects at high doses. Where proper toxicological practice is that you then look at where you see what's called the no effect level. So it's on

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that basis that you then conduct a risk assessment to humans.
Q. When did you do that first? When did you do your no effect level studies?
A. Many of those came when we started to do the regulatory toxicology studies.
Q. So could you give me a year when you did your no effect studies?
A. Well one of the key studies that we used were studies in the rat where we were able to confirm the lung as the principal target organ. That had the lowest no effect level.
Q. Excuse me, sir, I move to strike your answer as un-responsive. Specifically I asked you in what year did you first do the study? What was it?
A. I was about to say I can't recall what year the test was done.
Q. Was it after 2005?
A. No, it was before then.
Q. Was it in the '90s?
A. It may even have been before that. It certainly was one of the earliest regulatory toxicology studies that we were doing, on regulatory toxicology --
Q. It was at least 20 or 30 years after these studies were done, right?

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A. I can't give you a precise date.
Q. You're not willing to give me a precise date?
MR. NARESH: Objection: argumentative.
A. No, I honestly can't remember when that key -- the study I referred to was conducted.
BY MR. TILLERY:
Q. Did Syngenta or any of its predecessors ever take the position that neurotoxicity studies were unnecessary because of the human blood-brain barrier?
A. I don't believe that that was the case.
Q. You're not aware that they took that position one way or another?
A. No.
Q. Do you think that these study results that I just showed you, that you said you had never seen before, would be inconsistent with the position that the blood-brain barrier was so protected that no neurotoxic studies should be undertaken?
MR. NARESH: Objection to form.
A. This was -- these studies were done at a time when doing specialized neurotoxicity studies was not conducted. No laboratory would have normally done such a thing.
BY MR. TILLERY:
Q. Would it have been reasonable for ICI to have

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inferred by no later than 1969 that paraquat undergoing redox cycling in the brain would produce superoxide radical and other reactive oxygen species?
A. It would be reasonable to assume that paraquat was having that effect in a number of tissues, including the brain.
Q. Specifically would it include the brain, sir?
A. Yes.
Q. And would it have been reasonable for ICI to have inferred by no later than 1969 that paraquat undergoing redox cycling in the brain and producing superoxide radical and other reactive oxygen species would damage or kill brain cells?
A. It would be reasonable to assume that was a possibility, yes.
Q. When were neurotoxicity studies, the specific neurotoxicity studies first done in toxicological laboratories?
A. In my recollection the first requirement for such studies, which came from actually from the U.S. environmental protection agency, was in the 1990s.
Q. I'm talking about generally. Whether or not it's for your products, whether or not it's for any -- I'm saying when were neurotox studies first undertaken?
A. In the 1990s.

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Q. So there were no studies worldwide in any laboratory studying neurotoxicity before the '90s?
A. Not using specialized techniques that are required for such studies.
Q. Well were there tests of any kind studying neurotoxicity before the '90s?
A. There may have been but I can't speak for every compound and every situation.
Q. Has Syngenta or any of its successors -- I'm sorry. Has Syngenta or any of its corporate predecessors ever warned paraquat users that paraquat could get in their brains?
A. I'm not aware of that being given.
(Exhibit 10 marked for identification.)
Q. Is Exhibit 10 a 1974 report of a study by M. Rose and Lewis Smith titled "Evidence for energy-dependent accumulation of paraquat into rat lung"?
A. It is.
Q. Did M. Rose work at ICI?
A. He did.
Q. What was his job at ICI in 1974?
A. In 1974 he would have been the section head of what was then called the Biochemical Mechanisms Unit.

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Q. And Lewis Smith is the same Lewis Smith you've mentioned before in this deposition?
A. He is.
Q. What was his job at that time at ICI?
A. In 1974 he would have been a research worker in Mike Rose's department.
Q. In this study paraquat accumulation was found to be energy-dependent and to follow saturation kinetics, right?
A. Yes.
Q. Did Rose and Smith say this implies that uptake of paraquat involves active transport across cell membranes?
A. In the lung, yes.
Q. What relationship if any is there between paraquat accumulation being energy-dependent and uptake of paraquat involving active transport across cell membranes?
A. A level of detail which I'm not able to answer, I'm afraid.
Q. Does paraquat accumulation being energy-dependent and uptake of paraquat involving active transport across cellular membranes mean energy is used to transport paraquat across cellular membranes?

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A. That's what that would mean, yes.
Q. This study shows that paraquat can be transported across cell membranes even though it's a charged molecule, right?
A. It does.
Q. Do the findings in this study show that paraquat doesn't pass through cell membranes by passive diffusion?
A. Again, I would have to read this paper again in more detail.
Q. What are saturation kinetics?
A. They are the kinetics of the behavior of transport of a substance across -- in this case across a membrane barrier. So it puts some mathematical numbers on to that, the rate of transport for example.
Q. If paraquat passes through cellular members through active transport, as this study found, isn't it reasonable to infer that it could also pass through the blood-brain barrier through active transport?
A. Well each membrane that we're talking about has different properties and has different transporter molecules for example, so you can't always say that what happens in one will necessarily happen in another.
Q. So you're saying that the answer to my question is, no, it can't happen that way?

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A. No, I'm saying --
Q. Or are you saying you don't know?
A. I'm saying don't assume it would happen in the same way.
Q. And conversely you can't assume that it wouldn't, right?
A. No. No.
(Exhibit 11 marked for identification.)
Q. To make this easier we've given you the whole document, but also the specific page referenced documents.
A. Okay.
Q. Would you mind familiarizing yourself a bit with that document, please. This is Plaintiff's Exhibit 11.
A. Okay.
Q. Is Exhibit 11 a 1976 report of a study by M. Rose of ICI entitled "Paraquat Accumulation: Tissue and Species Specificity"?
A. Yes, I believe you said 1976. It says 1975.
Q. I'm sorry, July 1975. So is this such a study?
A. Yes.
Q. And again this was done by Mr. Rose, Lock, Smith and Wyatt?

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A. Yes.
Q. And these are all people from ICI?
A. They are.
Q. So this was an ICI-produced document?
A. Yes.
Q. And in this study Wistar rats were dosed orally with 680 micrograms -- what is that measure?
A. No, it's micromoles.
Q. Micromoles per kilogram?
A. Yes.
Q. Of paraquat; correct?
A. That's correct.
Q. The study found paraquat was markedly accumulated by lung slices and significantly accumulated by brain slices. Do you see that?
A. Yes.
Q. And you can look at page 25, if you wish, to verify that statement?
A. Just before we go on. To clarify, if I may. This was a study which involved both, as you described, giving an oral dose of paraquat to rats but also the use of tissues slices, which is different.
Q. Right. Exactly right. Now, if you would look at Table 3 on page 31?
A. Yes.

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Q. And it's Table 3, page 31, paraquat concentration in rat tissues after oral administration of 680 micromoles per kilogram body weight. Do you see that?
A. Yes.
Q. Does that table show that at 2 hours after dosing the concentration of the brain was 6.8 is that -- what is the measure there?
A. This is nanomoles, so that is three orders of magnitude lower than a micromole.
Q. So the concentration of the brain was 6.8 nanomoles per gram of wet weight tissue?
A. That's correct.
Q. At 4 hours the concentration in the brain was what?
A. 0.81 nanomoles per gram.
Q. Okay. At 18 hours it was what?
A. 1.5.
Q. At 30 hours it was what?
A. 3.1.
Q. So paraquat's concentration in the brain was increasing over time, wasn't it?
A. Yes, but you have to be careful about how to interpret these studies.
Q. Would you agree with me, sir, that the

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paraquat's concentration in the brain was increasing over time by this study?
A. The data here suggests that's a possibility, yes.
Q. When ICI did this 1976 study it knew from its own 1973 study by Litchfield and others that it found paraquat in the brain after 8 weeks, didn't it?
A. Yes.
Q. Knowing that, why did ICI run the study for only 30 hours?
A. I really am not able to answer that.
Q. Okay. So if you knew that it was in the brain from a study in 1973 for 8 weeks, it would be reasonable to conclude it would continue and stay in the brain, right?
MR. NARESH: Objection to form. Scope.
A. The study wasn't continued beyond 30 hours so it's not possible to predict what might have happened.
BY MR. TILLERY:
Q. You're not going to say one way or another?
A. Because we don't know what might have happened.
MR. TILLERY: Let's go off the record for just a moment, please.
THE VIDEOGRAPHER: Going off the record. Th

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time is 2:30.
(Break taken.)
THE VIDEOGRAPHER: Back on the record. The time is 2:43.
BY MR. TILLERY:
Q. In June of -- sorry, strike that. In 1974 Chevron was distributing paraquat in the United States under an agreement with ICI, wasn't it?
MR. NARESH: Objection to scope. If you know.
A. I can't confirm that. I don't know exact dates of commercialization.
BY MR. TILLERY:
Q. Do you know whether or not Chevron ever distributed paraquat in the United States?
A. Oh yes I know that, yes. Yes.
Q. Do you know when that started?
A. I don't know the start date, no.
Q. Did you understand that they had an agreement between Chevron and ICI where Chevron was a sole distributor of paraquat in the United States?
A. I was aware that there was a period of time where Chevron were the sole distributor.
Q. Do you know when it ended?
A. I do not.

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Q. Let me hand you what's been marked as Exhibit 12.
(Exhibit 12 marked for identification.)
You would please read Plaintiff's Exhibit 12 which is entitled "Notes on Discussions with Chevron San Francisco March 28 and 29, 1974". Do you see that at the top?
A. I do.
Q. And it says:
"Present for formal discussions on the Ortho paraquat label were:- "
And from Chevron it lists Mr. Ospenson. Do you see that?
A. I do.
Q. Mr. Cavalli, Tanner, Lewis, Hopkins, Doppelt, Stelzer, Searle, Kamienski. Do you see that?
A. I do.
Q. And then from IHRL, Mr. Fletcher?
A. Yes.
Q. What is IHRL?
A. Industrial Hygiene Research Laboratory.
Q. Do you know what they were?
A. It was the name of the laboratory that subsequently became the Central Toxicology Laboratory.
Q. Was this part of ICI at that time?

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A. It was.
Q. And then below that it has PPL, and that's Mr. Jenkins and Mr. Schumacher. Do you know what PPL was?
A. I'm not absolutely sure. I suspect it's prime protection, but I don't know what the "L" stands for.
Q. Okay. And would that be another corporate predecessor of Syngenta's?
A. I can't accurately answer that question, not knowing exactly what PPL is.
Q. Do you know who these people Jenkins and Schumacher?
A. They're not names that I remember seeing before.
Q. Do these notes recount what was discussed at a meeting about Ortho Paraquat?
A. Well I haven't read the document so I can't --
Q. Why don't you take a minute and look at it.
MR. TILLERY: So if he's not prepared to discuss anything about the relationship between Chevron and ICI, is that a topic that will be discussed when we resume on April 9th?
MR. NARESH: I don't believe that he is

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designated for that topic, and off the top of my head I don't remember that being a topic.
MR. TILLERY: Yeah, it is. It's in the first series of topics.
MR. CRAIG: Communications about studies --
MR. TILLERY: Yeah and one of his topics is internal and external communications about the paraquat.
MR. NARESH: So I think you're saying two different things. One is the relationship between Chevron and ICI, the contractual relationship?
MR. TILLERY: Well not really contractual, I'm not going to ask that because that's a foregone conclusion, they've got a contract. What I'm asking is, is he going to be the one that discusses the discussions they had and the sharing of scientific information?
MR. NARESH: So I think we ought to see where this goes and then we can talk about it afterwards.
MR. TILLERY: Okay.
A. Okay.
BY MR. TILLERY:
Q. Now, do these notes say Chevron intended to submit a revised paraquat label to the EPA and then the quote is:

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"... containing, among other things, the phrase 'when spraying, wear goggles and a respirator to avoid eye contact and nasal, throat and respiratory tract irritation'."

It does say that, yes.

Q. And would you read the third paragraph for the record, please?

A. The one beginning:

"Dr. Lemac Hopkins's job ..."

Q. Yes, and if you could go to the fourth line down, "Extreme"?

A. "Extreme examples quoted were the proposal in California to require workers to undergo a cardio-pulmonary evaluation before spraying paraquat, and a proposal from a Mr. Stephenson of Georgia for a paraquat ban. In both these instances the persons concerned were persuaded not to proceed with their proposals."

Do you want me to go on?

Q. Yes, please.

A. "Other comments from State officials indicate concern about possible long term chronic effects of workers licking small quantities of paraquat daily from their lips and/or breathing in low doses via small droplets from spray mist. Some agricultural

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commissioners have criticised the label for not being clear."

Q. So Chevron and ICI knew at the time of this meeting, and what was the date of it? It was in March of 1974?

A. Correct.

Q. That California state officials were concerned about the possible long-term chronic effects of workers licking small quantities of paraquat daily on their lips and/or breathing in low doses via small droplets from the spray mist; correct?

A. Yes.

Q. If you would go to the second page. Oh actually -- yes, go to the second page, please. The last sentence of the third paragraph?

A. The paragraph which starts "Mr. Lewis"?

Q. I'm looking for the one that said Dr. Fletcher confirmed in answer to a direct question --

A. That's the fourth paragraph.

Q. The fourth paragraph, I'm sorry. Yes, the last sentence of the fourth paragraph, would you read that into the record?

A. "Before the point was conceded by PPL Dr Fletcher confirmed in answer to a direct question

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that IHRL had no experimental evidence to support the contention that there is no chronic effect from continual exposure to spray mist at sub acute effect levels."

Q. Dr. Fletcher was again from ICI?

A. Yes.

Q. And he confirmed they had no evidence of that, right?

A. That no evidence that there is no effect. It's a double negative.

Q. And there's a Post-it note on the right. Do you see that? It says:

" i.e. we have done no long term inhalation studies."

Do you see that?

A. I see that, yes.

Q. So as of 1974 when Chevron had been selling products that were formulated from paraquat manufactured by ICI for nearly 10 years, ICI knew it hadn't done no long-term studies on the effects of inhaling paraquat mist; correct?

A. That's what that suggests.

Q. If they had done those studies they would have presumably given those to Chevron at that time?

A. I would have presumed so.

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Q. So by the time of this meeting Chevron hadn't done long-term inhalation studies itself and ICI hadn't provided Chevron any long-term inhalation studies, Chevron knew even before this meeting that no long-term studies had been done to investigate the effect of inhaling paraquat spray mist, didn't it?

A. This is what that suggests.

(Exhibit 13 marked for identification.)

Q. Now if you'd look at number 13. This is another meeting between Chevron and ICI and this is October 6th through to the 9th, 1975, isn't it?

A. Yes.

Q. And it's an international paraquat meeting reporting October 7?

A. Yes.

Q. Do you see that?

A. Yes.

Q. CTL is the same place we've been talking about; correct?

A. CTL was what IHRL had become known by then.

Q. It became?

A. Yes.

Q. If you would turn to the last page and read the paragraphs numbered 5 and 6 to yourself.

A. Okay.

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Q. Near the end of the paragraph numbered 5 with the heading "CHRONIC TOXICITY", do you see that?
A. I do.
Q. It says:
"It is suggested that a critical epidemiology study is carried out and a long term toxicity study using sprays on animals."
Correct?
A. Yes.
Q. So an epidemiology study was referred to as critical but it hadn't been done, had it?
A. That's what this would be -- the assumption would be that that was the case, yes.
Q. And a year had passed since the previous meeting, when it was noted that no long-term study had been done to investigate the effects of inhaling paraquat?
A. Yes.
Q. Still no study; correct?
A. That's what I'm assuming.
Q. And you earlier said that non-human primates are the best to use for these studies; correct?
A. No, I didn't say that. I said non-human primates are often useful to check whether for example the kinetics of paraquat in humans could be different

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from what we see in rodents.
Q. So what other species would you suggest would give the best predictive results for health effects on humans other than non-human primates?
A. Well, it is obviously possible that the rodent studies or dog studies could equally identify the potential target organ toxicity that you might see with paraquat in humans.
Q. So you're suggesting that rodent studies are equally predictive to non-human primate studies, correct, is that what you're saying?
A. I'm not saying that. I was saying that, as is always the case in toxicology it is always possible, and indeed often is true, that lower species, rodents and dogs, are capable of predicting human toxicity. It's not always the case.
Q. In the ten years that paraquat had been on the market in the United States at the time of this meeting -- I'm going to suggest to you that paraquat was first marketed in the United States in 1965, from the information that your attorneys have provided us.
Assuming that's correct, in that ten years that paraquat had been on the market, did ICI have the facilities to conduct a long-term, low dose, non-human primate study?

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A. I don't believe that it did. I'm not aware that ICI itself had a non-human primate facility. There may have been at least -- let me just build on that, if I may. It's pharmaceutical division may have had such a facility, but not the laboratories we're talking about here.
Q. And had they wanted to do it, they could have hired somebody to do it?
A. Of course, yes.
Q. Or they could have done it in their pharmaceutical division?
A. That is undoubtedly feasible, yes.
Q. So it wasn't a question of having the ability to do it, or the staff to do it, or the facilities to do it, they for reasons which apparently you don't know, they just chose not to do it; correct?
A. But this doesn't suggest, if I may say --
Q. I want you to answer my question. They had the ability to do these things?
A. I believe that the pharmaceuticals division did have.
Q. All right. And as far as you know could Chevron have also done that study if they wanted to?
A. I don't know whether they could have done it themselves in their own laboratory or whether they

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would have been able to contract it to somebody else.
Q. A long-term low-dose non-human primate study could be used to investigate the effect of an applicator's exposure to paraquat, couldn't it?
A. It could.
Q. But ICI didn't do that study at that time, did it?
A. No.
Q. And Chevron, to your knowledge, didn't do that study either?
A. I've no evidence to suggest that they did.
Q. Now look at the first sentence in paragraph 6. It says:
"ACTIVITY OF PARAQUAT ON [CENTRAL NERVOUS SYSTEM]."
That's the heading, right?
A. Yes.
Q. It says:
"In a recent autopsy on a paraquat poisoning the pathologist discovered lesions on the motor neurons."
Did I read that right?
A. Yes.
Q. This is referring to lesions on motor neurons in the brain, right?

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A. No, that's not necessarily the case. I don't know where those motor neurons were.
Q. What studies, if any, did ICI undertake to investigate whether paraquat may have been responsible for the lesions on the motor neurons in the brain?
MR. NARESH: Objection to the form.
A. I'm not aware whether any specific study was done in response to this.
BY MR. TILLERY:
Q. It also says in paragraph 6:
"Fisher has also reported ataxia from paraquat administered by any route ..."
Do you see that?
A. Yes.
Q. Who is Fisher?
A. That's a good question. I don't know -- there's a reference to Dr. fisher in this document and I don't know who Fisher is.
Q. Is ataxia a lack of voluntary movements?
A. Ataxia is certainly an effect on the muscles which can result from an effect on the nerves, supply of muscles.
Q. On the central nervous system?
A. Yes.
Q. Ataxia is a clinical finding consistent with

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neurological injury, isn't it?
A. It can be, yes.
Q. As a matter of fact, it's most often that way, isn't it?
A. I'm not a neurologist so I wouldn't be able to say.
Q. It's a finding consistent with neurological injury to the brain, isn't it?
A. Well, that's possible but I would imagine it can also be a direct injury to the peripheral nervous system. But, again, I'm not a neurologist so I don't know.
Q. What studies if any did ICI undertake in light of Fisher having reported ataxia from paraquat administered by any route?
A. I'm not aware of any specific studies in response to that.
(Exhibit 14 marked for identification.)
Q. We've handed you Plaintiff's Exhibit 14. This is a letter from R. Cavalli to Ken Fletcher, dated July 9, 1975. Who is Ken Fletcher? And this is Bates number -- I want to direct your attention from that overall document to Bates number 189777.
MR. NARESH: I'm not following the dates here.

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BY MR. TILLERY:
Q. Page 189777.
A. So 189777 is the second page of the shorter document you've given me.
Q. Yes.
MR. NARESH: And where is July?
BY MR. TILLERY:
Q. It looks like it's "PARAQUAT TOXICOLOGY MEETING FEBRUARY, 1976". Do you know who Mr. Fletcher is?
A. Yes. He was a senior toxicologist at CTL.
Q. And Mr. Cavalli?
A. No, I don't know Mr. Cavalli.
Q. I will represent to you that he was an individual who worked for Chevron Chemical Company, sir.
A. Okay.
MR. TILLERY: Let's go off the record, please.
THE VIDEOGRAPHER: Off the record. The time is 3:07.
(Break taken.)
THE VIDEOGRAPHER: Back on the record. The time is 3:09.
BY MR. TILLERY:

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Q. Have you had a chance to read this document, sir?
A. Well I'm still only halfway through the entire short version.
Q. Okay, go ahead and do the short version, please.
A. Okay.
Q. Can you go to the Bates number that says 189736?
A. So 189736 is the title page.
Q. And can you find 189777?
A. Yes, that's the page which follows in my version.
Q. Is that the first page that follows?
A. It's the page after the title, yes.
Q. And there's a section that says "We discussed at some length", do you see that?
A. I do.
Q. Would you read that into the record, please?
A. "We discussed at some length, the gaps in our knowledge of the chronic effects of paraquat exposure. The animal studies available are old and do not meet current standards."
Q. I couldn't hear you:
"... do not meet current standards."

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May I read this on the record, please, so we can all hear:

"We discussed at some length, the gaps in our knowledge of the chronic effects of paraquat exposure."

Is that correct, did I say that right?

A. Yes.

Q. "The animal studies available are old and do not meet current standards. Some are poorly done. In fact, the cause of death from chronic exposure to paraquat could not be determined from these studies. Dr. Fletcher agreed to review these and to consider repeating certain of the studies. I have recently received a letter from him (enclosed) in which he states that he has reviewed this area with Allen Calderbank and Arthur Waitt, and they do not believe it warranted to repeat any of this work. I agree with this only if we can do the proposed epidemiology study. If not, our only recourse will be to have good animal studies in this area."

Do you understand that? Did you read it?

A. Yes.

Q. Now, the poorly done chronic animal studies had been done on rabbits, rats and mice; correct?

A. I'm not sure exactly what studies they're referring to here.

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Q. And the date of this is 1976?

A. That's correct.

Q. And how long had the product been on the market in the U.S. at this time?

A. From what you told me earlier that would suggest about 11 years.

Q. And this was two years after Chevron and ICI knew the State of California was concerned about tiny amounts of paraquat having long-term effects, right?

A. Yes.

Q. And still no testing done or at least no adequate testing being done?

A. At this point this is what this suggests.

Q. In the two years after you were put on actual notice by the State of California of its concerns about chronic effects from paraquat, you could have done a non-human primate study if you'd chosen to do it, couldn't you?

MR. NARESH: Objection to the form.

A. Potentially, yes.

BY MR. TILLERY:

Q. But you didn't do any such study?

A. No, I don't believe we did.

Q. Can you tell me why ICI did not do the study?

A. Well, you are specifying a non-human primate study there, and I'm not sure that that was necessarily what was intended when they were thinking about long-term studies. It could have been a rodent study or a dog study, so I wouldn't say you would specify the species. But I can't comment beyond that.

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Q. So you just don't know?

A. Because I don't know.

Q. Okay. Do you think it had anything to do with potential effects or results from the study?

A. I can't speculate on that.

Q. When did ICI first learn that a person had died from an oral dose of paraquat?

A. I don't have that date to hand.

Q. When did ICI first learn that a person had died from a dermal dose of paraquat?

A. Again, I don't have a precise date to hand.

Q. Do autopsies in known or suspected poisonings typically involve analysis of tissues and measurements of the concentration of a suspected poison in tissues suspected to be involved in the process?

A. I can't speak about tissues. I know that normally blood samples would be analyzed.

Q. ICI and Chevron kept each other apprized of adverse incidents occurring with respect to paraquat products, didn't they?

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A. It would seem so, yes.

Q. And Chevron Environmental Health Center did analysis of tissues after poisonings, didn't it?

A. I don't know.

(Exhibit 15 marked for identification.)

Q. I'll show you what's been marked 15 and number 16, just to acquaint you with the fact that Chevron and ICI were aware of these studies. Number 15, if you look at that document, indicates a death in 1970, a person aged 33 years drank Gramoxone from a beer bottle, died within 10 days. Do you see that?

A. I do.

Q. The next one is in 1971, a four year old child ingested an unknown quantity of Gramoxone, given immediate attention for paraquat poisoning, lavage, exchange blood diffusion, forced diuresis, the child survived.

1972, aged 46 year old died as a result of drinking Gramoxone, died within hours. Do you see those?

A. I do.

Q. And then you see that the materials that -- the other parts of the body that they receive reports on?

A. Yes.

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(Exhibit 16 marked for identification.)
Q. Likewise, sir, if you take a look at number 16. This is an indication that they were aware of these being reported and then sharing the information about toxicological studies and analysis of autopsies of people who ingested paraquat products and died?
A. Okay.
(Exhibit 17 marked for identification.)
Q. 17 is headed "Fatal case of poisoning by paraquat" by F.B. Bronkhorst, J.M. van Daal, H.D. Tan. Do you see that?
A. I do.
Q. It's a report of a poisoning in a scientific literature in February 1968?
A. That's correct.
Q. If you go to page 8 of that document, you see observations of a man poisoned with paraquat. It's in the first paragraph I'll direct your attention to. The observations included perivascular oedema in the white matter of the brain and areas in which ganglion cells from the cortex showed "pycnosis of the nuclei". Do you see that?
A. Yes, that's in the -- written with a pen writing, yes. I see that.
Q. So this autopsy was reported to have found

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histopathological changes in the brain including active cell death in the ganglion of cells in the cortex; didn't it?
A. That's what that says.
Q. What are histopathological changes?
A. They are changes that you can see in tissues by using a microscope. So you're looking at the cellular detail.
Q. Sir, I'm going to break a little bit here and move on to a different topic and then come back and finish this because we have a couple of missing exhibits that we're going to add to this discussion we'll finish either today or tomorrow when we finish your deposition. But I do want to ask you some more questions now, if I can.
A. Okay.
Q. Would you agree that Syngenta knew that users of paraquat and persons nearby could be exposed to paraquat while it was being mixed and loaded into the tanks of sprayers as a result of spills, splashes and leaks?
A. Yes, we were aware of that.
Q. Would you agree that Syngenta knew that persons who sprayed paraquat or were in or near areas where it was being or recently had been sprayed would

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be exposed to paraquat as a result of spray drift and as a result of contact with sprayed plants?
A. That is possible, yes.
Q. You would agree with that?
A. Yes.
Q. Would you agree that Syngenta knew that users of paraquat and persons nearby could be exposed to paraquat as a result of spills, splashes and leaks while equipment used to spray paraquat was being emptied or cleaned or clogged spray nozzles, lines or valves were being cleared?
A. Yes.
Q. Syngenta also knew that paraquat could enter the human body via absorption through or penetration of the skin, mucus membranes and other epithelial tissues including tissues of the mouth, nose and nasal passages, trachea and conducting airways, particularly where cuts, abrasions, rashes, sores and other tissue damage was present?
MR. NARESH: Objection to form.
A. That is possible, yes, of course.
BY MR. TILLERY:
Q. Syngenta knew that paraquat could enter the human body via respiration into the lungs, including the deep parts of the lungs where respiration or gas

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exchange were to occur?
A. Well we know that the amount of paraquat that is respirable, that is small enough to get into those deep parts of the lungs, is actually very, very small. Most of the paraquat when it's sprayed is larger particles which can't get into the deep lung.
Q. But it does. But you knew that it could get into those lung parts?
A. Potentially it could if the particles were small enough, but that is not normally the case.
Q. But are you saying it can't get into the lungs?
A. No, I'm not saying it can't get into the lungs, no.
Q. And did ICI know all of these things, the same as Syngenta?
A. ICI could have known that kind of information. But, again, that information became more information about that was received as time went on so we understood more about it.
Q. But in terms of how farmers were to apply chemicals, in terms of how they handled chemicals, in terms of their exposure to chemicals, all of these same things were known to ICI the same as Syngenta?
A. Yes.

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Q. Did Syngenta or ICI ever learn paraquat could enter the human body via injection into the digestive track of small droplets swallowed after entering the mouth or nose?
A. Again that was something that was known to be possible, yes.
Q. Did ICI or Syngenta also know that paraquat that entered the human body via ingestion into the digestive track could enter the enteric nervous system?
A. No.
Q. That wasn't until later?
A. That was -- and again, that is still a hypothesis that that is one way in which paraquat could be transported?
Q. Does Syngenta flatly dispute that as an avenue, or does it say that it's still an open question?
A. I think I've said it's a hypothesis, which is absolutely another way of saying it's an open question.
Q. All right. Syngenta or ICI knew that paraquat that entered the human body whether via absorption, respiration of ingestion could enter the bloodstream?
A. Yes.
Q. Syngenta also knew that paraquat that entered

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the bloodstream could enter the brain, whether through the blood-brain barrier or parts of the brain not protected by the blood-brain barrier?
A. We obviously know that there was evidence that that could occur.
Q. Syngenta or ICI learned through studies in the public domain that paraquat that entered the nose and nasal passages could enter the brain through the olfactory bulb which is not protected by the blood-brain barrier?
A. That was conceivable, yes.
Q. And you don't dispute that?
A. I don't dispute that that is possible, yes.
Q. So you used the word "possible". It makes me a little queasy, let me say. I'm a little concerned. I want to explore that a little bit more. Are you saying that it's just possible? Are you saying that it can't happen? It can? What is the probability?
A. Well I think you're making an assumption that any -- that paraquat that we know may get into the brain in low concentration will necessarily have come via those routes, including the olfactory bulb, and we don't necessarily know that for sure.
Q. Well then let me rephrase that statement and ask if you would agree with it. Syngenta or ICI

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learned through studies in the public domain that paraquat that entered the nose and nasal passages could enter the brain through the olfactory bulb?
A. Of course, yes. Could.
Q. Would you agree that Parkinson's disease is a progressive neuro-degenerative disorder of the brain that affects primarily the motor system, the part of the nervous system that controls movement?
A. Yes.
Q. The characteristic symptoms of Parkinson's disease are its primary motor systems, resting tremor, shaking of muscles, Bradykinesia, slowness of movement, rigidity, stiffness, and postural instability. Would you agree with that?
A. I agree.
Q. Would you agree that Parkinson's disease primary motor symptoms often result in secondary motor systems such as freezing of gait, shrinking of handwriting, a mask-like expression, a flat face expression, slurred, monotonous, quiet voice, stooped posture, muscles spasms, impaired coordination, difficulty swallowing, excess saliva and drooling caused by reduced swallowing movements. Would you agree with that?
A. I would agree with that, yes.

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Q. Would you agree that the non-motor symptoms, such as the loss or altered sense of smell, constipation, low blood pressure on rising to stand, sleep disturbances and depression are present in most cases of Parkinson's disease, often for years before any of the primary motor symptoms appear?
A. I would not be able to comment about most. I am certainly aware that those symptoms have been detected in some Parkinson's patients.
Q. And you know that from your research at Syngenta in terms of that particular group that studies Parkinson's disease in paraquat?
A. Yes.
Q. What is the name of that group?
A. In terms of let me just go back. So when you say we knew it, all those symptoms we knew from that particular group?
Q. Well you know from all sources, I presume?
A. I was going to say, not exclusively from that source.
Q. Of course. Of course. From your own private research or the group or presentations or whatever, this would be known generally across the board by the scientists who were involved in that study area?
A. That's right, yes.

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Q. Is that correct?
A. Yes. Yes.
Q. There's currently no cure for Parkinson's disease. No treatment will slow, stop or reverse its progression and the treatments most commonly prescribed for its motor symptoms tend to become progressively less effective and to cause side effects the longer they're used. Would you agree with that?
A. I would, yes.
Q. The selective degeneration and death of dopaminergic neurons, that is the dopamine-producing nerve cells, in part of the brain called the substantia nigra pars compacta is one of the primary patho physiological hallmarks of Parkinson's disease?
A. It is.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. Dopamine is a neurotransmitter, a chemical messenger that transmits signals from one neuron to another neuron, muscle cell or gland cell that is critical to the brain's control of motor functioning. Would you agree with that?
A. I would agree with that.
Q. The death of dopaminergic neurons in the substantia nigra decreases the production of dopamine?

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A. Yes.
Q. Once dopaminergic neurons die they're not replaced. When enough dopaminergic neurons have died, dopamine production falls below the level the brain requires for proper control of motor function, resulting in motor symptoms of Parkinson's disease. Do you agree with that?
MR. NARESH: Objection to form.
A. That's my understanding of it, yes.
BY MR. TILLERY:
Q. The presence of Lewy bodies, the aggregates of protein called Alpha-synuclein, in many of the remaining dopaminergic neurons in the substantia nigra is another of the primary patho physiological hallmarks of Parkinson's disease. Would you agree with that?
A. I would agree.
Q. Dopaminergic neurons are particularly susceptible to oxidative stress, a disturbance in the normal balance between oxidants present in cells and cells antioxidant defenses. Would you agree?
A. Yes. Yes.
Q. Scientists who study Parkinson's disease generally agree that oxidative stress is a major factor in the degeneration and death of dopaminergic neurons in the substantia nigra and the accumulation of Lewy

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bodies in the remaining dopaminergic neurons that are the primary pathophysiological hallmarks of Parkinson's disease?
MR. NARESH: Objection to scope; form.
BY MR. TILLERY:
Q. Would you agree with that statement?
A. If the inference from that is that most cases of Parkinson's disease are caused by oxidative stress, I'm not sure that that is necessarily right, because I think a lot of cases of Parkinson's disease are idiopathic, in other words it's not clear exactly how they have occurred.
Q. Could you tell me your source for that statement?
A. Again by what I've heard from neurologists speaking at conferences for example.
Q. Would you agree that paraquat is highly toxic to both plants and animals?
A. Yes.
Q. Would you agree that paraquat injures and kills plants by creating oxidative stress that causes or contributes to cause the degeneration and death of plant cells?
A. Yes.
Q. Paraquat injures and kills humans and other

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animals by creating oxidative stress that causes or contributes to cause the degeneration and death of animal cells?
A. Yes.
Q. Paraquat creates oxidative stress in the cells of plants and animals because of redox properties that are inherent in its chemical composition and structure?
A. Yes.
Q. Paraquat is a strong oxidant and it readily undergoes redox cycling in the presence of molecular oxygen which is plentiful in living cells?
A. Yes.
Q. The redox cycling of paraquat in living cells interferes with cellular functions that are necessary to sustain life with photosynthesis in plant cells and with cellular respiration in animal cells?
MR. NARESH: Objection to form.
A. Yes.
BY MR. TILLERY:
Q. The redox cycling of paraquat in living cells creates a reactive oxygen species known as superoxide radical, an extremely reactive molecule that can initiate a cascading series of chemical reactions that creates other reactive oxygen species that damage

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lipids, proteins and nucleic acids, molecules that are essential components of the structures and functions of living cells?
MR. NARESH: Objection: form.
A. Yes.
BY MR. TILLERY:
Q. Because the redox cycling of paraquat can repeat indefinitely in the conditions typically present in living cells, a single molecule of paraquat can trigger the production of countless molecules of destructive superoxide radical?
MR. NARESH: Objection: form.
A. In theory that's true one molecule could. Whether one molecule would, I wouldn't like to be able to speculate.
BY MR. TILLERY:
Q. But it's certainly consistent with what we know of a mode of action of the molecule, isn't it?
A. Of course, yes.
Q. Paraquat's redox properties have been known to science since at least the 1930s, '33; correct?
A. Yes, correct.
Q. From the study we reviewed this morning?
A. That's correct.
Q. That paraquat is toxic to the cells of plants

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and animals because it creates oxidative stress through redox cycling has been known to science since at least the 1960s; correct?
A. Yes.
Q. The surfactants with which paraquat was typically formulated were likely to increase paraquat's toxicity to humans by increasing its ability to stay in contact with or penetrate the skin, mucus membranes or other epithelial tissues, including issues of the mouth, nose and nasal passages, trachea and conducting airways, the lungs and the gastrointestinal tract?
MR. NARESH: Objection: scope; foundation; form.
A. I don't know that I have direct evidence that surfactants would necessarily have those effects in all the tissues that you're describing.
BY MR. TILLERY:
Q. Can you point me to any single study that Syngenta has ever done which would dispute that statement?
MR. NARESH: So I'll object. And, Steve, I thought we had an agreement that 31(j) is not the subject of today's deposition?
MR. TILLERY: I won't ask him any more.
MR. NARESH: If you know.

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BY MR. TILLERY:
Q. Can you point to a single scientific study or any analysis that Syngenta has ever done or is aware of that would dispute that statement?
A. I can't today point to such a study.
Q. The same redox properties that make paraquat toxic to plant cells and some types of animal cells make it toxic to dopaminergic neurons; that is, paraquat is a strong oxidant that interferes with the function of, damages and ultimately kills dopaminergic neurons by creating oxidative stress through redox cycling?
MR. NARESH: Objection: form; foundation.
A. It has that potential.
BY MR. TILLERY:
Q. So you agree with that statement?
A. I can't dispute that statement.
Q. I'm sorry?
A. I can't dispute that statement, yes.
Q. Paraquat is used by scientists in laboratory studies to produce animal models of Parkinson's disease?
A. That is true.
Q. In animal models of Parkinson's disease hundreds of studies involving various routes of

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exposure have found that paraquat creates oxidative stress that results in the degeneration and death of dopaminergic neurons in the substantia nigra, other pathophysiology consistent with that seen in human Parkinson's disease and motor deficits and behavioral changes consistent with those commonly seen in human Parkinson's disease?
MR. NARESH: Objection to form.
A. I don't know that "hundreds" is a correct description. There are certainly studies that have shown those effects in the brain that you describe, and it is assumed that that may occur through the oxidative stress mechanism.
BY MR. TILLERY:
Q. Studies of in vitro -- strike that. In vitro studies have found that paraquat creates oxidative stress that results in the degeneration and death of dopaminergic neurons?
A. In vitro that is true, yes.
Q. Many epidemiological studies have found an association between paraquat exposure and Parkinson's disease, including multiple studies finding a 2 to 5-fold or greater increase in the risk of Parkinson's disease in populations with occupational exposure to paraquat, compared to populations without such

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exposure?
MR. NARESH: Objection to the form.
A. Some studies have seen that effect. Other studies have seen no effect.
BY MR. TILLERY:
Q. Right but as that's phrased you would agree with the statement?
A. Yes.
MR. TILLERY: Want to take a few minutes break?
THE VIDEOGRAPHER: Going off the record. The time is 3:42.
(Break taken.)
THE VIDEOGRAPHER: Back on the record. The time is 4:09.
(Exhibit 18 marked for identification.)
BY MR. TILLERY:
Q. Before you start looking at Plaintiff's Exhibit 18 I'd like to clear up one thing from the discussion prior to the break. Was ICI aware by 1970 of all of the plausible ways for paraquat to get into the brain that Syngenta is aware of now?
A. I doubt that but I couldn't be definitive about it.
Q. You know we went through and I asked you all

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those questions about what Syngenta knew and you gave me answers. What I'm trying to understand now, would any of them differ with respect to ICI's knowledge of the means by which paraquat could enter the human brain?
A. Well I think that science has moved on and other hypotheses have emerged. We talked about the enteric one, for example.
Q. Right, other than that, and I knew you would say that and I think that's fair, but you said that that's more common in terms of recent days. But other than those, in terms of knowledge about the cerebral spinal fluid or knowledge about the olfactory bulb, or knowledge about transdermal into the bloodstream, were those known in terms of human physiology, in terms of potential routes of access to the brain by ICI in general terms as much as Syngenta now?
A. Yes, I think that's fair.
Q. Thank you. If you wouldn't mind taking a look at number 18, please. And we've given you a shortened version just to make sure that you have easier access to the pages that I'm going to ask you questions about. But if you take a few minutes and familiarize yourself with the study. Take the time that you need, sir.

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MR. NARESH: Just for the record, you gave the witness both the excerpted version you gave me and the complete version?
MR. TILLERY: I gave him both a complete and a short. And if you need the complete one --
MR. NARESH: I can get it.
MR. TILLERY: Thank you. Mr. Orlet, that's 20406.
(Pause. Witness reviews document.)
BY MR. TILLERY:
Q. You ready?
A. I'm ready.
Q. Thank you very much. Exhibit 18 is a 1981 report of a "Lifetime Feeding Study in the Mouse" that ICI performed; correct?
A. Correct.
Q. And this starts at Bates number CUSA-0020408.
A. The title page is 406.
Q. Title page is 406. And the -- if you go to page 408 in the Bates range it says:
"Study Title: PARAQUAT: LIFETIME FEEDING STUDY IN THE MOUSE"
Do you see that?
A. I do.
Q. The study director was M. H. Litchfield?

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A. Yes.
Q. Who was he?
A. He was again a senior toxicologist at CTL.
Q. As far as you know this was the type of information -- this came from production from Chevron U.S.A. so it's another document. As far as you know this was information that would have been shared with Chevron as the work was done?
A. Well I can't comment whether it was shared, but I couldn't dispute it either.
Q. Now what did Mr. Litchfield do at ICI?
A. He was what we would have called in those days a consultant toxicologist largely. So he had -- he provided input in a number of different ways to science issues. But at that time it was customary for such senior people to act as study directors of major studies.
Q. Was he a senior person at that time?
A. Yes, he was.
Q. Okay, if you would please turn to 20411 and the top of that page says "INTRODUCTION". Do you see that?
A. Yes.
Q. And it starts, on the first full paragraph "on assessment" if you'd read that to yourself, please.

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I think you've already probably read that paragraph?
A. So 11 I beg your pardon, yes.
Q. And the study was designed as a cancer study, right?
A. That's right.
Q. It wasn't designed as a chronic neurotoxicity study?
A. No, it was not.
Q. So if you would please turn to the next page, under 2.2 "Animals and Accommodation", do you see that and if you read that section I think you probably already have?
A. Yes.
Q. It says:
"The Alderley Park strain was used since this was the strain used in the previous study and background tumour incidences are available from other mouse carcinogenic studies ..."
A. Yes.
Q. If you look at the top of the page in the first paragraph -- I'm sorry, if you go back a page. It talks about, in the assessment stage, that the study was restarted. Did you see that?
A. Can you just tell me where you're reading that now?

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Q. The second sentence it says:
"However in this study there was a high mortality rate in all groups and some evidence of respiratory infection. In addition, although the original study design was acceptable at that time (1969), it fell short of current standards particularly regarding the duration of the study. As a consequence of this, a new study was commissioned starting 25 October 1977."
A. Yes.
Q. So the first one was scrapped; correct?
A. The first one was -- yes, it was terminated because of -- at a certain period of time because many of the mice had died I think because they'd reached a certain age where that's what happens to mice.
Q. Well if you go to the next paragraph, the second sentence:
"The duration of the study was set to last two years or until approximately 80% mortality occurred in a control group or the study overall ..."
A. That's correct.
Q. If we go now back, this involved feeding Swiss albino mice food laced with paraquat, right? Is that what your understanding was?
A. You're now talking about the earlier study?

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Q. No, the one that is the subject of this report.
A. Right. Okay, that I agree, yes.
Q. And it says here on 14 -- if you go to 14. Do you see a reference to using "expanded portion rat diet with a vitamin E supplement"? Did you notice that they did that?
A. I don't see that on page 14.
Q. I'm sorry. Go to the next page, number 15. I misspoke. "2.4 Specification of Diets, Diet Preparation and Diet Analysis"?
A. Yes.
Q. "... Expanded Portion Rat Diet with a Vitamin E Supplement (PRDE) was used."
Do you know why that was used?
A. I actually do not know why that was done at that time.
Q. Is vitamin E an antioxidant?
A. I can't remember. I would need to check that.
Q. Well let me ask you to assume that it is a --
A. I thought it was but I -- thank you for --
Q. Yes. An antioxidant, okay. And does vitamin E bioaccumulate?
A. Again, I don't know without checking.

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Q. Let me ask you to assume that it does.
A. Why not.
Q. So it is an antioxidant which bio-accumulates okay. And what does bio-accumulation mean?
A. It means the -- a substance or any biological substance which builds up over a period of time in the body.
Q. And because it's an antioxidant that bio-accumulates, increased levels of vitamin E in the body would reasonably be expected to reduce whatever effects the redox cycling of paraquat would otherwise have; correct?
MR. NARESH: Objection to the form.
A. I think it's speculation as to whether that would have happened in the context of a study like this.
BY MR. TILLERY:
Q. Can you rule it out?
A. I can't rule it out.
Q. Giving an antioxidant is a means currently used by clinicians to help people with Parkinson's disease to protect them, protect dopaminergic neurons; were you aware of that?
MR. NARESH: Objection: foundation.
A. I had heard about that. But yes, I can't

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dispute that.
BY MR. TILLERY:
Q. So to provide a neuro-protective device for the substantia nigra?
A. That's the clinical meaning of that absolutely, yes.
Q. And so here these rats were laced with a vitamin E supplement; correct?
A. That's what this says.
Q. A higher level of vitamin E in the body would be expected to provide more protection from the destructive effects of a reactive oxygen species, wouldn't it?
A. Yes, but my understanding of this is that the main part of this study did not involve a diet with vitamin E supplement. That's my reading of this.
Q. I move to strike the answer as non-responsive. Let me ask you again, sir. A higher level of vitamin E in the body would reasonable be expected to provide more protection from the destructive effects of reactive oxygen species, wouldn't it?
MR. NARESH: Objection: form.
A. Again, to me that would be speculative as to whether that would occur if it was given in this way to

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an animal.
BY MR. TILLERY:
Q. Well let's say this. From a purely scientific perspective of what you know about reactive oxygen species and about an antioxidant, is that consistent what I said?
A. Yes, there's nothing scientifically wrong with what you said. Whether it applies in this circumstance I couldn't comment.
Q. Okay. Could you look at number 13 and see what the housing of these animals was, if it was stainless steel cages?
A. Yes.
Q. It was, wasn't it?
A. Yes.
Q. So from a purely scientific standpoint would you agree with me, sir, that effectively the mice were being given an antidote for the redox cycling effects of paraquat?
A. I would find it very difficult to imagine that that was what was intended by what it says here is in the pre-experimental phase feeding the animals that type of diet.
Q. Can you go to 17, on that Bates number, and confirm for me that the urine was collected in a pan at

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the bottom of the cage?
A. Yes. To clarify that's the mice where urine was collected were transferred from where they would normally reside and eating the diet into what are called metabolism cages. So a different device.
Q. And on 17, that 020417, the urine was then analyzed for paraquat, wasn't it?
A. That's right.
Q. If you can now turn to 20549.
A. Okay.
Q. The control mice were the mice that weren't given food laced with paraquat, right?
A. Yes.
Q. No paraquat was detected -- strike that. If you look at 20549, do you see that?
A. Yes.
Q. Where it says "Metabolism cages"?
A. Mm-hmm.
Q. "Metabolism cages were used to collect urine with added paraquat equivalent to that excreted by high dose animals; the cages were washed and autoclaved in the normal manner. They were then returned to the animal cell and used to collect urine from control animals. This urine was found to contain low but detectable levels of paraquat ..."

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And this was the control group?
A. That's right, and that's why they were trying to understand where that had come from.
Q. And they found that it was from cages that hadn't been properly cleaned?
A. Yes because paraquat is known to stick to a number of different surfaces.
Q. And stainless steel is one of them?
A. Including stainless steel.
Q. And that's why I asked you that question. So they were using stainless steel cells for the animals and they found that in the control group that had not been fed the paraquat that they tested positive from the urine collected; right?
A. Yes.
Q. 10 mice that weren't even in the study were tested and found to have paraquat in their urine?
A. Due to the contamination, yes.
Q. Due to the contamination. Okay. So based upon the urine samples that tested, ICI couldn't distinguish between mice that were in the treatment group that got paraquat in their food as part of the study, mice that were in the control group so they couldn't get paraquat on their food, and mice that weren't in the study at all, could they?

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A. And that's why, as I understand it, they subsequently made sure that a revised washing procedure was put in place to reduce the possibility of cross-contamination.
Q. Okay. Would you go to 20511 and read that section to yourself. Conclusion page. Do you see this?
A. I do.
Q. ICI gave two possible reasons for the controlled urine having paraquat in it, didn't it?
A. Yes.
Q. One was a bad laboratory practice in washing the cages, right? And the other one was a bad analytical method, meaning a bad measurement. Correct?
A. I think "bad" is not quite the word I would use here, because I think this was at a time when we were only beginning to really understand how paraquat can stick to surfaces like stainless steel. So in that particular case I think this was a discovery if you like rather than bad practice.
Q. And look at the one rat or one mouse that's referred to here, and it says: there was one female control with paraquat in her urine that neither of these explanations could account for. Do you see that?
A. Mm-hmm.

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Q. So ICI just speculated about the cause and used the results in the study anyway, didn't it?
A. Yes.
Q. Did they discard the data that occurred and was collected before the new washing procedure?
A. I don't know. I've not -- I need to do a more thorough --
Q. Would you have if you were conducting the study?
MR. NARESH: Objection to the form.
A. I think if you don't have an explanation then one option is to take that animal out of the study. That is one possibility.
BY MR. TILLERY:
Q. Would you say that a responsible laboratory method would be to discard all of the results achieved from using contaminated pens or containers for the mice?
MR. NARESH: Same objection.
A. Not necessarily if you're able to actually understand how that happened and that it actually tells you that in reality those control animals did not receive paraquat in their diet, they were not actually exposed to it, then it's okay to include those animals.
BY MR. TILLERY:

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Q. So you think that even though the controls showed they were contaminated and that they found out was due to improper methods of collection because they were using contaminated pens for the animals, that it was still okay to use those test results?
A. It did not, in my view, invalidate the study as a whole, no.
Q. Has ICI relied on those results in that study?
A. It relied in the sense that by the time the study that we're now looking at was conducted, we are talking about the regulatory toxicology requirements that we were discussing earlier today and so it became necessary to include that in some of our registrations or re-registrations. Part of the dossier.
Q. Have you informed the regulatory authorities of the problems with contamination of the pens for the animals?
A. These studies will be made available to regulatory authorities.
Q. But have you told them about that, affirmatively?
A. I don't know whether my colleagues may have specifically pointed that out.
(Exhibit 19 marked for identification.)

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MR. NARESH: Do you have a Bates number for this document?
MR. TILLERY: We do not. If you look in the upper left-hand corner, sir, of the document in number 19 it says "ICI Americas Inc. Agricultural Products, Wilmington, Delaware". Do you see that?
A. Yes, I do.
Q. "Submission for Draft Paraquat Registration Standard"?
A. I see that.
Q. And I'll submit to you that this was obtained from the State of California in a FOIA request and that's why it doesn't show a production Bates number on it. What is this document, sir?
A. Well you haven't yet given me much time to read it.
Q. Sorry. Take your time.
MR. NARESH: Steve, I can't pull this one up on my system.
A. I could spend a lot longer getting into the detail of this that may not be necessary. Maybe we can try where your questions are?
BY MR. TILLERY:
Q. I'm just going to ask a couple of questions about the study, sir. What is the study -- what is the

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purpose of the study, as far as you know?
A. So this is a study in the rat. The previous one we were talking about was the mouse. So it's a two-year, 104-week study which is normal for what is described here as a chronic toxicity study. So it's looking at long-term effects, in this case of paraquat, in the rat.
Q. And when was that done?
A. So the study was completed in 1982.
Q. And it wasn't designed to investigate neurotoxicity, was it?
A. It was not.
Q. It was designed to investigate paraquat's effects on the central nervous system?
A. Not specifically.
Q. Paraquat was mixed into a rat's food in concentrations of 60, 30, 100 and 300 parts per million correct?
A. That's correct, yes.
Q. Would you look at the summary, please, and read that to yourself. And I think that's on pages 6 and 7?
A. Yes, I was looking at that earlier.
Q. Do you see the reference to the brain?
A. I'll just go down that again, please. So in

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paragraph 9.
Q. Okay. Read that in the record?
A. "At week 52 in the 300 ppm group, males showed elevation of thyroid and kidney weights and females displayed a rise in ovary (left) weight and drops in the relative weights of the brain, heart and liver."
Q. Is a drop in the relative weight of the brain in these female rats a finding that suggests neurotoxicity?
A. No, it probably does not indicate that.
Q. And you can tell that in what way?
A. Because it's an organ which is subject to changes in relative weight due to changes in body weight.
Q. And was that the conclusion of the study group?
A. I'm not sure whether I've seen a particular comment about that. That's my assessment of it.
(Exhibit 20 marked for identification.)
Q. Number 20, another study "Paraquat: Combined Toxicity and Carcinogenicity Study in Rats". Do you see that?
A. Yes.
Q. At the bottom it's Imperial Chemical

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Industries PLC?
A. Yes.
Q. What's the date of the document? Upper right-hand corner.
A. 27 October 1983.
Q. And this is a Chevron document 241880 it starts in the Bates range; correct?
A. Okay.
Q. If you'd take a minute and look at that, please?
A. Again, I could spend a long time going into the detail of this if you wish to proceed?
Q. What was the purpose of the study, sir?
A. So this --
Q. Go to 241899 if you want that will tell you exactly what it says?
A. Repeat that number, please?
Q. 899, purpose of the study?
A. Yes, to investigate the chronic toxicity -- chronic effects of paraquat including whether it may cause neoplasms, in other words whether it could cause carcinogenicity, rats in this case, using dietary exposure over what would normally be the treatment period of 104 weeks but a treatment was continued in this particular study until I believe 50 percent of the

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animals were dead.
Q. And this study was reported 10/27/83?
A. That's right.
Q. And it was performed by ICI Americas, or for them?
A. For them certainly, yes.
Q. By Life Science Research?
A. Correct.
Q. And it was not designed to investigate neurotoxicity of paraquat, correct?
A. It was not, no.
Q. Imperial Chemical Industries Plc, what is that?
A. That is what the company name had become by that time. The term Plc is a U.K. -- it's a limited company basically so ICI that was the name of the company.
Q. It's the same entity?
A. Same as "Limited". It used to be called "Limited" and then became "Plc".
Q. That's the same toxicology laboratory Alderley Park, exactly the same entity?
A. That's correct.
Q. Now, does Syngenta believe the results of this study show paraquat is not neurotoxic? Do you

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know one way or another?
A. I don't know whether a conclusion was made on that specific point.
Q. The treatment in the study was initiated on April 6, 1978. Do you see that?
A. Yes, I did see that.
Q. ICI knew by 1978 that paraquat entered the brains of experimental animals, didn't it?
A. We've established that earlier, yes.
Q. All right. Now, please turn to 241914, "Paraquat tissue levels"?
A. Yes.
Q. Was brain tissue tested?
A. This suggest not.
Q. They didn't test brain tissue, did they?
A. This is talking about paraquat tissue level so that's how much paraquat may have been in these tissues.
Q. Look through the study and see after they dosed these animals for two years and had them and sacrificed them, and then studied liver, lungs, kidneys whether or not you see any evidence of them testing the brains?
A. By "testing", if you're indicating --
Q. Analyzing them.

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A. They were analyzed in the way that you would do normally in a study like this which is the pathology and the histopathology.
Q. Where does it show that?
A. Because I saw evidence of effects that were supposedly seen in the brain. I thought I noticed that as I was going through.
Q. Did you see evidence of numbers of cysts or cystic spaces in the spinal cord?
A. Yes, that's one of the things I noted.
Q. So you saw evidence of it but do you see any evidence that they actually looked at the brain itself?
A. Well this is where I would need to get into the detail and I haven't had a chance to look at all -- these will be in the tables I would need to go through.
Q. Quickly look at this and confirm this, if you wouldn't mind. Whether one of the findings of the study was that animals given paraquat had "hydrocephalus degeneration of the nerve fibres of the sciatic nerve, and an increase in the numbers of cysts or cystic spaces in the spinal cord."
Did you see that?
A. I did see that, yes.
Q. Those are effects on the central nervous system, aren't they?

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A. The sciatic nerve is not necessarily on the central nervous system.
Q. But the spinal cord is, isn't it?
A. Yes.
MR. TILLERY: Let's go off the record for a moment.
THE VIDEOGRAPHER: Going off the record. The time is 4:55.
(Whereupon, the deposition continued the following day).
MR. TILLERY: We'll stipulate the exhibits will be left for tomorrow's court reporter.

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CERTIFICATE OF COURT REPORTER

I, Chanelle Malliff, an Accredited Real-time Reporter of the United Kingdom and Europe, hereby certify that the testimony of the witness Dr. Philip Botham in the foregoing transcript, numbered pages 1 through 240, taken on this 25th day of February, 2020 was recorded by me in machine shorthand and was thereafter transcribed by me; and that the foregoing transcript is a true and accurate verbatim record of the said testimony.

I further certify that I am not a relative, employee, counsel or financially involved with any of the parties to the within cause; nor am I an employee or relative of any counsel for the parties; nor am I in any way interested in the outcome of the within cause.

Chanelle Malliff

Signed: .....
Name: CHANELLE MALLIFF
Date: February 26, 2020

Ragan Naresh, Esq.
ragan.naresh@kirkland.com
March 2, 2020
RE: Hoffmann, Diana v. Syngenta Crop Protection LLC
2/25/2020, Dr. Philip Botham (#3984456)

The above-referenced transcript is available for review.

Within the applicable timeframe, the witness should read the testimony to verify its accuracy. If there are any changes, the witness should note those with the reason, on the attached Errata Sheet.

The witness should sign the Acknowledgment of Deponent and Errata and return to the deposing attorney. Copies should be sent to all counsel, and to Veritext at cs-ny@veritext.com.

Return completed errata within 30 days from receipt of testimony.

If the witness fails to do so within the time allotted, the transcript may be used as if signed.

Yours,
Veritext Legal Solutions

Hoffmann, Diana v. Syngenta Crop Protection LLC
Dr. Philip Botham (#3984456)

ERRATA SHEET

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Dr. Philip Botham Date

Hoffmann, Diana v. Syngenta Crop Protection LLC
Dr. Philip Botham (#3984456)

ACKNOWLEDGEMENT OF DEPONENT

I, Dr. Philip Botham, do hereby declare that I have read the foregoing transcript, I have made any corrections, additions, or changes I deemed necessary as noted above to be appended hereto, and that the same is a true, correct and complete transcript of the testimony given by me.

_____
Dr. Philip Botham Date
*If notary is required

SUBSCRIBED AND SWORN TO BEFORE ME THIS
_____ DAY OF _____, 20___.

_____
NOTARY PUBLIC

IN THE CIRCUIT COURT
TWENTIETH JUDICIAL CIRCUIT
ST. CLAIR COUNTY, ILLINOIS

- -

DIANA HOFFMANN, individually and as Independent Administrator of the Estate of THOMAS R. HOFFMANN, Deceased, et al.,
Plaintiffs,
Case No.: 17-L-517
v.

SYNGENTA CROP PROTECTION, LLC, et al.,
Defendants.

- -

February 26, 2020
9:13 a.m.

CONTINUED VIDEO DEPOSITION of DR. PHILIP BOTHAM, held at the offices of Kirkland & Ellis LLP, located at 30 St. Mary Axe, London EC3A 8AF, United Kingdom, before Laura Evans, Accredited Court Reporter of the United Kingdom and Europe.

C O N F I D E N T I A L

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Mark Smith, in-house, Syngenta
Philip Viner, Videographer, Veritext

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WITNESS INDEX

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EXHIBIT INDEX

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2016, Brazil
Exhibit 41 Email exchange dated 22 June 2007 ...459
subject "Study titles".

PHILIP BOTHAM
having been duly sworn testified as follows:
THE VIDEOGRAPHER: Good morning. The date today is February 26, 2020. The time of commencement is 9:13 am. This is Day 2 in the deposition of Mr. Philip Botham.
I would just add for the record that the court reporter today is Ms. Laura Evans, and the videographer is Philip Viner, both of Veritext.
With that you may continue your questions.
MR. NARESH: Before you start, Steve, I think I didn't do this on the record yesterday: we will read and sign and the transcript should be marked "confidential" in accordance with the protective order in the case.
MR. TILLERY: Are you ready to resume the deposition, Mr. Botham?
THE WITNESS: I am.
EXAMINATION BY MR. TILLERY (continued):
Q. Can you give me your understanding and definition of Parkinson's disease.
A. Parkinson's disease is a neurodegenerative disease which is focused on the region of the brain called the substantia nigra. The specifics neurodegeneration is what are called dopaminergic cells in that region.
When a significant proportion of those cells have died, then that results in the clinical symptoms of

Parkinson's disease, which are related to changes in motor function but there are other clinical symptoms as well as, but in short, that's -- that is Parkinson's disease.
Q. What is alpha synuclein?
A. Alpha synuclein is a protein which can be found in -- including in cells in the brain.
Q. And what role does the misfolding of alpha synuclein have in Parkinson's disease?
A. It's, again, perhaps -- as I said yesterday, I'm not a clinical neurologist, but my understanding of alpha synuclein is that it's believed to play some role in Parkinson's disease.
Some people believe it has a pathological role, in other words it's in some way causing some of the symptoms that we have been describing; but I have heard others say that it has a protective effect. So I think there is still some uncertainty about precisely how alpha synuclein would work.
Q. What are the risk factors for Parkinson's disease?
A. The biggest factor that I am aware of is genetic. So there are a number of people who would have genetic susceptibility. I believe that that is particularly so for people who get early onset Parkinson's disease.
Q. And could you define what early onset Parkinson's disease is?

A. Again saying I'm not a clinical neurologist so my accuracy here may not be complete, but that would generally mean people who are under the age of 60. There are other risk factors which are known. Head jury is a similar one --
Q. I'm going to work through those.
A. Yes.
Q. Yes. When you used the word biggest factor, what do you mean by that?
A. In terms -- quantitatively, yes.
Q. Okay. What is Syngenta's position or conclusion as to whether exposure to paraquat causes or contributes to cause Parkinson's disease?
A. Our position is that whilst there is biological plausibility that the chemical properties of paraquat could cause damage to cells in the substantia nigra, so we certainly don't deny that that is a plausible hypothesis, but the overall evidence based on studies in animals -- the mouse model particularly -- and the epidemiology studies do not allow you to conclude that paraquat is a causative factor in Parkinson's disease.
Q. And were Syngenta to see the mass of scientific evidence shift to the point where all the key studies are replicable in independent laboratories, what would Syngenta's position be about the ongoing manufacture and sale of paraquat?

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MR. NARESH: I object to the form and scope.
You can answer.
A. Clearly if the evidence became more convincing that there was an association and indeed a causation, then we would need to consider what appropriate steps might be taken.
BY MR. TILLERY:
Q. And what quantum of evidence would Syngenta require to reach that stage?
MR. NARESH: Same objections.
A. That would include more evidence from the two strands that I mentioned previously. So if the experimental research studies were lending further evidence to paraquat being a causative agent, or epidemiology goes beyond what it currently does which is very equivocal on this subject, then we may be in a position where we need to take a different view.
BY MR. TILLERY:
Q. And would the different view include terminating the sale of the product -- product paraquat?
MR. NARESH: Same objections.
A. I wouldn't rule that out if the evidence became so strong. But at this stage I think we are some way from being in that position.
BY MR. TILLERY:

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Q. You indicated a minute ago there was a plausible mechanism for paraquat causing damage -- neurological damage -- in the substantia nigra portion of the human brain; do you remember?
A. I do.
Q. How long has Syngenta been aware of that mechanism?
A. We have been aware that paraquat can cause what is called oxydative damage because of its redox cycling capability for many years. What we still don't know is whether that potential -- and I think it is important to talk about this as potential -- to have to express that effect, that mechanism, in a particular region of the brain, that that is still -- why it's plausible but not a proven hypothesis.
Q. Did ICI know that as well?
A. ICI have known that paraquat has that mode of action that I have just described, yes.
Q. At least for the time you were there, right?
A. Yes.
Q. Okay. Has Syngenta ever tried to market a treatment for Parkinson's disease?
MR. NARESH: Objection, scope.
A. I am not aware of a treatment. But we certainly are very actively -- we always actively support the use of general treatment procedures.

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So we have not developed a treatment ourselves, but we would -- we encourage the use of appropriate treatments to -- that are used in acute poisoning, such as the use of Fuller's Earth and deactivating -- other deactivating materials.
Q. So you have not generated your own treatment for Parkinson's disease?
A. Not generated it per se, no. No, we have used existing mechanisms --
Q. Used it from other people?
A. Correct.
Q. Okay.
Now what is our next exhibit number you have?
(Exhibit 21 marked for identification)
BY MR. TILLERY:
Q. And would you mark this as 22, please.
(Exhibit 22 marked for identification).
BY MR. TILLERY:
Q. Have you ever seen exhibit 21 before?
A. No, I have not seen this exhibit.
Q. Were you aware of this process?
A. I was aware of the -- the research that had gone on with this, yes.
Q. And let's, first of all, describe for the record what number 21 is.

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A. Would you like me to do that or --
Q. Yes, please.
A. Well, I just will take a little while to read this, if I may.
Q. My questions will be general in nature.
A. Okay.
Q. This is a patent, right?
A. It is. It is, yes.
Q. And it shows the "Inventors/Applicants" as John Doe -- and that is actually a man's name, right?
A. Yes, correct.
Q. And he works for Syngenta?
A. He did work for Syngenta.
Q. Okay. And then there is a person named Nicholas Sturgess; correct?
A. Yes.
Q. And Kim Travis, right?
A. Yes.
Q. They all work, or both worked, at one point --
A. That is correct.
Q. -- for Syngenta?
A. That is correct.
Q. And this was issued in what date? 2006?
A. That's correct.
Q. Okay. And in general terms what do you understand

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this patent to involve?
A. Well, in very broad terms, this was a -- the patent was based on -- again I use the word "hypothesis", that this particular agent that is the subject of this patent could have utility in the treatment of Parkinson's disease. But I believe -- I believe -- that its actual use has actually never come to pass. But I maybe wrong about that, because this work originated with Syngenta but I believe was then passed on to another company.
Q. So would it be fair to say that the patent deals with the treatment by expanding the effectiveness of levadopa and other treatments in the substantia nigra of the human brain?
A. That was the hope in bringing this forward.
Q. And this was 2006, done by Syngenta employees while they were on duty?
A. Yes.
Q. And as a consequence of that, if you look at exhibit 22, they did, as is typical, assign their patent rights to Syngenta, didn't they?
A. Yes.
Q. Okay.
Do you know what the Brock theory is, sir?
A. I have an outline understanding of it, yes.
Q. Do you understand whether it includes the olfactory

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bulb as a route of access to the mid-brain?
A. It certainly includes that, yes.
Q. Has the olfactory bulb been implicated as an initial site of Parkinson's disease pathology?
A. It has. As what is called one of the prodromal symptoms, where -- the loss of smell.
Q. Do you know if Chevron quit producing and selling paraquat because of the likelihood of it causing Parkinson's disease?
MR. NARESH: Objection to scope.
A. I cannot comment on behalf of Chevron.
BY MR. TILLERY:
Q. ICI and Chevron were working a joint venture at that time, weren't they?
MR. NARESH: Same objection.
A. They were.
BY MR. TILLERY:
Q. You don't know why Chevron told ICI that they no longer wanted to sell -- manufacture and sell the product?
A. I don't know why they -- they said that, no.
Q. Okay. Did you ever attempt to develop any formulation of paraquat products with the intent of reducing the exposure of users to paraquat? Again, when I say "you", I mean Syngenta.
A. Yes, we did.

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Q. And that also includes ICI?
A. It would have started in the -- when ICI was the company, yes. That is correct.
Q. So you tried an alternative product --
A. We --
Q. Or a means of improving the safety of the product?
A. We did.
Q. What did you do?
A. We tried to develop formulations of paraquat which, if accidentally or deliberately, were ingested, would not be absorbed by the stomach as readily in order to be able to allow for more effective and quicker treatment.
Q. And this was a form of emetic, wasn't it?
A. Emetic was one of the agents that we used.
Q. And this contemplated a larger ingestion, for example, a teaspoon or more of paraquat?
A. It certainly contemplated that scenario, yes.
Q. Someone accidentally or perhaps even intentionally taking the product, you were designing a product that caused them, in addition to paraquat, to vomit to eliminate this product from their body and perhaps save their lives?
A. Because at that time that was considered by medical experts to be something that would have potential utility in the way in which you have described.
Q. With respect to the active ingredient of paraquat,

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would it be safe to say that since 1962, when it was first used in the UK, and then three years later in the United States in 1965, has the molecule been the same?
A. As far as I'm aware, the molecule is the same.
Q. And so far as you know, there's been no effort to change the molecular structure of that chemical --
A. I'm not --
Q. -- in order to affect or change the potential health effects on users or consumers of the product?
A. I -- I'm not aware of any attempt to change the fundamental structure of the molecule.
Q. If you wanted to test a hypothesis that repeated low dose exposures to paraquat over several years could cause or potentially cause Parkinson's disease, how would you do that, sir?
MR. NARESH: Objection to form.
A. Well, the normal toxicological practice would be to see if you can see effects in an appropriate laboratory animal model, and to consider what the appropriate routes of exposure and duration of exposure should be.
BY MR. TILLERY:
Q. More granularly, how would you do it?
MR. NARESH: Same objection.
BY MR. TILLERY:
Q. In other words how would you design this, if you

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were the lab lead scientist assigned to this product? How would you do that?
MR. NARESH: Same objection?
A. Well, you would first of all have to ascertain what end point, what effects you would want to detect in that animal model, regardless of the factors I have just been mentioning, and therefore you would want to see whether the hallmarks of Parkinson's disease that you see in a human could be seen and detected in such an animal model. So that would include the pathology in the relevant part of the brain, levels of dopamine and other such factors.
BY MR. TILLERY:
Q. Would your proposal include looking at the role of alpha synuclein in the development of Parkinson's disease?
MR. NARESH: Same objections.
A. It could. But as I said earlier, we are still unsure of exactly what role alpha synuclein has. So one would, I think, include that with some caution because it might be difficult to interpret the findings.
BY MR. TILLERY:
Q. How many studies has Syngenta done of alpha synuclein impact by paraquat?
A. We have not done very much in the way of addressing specifically alpha synuclein ourselves.
Q. Have you done one study?

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A. I don't recall if we have done one study. We may have done. I don't recall.
Q. You don't remember ever seeing one?
A. Not -- I don't remember now seeing a Syngenta study where we have looked at --
Q. Have you -- sorry.
A. No, it's fine.
Q. Have you ever asked a third party to do a study that evaluated the role of alpha synuclein in the development of Parkinson's disease with respect to paraquat?
A. We have had conversations with other scientists about alpha synuclein, but again I can't recall that we've ever asked a third party to include this in any of their experiments.
Q. Is alpha synuclein included in the tests you did in the paraquat mouse model, such as the Breckenridge line of studies?
A. No, I don't believe it is included.
Q. Has paraquat been shown to cause an upregulation of alpha synuclein in laboratory animals?
A. I believe that in some other -- in some studies that other researchers have done, that that is the case.
Q. And for the record, would you describe briefly what upregulation of alpha synuclein means?
A. It means that there is a change -- usually meaning

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an increase, when you talking about upregulation -- to the expression or the amount of alpha synuclein in a particular part of the body.
Q. Is Lewy body pathology a pathological hallmark of Parkinson's disease?
A. I think that is generally true.
Q. Does alpha synuclein misfolding comprise the majority of proteins in the Lewy bodies?
A. Again I think that is largely seen to be true, yes.
Q. And Parkinson's disease -- strike that question.
Can paraquat cause a misfolding of the alpha synuclein?
A. I'm not aware that there's any clear cut evidence of that.
Q. And there has been no test done by Syngenta to verify it one way or another?
A. We have certainly not looked at that specific parameter.
Q. Did Lewis Smith and Charles Breckenridge seek approval to perform exactly those studies?
A. We -- I certainly recall that we had discussions within our health scientists team about this on more than one occasion. But as I said earlier, the view was that although it was one possible avenue of research, the overall decision was that it was too uncertain that we would be able

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to interpret the findings.
Q. And just so we are clear, when I mentioned those two scientists, Charles Breckenridge was until recently in what role at Syngenta?
A. He was a senior toxicologist in our North American toxicology department.
Q. And you described Lewis Smith, but he was in a similar position in the UK; correct?
A. He had a number of senior roles in product safety and in the company more widely.
Q. So two very high ranking scientists in the Syngenta organization sought that.
Who did they need approval from in order to secure the approval to do the test and to get the funding?
A. Discussions of that sort, where we were proposing possible lines of research, were discussed within the paraquat health scientists team, which Lewis Smith was initially the -- the head of that team, and subsequently I became the head.
And we would, ourselves, make recommendations -- in some cases a strong recommendation -- about which line of research we should take and they were then further discussed with a group of more senior leaders in the company called the Paraquat Issues Leadership Team.
Q. And who sat on that committee you are referring to?

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A. The Paraquat Issues Leadership Team included -- and this is not an extensive list -- the head of research and development, a senior attorney -- a senior lawyer -- a senior person in the marketing department, other people in R&D, and the head of regulatory affairs.
Q. And let's assume they agreed that these studies should be undertaken. Was that the final authority or did they need to seek approval from yet a higher level in the company?
A. In normal terms, experiments would not require any further approval.
Q. Is the Syngenta executive committee involved in any of this process?
A. Only occasionally when there are some specific circumstances where we feel that we would like their opinion.
Q. Not just their opinion, their approval; correct?
A. And sometimes -- sometimes their approval.
Q. And for the record, describe what the Syngenta executive committee is?
A. The Syngenta executive committee, now called the Syngenta executive team, is the most senior group of leaders in the organization. So it is chaired by the Chief Executive Officer.
Q. These are the people who make the final decisions in

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the company; correct?
MR. NARESH: Objection to scope and form.
A. They make the strategic decisions for the company. Of course, a lot of decision-making is delegated to appropriate organizations within the company.
BY MR. TILLERY:
Q. Is there any higher form of authority at the company than the Syngenta executive committee?
A. Well, the chairman of the executive committee reports to the Syngenta -- or did report to the Syngenta board, so in that sense there is a higher authority.
Q. Could you tell me the names of the people on the paraquat leadership team?
A. So the Paraquat Issues Leadership Team.
Q. Yes. You referred to it as PILT?
A. Yes, the PILT, that's right.
Q. Okay?
A. Well, that's quite a difficult thing to do. It has existed for a long period of time and the names have changed so ....
Q. So it's different. I'm not trying to put you through a memory test, so okay.
A. Yes.
Q. Is there a group now?
A. There is a group which acts in that same capacity,

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although it's generally actually not used in the same way as it was before. It's a smaller group of people now who can help with this.
Q. Was the Syngenta executive committee involved in approving the studies that resulted in the Breckenridge and Minnema published studies?
A. The executive committee were informed about that at a point in time, but they were not -- we did not need to seek their approval to do those tests.
Q. Okay, but they were told about it?
A. I personally reported to them at one time, certainly, yes.
Q. Irrespective of whether or not they get involved at a level of approving or disapproving, are they informed of these types of studies at paraquat?
A. They are informed about the broad direction of the program, and from time to time they are given some detail where that is considered to be appropriate.
Q. Doesn't the Syngenta executive committee approve the entire Syngenta research project budget?
A. They -- the Syngenta executive committee would certainly approve the R&D budget, that is correct.
Q. Okay. What studies has Syngenta performed -- or had performed -- which investigated whether paraquat causes upregulation? Did we cover that?

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A. We covered that.
Q. All right, forget that.
Now, you mentioned head injury before and I told you we would come back to that. Do you think head injury is a risk factor?
A. Well, I think there is certainly some evidence that suggests that, which is why I mentioned it. And head injury appears to be a potential risk factor for other neurodegenerative diseases, not just Parkinson's.
Q. Can you tell me the mechanism that you believe causes head injury to become a risk factor for Parkinson's disease?
MR. NARESH: Object to the scope, the form.
Go ahead.
A. No, I can't tell you that. Because that's, again, a level of knowledge which I've never really explored.
BY MR. TILLERY:
Q. And you mentioned earlier that more sporadic cases of Parkinson's disease, other than those that you said were early onset, they start around -- they average around 60?
A. Again, I think that I wouldn't -- I would say that early onset Parkinson's is generally something that would be in people who are under the age of 60. Parkinson's disease as a whole is a disease of older age.
Q. And is age itself -- aging itself -- a risk factor

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for Parkinson's disease?
A. Indeed, that is probably in itself the biggest risk factor.
Q. And why is that? What is it doing in terms of the causative effects of Parkinson's disease, from your standpoint?
A. Again, really as a layperson in the clinical aspects of this, I would simply say that as you grow older things like repair processes and normal functioning of the body will tend to be less effective, thus leading us to be prone to a number of diseases.
Q. Let me ask you in terms of the research: you have a specific committee at Syngenta that deals with Parkinson's and paraquat, right?
A. We have a -- a health science team, yes.
Q. And that health science team has a name that applies to paraquat and Parkinson's studies, right?
A. Correct.
Q. What is that group called?
A. The paraquat health scientists team.
Q. And that explores and investigates the relationship between paraquat and Parkinson's, at least in part; correct?
A. It does.
Q. All right. Now, that committee and you -- you are heading it, that committee, or you did; right?

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A. I still do.
Q. You understood that typical onset in the absence of a genetic -- strong genetic -- predisposition to have onset irrespective of any kind of external toxicant, okay, like an environmental factor, paraquat for example, would occur normally much earlier than 60 years, you knew that?
A. Early onset Parkinson's disease occurs before 60, yes.
Q. Okay. And you understood that in the literature that often ranged from late 20s to 30s and 40s?
A. It --
Q. You knew that, right?
A. We knew that, yes.
Q. All right.
But the traditional kind where scientists are investigating the effects that are not generated by some genetic predisposition, but instead by environmental factors, are in the sporadic group that typically -- not always but typically -- start around age 60; you knew that?
A. I would say it was generally above 60. I think that Parkinson's --
Q. Over 60, perhaps --
A. Certainly well over 60.
Q. And for those of us who are over 60, okay, the stage of life would be like, what, the last fourth of our life,

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typically?
A. That's about right, yes.
Q. Right, okay. Now if we are using the model -- human model -- and we are talking about people exposed to paraquat or exposed to any other external toxicant and looking at those, and they typically wouldn't develop the condition until their 60s or later, can you tell me if you are using animal models whether it is appropriate to use a very, very young animal?
MR. NARESH: Objection to form, scope.
Go ahead.
BY MR. TILLERY:
Q. What I mean by that is let's say a mouse that lives for two years. We talked yesterday about mice and they were dying and you said that typically could be the end of their lives, two years, right? And these were six to eight week old mice that you were using in the studies, right?
A. When we first started to administer paraquat, that is correct.
Q. Okay. And can you extrapolate the effects of paraquat as a toxicant in these mice that are six to eight weeks old to the outcomes from the same exposure in the natural environment for people who have an onset at age 60 or later?
A. Toxicology is always based on an understanding that

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the animal model cannot be necessarily an accurate mimic of the human being. And you sometimes have to compensate -- for example, for the factor that you have just mentioned -- by exaggerating the way in which you expose the animals to a substance, to give very high doses, for example.
And yes, you can use different ages of animals, and we ourselves did use older animals than six to eight weeks in some of our experiments. But you are never in a position to accurately replicate what might happen in the human being, and, if I may just add, it's not clear when the disease of Parkinson's disease -- of Parkinson's actually starts in the human being.
Q. Let's talk about that for a second. Let me ask you, what age does a six to eight week old mouse translate to in terms of the human being?
A. A mouse would normally have a life span of around 18 months.
Q. Okay. So a six to eight week old mouse is, what, just passed a -- not even a teenager yet, in human terms, right?
A. If you want to extrapolate that, yes.
Q. If you take the study out for four weeks or six weeks, you have moved them up to maybe the beginning of their teenage years in human terms, right?
A. Yes.

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Q. Have you ever in your life read any accounts of people who were in their teens contracting Parkinson's disease that was not caused by some genetic predisposition?
A. No.
Q. All right, thank you.
Does well water cause Parkinson's disease?
A. I don't know. But there is, again, a hypothesis that it could, due to the presence of microorganisms in the well water.
Q. Or due to the presence of pesticides?
A. What I have seen is that microorganisms in well water have been hypothesised.
Q. But you have not done research to determine that; is that correct?
A. No, we have not.
Q. Do you know what percentage of people with Parkinson's disease have genes that give rise to the disease without any environmental factor?
A. I wouldn't be able to answer that.
Q. Are you aware of any geographical areas or occupational groups that have a greater than expected incidence of Parkinson's disease?
A. Again, I'm not a expert in this field. So again in broad terms, I sometimes read that there are such effects but they are not remarkable. There is nothing that strikes

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you as being very clear in that area.
Q. So would a -- let's say a odds ratio of two or three or four to one, that odds ratio for developing Parkinson's disease, would that be something that would get your attention?
A. It's, again, an area where you would have to consult with epidemiologists as to what a significant odds ratio would be. But certainly, yes, again in general terms, odds ratios of that sort you would want to look at to see whether you could understand where that might have come from.
Q. And for the court and ladies and gentlemen of the jury, what that means, by odds ratios of those types, means odds ratio 2 means that you are twice as likely to get Parkinson's disease, right?
A. That's correct.
Q. Three, three times more likely?
A. Yes.
Q. Four, four times more likely?
A. Yes.
Q. Is that what your understanding is --
A. That's my -- that is what odds ratio means.
Q. What is a potentially referable finding?
A. This is associated with the United States Environmental Protection Agency legislation, which in shorthand is called 6(a)(2), where findings in, for example,

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in toxicology studies but not exclusively in toxicology studies, may need to be reported to the US EPA.
Q. And does Syngenta have a committee known as the Potentially Referable Finding Committee?
A. It does, and that is a committee which is based in our United States organization.
Q. You mentioned using high doses of testing chemicals or tested chemicals in animals to exaggerate the exposure to make up for your inability to perfectly replicate real world exposure; do you remember that?
A. I do.
Q. Right. How would that make up for using animals that were the equivalent of teenagers at the end of the study?
A. I am not claiming that it necessarily would. I was making a broad point there that toxicology studies, because they can never accurately replicate what happens in a human being's lifetime, will take actions such as exaggerating the amount that is given to the animal, but not exclusively that.
Q. You agree with me that it would not make up for that difference of using young animals, would it?
A. You can't say that it would; equally, you can't say that it would not.
Q. Hasn't it been Syngenta's position that the high

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doses in your paraquat mouse study are not relevant to real world exposure?
A. That is a different question. Because what our argument there is, is that it's the route of administration which is particularly of concern. Which I have to say is a view also shared by the US Environmental Protection Agency.
Q. And you actually suggested that to them, didn't you?
A. We certainly came to that view ourselves, because here, for the record, we are talking about injecting paraquat into the intra-peritoneal cavity, which was clearly a very big exaggeration, if you like, of the way --
Q. You have done that consistently for years in studies, haven't you?
A. We did that for two reasons. One for the reason we just indicated so that we are not trying to -- not -- look to see whether the mouse might have the capability of showing Parkinson's pathology, but also because our -- and more importantly -- because our research efforts were directed to see whether the finding that other people have shown using this route of exposure is repeatable.
Q. Did you suggest that to the US EPA or did they suggest it to you?
A. I -- neither applies.
Q. So you didn't go to the US EPA and suggest that

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intra-peritoneal injections of mice for studies of paraquat are not appropriate, you never suggested that, is that what you are telling me?

MR. NARESH: I will object to the scope.

A. I may have misunderstood your question at first when you used the term "suggest". We certainly gave an opinion to the EPA that as a route of administration it was certainly not physiological.

BY MR. TILLERY:

Q. And you gave that opinion before they ever published a similar statement publicly, right?

MR. NARESH: Same objection.

A. I believe that would be correct in terms -- at the time, yes.

BY MR. TILLERY:

Q. Does your position with respect to the route of exposure being the issue mean that high doses themselves are not a concern?

A. No, high doses are -- in of themselves are still appropriate to consider. So we also did -- the Minnema paper that you referenced was where we gave paraquat through a more normal route of exposure, in their diet, but that was still at high doses.

Q. I'm going to come back later on the issue of potentially referable findings, okay. But I wanted to at

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least inquire before the rest of this deposition today and just see if we can summarize, without getting into all of the details which we will touch later.

A potential referable finding refers to some adverse effect, doesn't it?

A. It does.

Q. And your committee evaluates whether certain adverse effects require reporting them, correct?

A. That is their responsibility, yes.

Q. And there's regulatory authorities all over the world which you have an obligation to report to, right, not just the US regulatory authority?

A. That is true.

Q. And those include where you sell, manufacture, market paraquat?

A. Yes.

Q. How many of those countries are there?

MR. NARESH: Object to scope.

A. Where we -- where we market paraquat?

BY MR. TILLERY:

Q. Yes.

A. I am not able to give you answer.

BY MR. TILLERY:

Q. How many countries -- strike that.

In how many countries has paraquat been banned?

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MR. NARESH: Objection to scope.

A. Again, I can't give you an accurate number.

BY MR. TILLERY:

Q. If I told you it was over 32, would you dispute that?

MR. NARESH: Same objection.

A. I would not dispute that.

BY MR. TILLERY:

Q. Okay.

So the potential neurotoxic health effects of paraquat are required to be reported to regulatory authorities, correct?

A. It's not quite as straightforward as that. The reporting requirements are -- also say that the finding has to be new. A new finding. So if it is deemed already to be known by the agency, then that requirement is not -- is not in place.

Q. Well, more specifically, would you agree that withholding scientific findings from the regulatory agencies about the neurotoxic effects of paraquat would be inconsistent with compliance with the regulatory authorities?

MR. NARESH: I will just object to this. It calls for a legal conclusion.

You can answer to the extent you know.

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A. If the -- if all the criteria had been addressed and we believed that the -- we needed to report, then we would certainly always have done so.

BY MR. TILLERY:

Q. You understood -- and I again mean Syngenta -- that when the US Congress amended FIFRA -- you know what FIFRA is?

A. I do.

Q. In 1972, it adopted a very broad reporting requirement, typically referred to as a section 6(a)(2) requirement, right?

MR. NARESH: I will object. It calls for a legal conclusion --

A. Indeed, 6(a)(2) is what I referred to in my earlier answer.

MR. NARESH: Steve, can I have -- to the extent that I suspect we are going to have a number of objections to the extent calling for a legal conclusion, can I just have a standing objection as to that?

MR. TILLERY: Absolutely.

BY MR. TILLERY:

Q. Do you understand that section 6(a)(2) requires pesticide registrants like Syngenta to report to the Environmental Protection Agency information concerning -- and I'm quoting:

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"Any unreasonable risk to man or the environment."
Of their products? Did you know that?
A. I did know that.
Q. Okay. And do you know that FIFRA section 14(b) authorizes criminal prosecution of a registrant who knowingly violates FIFRA?
A. I did know that.
Q. All right. Sections 12(a)(2)(n) and (q) make it unlawful for a registrant:
"... to fail to file reports required by the subchapter."
Or to:
"Falsify all or part of any information relating to the testing of any pesticide including the nature of any observation made or conclusion or opinion formed submitted to the administrator or that person knows will be furnished to the administrator."
Did you know that?
A. I did know that.
Q. You are also aware that false statements to the EPA are also unlawful under the Criminal False Statement Statute which provides:
"Whoever falsifies, conceals or covers by any trick, scheme or device a material fact or makes an immaterially false fictitious or fraudulent statement or representation,

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or makes or uses --..."
(Fire alarm test)
BY MR. TILLERY:
Q. "... or makes or uses any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement ... or shall be fined under this title or imprisoned for not more than five years."
Did you know that?
A. Yes, I did.
Q. That is 18 USC section 1001. You know that, right?
A. I don't know all the detailed numbers.
Q. But you knew in general --
A. I know in general what this says --
Q. You can't lie about this stuff and you can't withhold information, you knew that?
A. I knew that.
Q. If you've got information, you got to turn it over, right?
A. I know that.
Q. It is an absolute obligation to do it, if you are selling a product that they are in control of in terms of regulation and that can cause harm to the consumer, right?
MR. NARESH: Object to scope.
BY MR. TILLERY:
Q. Is that correct?

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A. It is correct. But I would repeat that there are -- there is detailed guidance there on exactly what that means in terms of the findings.
Q. I am actually going to get into this, okay.
You are aware that the EPA regulations require registrants to report information that is relevant to the assessment of the risks or benefits of one or more specific pesticide registrations currently or formerly held by the registrant.
Correct?
A. Yes.
Q. And of course paraquat is one of those because Syngenta is a primary registrant of the chemical paraquat, right?
A. It is.
Q. In the United States and elsewhere, correct?
A. It is.
Q. And you knew that information is relevant to the assessment of the risks or benefits if it includes the conclusions or opinions of a person (i) who is employed or retained by the registrant and was likely to receive such information, (ii) from whom the registrant requested an opinion or conclusion, or (iii) who is a qualified expert as described in the codafel(?) regulations.
You knew that as well?

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A. We did.
Q. Okay. You knew that conclusions and opinions of Syngenta employees and retained experts relevant to the assessment of the risks or benefits of a regulated chemical must be reported to the US EPA?
A. Yes, yes.
Q. Did you know that?
A. Yes.
Q. Okay. How long have you known this?
A. Personally, I've known this since the 1990s when I was --
Q. Okay. Syngenta knew that EPA regulations require that codafel(?) regulations section 159.165 makes mandatorily reportable adverse findings in toxicological studies not withstanding similar findings in prior studies:
"If relative to all previously submitted studies they show an adverse effect."
And then it lists a number of things: in a different organ or tissue of the test organism; at a lower dosage; after a shorter exposure period; after a shorter latency period; at a higher incidence or frequency; by a different route of exposure; in a different strain, sex or generation of test organism.
You knew that too?
A. That's right. Those are the qualifications I was --

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Q. Those are the ones you were talking about?
A. Yes, yes.
Q. Would you agree that an adverse effect finding is a completely -- in a completely different species is a highly relevant mandatory reportable adverse effect finding under 40 CFR 159.165?
MR. NARESH: Objection to form.
A. In a different -- excuse me, in a different species, yes.
BY MR. TILLERY:
Q. Okay. You also knew that the EPA has a catchall regulation that makes "Other information" mandatorily reportable. A registrant must submit "information other than as described", in the section I just quoted 159.165: if the registrant knows or reasonably should know that if the information should prove to be correct, EPA might regard the information alone or in conjunction with other information about the pesticide as raising concerns about the continued registration of a product, or about the appropriate terms and conditions of registration of a product. Right?
MR. NARESH: Objection to form.
A. Yes. But if I could say at this point --
BY MR. TILLERY:
Q. Just tell me this: were you aware of that rule, 40 CFR 159.165?

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A. Well, the script -- the last few words that you read out, I am less familiar with because my responsibility was largely to deal with toxicological information or opinion given to us by experts.
Q. What I'm asking is did you recognize this to be your duty at Syngenta?
MR. NARESH: Objection, asked and answered.
A. In broad terms, of course, yes.
BY MR. TILLERY:
Q. Okay. Syngenta never got a pass for compliance with these rules, did it?
MR. NARESH: Objection to form.
A. Would you repeat the question?
BY MR. TILLERY:
Q. Syngenta never got any kind of exoneration or pass from compliance with the rules?
A. You mean an exemption? No.
BY MR. TILLERY:
Q. Yes, exemption?
A. No, they didn't.
Q. Okay. At all relevant times Syngenta was required to fully comply with all of the rules that I just read to you about paraquat, wasn't it?
A. That is correct.
Q. Would you agree with me that in case of any doubt

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about whether to make a report to the US EPA under any of these laws, the most responsible way to proceed would be to file a report?
A. That is correct. And I will have to say that that is absolutely the philosophy that I was encouraging.
Q. Okay.
A. If in doubt, we put it into the system to decide whether we should be submitting.
Q. I move to strike the answer as unresponsive.
Would you agree with me that in the case of any doubt about whether to make a report to the US EPA under any of these laws, the most responsible way to proceed is to file the report?
MR. NARESH: I will object as asked and answered.
BY MR. TILLERY:
Q. Would you agree with that?
A. It is. But I still believe that that is and should be done in accordance with understanding the specific requirements that you have been reading out.
Q. Were there others at Syngenta that argued the other side of this position?
A. Let me, at this point, say that the final decision for this was taken by the US PRF committee that I mentioned before. I personally was not a member of that committee. My responsibility was actually to give information to that

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committee from studies or opinion that my department or my team were aware of or had found.
Q. So you may have never made a final report decision yourself?
A. I was never in the position of being part of that US committee that made those decisions.
Q. Right. And who was?
A. They were employees of ICI-Zeneca Syngenta in North America.
Q. And who was on the US PRF committee?
A. Rather like the answer to the previous question, the personnel have changed over the years so I could give a number of --
Q. It depends on the year is what you are saying?
A. It depends on the year, yes, yes.
Q. What are you saying is you could make recommendations but whether they followed them and reported it wasn't within your wheelhouse so to speak?
A. It was not my accountability to do that.
Q. Accountability, right. And would you agree with me that in case of doubt there should be a report made?
A. That was very much the philosophy of what -- what I was responsible for was what we called an approach process. So we had a PRF approach committee in my function and it -- absolutely, people were encouraged that if in

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doubt they brought that for my committee to look at, and then we again would pass most of that information on to the US committee.
Q. How many times has a 6(a)(2) report about paraquat been considered but rejected in terms of advancement to the US EPA by either the PRF committee or someone above them?
A. I wouldn't want to speculate on that number. So I don't want to answer that question, because I don't -- I don't know.
Q. Okay. You know it's happened, don't you?
A. The word "rejected" is perhaps not quite the word I would use. Certainly a decision has been taken that certain findings did not meet those criteria that you read out.
Q. Right. That would be certainly something that you would put in a document perhaps. Would that be done by you or by the PRF committee or by the SEC?
A. By the US PRF committee who made that final decision.
Q. And would they make that decision or would that have to be approved by the managing board of the company?
A. My understanding is that that would be the accountability of the US PRF committee.
Q. Okay.
Would you agree that science is built on the sharing

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of information; that scientists generate knowledge building on the information produced and shared by other scientists?
MR. NARESH: Objection to form, scope.
A. I think that's a very sound description.
BY MR. TILLERY:
Q. Okay. You would agree with it?
A. Yes.
Q. Would you agree that science flourishes best in conditions of the open and public exchange of ideas, methods, findings and interpretation; openness facilitates vetting new findings and new theories through continued study and analysis?
MR. NARESH: Same objection.
A. I would have to agree with that.
BY MR. TILLERY:
Q. Would you agree that the absence of disclosure of scientific information inevitably causes society to be the loser?
MR. NARESH: Same objections --
A. It could -- it could be one consequence.
BY MR. TILLERY:
Q. You would agree also that secrecy regarding scientific findings diminishes our ability to both identify public health and safety hazards and to prevent harm from them?

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MR. NARESH: Same objections.
A. As a general statement, I think that is true.
BY MR. TILLERY:
Q. On the other hand, awareness of scientific studies and findings helps redirect precious efforts and dollars and avoids unnecessary delay and expense?
MR. NARESH: Same objections.
A. Yes.
BY MR. TILLERY:
Q. Okay. Scientific results establishing possible links between heavily used products and very serious health effects are all the more important to disclose because of the potential enormous cost and suffering to human victims specifically and to our society generally.
Would you agree with that statement?
MR. NARESH: Same objection.
A. Yes, I would agree with that.
BY MR. TILLERY:
Q. Okay. Would you agree that scientific research is often a cumulative process built on the knowledge learned from laboratory and epidemiological studies. Disclosing all scientific research is vital to this process and failing to do so interferes with the advancement of objective research and knowledge?
MR. NARESH: Same objection.

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A. I would -- I would add one qualifier if I may at this point. What is just as important is that the sharing of information must be done so in a way in which the quality of that information is also properly understood because --
BY MR. TILLERY:
Q. The quality of the studies?
A. Whether it is preliminary findings or whether it is confirmed findings.
Q. Would you say that would also be sharing information about whether the sponsor of a study or the people paid for a study or to do a study had a financial interest in the outcome?
A. Some people would believe that that was an important factor. And I have no problems in transparency of that issue.
Q. Right. Would you agree that the importance of public disclosure of adverse effects of chemicals is especially true when studies link that chemical to a pervasive and progressive disease like Parkinson's disease?
MR. NARESH: Same objections.
A. I think that that would be not unreasonable.
BY MR. TILLERY:
Q. Okay.
What is neurotoxicity? What does that mean?

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A. Neurotoxicity is the effects of agents on the nervous system.
Q. How would you define neurotoxicity?
A. It is toxicity to the parts of the nervous system, the nerves, the brain and so on, and to neurological function.
Q. Let me propose a sort of a textbook definition of neurotoxicity and see if you agree with it so that we can agree to use it for the next round of questions I'm about to ask you.
A. Okay.
Q. Neurotoxicity is a form of toxicity in which a biological, chemical or physical agent produces an adverse effect on the structure or function of the central and/or peripheral nervous system. It occurs when exposure to a neurotoxin alters the normal activity of the nervous system in such a way as to cause damage to nervous tissue. This can eventually disrupt or kill neurons and other parts of the nervous system.
Do you understand that?
A. I do.
Q. Does that make sense to you?
A. It makes sense.
Q. Okay. Can we use that definition for the purpose of this line of questions?

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A. I am fine with that.
Q. Is paraquat neurotoxic?
A. I believe that that is not yet shown to be the case.
Q. So your answer is it is not?
A. At this point in time, it is not.
Q. Okay. In the Charles River black mouse, does paraquat kill dopaminergic neurons in the substantia nigra?
A. In some laboratory experiments, some investigators, but not all, have found -- have found that.
Q. So if it did kill dopaminergic neurons, under the definition it would be neurotoxic at least as to the Charles River black mouse, right?
A. If that were a consistent and reproducible finding, yes.
Q. When did you first learn that paraquat was neurotoxic in the Charles River black mouse?
MR. NARESH: Objection to form.
A. When some of the publications from other researchers began to appear in peer-reviewed journals.
BY MR. TILLERY:
Q. Why did you conduct paraquat studies using the Charles River black mouse?
A. Because we were trying to do as I have just indicated, to see whether that apparent toxicity, neurotoxicity, could be repeated and therefore could

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potentially be a real effect.
MR. TILLERY: Let's go off the record for a minute.
THE VIDEOGRAPHER: We are going off the record at 10:15.
(Break taken.)
THE VIDEOGRAPHER: We are back on the record as of 10:27. This is now media number 2. You may continue.
BY MR. TILLERY:
Q. Before we move on to this line of questions, just for clarification's sake for this record: the PRF committee, you said, could make a recommendation to the US Syngenta folks -- that would be Syngenta Crop Protection LLC, correct?
A. That is right.
Q. And they had the final authority about whether or not to report it to the US EPA?
A. That is correct.
Q. Okay. Now I would like to direct your attention to exhibit number 23.
(Exhibit 23 marked for identification)
BY MR. TILLERY:
Q. This starts at a Bates range of Syngenta 493318. Is that correct, sir?
A. That is correct.

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Q. I will be using those numbers as references to guide you to different pages of this document.
A. Okay.
Q. Okay. This is a document I will represent to you that was produced in discovery by your counsel to us --
A. Um-hm.
Q. -- as one of Syngenta's documents. This is a Syngenta presentation entitled:
"Paraquat & Parkinson's Disease."
Correct?
A. Yes.
Q. And when was this presentation given?
A. I'm not able to answer that question at the moment. I can't see a date.
Q. All right. And if you would go to -- I will just refer to the last three numbers on the Bates number -- to 319.
A. Okay.
Q. The presenters of this -- it looks like a presentation and a PowerPoint presentation, doesn't it?
A. It does.
Q. All right. The presenters were Mr. Sturgess -- Nick Sturgess -- Louise Marks and Alison Foster; correct?
A. Yes.
Q. And Nick Sturgess is the person that you described

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yesterday in the deposition. He was the former technical -- senior technical expert product safety at Syngenta; correct?
A. That is correct.
Q. Okay. He served as senior technical expert in product safety from 1989 to 2018. Is that also correct?
A. Those dates sound familiar. I can't be sure those are absolutely accurate, but I think that that's correct.
Q. Okay. And for this presentation, and from this exhibit, Mr. Sturgess presented an introduction to paraquat and Parkinson's disease, and the summary comments as well. Okay?
A. Yes.
Q. Is that what --
A. That's what that says, yes.
Q. And Dr. Marks was a research scientist at Syngenta CPL in the neurotoxicity group in the investigating toxicology section; correct?
A. That is correct.
Q. And she worked for Syngenta?
A. She did.
Q. And Dr. Marks presented the part of this presentation referenced as "In vivo studies with paraquat", right?
A. That is correct.
Q. Now if we go to 328, Dr. Sturgess in his

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presentation said that:
"Paraquat is unlikely to be neurotoxic owing to the fact that it has a chemical structure and physical properties (charged, polar molecule) which mean it will not readily cross the blood brain barrier ..."
Correct?
A. That's what that says.
Q. That's what it says.
Syngenta, however, knew that paraquat crossed the blood-brain barrier when this presentation was given, didn't it?
A. As we discussed yesterday, it depends on how you define "readily", yes.
Q. But it did cross it?
A. Of course.
Q. All right.
If you go to the next page, Dr. Sturgess actually refers to the radio-labeled paraquat studies that we talked about yesterday, didn't he?
A. Yes.
Q. And he said "some of this material gets into the brain"; he acknowledges that, right?
A. Yes.
Q. Yes. Now if we go to 330, the following page, it's entitled:

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"Literature Developments of Concern."
It lists a number of them. One, the first one it starts with, is Fredriksson et al 1993, right, do you see that?
A. I do.
Q. It is listed as a literature development of concern, isn't it?
A. It is.
Q. And the study found behavioural effects in mice given oral doses of paraquat, right?
A. Correct.
Q. And it found reductions in striatal dopamine in mice given oral doses of paraquat too, didn't it?
A. That's what this says.
Q. So this was a presentation that the Syngenta scientists were presumably making to other people at Syngenta?
A. I'm not sure exactly where this presentation was made.
Q. But we weren't given any information as well. Had we been given that in discovery, I would have given it to you.
A. Right.
Q. So you would have it.
A. Okay.

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Q. This is as best I have. You have to go to your lawyer to get more information.
MR. NARESH: I will object to all this.
BY MR. TILLERY:
Q. So based upon where we are right now with the document, is that what you would think the situation would be?
MR. NARESH: Just for the record, I object to the whole attorney commentary.
Could you please just ask your question again?
BY MR. TILLERY:
Q. Yes. Does it appear to be a presentation by Syngenta scientists to other Syngenta employees?
A. It appears to be a presentation by Syngenta scientists, but I don't know to whom this particular presentation was made.
Q. Okay. All right.
Okay. Continuing on, and this would be 331 --
A. Yes.
Q. -- and this was again under the topic heading:
"Recent Literature Developments of Concern."
Right?
A. Yes.
Q. And here it says, by Dr. Sturgess, there is a note that:

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"Two US based research groups have produced a series of publications since 1999 implicating paraquat in a Parkinson's disease ..."

Model in the mouse, right?

A. It does.

Q. And that references a Cory-Slechta Group and that is Rutgers, New Jersey?

A. Correct.

Q. And the Di Monte Group at the Parkinson's Disease Institute in Sunnyvale, California?

A. Correct.

Q. And he's the person that you mentioned yesterday as the person who educated, I think Dr. Louise Marks about stereology, right?

A. Yes, she visited Dr. Di Monte in his institute.

Q. At his facility?

A. Yes.

Q. And he acquainted her with techniques about how to do that?

A. He did.

Q. Okay. Continuing, the studies observed neurotoxicity in paraquat in three biological endpoints that are referenced: loss of neurones from the substantia nigra; loss of dopamine from the striatum; and reduction in locomotor activity. Correct?

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That's what Dr. Sturgess is telling the people in the audience?

A. Yes, he was saying that those were the endpoints that were looked at in those studies.

Q. In those studies that he's reporting. Okay.

If you look at the next three slides in the presentation, all three of these fall under the heading:

"Recent external pressures on paraquat quoting links with Parkinson's disease."

Do you see that?

A. I do.

Q. Now, one of them, the first one, is a reference to PAN Europe. Do you remember that?

A. Yes.

Q. Where that was a group of people who had as their position or their mission statement to fight against chemicals that they thought were destructive to human health. Did you understand that?

A. This is the Pesticides Action Network, as it says.

Q. What do they do?

A. They are an NGO, a nongovernmental organization, whose aim is to promote that pesticides should, essentially, be used as little as possible.

Q. Well, at least the ones that kill people, right?

A. They have concerns -- obviously more concerns about more toxic pesticides, but they campaign against pesticides generally.

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Q. That's how you see them, right?

A. Yes.

Q. And they really, really burn up over those that cause horrible, long-lasting miserable deaths too, right?

MR. NARESH: Objection to form.

A. They will certainly --

BY MR. TILLERY:

Q. They don't like those at all?

A. They will certainly focus on those that they perceive in that manner.

Q. Right. Okay. So were they at that time writing an open letter for a ban of this chemical across all of the European Union?

A. I can only read what I've got in front of me. At the time that this was written, I was not familiar with this.

Q. Okay. But you are the corporate designee and you are sitting there as the two Syngenta entities, so I have nobody else to ask.

A. Well, I -- they clearly -- this suggests they did write such an open letter.

Q. They wrote a letter dated August 4, 2003, saying they wanted it banned in Europe; right?

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A. That's what this suggests, yes.

Q. And you know that it was banned in Europe?

A. It was subsequently, um, deregistered in Europe.

Q. That's right. Isn't that about the same?

Let me ask you this: can you sell it in Europe?

A. We are not able to sell it in Europe.

Q. Okay.

A. And --

Q. I view that as a ban.

A. Well, we voluntarily withdrew our registration.

Q. Okay. So you just, out of the goodness of your heart not because everybody was trying to ban your chemical, like the open letter from PAN Europe, you just decided not to engage, right?

MR. NARESH: I will object to the form.

A. The situation in Europe is much more complicated than you portray it.

BY MR. TILLERY:

Q. Okay. Well, let's continue on. Let's look at the next one.

What is the next page?

A. "The Swedish government is suing the EU Commission", yes.

Q. So let me ask you this. You withdrew it when you were asked to prove that it was safe, didn't you?

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A. No, we withdrew it because of what it says here, that the process that the EU had gone through in the new legislation for registering pesticides was considered by Sweden to have been a process that had not been followed through appropriately.
Q. They actually filed a lawsuit, didn't they?
A. That, I believe, is the case.
Q. And that's, if you look at 333, that page --
A. Yes.
Q. -- "Swedish government is suing the [European Union] Commission", right?
A. That's right.
Q. And they filed a law suit?
A. Yes.
Q. They decided that day, 6 February 2004, to sue the EU Commission for their decision about paraquat in pesticides in the European Union, didn't they?
MR. NARESH: Objection to form.
A. They did. And I would like to reiterate that it was suing the EU because they had not followed the process correctly.
BY MR. TILLERY:
Q. Well, look at what Mr. Sturgess says. He says:
"The suit means that the EU Court of Justice is trying the government's partition to nullify the

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commission's decision."
Right? That's what Mr. Sturgess says, if you could just answer that question.
A. That's -- that is what that says, yes.
Q. Okay. That's what he's submitting.
Were you there at this meeting?
A. I don't know if I was.
Q. Okay.
Now go to the next page. It says at the top:
"Recent external pressures on paraquat quoting links with Parkinson's disease."
Right?
A. Yes.
Q. And that was:
"Stockholm to seek ban on paraquat herbicides By Nicholas George."
Who is Nicholas George?
A. I don't know. But that -- this page suggests he may have been a journalist.
Q. A journalist from the Financial Times seeking -- strike that.
A journalist from the Financial Times quoting Stockholm seeking a ban on paraquat herbicides, right?
A. Okay.
Q. Okay.

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Now -- now let's go to 335 if we can. This is a slide entitled:
"Research Activity at Syngenta CTL Strategy Being Followed."
Okay. You agree?
A. Yes.
Q. All right. And it starts off with a first bullet point:
"Establish whether there is a sound scientific basis ..."
For claims, right?
A. Yes.
Q. And second one:
"If findings are not reproducible, aim to publicly refute the claims in the literature by offering our own alternative experimental findings."
Right?
A. That's what that says.
Q. Did Syngenta at that time and earlier have a group whose job it was to monitor publications about its products?
A. Not knowing the exact date of this, but this preceded what I have been referring to as the paraquat health science team --
Q. Irrespective of whether it is paraquat, I am talking about products in general: did it have a group of people

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whose job it was to monitor publications that were -- that were published about their products?
A. It – it did not, as far as I am aware, have a specific group whose objective was to do that. We expected the scientists who were engaged in either having responsibility for products or particular areas of science to monitor the literature.
Q. So you had groups of scientists -- of these 2000 chemists and other scientists that you had, you had these groups who had portions of them assigned particular products to monitor?
A. I am just talking specifically about what we now call the product safety organization, where we were looking -- where we were expecting our researchers to be aware of the appropriate literature.
Q. If you look at the next bullet:
"If findings are repeatable, Syngenta CTL generated data will be used to build a defensive position for [paraquat] based on establishing a no effect dose (under various dosing regimens) in the C57Bl6 mouse model, based on a biological endpoint -- neuronal cell loss in the substantia nigra."
Right?
A. That's what that says.
Q. So Dr. Sturgess was coming up with a game-plan to

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refute findings that you made in your own laboratories that duplicated what was done in the public literature, right?
A. I would not put it that way. What the intent here was to say if the finding that we are talking about here was indeed repeatable, as would always be the case with any toxicological finding, you don't simply say you have that finding, at very high doses quite often, and you leave it at that. You actually say at what dose levels do you stop seeing that finding? You go down the dose levels --
Q. Okay.
A. -- to find a "no effect" level.
Q. Have you seen this before?
A. I have may have done. I don't today recall whether I have or not.
Q. Okay. So -- and you don't remember being here, right, at this meeting?
A. Because I don't exactly know which meeting this was.
Q. Okay. Let's go to the last point that Dr. Sturgess made, which says:
"Avoided measuring PQ levels in the brain ..."
So Syngenta was avoiding measuring PQ levels in the brain, right? That's what he says?
A. At that point clearly that was what some people felt was the right thing to do.
Q. Right. And to, in other words, when you do

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laboratory analysis avoid measuring that level in the brain?
A. That would not be our position today, and it wasn't our position --
Q. Well, what it -- excuse me, sir.
A. -- at a later time.
Q. Excuse me. I move to strike your answer as unresponsive.
Did he at that time say --
MR. NARESH: Hang on, Steve, your question was: when do you do laboratory --
MR. TILLERY: No.
MR. NARESH: -- analysis avoid measuring that level in the brain, and he was trying to answer your question.
MR. TILLERY: I said did he -- "avoiding measuring PQ levels in the brain", is that what he said?
MR. NARESH: That wasn't your question --
MR. TILLERY: Well, I will withdraw the question and I will ask him.
BY MR. TILLERY:
Q. He said, Dr. Sturgess said:
"Avoided measuring PQ levels in the brain, ..."
That means Syngenta was avoiding measuring paraquat levels in the brain, doesn't it?
A. At that point in time, that was the opinion of the

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people who were engaged in this conversation.
Q. Right. And continuing on with that same bullet, he says:
"... since the detection of any [paraquat] in the brain (no matter how small) will not be perceived externally in a positive light."
Correct?
A. That's --
Q. Is that what he says?
A. That's what it says.
Q. All right.
A. But I would like to add --
Q. Excuse me, sir: is that what it says or not?
A. That's what it says.
Q. All right. So at this time, based upon what he said, Syngenta knew that any amount of paraquat in the brain, "no matter how small", would be perceived negatively outside the company; correct? That's what he was saying?
A. That is what he was saying.
Q. All right.
So the research program at Syngenta CTL described here, Syngenta simply didn't do studies to determine how much paraquat was getting into the brains of animals and they did that intentionally?
A. That's what I was about to follow on by saying. The

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record shows that in our research program which followed --
Q. Not followed -- excuse me.
MR. NARESH: Steve, you have to stop interrupting him --
MR. TILLERY: Now that is -- we are not going to do this. You are not going to do it. You may try to override and state another answer. Not with me. Okay. You are not going to do it. I'm not going to let you.
So here's what you are going to do, you are going to answer my questions, or we are going to do this -- and this is for you, counsel -- we are going to terminate it, if you want it that way, and you will go to St. Clair County Illinois and finish this in front of our judge.
Now I know you have prepared him very well. Okay. But you are going to answer my questions, not what your counsel told you to say.
A. Can I just say my counsel has not told me to say that --
BY MR. TILLERY:
Q. Well, here's what we're going to do. I want you to answer my specific --
MR. NARESH: Steve, you've got to stop interrupting him.
MR. TILLERY: -- question.
MR. NARESH: You have interrupted him over and

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over again.
MR. TILLERY: No, I wasn't talking to him about anything else.
MR. NARESH: You just interrupted him again.
MR. TILLERY: I want you to answer my question and my question only. Not something else.
MR. NARESH: Why don't you ask your question again? Ask your question again. I don't think -- the question you are asking in your mind is not the question that's showing up on the transcript.
MR. TILLERY: Well, maybe --
MR. NARESH: He's answering the question that you're asking. Why don't you ask your question --
MR. TILLERY: I'm reading it, and I have it right here, okay.
MR. NARESH: The one that you just asked was the one he was answering and you interrupted him.
MR. TILLERY: So --
MR. NARESH: So why don't you try it again --
MR. TILLERY: What we are going to try is this -- and we are going to continue it for a bit -- and then we are going to see what the judge says.
MR. NARESH: Ask your question.
MR. TILLERY: It is 10 to 5 there right now, and we will go to the court and see what the judge says whether

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or not -- and we can email the rough to the judge and see if the judge feels that this deposition should go forward.
MR. NARESH: That's fine. Ask your question.
BY MR. TILLERY:
Q. So I'm asking you, sir, to answer my specific questions and not volunteer information. If you want to do that at the trial, called by Syngenta as a witness, that is up to you.
Do we have an understanding, clearly what I want at least?
A. I understand what you are saying.
Q. All right. Thank you.
Syngenta knew at that time -- at the time this was done, this presentation -- Syngenta knew that any amount of the brain -- strike that.
Syngenta knew at that time that any amount of paraquat in the brain, no matter how small, would be perceived negatively outside the company; correct?
A. It is correct that that was the view at that time.
Q. Right. And Syngenta at that time, as reported by Dr. Sturgess, didn't do studies to determine how much paraquat was getting into the brains of animals, correct?
A. It is correct to say that at that time that is the case.
Q. And those studies couldn't -- strike that.

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Those studies could have been done at that time, couldn't they?
A. They -- further studies could always have been done at any time.
Q. Right. But Syngenta had not been doing them, had they?
A. That's not quite true, if I may say so. There had been studies done by Syngenta earlier than this time.
Q. That we have talked about?
A. Which included measuring paraquat in the brain.
Q. Okay. Now if you would go to 36 -- I'm sorry, yes, to 36 -- and that is:
"Research Activity at Syngenta CTL in vivo Studies."
And that references Louise Marks, do you see that?
A. I do.
Q. Okay. And the first bullet says:
"Repeat of published in vivo experiments with [paraquat] alone being dosed to C57Bl6 mice."
Right?
A. It does.
Q. What does that mean?
A. It means to repeat the studies done by, for example, the researchers that were referred to in earlier slides, Di Monte and Cory-Slechta, whether paraquat if given to the -- this particular strain of mice may cause the same

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effects.
Q. Okay. "In vivo" just means live animals, right?
A. It means -- to live mice in this case.
Q. So Dr. Marks' research was intended to repeat the independent research in the published literature and determine whether she could reproduce the neurotoxic effects in the mouse; correct?
A. That was correct, yes.
Q. Okay. The last bullet, if you would see on the very last one on that page, notes Syngenta intended:
"... to seek peer review of our findings."
Correct?
A. Correct.
Q. Did Syngenta ever seek peer review of any of Dr. Marks' findings?
A. No, it didn't at the time that they were conducted because the, er --
Q. Did I ask you about "because"?
A. Yes, right.
Q. Okay. Read back my question to this gentlemen, please.
COURT REPORTER: "Did Syngenta ever seek peer review of any of Dr. Marks' findings?"
A. I don't believe that we did.
Q. Thank you.

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Did Syngenta publish any of Dr. Marks' studies anywhere?
MR. NARESH: Objection to form.
A. I don't believe that Dr. Marks' studies specifically were ever published.
BY MR. TILLERY:
Q. Okay. Now, let us go to next exhibit number 98, please, our internal number 98.
Next exhibit is 24, counsel.
(Exhibit 24 marked for identification).
A. Thank you.
MR. NARESH: Is this the first page of the document?
BY MR. TILLERY:
Q. It is.
Is this another presentation so far as you can tell, sir?
A. This looks like it is another paraquat presentation -- PowerPoint presentation, yes.
Q. PowerPoint?
A. A PowerPoint presentation.
Q. And this has a date of -- can you see a date on it? We may see one.
A. I don't immediately see one.
Q. It discusses work to be done at CTL with paraquat in

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the mouse, right?
A. Starting at 628, it's moving into the in vivo studies that we were just discussing.
Q. Right. The studies that Dr. Marks undertook, is that correct?
A. This looks like it is the case.
Q. And who authored the presentation?
A. I can't see an author on the copy that you've given me.
Q. Okay. If you wouldn't mind turning to 633 of that document.
Do you see that page, sir?
A. I do.
Q. Okay. The first bullet in this PowerPoint presentation is entitled -- it's under "Investigative Toxicology Input," correct?
A. Correct.
Q. And it says:
"Investigative toxicology is involved in establishing whether there is a sound scientific basis for the claims by some research groups that exposure to paraquat causes Parkinsonian like [symptoms] in animal models."
Correct?
A. Correct.
Q. And Investigative Toxicology is a group at CTL that

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conducted paraquat mouse research, correct?
A. That is correct.
Q. Did that group include Drs. Sturgess and Marks?
A. That is correct.
Q. Okay. And on this slide, Syngenta is concerned whether the findings that paraquat is neurotoxic that have been made in the independent published literature are accurate.
Would that be a fair statement?
A. I would use the word "repeatable".
Q. And that means, if they are not repeatable, there would be some question about whether they are legitimate?
A. That is right. That is normal scientific practice.
Q. And replication in science is kind of the gold standard, isn't it?
A. It is the hallmark of quality science, of course.
Q. And if they are not replicable in laboratories that are well-run and well-organized and using the same technology and people who don't distort and alter the results intentionally or not intentionally --
A. Yes.
Q. -- then if they get those results and keep repeating them at different labs, it becomes more or less an established fact among the scientific community; right?
A. That is -- you have described the scientific process

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well, yes.
Q. Okay. Let's turn to, if we can -- actually on that same list, if you don't mind, going down it says:
"Are their findings repeatable?"
It asks that question.
A. Yes.
Q. And then it says:
"If so can we offer a mechanistic explanation for their results?"
Right?
A. Yes.
Q. What is a "mechanistic explanation" as you understand it referenced in that slide?
A. Again, not knowing exactly what point in time this was, I believe the most likely explanation for what they meant here was to say if you see -- let me call them discrepant results, one laboratory has seen this, another laboratory has seen something different so they are not repeatable -- in an ideal world you would like to understand why. So is there an explanation, a mechanistic explanation, as to why one lab has seen something and another has not? That's what I suspect may have been --
Q. Actually look at it again, sir. It says the exact opposite. It says:
"Are their findings repeatable?"

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And it says:
"If so can we offer a mechanistic explanation ..."
So in other words, they are saying here that if we repeat their same findings, can we offer an explanation? Correct?
A. Oh sorry, yes, I do -- sorry, there's -- I should have looked at this more carefully. You are quite right. As written there, I think what I said --
Q. As written here it means --
A. Yes.
Q. -- that they are saying, the presentation: if we reproduce the results, we better come up with a mechanistic explanation for why we are reaching the same results.
A. Right. So I think that's true. I mean, what I also said is equally true, but yes, you are right, as written you would need to understand what the mechanism they are --
Q. I mean, what is the final bullet? Read that one into the record.
A. "If findings are not reproducible, can we refute the claims in the literature and offer alternative experimental findings?"
Q. Was that the course of Syngenta at that time: when the findings were not reproducible in their labs, they could refute the claims in the literature and offer alternative experimental findings in the literature; was that the

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standard?
A. The standard is if the -- if findings are not reproducible, then you don't necessarily just leave it at that. That's why I made my previous answer, if I may say so, which is to say that you do need to understand why that might be the case, and not just assume that we are right and somebody else is wrong.
Q. But it says here very clearly:
"... can we refute the claims in the literature and offer alternative experimental findings?"
A. Yes.
Q. That's what they intended to do --
A. That's a question --
Q. -- if they didn't reproduce the results?
A. That is a question at the time.
Q. Right. Now please turn to 638 on that document.
It's entitled "Paraquat and Parkinson's Disease Investigative Toxicology Research", isn't it?
A. It is.
Q. The first bullet says:
"The issue around the claims that paraquat exposure and Parkinson's disease are linked needs to be addressed if the future Syngenta aspirations for the product are to be realized."
The future aspirations for the product mean selling

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it on the market and making profits from the sale, don't they?
MR. NARESH: Objection to scope.
A. That's an assumption which you can certainly take from the way that's written.
BY MR. TILLERY:
Q. Yes. You would not disagree with that interpretation, would you?
A. I think that is one plausible interpretation.
Q. That is probably the most plausible, would you agree?
A. It may well have been.
Q. Okay. So Syngenta's aspiration for products, paraquat products, would not be realized if the link between paraquat exposure and Parkinson's disease was established; is that right?
A. That's what you would infer from that.
Q. So going to the next bullet:
"Data generated will be used to build a scientifically robust, defensive position for paraquat in response to the issues already in the scientific literature, and to questions raised by the media, customers and regulatory authorities."
Is that what that says?
A. That's what that says.

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Q. Okay. Now let's go to 641 of that document. The third bullet says:
"External publication of findings at scientific meetings to assist our influencing strategy."
Do you see that?
A. Yes.
Q. And "influencing strategy" was a strategy intending -- intended to influence publications, scientists around the world, wasn't it?
A. As written that would be what it suggests it -- yes, yes.
Q. Okay. And Syngenta's paraquat mouse research was intended to influence independent researchers regarding the safety of paraquat, wasn't it?
A. It was intended to ensure that we understood the validity of those findings that other researchers had published, including the aspects, as it said earlier, about repeatability.
Q. And it says very clearly in bullet three there -- were you at this presentation, sir?
A. I don't know that I was.
Q. All right. It says very clearly in this bullet, the:
"External publication of findings at scientific meetings to assist our influencing strategy."

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Right?
A. Yes, but I can say that --
Q. Can you answer that question?
A. Yes, that's what it says.
Q. And scientific meetings are meetings where Syngenta's people would go with boards or presentations and speak and present to scientists around the world the findings from their studies; right?
A. Yes, yes.
Q. And you have done that yourself, haven't you?
A. I have.
Q. Okay. And what's the purpose? It is to get that information -- your position or your findings -- out, right?
MR. NARESH: Objection to form.
A. That's -- that's correct.
BY MR. TILLERY:
Q. Okay. And that, if there was a strategy, it's referenced here as "spring 2003", there was a strategy that had been adopted by paraquat -- sorry, strike that.
There had been a strategy announced in spring 2003 by Syngenta scientifics meetings within them to influence other scientists around the world?
A. To give transparency, as we have said before, to the fact that the science behind this issue is still a work in progress.

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Q. Okay. Would you see where it says -- read where it says that in bullet 3, what you just said?
It doesn't say that at all. You made that up.
MR. NARESH: Objection --
A. I didn't, I was --
MR. NARESH: Objection to form, argumentative.
Ask your question.
BY MR. TILLERY:
Q. Did you make that up?
A. No, I didn't make it up. I agree that this is what it says.
Q. All right. It says that in spring 2003 there was an influencing strategy adopted, okay?
A. Yes, I was trying to describe what I believe "influencing strategy" meant.
Q. Okay. But the document doesn't say what you say, does it?
A. The document does not say that.
Q. All right, okay.
The bottom line is the paraquat mouse research by Syngenta was intended to convince others outside of Syngenta that paraquat was safe, correct?
A. It was at that time trying to see whether the findings were replicable in order for a judgment to be made about that point.

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(Exhibit 25 marked for identification)
BY MR. TILLERY:
Q. Can you identify exhibit number 25, please?
A. Again, this is a PowerPoint presentation on paraquat and Parkinson's disease.
Q. It's another presentation or excerpt entitled:
"Paraquat & Parkinson's disease."
Right?
A. That's right.
Q. And the front page says:
"Paraquat and Parkinson's Disease Experimental Strategy."
A. Correct.
Q. And it says:
"Carry out in-house research to further our understanding of paraquat and it's role in Parkinson's disease models ... to ensure safety in use."
And it says:
"Use these data to gain a presence in the International Scientific Community and promote a balanced view for the use of paraquat as a non selective herbicide."
A. That's what that says.
Q. That's what it says.
And all of "these data", as mentioned, refers to paraquat mouse research at CTL; correct?

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A. I believe that that is correct, yes.
Q. Okay. If you go to 238, please, you see in the second bullet -- the top of this one says, the first line says:
"Paraquat & Parkinson's Disease."
And then the second bullet says:
"Threats to paraquat from ... recent scientific literature."
A. That's right.
Q. Those were threats to Syngenta's continued ability to manufacture and sell paraquat, weren't they? Is that a fair reading?
A. That would be an ultimate consequence that was intended.
Q. Okay. And the ultimate threat was that the scientific literature would cause paraquat to be banned, correct?
A. If the -- if the evidence eventually came together to make -- to lead to that possible conclusion.
Q. Okay.
If you go to the next page. This presentation, if you look at the next page and that is 484239, you see that?
A. Yes.
Q. Also refers to the Di Monte group at the Parkinson's Institute in California?

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A. Yes.
Q. And both groups had shown paraquat was neurotoxic in the C57B16 mouse; correct?
A. They had seen findings which suggest that that was a possibility.
Q. Syngenta considered the work by Dr. Cory-Slechta and Dr. Di Monte to threaten its aspiration for paraquat product sales, didn't they?
A. The findings, if they had -- if indeed they were replicable -- could lead to a view being taken on the safety of paraquat. That is correct.
Q. And that would ultimately lead into the decision that it would not be allowed to be used?
A. That was always one possible outcome, yes, as we said before.
Q. That's a fair interpretation of this slide?
A. Yes.
Q. If you go to 889 --
MR. NARESH: 889?
(Exhibit 26 marked for identification)
A. Thank you.
BY MR. TILLERY:
Q. We've handed you what's been marked as plaintiff's exhibit number 26.
Do you see that, sir?

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A. I do.
Q. Can you identify what this document is?
A. It's an internal research report from Syngenta. And specifically from Syngenta CTL.
Q. Okay. Could you repeat -- read the report title and date?
A. It's:
"Paraquat Dichloride Hydrate.
"Investigating reported paraquat-induced neurotoxicity in the Alderley Park C57 black mouse: The neurochemical and pathological effects on the dopaminergic system of 3 weekly injections of 10mg/kg 1,1'dimethyl-4,4'bipyridinium (Paraquat)."
Q. And this is a report of a study that Dr. Marks did, right?
A. That's correct, yes.
Q. It says "Author(s): L. Marks"?
A. Correct, yes.
Q. That was conducted by Syngenta at its CTL laboratory in Alderly Park; right?
A. That is correct.
Q. The study was part of the paraquat mouse research program at Syngenta that was discussed in the presentations we just looked at, correct?
A. That is right, yes.

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Q. And the author was -- was Louise Marks?
A. Yes.
Q. And she also served as the study director and principal investigator?
A. That is correct, yes.
Q. And Mr. Sturgess served as a contributor to the report and study reviewer, correct?
A. That is correct.
Q. Okay. And that's the same Dr. Nick Sturgess we have been talking about, right?
A. It is.
Q. Okay. Dr. Marks reports the study was initiated on April 17, 2003?
A. Yes.
Q. And the experimental phase terminated August 21, 2003; correct?
A. Yes.
Q. And that just means the experiments on these mice were terminated at that time?
A. That's right.
Q. But the study report was not issued until four years later --
A. That's --
Q. -- July 21, 2007; right?
A. That is correct.

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Q. Okay. And do you have knowledge of why it was delayed for four years?
A. I have some knowledge of that.
Q. Okay. Who has all of the knowledge? Dr. Marks?
A. Dr. Marks would be able to give you more knowledge than me.
Q. You talked to her recently. Did she talk to you about this?
A. Not specifically about this point.
Q. Okay. Dr. Marks issued this report during her last week of employment with Syngenta, didn't she?
A. I can't comment on that accurately. But certainly 2007 was, I believe, the last year of her employment.
Q. Okay. The study was designed to investigate the reproducibility of claims in the literature of what?
A. Um, of the ability of paraquat to cause damage to the substantia nigra in the mouse brain.
Q. Okay. And that's exactly what she was designing this study to do, right?
A. Yes. And this was one of -- there were more than one study performed, just to add.
Q. Okay. And other independent laboratories had observed loss of striatal dopamine and the loss of dopamine neurons in the substantia nigra of mice given paraquat --
A. Correct.

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Q. -- and she was trying to replicate those studies?
A. That is correct.
Q. Okay. And it involved dosing male C57Bl6J mice with paraquat once a week for three consecutive weeks, correct?
A. That is correct.
Q. And the dose was 10 milligrams per kilogram body weight of the test animals; is that also correct?
A. That is also correct.
Q. The administration of paraquat resulted in a small reduction in dopaminergic cell number, correct, in the substantia nigra portion of the brain?
A. Yes. What it says precisely is a small but non-statistically significant reduction in dopaminergic cell number.
Q. And she found that it was not statistically significant?
A. Yes.
Q. Okay. And the dopaminergic cell number in the study was counted -- counting -- strike the question.
The dopaminergic cell number in this study was counted using a technique called stereology, wasn't it?
A. Yes.
Q. Specifically, she used an optical fractionator method for stereology, didn't she?
A. That is correct.

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Q. What is that?
A. It's essentially a device -- a microscopic device -- that allows you to accurately identify the region of the brain that you are looking to investigate and to count the number of cells. So it is quantitative microscopy, in other words.
Q. And she was actually nominated for what is called the Ashby Prize because she was the first scientist at Syngenta to use that technique, right?
A. Now you mention it, I think that is correct.
Q. And she was nominated by Dr. Sturgess --
A. I think that is correct, yes.
Q. -- for the Ashby Prize. And she was one of the finalists for the prize. Correct?
A. I think -- yes, I think that's right.
Q. Okay. And the reason being that she came up with this. And she had not yet been to Sunnyvale but she used this optical fractionator; right?
A. Back in 2003, that is correct.
Q. Okay. What is the Ashby Prize?
A. It was a prize which was initiated in CTL to recognize scientific achievement.
Q. Okay. In other words, to reward people who you thought had done a very good job?
A. A good technical job, yes.

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Q. Yes. And who maybe were innovative, creative and doing sound scientific work?
A. Absolutely.
Q. Okay. And that's why Dr. Sturgess, who was one of the advisers to this study, recognized that work and nominated her for that award; right?
A. Yes.
Q. Okay. The studies in the independent literature to that point had reported that paraquat was neurotoxic using an optical fractionator stereology to count dopaminergic cell loss; right?
A. Yes.
Q. They had used the same technology or similar technology?
A. Yes, similar technology is the best way to describe it.
Q. All right. Now let's go back, if we can, to 2905 here. 2905.
You see the heading "Stereology", 3.9?
A. Yes.
Q. Okay. You have seen this study before, haven't you?
A. I have.
Q. You read this in preparation --
A. I have seen this study before.
Q. And you read it in preparation. It is all in your

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reliance materials.
A. I certainly have read this study relatively recently.
Q. Right. In preparation for this deposition?
A. Not specifically for this, actually, no.
Q. Okay. So under the heading "Stereology" --
A. Yes.
Q. -- you see where it says "All cell counts"? I'm going to read that into the record, and you tell me if I have read it correctly when I'm finished, okay:
"All cell counts were carried out with the help of an interactive computer system and stereology software (Digital Stereology, Kinetic Imaging, UK) connected to a Zeiss Axioplan microscope. The stage itself was not automated and had to be moved from sampling point to sampling point."
Is that correct?
A. That's what it says.
Q. Okay. And if you go to 2910, at the bottom there, Dr. Marks reports that the optical fractionator method was used by the majority of studies in the independent literature. Okay?
A. Yes.
Q. And it says at the very last part of that page, if you read it:

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"Our method..."
Do you see that sentence where she's talking about this? This is within her study still, isn't it?
A. Yes, yes.
Q. Okay:
"Our method, in which the counting frame is moved manually from sampling point to sampling point, has been tested for sensitivity and has produced consistent values for the total number of cells in control and MPTP treated animals ... Our technique has been proven sensitive enough to detect a 13.8% reduction in TH+ cell number following MPTP administration and therefore should be sensitive enough to detect the reported 25-30% loss ... observed following PQ exposure: ..."
Do you see that?
A. I do.
Q. Now the last sentence of that, if you read that into the record, that last sentence that starts "Nevertheless ..." and continues to the next page?
A. "Nevertheless, even small differences in methodology could lead to our system potentially being deemed less accurate than the automated systems available and this may explain in part the differences in total cell counts obtained."
Q. So she was reporting in her report that she was

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using a manual system that could be the reason her cell counts were different from the independent literature that had already found that this chemical could produce loss of dopaminergic neurones in the same mouse, right?
A. At that time, that was a reasonable possibility for any discrepancy.
Q. And she was -- she was reporting that, right?
A. Yes.
Q. Putting that in the study. The independent researchers had been using an automated system. She was using a manual system. That's what she was saying?
A. That's what she said.
Q. Okay. And she said the automated set up may confer a greater degree of accuracy to the counting process; do you see that?
A. Yes, I do.
Q. All right. In contrast in this study, Dr. Marks used a manual method to move the counting frame from sampling point to sampling point, didn't she?
A. Yes.
Q. She goes on to say:
"It is therefore important to further investigate PQ [paraquat] toxicity and attempt to replicate our findings."
Correct?
MR. NARESH: Where are you?

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A. Where are you now, please? Yes, at the bottom of the page.
BY MR. TILLERY:
Q. It's the bottom of the page.
A. Yes, I see, yes.
Q. Read it into the record, please?
A. Yes: "It is therefore important to further investigate PQ toxicity and attempt to replicate our findings."
Q. "Further input is required", I am reading now, follow along with me, please?
A. Yes.
Q. "Further input is required to determine whether the stereology set-up and parameters used in the present study are accurate enough to detect the reported cell loss."
Is that right?
A. That's what it says.
Q. Okay. Was that the first optical fractionator stereology study done at Syngenta?
A. This was the first one, other than the -- some of the method development which I think this report refers to, where we were trying to get the methods that we are now describing to work appropriately.
Q. And she was the first researcher at CTL to use that stereology unit technique?

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A. That is correct.
Q. And she was credited with establishing the technique at CTL?
A. That's correct.
Q. And that's one of the reasons she was nominated for the Ashby Prize?
A. I think that was certainly one of the factors, I agree.
Q. Okay. I have her nomination if you want to see it. That's up to you. If you wish to, I will give it to you --
A. I don't think I need to see that.
Q. All right, okay.
She was, you would agree, concerned that the technique she used was not comparable to the technique used by independent researchers in the published literature. Would you agree?
A. She clearly wanted to make sure that we understood where methodological differences could lie.
Q. Right. She was also concerned the technique she used might be less accurate than the technique used by independent researchers in the published literature?
A. Yes, and it is important that you --
Q. Can you just answer my question?
A. Yes.
Q. Okay. And she was also concerned that the manual

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technique was not as accurate as the automated, newer technique?
A. Accurate, but not necessarily sensitive. I think those are -- those are two different issues here.
Q. Okay.
Now, despite Dr. Marks' concerns about the accuracy of this study, Syngenta published the results of the study. We are going to refer to that first study by her number -- you assign numbers to studies at Syngenta, don't you?
A. Yes, we do.
Q. That number for that study was XM7229. Correct?
A. Correct.
Q. Okay. And Syngenta published the results of that study, didn't they?
A. Can you remind me where we published that?
Q. I will, okay.
(Exhibit 27 marked for identification)
BY MR. TILLERY:
Q. What number is this document you are referring to, sir, so we are clear?
A. The Bates number, do you want?
Q. No, the --
A. Oh, the reference --
Q. The exhibit number is 27?
A. Exhibit number 27.

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Q. Thank you. Exhibit number 27 is an abstract for a presentation at the Society for Neuroscience Annual Meeting, October 23 through 27, 2004, in San Diego in California?
A. That is correct.
Q. Okay. The title of that is:
"Lack of Effect of Paraquat on the Nigrostriatal Dopaminergic System of the Mouse."
Correct?
A. Correct.
Q. It shows Louise Marks as the principal investigator with that asterisk underlying her name?
A. That asterisk would represent that she was the presenter of this.
Q. Oh, she was the presenter as well?
A. Yes, that's what --
Q. Okay.
A. -- the convention would normally suggest that she was.
Q. And it says "a control group of mice received injections of ... paraquat did not alter the concentrations ..."
Do you see that?
A. Yes.
Q. It comes through and says it was basically a finding

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of no impact, no loss of dopaminergic neurones in a statistically significant way, right?
MR. NARESH: Objection to form.
A. Yes, that's what that says.
BY MR. TILLERY:
Q. And the abstract would have been published in the symposium materials, wouldn't it, is that right?
A. I don't know exactly what this particular annual meeting's procedures are. Certainly this is not a peer-reviewed publication.
Q. Absolutely. Is it customary that the abstract be published in the symposium materials?
A. In some meetings, yes. In other meetings, no.
Q. And it is made available -- it's published to the people who are there and there's a presentation made?
A. That is correct.
Q. Okay. The presentation would be -- would announce -- that a Syngenta study showed that there was no impact on the substantia nigra in that mouse, correct?
A. In this study that is correct, yes.
Q. Okay. All right.
Did Syngenta at any time report Dr. Marks' reservation about the study technique using a manual system?
A. Well, I was not in this particular meeting so I don't know whether Dr. Marks took the opportunity to make

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that point.
Q. Did Syngenta otherwise -- did anybody at Syngenta -- not just Dr. Marks, she made it clear in her entire study which was, not to your knowledge, distributed to the attendees at that Society for Neuroscience Annual Meeting, was it?
A. This, if you are referring to the detail in this report, no.
Q. It was kept highly confidential at Syngenta?
A. At this time, that report had not even been finalized.
Q. That's right. It wasn't printed, right?
A. Right.
Q. Okay. So none of her reservations were announced, to your knowledge?
A. But normal scientific practice in a meeting of this sort is that this will lead to conversations with other research people, and I can't rule out that Dr. Marks may have had such conversations about some of those technical reservations.
Q. I move to strike your answer as unresponsive.
Would you read back my question to the witness?
COURT REPORTER: "So none of her reservations were announced, to your knowledge?"
A. Well, to my knowledge, that's true.

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Q. Okay.
Do you know of anyone at Syngenta who ever publicly stated or admitted that the manual cell counting method Dr. Marks used could account for the differences in the studies?
A. I'm not aware of any such occurrences.
Q. Was that ever reported to the US EPA?
A. Um, this --
Q. Her reservations?
A. Her reservations were not reported to the EPA, no.
Q. So the principal investigator acknowledged that her manual counting technique was not as accurate as automated techniques, and could explain the difference in results, but it was never announced by anybody else at Syngenta to your knowledge?
A. To my knowledge.
Q. Okay. Did you ever report her reservations about her study technique to your knowledge?
A. Report in -- in what sense?
Q. In any sense. Publicly?
A. Well, I -- the only thing that I could offer there is that Dr. Marks certainly did discuss that as part of her discussions with Dr. Di Monte.
Q. Okay. So that's the public disclosure is to another scientist who was teaching her how to improve her technique?

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A. If you call that public. I mean, that is part of normal scientific discourse as we have said many times.
Q. Okay, all right.
(Exhibit 28 marked for identification)
BY MR. TILLERY:
Q. We are giving you the full study as well as the quotes that you may want to look at.
We have handed you plaintiff's exhibit number 28.
A. Correct.
Q. Okay. What is this document?
A. It's another research report from CTL of a study, authored again by Dr. Louise Marks, again looking at the effect of neurotoxicity in the same strain of mouse using the same techniques that we were describing previously.
Q. So this is the second paraquat study that was conducted at Syngenta by Dr. Marks, right?
A. You may be right. I don't have accurate knowledge of the -- of the order of which these studies were done. But this was -- there were four or five studies in total.
Q. And this is the study Dr. Marks recommended to try to replicate the first study's findings that paraquat was not neurotoxic; correct?
A. If this is the second study, that would be the case.
Q. Okay. It was part of the paraquat mouse research program at Syngenta CTL?

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A. At that time, yes.
Q. Dr. Louise Marks was the report author?
A. Correct.
Q. Did she use different techniques?
A. I'd need to read the detail of, um, what she said in here --
Q. Actually, let me withdraw that for a second. We will get to it, okay. Rather than going through in sequence, I would rather go through the whole thing in sequence and then get to the different technique.
A. Okay.
Q. Dr. Sturgess contributed to the reported -- report as a study reviewer as well, didn't he?
A. Yes, that is correct.
Q. Okay. And Dr. Marks reports that this study was initiated on September 17, 2003?
A. Correct.
Q. And it terminated on December 22, 2003.
A. Correct.
Q. Okay. That just means the mice were terminated on that day?
A. I'm not sure if that means that the experiment as a whole was terminated on the 22 December --
Q. Okay. The study report was issued three and a half years later, June of 2007?

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A. That's because the reports of all of that series of studies were written up together.
Q. And they were generated in the last week of her employment?
A. As you said earlier, that is what you -- your information suggests.
Q. The study completion date is June 21, 2007?
A. The -- yes, in terms of writing the report --
Q. Instead --
A. -- yes.
Q. I should have said "the report completion date"?
A. Yes, yes.
Q. That would have been a more accurate question?
A. Yes, it would.
Q. Thank you. Okay. You have answered.
Dr. Marks announced the study purpose on page 6791, didn't she?
A. Yes.
Q. And the purpose she announced is:
"The aim of this study was to assess whether at a dose of 10 mg/kg, paraquat dichloride caused changes in the concentrations of striatal dopamine and its metabolites, and a loss of dopamine containing neurons in the substantia nigra pars compacta when dosed i.p. ..."
That is intra-peritoneally.

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"... to Charles River male C57Bl6J mice."
Is that correct?
A. That is correct, and that part of the purpose is the same as the purpose of the same previous experiment.
Q. It is exactly the same, isn't it?
A. Yes.
Q. Okay. And continuing on, she says:
"This study was conducted in order to determine the reproducibility of findings from an earlier CTL study ... where no apparent effect of [paraquat] was observed at these toxicity endpoints. The stereology methodology used in the present study has been modified from that detailed in ..."
The study that she reports as XM7229. Is that the first study?
A. That's what we were talking about previously.
Q. And continuing on, she says:
"This was as a result of information obtained following a lab visit to the Parkinson's Institute, California, and discussions with Dino Di Monte's research group."
Correct?
A. Indeed, as I have indicated.
Q. And she was educated in the use of an automated stereology technique, correct?
A. That's right, as used in his laboratory.

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Q. Right.
Now what were the results of this study? I think that is probably 6808?
A. Actually, I was looking at the executive summary of that --
Q. Okay.
A. -- on 6790, where it states that on this occasion, again, paraquat did not result in any significant reduction in the concentration of dopamine or its metabolites, whereas the positive control substance did. But on this occasion -- in this study, administration of paraquat did result in a statistically significant reduction, 23.7 percent.
Q. 23.7 percent reduction?
A. Yes.
Q. Okay.
A. In dopaminergic neuronal cells.
Q. And she reported that as statistically significant?
A. Yes.
Q. And that finding is comparable with the findings reported by independent laboratories who investigated the effects of paraquat on the black mouse; correct?
A. Absolutely. This is more, if you like, similar to the findings that you've described, yes.
Q. So she, effectively, in your laboratories replicated what the other scientists in the independent labs had done?

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A. Yes.
Q. Correct?
A. Yes.
Q. Okay. Now she reported a 23.7 percent reduction in dopaminergic neurons found in the study, and that was comparable to the other publications finding between 25 and 30 percent reduction in dopaminergic neurons in the substantia nigra; all right?
A. Yes.
Q. And she refers in this to the McCormack studies, didn't she? Do you see that? If you want to go to the top of 6808 that will give you a reference. On the preceding page, as well. Bottom of the preceding page 6807 and to the top of the page. Do you see that?
A. Yes, yes.
Q. And she shows you the results from the preceding page, reduced by 24 percent. It is comparable to the findings in publications observing a 25 to 35 percent reduction in cell numbers in the substantia nigra?
A. Yes.
Q. And she references studies and those -- one is McCormack et al, and that is 2002.
A. Yes.
Q. Can you tell me how to pronounce the second scientist's name?

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A. We pronounced it Thiruchelvam.
Q. Thiruchelvam?
A. I don't know whether that's the right pronunciation, but that's the one we used.
Q. And that is 2002; and Thiruchelvam et al 2003; and McCormack & Di Monte 2003. Right?
A. Yes.
Q. These were the studies by independent researchers in the published literature who had found paraquat to be neurotoxic in that mouse, hadn't they?
A. Yes.
Q. And these were published literature findings that CTL was trying to replicate?
A. Yes.
Q. Okay. And this study, in fact, replicated those independent scientific findings?
A. On this occasion, that is true.
Q. Those were in peer-reviewed journals as well, weren't they?
A. The publications that are cited here, yes.
Q. That she refers to?
A. Yes.
Q. And then the last -- okay, she reports the results and compares them to the XM7229 study; do you see that?
A. Yes.

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Q. Look on page 6808:
"With respect to the apparent cell loss ..."
A. Yes.
Q. Okay. And Dr. Marks -- would you take a minute to read that, please?
A. Yes, I would like to do that, please.
Q. Yes. And, sir, that whole page or at least the last two paragraphs. Take your time.
A. Okay.
Q. Have you read it?
A. Yes.
Q. Dr. Marks attributes the failure to detect neuronal cell loss in study XM7229 to differences in the stereology methodology, software and hardware used in that study; correct?
A. She does.
Q. And she also reports that in the study that you have in front of you, the newer one or the more recent one, XM7258, she:
"... used one of the most widely used and accurate stereology systems currently available and the methodology was refined to further improve the accuracy of the cell count data."
Correct?
A. Indeed.

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Q. "These changes to the stereology hardware and software were implemented following ... "
The visit and training by Dr. Dino Di Monte. Is that right?
A. That is correct.
Q. And that was in the Parkinson's Institute in Sunnyvale, California?
A. That's right.
Q. The previous study used "a non automated stage and used much older stereology software."
Correct?
A. Yes.
Q. Dr. Marks also notes that brain tissue in the previous study had deteriorated and thus could not be examined using the new, improved stereology equipment?
A. Correct.
Q. So what she did is she actually used the old methodology on the second group of mouse brains to count, didn't she? And when she did, she found negative results. She would have reached the same conclusion, that's what she found.
MR. NARESH: Objection to form.
A. Could you just repeat that?
BY MR. TILLERY:
Q. Of course. Did you understand or did you know that

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Dr. Marks had actually repeated the same manual technique on the second round analysis, and came up with the same results as the first study.
When she used the automated technique --
A. Right.
Q. -- she got an accurate result because of the difference in techniques?
A. I don't understand that I actually knew that --
Q. But you do now?
A. But I do now.
Q. All right. She re-examined the tissue with new, improved stereology equipment and found the loss of neurons in the substantia nigra that she reports here?
A. Okay, that's fine.
Q. Now, did -- strike that.
Did Syngenta send Dr. Marks to Sunnyvale?
A. Yes.
Q. Okay. Did Syngenta ever publish the results of the second study?
A. Again, not that I remember, unless, like on the previous occasion, it was at a scientific meeting. But I've no evidence for that.
Q. Did Syngenta ever notify the Society of Neural Science where the first study was reported to tell them that the first study was wrong?

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A. I have no evidence we did that.
Q. Okay. Based upon what you have seen from these two studies, would you agree with me that the results of the first study was wrong?
A. The -- it points to the possibility that the first study was wrong.
Q. Do you have any reason to dispute her statements that the difference in automated versus manual technology accounted for the difference in the results?
A. No reason to dispute that at all.
Q. Okay. Did Syngenta ever inform the Environmental Protection Agency about the loss of dopaminergic neurones found in the study?
A. In this study, no, because they were not new findings.
Q. I am just asking whether they did.
A. Right.
Q. Did they?
A. So far as I'm aware, they did not.
Q. Okay. So you weren't aware that on December 13, three months ago, your counsel notified them of this study --
A. I thought you meant at the time, sir, so I --
Q. Oh, that would be the logical thing to do --
A. Right.

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Q. -- would be to tell them.
Would you think it would be appropriate to wait 16 years and a half -- 16.5 years -- to tell them?
MR. NARESH: And I will object to the attorney commentary.
BY MR. TILLERY:
Q. We're just asking you. Is 16.5 years an appropriate time period to make a report?
A. I believe it was still the correct decision at the time that these findings were not reportable.
Q. Okay. So when it changed and suddenly you decided to notify the US EPA on December 13, 2019, sixteen and a half years after the report was finalized --
A. Well, that was not a decision that I was involved in taking.
Q. Okay. Would you have done that?
A. I wouldn't want to comment on that. I'm not an expert in whether these things should be done.
Q. You don't want to go down that path, do you?
A. I --
MR. NARESH: I object to the form, argumentative.
BY MR. TILLERY:
Q. Okay. So can you explain to me why there was a 16.5-year delay?
A. I don't want to venture in any speculative way,

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because I'm not involved in that process.
Q. Were you aware that I wrote your counsel a letter demanding that they notify the US EPA?
A. I saw that letter.
Q. Okay. That might account for why they did it a week later, do you think?
MR. NARESH: Objection to form, argumentative.
BY MR. TILLERY:
Q. Do you think there's a connection?
A. I wouldn't want to comment on that.
MR. TILLERY: Okay. Let's take a lunch break. Is this a good time? Or we can keep going --
MR. NARESH: Let's go off the record for a second.
THE VIDEOGRAPHER: Off the record at 11:49.
(Break taken.)
THE VIDEOGRAPHER: We are back on the record at 12:08. This is now media number 3 in the deposition of Philip Botham.
You may continue.
(Exhibit 29 marked for identification)
BY MR. TILLERY:
Q. I'm directing your attention, sir, to plaintiff's exhibit 29. Can you tell us what that is?
A. Again, another study on paraquat dichloride

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investigating the reported paraquat-induced dopaminergic neurotoxicity in the black mouse.
Q. And this was at Central Toxicology Laboratory Alderley Park, right?
A. It was.
Q. And the principal investigator was Louise Marks?
A. That is correct.
Q. And the study number is XM7371?
A. Yes.
Q. This was a study that was part of the paraquat mouse research program at Syngenta CTL, right?
A. At that time, yes.
Q. Dr. Sturgess again was the study reviewer?
A. Correct.
Q. The study was initiated on April 26th, 2004?
A. Yes.
Q. And was terminated on November 17, 2004?
A. Yes.
Q. And reported in June 2007?
A. Correct, along with the other reports we have been discussing.
Q. Right.
If you would go to 911 in the "Study Design" section, Dr. Marks reports that the purpose of the study was to investigate whether the loss of dopaminergic neurons in

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the substantia nigra observed in XM7258 could be further enhanced by increasing the frequency of dosing; correct?
A. Correct.
Q. And then if you go to the "Results" section, Dr. Marks reports dosing of paraquat resulted in a statistically significant loss of dopaminergic neurons in the substantia nigra pars compacta of mice; correct?
A. Correct.
Q. But the increased doping frequency did not result in a greater magnitude of cell loss, correct?
A. Correct.
Q. At the bottom of that page, that is on 911, Dr. Marks reports:
"These results support the findings of study XM7258 and demonstrate that paraquat, when administered to [C57Bl6] mice ... induces nigral, but not striatal, toxicity."
Correct?
A. Correct.
Q. And nigral toxicity is a form of neurotoxicity, isn't it, sir?
A. It is an effect on that part of the -- of the brain, yes.
Q. The results support the findings that paraquat is neurotoxic, correct?
A. They support the possibility that paraquat could be

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neurotoxic, yes.
Q. Support the findings of it as well, at least in mouse, right?
A. The findings are now becoming more replicable, yes.
Q. As a matter of fact, this result replicates the studies in the independent literature she found as well, correct?
A. It does. As did the previous one. Although, interestingly, there was no exacerbation of the effect compared to the previous study.
Q. All right. And if you go to 25, Dr. Marks reports:
"The present study has confirmed that administration of 3 weekly injections of 10 mg/kg paraquat dichloride to ... C57Bl6J mice, results in a statistically significant reduction in the number of ... dopaminergic neurons in the [substantia nigra] ..."
Correct?
A. That's what that says, yes.
Q. Yes. She further reports this reduction is comparable with the loss reported in the public literature?
A. Yes.
Q. And she references several studies by independent researchers, right?
A. Yes.
Q. And who does she list as the source: McCormack et al

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2002; McCormack & Di Monte 2003; correct?
A. Correct.
Q. Did Syngenta ever publish the results of this study in a peer-reviewed journal?
A. I'm not aware that it did.
Q. Okay. Did the results of this study ever appear anywhere in any public literature?
A. I am not aware of -- of whether that actually did happen.
Q. Did Syngenta ever inform the United States Environmental Protection Agency about the loss of dopaminergic neurons observed in this study?
A. At the time of this study, there was -- this was not reported to the EPA, that I do know.
Q. This was reported sixteen and a half years later in December 2019; correct?
A. As you were indicating on the previous occasion, yes.
Q. You saw that report, and you saw my letter demanding that it be reported?
A. I saw your letter, yes.
Q. You saw my -- I'm sorry, strike that.
You saw my letter and you saw the report that was filed?
A. I'm not sure that I've seen the report.

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Q. Okay. Do you know who made the decision to file the report?
A. I don't.
Q. Did Syngenta ever disclose the study to any other regulatory agency around the world?
A. I -- I'm not able to answer that accurately. I am not sure.
Q. Okay. You've dealt with other regulatory bodies yourself, haven't you, outside the United States?
A. I have.
Q. You haven't dealt with the US EPA?
A. I have not engaged with the US EPA on this issue, no.
Q. Okay. And you have engaged with other regulatory authorities?
A. Yes.
Q. Okay. Which countries have you dealt with?
MR. NARESH: You are asking him personally?
MR. TILLERY: Yes.
A. Right. So for me personally, I have had some engagement with Brazil. But I have had -- there has been indirect contact with other -- Australia by members of my team, but not me personally.
BY MR. TILLERY:
Q. Are those the only two countries that you know of

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that -- that you interact with in terms of this?
A. Well, certainly in terms of personal interaction, there were no other countries.
Q. Do you know of any other regulatory bodies in other countries besides Brazil and Australia?
A. There are other regulatory authorities who will have had -- where there will have been discussions about this topic.
Q. You don't know whether this study was reported to them?
A. I can't give you any indication of that, I am afraid.
Q. Was it given to Brazil?
A. I don't think it was specifically given to Brazil.
Q. Was it given to Australia?
A. I don't believe so.
Q. Are you aware of any disclosures of Dr. Mark's study results to any regulatory agency in the world?
A. I am not aware of that.
Q. When Dr. Marks -- strike that.
When Dr. Marks reported the results of the studies to her superiors, her superiors did not want her to accept the findings that paraquat causes neuronal cell loss in the black mouse; is that a fair statement?
A. I would not say that was a fair statement because

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I don't know what your evidence is to -- to back that up.
Q. Okay, okay.
Were you aware that her superiors wanted her to find a flaw in her methodology?
A. Again, I would not -- I would like to understand what the basis of that is.
Q. Okay. Before we get into the documents, because I promise you I will -- after lunch I will share that with you, I will -- were you aware that they were doing that?
A. No, I was not aware that there was such -- such conversations were going on at the time.
Q. Have you ever heard of a scientist being asked to find -- search for flaws in her own methodology in order to disprove her own scientific results?
A. Well, put that way, I think that is something that you wouldn't expect. But you would expect that people would be -- would say: are you really sure that the methodology that you are using is actually being used as well as possible?
Q. But you've studied -- you've looked at these studies and this is a scientist who has gone through -- who has criticized her first result because it was manual technique, who has gone to the trouble of educating herself at Sunnyvale, California, in a -- in a more automated technique in order to enhance the accuracy of her scientific findings.

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For that, she's been recognized with the highest prize for professionalism that your company even recognizes; correct?
A. Correct.
Q. Okay. Now in that context, right, can you imagine a scientist being told, of that type, to discredit her own findings?
MR. NARESH: Objection to form.
A. I would personally never put such a -- a proposal to a scientist.
BY MR. TILLERY:
Q. You wouldn't do that, would you?
A. I would not do that personally.
Q. Okay. And that would be unethical, would you agree?
MR. NARESH: Objection to form, scope.
A. As you -- as you actually stated it, that would, to my mind, be an inappropriate way of dealing with a scientist.
BY MR. TILLERY:
Q. All right.
Do you, as Syngenta's representative who prepared to testify on the subjects that included what we are talking about here today, need to know what evidence I have before you are able to testify about what Dr. Marks' superiors wanted?
A. As I said a minute ago, yes, I would like to see

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that evidence.
MR. NARESH: Steve, just so we have a clear record, you mentioned the Marks studies. You are referring to the three studies you have introduced as evidence?
MR. TILLERY: No, all of the studies. Every one she did for Syngenta.
MR. NARESH: Including the studies you have not yet introduced?
MR. TILLERY: Yes.
MR. NARESH: All right, then --
MR. TILLERY: I'm going to go through them all.
MR. NARESH: Okay. Well, I'm concerned that there might be confusion from the witness because you asked some questions about disclosure to the EPA --
MR. TILLERY: Yes.
MR. NARESH: -- and referred to the Marks studies. And if you are referring to all, as opposed to the ones you have introduced, I think there maybe some confusion on the record. So I don't know if you want to --
MR. TILLERY: I don't want an incorrect record. So if I -- if my question did -- was too broad and encompassed it, I am willing to allow you to have him correct that so he's not impeached by it later.
MR. NARESH: You want to do it now or later --
MR. TILLERY: We can do it later. Then you can

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use the hour time to fix that with him. I'm happy to let you do that.
MR. NARESH: Let me put it this way, I do anticipate having more fulsome redirect than just on that question. Would you want me to do that, do all of it at the conclusion of your examination, or do you want me to do that at some other point?
MR. TILLERY: Probably at the conclusion of the examination.
MR. NARESH: I will reserve the right to do redirect on that point and all of the points at the conclusion of your deposition.
MR. TILLERY: I'm not saying that I agree that you are entitled to do that, so that you understand, okay?
MR. NARESH: Okay.
MR. TILLERY: Thank you.
BY MR. TILLERY:
Q. Were you aware that her superiors wanted Dr. Marks to come up with other explanations for why paraquat could have caused the same findings that were not consistent with it being a potential cause for neuronal cell loss?
A. I can't speak about the specific conversations at the time. But such conversations were certainly had at a later time which I was involved with, when we continued to find an apparent loss of dopaminergic neurons, and which

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indeed we have subsequently published.
Q. Well, let us go to the next exhibit.
(Exhibit 30 marked for identification)
BY MR. TILLERY:
Q. Now, on that last point that you made, could you tell me where Syngenta published a Syngenta study finding loss of dopaminergic neurons after the use of paraquat?
A. Yes.
Q. Where?
A. In the neurotoxicology publication of Breckenridge et al. One of the studies that was reported in that showed an apparent loss of dopaminergic neurons.
Q. And which study specifically, could you tell us on the record, please?
A. I would have to go back and look at the publication to see exactly what study number it was referred to in that, but it was -- I know the dose level was 15 milligrams per kilogram of paraquat.
Q. Okay. Now look at exhibit number 50, please -- I'm sorry, number 30.
A. 30.
Q. Can you read into the record the title of this document?
A. "Notes of discussions with Lewis Smith to brief him on the latest Parkinson's disease findings on

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3rd December 2004".
Q. And present were, can you tell us?
A. Lewis Smith, Nick Sturgess, Louise Marks and Mike Clapp.
Q. And Nick Sturgess and Louise Marks presented the latest findings, correct?
A. That's what the next line says.
Q. Okay. And the first bullet point of number 1 paragraph says:
"Is the loss of neurones indicating generalised neuronal toxicity in the brain rather than a specific effect in the Substantia Nigra? This is not ... clear, however data from other brain areas (e.g. hippocampus) suggest that it is specific, but it may be difficult to detect changes in dopaminergic neurone number in other brain regions where the density of dopamine containing neurones is lower than in the [substantia nigra], thus making a loss of neurones more difficult to detect."
Right?
A. Yes.
Q. Okay. Lewis Smith, who is listed here, is the same Lewis Smith that we have been talking about, right?
A. He is.
Q. And what was his role at that time?
A. I think in 2004 it would be when he was the head of

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the Central Toxicology Laboratory.
Q. Who is Mike Clapp?
A. Mike Clapp was the product toxicologist for -- based at CTL who had paraquat as one of his product responsibilities.
Q. Is he still employed with the company?
A. He is not.
Q. Where is he now?
A. He's retired.
Q. Okay. The purpose of the meeting was to brief Lewis Smith regarding the latest Parkinson's disease findings from Dr. Marks; correct?
A. That's what the title suggests.
Q. Now if you would look at page 2 of that two-page document, that's dated what, if you look at the bottom of the second page?
A. 7 December 2004.
Q. 7 December 2004?
A. Yes, if this is an English document, the --
Q. Okay. All right.
Were Dr. Smith and Dr. Clapp, Louise Marks' and Sturgess's superiors?
A. Dr. Smith, yes; Dr. Clapp, no.
Q. But Dr. Smith was their boss?
A. He was the head of the laboratory at that time.

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Q. He was the head of the entire operation?
A. I believe at that time that is correct.
Q. Okay. So if you would read this, does it report that Dr. Smith wanted to have the research team investigate other reasons for dopaminergic neuronal death in paraquat-dosed mice?
A. I would just like to read it a little bit more if I could.
Q. Sure, take your time.
A. Okay. Would you like to repeat the question?
Q. Of course, thank you.
The question -- the first question I would ask is whether Dr. Smith wanted the research team to investigate other reasons for dopaminergic neuronal cell death in paraquat-dosed mice? He was looking for other explanations?
A. He was suggesting that some methodological things needed checking and that there were other hypotheses that might explain the findings.
Q. Trying to think of other ways this could account for the results?
A. Yes, to see -- yes.
Q. Okay. Right. That's what he was doing.
Because Syngenta had replicated the paraquat neurotoxicity findings in the independent published literature, correct?

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A. Yes.
Q. And unless those findings could be attributed to a cause other than paraquat, Syngenta had established a sound scientific basis for the claims made in the public literature that paraquat is neurotoxic; correct?
A. That would be the implication of the replication and confirmation.
Q. And those claims were a threat to Syngenta's aspirations for paraquat too, weren't they?
A. That would undoubtedly have led to discussions about the -- paraquat and how it should be continued, I agree.
Q. In fact, a threat to the bottom line of the company?
A. Well, that's a -- possibly what some people had in mind. Certainly it wasn't, within the scientific community, something that was prominent.
Q. Well, I mean, look at the last paragraph of the conclusion. He says, second sentence, "HA."
Who is that? At that time, what is HA?
A. That would be "Health Assessment".
Q. "[Health Assessment] have a responsibility to create the scientific understanding and there will be no intention to slow down this understanding, although business risk will need to be considered in the decision making process."
"Business risk" means selling paraquat, doesn't it?
A. It does.

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Q. Right.
A. But it did reinforce the point I was making about creating scientific understanding, so I think it --
Q. Right.
A. -- said the same as I did.
Q. So HA at Syngenta had the responsibility to create the scientific understanding regarding paraquat's neurotoxicity?
A. That's right. That was our accountability.
Q. The business threats which needed to be considered in the decision-making process for creating the scientific understanding of paraquat was that they could further prove paraquat was neurotoxic. That was the business risk?
A. Of course.
Q. Yes. There was a business risk that paraquat would be banned in more countries if it were established by additional tests; correct?
A. I would put it differently. It was always our role, in health assessment as it was called then, to -- to say if there was a scientific basis for there being a risk associated with the product, we would want that to be understood by the business.
Q. How many of these studies need to be repeated before you're happy with the fact that this stuff causes brain injury?

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A. That's a -- you can never put an exact number on that. And don't forget, this was still very much at the forefront of research which is why, um, Louise Marks received that award, because, you know, this was new technology. We were still understanding how it worked.
Q. It was new technology with you. It wasn't new technology around the world, was it?
A. Even around the world, if we had -- conversations were made as an example when we spoke to Professor Nyengaard, I think I mentioned his name yesterday, where -- which said this is technology where we are all still learning how to use it properly.
Q. Let me ask you: you knew that this automated technology was already being used by the independent researchers before this, right?
A. Yes.
Q. They had access to this; they were using it.
Do you know how long they had it in use before you got it?
A. I can't answer that question.
Q. You don't know?
A. I don't know.
Q. Let me ask you this. Do you think had you wanted to get it at the time that these independent researchers got it, you could have done exactly the same thing at CTL

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laboratory?
A. Of course we could have done that, yes.
Q. Sure. And hired the best researchers in the world to do it?
A. We could. But there was no reason for us to do it, because at that time there were no findings in the literature. So things go in a -- in an order.
Q. Okay.
And this technology, stereology, wasn't the first technology the scientists could use to detect the death of dopaminergic neurons in the substantia nigra, was it?
A. Well, there are some other pathological techniques you could use, of course.
Q. Of course. And they long pre-dated stereology techniques, didn't they?
A. They are, but those pathological techniques are not necessarily specific to the cells that you are -- that are involved here.
Q. Okay.
THE VIDEOGRAPHER: In that case, we will go off the record at 12:33.
(Break taken.)
THE VIDEOGRAPHER: In which case we are back on the record as of 1:26.
You may continue.

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(Exhibit 31 marked for identification)
BY MR. TILLERY:
Q. Sir, we have handed you what's been marked as plaintiff's exhibit number 31.
This is Bates range Syngenta 1981435. Do you see that?
A. I do.
Q. Okay. And the top of this page says what?
A. "Thoughts On Options For Challenging The PQ and C57Bl6 Mouse Model."
Q. And if you look on the second page, it's got a reference to Nick Sturgess and Louise Marks, 6 December 2004. Do you see that?
A. I do.
Q. Okay. Are these notes Drs. Sturgess and Marks made on December 6 regarding challenging the paraquat results they had seen in the C57B6 mouse?
A. It suggests that this is a record of their conversation.
Q. Okay. And these notes were made one day before the meeting with Dr. Smith on the paraquat results in the C57 black mouse, weren't they?
A. They were made -- well, that meeting itself was on 3 December.
Q. On the 3rd?

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A. Yes. So the meeting minutes were dated 7 December, but the title says that the meeting itself was on 3 December, if I have read this correctly.
Q. This meeting minutes says 6 December 2004. And you read the other one as being --
A. I do, sir, yes.
Q. -- later?
A. Yes. Well, earlier --
Q. Earlier, right?
A. So the meeting here is earlier, yes.
Q. So Lewis Smith, from your prior review of the meeting with Lewis Smith, was of the opinion that CTL should aggressively challenge the results in the Marks studies; do you agree?
A. And by "aggressively", it is to get on with it.
Q. Yes. He wanted them to aggressively challenge the methodological issues with the --
A. That was one of the factors, yes.
Q. Okay. And did Lewis Smith ask Drs. Sturgess and Marks, or both, to come up with ways to challenge the paraquat mouse model in preparation for the briefing?
A. Which briefing are you talking about?
Q. Assuming you are right about the times, then it wouldn't be a briefing: this would be a meeting that occurred after they met with Dr. Smith, is that what you are

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thinking?
A. Well, I'm taking it to be that way. That they have met with Dr. Smith, and maybe this was Dr. Sturgess and Dr. Marks saying, "Well, where do we go from here?"
Q. So your meeting -- the first meeting with Dr. Smith, and then this is notes of meetings that these two scientists had after they met with Dr. Smith, is that what you are saying?
A. If the dates on these pieces of paper are accurate, then you would conclude that.
Q. Okay. So if you look at the fifth bullet, it says Drs. Sturgess and Marks note, on the fifth one down:
"It has not been reported that C57Bl6J mice are more sensitive to PQ induced toxicity than other strains of mice. In fact, given that the animals have been obtained from different suppliers including our own data, would suggest that subtle differences between strains in their susceptibility to PQ are unlikely."
A. Correct, yes.
Q. So one of the things they were looking at was to try to change the mice to come up with different results, potentially?
A. One of the things they were looking at was asking the question about is there strain sensitivity, which may be important.

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Q. Okay. The next says:
"The only studies we are aware of involving non-C57Bl6 mice with [paraquat] relate to studies investigating PQ induced cell loss in alpha synuclein over-expressing animals."
Correct?
A. Yes.
Q. So Syngenta was aware of studies involving other strains of mice where paraquat induced cell loss occurred, right?
A. Yes.
Q. And this was neuronal cell loss, correct?
A. Yes, that would be correct.
Q. And this paraquat induced neuronal cell loss occurred in mice who were over-expressing alpha synuclein?
A. That's what the Swiss Webster was describing, yes.
Q. And over-expressing alpha synuclein means the same thing as upregulation of alpha synuclein, would you agree?
A. It is expressing more of the protein, yes.
Q. You are aware that upregulation of alpha synuclein is part of the Lewy body pathology in human Parkinson's disease patients, correct?
A. Yes.
Q. Syngenta was fully aware of that fact in 2004 --
A. Yes.

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Q. -- would you agree?
When was that first known to be true?
A. I can't give you a date as to when that was first known.
Q. Okay. The next bullet point says:
"If we were concerned that the pigmented mouse was more sensitive to [paraquat] than other strains, one option would be to dose 10mg/kg [of paraquat] to variety of different mouse strains including BALB/c, Swiss Webster and CFI, and observe the extent of the neuronal cell loss."
Right?
A. Yes.
Q. What are those?
A. They are different strains of mice.
Q. Okay. Then it says, "however" -- it goes on to say:
"However, this would generate a PRF since no one else has dosed [paraquat] to these strains."
A. That is absolutely correct.
Q. And a PRF there means what?
A. As we were discussing this morning, the potentially referable findings under 6(a)(2).
Q. So they didn't do that, because had they made the finding they would have had to report it?
A. That doesn't say that. It says:
"However, this would generate a PRF ..."

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Q. And do you know if they ended up doing that study?
A. I don't believe that they did.
Q. Okay. Do you think that the reason they didn't do it is because it might generate a PRF?
A. I don't know what the full reasoning was. It may have been taken into consideration but I wasn't involved in these discussions.
Q. Okay. Do you agree with their conclusion that there was not strain sensitivity?
A. I -- it depends whether you are looking at that question as it was seen at that time or with the benefit of hindsight, because with the benefit of hindsight more research has shown that there is perhaps some strain -- difference in the sensitivity.
Q. Statistically significant strain sensitivity?
A. That is on the borderline, I have to say.
Q. Okay. Are PRFs something that Syngenta generally wants to avoid?
A. We don't avoid them if it actually is doing the right scientific study.
Q. Okay. The next page -- flip this over -- fifth bullet down says:
"The reported PQ induced nigrostriatal toxicity is not just mouse specific."
Do you see that?

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A. Yes.
Q. And then it cites another name you are going to have to pronounce for me.
A. Chanyachukul.
Q. We probably should spell that for the reporter, please?
A. C-H-A-N-Y-A-C-H-U-K-U-L.
Q. "... (work in part carried out at University of Nottingham) investigated the effect of acute [paraquat] exposure to Wistar rats, demonstrating neurochemical and behavioural deficits, which were attenuated by the administration of L-valine."
Q. What is L-valine?
A. It is an amino acid.
Q. "Also neurochemical, pathological and behavioural changes have been reported following intracerebral injection of [paraquat] into rats."
Correct?
A. Yes.
Q. Do you agree with that statement?
A. Yes, those are published papers.
Q. Okay. So Syngenta knew the same types of results would occur in rats as well, wouldn't it?
A. There was clearly a potential for that to be the case, yes.

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Q. Drs. Sturgess and Marks note:
"The options for challenging the [paraquat] mouse model would appear to be somewhat limited."
Okay?
A. That's what it says.
Q. Dr. Sturgess and Dr. Marks considered the options to be challenging -- strike that.
Dr. Sturgess and Dr. Marks considered that the options to challenging the methodology of the paraquat mouse model appeared very limited, didn't they?
A. Yes. And I think what was meant there is challenging its relevance to human Parkinson's disease potential from paraquat.
Q. What options for challenging the paraquat mouse model did they provide?
A. Well, what was being discussed at the time, and certainly was discussed subsequently, was whether there were more relevant models. The rat was discussed frequently as -- as another option. Indeed we did go on to do a rat study ourselves.
Q. Well, didn't they say in the same bullet point there, they wrote:
"The best way of challenging the model would be based on the dose, duration and route of exposure ..."
A. Indeed, and that was going to be my second point.

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So human relevance is much more going to be directed to how you administer the compound, indeed.
Q. They are not challenges to the methodology of the model, so much as changing certain aspects of the model?
A. Yes, it is back to what we discussed this morning: the relevance of your model is always an important consideration.
Q. What is NOEL?
A. A no effect level.
Q. What does that mean?
A. It is the dose that when you do a toxicology study and you use more than one dose level -- so in other words you feed or inject different concentrations of a chemical to your animals -- it is the dose at which you saw no effects.
Q. And the very next bullet point says:
"I still believe our best defence is to conduct an exposure based risk assessment based upon a dietary/dermal NOEL using the mouse model of neuronal cell loss."
Correct?
A. Correct.
Q. Best defense?
A. And that -- if I may, again I would say that that was being positioned at the time on the assumption that the effect is real. It is reproducible. You know, it would be perhaps not easy to deny it with the information that was

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available at that time.
But is that model that's being used relevant to humans because it is an injection model? And actually, even if you do see an effect at a high dose, if you can find a dose which is still orders of magnitude above anything a human would be exposed to, then that would say that that -- your concern would be reduced.
Q. I move to strike the answer as unresponsive.
So it says, my question was:
""I ... believe our best defence is to conduct an exposure based risk assessment based upon a dietary/dermal NOEL using the mouse model of neuronal cell loss."
Doesn't it?
A. Yes.
Q. And it says the word "defence", that was the question I had. "Defence", do you see that?
A. Yes.
Q. And defense is defense against the fact that the study showed damage to the substantia nigra and to the production of dopamine by the dopaminergic neurons?
A. No, I disagree, sir. The defense at that time, I am sure, was not to say we are trying to discredit the possibility that you see the neuronal cell loss in the conditions that we have been talking about; but actually to say -- to, if you wish, discredit its relevance to human

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risk assessment. And that's why they used "exposure based risk assessment" as a shorthand way of describing what I just said to you.
Q. Well, aren't they really saying that Syngenta should accept the results of the Marks studies and the findings of independent researchers that paraquat causes neuronal cell loss? Isn't that what they were suggesting?
A. I don't dispute that and actually agree with it.
Q. And you agree with it too?
A. Indeed. And as I said to you this morning, when we continued our work and published the Breckenridge paper, that was a position we were first in. We again replicated that finding.
Q. And when you found that -- in the Breckenridge paper, you found that it caused neuronal cell loss in the substantia nigra, didn't you?
A. In one study at one dose level.
Q. In one study and one dose level in one type of rat, I apologize --
A. Mouse.
Q. A rat, right?
A. Mouse.
Q. Mouse, sorry, excuse me. In one type of mouse you found it and it was attributable to paraquat exposure?
A. It appeared to be at the time. But then, as that

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Breckenridge paper says, we did many more experiments as part of that publication and in none of the others were we able to replicate it nor were we able to see any evidence that you would -- that other pathologists who we were now consulting with said you should see if that was a genuine death of cells. Because pathologists were telling us that if cells were dying other things would happen around them.
Q. I just wanted to clarify one thing. My question was really this -- I move to strike your answer as unresponsive.
My question was simply this: did you find damage in that single mouse study that was reported there as a result of paraquat exposure in the mouse?
A. Yes. In that single study, yes.
Q. Okay. And that was reported, correct?
A. As part of our publication.
Q. Okay, all right.
Would you agree that instead of challenging the results, Syngenta should use them as the basis for a human health risk assessment of paraquat?
A. Now that we have done many more experiments, including those we have just been referring to in neurotoxicology, I believe quite strongly that our position is that the replicability has not been established, so I don't think it would be appropriate to do that.
Q. Okay.

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You see the next section says, bottom of the second page:
"Potential experimental follow-ups suggested by Lewis Smith include:
"Can the changes observed be accounted for by tissue shrinkage owing to the diuretic effect of PQ? Suggests dosing with a diuretic to look for changes in ... cell counts."
Do you see that?
A. Yes, yes.
Q. Okay. And it says:
"Are the effects observed with the mouse model irreversible? Conduct a ip study ..."
What does "ip" mean?
A. Intra-peritoneal.
Q. Intra-peritoneal study:
"... at 3 x 10 mg/kg, and assess the extent of neuronal cell loss 7, 14, 28, and 90 days post final dose."
A. Yes.
Q. "This will confirm the loss detected so far is irreversible."
Do you see that?
A. I do.
Q. Okay. And those were suggested by Lewis Smith, apparently, from this report --

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A. From what this says, yes.
Q. Okay.
He suggested -- he being Lewis Smith -- suggested dosing mice with a diuretic to determine if the loss of neuronal cell loss could be attributed to the diuretic effect of paraquat on tissue samples; right?
A. Yes.
Q. That was one of the theories that they had for why these results could have come back the way they did?
A. Indeed, and it was --
Q. It's a diuretic?
A. It was included in the notes of that other meeting we were talking about.
Q. Right. And Lewis Smith has also suggested conducting a paraquat mouse study with animal sacrifice at 7, 14, 28 and 90 days to confirm whether paraquat induced neuronal cell loss was irreversible, whether it was permanent?
A. Yes. And an experiment of that sort was actually subsequently done.
Q. It was done, wasn't it?
A. Yes.
Q. Okay.
MR. NARESH: Steve, just as housekeeping thing, can I move some of these --

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MR. TILLERY: Yes, you do whatever you need.
(Exhibit 32 marked for identification)
BY MR. TILLERY:
Q. The next exhibit is number 32, correct, sir?
A. That is correct.
Q. What is this?
A. This is another study in the series of studies conducted with the title "Paraquat Dichloride Hydrate", looking at, in this case, the time course and reversibility of dopaminergic cell loss in that same mouse model following the administration of paraquat.
Q. And this is XM7480, right?
A. That is correct.
Q. And it started June 21, 2007, right?
A. That was when it was reported.
Q. I'm sorry, that was the report date. The study dates were February 18, 2005, and the termination date was September 1, 2005; right?
A. Which I think it must be misprint -- no, it may not be. I beg your pardon, forgive me. Yes, that is probably correct, yes. Yes.
Q. Okay. This study was designed to investigate the time course and potential reversibility --
A. Yes.
Q. -- of the loss of dopaminergic neurons in the

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substantia nigra after three months of dosing; right?
A. Yes.
Q. And using paraquat?
A. Well, if I may, I believe -- I would just like a little time to double-check this.
Q. Go ahead and take your time.
A. Okay.
Q. If you look at 2793 under "Purpose"?
A. Yes. So I think I would just need to, if I've heard you correctly, slightly qualify. So paraquat was given as three weekly injections but then it was not continued to be administered. I believe the animals were then rested, if you like, and sacrificed at different time points.
Q. Yes. For clarity in the record, the purpose set out at page 2793 by Dr. Marks was:
"The aim of this study was to investigate the time course and potential reversibility of nigrostriatal effects following 3 weekly injections of 10 mg/kg paraquat dichloride by assessing dopaminergic cell loss in the [substantia nigra] and concentrations of striatal dopamine and its metabolites at 7, 28 and 90 days after the final dose of paraquat."
A. That is correct, yes.
Q. That's what you --
A. That's what I was qualifying, yes.

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Q. In the previous studies, Dr. Marks had observed loss of dopaminergic neurons in mice dosed with paraquat and sacrificed seven days later, correct?
A. Yes.
Q. In this study she observed loss of dopaminergic neurons dosed with paraquat, didn't she?
A. Yes.
Q. And the loss was statistically significant too, wasn't it?
A. Yes.
Q. The study also measured the loss of dopaminergic neurons 28 and 90 days after the last dose was given?
A. Yes.
Q. And the degree of dopaminergic neuron loss at 28 and 90 days was similar to the loss at 7 days, wasn't it?
A. That is correct.
Q. In other words, the animals did not recover dopaminergic neuron function after a passage of 28 or 90 days?
A. That's right. Using that measurement they stayed the same, correct.
Q. The loss of dopaminergic neuron function was permanent throughout the 90 days of the study?
A. That's right.
Q. It was not reversible, is what you found?

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A. Within that timescale, it did not reverse.
Q. The last paragraph, okay -- and that is 2792 --
Dr. Marks says:
"These results support the findings of two previous CTL studies XM7258 and XM7371 ... and demonstrate that paraquat, when administered to C57Bl6J mice ... would appear to be capable of inducing nigral but not striatal toxicity."
Right?
A. Yes.
Q. And nigral toxicity is a form of neurotoxicity again?
A. Nigral is meant to be the substantia nigra.
Q. The substantia nigra, yes, okay. The studies suggest -- support -- the findings that paraquat is neurotoxic, don't they?
A. They support that, that finding yes.
Q. Yes. This is the third Syngenta CTL study that found that paraquat causes loss of dopaminergic neurons; correct?
A. Correct.
Q. And the third Syngenta CTL study where Dr. Marks found the loss of dopaminergic neurons were comparable to the loss reported by independent researchers in published scientific literature; correct?
A. Correct.

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Q. The third Syngenta study to repeat the results of independent researchers' finding that paraquat is neurotoxic?
A. As specifically defined by the loss of dopaminergic cells. There were other findings that were not seen. Like the loss of dopamine has not been seen consistently in the studies --
Q. But in the limited context in which I asked the question, to repeat the findings means replicate the findings?
A. In that area, that is correct --
Q. So this is the third one in a row to replicate the work by independent researchers?
A. Can you just say that again?
Q. By independent researchers?
A. Yes.
Q. And it also means, for these purposes, that these studies reproduce the findings of the independent researchers?
A. They do.
Q. If you look at 2807, the first full paragraph, sir, tell me when you are there.
Dr. Marks says:
"Our data would appear to be supportive of the hypothesis that a sensitive subpopulation of dopaminergic

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neurons may exist which are vulnerable to paraquat induced toxicity."
Do you see that?
A. I do.
Q. Do you agree with that?
A. That's what it says.
Q. Okay. Did Syngenta publish the results of this study in any journal?
A. I'm not aware that we did.
Q. Did Syngenta publish this anywhere, or post it, or present it, or talk about it in any scientific symposium?
A. I'm not sure that we did that.
Q. Okay. Are you aware of anybody ever saying they did?
A. I'm not aware.
Q. Did Syngenta ever disclose this study to any regulatory authority in the world, including the United States Environmental Protection Agency?
A. This study was the subject of a disclosure to the EPA --
Q. You did report it, didn't you?
A. We did.
Q. Okay. When did you file that report?
A. I don't have the date to hand, so I would need to check the record of that date.

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Q. Okay. Why did you report this one?
A. Because the conditions -- some of the conditions of the study were different to what had been used by other researchers. So it fulfilled some of those detailed criteria that we were talking about this morning under 6(a)(2).
Q. Do you not know when you filed it with US EPA?
A. I can't give you the date off the top of my head.
Q. It certainly wasn't when the study was done, was it?
A. It was obviously after the study had been interpreted.
Q. It was years before it was reported --
A. It was before it was reported, yes. Yes.
Q. All right. You reported it as an adverse finding?
A. Yes, as defined by 6(a)(2), yes. Yes, where adverse --
Q. Adverse effect?
A. Adverse effect seen in -- because it was seen with different experimental conditions.
Q. Why was it considered to be an adverse effect?
A. Because we had, as we have been discussing, concluded that we now appeared to have a replicable finding showing loss of dopaminergic neurons which could be interpreted as neurotoxicity. And the reason that it was reported -- not reported before, as we said, is because up

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until that point that was not a new finding. Now the conditions of the experiment had changed which meant that it was appropriate to report it.
Q. So when you made this report, why didn't you include the other two prior reports at that time?
A. When -- I was certainly involved in -- you remember I talked about the approach, the PRF approach committee this morning? So we discussed that. And in the record of that meeting, it very clearly shows that we discussed the totality of those experiments not just this one in isolation.
And we proposed -- if my memory serves me right but it would be useful to check the record -- to the US PRF committee that that bigger picture should be -- should be included.
Q. All of them?
A. That was what I believe the record of our communications --
Q. So the PRF committee recommended to the US people that they report all of them?
A. That they could consider that, yes.
Q. They didn't do that, did they?
A. I would have to check the record of that.
Q. Well, you know that the earlier two studies were never reported until December 13, 2019; correct?

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A. They were -- you were telling me that they had been reported in some way in that time, yes. I have not seen that.
Q. Okay, all right.
(Exhibit 33 marked for identification)
BY MR. TILLERY:
Q. Do you have exhibit 33 before you, sir?
A. I do.
Q. Okay. Is this a report to the United States EPA?
A. Yes, this is a letter to the US EPA, yes.
Q. Okay. Let me ask you, wouldn't the evidence for the neurotoxic effect of paraquat be stronger if all three of the studies done by Dr. Marks were reported?
A. I think there's -- there's certainly a reasonable thing to -- to propose. And as I said, the approach committee suggested that was one possibility.
Q. And that was one of the reasons you told them, wasn't it?
A. It was, yes.
Q. Yes. Now, if you take a look at this document, number 33, what's the document date?
A. February 24, 2006.
Q. Syngenta made this disclosure under FIFRA 6(a)(2), correct?
A. Correct.

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Q. The only study results reported in this letter were XM7480; is that correct?
A. That is correct, yes.
Q. The study itself, which referenced the two earlier positive studies with similar results, was not sent to them, was it?
A. Not in this -- in this letter, certainly.
Q. Do you know if the study itself has ever been sent to them?
A. I would need to check that. I don't know for sure.
Q. Okay. Would it be your recommendation to include the entire study?
A. As part of the normal process, it wouldn't necessarily be the case. And sometimes studies of this sort are sent to them for other purposes, but I can't comment about this specific.
Q. In Dr. Marks' conclusions, at the "Results" section of study XM7480, she says the study results:
"... support the findings of two previous CTL studies XM7258 and XM7371 ... and demonstrate that paraquat, when administered to C57BL6J mice ... would appear to be capable of inducing nigral but not striatal toxicity."
That's what she says.
A. Where are you reading from?
Q. That would be from the document you are looking at,

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the study --
A. Which page?
Q. 492792?
A. Okay.
Q. I will read that question over if you want it, because you were looking.
MR. NARESH: Could you, please?
A. Yes, I'm there, thank you.
BY MR. TILLERY:
Q. All right. Dr. Marks concluded in the results section of that study that you are looking at -- that is 7480 you are looking at, right?
A. I'm now looking at --
Q. I am sorry, the study number?
A. Yes, the study number is --
Q. 7480?
A. 7480, yes.
Q. She stated in the study number -- and 792 is the page?
A. Okay.
Q. That the results:
"... support the findings of two previous CTL studies XM7258 and XM7371 ... and demonstrate that paraquat, when administered to C57BL6J mice ... would appear to be capable of inducing nigral but not striatal toxicity."

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Right?
A. That's right.
Q. Okay. That conclusion was not reported, was it?
A. It was not reported --
Q. To the US --
A. -- to the US EPA.
Q. Is that right?
A. No, it was not in its entirety. No, that's right.
Q. Dr. Marks concluded about 7480, that:
"Our data would appear to be supportive of the hypothesis that a sensitive subpopulation of dopaminergic neurons may exist which are vulnerable to paraquat induced toxicity."
She said that as well?
A. Yes.
Q. Okay. But that report and that conclusion was not contained within the February 24, 2006 report to the US EPA, was it?
A. It was not.
Q. You did not report in this letter that paraquat was neurotoxic in three separate studies, did you?
A. We did not in this letter, no.
Q. You did not report in this letter that you had conducted three studies with paraquat where the loss of dopaminergic neurons in the substantia nigra of the black

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mouse was comparable to the findings reported in the published literature, did you?
A. Indeed. Because the 6(a)(2) regulations did not require us to do so, because they were the same conditions and therefore the finding was not new.
Q. Let me ask you -- let me ask you, would that be the prudent thing to do and was that the reason you recommended that they do it?
A. The reason that I recommended that they should consider including that in the letter was that it would allow them to understand the totality of the program that we had done, which I didn't think was something which was unreasonable.
Q. Would you think it would be unreasonable to wait 16 and a half years to do that?
A. I can't comment on that. Certainly that was --
Q. You don't want to comment on that?
A. Well, I'm not able to comment on that, because I was not involved in that decision process.
Q. Okay. Okay. Who was involved in that decision process?
A. I don't know.
Q. Okay. You did not report to the US EPA in this February 24, 2006 letter that three different studies at CTL had replicated neuronal cell loss findings with

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paraquat in the C57 black mouse, did you?
A. We did not.
Q. Who was on the US PRF committee at that time, or was there one? Was the PRF committee here?
A. The US PRF committee, which is who would be responsible for writing this letter, would have included a number of people whose names I wouldn't be able to say at this point in time who they exactly were.
Q. Would you think that would be Montague Dixon?
A. It may not have been Monty Dixon in 2006 but I would need to check.
Q. Would it also have been Janice McFarland?
A. It could have been Janice McFarland. She was the head of regulatory in North America at that time, but I don't know.
Q. What did you send along, after the committee met here and made their recommendations about these -- all of these studies being reported -- did you send along any specific writings or papers to the committee?
A. Yes. As always we completed a proforma document.
Q. And sent it to them?
A. And sent it to them.
Q. And made that recommendation that they report the studies?
A. Indeed. You may well have seen that document.

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(Exhibit 34 marked for identification)
BY MR. TILLERY:
Q. We've handed you what's been marked as plaintiff's exhibit 34. I will give you some time to look it over, sir.
A. Okay.
Q. Tell me when you are ready to talk about the document.
A. Okay.
Q. Okay. What is this, please?
A. This is the fifth in the series of reports -- of studies conducted by Dr. Louise Marks. This one was looking at the effects on -- in the nigrostriatal region, including the substantia nigra, of a range of other compounds to the same strain of mice. And these were compounds which were toxic and -- were toxic compounds and they were given at high doses as one line of research that was suggested in that meeting that we were looking at earlier in this discussion.
Q. Let me see if I can state this as a layperson would in the best understanding I have of the study.
After the first couple of reports came back positive, Dr. Smith suggested that perhaps it was the study itself, the injection of the paraquat, that caused toxicity throughout the body; that the toxicity itself could have caused the results of seeing damaged or dead dopaminergic

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neurons, and that could account for this. That could be the explanation why not only Dr. Marks but the other folks who were publishing this in the sort of independent peer-reviewed literature, correct?
A. That was the hypothesis.
Q. And let's figure this out about by getting away from paraquat, and let's use other things in a toxic injection format?
A. That's right.
Q. And then if they create toxicity sufficient to actually kill the animal, or up to that point or close to it, then we can see if the injection of them could result in the same thing; correct?
A. That is correct.
Q. Have I said that accurately and fairly?
A. You have indeed, yes.
Q. All right. What were the results?
A. The results were that none of these compounds induced the same effect on TH positive cells, the dopaminergic neurons in the substantia nigra.
Q. So I'm looking at her discussion section. In the discussion section on 939, she says:
"The aim of the present study was to determine whether the degree of [dopaminergic] cell loss observed following administration of [paraquat] to C57 black mice

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could be attributed to a 'general toxicity' associated with dosing any compound at a high enough dose."
Correct?
A. That is correct.
Q. All right. And her results were that it didn't.
Now what did that mean for you as a scientist?
A. It meant that we had --
Q. Excuse me, I don't mean to interrupt you, I apologize to you. But when I asked that, I didn't say it right.
I meant: what did it mean to you in terms of the reliability of the prior studies in terms of the toxicity being the cause, if you could explain?
A. Well, it made it more likely that what we had seen with paraquat could be genuinely due to the -- to paraquat.
Q. Right. Instead of just the overall toxicity to the body of this mouse?
A. Yes, the stress -- in other words, putting it in a different way, the stress that you can cause in an animal if you are dosing anything at substantially high doses.
Q. Yes. All right. And what you "had seen with paraquat", meaning the loss of dopaminergic neurons?
A. Yes.
Q. Okay.
(Exhibit 35 marked for identification)

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BY MR. TILLERY:
Q. Please take a look at exhibit number 35.
After you are familiar, I am going to ask you couple of questions about it. If you go specifically to page 3432?
This is a presentation that Dr. Marks gave, isn't it?
A. Yes, I believe that is the case.
Q. All right. If you look at 3432, she's discussing the study that you just commented on, isn't she?
A. She is.
Q. And she concludes, in reference to that study, that:
"The data would suggest that [paraquat] induced cell loss in the [substantia nigra] is not likely to be attributable to a 'general toxicity' associated with dosing a compound at high doses rather it suggests a selective effect on vulnerable dopaminergic cells within the [substantia nigra]."
Is that right?
A. That's right.
Q. You agree with that?
A. That was not an unreasonable conclusion at the time.
Q. What is the significance scientifically of the effect of paraquat being selective?
A. Well, if it is selective to dopaminergic cells within that region, then clearly that could lead to

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emphasizing a possible concern for Parkinson's disease.
Q. Right.
(Exhibit 36 marked for identification)
A. Okay.
BY MR. TILLERY:
Q. This is a presentation or a summary of a presentation at a meeting in Atlanta on February 13 and 14, 2008; correct?
A. It was.
Q. This would have been a Syngenta meeting?
A. Yes.
Q. And it is "Paraquat & Parkinson's disease" as the subject matter of the meeting?
A. Yes.
Q. Okay. And this would be an internal presentation about Syngenta's research into paraquat and Parkinson's disease, right?
A. It was. But we were -- I was aware -- I was actually at this meeting, I believe.
Q. Okay.
A. And I believe also we did have people from outside Syngenta in that meeting.
Q. Okay. This meeting was held over two years after Dr. Marks had completed the paraquat mouse studies --
A. Yes.

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Q. -- as you know.
Did Dr. Sturgess give this presentation?
A. I don't recall who gave this presentation, whether it was one person or more than one person.
Q. Do you know who was in attendance?
A. I -- there would be a number of people, including myself, Dr. Sturgess and Dr. Smith, and a number of other people.
Q. And other of the people from Syngenta Crop Protection?
A. I couldn't give you an exact list. I would need check that.
Q. If you turn to 742, please, at the top of this particular slide it says:
"Syngenta CTL Investigative Studies."
Right?
A. It does.
Q. The first paragraph says:
"In vivo studies -- replicating studies conducted in the C57Bl6 mouse model with paraquat to validate the literature claims."
Correct?
A. Correct.
Q. And that refers to the studies Dr. Marks conducted with paraquat in the mouse at CTL, correct?

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A. It does.
Q. Please turn to the last slide. That would be -- I think that is at 754.
A. Yes.
Q. Is that right?
A. That is correct.
Q. And that's a summary slide: paraquat and Parkinson's disease literature findings; right?
A. That is correct.
Q. The first bullet says:
"Reports in the literature suggest that in a certain strain of pigmented mouse (C57Bl6), multiple i.p. [again that is intraperitoneal] injections of paraquat at relatively high doses can result in a 30% loss of dopaminergic neurones in the substantia nigra."
Okay?
A. Yes.
Q. And then it says:
"These findings have been replicated in Syngenta studies."
Is that what it says?
A. Yes, it does.
Q. Then it says:
"There are also claims that the effect can be observed in another rodent species ... however Syngenta

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studies have failed to repeat this finding."
Okay?
A. Yes. And we have not talked about those studies but that is true: in the Louise Marks period, we also looked in the rat as well as the mouse, and we did not see such a finding.
Q. And then the final bullet says:
"We should be aware that there may be NHP data with paraquat emerging in the near future that may replicate the findings already reported in rodent species -- potential relevance to humans."
All right?
A. Yes.
Q. All right.
A. I don't know if you will allow me to just restate that I believe this meeting had some external people to Syngenta -- we should check the record -- but I think if that is the case, it shows we were being very transparent about those findings with those people.
Q. To follow up on that point, meaning being very transparent to the public?
A. To other researchers engaged --
Q. Which would be the public?
A. That's right, yes.
Q. And transparency, to follow up on your point which

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I allowed you to make to clarify, would mean that you wanted to set the record straight and be honest and straightforward with everybody?
A. We wanted to make sure that the scientific community and, as you put it --
Q. And the public?
A. -- and the public knew that at that point in time we had come to a conclusion that the findings appeared to be replicable.
Q. Right. They were replicable?
A. At that time.
Q. At that point. And that was 2008, right?
A. Yes.
Q. Was Dr. Cory-Slechta there?
A. That's what I was wanting to check, exactly who the attendees were. We had a number of meetings and I can't remember who was present at which.
(Exhibit 37 marked for identification)
BY MR. TILLERY:
Q. The next document is included in such a voluminous format because only it includes one or two pages that are relevant --
A. Okay.
Q. -- but I didn't want to include a bunch of -- I didn't want to include just a page or two of the document.

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So very little relevance to virtually all of it, but I want to direct your attention to a particular section and follow up to a statement that you just made on the record, okay.
If you would go to -- and feel free to refresh yourself about any of this as you wish, it just wasn't contained within this document -- but what I'm going to direct your attention to is 86601.
Please take a look at that document. Again it is 86601.
A. Okay, got it. And, sorry, that was the one that you printed out separately but --
Q. Go ahead --
A. -- thank you for --
Q. Go ahead and read that. Does it say "Paraquat Information Center" at the top?
A. Yes, it does.
Q. All right. And when you are finished, you let me know, please. Okay?
A. Okay.
Q. You had just clarified the record a minute ago and said that a document that I had put in the record mark and dated February 8, 2008, right?
A. Yes.
Q. Was the summary of a presentation -- February 13 and

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14th --
A. Yes.
Q. -- of 2008 was a summary of a meeting where you had invited people and you had been transparent. That's what you told me.
A. To those people, yes.
Q. All right. Now I want to direct your attention to this exhibit, which is marked as exhibit 37, okay? And I want you to tell me if this is a clip from the Paraquat Information Center, and what appears to be a --
A. Yes.
Q. -- page from the internet, right?
A. It is. It is from, as it says at the bottom, from paraquat.com, yes.
Q. What is paraquat.com?
A. It's information resource which is provided for customers and for the public generally to understand more about the benefits, the use -- the appropriate use -- and some aspects of the safety of paraquat.
Q. And, actually, it tells them about farming uses, explains things, gives them references to application, to its effectiveness, all kinds of information?
A. It does.
Q. And it's designed for use by the consuming public?
A. Indeed. And especially the farmer and grower who

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may be using it.
Q. The farmer and grower. The person like Freeman Schmidt in this case, or Mr. Hoffmann or Mr. Mills or any of these people who could -- who could, either by themselves or with help, get on the internet and ask questions or do research, correct?
A. Of course.
Q. Now look at this. And this is maintained by Syngenta, correct?
A. It is certainly -- the content is certainly maintained by Syngenta.
Q. Right. Whether it is housed by a third party, the content is supplied by Syngenta?
A. Yes.
Q. And then it contains paraquat frequently asked questions, doesn't it?
A. It does.
Q. And a frequently asked question is a question that you would expect the people out there who buy your product to perhaps want answered about that product?
A. Yes.
Q. One of those might be whether it causes me to get sick?
A. Yes.
Q. Whether it causes me to get Parkinson's disease?

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A. Yes.
Q. Because there had been some rumblings, right?
A. There had.
Q. All right. Let's take a look at what Syngenta had on its website three weeks before that meeting that you just told me they were so transparent at, okay?
Let's look at this. First question:
"Is paraquat safe to farmers and their families?"
Next question:
"What is the safety of paraquat to farmers when used long-term?
"Has paraquat been found to cause cancer ...?
"Does paraquat cause Parkinson's Disease?"
Do you see those?
A. I do.
Q. The answer given is:
"There is no scientific or reliable epidemiological evidence so far to link paraquat with Parkinson's Disease. Previous studies have demonstrated that paraquat does not cross the blood-brain barrier easily, meaning that it does not reach the specific location in the brain necessary to produce Parkinson's symptoms.
Am I reading that correctly?
A. You are reading it correctly.
Q. I will continue:

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"Epidemiology studies in areas of high and long-term paraquat usage have shown no increase in neurotoxic incidents."
Right?
A. That's what it says.
Q. Now, were all those statements true?
A. Well, you have to remember --
Q. I am just asking you if they are true, in 2008?
A. In 2008, I think that it is still broadly true because we were not yet seeing the totality of evidence that was sufficiently convincing to say that paraquat was a clear causative agent for paraquat -- for Parkinson's disease.
Q. In the preceding five years, you just had test after test after test showing you that this chemical gets into the brain -- the substantia nigra -- of the exact location where paraquat can cause damage and cause Parkinson's disease, didn't you?
A. Let me qualify --
Q. If you could answer that?
A. I need to answer it with a qualification, if I may.
Q. All right.
A. We had shown that paraquat had got potential to get into the brain. That a small amount of blood would get into the -- cross the blood-brain barrier into the brain. We hadn't definitely looked in the substantia nigra. We had

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not teased out that area of brain and measured paraquat in that region.
Q. Do you think it mattered to the average farmer whether you had teased that out --
A. No, of course not.
Q. Okay. Don't you think they are really worried about whether or not this stuff can make me sick generally?
A. Of course.
Q. And you think they might be concerned about whether or not it is going to cause them to get Parkinson's disease?
A. Of course.
Q. Do you know what the Illinois plaintiffs said when asked in their depositions whether they would have used this chemical if they had known there was any chance of getting Parkinson's disease? Do you know what they said?
A. I do not.
Q. Do you think that statement was transparent?
A. It was transparent in terms of it being a conclusion that was appropriate at the time in that we did not believe -- and indeed still do not believe -- that the totality of evidence, not just the mouse models that we were talking about earlier but also the epidemiology, has yet come to a clear conclusion that paraquat is a causative agent in Parkinson's disease.
Q. Didn't Dr. Marks conclude after repeated studies

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that paraquat selectively targeted the substantia nigra?
A. She did. But that's not the same as saying that in the conditions at which people would be exposed to paraquat that that would pose a risk to those farmers and growers.
Q. But telling them that it would cause this kind of dreadful disease would impact the bottom line, wouldn't it?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. If you told all the farmers in America that you -- had brought your product that it could cause them to have Parkinson's disease, what do you think that would do to your sales?
MR. NARESH: Objection to form, scope.
A. Well, it absolutely --
BY MR. TILLERY:
Q. Absolutely what?
A. If I may say, it is a bit like me saying to you if you knew if you knew that you took twice the dose of acetaminophen or paracetamol that your liver may pack up, then you might be scared of taking paracetamol.
Q. You bet I would.
A. Yes, and that is the truth of the matter. But we don't suggest that you should stop using paracetamol.
Q. Isn't damage to the substantia nigra the part of the brain associated with Parkinson's disease?

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A. Yes.
Q. How long did this statement appear on your Parkinson's -- on your paraquat website?
A. I am afraid I don't know the answer to that.
(Exhibit 38 marked for identification)
MR. NARESH: Steve, could we go off the record and discuss this for a moment?
MR. TILLERY: Sure.
THE VIDEOGRAPHER: We are off the record at 2:34.
(Break taken.)
MR. NARESH: For the record we have discussed and we are willing to let you go forward on questioning on documents marked exhibit 38 -- which I assume will be exhibit 39 -- which were marked 502D documents by Syngenta, with all parties reserving the rights and to the extent that we believe that any of the questioning calls for the divulging of privileged or otherwise protected content, we will object on the record.
MR. TILLERY: Okay. Back on the video record, please.
THE VIDEOGRAPHER: We are back on the record as of 2:57. This is now media number 4 in the deposition of Philip Botham. You may continue.
BY MR. TILLERY:
Q. What is the number of the exhibit in front of you now, sir?
A. Exhibit 38.
Q. Okay. Do you know what 38 is?
A. I know what the document is, yes.
Q. Yes. What is it?
A. It's an internal -- i.e. product safety, the department that I was responsible for evaluation of -- essentially doing a risk assessment of the possibility that the findings that we have been discussing are real, and therefore we were looking to see what margins of exposure and safety margins would be -- occur if we assume that those findings were real.
Q. And when you say "findings are real", what is it, more specifically, that you are referring to?
A. We are referring to the findings we have just been discussing around the loss of dopaminergic cells in the brain.
Q. That paraquat causes Parkinson's disease?
A. That paraquat causes in the mouse model a loss of dopaminergic cells.
Q. So you are limiting your evaluation in this product safety technical evaluation to the mouse model?
A. That's -- the calculations are based on the data from the mouse model.
Q. Okay. What I'm trying to figure out is the scope of this. You were evaluating product safety in terms of a mouse model?
A. Yes. And it is a standard toxicological practice to take things like the no effect level we were discussing earlier and to do risk assessments from that.
Q. Okay. Do you see the names listed on this document? I think, if you look at 14 --
A. Yes.
Q. -- who was the document's author?
A. It is the four people that you see on page 14.
Q. And that's Nick Sturgess, Kim Travis, Andy Cook and Phil Botham?
A. Correct.
Q. You are one of those authors?
A. I am.
Q. Okay.
Was this kind of document prepared regularly at Syngenta?
A. This kind of document is somewhat atypical in that we were taking a very precautionary approach, as I said a few minutes ago, assuming that this is an effect of real concern. But the principles of calculating no effect levels, doing risk assessment, is standard practice.
Q. Why was the document prepared?
A. In order for product safety, the function that I was responsible for, to be fulfilling its duty of care to do risk assessment.
Q. Was it prepared for any litigation?
A. It was not in any sense done for litigation -- purposes of future litigation.
Q. Okay. On the first page, it says:
"There is consistent evidence..."
Do you see that?
A. Yes.
Q. Why don't you read that paragraph into the record?
A. "There is consistent evidence in animal studies for the loss of dopaminergic neurones in the substantia nigra of male [C57Black6J] mice when dosed with paraquat (at up to one third of the median lethal dose) via the i.p. route."
Q. And the next, if you wouldn't mind, where it starts:
"There is no evidence..."?
A. "There is no evidence to indicate that the observed effect on neuronal cell loss is an artefact of the test system, though this remains a possibility. Therefore it is prudent to assume at this stage that the finding is real, and that it is related to paraquat treatment in this strain of mice."
Q. Okay. The next bullet reads, "In the absence..." Would you read that?
A. "In the absence of evidence to the contrary, it is

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assumed that this finding is potentially qualitatively relevant to man for the purposes of a re-evaluation of the reference dose."
Q. What is a reference dose?
A. It is a dose that is used in order to determine the -- again, the margin of safety as part of risk assessment.
Q. And the sixth bullet reads, please check me for accuracy:
"The estimated reference dose for neuronal cell loss is ... less than the current sub-chronic and chronic reference doses."
MR. NARESH: Steve, I think you misspoke.
MR. TILLERY: Really?
MR. NARESH: I think you missed a word.
MR. TILLERY: Okay, let me start over. Thank you, counsel.
BY MR. TILLERY:
Q. Why don't you read it, the sixth bullet, where it says "The estimated reference dose"?
A. "The estimated reference dose for neuronal cell loss is a little less than the current sub-chronic and chronic reference doses, but given the uncertainties of the calculation Product Safety considers the difference not to be significant."

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Q. Okay. And the sub-chronic and chronic reference doses were based upon damage to the lungs as an endpoint, right?
A. That is correct.
Q. Product safety calculated the reference dose based on neuronal cell loss in the substantia nigra pars compacta as the endpoint, and that reference dose was lower; correct?
A. The reference -- we took the no effect level from studies -- not our studies, actually, the studies of other researchers we have spoken about -- as the no effect level and then the reference dose is calculated by dividing that by some usual factors.
Q. It was a lower number, wasn't it?
A. Yes, yes.
Q. The technical evaluation gives the position of Syngenta's Product Safety department in September 2009?
A. That's correct.
Q. With respect to paraquat's neurotoxic potential in the substantia nigra portion of the brain?
A. Correct.
Q. When did the product safety department or product safety group -- what do you refer to it as?
A. It doesn't really matter, product safety team is fine.
Q. Team?

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A. Um-hm.
Q. When did the product safety team first adopt this position?
A. I believe that this was the first time that we put together the information in such a way.
Q. Was it the position of Syngenta's product safety team in 2008?
A. Well, I don't think we had actually -- we certainly hadn't done these kind of calculations in 2008.
Q. Would it be different -- had you asked the same group of professionals in 2008 for their answer, would they have given you the same results?
A. It would have been the same.
Q. Would have been the same?
A. Yes.
Q. So the statement on the paraquat.com website "paraquat does not reach" the substantia nigra pars compacta is not all consistent with the position adopted in this technical evaluation, is it?
A. It is not consistent, I would agree.
Q. Okay. The second paragraph on the second page, starting with "A number", would you read that first full sentence?
A. "A number of laboratories, including Syngenta CTL, have observed a reduction in neuronal cell counts in

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dopaminergic neurones in the substantia nigra pars compacta brain region following paraquat administration [using] a dosing regimen of 10 mg/kg paraquat once or twice a week for three weeks (McCormack et al, 2002; Barlow et al, 2004; Cory-Slechta et al, 2005; CTL report number XM7258 ...)"
Q. So the CL studies referred to here are Dr. Marks' studies, right?
A. That is correct.
Q. And the third party or independent scientific references are the same ones that Dr. Marks used in her studies and referenced?
A. That -- that is correct.
Q. Did Syngenta share this document with the United States Environmental Protection Agency?
A. I don't believe we did.
Q. Did Syngenta share this with any pesticide regulatory agency in the world?
A. I cannot answer that. I don't know.
Q. Did Syngenta ever publish these conclusions and share them with the public health committee?
A. I don't believe it did.
Q. Was this document restricted to internal use at Syngenta?
A. It was largely intended to be our own internal evaluation, as I said, as part of our duty of care.

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Q. Okay. Now let's go to the next document which will be 39.

(Exhibit 39 marked for identification)

BY MR. TILLERY:

Q. Would you please take a minute and familiarize yourself with this document?

A. Okay.

Q. Could you on the record please describe or identify the document?

A. This is an update of the document we have just been talking about. So it has the same title as the previous one "A consideration of the Potential Implications for Reference Doses" now dated draft July 2011. So just under two years after the previous version.

Q. Does a final document have draft on it? They have "draft" for years. They just keep putting the word "draft" on it. Do you know why?

A. Because we were using draft to recognize that we were still in the middle of a research program, so new data were going to continue to emerge.

Q. Right. But you, as of the date of the issuance of the document, it was at that point in time final?

A. With the information that was available at that time. This was our best estimation of this situation, yes.

Q. All right. Okay.

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And this document wasn't produced for litigation purposes, was it?

A. It was not, in my understanding, no.

Q. Okay. Were you the head of this group?

A. Yes. By that time I was the head of the paraquat health science team and also I had a leadership position in the product safety organization.

Q. And the authors of this were Nick Sturgess, Kim Travis, Andy Cook and you, is that right?

A. That is correct.

Q. And were others in attendance, do you remember?

A. By "attendance", this wasn't a meeting, this was a document that was generated by that team working together.

Q. Okay. So there was no meeting to discuss the content. It was just sent back and forth to reflect the 2011 --

A. It was a combination of the four of us having discussions and also looking at various drafts of this document.

Q. As a matter of fact, you anticipated that 18 months later you would have a next review, right?

A. That's right. Because as it said there, and as I indicated a few moments ago, we were in the middle of a research program and we were doing what we thought was going to be a very relevant study, which is the 90 day data

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study.

Q. Does this document give the position of the Syngenta product safety with respect to paraquat's neurotoxic potential as of July 2011?

A. I will qualify that if I may. It establishes as I indicated a conservative position that paraquat could cause the neuronal cell loss and therefore we were establishing if that were the case whether we believed that there were adequate margins of safety.

Q. Okay. The first bullet, if you read that, "Executive summary."

A. "There is some evidence in animal studies for the loss of dopaminergic neurones in substantia nigra of male [C57 black 6J] mice when dosed with paraquat (at up to one third of the median lethal dose) by the i.p. route."

Q. And the next, starting with "Recent"?

A. "Recent Syngenta studies have failed to consistently replicate the findings reported in the literature of the loss of dopaminergic neurons at doses of paraquat up to 10 mg/kg or at higher doses up to the maximum tolerated dose (25 mg/kg). In addition, comprehensive neuropathology studies have consistently indicated no evidence for neuronal cell damage, cell loss or an inflammatory response following paraquat exposure. It therefore remains a possibility that the reported findings described in the literature on

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neuronal cell loss are an artefact of the test system. It is however prudent to assume at this stage that the reported finding of neuronal cell loss is real, and that it is related to paraquat treatment in this strain of mouse."

Q. And the recent Syngenta studies referred to in that paragraph that you just read were experiments that would later be published as the Breckenridge et al, 2013 study; correct?

A. That is correct.

Q. What does "artefact of the test system" mean in this context?

A. Rather like some of the discussions we were having earlier today, that there may have been other explanations that could have explained why there was an apparent loss of dopaminergic neurons. Technical -- technical reasons, in other words.

Q. The last sentence concludes:

"It is however prudent to assume at this stage that the reported finding of neuronal cell loss is real, and that it is related to paraquat treatment in this strain of mouse."

Correct?

A. Yes.

Q. The next bullet reads:

"In the absence of evidence to the contrary, it is

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assumed that this finding is potentially qualitatively relevant to man for the purposes of a re-evaluation of the reference dose."

Correct?

Yes.

Q. On page 4, if you look at that, in the product safety evaluation, is 44.0004?

A. I have that.

Q. Okay. It begins:

"The most consistent finding from the body of animal studies reported in the literature is the loss of dopaminergic neurons in the substantia nigra pars compacta of male C57Bl6J mice, when compared to control animals."

Correct?

A. Correct.

Q. Did Syngenta share this document with the United States Environmental Protection Agency?

A. I don't know, but I don't believe so.

Q. Did it share this document with any pesticide regulatory agency?

A. I am not aware that it did.

Q. With the public health community?

A. I am not aware that it did.

Q. Was it restricted to internal use?

A. That is my understanding of this document.

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Q. I'm going to go backwards. How does one arrive at the conclusion that an effect noted by a study result is an artefact of the test system?

A. How would one conclude that it was an artefact --

Q. How would you, as a scientist, conclude that?

A. By finding a technical explanation that it was due to some way in which the effect was measured, for example.

Q. Have you ever done that?

A. We have done a lot of work to do -- to check that out, yes.

Q. What was the artefact of the test system that you found?

A. We -- I'm not saying that we found an artefact as such. What we found was that what the -- the results that you got when you measured the number of neurons in that part of the brain was very critically dependent on a number of factors. Not just the stereology machinery we were talking about this morning, but also the way in which you prepared the material, the brain, how you cut it, how you stained it, how -- whether you had -- were reading it blind to treatment. So a number of factors seemed to be at play here.

Q. Well, did you find that any of the preparation had been done incorrectly in any of the studies of the public health community?

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A. It's -- again, I wouldn't quite put it "incorrectly". As we said this morning, this was -- and is still -- a relatively new technique. Not that many people used it. And I think the community as a whole, not just us, was still learning that you could get different results simply as an example that I was showing there how thick the sections were that you put under the microscope.

Q. Right. But you did take note as the group, didn't you, that Dr. Marks' results were consistently virtually identical to laboratories doing the same test in different parts of the world; right?

A. Of course, yes. Yes.

Q. Okay. And presumably doing it slightly differently, following the same test protocol but different people, different -- perhaps different protocols for the test, but arriving at the same results. Did you take that into account?

A. We took that into account. But I think as this also said, we were, by this time as reported in Breckenridge et al, given advice by again independent pathologists that you needed to look in addition to just measuring the TH positive cells, at other histopathological or pathological measurements that you should see if those cells were genuinely dying.

Q. What is a TH positive cell?

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A. That is a dopaminergic cell for the purposes of the discussion here, because dopaminergic cells express on their cell surface an enzyme tyrosine hydroxylase, and that's actually what you see when you stain -- it is a marker for tyrosine hydroxylase.

Q. What is the purpose of that enzyme?

A. That is involved in the utilization of dopamine.

Q. That is involved in using it, creating it, isn't it?

A. Yes, yes.

Q. That's what you need for that cell to be able to help you?

A. Yes.

Q. Without it, it may be there -- may or may not be showing up as dead or alive or one way or another, but without it, it is obviously not able to help you --

A. If it is nonfunctioning.

Q. If it is nonfunctioning?

A. And there is a difference between not being able to see it with the markers we were using and it necessarily being nonfunctioning.

Q. You mentioned cut as well. Did you see any evidence of a problem with the cut in Dr. Marks' studies?

A. We didn't obviously go back and look at Dr. Marks' studies because the tissue was then too old to do that.

Q. You never evaluated hers and thought that they were

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done incorrectly?
A. We were not able to do that.
Q. Okay. And you didn't find her prep was wrong?
A. We were not able to do that.
Q. You did not find that her staining method was wrong?
A. We are not saying that anything was wrong.
Q. Or that anything else she did was wrong?
A. We are not saying that anything she did was wrong.
Q. What about McCormack or Di Monte, or any of these other people?
A. I would say we would never have said that what they did was wrong.
Q. Maybe that's word is too harsh. Okay, that they used an incorrect technique: did you ever find that anything done scientifically by way of technique achieved an unreliable result?
A. I think the issue is that we know that the particular -- particularly the stereology technique is subject to the variability that we were able to see when we started to look at various things like the thickness of the tissues, how you looked down the microscope, at what depth. There were lots of technical detail there which started to uncover variability which maybe other researchers apart from ourselves were not aware of.
Q. That's what I'm trying to find out. What are those

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that you found to be an explanation for why these consistent independent researchers and independent laboratories published in peer-reviewed journals and Dr. Marks reached virtually identical results showing that the substantia nigra was being impacted by paraquat? What did you find that could explain the consistent results that they got?
A. I would say the right thing to say is that we didn't find a specific issue which said "yes, it's that which must be responsible for the difference in the results".
What I'm saying to you is that the large body of evidence that we accumulated with other external pathologists gave us some possible explanations which I have just been explaining to you, which could cause variability in results.
Q. Is that the extent of your answer as far as deep as it can go and detail?
A. I think that's probably adequate for now.
Q. That makes me nervous. Okay, I am trying to find out if you have any specifics to answer my question.
A. Well, I can repeat what I said earlier.
Q. No, that's not necessary. You don't need to do that.
A. Okay, fine.
Q. I'm trying to find did you -- was there one of these

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"aha" moments when you looked at it and said you have got the answer. Did you do that?
MR. NARESH: I object to the form of the question. I think if you would like him to answer the question, he was offering to give you more detail.
MR. TILLERY: He was offering to repeat what he said before.
A. Let me say that one of the number of factors that I said before, one thing which came closest to being a critical factor -- not necessarily the critical factor but closest to it -- was actually for the pathologist to be blinded to treatment; to not know that he or she was looking at control animals not dosed with paraquat versus those that had been treated.
BY MR. TILLERY:
Q. And that would be the one thing you would point to?
A. No, that's why I said that very carefully. I said that that was the closest thing that we came to which could be the biggest factor. But we did not finally conclude that any of these factors was the sole definite reason for that.
Q. Of all of them that you can think of, would you think not being blinded would be the most telling explanation?
A. Well, when we looked at what it said in the publications of other people -- and actually what Dr. Marks

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herself said -- then it seemed to be that some of those studies were certainly not read blinded to treatment. Either it said they weren't, or the matter was silent.
Q. Okay.
A. So that's why we wondered if that, indeed, may be an important factor.
Q. And you are referring to the Minnema study, is that what you are --
A. Yes, subsequently we have made that point in other papers.
Q. And that's a study that you rely on, too, isn't it?
A. It is, yes.
Q. Okay. And that was one where a number -- the report was that a large number of the results were -- were not blinded?
A. Yes, yes.
Q. And that was a significant finding for you?
A. I think it was certainly an important finding, I agree, yes.
Q. Okay. But you never identify the flaw in the paraquat mouse model itself which could lead you to conclude that the neurotoxic effects are an artefact of the test system, right? That's right. Although if I may just speak from a toxicological principles perspective, again if the effect was real one would anticipate that had you dosed at

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higher dose levels -- which we did do, we went up to 25 milligrams per kilogram, as high as we could possibly go without killing a lot of the animals -- that you would see that effect. It is another factor which says "if this is really real, you would perhaps see it in a more pronounced form" and we didn't.

Q. You mentioned you got advice from independent pathologists. Are you saying that the pathologists you took advice from were not in any way compensated by Syngenta?

A. No, I am not saying that.

Q. When you use the word "independent" do you include people that you pay?

A. I do. Because although we paid them, at no time were we sitting in their laboratory or sitting alongside them when they were doing their microscope readings or changing their reports.

Q. You are saying independent means that they are not in your employ?

A. Indeed, and working independently from our scientists.

Q. Okay. Are you aware that other people refer to independents as people who do not have a pecuniary relationship with Syngenta, are you aware of that?

A. Of course.

Q. Okay. And other independent people might be people

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who don't have a financial interest to where the results could be impacted one way or another.

You understand that?

A. Of course, yes.

Q. That's why in peer-reviewed journal articles if any part of your paying -- compensation, honorariums, anything that is paid for by the company that is making the product -- you have to report it?

A. Indeed.

Q. Why is that, do you think?

A. So that we are being transparent.

Q. Don't you think it might be that those editors of those peer-reviewed journals want to make sure that the people don't have another motive for what they found in their science?

A. Of course.

Q. Okay. That's what I am thinking.

A. Yes.

Q. So when we use the word "independent", your definition is that they are not sitting in your laboratory; my definition is that they are not paid by you?

A. Okay. That's fine.

Q. All right. Let's go to the next one.

(Exhibit 40 marked for identification)

BY MR. TILLERY:

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Q. Can you identify and describe plaintiff's exhibit 40?

A. Just give me a minute or two to check, please.

Q. Of course, of course.

A. Okay.

Q. What is the document?

A. It is a PowerPoint presentation.

Q. And it is dated March 2, 2016?

A. That's correct.

Q. And it was done in Brazil?

A. That is correct.

Q. Okay. And did Syngenta sell paraquat in Brazil?

A. Yes.

Q. Okay. This is a presentation Charles Breckenridge made to a expert panel at the Brazil pesticide regulator ANVISA when the agency was considering banning paraquat, is that right?

A. That is correct.

Q. And the topic here or the title is: "Does the animal or human element support a causal relationship between Paraquat use and Parkinsonism."

Correct?

A. Yes.

Q. You were asked to address that topic there, weren't you?

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A. Yes, because the agency had asked a number of questions.

Q. And the agency was concerned about that connection?

A. They were.

Q. And they wanted you to come there and answer questions about it, right?

A. That is correct.

Q. So if turn to page 18, the top of it is "ANVISA's Question on PQ as a Model for Parkinson's Disease". If you can find that page, my number is cut off.

A. Can you just --

Q. What is your page reference at the bottom?

A. Did you say page 18?

Q. I think so.

A. That is 116230.

Q. Thank you. It is actually page 14 of the PowerPoint, isn't it? It looks like. But if you look at the Bates number, I think it is 6223.

A. Yes, I am on that page.

Q. All right. And it's at the top of that says:

"ANVISA's Question on PQ as a Model for Parkinson's Disease."

Do you see that?

A. I do.

Q. Two questions are presented and they both ask about

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animal studies investigating the relationship between paraquat and Parkinson's disease, right?
A. Yes.
Q. And Syngenta's response is that animal studies should produce a constellation of neurochemical, neuropathological and motor symptoms observed in human cases of PD or Parkinsonism; right?
A. Yes.
Q. And one of the neuropathological symptoms listed is loss and neurodegeneration of dopaminergic neurons?
A. Yes.
Q. Now the last bullet says:
"Paraquat had no effect on these parameters in our experiments after either [intra-peritoneal] ..."
And that references Breckenridge et al:
"... or oral administration at maximum tolerated doses, (Minnema et al 2014)."
A. Yes.
Q. Did you inform ANVISA -- the expert panel of ANVISA -- that Syngenta had observed the loss of dopaminergic neurons in paraquat-treated mice in previous studies?
A. I'm not sure whether that came up in the discussion because I was not actually present in the meeting.
Q. Who did that presentation?

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A. Dr. Breckenridge.
Q. It looks like, if he didn't, he never told them anything about Dr. Marks' studies, did he?
A. It is a possibility.
Q. Look at this document and show me where he --
A. No, there is nothing on the slide, I agree.
Q. There is nothing there that he said one single word about it.
Would you agree with me that making that statement without producing those studies and telling those people about it was absolutely a misrepresentation?
MR. NARESH: Objection form, foundation.
A. I think that there's a reasonable argument that we could have actually included the word "consistent" in that. Then that would have included the reality of what we found, no consistent effect.
BY MR. TILLERY:
Q. Were you involved in drafting this presentation?
A. Actually, yes, I was. And it's a point I think with -- sometimes these things happen with the benefit of hindsight, it is probably something that we should have done.
Q. Would you, as a scientist, tell me right now that you should have put it in there, shouldn't you?
A. I think that's not unreasonable. But it doesn't

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take away the overall conclusion that we were presenting.
Q. Right. You were trying to keep it from getting banned, weren't you?
A. No. I would object to that. At no point did we have a conversation where we said we would deliberately take that information out.
Q. Was it banned in Brazil?
A. No.
Q. Okay. Do they know today about those studies? Have you told them?
A. I don't know whether any further communication on those studies has been made.
Q. Are you still selling the product in Brazil?
A. We are.
Q. Okay. What do you think the reaction will be when this case comes out, all of the information comes out, that you didn't tell them?
MR. NARESH: Objection to form, scope.
A. I would still maintain that what we were presenting here -- as one often does in science -- was an overall weight of the evidence.
BY MR. TILLERY:
Q. Okay. So the weight of evidence you presented happened to be in favor of continuing to sell it; the weight of the evidence you omitted would be against continuing to

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sell it, right?
A. Well, weight is weight, sir. The fact that we were finding effects in some of the studies, as were other people, was, in the context of this larger amount of information, a smaller proportion of that weight of evidence.
Q. You knew when you drafted this -- or helped draft it -- that you were omitting Louise Marks' words, right?
A. I think if you were inferring that we made a deliberate decision to do that then --
Q. No, excuse me. I move to strike that answer as unresponsive.
A. That is fine.
Q. Did you know, when you drafted this, did you happen to remember about Louise Marks' words?
MR. NARESH: Objection to form.
A. I think at the time these were drafted we were not considering the Marks studies in our weight of evidence thinking.
BY MR. TILLERY:
Q. Because they didn't reach the same conclusion, did they?
A. At the time they were suggesting otherwise, yes.
Q. So you left them out?
A. I say again, I'm not aware that I or anybody else

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deliberately left them out.
Q. Did you just forget about them? Did you happen to forget about multiple studies of consistent results parallelling virtually identically the results of independent researchers in published literature, did you just forget about them?
A. We were aware that ANVISA, because they had told us that, were well aware that there was published literature showing that there was an effect in this mouse model. So they were not blind to the fact that there was another part of the weight of evidence that would suggest that that should be taken into consideration.
Q. So you are thinking they knew about McCormack, they knew about Di Monte's results?
A. I believe they had already told us about that in some of the responses they gave us.
Q. But they didn't know about the Marks studies, did they?
A. I imagine that they didn't.
Q. And you have never told them to this day, have you?
A. I don't know. I would have to check that. I don't believe so.
Q. All right.
Has paraquat been phased out in Brazil?
MR. NARESH: Objection, scope.

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A. Not so far as I'm aware.
BY MR. TILLERY:
Q. If you look at the same page where you were under the questions that were asked by the regulatory authorities in Brazil?
A. Mm-hm.
Q. If you would like under "Response", the first bullet. Read that into the record, and that response is to which question?
A. Well, there are two questions above:
"Why could the results obtained in a study using PQ as a model for the induction of [Parkinson's disease] not be enough to consider such a substance as a potential causer of [Parkinson's disease] or Parkinsonism in humans?"
Q. So your response, the first bullet, responds to all of that?
A. Well, there is a second question which is:
"What would be necessary to conclude that the animal model studies show evidence of [Parkinson's disease] or Parkinsonism resulting from human exposure to [paraquat]?
Q. And your first bullet, would you read that?
A. "Only human epidemiological evidence can be used to conclude that a causal relationship exists between Parkinsonism in humans and paraquat exposure."
Q. Is that Syngenta's position today?

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A. Causal means that you've got direct evidence in humans that there is a direct relationship between exposure to paraquat and the development of Parkinson's.
Q. What I'm asking you is, is the Syngenta position consistent with that today, that statement?
A. I would say that today we would still say that human epidemiological information would carry more weight in that weight of evidence that I was describing --
Q. That is not --
A. -- but animal model data are still part of that.
Q. Well, then your answer to them was wrong, wasn't it?
A. No, because the important word there is "causal" --
Q. No, the important word is the first one. Do you see that?
MR. NARESH: Steve, stop interrupting him.
BY MR. TILLERY:
Q. What does the sentence say? "Only", that's what I'm asking.
MR. NARESH: Just please let him finish his answers to your questions --
MR. TILLERY: He's not answering it.
BY MR. TILLERY:
Q. Just answer my question --
A. Yes.
Q. Is that statement --

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MR. NARESH: Why don't you withdraw your prior --
BY MR. TILLERY:
Q. I will withdraw it. Let me ask you, here's what it says:
"Only human epidemiological evidence can be used to conclude that a causal relationship exists between Parkinsonism in humans and paraquat exposure."
Is that what it says?
A. That's what it says.
Q. Is that Syngenta's position today?
A. It is Syngenta's position that human epidemiological evidence is the only evidence, if you like, that can definitively lead to a conclusion about causality.
Q. Okay.
Would you go to the next page, sir, which is 116224? There's "Questions #3 and 4", do you see that, at the top?
A. Yes.
Q. And then down at the middle of the page, it says number 2:
"Establish that the results are reproducible."
A. Yes.
Q. Okay. And you said:
"The results from such studies must be robust and reproducible when investigators are blinded to treatment using confirmatory independent assessments both within and

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between labs/research groups ..."
Okay?
A. Right.
Q. And then you say:
"In our experiments we have not been able to reproduce the results reported by others."
A. Yes.
Q. That's an absolute misrepresentation, isn't it?
A. Well, in the context of the conversation we have been having then clearly that, as we said before, did not fully include the, um, the earlier findings of our lab, yes.
Q. You agree with me?
A. Yes. As I said before, yes. With the benefit of hindsight, we might have put an additional clause in that to qualify.
Q. Namely all of the tests --
A. "Consistently" or --
Q. All of the studies that Dr. Marks did which verified the results of the independent researchers, correct?
A. That's something which we could have taken more consideration of, yes.
Q. And put it in there and told the truth, right, okay?
MR. NARESH: Objection to form.
A. I still believe that the truth is based on that overall weight of evidence, but that's, I think, a point we

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have covered before.
BY MR. TILLERY:
Q. Did you ever tell ANVISA that Dr. Marks' studies provided evidence that dopamine were lost -- or had lost dopamine function?
A. As I said earlier, I'm not aware that we did that.
Q. Did you ever disclose to the ANVISA panel in Brazil that Syngenta CTL had replicated the loss of dopaminergic neurons in the paraquat treated mouse that Di Monte's group had observed?
A. I am not aware that we did that.
Q. Did Syngenta disclose to ANVISA that it had observed loss of dopaminergic neurons at lower doses in the Marks studies?
A. Lower doses than?
Q. Than the NOEL of 10.2 milligrams per kilogram per day that you had identified?
A. On which study -- which study are you referring to?
Q. What is a NOEL again, sir?
A. A no effect level.
Q. Okay. Do you reference that here?
A. The "no effect level" is in the notes, 10.2 milligrams per kilogram.
Q. Per day?
A. Per day.

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Q. And did you tell them that it had observed a loss of dopaminergic neurons at lower doses in the Marks studies?
A. That isn't lower doses than the Marks studies.
Q. One of them had 10.0, do you know that?
A. Well, that's very marginal, I think, yes. Yes, yes. I think with the -- the analytical and other factors involved, 10 and 10.2 are essentially the same.
Q. So they are the same?
A. Yes.
Q. Okay.
Syngenta did not disclose to the Brazilian regulatory authorities that it had estimated a reference dose for paraquat based upon the loss of dopaminergic neurons in the substantia nigra, did it?
A. It did not talk about the work we were talking about here earlier.
Q. Okay.
Syngenta also made a number of presentations to update the United States EPA regarding its paraquat mice research, didn't it?
A. I believe it did, yes.
MR. NARESH: I will object to the scope of this line of questioning.
I think there is no (inaudible) about the interaction with the EPA. You can ask him in his personal

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capacity --
BY MR. TILLERY:
Q. Okay. In your personal capacity is fine.
Did Syngenta ever disclose the full paraquat mouse research program conducted by Louise Marks in those updates to the US EPA?
A. I can't answer that question. I was not involved in those presentations.
Q. Okay. Did Syngenta ever disclose in those updates to the US EPA that CTL, the laboratory, had replicated the loss of dopaminergic neurons the substantia nigra seen in published literature?
A. Again, I was not involved in those presentations so I don't know the answer to that question.
Q. Did Syngenta ever represent to the US EPA that they could not replicate the loss of dopaminergic neurons seen in the published literature?
A. So we were not able to replicate?
Q. Yes.
A. Yes, that --
Q. Did you tell them that?
A. That was the nature of the research that we've just been talking about.
Q. Would that statement have been false?
A. Well, it depends on the context in which it was

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said.
Q. Well, in the context of having known that Louise Marks did these studies that replicated the prior results?
A. Yes. But then, as we have said at some length, when these presentations were made we had done a lot more detailed research which had failed to replicate the findings.
Q. So at no time did you ever tell them about Louise Marks --
A. That I would need to check. Because, as I say, I have not been involved in all those communications.
Q. Wouldn't transparency have required you to disclose the Marks studies and allow the agency to decide their significance or relevance?
A. One thing of course we can say, because we mentioned it earlier, is that one of those Marks studies was submitted to the EPA.
Q. Yes. But wouldn't transparency -- and when in case of doubt doing the right thing, in terms of being fully transparent, as you said it's your desire to do -- have pushed you to the direction of full disclosure?
A. I -- as we said with Brazil, it is possible that with the benefit of hindsight, you could make that judgment It would still -- and I would repeat -- not change our

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conclusion that the overall weight of the evidence suggests that their -- that paraquat does not have a reproducible effect on the substantia nigra.
Q. That was not my question. I will move to strike it as unresponsive.
My question is: would you agree that in the interests of full compliance in case of doubt, that it would be best to err in terms of being fully transparent with the agency, the regulatory agencies, responsible for guarding the public's interest; would you agree with that?
A. Yes, but they were aware of the Marks study that we talked about earlier through the 6(a)(2) process.
Q. I'm talking about all of the studies. Would you agree it would be best to err towards inclusion and to make them aware of all the findings?
A. That is -- I have said several times that a different judgment could be made which would incorporate those findings as well.
Q. And you actually made that judgment and recommended that course, didn't you?
A. With regard to reporting under 6(a)(2), I said it might be something that was considered, yes.
(Exhibit 41 marked for identification)
BY MR. TILLERY:
Q. Please read this email exchange including

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Dr. Louise Marks in her last week of employment.
A. So you want me to read everything right from the first email?
Q. No, I just want you to read it yourself.
A. Okay, that's fine.
Okay.
Q. She issued her study reports on June 21, 2007, didn't she?
A. That's the date we saw earlier.
Q. This email exchange is 2007, June 22nd, the following day. Right?
A. Mm-hm.
Q. And in her first email, she says:
"From 30th June my contact email will be ..."
And she points out that that's her last week, okay?
A. Yes.
Q. And then she sends this to Barry Elliott. Who is that?
A. Yes. Barry Elliott by that time had taken over the role that Mike Clapp had, if you remember Dr. Clapp earlier? So he was the product toxicologist for paraquat.
Q. What did she send in that email?
A. She sent details of the studies that we were discussing earlier and that they -- the studies had been issued, as we saw earlier, and that in accordance with

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proper practice the raw material, the data and the slides had been archived.
Q. And she sent along XM7229, XM7258, XM7371, XM7480, XM7552, XM7570, XR7641; correct?
A. That's correct.
Q. All of the study materials she sends along?
A. Yes.
Q. And then this information is sent on by Barry Elliott to a person named Sheldon Ros, right?
A. Mm-hm.
Q. And he says:
"Can you check this SAMSON part please."
What is a SAMSON part?
A. SAMSON is essentially -- or was at that time -- our document management system.
Q. And he says to Mr. Sheldon Ros --
A. It is Ros Sheldon. It is a lady.
Q. Okay. So says to Ros Sheldon:
"We must control the accessibility of them to that usual for any such investigate reports."
Right?
A. Yes.
Q. And Ros Sheldon says:
"They are all entered as Research reports not for submission."

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A. Yes.
Q. What does "submission" mean?
A. Submission to a regulatory authority.
Q. That means they are not to be submitted to the regulatory authority. That's where they are filed?
A. And this, let me say, is absolutely normal practice and was nothing specific to these reports.
Q. Okay. All right, got it.
But just coincidentally, they didn't get submitted to regulatory authorities, did they?
A. They did not, I believe.
MR. TILLERY: Thank you. We will take a break right now.
THE VIDEOGRAPHER: We are going off the record at 3:53.
(Break taken.)
THE VIDEOGRAPHER: We are back on the record as of 4:08. You may continue.
BY MR. TILLERY:
Q. Earlier in the day I told you that I would come back to the topic of potentially referable findings, remember that?
A. Yes.
Q. Let's go back to the history of that group. When was the first time that Syngenta -- and by that I mean the

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definition we agreed to yesterday at the beginning of the deposition, to include all of the entities -- when was a potentially referable finding committee first created in the Syngenta organization or by its corporate predecessors?
A. Well, again, remembering that we have to make the distinction between the US PRF committee which is the one that is accountable for fulfilling the obligations of the law, I can't speak directly as to when that committee was formed because I was never part of it. But we certainly set up the -- the approach committee within our function at the time that was required in order for us to start complying. I can't give you a date for that either off the top of my head.
Q. I didn't understand what you said, approach committee?
A. You remember I said this morning that the product safety organization as we now call it met to consider if findings were truly adverse as defined by the legislation, and then sent our recommendations to the US committee.
Q. So the product safety committee?
A. That's the product safety -- what we call the PRF approach committee.
Q. Okay, the PRF approach committee?
A. Yes.
Q. And that's the group that you discussed about your

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2009 and 2011 documents discussing the impact paraquat would have?
A. No, that's different. No, we are talking about when studies are conducted, and we get the results and we have interpreted them, whether the -- they would meet the criteria of, or could potentially meet the criteria, of 6(a)(2).
Q. Okay. I want to start over if we can. I want to try to understand every single one of these different groups, subgroups, that impact paraquat.
A. Right.
Q. And I want to talk about them and then their interrelationship with America, okay?
A. Okay.
Q. So let's start over, if we can?
A. Sure.
Q. And let's go through each one of them. You have a Paraquat Parkinson's group, what is that called?
A. So we have since 2008 --
Q. Okay, in 2008 --
A. Yes, we created the paraquat health science team.
Q. And you certainly by that don't mean the health of paraquat, do you?
A. No. No, we don't.
Q. Okay. So the paraquat health science team?

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A. Yes.
Q. Let's get them all down first --
A. Okay.
Q. -- and then let's come back and see how they inter-relate.
A. Right.
Q. And then what's next?
A. Well, maybe the closest related to that, which we talked about yesterday, is the paraquat issues leadership team.
Q. The paraquat issues leadership team.
A. Correct. And that was responsible for overall governance. Remember we discussed who authorizes studies, et cetera.
Q. Okay. When was that started?
A. I am not -- I can't give a date, precise date to that. As I say, 2008 for the health sciences team. I can't remember when the PILT -- this is the PILT -- when that was created.
Q. Before or after the paraquat health science team?
A. I think it would be around about the same time, actually, yes.
Q. Okay.
A. Right. So they -- they were tasked with our research program on paraquat, particularly the health

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sciences team, with some governance from the PILT.
Q. Okay.
A. Right. Now if you then look at the product safety function, which is the organization that I for a time was leading, a separate committee to what we have just been talking about because it dealt with any potentially -- any findings from studies on any compounds that we were testing or any information that we were getting from the outside world, the PRF approach committee --
Q. PRS approach --
A. PRF, potentially referable findings, approach committee was set up within what we now call product safety in order to discuss whether the findings might meet the criteria for a 6(a)(2) as defined in that regulation we were reading out this morning.
And they would send on their recommendations or their -- the outcome of their discussion to the US PRF committee. So a separate committee -- this is coming to your point -- was the United States PRF committee, and it was that committee which had the accountability to make the final determination of what was submitted to the US EPA.
Q. And so it is potentially referable --
A. Findings, yes.
Q. -- referable findings committee?
A. Yes.

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Q. Now, so we have identified four different committees?
A. Yes.
Q. Are they the only ones that could have anything to do with paraquat?
A. Well, if we go back further in history, there were other bodies --
Q. I will get to those. But right now, those are in existence?
A. Right now, those are indeed all in existence still.
Q. How many PRF committees are there in the entire umbrella of Syngenta?
A. Well, there are other PRF committees in other regions. I believe, for example, although I don't have any direct contact, that there may still be a European PRF committee that has a similar task to the US to comply with the appropriate legislation in the EU.
Q. Well, is there one or not?
A. I don't know, because I no longer have any interactions in that area. There certainly was for a -- a period -- significant period, when I was directly involved with the PRF process. I no longer am directly involved with the PRF process.
Q. And they would then make potentially referable finding conclusions about notifying regulatory authorities

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in different countries?
A. Correct.
Q. And that might include, of course, the fact that as Syngenta sells paraquat in multiple different countries --
A. Yes.
Q. -- it may include reporting or making reports in those countries --
A. Yes.
Q. -- about paraquat?
A. Yes, yes.
Q. Okay. In how many countries is paraquat sold by Syngenta?
A. I don't have that figure in my head.
MR. NARESH: Object to the scope on that.
MR. TILLERY: Actually, it is one of his topics.
MR. NARESH: Which topic?
MR. TILLERY: I don't have the topic list. It is right there in front, in your stack of papers.
BY MR. TILLERY:
Q. Does the Syngenta executive committee have anything to do with this?
A. With what, sir?
Q. With any oversight of paraquat?
A. Well, in the sense that it has oversight of the way in which paraquat is used and sold and marketed, of course,

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as one of the key products in the company.
Q. And as a result of that, the SEC that you identified this morning and described in terms of their authority, would be put on notice and -- about items that might have some bearing on the sales of the product?
A. They would, yes.
Q. Okay. And research concerning the product?
A. Any significant research they would potentially be informed about, yes.
Q. And how many members are on the SEC?
A. At the moment less than ten. This has changed very recently because we are now Syngenta Group so the numbers change actually from one -- almost from one year to another.
Q. Syngenta's headquarters are in Basel, Switzerland?
A. They are.
Q. And in what parts of the world are you located?
A. In virtually all parts of the world.
Q. Okay. So you have operations in South America, and the Pacific Rim, all over North America, Canada, Australia?
A. Yes.
Q. China?
A. Yes.
Q. Africa?
A. Yes.
Q. Is there an area of the world where you don't have

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a dominant position in terms of agricultural chemicals?
MR. NARESH: Objection to form and scope.
I am not seeing it in the -- if you can point me to something, I am just not seeing anything -- I am fine with you asking questions in his personal capacity on Syngenta sales, but I am not seeing it in the topics.
MR. TILLERY: No, no, I was talking to it -- well okay.
BY MR. TILLERY:
Q. Go ahead.
A. Well, we are a leading crop protection company in what we call all the four main regions of the world: Asia Pacific; European -- Europe, Middle East and Africa; North America and South America.
Q. Has there been any significant change in the way Syngenta is managed since the acquisition by ChemChina?
MR. NARESH: Objection to scope.
A. We still have the Syngenta executive committee who is responsible for the strategy and operation of Syngenta and its associated businesses.
BY MR. TILLERY:
Q. But in terms of its leadership teams, its hierarchy of responsibility, is it generally the same?
MR. NARESH: Same objection.
A. It is generally the same, although recently we have

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formed this Syngenta Group which -- where other companies are now part of that group, and the leadership team has changed as a consequence of that.
BY MR. TILLERY:
Q. Now the descriptions that you have given to me -- you talked about the paraquat health science team -- is that comprised of members of Syngenta employees only?
A. The team is -- the core team is certainly Syngenta employees. But we have consistently, since 2008, included in our teams and our team meetings external experts. Some have had a longstanding relationship with us, others have had -- come in from time to time.
Q. And what is the overall responsibility of that team?
A. To address the issue of whether paraquat could be a causative agent in Parkinson's disease.
Q. And you have involved outside lawyers in that team as well?
A. Occasionally outside lawyers have come in to talk to us.
Q. But actually, more than talk to you; right?
A. Perhaps you could clarify what you mean?
Q. Well, have you had lawyers from Fulbright Deloitte sit in on your meetings, presentations at science committees?
A. That has occurred, yes.

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Q. And they have actually made presentations?
A. Yes, that's true.
Q. All right. You have been there when they have made presentations?
A. Yes.
Q. And they are there during scientific reports and giving advice about the inclusion of information in those reports; correct?
A. By reports, you mean what?
Q. Well, let's say this: PowerPoints with the rest of the group, editing PowerPoints, are you aware they did that?
MR. NARESH: Objection to form.
A. I was not aware that external counsel were involved in editing our PowerPoints.
BY MR. TILLERY:
Q. Would you think that that would be inappropriate?
A. I think under some circumstances it certainly would.
Q. Why? Why would you that having some outside lawyer from some private law firm in America editing your reports and telling scientists what they can and cannot say about paraquat would be inappropriate?
MR. NARESH: Objection to form.
A. I don't believe in my experience that has happened.
BY MR. TILLERY:
Q. Okay. So you certainly would not put up with it,

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would you?
A. No.
Q. Okay, what would you tell them?
MR. NARESH: Objection to form.
A. I would tell them that they are perfectly entitled to give advice about how we are made aware of the situation that exists in terms of things like potential litigation. But we -- we would not expect them to be saying "you do this experiment and not that experiment".
BY MR. TILLERY:
Q. Or that you say this about this chemical, or you say that about this chemical?
A. Absolutely, absolutely.
Q. You would think that that should rest within the discretion of the Syngenta scientists and leadership team within Syngenta; correct?
A. That is part of the ethos of the team exactly, yes.
Q. Right, right.
Now, can you tell me in terms of the paraquat health science team, is it made up of people from around the world, or are you located in one particular geographic area?
A. No, it's from more than one part of the world. So we have people -- or have had people, again there is history of people, some people being in it at one time and not at others -- but we generally have people from both Europe and

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North America, particularly.
Q. Any other parts of the world besides Europe and North America?
A. Generally speaking, no. It has largely been from those two regions.
Q. Has there been any specific accomplishment by the paraquat health science team in terms of the progression of your thinking about paraquat and Parkinson's disease?
MR. NARESH: Objection to form.
A. Well, I think you have seen that the work program that we have conducted in the form -- and how it has been published, the kind of experiments that we have done -- and we spoke yesterday about experiments which are still in progress to completion and publication.
So our achievements have been to conduct a large body of research and to put that into the public domain as much as we can.
BY MR. TILLERY:
Q. Have you received advice from any outside lawyers about what studies you should do?
A. Not in terms of what studies we should do, no.
Q. Okay. Again, would that fall into the realm of things that you would think would be inappropriate?
A. Unless there was a particularly good reason to -- to give out that kind of advice then, generally speaking,

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I wouldn't want the science -- good science to be not allowed to progress.
Q. Would you agree with me that an outside lawyer who is retained primarily to represent the company in terms of potential exposure from the sale of its product would have different kinds of motives than that of a scientist whose motives are to obtain an accurate objective reproducible scientific result?
MR. NARESH: Objection to scope, form.
A. Call it motives, different agendas, what you will, of course, yes, that's true.
BY MR. TILLERY:
Q. That seems pretty fundamentally correct, yes?
A. Of course.
Q. And that's the reason why you wouldn't want them telling you what science to do, would you?
MR. NARESH: Same objection.
A. And why in my experience, I don't recall ever having been told by lawyers not to do --
BY MR. TILLERY:
Q. Ever saying that?
A. No.
Q. And if that happened, they didn't tell you about it?
A. Indeed.
Q. Okay.

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Let's talk about -- I don't remember the name of the group that you headed up.
A. Yes, yes.
Q. What was the name of that group?
A. It didn't have a particular name. I think you're referring to the documents where we were talking about reference doses and so on.
Q. It was you, Dr. Sturgess and --
A. Dr. Travis.
Q. Dr. Travis.
A. And Mr. Cook.
Q. And you had two documents, 2009 and 2011. What was the name of that group?
A. Well, we didn't call ourselves -- there wasn't an official title. We were part of what we called a -- the paraquat technical team, which was a subset of the paraquat health science team.
Q. And how do you keep all these teams, committees, groups, straight?
A. That's part of my leadership responsibilities.
Q. So that's the paraquat --
A. Let's describe it as the paraquat technical team.
Q. Technical team?
A. Yes.
Q. Okay.

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And are you no longer on that team?
A. No, I'm still part of that team.
Q. All right. Are you the head of that team?
A. I still act to head that team, yes.
Q. All right. And how long has that team been in existence?
A. It's been part of the modus operandi of the health science team, i.e. being a group which feeds into the health science team, for as long as the health science team has been in existence.
Q. Okay. So in 2008 or thereabouts when the paraquat health science team started, you started a technical team to support it --
A. We had something similar to what we've got now. Different people -- some different people, but broadly having the same --
Q. Do you have marketing people on the paraquat health science team?
A. No.
Q. Okay. Do you have marketing people on the paraquat issues leadership team?
A. Yes.
Q. And who are those people?
A. I -- I can't give you names off the top of my head. And today the paraquat issues leadership team is a looser

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association, it is a looser organization than it used to be until a few years ago.
Q. Can you explain why you have marketing people on the paraquat issues leadership team?
A. I believe that it was thought wise to have -- to give again transparency to the marketing organization about, um, safety and regulatory issues regarding paraquat, so it is giving them foresight of things that could affect their ability to sell paraquat.
Q. Anybody from the business side on the paraquat health science team?
A. No.
Q. Okay. You talked about different PRF committees, and you mentioned the difference between the US and Europe. Are you aware of any other PRF committees with respect to regulatory oversight by other countries?
A. No, I am not aware. I am not saying that there aren't, but I don't remember having visibility of any other PRF committees other than the one in Europe.
I don't even know whether that still works. I assume it does, but I don't see evidence of that, or the North American one.
Q. When an adverse effect is reported to the regulatory authority in the United States, the US EPA, is it automatically reported in other countries where the product

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is sold?
A. I'm not sure if that process is in place. I don't know.
Q. Was it when you were on the committee?
A. I -- at the time I was on the committee I don't know, because I think as I said earlier the US PRF committee I was not a member of that, so I don't exactly know what their onwards process of communication was, other than into the EPA.
Q. When a person makes -- or scientist makes -- a finding and sends it to, you said, a PRF approach committee, do they get it before the PRF committee?
A. Yes. Because the PRF approach committee is within the function that is generating the data doing the studies, either within the function itself or at contract research organizations. So they are the scientists who first become aware of the findings.
Q. And they then do an evaluation?
A. They evaluate whether the findings -- whether they are real, whether they are related to treatment, if they are adverse and if they fulfill the criteria for 6(a)(2).
Q. And they say it doesn't, does that stop it? Right there it ends?
A. If the committee -- if that approach committee makes -- if it is clear to that approach committee, and this

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is my experience from sometimes chairing that committee as well as being part of it, if it is clear that the criteria are not fulfilled then the record is there that we had that discussion, but it does not get submitted to the US committee.
If it is clear that they do meet the criteria, or if there is any doubt, then they are submitted to the US committee.
Q. Okay. It goes to the PRF committee?
A. To the US PRF committee, yes.
Q. Okay.
So along the process, the PRF approach committee has the authority to stop the advancement of an adverse effect potentially being sent on to a regulatory authority, and the PRF committee itself does, right?
A. Yes.
Q. And then after the PRF committee makes the recommendation, where does it go from there?
A. Are you there referring to the approach committee or the US committee?
Q. No, the US committee. The PRF committee in the United States?
A. If the US committee believes that it meets the criteria of 6(a)(2), it will submit to the US EPA.
Q. Without further ado?

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A. I don't believe there is another check in that process.
Q. Okay. So you don't believe the Syngenta executive committee has to approve any decision or recommendation by a potentially referable finding committee about whether to report adverse effects to regulatory authorities?
A. I don't believe that the Syngenta executive committee gets involved in that kind of decision.
Q. Now have we identified all people outside of Syngenta in all the committees? Are there other people who are not fully employed by Syngenta who occupy roles in any of these committees other than one you've described for me?
A. Right. So certainly there are no outside non-employed -- Syngenta employed -- people on either of the PRF committees. So we can exclude those.
Q. Okay. All right.
A. There is nobody outside of Syngenta on the PILT.
Q. Okay.
A. Paraquat issues leadership team.
Q. All right.
A. As I said earlier, when it comes to the paraquat health scientists team, we have had people, consultants, outside experts, be part of that team for in some cases quite a long period and other cases for a short period.
Q. Okay. Is a notifiable effect the same as

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a potentially referable finding?
MR. NARESH: Objection, calls for a legal conclusion.
A. Possibly, yes. It sounds a reasonable conclusion.
BY MR. TILLERY:
Q. Have you ever heard of the term "notifiable effect" being used at Syngenta?
A. Yes, it is a term which is sometimes used, yes.
Q. Interchangeably with --
A. Yes, my understanding of how that would be used would be interchangeable with potentially referable, yes. That's not to say that other people might have a different view, but that would be my understanding.
Q. If a product is determined to be potentially neurotoxic does that indicate to you that much more care in analysis is required because of possible serious harm or death to consumers?
A. We take all potential findings in studies that may have consequences for human health very seriously, so not just neurotoxicity.
Q. So, in other words, you don't treat products that are determined to be potentially neurotoxic any more seriously than any other product?
A. That is in no way to diminish what you -- what you are inferring, that any potential health effect is something

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which we need to take seriously.
Q. Okay. Would you agree with me that if a product is determined to be potentially neurotoxic, it sends an indication, a red flag to you that care, deliberation, caution is required because of the potential side effects to, impact caused -- whatever you want to call it -- to the consuming public, the people who by your product?
MR. NARESH: Objection to form.
A. Of course. And that has always been the ethos of the approach committee which I was apart of, indeed.
BY MR. TILLERY:
Q. Let's talk about countries that have banned the chemical paraquat, okay?
Does Switzerland allow paraquat to be used?
A. I believe it does not.
Q. Okay. Does England?
A. No.
Q. Does France?
A. No.
Q. Germany?
A. No EU country does.
Q. So I could go through the whole list --
A. You could.
Q. -- and none of them, okay?
When you say "EU", every country ever of the

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European Union has banned it?
A. It was part -- well, because the decision-making is done at the EU level and we were talking about that list just now.
Q. All right. So it can't be sold in the EU?
A. That's the current position, yes.
Q. All right. What other countries have banned it?
A. Well, a number of other countries in the Far East, China for example. Again, I would have to check back on the list that -- yes, the number of countries have banned it.
Q. Who keeps that list?
A. The marketing organization.
Q. Okay. And you say China. When did China ban it?
A. Again, I can't remember the exact date.
Q. And did Vietnam ban it?
A. I can't remember whether that was one of the countries.
Q. What other Pacific Rim countries have banned paraquat from being sold in their countries?
A. Well, I think I would need notice of that question to check. It is not a list that I tend to keep in my head.
Q. Do you know the rough number of countries --
A. I think you indicated a number this morning --
Q. I told you 32, but I think my information might be out of date.

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A. Yes, I can neither confirm nor deny that.
Q. Who is -- strike that.
Who owns Syngenta?
MR. NARESH: Objection, scope.
A. ChemChina.
BY MR. TILLERY:
Q. Where is Syngenta headquartered?
A. Basel.
Q. Okay.
Was paraquat banned by any country because of its neurotoxicity, or its potential to be neurotoxic?
A. I don't believe so. But I would -- again a detail that I would need to check. My understanding is most of the bans have been associated with its acute toxicity.
Q. Has paraquat been banned by any country because Syngenta could not establish that it was not neurotoxic?
A. I'm not aware of that, but again I would need to check the detail.
Q. Has any country banned paraquat because of a risk of brain injury?
A. I am not aware of that.
Q. But you can't deny --
A. I would need to check that.
Q. Has Syngenta been asked by any country considering the registration and permission to continue to sell it to

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provide evidence that it is not neurotoxic?
A. Well, we did discuss earlier on this afternoon Brazil, for example.
Q. We went through that.
A. They were asking questions about that matter --
Q. So excluding Brazil and their request for information about neurotoxicity?
A. Yes.
Q. Any other country ask for that same information?
A. I can think of another example in the form of Australia.
Q. Have they asked for that?
A. They asked for our evidence which we discussed with their regulatory authority, yes.
Q. And when did they ask for that?
A. I can't give you the date. It was -- I think we are talking about over the last ten years or so as they have been rereviewing.
Q. And Charles Breckenridge made a presentation to them there, didn't he?
A. He did, yes.
Q. Just like he did to the folks in Brazil?
A. Yes.
Q. And in that presentation he didn't mention anything about Louise Marks, did he?

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MR. NARESH: Objection to form.
A. And I think the same applies to what -- to the discussion we had earlier that two things are important.
First of all, Australia were well aware of the published literature suggesting that paraquat has an effect on the mouse brain, so they were starting from an assumption that that might be something of significance. But they saw from the extensive research that we have done that that was giving a different weight of the evidence.
BY MR. TILLERY:
Q. Okay. I move to strike the answer as unresponsive.
Could you repeat my question, please?
COURT REPORTER: "And in that presentation he didn't mention anything about Louise Marks, did he?"
A. I believe he did not.
Q. To your knowledge, the Australians selling or allowing paraquat to be sold today know nothing about the studies that you did internally in CTL by Louise Marks, right?
A. That is a possibility. But again I would need to confirm that with other colleagues.
Q. Okay.
Has Syngenta ever reported to any regulatory agency anywhere on this globe that paraquat is neurotoxic?
MR. NARESH: Objection to scope.

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A. I do not believe so.
BY MR. TILLERY:
Q. Okay. Has Syngenta ever reported to any regulatory agency that paraquat has the potential to be neurotoxic?
MR. NARESH: Objection to scope.
A. Yes, because as exemplified by the discussions we had with Brazil, we said the potential was there, which was why we were conducting our research program.
BY MR. TILLERY:
Q. You were telling them about the potential. Why didn't you tell them about Louise Marks?
A. Well, as I say, hindsight is a wonderful thing, and we could have added the Marks studies to what these regulatory authorities already knew, which is that that mouse model has, in the hands of some researchers, shown an effect, an apparent effect, of the paraquat.
Q. You don't think it makes a little bit of difference if the people involved in the manufacturing and sell -- sale -- and who have an obligation to go forward with the registration of the chemical, if the same people behind that chemical had done testing within their own laboratories and made findings that are consistent with outside scientists, you don't think that's important to regulators?
MR. NARESH: Objection to form.
A. I don't think I have ever said that it is not

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important to regulators. And I have said, I think, several times now that in my view it would have been not an unreasonable course of action to include that, but obviously the overall weight of evidence was telling us something differently.
BY MR. TILLERY:
Q. Have you ever told anyone not to report an adverse effect of paraquat to any regulatory agency?
A. I am not aware that I have ever done that.
Q. Are you aware of anyone at Syngenta who has ever told anyone not to report the results of an adverse effect of paraquat to any regulatory agency?
A. Again, I'm not aware of that being said in any -- in any direct way, no.
Q. Have you ever participated in a group that discussed whether to report an adverse effect of paraquat?
A. The PRF approach committee is the closest that I've got to. But again that's making recommendations, not decisions.
Q. And you told us about that earlier.
A. I did.
Q. When you made the recommendation for the US EPA?
A. That is correct.
Q. Did the Syngenta executive committee ever decide not to report a potential adverse effect of paraquat to

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a regulatory agency?
A. Again, as I have said before, in my experience I don't think the SEC have ever been involved in making those decisions.
Q. Would you agree with me, sir, that companies engaged in the development and sale of a product subject to ongoing regulation like paraquat have an obligation to be truthful to those regulatory bodies and to the public when they report their scientific findings?
A. I do agree with that.
Q. Okay. Would you agree with me that companies engaged in the development and sale of a product subject to ongoing regulation like paraquat have an obligation to the public to share their scientific findings?
A. Yes, I agree with that.
Q. Would you agree with me that Syngenta scientists are ethically required to share their scientific findings about paraquat?
MR. NARESH: Objection to scope.
A. I do agree.
BY MR. TILLERY:
Q. Would you agree with me that the amount of money Syngenta makes should never, ever, be a reason or justification for concealing health risks of paraquat?
A. Very much so, yes. I agree.

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Q. Okay. Can you think of any justification for concealing or withholding information about an adverse effect concerning paraquat?
A. Only if the -- the definition of a PRF, for example, has not been felt to have applied, which is the case we were discussing earlier.
Q. Would you agree with me that withholding scientific findings from the public about the neurotoxic effects of paraquat would be unethical?
A. If we truly believed that paraquat had genuine neurotoxicity, then of course we would not wish to withhold that.
Q. And do you agree with me that would be improper and unethical?
A. If we genuinely believed that that was the property of paraquat.
Q. But it is only when you subjectively believe it, right?
MR. NARESH: Object to form, argumentative.
A. Could you repeat the question?
BY MR. TILLERY:
Q. It is only when you believe it, that is the standard?
MR. NARESH: Objection.
A. No, let me qualify that by saying that this is

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dependent on the best possible scientific evidence which, when I have been talking about weight of evidence, is what we have been engaged for many years in trying to create.
BY MR. TILLERY:
Q. Would you agree with me that withholding scientific findings from the public about the neurotoxic effects of paraquat would be fraudulent?
MR. NARESH: Objection to form.
A. If there were -- if the weight of evidence had suggested there was clear neurotoxicity, then I don't know whether you call that fraudulent, but I think it is certainly not something that we would -- we would do.
BY MR. TILLERY:
Q. Well, whether or not you would do it or not, would you agree with me that if you did it, it would be fraudulent?
MR. NARESH: Same objections.
A. I don't know that I would be happy to -- to use the word "fraudulent".
BY MR. TILLERY:
Q. Okay, let's substitute a word. Let's substitute the word "dishonest"?
A. I think that is probably a better --
Q. Are you okay with that word?
A. Yes.

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Q. Let me start over again. Would you agree with me that withholding scientific findings from the public about the neurotoxic effects of paraquat would be dishonest?
MR. NARESH: Same objection.
A. Yes, and again if we had come to a conclusion on that subject based on the best science.
MR. TILLERY: I am at your magic number. I will see on you the 31st.
A. I understand, sir.
MR. NARESH: Let me just make on the record, I do anticipate having redirect for this witness. I understand that my opportunity for redirect will come at the conclusion of your questioning and I do object to the use of this deposition until I have my opportunity for redirect.
THE VIDEOGRAPHER: At that point, are we concluding for today?
MR. TILLERY: We are.
THE VIDEOGRAPHER: In which case we shall go off of the record at 4:49 pm concluding today's part of the deposition.
(Whereupon, the deposition concluded at 4:49 p.m.)

CERTIFICATE OF COURT REPORTER

I, Laura Evans, an Accredited Real-time Reporter, hereby certify that the testimony of the witness Philip Botham in the foregoing transcript, numbered pages first page 244 through last page 495, taken on this 26th day of February, 2020 was recorded by me in machine shorthand and was thereafter transcribed by me; and that the foregoing transcript is a true and accurate verbatim record of the said testimony.

I further certify that I am not a relative, employee, counsel or financially involved with any of the parties to the within cause, nor am I an employee or relative of any counsel for the parties, nor am I in any way interested in the outcome of the within cause.

Laura Evans

Signed: .....
Name: Laura Evans
Date: February 27, 2020

Ragan Naresh, Esq.
ragan.naresh@kirkland.com
March 3, 2020
RE: Hoffmann, Diana v. Syngenta Crop Protection LLC
2/26/2020, Dr. Philip Botham, V2 (#3984465)

The above-referenced transcript is available for review.

Within the applicable timeframe, the witness should read the testimony to verify its accuracy. If there are any changes, the witness should note those with the reason, on the attached Errata Sheet.

The witness should sign the Acknowledgment of Deponent and Errata and return to the deposing attorney. Copies should be sent to all counsel, and to Veritext at cs-ny@veritext.com.

Return completed errata within 30 days from receipt of testimony.

If the witness fails to do so within the time allotted, the transcript may be used as if signed.

Yours,
Veritext Legal Solutions

Hoffmann, Diana v. Syngenta Crop Protection LLC
Dr. Philip Botham, V2 (#3984465)

ERRATA SHEET

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Dr. Philip Botham, V2 Date

Hoffmann, Diana v. Syngenta Crop Protection LLC
Dr. Philip Botham, V2 (#3984465)

ACKNOWLEDGEMENT OF DEPONENT

I, Dr. Philip Botham, do hereby declare that I have read the foregoing transcript, I have made any corrections, additions, or changes I deemed necessary as noted above to be appended hereto, and that the same is a true, correct and complete transcript of the testimony given by me.

_____ _____
Dr. Philip Botham, V2 Date
*If notary is required

SUBSCRIBED AND SWORN TO BEFORE ME THIS
_____ DAY OF _____, 20___.

_____
NOTARY PUBLIC

IN THE CIRCUIT COURT
TWENTIETH JUDICIAL CIRCUIT
ST. CLAIR COUNTY, ILLINOIS

DIANA HOFFMANN, individually and as Independent Administrator of the Estate of THOMAS R. HOFFMANN, Deceased, et al.,	)	No. 17-L-517
Plaintiff,	)	
v.	)	
SYNGENTA CROP PROTECTION, LLC, et al.,	)	
Defendants.	)	

- - - - -

CONFIDENTIAL PURSUANT TO PROTECTIVE ORDER

VIDEOTAPED ZOOM DEPOSITION OF
SYNGENTA CROP PROTECTION, LLC

PHILIP BOTHAM
(Volume III, pages 498-834 inclusive)

Wednesday, June 17, 2020

Berkshire, England,
United Kingdom
(Deponent's location)

Reported by:
LEAH M. WILLERSDORF,
(AVR, MBIVR No. 166,
QRR2, International
Participating Member NCRA.)

Job No. 27625

June 17, 2020
10:20 a.m.
(British Summer Time)

Zoom videotaped deposition of SYNGENTA CROP PROTECTION, LLC - Philip Botham, Berkshire, England, United Kingdom, reported remotely via videoconference before Leah Willersdorf, Accredited Verbatim Reporter, Member of the British Institute of Verbatim Reporters (Accreditation No. 166), Qualified Realtime Reporter (Level 2), International Participating Member NCRA (USA).

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Mark Smith - Syngenta in-house counsel
Wendy Viner - Videographer

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EXHIBITS PREVIOUSLY MARKED

(On the record at 10:20 a.m.)

THE VIDEOGRAPHER: This is the continued videotaped deposition of Dr. Philip Botham, in the matter of Diana Hoffmann, individually and as Independent Administrator of the Estate of Thomas R. Hoffmann, Deceased, et al., versus Syngenta Crop Protection, LLC, et al., in the Circuit Court, Twentieth Judicial Circuit, St. Clair County, Illinois, Case No. 17-L-517.

This deposition is being held remotely via Zoom on June 17, 2020 at 10:20 a.m.

My name is Wendy Viner from TransPerfect and I am the legal video specialist. The court reporter today is Leah Willersdorf, also with TransPerfect.

Could I ask all counsel to introduce themselves for the record.

MR. TILLERY: For the plaintiff, Steve Tillery.

MR. NARESH: For Syngenta, Ragan Naresh, Kirkland & Ellis.

MR. TILLERY: All right.

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Swear him in.
THE VIDEOGRAPHER: Could I ask the court reporter to please swear in the witness and we can proceed.
PHILIP BOTHAM,
having been duly re-sworn,
was examined and testified as follows:
MR. TILLERY: Can we get the full screen of Dr. Botham instead of just the small icon of him. Is there a way to do that?
There we go. All right. Okay.
Thank you.
EXAMINATION ON BEHALF OF PLAINTIFFS (continued):
BY MR. TILLERY:
Q. Would you state your name, please, for this record, once more.
A. Dr. Philip Botham.
Q. You understand, Dr. Botham, this is a continuation of a deposition that was started in London in about the third week of February of this year, correct?
A. Correct.
Q. And we were not able to finish that

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deposition because of a lot of issues with the coronavirus and the deposition has been delayed until this time. We are now doing this deposition remotely, which means that lawyers from different parts of the United States are logging in to a video-audio system that allows them to watch you where you're located in England, and we are located in different positions in different parts of the United States.
Do you understand all that?
A. That's fine. I understand.
Q. All right. And you're connected to an electronic system that allows you to look at exhibits electronically, and those exhibits are then put on a screen for you to see and you can study those exhibits, look at them, ask your own questions if you want to see more of that exhibit than as what we pull up on the screen.
Did you understand that?
A. Yes. Thank you, that's my understanding.
Q. So for clarification, just to make sure, for that purpose, if you were to see

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a document that you thought you wanted to see more of, if you thought there was some issue about what -- the part of the document that I was showing you or whatever, you have the right to stop me and ask or to show different parts of that document or to look at it.
No one wants to rush you. Given the circumstances of this communication, you have the right to take your time in looking at those exhibits any way you want. I want to make sure you have that.
Right?
A. Okay, thank you.
Q. And as we indicated off the record, if you need to take a break, you do that at your discretion, and just so long as we're not in the middle of a deposition question. Okay?
A. Thank you.
Q. And before we begin the deposition, this remote deposition, I want to make clear the expectations regarding communications with the deponent.
During this deposition, as I've indicated, counsel appearing with the deponent and the deponent, here you don't have counsel

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appearing physically with you, do you, sir?
A. No, I don't.
Q. But you'd have an opportunity at a break to have an electronic chatroom, they refer to it as, a way to communicate at a break with your counsel if you wish to. But while we're appearing on the film, while we're asking questions, it's our expectation that there's no electronic communication going on between you and anyone else.
You understand that?
A. Yes. That was something that I've discussed with my counsel and I clearly -- I understand those -- that requirement.
Q. And you're in a deposition room by yourself, and you're physically located where at this time?
A. Yes, I'm on my own. I'm physically located in the Syngenta Jealott's Hill complex and I'm in the building that is occupied by the product safety department.
Q. All right. And this is in -- just so we're clear, this is in a city outside of London about how far?

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A. We are in a science park, which is -- where the nearest city is called Bracknell, and that is around 20 miles away from London.
Q. All right.
So the first thing I want to do in the deposition is to indicate to you that we should clean up or clear up some open-ended issues that were left open during the deposition, before we move on to new topics.
I had been -- I wouldn't expect you at this length of time of delay, unless you've re-read your deposition recently, to understand that we had finished -- we hadn't finished on some questions because there was some issue about numbers, if you remember that, okay --
A. I do.
Q. -- in the first -- all right.
So we're going to go back for a few questions and finish those before we move on.
One of the first ones I had was marked as Exhibit No. 14 in your deposition, in the earlier part of this deposition. That is a document that we could pull up at this point in time.
Because of the size of the document,

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it's going to be submitted to you on the screen. The document that I've shown you is a document from a production by Chevron and it relates to an ICI-Chevron communication.
MR. NARESH: Steve, not to interrupt, but, Dr. Botham, do you have access to an electronic version of the prior exhibits that were used in the deposition in February?
THE WITNESS: I do.
BY MR. TILLERY:
Q. Actually, that might be easier for you if you wish to do that.
A. Yeah, okay.
Q. All right. So if you pull up Exhibit No. 14.
(Botham Exhibit 14 previously marked for identification.)
THE WITNESS: Sorry. I just need to log on to the access for this.
BY MR. TILLERY:
Q. Yeah, it's that page that's on your screen if you look at your screen right now.
A. Yeah, so --
Q. Do you see where --

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A. Yeah. I'm just downloading this, I'm sorry. I didn't download every previous document I had so I'll just take a minute.
Q. All right. No problem.
A. Okay. So I can now see my local version here.
Q. And the page, if you see the reference that we're looking at, there is a CUSA number at the bottom.
Do you see that?
A. Yeah. Yes, I can see that.
Q. We're going to the last number 885, and that -- it's Exhibit 14 but the Bates number at the bottom of the page is 885. it's CUSA-00189885.
A. Yeah, I'm almost there.
Yeah, I'm there. I can see that, thank you.
Q. All right. All right.
So if you would read the paragraph that starts with Mike's letter. You can read it to yourself if you wish.
A. Yes, I -- do you want me to -- you don't want me to read that out loud or just to myself?

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Q. Just to yourself's fine. I want to ask you some questions about that.
A. Okay.
Yes, okay, I've read that paragraph.
Q. All right. So this is a page from a letter from R. Cavalli to Ken Fletcher, dated July 9, 1975, and though we may have identified those gentlemen at an earlier time of the deposition, out of an abundance of caution let's one more time explain who they were.
You understand R. Cavalli to be a toxicologist at Chevron, correct?
A. I'm not sure that I did know that but I certainly don't remember ever meeting that person, so I can't confirm that.
Q. But you understand that from the deposition, from the exhibits that we looked at before in the earlier part of the deposition, we referred many times to R. Cavalli. Do you remember?
A. Yes, okay.
Q. All right.
And there's a Ken Fletcher as well. And who is he?

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A. Yes. Ken Fletcher I know was a -- somebody who worked at the Central Toxicology Laboratory of ICI. He left before I joined.
Q. And Ken Fletcher then would be working with the predecessor of Syngenta corporation, correct?
A. That is correct.
Q. And during this period of time, July 9, 1975, was when ICI and/or Syngenta and Chevron were working together in terms of the production of a product in -- a paraquat product, and the formulation of product by Chevron and the sale of product in the United States that included paraquat by Chevron, correct?
A. That's correct.
Q. All right.
Now, if you would look at this -- as I ask you this question, if you look at this part of the exhibit, the letter indicates that a Mr. Fales, or Fales, alleged permanent CNS effects from paraquat.
Do you see that?
A. Yes, I do.
Q. All right. CNS stands for what?

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A. Central nervous system.
Q. And Dr. Cavalli asked Dr. Fletcher for any information he may have on the question of permanent injury from paraquat, doesn't he?
A. He does.
Q. He asks for any follow-up evaluations several years after spraying, doesn't he?
A. He does.
Q. By the time of this letter, ICI had been manufacturing paraquat active ingredient and selling it to Chevron for formulation and distribution in the United States for just about ten years, correct?
A. Correct.
Q. But the sole distributor of paraquat products in the United States was asking the manufacturer of the active ingredient for any information it might have about whether long-term use of paraquat could cause problems at that time, right? Health problems.
MR. NARESH: Object to the form.
Go ahead and answer.
THE WITNESS: That is correct, yes.
///

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BY MR. TILLERY:
Q. The letter also indicates that a pathologist who examined, a Dr. -- a Thomas Paul, found a lesion in the spinal cord.
Do you see that?
A. Yes.
Q. The letter also says that the pathologist was suspicious that it was due to his exposure to paraquat. Correct?
A. That's correct.
Q. So did ICI do any study to investigate whether exposure to paraquat could cause a spinal cord lesion in response to this report?
A. I'm not aware that any such study was done.
Q. Did Chevron, to your knowledge, do any study to investigate whether exposure to paraquat could cause a spinal cord lesion?
A. I'm not aware of Chevron doing such a study.
Q. Okay.
In response to this letter, did ICI investigate paraquat's potential to cause the kinds of central nervous system effects that

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were being reported in the letter?
A. I'm not aware of any studies that were directly related to the issues that are described here.
Q. Well, even indirectly did they do any? Whether they were a direct response to this letter or generally, did they do any?
A. Well, generally, yes, ICI and its companies which followed, of course, did do a considerable amount of work on -- to look at the potential for paraquat to affect the nervous system, but not directly related to this.
Q. Okay. Tell me the first long-term neurological study that ICI-Syngenta did for studying the impact of paraquat on the central nervous system. When did they do that?
A. Well, we had done a number of studies in the 1990s -- 1980s and 1990s to address that question, and that research continued until our publications in 2013 and 2014; so we did a considerable number of studies over a 25-year period.
Q. Okay. Why don't you name me one. The --

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A. Well, the --
Q. Excuse me, sir. We got a lot of feedback. Let me start that question over.
Why don't you name me a single long-term neurotoxicity study that Syngenta did in the 1990s for paraquat?
A. Well, we -- for example, the studies that were conducted by Louise Marks at CTL which we discussed earlier.
Q. You understand that those didn't occur until 2003?
A. Yes. I'm sorry, yes, that's correct.
Q. So you certainly did those, and we're going to talk a lot about those today and we're going to study -- we're going to discuss them.
My question to you is, you said you did studies at this time period, or up until the '90s. Tell me one study Syngenta did, or Chevron did -- let's broaden it -- or ICI did through the '80s or '90s to evaluate the neurotoxicity of paraquat on a long-term exposure basis?
A. Okay. So one example would be in

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the Nineteen -- which was definitely the 1990s, was a study that was published as Widdowson, et al.
Q. Widnes?
A. Widdowson, et al. No, I'm sorry --
Q. Widdowson --
A. No, it was Naylor, et al., I'm sorry. Widdowson was the second author, excuse me. It was Naylor, et al.
Q. And Naylor, et al. was one -- a study that Syngenta did?
A. Yes. It was Zeneca at that time.
Q. Okay. Zeneca did a long-term neurotoxicity study and -- where the primary investigator was Naylor?
A. Yeah. It's -- it depends how you define long term. This wasn't a long-term toxicity study as would be understood in regulatory guideline terms but it certainly was looking at the potential for paraquat to affect the nervous system.
Q. Okay. When was that study done?
A. It was published in 1995.
Q. Did Mr. Naylor work for Zeneca at that time?

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A. He did.
Q. And what were the study parameters?
A. The main investigation was looking at whether paraquat could enter the brain; so it was mainly a kinetic study but there were some parts of it that looked at the pathology of the brain.
Q. Was it published?
A. It was. It was published in Human and Experimental Toxicology.
Q. And that was one that was funded by ICI or Zeneca?
A. That's correct.
Q. What year was that study?
A. Published in 1995.
Q. Okay. And are there any other studies besides that one?
A. I can't recall any --
Q. Until Marks --
A. I can't recall any more in the 1990s so we would move into the 2000s to identify other studies.
Q. And then the first ones of those would be the Louise Marks studies that we have gone through in this deposition earlier,

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correct?
A. Yes. It's my understanding that those -- that was the next series of studies that was done.
Q. All right. So the only study from 1965 until 2003 that studied long-term neurotoxicity potential of paraquat was the Naylor study in 1995, correct?
A. I was quoting that as an example that I was aware of. I think if -- if you look at the reference list in Naylor, it may refer to other studies that were done before that time.
Q. Now, have you read the Naylor study yourself?
A. I have, yes.
Q. When was the last time you read it?
A. In preparation for this deposition.
Q. So you had read it, what, in the last couple -- two or three weeks?
A. I have.
Q. All right. Now, you know from reading the Naylor study it was a rat study, don't you?
A. That's correct.

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Q. And you know the rats were given paraquat and examined after 24 hours, right?
A. That's correct.
Q. Okay. So you just represented on this record that there was a long-term neurotoxicity study of paraquat in 1995 by Naylor, and you understood my question to be asking for a 24-hour study? Is that what you thought?
A. No, I think I --
MR. NARESH: Objection to form.
THE WITNESS: As I said in my earlier answer, it does not conform to the normal definition of long-term toxicity.
BY MR. TILLERY:
Q. All right. So it was a 24-hour study, right?
A. It was.
Q. All right.
So let's go back now and talk about the work that Syngenta did or Chevron did up until Louise Marks. You did a one-day, 24-hour rat study in 1995, correct?
A. Correct.

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Q. Is there any others before Dr. Louise Marks's work in 2003 that Syngenta or Chevron did?
A. I can't recall if any other work was done.
Q. All right. You're speaking, you know, on behalf of Syngenta today, right?
A. Correct.
Q. You remember at the beginning of this deposition I went over and asked you and told you if you knew and understood that you could access any information, you could research it, you could get any information that you knew or learned historically from the effect of all the work done by Syngenta and its corporate predecessors. You understood that, right?
A. Yes.
Q. All right. Now, let's go back and clarify this.
From the 38-year period, from 1965 until 2003, when Dr. Marks started -- started -- her paraquat neurotoxicity studies, neither Syngenta or its corporate predecessors or Chevron did anything more than the Naylor

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24-hour test; is that correct?
A. I think that I --
MR. NARESH: Object to form.
THE WITNESS: -- would need to re-check they -- for example, through the references quoted in Naylor, but other studies were done; so Naylor was not the only study that was done in that time period.
BY MR. TILLERY:
Q. Yeah. So we're clear, when you say done, you -- I'm talking about by Chevron or Syngenta.
A. And my answer is --
Q. There were certainly -- excuse me.
There were certainly other studies done by other people. What I'm asking is did Syngenta or Chevron do any neurotoxicity studies other than the 24-hour rat study in 1995 in the period of time between 1965 and 2003?
A. I would need to check that. I can't answer that question directly today.
Q. Well, actually, unfortunately, we can't come back to it so let's ask it this

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way: Are you aware of any studies that Syngenta or Chevron did studying the neurotoxicity of paraquat, other than the Naylor study, the 24-hour rat study, in the time period between 1965 and 2003?
A. I'm not aware of any.
Q. All right.
Did ICI ever warn paraquat users about potential nervous system effects from exposure of paraquat?
MR. NARESH: Object to scope.
BY MR. TILLERY:
Q. To your knowledge, sir.
A. It certainly -- the possibility that paraquat could cause Parkinson's disease was included in our external communications such as on paraquat.com.
Q. And when did you first say that paraquat causes Parkinson's disease on your website?
MR. NARESH: Object to form.
THE WITNESS: I can't recall the precise date when that was the case, and we would not have said that it causes; we would have said there is evidence

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showing an association.
BY MR. TILLERY:
Q. And does -- is it -- strike that.
Is it Syngenta's position today that there is good, solid scientific evidence linking paraquat to Parkinson's disease?
A. It's our position that the evidence does not lead to that conclusion. There is no clear causative link.
Q. Okay. So why, then, did you put on your website exact opposite of what you believe?
A. Could you clarify that question, please?
Q. You just told me you put this information on your website to warn people, paraquat users, about potential nervous system side effects from exposure to paraquat. Why'd you do that if you don't believe it?
A. I indicated that what we did was to say that there was -- there were publications, evidence that had been generated that suggested that that -- there could be a relationship but that we did not --
Q. When did -- sorry.

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A. -- that we did not believe that there was a causal relationship.
Q. And when did you first say that?
A. I don't recall when we first said that.
Q. Did you ever warn that in any other way than putting some reference in paraquat.com?
MR. NARESH: Object to scope.
THE WITNESS: That was our main route of making that position available to the external world.
BY MR. TILLERY:
Q. What were all the minor routes?
MR. NARESH: Same objection.
THE WITNESS: Well, for example, when we were engaged in our research program, particularly from 2003 onwards, this issue was discussed at scientific meetings.
BY MR. TILLERY:
Q. So you say that scientific meetings would tell somebody like Ronald Niebruegge or Freemon Schmidt or Jerry Mills or Carroll Rowan, your scientific meetings would alert

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them to the fact that if they sprayed your paraquat products they might get Parkinson's disease. Is that what you're saying?
A. No, of --
MR. NARESH: Object to form.
THE WITNESS: No, I'm not saying that. I'm saying that this was a way in which we were being very open through the normal process of scientific discussion that this was --
BY MR. TILLERY:
Q. And --
A. -- an open research question.
Q. And would you say that it was open to hide Dr. Marks's scientific analysis and studies for 16 years?
MR. NARESH: Object to form.
THE WITNESS: Well, we didn't actually hide that. If you recall, we discussed that Dr. Marks did actually talk about some of her research at an external scientific meeting.
BY MR. TILLERY:
Q. Right. A scientific meeting with Syngenta people. What I'm saying is, did you

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publish the Marks studies that confirmed the association between paraquat and neurotoxicity, brain injury? Did you give those to the US EPA until December 2019?
MR. NARESH: Object to form.
THE WITNESS: The first we did describe some of Dr. Marks's work at an external scientific meeting, it wasn't just a Syngenta meeting, and I think we discussed that the last time we met.
And, secondly, yes, the EPA were informed about some of Dr. Marks's work in 2019, but they had received information about other parts of her work back in 2006 or so.
BY MR. TILLERY:
Q. Yeah. The parts that you gave them, however, in 2006 did not include the three neurotoxicity studies that showed the relationship between paraquat and damage to the center part of the brain called the substantia nigra, did they?
MR. NARESH: Objection to form.
THE WITNESS: That is correct.
Those studies were not referred to the

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EPA at that time.
BY MR. TILLERY:
Q. All right. The only study that you said you circulated in scientific literature was the first study she did, correct? And that was at a neurotoxicity meeting, correct?
A. That is correct.
Q. And that was the one that she later discounted and said that it was inaccurate because of the stereology technique, correct?
A. That's correct.
Q. And you never went back and corrected for the neurology, or the group where it was presented, to tell them that the study was incorrectly done, did you?
A. No, and that is not necessarily the only thing that would accurately describe what happened, because Dr. Marks did actually have discussions with external researchers about that study and why it may -- we may need to address the way in which we do them, so certainly we were -- we continued to have an open dialogue about that.
Q. Did you ever go back and have a public retraction of the first study because

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the stereology technique was incorrectly done?
A. No, we did not, and actually the study was not incorrectly done so requiring a retraction; it was done with a methodology that could be improved.
MR. TILLERY: So I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Did Syngenta or Dr. Marks ever go back and retract the findings and statements about the first study? Can you answer that straightforwardly, please?
A. No, we did not retract.
Q. All right. The external meeting where Dr. Marks discussed her work involved only her first study that reported negative results, correct?
A. Correct.
Q. You didn't have an external meeting where Dr. Marks discussed her next three studies that were finding positive results, did you?
A. That is correct.
Q. So when you just told the court and jury that she reported her work, you're only

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reporting the first one which she found out later to be having had -- strike that.
She only reported the first study, which had been negated in terms of results from her next three successive studies using an updated stereology technique. Is that a correct statement?
A. That is correct, yes.
Q. All right.
Do you know if Chevron ever warned paraquat users about potential central nervous system effects from exposure to paraquat in the --
MR. NARESH: Objection to scope.
I'm sorry.
BY MR. TILLERY:
Q. -- 21 years that it marketed your products?
A. I'm not aware of anything of that nature from Chevron.
Q. Getting back to this report where we started this deposition today, in this letter from Mr. Cavalli to Mr. Fletcher, did either of these two companies ever do anything in response to that report?

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A. I'm not aware of any action that was taken by either company.
Q. Okay. Let's go to that same document, and this would be the second portion and its response communication. If you would look at CUSA-00189805.
A. Okay. I have that on my screen now.
Q. All right. This is a continuation of that same letter communication between these two scientists, correct?
A. Yes, that is correct.
Q. All right. If you'd look, starting at paragraph 4, and read paragraph 4 and -- where it starts on the bottom of 805 and continues on to 806.
Do you see that?
A. Paragraph --
Q. All --
A. Paragraph 4 begins, "I am sorry ..."?
Q. That is correct, sir. If you just read that to yourself.
And I'll read for the record now paragraph 4 of that letter. This is

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Dr. Fletcher's July 21, 1975 letter in response to Mr. Cavalli's letter, isn't it, sir?
A. It is.
Q. And, again, these are representatives of Chevron and Syngenta. At that time, the predecessor was ICI, correct?
A. Correct.
Q. And he says in this paragraph:
"I am sorry not to be more helpful with your legal problems. To my knowledge, no-one here has followed up a case of recovered paraquat poisoning for more than a few weeks. I have not heard of delayed sequelae being attributed, rightly or wrongly, to paraquat. Due possibly to good publicity on our part, very few people here believe that paraquat causes any sort of problem in the field and we have the support of the official side. Consequently, any allegation of illness due to spraying never reaches serious proportions and we have never had to defend this type of action. Also, since it is not believed that paraquat causes damage, there has been no study [of] long-term effects. This would be very difficult in an uncontrolled population."

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Did I read that correctly, sir?
A. You did.
Q. So Dr. Fletcher, a toxicologist at ICI, told Dr. Cavalli that to his knowledge no one at ICI had followed up on a case of recovered paraquat poisoning for more than a few weeks. Is that a fair statement?
A. That is fair.
Q. And I wanted to ask you a question. He says:
"Due possibly to good publicity on our part, very few people here believe that paraquat causes any sort of problem in the field and we have the support of the official side."
Do you see that?
A. I do.
Q. And Dr. Fletcher goes on:
"Consequently, any allegation of illness due to spraying never reaches serious proportions ..."
Right?
A. Correct.
Q. In short, Dr. Fletcher is saying that maybe because of good public relations

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work on the part of ICI, most people, including the government, believe that paraquat does not cause problems. That's what he's saying, isn't he?
MR. NARESH: Object to form, foundation.
THE WITNESS: Well, that's an interpretation of what it says. I couldn't really comment whether that was what was meant.
BY MR. TILLERY:
Q. Can you dispute that interpretation?
A. Well, as I say, I'm not able to make a judgment on that.
Q. Okay. Let's say that's my interpretation. Tell me where I'm wrong.
A. I wouldn't be able to say you were wrong. I couldn't dispute your interpretation, but I can't equally say that something else may have been meant.
Q. Okay. But could you offer up what that alternative would be if mine's wrong?
A. No, I wouldn't want to speculate.
Q. Okay. All right.
He goes on to say:

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"... since it is not believed that paraquat causes damage, there has been no study on long-term effects."
So my question is, in 1975, 20 years after it was discovered that paraquat could be used to kill plants -- because that was in 1955, right?
A. Correct.
Q. -- ICI still had done no study to investigate the long-term effects of paraquat exposure on humans or animals. Is that a correct statement?
A. That is correct.
Q. Okay. And would you agree that without a long-term study of the effects of paraquat exposure, a reasonable scientist could not conclude that paraquat does not cause long-term effects?
MR. NARESH: Objection to form.
THE WITNESS: Yes, that would be a reasonable conclusion.
BY MR. TILLERY:
Q. Okay. ICI could have studied the long-term effects of exposure to paraquat in nonhuman primates before it began selling

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it for use as a weed killer, couldn't it?
A. It could but, of course, before selling it we're talking about a time where perhaps this potential was not fully understood.
Q. It could have done it, couldn't it? Could you directly answer my question?
A. It could have been done, yes.
Q. But it didn't do that, did it?
A. It did not.
Q. Okay. And it hadn't done that as of 1975 either, had it?
A. I'm not aware of it having done any such study.
Q. And Chevron, to your knowledge, had laboratories where those studies could have been done as well, didn't it?
A. Chevron had laboratories. Whether they had the type of labs that would be required for a nonhuman primates study, I don't know.
Q. But they could have certainly had someone else do it if they wanted to, right?
A. They could.
Q. ICI could have studied the long-term

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effects of exposure to paraquat in ways other than in nonhuman primates before it began selling it for use as a weed killer, couldn't it?
A. It could.
Q. But it didn't do that either, did it?
A. At the time when it was first put for sale, there was no reason, nor indeed no practice at that time, to do such studies.
Q. Have you looked at the long-term communications -- strike that.
Have you looked at the communications between Chevron and ICI and their findings of animal studies from the '60s and '70s, sir, in preparation for the deposition?
A. I have not done that.
Q. Okay. So you're unaware of the animal studies showing neurological effects, aren't you?
MR. NARESH: Objection to form.
THE WITNESS: From the 1960s?
BY MR. TILLERY:
Q. Yeah, from the 1960s. Yes.

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A. I can't immediately recall what they may be, no.
Q. Okay. So if I told you there were such, you haven't looked at them at all, have you?
A. I don't recall having looked at those.
Q. Okay.
Now, let's go to CUSA-00189806, and that's the third page reference from this -- that same communication.
A. So that was 896?
Q. Yes. It's actually -- the Bates range is CUSA-00189795.
A. Oh.
MR. NARESH: Steve, do you have a PDF number? It's such a big document it might be easier for Dr. Botham to find if he has a PDF number.
THE WITNESS: Okay. I've got -- I do have 189795 in front of me.
MR. TILLERY: Actually, I think we have the wrong reference page.
BY MR. TILLERY:
Q. If you look at 189806. It's page 71

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of the group of documents in the CUSA production.
Let me explain something to you, sir. Chevron produced entire files in one large exhibit when they produced these to us, so we're making do with what we've been provided in production of documents, okay --
A. Okay.
Q. -- just so you understand.
A. Yeah.
Q. All right.
If you'd look at that document and that page, 00189606 --
A. 608, okay. I thought you said 806, I'm sorry.
Q. It is 806.
A. Oh, right.
MR. NARESH: This is the same document that we were just looking at? Is that what you're --
MR. TILLERY: Yeah. It's page 71.
MR. NARESH: Okay.
THE WITNESS: Yeah. Sorry, I was there; I now just need to go back again.
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BY MR. TILLERY:
Q. And start with the paragraph, "As you say ..."
A. Yes, okay.
Q. Do you see that, "As you say ..."?
A. I do.
Q. Read that, I think it's about eight or nine lines, into the record, please.
If you want I can read it, if that would be better. You just follow along with me. As --
A. I could -- yes. Please go ahead.
Q. Do you have the reference where it says, "As you say"?
A. Yes, I do, and I have read that paragraph.
Q. And this, again, just for the record, is a letter between Mr. Fletcher, writing it, to Dr. Cavalli; correct?
A. That is correct.
Q. And what is the date of the letter, the communication?
A. July 21, 1975.
Q. Okay. So, "As you say," it says:
"... there are sporadic reports of

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CNS effects in paraquat poisoning although I cannot recall any CNS pathology being found in other cases, apart from brain oedema and hemorrhage in a few cases."
Do you see that?
A. I do.
Q. And then you see the statement:
"My impression is that paraquat does not affect the CNS to any significant extent, except in ... large doses."
Do you see that?
A. I do.
Q. Okay. What studies did ICI and Chevron have as of the date of this letter to support the conclusion that paraquat does not affect the CNS to any significant extent except in very large doses? What studies did they --
A. I'm not able to answer that. I don't know what studies would have been available, or whether they were just here referring to paraquat poisoning cases in humans.
Q. All right. Let me ask you this: Are you aware of any such studies?

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A. No, I am not.
Q. All right. Let's go now to -- this is Exhibit 14 and it's page 60. And I think that's -- it'd be 189795, sir.
A. Okay, yes. I'm there.
Q. All right. Do you see where he says second -- "Secondly"?
A. Yes.
Q. Read that into the record. Again, let's, for identification, identify which document you're referring to.
A. Okay. This is a letter written by Dr. Fletcher to Dr. Cavalli at Chevron.
Q. Okay. It's a Syngenta predecessor company, ICI, scientist K. Fletcher, and he's communicating with Dr. Cavalli. Right?
A. Yes, he is.
Q. And he has -- at the bottom of this, he says -- he's Cc'ing three people. Who are they?
A. Okay. Dr. M.S. Rose was a toxicologist at Central Toxicology Laboratory where Dr. Fletcher was based. Dr. Calderbank was in another part of research and development of ICI, based at Jealott's

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Hill, and Mr. Waitt was in the headquarters of ICI, as it was then, in Fernhurst.
Q. All right. Now, if you'd read that into the record, please.
A. You'd like me to read the paragraph beginning "Secondly"?
Q. Yes, sir, if you wouldn't mind, Dr. Botham.
A. "Secondly, we discussed last week the point you raised about possible chronic effects, which you see causing legal problems. This is a quite terrible problem and, frankly, I do not believe a satisfactory investigation can be made. However, I think some plan could be made and, to be as definitive as possible, any study must be as free from doubt as possible. Ideally, we need a fairly large coherent group (say 50) who are exposed to paraquat frequently over a long period, who are exposed to no other pesticide or herbicide and can be followed medically for several years."
Q. Was that ever done?
A. I'm not aware of such a study having been done.

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Q. Okay. So Dr. Fletcher told Dr. Cavalli that on November 11, 1975, that he doesn't believe a satisfactory investigation can be made into the chronic health effects of paraquat exposure, correct?
A. That is what this says.
Q. . All right.
If a manufacturer suspects possible adverse health effects from chronic exposure to its products, do you agree with me that a satisfactory investigation of chronic health effects should be made before the product is sold?
MR. NARESH: Object to the form and scope.
THE WITNESS: With today's standards of how we would do that, that is absolutely the case, but when we go back in history, that was not necessarily custom and practice.
BY MR. TILLERY:
Q. Okay. So it -- strike that.
Today you would do such studies before you ever marketed paraquat, right?
A. We certainly would, yes. We would

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do chronic studies, yes.
Q. Okay. So what you're saying is that the standard in 1965 was different; you didn't need to do that. Right? Is that --
A. That is correct.
Q. -- what you're saying?
MR. NARESH: Objection --
THE WITNESS: That is correct, yes.
BY MR. TILLERY:
Q. Okay. Could you tell me the standard --
(Stenographer interruption.)
MR. NARESH: Oh, yes. Same objections as before; scope and foundation.
THE STENOGRAPHER: Thank you.
And the witness, sorry, you said -- you answered Yes that question?
THE WITNESS: Repeat the question, please.
THE STENOGRAPHER: Yes. Yes. So what --
MR. TILLERY: Absolutely.
THE STENOGRAPHER: Sorry.
MR. TILLERY: Absolutely. Let's

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start over. Okay.
BY MR. TILLERY:
Q. So you're saying there was a different standard in 1965 where Syngenta would not have to do such studies if it suspected possible adverse health effects from chronic exposure to paraquat at that time, correct?
A. That is actually, if I may say so, a slightly different question. What I answered before was that the custom and practice before, when you were marketing a new chemical, would be different to what it is today in terms of the standards required of testing.
Q. Well, I asked --
A. It --
Q. I'm sorry. Go ahead and finish your answer, sir.
A. Yeah. You just asked the question that if you had indications that there could be adverse effects would you -- would you do something differently. That is a slightly different question.
Q. No, that's -- my original question

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to you is simply this, I'll restate it. if the manufacturer suspects possible adverse health effects from chronic exposure to its product, here paraquat, would you agree that a satisfactory investigation of chronic health effects should be made before the product is sold?
That was my original question. Can you answer that?
MR. NARESH: Object to form, foundation and scope.
THE WITNESS: Yes. That's -- but I don't -- the issue here is that the suspicion of these chronic effects only became apparent sometime after marketing had started.
BY MR. TILLERY:
Q. And you're basing that on the fact of -- the materials you've read, which does not include the 1960 animal studies, correct?
A. Correct.
Q. So if I ask you to assume that there were central nervous system signs in animal studies at or about the time of the launch of paraquat in 1965, would you agree with me that

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it would have been the best course, before paraquat was marketed, to evaluate the adverse health effects from chronic exposure to paraquat?

MR. NARESH: Same objections.

THE WITNESS: I am not able to accurately ascertain whether that would have been the right judgment at the time.

BY MR. TILLERY:

Q. So you can't answer my question, is that what you're saying?

A. The way in which I would answer your question would be that this is what toxicologists do all the time. Adverse effects are seen in animal studies, even in today's world, and a judgment is made about whether those findings could have relevance for humans, and, in which case, whether it is the right thing or not to do to market or sell a product.

And that same judgment would have been made at that time.

Q. So you don't see a different standard when the evidence is there; the standard that exists today would have

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applied in 1965 based upon the evaluation of available scientific evidence, correct?

A. The standard of making that judgment, as I have just described it, is indeed the same -- would have been the same then as it is today.

Q. All right.

A. The difference, which is what I was referring to before, is that the requirements and the practice that was present in the 1960s, in terms of what you did, was different to how it is today.

Q. When did it change over time?

A. This began to change in the 1970s when --

Q. Okay.

A. -- regulatory guidelines for toxicology testing began to emerge.

Q. Okay. So let's assume then -- pick a date in the 1970s that you think applies where the standard changed.

A. The standard changed in the late 1970s when guidelines were -- international guidelines were beginning to be required for the conduct of toxicology testing.

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Q. So are you suggesting, then, that if the science was in existence and the regulatory standards were in existence, that at that point in time, in the 1970s, that the defendants, ICI-Syngenta, and Chevron, should have at that time conducted studies to determine adverse health effects from chronic exposure to paraquat?

MR. NARESH: Objection to form, foundation.

THE WITNESS: Are you referring to a response to the effects that had been -- that are reported in people who have been exposed to paraquat?

BY MR. TILLERY:

Q. I'm referring to all of the knowledge that Syngenta, through ICI, and Chevron had at its disposal. Every bit of it. Should they have conducted, at that time, long-term neurotoxicity studies to evaluate adverse health effects from chronic exposure to paraquat?

A. They would -- they should have conducted the long-term chronic toxicity studies when those studies began to become

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the standard practice for toxicology reinforced by regulatory guidelines.

Q. Okay. So by the late '70s at the latest, correct?

A. Correct.

Q. All right. Thank you.

Had either ICI or Chevron wanted to perform a study of chronic exposure, either or both of them could have done long-term study in nonhuman primates to determine the central nervous system effects, couldn't they?

A. They could have.

Q. Yes. Did either ICI or Chevron conduct those studies before they put paraquat on the market?

A. I don't believe that they did.

Q. Okay. Did they do any of them in the '60s?

A. I'm not aware of such studies in the nonhuman primate in the 1960s.

Q. ICI and Chevron could have done a long-term study on nonhuman primates when they learned that -- from an evaluation of people's brains in autopsies that paraquat got into the brain of human beings on ingestion.

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They could have done it at that time, too, couldn't they?
MR. NARESH: Objection to form.
THE WITNESS: They could have done such a study.
BY MR. TILLERY:
Q. I'm sorry?
A. Yes, they could have done such a study.
Q. And they didn't do it at that time either, did they?
A. I'm not aware that such a study was done.
Q. Did ICI assume that in poisoning cases, paraquat got into the brain of the human because of a high dose?
A. I --
Q. Or do you know one --
A. I don't know whether such an assumption was made at that time.
Q. Okay. Did you know one way or another whether your -- strike that.
You're the spokesperson here today for Syngenta, not just 2020 but all the way back to before the marketing and sale of

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paraquat in the United States 1965. Do you know whether Chevron assumed that, in poisoning cases, paraquat got into the brain because of high dose?
A. I don't know.
Q. All right.
Even assuming if they did, that ICI and Chevron thought that, in poisoning cases, paraquat got into the brain because of the high dose, it certainly put ICI and Chevron on notice that there was a way through which paraquat could get into the brain, correct?
MR. NARESH: Objection to form.
THE WITNESS: That is one -- certainly one possibility. Again, I cannot comment whether that was something that was discussed at that time.
BY MR. TILLERY:
Q. Well, let's simplify this. We're going to go over a few studies or reports of autopsies, and they will demonstrate, I believe, to you that paraquat gets in the brain. I'll show you these studies.
Now, all I'm asking you is, that

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evidence would have put ICI and Chevron on notice that through oral ingestion of the product, at least through that source, paraquat finds its way into the brain tissue. Correct?
MR. NARESH: Objection to form.
THE WITNESS: If such evidence was available, then yes.
MR. TILLERY: All right.
This is Exhibit 16 for this deposition. It will be referred to as Botham Exhibit No. 16.
For counsel on this call, this is SYNG-PQ-04263689. There are two parts to this and we are going to show a second component and, for counsel, that second is going to be -- we are going to be showing SYNG-PQ-04263571.
(Botham Exhibit 16 previously marked for identification.)
BY MR. TILLERY:
Q. Now, can you pull up the first one, please, for him. Is that on eDepoze for you to see? Can you see it, Doctor?
A. I can -- yes, I could until a moment ago. Yes, I can see it, yes.

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Q. All right. Take your time and read that.
MR. NARESH: I think you're in presentation mode, Steve. Could you take it out of presentation mode so that he can review?
MR. TILLERY: It's just one page, Ragan.
MR. NARESH: Thanks.
THE WITNESS: Okay, thank you. I can now see that.
MR. TILLERY: And can you look at -- can you pull up the second exhibit as well. This is Exhibit No. 17. -- is that correct? This is Exhibit No. 42, I'm sorry.
(Botham Exhibit No. 42 marked for identification.)
THE WITNESS: Okay. I have read the first exhibit, Exhibit 16.
BY MR. TILLERY:
Q. Yeah. And the first exhibit says that in March 1968 a Japanese woman swallowed Gramoxone and died, and her autopsy revealed that 8.6 -- and that says a unit of measure,

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ug/g. And would you, for the ladies and gentlemen of the jury, tell us what that measurement is.
A. That says micrograms of paraquat per gram of tissue, so 1 microgram is a thousand -- one-thousandth of a gram.
Q. All right. So that's 8.6 micrograms per gram of paraquat was found in her brain.
Do you see that?
A. Yes.
Q. And did Ken Fletcher of ICI say about this that the tissue analysis results were "rather higher than we would have expected particularly in the brain, considering the relatively small quantity that was taken"?
Is that what he's saying?
A. Yes, that's what it says.
Q. So in 1968, three years after this product was first marketed in the United States, ICI knew that swallowing a relatively small amount of paraquat would result in paraquat entering the brain, didn't it?
A. Yes.
Q. Several people at ICI were made aware of this report, weren't they?

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A. I don't have direct evidence for that, but I assume so.
Q. Well, you look on -- if you look on the face of the exhibit, sir?
A. Ah, yes, I see. Yes, copies. Okay. Yes, that is true.
Q. And these were other scientists at ICI. It wasn't sheltered information, it was information that was distributed, and that would be the practice at that time, too, wouldn't it?
A. Yes, that would be practice.
Q. And isn't it your testimony that it would be standard practice to share information not only with the Chevron scientists but also with all of the people who were working with paraquat at ICI at the time if they thought it was a significant finding?
A. Well, that, I can't confirm as to exactly how much and which people such information would be shared with. I can't comment on the detail that was practiced at that time.
Q. Well, would you at least say that that would be the standard practice in

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a scientific laboratory, for the scientist to --
A. I --
Q. You would agree with --
A. Yes, I would expect that. I would expect that.
Q. All right.
Chevron was also made aware of this since it came through them, didn't it, sir?
A. I can't see that Chevron were made aware of this from the document I have here.
Q. Wouldn't it have been standard practice for you during that period of time to share information, scientific information, with Chevron?
A. I'm sure it possibly was, but, again, I can't confirm that that was necessarily or was the case.
Q. If you'd look at No. 42 again, it shows that this was brought to the attention of Dr. Litchfield, Dr. Conning, Dr. Swan, Dr. Fletcher, Dr. Gage. These are all scientists at ICI, correct?
A. Just before we go on, which document are you now looking at because

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I'm still looking at 16.
Q. This is Exhibit 42. I'm sorry, it's tab --
MR. TILLERY: I'm sorry, can you pull that document up?
MS. BRUMITT: Yeah.
MR. TILLERY: I'm going to show you the next document, sir, and it's Exhibit 43. This document is a summary of the findings from the documents that you've just looked at, of the Japanese woman --
MR. NARESH: Steve, I don't mean to interrupt but I am genuinely confused.
MR. TILLERY: All right. Ragan, if you wouldn't mind looking at SYNG-PQ-03720698.
MR. NARESH: I think my concern is that I don't know if your questioning just now was about Exhibit 16 or 42, and the questioning was --
MR. TILLERY: This is --
MR. NARESH: -- a little confusing to me. Did you ask him questions about Exhibit 42?

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MR. TILLERY: Yes, I'll -- I'll withdraw it. I'll withdraw it. Okay.
MR. NARESH: Okay.
MR. TILLERY: This is Exhibit No. 43 and it's, for the record, as I told you, SYNG-PQ-03720698. Okay. Can you pull that up and we can put it on the eDepoze for you.
THE WITNESS: Yeah, I've just opened up a document which is a letter from Dr. Litchfield to Dr. Swan. Is that that ...
MR. TILLERY: Yes, that's it.
THE WITNESS: Right, okay. Yes, I have that in front of me now from eDepoze.
(Botham Exhibit 43 marked for identification.)
BY MR. TILLERY:
Q. Okay. And this report was, from the face of that document, brought to the attention of Litchfield, Conning, Swan, Gage, Fletcher, et cetera, right?
A. That is correct.
Q. And they're all ICI scientists,

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correct?
A. They are. They are, yes.
Q. So all of them knew in 1968 that paraquat could enter the brain of a person exposed to the chemical, correct?
A. Correct.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. What did they do with the knowledge of that particular fact in terms of planning studies?
A. I'm not able to comment on that. I don't know what conversations or planning was done.
Q. Are you aware of them using this information to plan any kind of study evaluating the health or safety of paraquat?
A. I'm not aware of that, no.
MR. TILLERY: Okay.
Now we'll go to Exhibit 44. Counsel, this is CUSA-00206717.
(Botham Exhibit 44 marked for identification.)
THE WITNESS: Okay, I can see that document.

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BY MR. TILLERY:
Q. Would you take a minute to familiarize yourself with the document, please.
A. Okay, I've read that document.
Q. All right. This is an analysis of tissue performed after autopsy of a patient who ingested 15 to 20 milliliters of paraquat in 1974. Correct?
A. Correct.
Q. The patient died after four days. Correct?
A. Correct.
Q. Paraquat was found in the cerebellum, which is part of the brain. Correct?
A. Correct.
Q. Paraquat was found in the cerebrum, which is also part of the brain. Correct?
A. Correct.
MR. TILLERY: Now let's go, if we can, to Exhibit 45 and this is CUSA-00169412, and we're going to be looking at that and that front page.
(Botham Exhibit 45 marked for

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identification.)
THE WITNESS: Okay, the document is received so I can see that.
BY MR. TILLERY:
Q. If you'd read that and the second page, Doctor.
A. Okay, I've done that.
Q. Okay. And if you wouldn't mind, direct your attention to the paragraph on the first page where it says:
"In their letter Merck emphasise that these results confirm earlier findings on the distribution of paraquat and they also mention that obviously the lungs are not a particular target organ, as the paraquat concentration was only slightly higher than in some other organs that are also well supplied with blood."
Do you see that?
A. I do.
Q. This is a recitation of a letter received from Merck about a woman who had died possibly from suicidal poisoning using paraquat, correct?
A. Yes.

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Q. The communication is dated February 12, 1974; is that correct, Dr. Botham?
A. Yes, it is.
Q. In their letter they emphasize that the lungs are not necessarily a target organ, correct?
A. Yes.
Q. So after Syngenta and Chevron knew that the lungs were not a specific target organ, did you do studies to determine the effects of paraquat on organs that were well supplied with blood?
MR. NARESH: Objection to form, foundation.
THE WITNESS: To clarify, when the word -- when the term "target organ" is used, normally that is meant to indicate an organ that may be susceptible to damage by a toxicant, not necessarily to indicate how much of a toxicant gets to that tissue. So it's -- the use of that term here, which is based on how much got into the lung, is not what we would normally have expected to see.
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BY MR. TILLERY:
Q. Well, let me ask you this: Does that report from Merck indicate that, again, they found that paraquat gets into the brain of people who get it in their system, if you'd look at where --
A. That is correct, yes. Yes.
Q. It does. They had findings of paraquat in the brain, didn't they?
A. They did.
Q. The concentration of paraquat found in the woman's brain was 0.17 part per million, correct?
A. That's correct.
Q. All right.
MR. TILLERY: Let's go to Exhibit No. 46 and this is CUSA-00168423.
(Botham Exhibit 46 marked for identification.)
THE WITNESS: Okay. That's received here. I can see that.
BY MR. TILLERY:
Q. Why don't you take a look at it really quickly.
A. Okay, I've read that.

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Q. All right. And this is a postmortem analysis of someone named Charles Lockwood, correct?
A. That's correct.
Q. He ingested 35 milliliters of paraquat CL on June 10, 1978; is that correct?
A. That is correct.
Q. A plasma sample taken on June 14 had 0.06 part per million paraquat, correct?
A. Paraquat, I think, was 0.04.
Q. 04, okay. Subsequent plasma samples were taken on the 15th and 16th.
Do you see that?
A. I'm sorry, excuse me. I was looking further down the letter. You're quite right; first, it was initially 0.06.
Q. Okay. And subsequent plasma samples were taken on the 15th and 16th and were found to be below the detection limit, right?
A. That's correct.
Q. Now, postmortem analysis was performed of the brain, lung, liver, kidney, right?
A. Yes.
Q. And only the brain had a 0.04 part

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per million of paraquat, right?
A. Yes.
Q. So the brain was the target organ for paraquat here, correct?
A. Again, the use of the term "target organ" is not really a correct one. It simply indicates that that level of paraquat was in the brain at that time.
Q. Was there any level of paraquat found in any other organ, other than the brain, at that time?
A. This indicates that that was -- that there was no paraquat, detectable paraquat, in other tissues.
Q. The only detectable paraquat from this ingestion was in the brain, correct?
A. That is correct.
Q. And from the time period here, had paraquat accumulated in the brain as opposed to other tissues? Would you agree with that?
A. It had certainly entered the brain.
MR. TILLERY: Now let's go to -- sorry. Number 47, Exhibit 47.
(Botham Exhibit 47 marked for identification.)

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MR. TILLERY: This is -- I'm sorry, it's SYNG-PQ-0467141.
THE WITNESS: Okay, I can see the document.
BY MR. TILLERY:
Q. All right. Take a look at it, please, and tell me when you're ready to talk about it.
A. Okay, I've looked at that.
Q. And this was a document that was disclosed to us by Syngenta, so it was in Syngenta's files.
Have you seen this before?
A. No, I have not.
Q. All right. And this is a 1976 autopsy report by Dr. L. Henry from Sheffield, UK. Is that right?
A. Yes, certainly Dr. L. Henry. I can't see the Sheffield attribution but I think that's because I may not be able to see the very top of the page.
Q. All right. And this is a report of an autopsy of a farmworker who ingested paraquat, right?
A. Correct.

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Q. If you turn to page 3, and that's SYNG-04267143, does the report there say that the histological examination of his brain revealed degenerative changes "present in the cells of the substantia nigra and the Purkinje cells of the [cerebrum]."
Does it say that?
A. Yes, it does say that.
Q. Just for purposes of the court and jury, what does histological examination mean?
A. It means that you take a tissue, in this case the brain, and you cut very fine slices of that brain and you look at those slices under the microscope, usually with the tissue being stained so you can see the cells, the architecture, and that is called histological analysis.
Q. And Dr. Henry concludes that:
"The gross and microscopic findings in [the] case are consistent with those found following the ingestion of paraquat."
Right?
A. Yes, it does.
Q. The substantia nigra is the part of the midbrain that controls dopamine production, isn't it?

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A. That is correct.
Q. And loss of dopamine production causes motor symptoms in Parkinson's disease I think you told me earlier in this deposition?
A. I did. Yes, that is correct.
Q. Purkinje cells are neurons located in the cerebellum, aren't they?
A. Yes.
Q. They release a neurotransmitter called G-A-B-A, GABA. Do you know what that stands for?
A. GABA? I'd --
Q. GABA.
A. Yeah, GABA. Yeah. It's -- I can't immediately give you the --
Q. I'll -- yeah, yeah, it's not a test, and I have trouble even pronouncing the scientific term. I'm going to do my best and let you correct me, okay. But I think GABA stands for gamma-aminobutyric acid, okay --
A. Yes, that is correct.
Q. Does that sound right?
A. That is correct.
Q. All right. And they release

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a neurotransmitter called GABA that regulate and coordinate motor movements; is that right?
A. That is correct, yes.
Q. All right.
Given ICI's knowledge of reports that applicators exposed to paraquat had central nervous system problems, and its knowledge from this report that damage to the substantia nigra had been found after paraquat ingestion and that paraquat hadn't been ruled out as a cause of that damage, would you agree with me that a reasonable manufacturer of paraquat would have studies done to investigate the effects of paraquat exposure on the central nervous system, including the substantia nigra, at that time?
MR. NARESH: Objection to form, foundation, scope.
THE WITNESS: So if I may just point out that on the final page of that letter from Dr. Henry, he suggested that the degenerative changes in the brain that we have just been describing are consistent with anoxia, which is a technical term meaning the lack of

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oxygen; in other words --
BY MR. TILLERY:
Q. All right.
A. So there are -- there was an explanation for why these effects could have occurred.
Q. He also said, the results -- "The gross and microscopic findings in this case are consistent with those found following the ingestion of paraquat," doesn't he?
A. That is correct, and --
Q. All right.
A. -- especially so in the lungs, yes.
Q. So let me go back to my question. Armed with this knowledge, would it have been reasonable at that time for the only manufacturer of paraquat to undertake studies to determine whether or not this indicated central nervous system damage from paraquat?
MR. NARESH: Same objections as to the prior question.
THE WITNESS: Given that the more likely explanation at that time was that the effect on the brain was an indirect result of damage to the lungs, which was

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the well-known findings that are referred to here, that would not necessarily have led to a conclusion that a direct effect on the brain would needed to have been investigated.
BY MR. TILLERY:
Q. Okay. So are you telling the ladies and gentlemen of the jury that that's what ICI decided, that it was --
A. No, I'm giving you my interpretation of what could have happened in response to this letter.
Q. And there's other alternative explanations; that they just didn't do the study, right?
A. Of course I can't rule out other explanations.
Q. And you don't know which one of them it was, do you?
A. No, of course.
Q. Okay. By comparing paraquat concentrations in the brain and blood, can you say whether paraquat had accumulated in the brain?
A. Are you referring to this

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particular situation here or is that a general statement?
Q. General statement.
A. Paraquat is -- I agree that paraquat is able to enter the brain.
Q. All right. And can accumulate in the brain, right?
A. It can accumulate in the brain, yes.
Q. Okay.
MR. NARESH: Steve, I don't know if you -- you're on mute as far as I can tell.
MR. TILLERY: Yeah. Give us about two minutes off record. Thank you.
MR. NARESH: Yeah, sure.
MR. TILLERY: I'm moving to a new subject matter. Could we take about a less-than-five-minute break, just a couple minutes, okay?
MR. NARESH: Sure. Yeah, I think, if my clock is correct, it's, what, about 11:50 a.m. your time, Dr. Botham?
THE WITNESS: It is, yes.
MR. NARESH: So we would also break

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for lunch in about half an hour or so, so I don't know how that affects your planning, Steve.
MR. TILLERY: Like I said, he can break whenever he wishes. I'm only looking for a couple of minutes. Thank you.
MR. NARESH: Thank you.
THE VIDEOGRAPHER: We are going off the record. The time is 11:49.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 11:57.
MR. TILLERY: I'm going to refer you to Plaintiff's Deposition Exhibit No. 48. For the record, this is SYNG-PQ-23457731.
(Botham Exhibit 48 marked for identification.)
BY MR. TILLERY:
Q. Please take a look at that document. Tell me when you're ready to address questions about the document.
A. Okay, I've read that.
Q. And would you, for the court and

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jury, please identify the document.
A. This is a letter from Dr. Gage, in the medical department of ICI, to Dr. Snowdon, who was described as the division toxicological liaison officer at ICI.
Q. And he's in the technical department, Billingham civision, Durham, right?
A. That's right.
Q. Okay. And the date of the letter is October 13, 1958?
A. That's correct.
Q. And what is the subject matter of the letter at the top?
A. The toxicity of 2,2-prime dipyridyl.
Q. Okay. And J.C. Gage, what was his role in the medical department?
A. I'm not sure what his precise role was, I'm sorry.
Q. Okay. And Dr. Snowdon, do you know what his role was?
A. Well, a division toxicological liaison officer, I'm aware that that was the -- a generic job description for a person in a particular part of the company, ICI in

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that case, who had responsibility for toxicology.
Q. Okay. He would have been a high-ranking official at that point in time in the company, wouldn't he, in terms of the science development?
A. Well, yes, he would certainly have been a senior person in the department at that time, yes.
Q. Okay.
In an earlier part of this deposition, you confirmed that ICI recognized paraquat's herbicidal characteristics in 1955, correct?
A. Correct.
Q. And that's when you had the patent issued, correct?
A. Correct.
Q. And paraquat was first sold in the United States in 1965, right?
A. Correct.
Q. What was the very first date on which ICI or Syngenta learned that paraquat had a toxicity affecting the central nervous system?

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A. I --
MR. NARESH: Objection to form.
Go ahead.
THE WITNESS: I don't know what that date might have been.
BY MR. TILLERY:
Q. Okay. Certainly by October 1958 ICI knew this, didn't it?
A. Well, this letter indicates that, as it says here, dipyridyl appears to have a moderate toxicity mainly by affecting the central nervous system.
Q. Okay. And the date of this letter is 1958, isn't it?
A. That's correct.
Q. Okay. So this is a letter from J.C. Gage of the ICI medical department to Dr. F.F. Snowdon as division toxicological liaison officer at ICI, right?
A. Right.
Q. The letter indicates that the ICI medical department has studied the toxicity of 2,2 dipyridyl by injection and by application to the eye, correct?
A. Correct.

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Q. And this -- he indicated that before issuing a toxicological -- strike that.
He indicated that before issuing a toxicological report, Mr. Gage was inquiring whether there would be exposure to vapors during distillation, correct?
A. Yeah, I think what it actually says is that on the toxicological inquiry form that came from Dr. Snowdon, that it was a question about exposure to vapor during distillation.
Q. Okay. And this particular chemical is what that they're looking at?
A. This is paraquat.
Q. All right. And he concludes the first paragraph by saying that if fumes are likely, his laboratory would attempt further investigations, correct?
A. Correct.
Q. All right. And the final paragraph, he informs Dr. Snowdon that 2,2 dipyridyl has a moderate toxicity because it affects the central nervous system, correct?
A. Correct.
MR. NARESH: Object to the form.
Go ahead, sorry.

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BY MR. TILLERY:
Q. And this is about --
MR. TILLERY: Sorry, you were --
MR. NARESH: I --
MR. TILLERY: -- finished, Ragan?
MR. NARESH: Yes.
BY MR. TILLERY:
Q. This was about seven years before paraquat was first sold in the United States, right?
A. Correct.
Q. Now, after hearing that paraquat was toxic by affecting the central nervous system in 1958, what studies were undertaken to determine just how it caused toxicity to the central nervous system?
A. I --
MR. NARESH: Objection to form.
THE WITNESS: I don't know the answer to that question.
BY MR. TILLERY:
Q. Were any neurotoxicity studies ever undertaken before paraquat was sold in the US seven years later?
A. I'm not sure what studies were

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conducted.
Q. Do you know if ICI ever took this information from their own medical laboratories to investigate neurotoxicity before this product was launched for sale in the United States?
A. No, I don't know whether that was the case.
Q. Were the inhalation analyses mentioned by Mr. Gage, or Dr. Gage, ever done then?
A. I don't know.
MR. TILLERY: Now if we could move on to -- and this is -- that last exhibit that we just mentioned, I hope I referenced on the record, was Plaintiff's Deposition Exhibit No. 48, Dr. Botham, okay?
THE WITNESS: Right, okay.
MR. TILLERY: All right. Now we're going to go to Deposition Exhibit No. 49, and if you would pull this up, please, for him.
This, whilst he's doing that, is a document that's marked

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CUSA-00383879.
(Botham Exhibit 49 marked for identification.)
MR. TILLERY: It's this one here.
THE WITNESS: Okay, I can see that document.
BY MR. TILLERY:
Q. All right. I don't -- I want to make sure you understand the context, and if you need more context I have other documents surrounding this.
But the question I would have would be that Chevron and ICI were working to develop paraquat as a no-till product for soyabeans relatively soon after it was sold in the United States, correct? That's your understanding?
A. I'm -- you may be right. I can't confirm that but I take your word for it.
Q. Yeah, I've got other documents around this. It will just delay this deposition and they are of no account. Please let me represent to you that's what the documents show --
A. Okay.

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Q. -- that ICI and Chevron were attempting to sell the product to other companies as an additive to other chemicals, like atrazine, simazine, Lorox, Lasso, that were manufactured by other chemical companies, like Geigy or DuPont or Monsanto, and this was a time period where they were trying to market that.
I'll ask you to assume it but I'm happy to show you documents to verify that if you wish to see them. Okay?
A. No, I'm happy to accept that.
Q. All right, okay.
Now, Chevron and ICI sold paraquat at times for mixing with other products sold by other chemical companies, didn't they?
A. Yes.
Q. All right. They wanted to be able to market paraquat for use as a residual -- with residual herbicides from other companies, as far as you know?
A. Yes.
Q. Now, if you would look at this April 23, 1969 memo from Chevron's Don F. Dye to -- and he was the supervisor of product

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registration, to T.W. Reed, manager technical coordination, and, again, the reference number is CUSA-00383879.
A. Okay.
Q. All right. Here Mr. Dye is reporting to Mr. Reed about a conversation he had about paraquat with J. Hood [sic], vice president of Geigy Agricultural Chemicals, correct?
A. Correct.
Q. And he is giving a memo back to his boss, it looks like, where he is saying that he's reporting what he learned on a conversation with Geigy about their acceptance or use of paraquat along with their product. That's what this is about, isn't it?
A. Yes. I haven't full -- read all the way through yet. I don't know if you want me to make sure that I --
Q. Oh, no, no, no, I want you to -- no, I want you to read it all the way through. Take your time, sir.
A. Okay.
Q. You tell me when you're ready.
A. Thank you.

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Okay. I've read that now, thank you.
Q. All right.
So in this memo, do you understand it to be a memo from Mr. Dye where he's reporting on a conversation he had with vice president of research from Geigy Agricultural Chemicals --
A. Yes.
Q. -- and that was a Dr. John J. Wood, right?
A. Yes.
Q. All right. And he's reporting to his boss what that conversation was, correct, and that's about whether or not Geigy would start buying paraquat to add to their own chemicals that they sold to farmers around the country, correct?
A. Correct.
Q. And here he says:
"John [who he's reporting to] said that Geigy felt that Paraquat was a potentially hazardous chemical and they were not doing any research on this product. Their Marketing people have been advised to not promote or

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encourage the use of Paraquat in any way."
Do you see that?
A. I do.
Q. Okay. And then if you skip down here, you'll look -- and the second paragraph, last sentence. Do you see that?
A. Yes.
Q. "Geigy felt ... they had sufficient liability with their own products and did not want to increase their liability by having Paraquat included [in] these products."
Do you see that?
A. I do.
Q. Okay.
Now, did you understand, then, that Geigy refused to buy or use or promote the sale of paraquat because they considered it to be hazardous?
MR. NARESH: Objection to form.
THE WITNESS: This is -- this is certainly what this implies, yes.
BY MR. TILLERY:
Q. All right. And were you aware that they wrote a follow-up letter where they said exactly that? And I can show you this, where

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Mr. Wood said:
"Following a thorough review of all the information we have on paraquat, including the Industrial Hygiene and Toxicology Bulletin distributed ... and other information supplied by Chevron, we have made the decision [not to] label or promote the combination of paraquat with the various triazine herbicides at this time."
Were you aware of that document --
A. No, I was not aware of that.
MR. NARESH: I'll object to the form. If you'd like to show him the document, please feel free.
MR. TILLERY: Okay, let's put that up. We'll pull up 50 so we can verify for counsel that comment.
MR. NARESH: Thank you.
MR. TILLERY: And that's CUSA-00383840, Plaintiff's Exhibit No. 50.
(Botham Exhibit 50 marked for identification.)
BY MR. TILLERY:
Q. If you could take a look at that,

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Dr. Botham. Do you have it in front of you?
A. I do.
Q. I was reading directly from paragraph 2.
A. Yes, I agree that that is what you said previously.
Q. It is precisely as I reported it on the record, isn't it, sir?
A. It is.
Q. And that is a June 23, 1969 letter from J.J. Hood, vice president, Geigy Agricultural Chemicals, to Mr. D.F. Dye, supervisor, product registration, ortho division. Correct?
A. Correct.
Q. And that's Chevron Chemical Company.
A. Correct.
Q. They were not going to use paraquat, were they, and they didn't?
Now, when you -- you have to answer out loud.
A. I'm sorry. Yes, I assume that they didn't, yes, but this certainly indicates they had no intention to.
Q. Let me ask you, after you received

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information that another major chemical company in the United States thought paraquat was too hazardous to use with their own products, did you initiate any further evaluation, investigation studies to verify what their concerns were?
A. I'm not aware of what might have been done directly in response to this, no.
Q. Did you ask them to turn over their laboratory findings to determine what they based their decision on?
A. I don't know whether that was done.
Q. Okay. Would that have been a prudent thing to do?
A. It could have been, yes.
MR. NARESH: Objection; form.
BY MR. TILLERY:
Q. I don't know if the reporter got your answer?
A. I said it could have been the prudent thing to do, certainly.
Q. I mean, if you're selling a product to another company and the company sees laboratories come back and say this stuff is too hazardous to sell, wouldn't you want to

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know from them upon what information or scientific findings they based their decision?
A. I would have expected that to be true, yes.
Q. Okay. Have you, in all your evaluation of records, ever seen one indication that ICI did any of that?
A. I don't recall any of that, no.
Q. Okay. Are you aware of Chevron ever doing that?
A. I am not.
Q. Okay.
Do you know if any other companies refused to apply a product to paraquat, your product?
A. I'm not aware of any other examples.
Q. Okay.
MR. NARESH: Steve, if you're shifting topics, I would suggest that now might be a good time for a lunch break, given the time difference.
MR. TILLERY: It's your call, Ragan, I told you.
THE WITNESS: Just whilst we had

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the previous break, I confirmed that my lunch will be here at 12:30. We can go for another 15 minutes if that's okay.
MR. TILLERY: That's fine. That's perfectly fine with me. Hold on one second.
BY MR. TILLERY:
Q. Dr. Botham, would you agree with me that companies like Chevron and Syngenta, who are in the business of manufacturing and distributing pesticides like paraquat, have a duty to act responsibly to ensure the health and safety of the consumers of their products?
MR. NARESH: Objection; foundation.
THE WITNESS: I would agree with that.
BY MR. TILLERY:
Q. And would you agree with me that companies like Chevron and Syngenta, who are in the business of manufacturing and distributing pesticides like paraquat, have a duty to be truthful in dealing with regulatory agencies?
MR. NARESH: Same objection.
THE WITNESS: I would certainly

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agree with that.
BY MR. TILLERY:
Q. Okay. Would you agree with me that companies like Chevron and Syngenta, who are in the business of manufacturing and distributing pesticides like paraquat, have a duty to disclose lists of serious harm from their products to the consumers of their products?
MR. NARESH: Objection; scope.
THE WITNESS: I agree.
BY MR. TILLERY:
Q. Okay. Would you agree with me that companies like Chevron and Syngenta, who are in the business of manufacturing and distributing pesticides like paraquat, have a duty to conduct scientific research with the highest standards of professionalism and good science?
MR. NARESH: Same objections.
THE WITNESS: I agree.
BY MR. TILLERY:
Q. Okay. Would you agree with me that companies like Chevron and Syngenta, who are in the business of manufacturing and distributing pesticides like paraquat, have

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a duty to be transparent regarding their research findings and to publicly disclose research results of significance in an objective and accurate way?
MR. NARESH: Same objections.
THE WITNESS: I agree.
BY MR. TILLERY:
Q. Okay. Would you agree with me that companies like Syngenta and Chevron, who are in the business of manufacturing and distributing pesticides like paraquat, have a duty to communicate information concerning health, safety and toxicity in a timely and responsible manner?
MR. NARESH: Same objections.
THE WITNESS: I agree.
BY MR. TILLERY:
Q. Would you agree with me that these general principles guiding corporate duties and responsibilities have remained generally constant from the first development of paraquat?
MR. NARESH: Same objections.
THE WITNESS: Yes.
///

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BY MR. TILLERY:
Q. Okay.
What does "state of the art" mean in the context of paraquat as you referred to it earlier?
A. Do you mean state of the art in terms of the scientific assessments that would be done?
Q. Yes.
A. Well, that was meant to indicate that you -- the state of the art would be governed by, first of all, the science and understanding of potential toxicity that a compound like paraquat might have, so how much scientific understanding is there, combined with what the regulatory requirements might be, which, I think as I said earlier, have moved forward over the period that we're talking about.
Q. Do you believe that paraquat was designed and manufactured according to the state of the art at the time existing in 1965?
A. Manufactured rather than sold?
Q. I'll say sold. Let's modify it and say sold.

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A. It's hard for me to answer that precisely because I can't, sort of, recreate all of the historical information in my head to answer that.
Q. All right.
Would you say that there was any time after 1965 when it was sold where the state of the art for chemical manufacturers changed?
A. Yes, absolutely. The state of the art changed over time.
Q. And you said it changed in the late '70s with the introduction of regulatory matters, right?
A. That's when there was a greater requirement for what are now the standard toxicological studies that are done.
Q. And when you say toxicological studies, you're saying a requirement that's imposed by regulatory bodies to do minimal toxicological studies, correct?
A. These are the requirements imposed by regulatory authorities to do the package/the toxicity tests that regulatory authorities deem to be needed to assure the

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safety of a product.
Q. Does FIFRA, or the EPA, provide the only guidance or standards for pesticide manufacturers in the United States?
MR. NARESH: Objection; foundation, scope.
THE WITNESS: FIFRA certainly is the one area where the requirements are -- can be found but they are also based on international requirements, guidelines, governed, for example, by the OECD.
BY MR. TILLERY:
Q. OECD?
A. Yes, the Organisation for Economic Co-operation and Development, OECD.
Q. Tell us about that. What is the OECD?
A. The OECD is an international organization which includes a branch which is responsible for standards of safety testing, toxicological testing that we're now talking about, and they, over the years, have issued specific guidelines about how to conduct toxicology studies.

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Q. So besides OECD and FIFRA, are there any other standards that provide guidance for pesticide manufacturers in the United States?
A. Those are the main ones in the United States. There are -- other countries also have their own regulations.
Q. Does OECD apply to the United States?
A. Yes --
MR. NARESH: Objection to form.
THE WITNESS: -- the United States has signed up to what's called the Mutual Acceptance of Data, which means that studies should be done according to OECD guidelines.
BY MR. TILLERY:
Q. And are you saying that you had a lesser standard of care before FIFRA, EPA and OECD guidelines were applicable?
A. I wouldn't --
MR. NARESH: Objection; scope, form, foundation.
THE WITNESS: I wouldn't put it that way. I think -- what I'm saying is that, as you said earlier, the state of

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the science, the state of the art changed over a period of time, so before these guidelines appeared, a different standard was applied.
BY MR. TILLERY:
Q. Okay.
What safety testing of pesticides did US regulators require pre market in 1965?
A. I --
MR. NARESH: Objection; scope, foundation.
THE WITNESS: I haven't got a list of the requirements at that time.
BY MR. TILLERY:
Q. Would the answer be you don't know?
A. Which -- so, in other words, I don't know.
Q. All right.
Has the United States EPA ever required Syngenta to conduct neurotoxicity studies of paraquat?
MR. NARESH: Objection; scope.
THE WITNESS: Yes, it has. We have conducted a specific neurotoxicity study according to FIFRA and OECD guidelines.

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BY MR. TILLERY:
Q. And what was the first year that was done?
A. I don't recall when that was -- exactly when that was done. That would be certainly after 1980, probably in the 1990s, but I would have to check.
Q. What was the study?
A. It was a 90-day dosing study, a neurotoxicity study according to the guideline, where a chemical like paraquat is given to rats.
Q. Was it fed to a rat?
A. Correct.
Q. And who was the author or principal investigator of that study?
A. I don't recall who that would be, who that was.
Q. Was it published?
A. It was submitted to the regulatory agencies as required.
Q. Okay. Was it published?
A. Not as an external peer-reviewed publication, no.
Q. Okay. Were there any others?

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A. Well, the other FIFRA studies, which are required since the 1980s, include other toxicological studies which incorporate investigations of the nervous system. So the one I've just described is a specialist neurotoxicity studies -- study, but many other of the required studies include investigations of part of the nervous system.
Q. Are there any other sources of standards or customs in the pesticide industry besides the ones you have mentioned, OECD and FIFRA?
MR. NARESH: Objection; foundation, scope.
THE WITNESS: There are -- as I indicated, every region and country has -- publishes their own requirements and guidelines, which are mostly based on OECD guidelines.
BY MR. TILLERY:
Q. So you're saying the United States has published guidelines as well?
A. Yes, which is FIFRA, yes.
Q. Can you give examples of the studies that incorporate neurotoxicity that were done?

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A. Yes. So, for example, the chronic toxicity study where a paraquat or another chemical is given to a rodent, usually a rat, over a lifetime, would include investigations of the nervous system.
Q. What was that study?
A. That would be a two-year chronic/carcinogenicity study in the rat and usually also in the mouse.
Q. And that particular study was done when?
A. Again, I don't -- can't give you an exact date.
Q. And that was a study not testing neurotoxicity but was really designed to test whether or not paraquat caused cancer, wasn't it?
A. Cancer and also other chronic toxicities, any other target-organ toxicities.
Q. The brains weren't even evaluated in that study of the animals, were they?
A. The brain is certainly one of the tissues that one needs to perform some investigations on.
Q. Well, let's answer my question

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directly. Do you know whether or not, in that particular study, the brains were even evaluated?
A. I would need to check exactly what was done on the brain.
Q. Okay. You don't know whether --
A. Not at this moment in time.
Q. -- in a cancer study, whether or not they even evaluated the brain, do you?
A. As I say, normally speaking, the brain would have some investigation. I can't, right now, tell you exactly what was done.
Q. And what investigations of the nervous system were made?
A. Normally, and, again, this is part of the state-of-the-science question because these guidelines continue -- have continued to evolve, and normally today one would look at not just the brain but also the peripheral nervous system, nerves elsewhere in the body, including histologically, as we were talking about earlier.
MR. TILLERY: Yeah. I move to strike the answer as unresponsive.
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BY MR. TILLERY:
Q. What I'm asking you is the studies you mentioned, you talked about a lifetime-feeding study of rats. What investigations of the nervous system were made?
A. I would need to check that report.
Q. All right. You don't know, do you?
A. Not right now, no.
Q. Was dopamine measured?
A. I think that's very unlikely.
Q. Any other neurotransmitter?
A. I think that's unlikely.
Q. To your knowledge, were neurons measured in those carcinogenicity studies?
A. Neurons measurement, as such, not likely.
Q. Okay.
So you indicated that based upon FIFRA/OECD, there were codes or standards applicable to the chemical industry generally or pesticide manufacturers in particular. Can you give us examples of those that are applicable to Syngenta in the United States?
A. Could you clarify that question? Examples of precisely what, please.

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Q. Of codes or standards that you indicated would be based upon OECD or FIFRA.
A. So these are the definitions of the study types that would be required to be conducted, so the sort of examples that we've just been discussing.
Q. Yeah. What I was asking is, is there any other code or standard other than what the regulatory body orders you to undertake as a minimum standard for use of a product.
A. Right. Well, a company of course always has the right, and will often do additional studies that are not necessarily required by regulatory authorities in order to investigate potential human-health issues.
Q. And a company like Syngenta would enact a code of conduct, too, right?
A. Of course.
Q. And when did Syngenta or its corporate predecessors launch a code of conduct?
A. I --
MR. NARESH: Objection to scope.
THE WITNESS: -- couldn't comment

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on that. I don't know.
BY MR. TILLERY:
Q. You've been with the company since it started, haven't you?
A. I've been with the company since 1980.
Q. Okay. So for 40 years.
A. Correct.
Q. Now, was there always a code of conduct?
A. I believe that there was. I think I've been more aware of that, say, in the last 20 years than before then.
Q. Okay.
MR. TILLERY: So let's pull up that exhibit. And which one would that be?
MS. BRUMITT: 51.
MR. TILLERY: Sorry?
MS. BRUMITT: 51.
MR. TILLERY: We're going to call this Plaintiff's Deposition Exhibit No. 51.
(Botham Exhibit 51 marked for identification.)
MR. TILLERY: We'll move forward on

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that.
MR. NARESH: Steve, can I have a standing objection to this line of questioning on scope and foundation?
MR. TILLERY: You sure can, sir. This, for the record, is going to be relatively brief.
Then we can take our lunch break for you, sir, okay?
THE WITNESS: Okay, thank you.
Yes, I can see this document.
BY MR. TILLERY:
Q. All right. If you go to page 24 of the document. Just for the record, this is the Syngenta Code of Conduct, correct?
A. Correct.
Q. Okay.
A. I'm just having difficulties in locating page numbers on my screen here.
Q. Okay. I'm sorry it's not Bates-numbered that I can direct you to. But it starts at the top of the page, "Science, products and property rights."
A. Yes, okay, I've got that.
Q. Of that, I think it's 26. Okay.

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You have it?
A. Yes, I have that.
Q. Would you mind looking at those two pages, 18 and 19, or the page and its following page.
A. Yes, I've read that.
Q. All right.
Now, I'm going to direct these questions primarily to that Syngenta Code of Conduct. Do you agree that one of the principles in the Syngenta Code of Conduct is:
"We will investigate all credible reports of previously unknown short and long-term effects associated with the correct use of our products and take appropriate actions."
Do you see that?
A. Yes, I do.
Q. All right. Do you agree with that?
A. I do.
Q. Okay. You agree that another principle of the Syngenta Code of Conduct is:
"We will publicly disclose research and development results of significance in an objective and accurate way"?

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A. Yes.
Q. Do you see that? Do you agree with that, too?
A. Yeah. I do, yeah.
Q. Do you see that? Okay. And does the Syngenta Code of Conduct also state:
"We will carefully identify hazards, assess risks associated with the use and alert users of consequences from misuse of a product on the product package, leaflet and label. Products carry clear end user instructions concerning safe storage, use and disposal."
Do you see that?
A. Yes.
Q. Is that on the Syngenta Code of Conduct?
A. Yes.
Q. Does another principle of the Syngenta Code of Conduct say:
"Syngenta employees will apply the highest ethical and scientific standards and adopt robust processes and controls. They will be alert to wider societal concerns about technology and its impacts, as well as applying rigorous scientific risk assessment."

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Do you see that?
A. Yes.
Q. And does the code also state:
"Syngenta ensures the quality and state of its products and services by applying state of the art science and technology standards throughout a product life cycle and ensuring adequate training for our employees and customers."
Do you see that?
A. I do.
Q. Now, whether or not these were the specific words used in the Syngenta Code of Conduct as of 2000 when the company formed, or through its predecessors' existence, which would include Zeneca and ICI when you were there, okay, has this been, in large measure, a good, solid reflection of the code that Syngenta has followed during the course of your employment at Syngenta?
A. Yes. In my personal experience, working in the part of the company that I have done, the essence of what has been codified in this more recent code of conduct is, I feel, exactly how things have been

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conducted.
Q. So this -- that how you feel it's been conducted, meaning that these codes have been applicable, right, throughout that 40-year period, right?
A. Yes.
Q. In other words, whether you or I agree or disagree about whether or not there's been compliance with these principles, you're telling me that these principles have been in existence and been there for people to follow for the last 40 years at Syngenta or its predecessor entities, correct?
A. They undoubtedly were not written down exactly as they have been done here in this more modern version, but certainly in my experience the principles I recognize as having been present throughout my career.
Q. All right.
Syngenta was the original manufacturer of paraquat and held a patent on it, right?
A. Correct.
Q. How long was Syngenta the only manufacturer of paraquat?

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MR. NARESH: Objection; scope.
THE WITNESS: I can't remember the exact number of years.
BY MR. TILLERY:
Q. Okay.
Do you agree that a company that holds a patent, and by that I mean has a legal monopoly for the manufacture, sale and distribution of a product, has a responsibility to make a scientific inquiry into all the dangers associated with use of that product?
MR. NARESH: Objection; scope, form.
THE WITNESS: I think that any company that is in that situation should certainly have that, yes.
BY MR. TILLERY:
Q. Well, what I'm saying is when no other company has the lawful right to sell your product because you hold the patent, does that impose upon you a standard of ensuring that people who buy your product and apply it don't get hurt by it?
MR. NARESH: Objection; scope, form, foundation.

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THE WITNESS: I would expect that any company that buys a product from a patent-holder would, as part of that, be given the necessary information to make that judgment.
BY MR. TILLERY:
Q. Well, what I'm saying is, is whether it's a company or it's a farmer, like Mr. Schmidt or Mr. Rowan or Mr. Niebruegge, Mr. Mills, what I'm saying is, is that when you're the only manufacturer of that product and there is no other competitor, do you agree with me that you have an obligation to make sure that the scientific aspects of that product are explored thoroughly to determine whether or not there's any dangerous or hazardous component to the use of the product?
MR. NARESH: Same objections.
THE WITNESS: Yeah, yes, when it -- a scientific -- when it's scientifically known that there is a hazard associated with a product, that, indeed, should be made known.
BY MR. TILLERY:
Q. And in 1958, your own laboratories

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told you that this chemical product caused central nervous system effects by virtue of the document I just showed you in this deposition, didn't it?
MR. NARESH: Objection; form.
THE WITNESS: My interpretation of that is that it was a -- believed that that could be the case. What I don't know is what further investigations were done at that time which said that that was clearly the case.
BY MR. TILLERY:
Q. Okay. So you don't know because you don't know that any were ever undertaken, correct?
A. I don't know what else was done to follow up from that letter you've described.
Q. Well, just so the jury and the judge is not in any way left in doubt, in all those documents you've seen in 40 years with this company, have you ever seen evidence that any scientist ever followed up on that 1958 report?
A. I can't say that I've seen any evidence for a direct follow-up to that.

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Q. Okay.
Would you agree with me that a company that holds a patent and has a lawful monopoly on the manufacture, sale and distribution of a hazardous product has the responsibility to spearhead scientific research to make the product safer?
MR. NARESH: Same objections as before.
THE WITNESS: If a hazard has been identified, then I think it is the responsibility of a company to properly manage that hazard, and that could take a number of different ways forward.
BY MR. TILLERY:
Q. Well, I mean, one of those ways of management is not to do -- stand by and do nothing. Would you agree with me?
A. It depends on the nature of the hazard, how critical it is believed to be in terms of human health.
Q. Well, let's say you get a report from your medical department that says that it can cause central nervous system effects. Is it okay just to sit back and say, "I'm going

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to do nothing"?
MR. NARESH: Objection; foundation, scope.
THE WITNESS: Well, with the -- looking at that from today's perspective, the answer to that question would be you would want to -- first of all, you'd want to confirm if that was the case. You would not always rely on one piece of information. This is, again, the scientific method.
BY MR. TILLERY:
Q. Okay. Let me ask you something. Did you ever see evidence that there was follow-up scientific analysis to determine whether J.C. Gage's conclusion that "dipyridyl appears to have moderate toxicity mainly by affecting the central nervous system"? Did you ever see evidence --
A. No, I've not seen evidence to -- no, I've not seen that evidence, no.
Q. And that was 1958, wasn't it, sir?
A. Yes.
Q. That was seven years before this chemical was even sold in America, wasn't it?

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A. Yes.
Q. All right.
Does industry regulation or custom require you to perform any testing on pesticides before selling them in the United States?
MR. NARESH: Objection; scope, foundation.
THE WITNESS: You temporarily just cut out there. Could you repeat that question, please?
MR. TILLERY: Actually, I'm going to withdraw it.
BY MR. TILLERY:
Q. In 1965, could Syngenta have done a behavioral study using animals exposed to paraquat for different periods of time, at different doses and by different methods of exposure to see whether paraquat caused any detectable central nervous system effects?
MR. NARESH: Objection to form.
THE WITNESS: The technology would have been available to do an investigation of that sort, yes.
///

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BY MR. TILLERY:
Q. Was that done -- was that done --
A. I'm not aware that that was done. No, I'm not aware that that was done.
Q. In 1965, was the technology available to analyze brain tissues to see if paraquat was present in the brain of test animals exposed to it?
A. The technology was certainly available to detect paraquat, yes.
Q. Was that done, to your knowledge?
A. In animals, I'm not sure whether that was done at that time.
Q. Have you ever seen a study indicating that it was done by Syngenta at that time?
A. I don't recall studies from that time.
Q. In 1965, was Syngenta able to analyze postmortem brain tissues to see if paraquat was present in paraquat-poisoning cases?
A. Yes, I believe that's right.
Q. Were those studies done?
A. I think there were some studies

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done, yes.
Q. That's done by being reported back to Chevron of people who were poisoned and killed, right?
A. Yes, correct.
Q. Did Syngenta or Chevron do any on their own other than evaluating brain matter that was sent to them by coroners from around the country because these people had ingested paraquat?
MR. NARESH: Objection; foundation.
THE WITNESS: I don't know.
BY MR. TILLERY:
Q. Okay.
In 1965, was the technology available to count neuronal cell loss in people exposed to paraquat?
A. I think that's not very likely.
Q. Okay. What do you base that opinion on?
A. Well, there are two parts to that question. One is you've indicated in people, so that would mean in humans, and -- so that would require very specialized histological techniques to be done on human brain tissue,

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and I'm not sure that the state of the science at that time would have allowed that.
Q. Well, then let me change the question a little bit. In 1965, was the technology available to count neuronal cell loss in animals exposed to paraquat?
A. Again, I think it would be -- it would have been quite difficult to do that because the technology and the stains and microscopy were not available at that time.
Q. Okay. Were you practicing at that time?
A. No, I was not. I was still at school.
Q. Okay.
In 1964, were in vitro studies of neuronal cell lines feasible?
A. Again, I can't accurately say but I think it's not very likely because the technology came somewhat later.
Q. When did it come?
A. You start to see studies in the 1970s and 1980s.
Q. Were nonhuman primate studies feasible in 1965?

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A. They were.
Q. Were other chemical manufacturers testing their products on nonhuman primates at that time, to your knowledge?
MR. NARESH: Objection. Objection; foundation.
THE WITNESS: To my knowledge -- to my knowledge, certainly there were some testing in nonhuman primates.
BY MR. TILLERY:
Q. Did Syngenta or its predecessors do any nonhuman primate studies with paraquat at that time?
A. They did. They were more to investigate the acute toxicity of paraquat.
Q. Okay. So what study are you referring to in 1965 on nonhuman primates that Syngenta did?
A. Well, there were studies done to look at how toxic, acutely toxic, paraquat was in the nonhuman primate, and that eventually led, after that date, to studies to look at whether paraquat could be made safer with regard to its acute toxicity.
Q. What I'm asking are the specific

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studies in 1965 of nonhuman primates you're referring to.
A. Yeah, I can't give you that level of detail today.
Q. Well, can you think of a single one of them?
A. Not right now, no.
Q. Okay. Can you tell me who might have done such studies? Were they done internally or externally?
A. My recollection is that they were mainly done externally by contract research organizations.
Q. And you don't know who that contractor is or was?
A. I can't accurately recall the name. It will be a speculation to give the name right now.
Q. And do you have a copy of that study available so we can look at it maybe?
A. There are --
Q. You can direct counsel to --
A. Yeah, there are certainly studies available, yes. And, again, I can't give you an accurate date as to whether -- how many

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were done in around 1965, how many were done later. Some were done later than that, sir.
Q. And were these neurotoxicity studies?
A. Not at all.
Q. What were they?
A. They were to look at the acute toxicity, so the acute poisoning, people who might ingest a single dose of paraquat and what the toxicity of that is.
Q. Okay. So these weren't studies to determine whether or not paraquat got into the brain of the nonhuman primate, correct?
A. Not at all, no.
Q. These were studies where you loaded up a squirrel monkey or some other nonhuman primate and saw how long it took to kill them, right?
A. Essentially, yes.
Q. Okay.
MR. NARESH: Steve, is it a good time to break?
MR. TILLERY: We'll take a break now. That's fine. How long did you want to take? A half an hour, thereabouts?

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THE WITNESS: That's fine by me. Thirty minutes will be good.
MR. TILLERY: If you need -- thirty minutes is fine. We'll break at this point and resume at 7:25 local time, Central time.
Okay. Thank you.
THE VIDEOGRAPHER: We are going off the record. The time is 12:51.
(Lunch break taken.)
THE VIDEOGRAPHER: We are back on the record. The time is 1:36.
BY MR. TILLERY:
Q. Dr. Botham, when we were discussing these documents that involved autopsies in the earlier part today, I omitted one particular document which is marked now as Plaintiff's Deposition Exhibit No. 52. It's CUSA-00283683 and it runs through 699.
If you would look at that, and I'm going to be asking you questions about -- for the first page, page 4, page 13. I believe that's it. First page, page 4 and page 13.
So if you could take some time and look at it, please, before I ask you some

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questions.
A. Okay, I will do that.
(Botham Exhibit 52 marked for identification.)
THE WITNESS: Did you say page 13, because that is a page of references in the copy I'm looking at.
BY MR. TILLERY:
Q. Well, let me give you the specific CUSA number. Page 4, last three digits are 686, and page -- the next one would be 695.
A. Okay. That's helpful, thank you. Okay, yeah, I've had a look at those.
Q. All right.
Plaintiff's Deposition Exhibit 52 is a paper entitled "Paraquat Poisoning: An Analytical Toxicologic Study of Three Cases." Correct?
A. Correct.
Q. Okay. The handwritten print says "Accepted toxicology 5/1/79." Correct? If you see it on the front page.
A. Yes, I do.
Q. Okay. And one of the authors is

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James Leary. Do you know that he is an employee, or was at that time an employee, of Chevron Corporation?
A. No, I did not know that.
Q. I'll ask you to accept that or assume that, that James B. Leary, one of the authors, if you look at the title --
A. Yes.
Q. -- was a Chevron employee. Okay.
Now, please turn to page 4, which is 686, and this is a reference to Patient 1. Tell me when you're there, please.
A. Yeah, I'm there.
Q. All right. And it referenced Patient 1, who accidentally ingested a mouthful of 29 percent paraquat. Correct?
A. Correct.
Q. And the patient history says:
"A 17-year-old caucasian male was transferred to the University of California, Irvine Medical Center ... five days after accidentally ingesting a mouthful of 29% paraquat."
And then at the end, it says:
"The patient died 22 days

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post-ingestion from respiratory failure."
Do you see that?
A. I do.
Q. Now, if you now go to page 695, and Table 1 is what I want to direct your attention to.
A. Yeah, I'm there.
Q. All right. Table 1 says "Tissue Paraquat Levels," doesn't it?
A. It does.
Q. And it says "Time Until Death," "Patient 1 - 22 days post-ingestion."
Do you see that?
A. Yes.
Q. Tissue assayed includes brain, heart, kidney, liver, lung and spleen, right?
A. Yes.
Q. And the paraquat levels are measured in micrograms per gram, correct?
A. Correct.
Q. And what is the highest level of any of them?
A. It's 0.089, which is in the brain.
Q. The brain was higher than the heart, it was higher than the kidney, higher than the

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liver, higher than the lung and higher than the spleen, wasn't it? It was the highest of any of the organs, correct?
A. That is correct.
Q. Okay. Twenty-two days after ingesting paraquat, among all of the tissues of Patient #1 that were measured, the highest concentration was found in the brain. Correct?
A. That is correct.
Q. So over time, paraquat accumulated in Patient 1's brain, would you agree?
A. The paraquat's certainly got into the brain. You can't use the word accumulate just on the basis of one day's assay; you don't know whether it was higher or lower before and after.
Q. Okay.
Now, let's go back to 686. Tell me when you're there, and I'm referencing Patient #2.
A. Okay, I'm there.
Q. Okay. Patient #2, who is a 16-year-old Caucasian male was admitted to the same medical facility 30 minutes after purposefully ingesting a mouthful of 29%

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paraquat. Correct?
A. Correct.
Q. "... the patient died 23 days after ingestion from severe pulmonary fibrosis."
A. Correct.
Q. Now, let's go back to that chart again, if you wouldn't mind, and that's on, I think, CUSA, the last three digits 695.
A. Yeah, I'm there.
Q. Okay. And like Patient 1, what was the highest level measured of the organs measured in Patient #2?
A. 0.07 in the brain.
Q. In the brain. So they measured adipose tissue, they measured brain, they measured kidney, they measured liver, and the brain was the highest for paraquat found of all those parts of the human body, correct?
A. Correct.
Q. Okay. Thank you.
Now, there was a techno-regulatory team or group formed within Syngenta in the early 2000s, wasn't there?
A. Yes, I believe there was.
Q. And when did you become involved

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with that group?
A. I had some involvement because of my role as a senior leader in the 2000s. I had some involvement between the years 2003 to 2006/2007, but not as a permanent member of the team.
Q. And who was the leader of the team?
A. I think at the time it would be people like Dr. Mike Clapp and then Dr. Barry Elliott.
Q. And Nick Sturgess?
A. Nick would certainly have been a member of that team, yes.
Q. And Nicola Wallis?
A. She would -- yes, again, I can't remember if she was a permanent member of the team but she would have been involved at some point, I agree.
Q. Okay. And was the techno-regulatory team proposed in October 2001 at a paraquat Parkinson's disease task meeting?
A. I don't remember that precisely but that makes -- it makes sense that that may have been the case.
Q. And the reason for the

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techno-regulatory team was prompted by recent literature linking paraquat to Parkinson's disease, wasn't it?
A. I believe that was the case.
Q. All right.
Now, would you agree that one purpose of the techno-regulatory team, after it had formed following literature in the late '90s and early part of the 2000s, was to get, sort of, into the game about the literature and the reaction to the literature, linking paraquat to Parkinson's disease?
MR. NARESH: Object to the form.
THE WITNESS: Yes, that was certainly one of the main factors to -- in recognition of the publications on this, in this area, for us to better understand and determine what else we might be able to do to contribute to that science.
BY MR. TILLERY:
Q. And to actually engage in affirmative behavior as well, correct?
A. If you mean by affirmative being proactive rather than just reactive, yes.

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Q. And that would include -- one of the affirmative actions would include influencing academia, regulatory and non-governmental organization environments, correct?
A. It would be to ensure that we were having appropriate dialogue with some of those stakeholders. I think influencing is perhaps not quite the right word.
MR. TILLERY: Okay. Well, then let's pull up this 543.
What exhibit number is this?
MS. BRUMITT: 53.
MR. TILLERY: 53. We're going to show you number 53.
(Botham Exhibit 53 marked for identification.)
BY MR. TILLERY:
Q. Please read this, and then I'm going to direct your attention to paragraph 11, which is on the next page. That's actually page 5, I believe, so if you could take a look at the document.
Okay. Have you read it?
A. Yes, I'm just finishing now. I'm just on the last page.

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Q. Okay, thank you.
A. Okay, thank you, I've done that.
Q. All right. If we go to the first page of the document, okay. If you look under number 2, third paragraph, do you see that?
A. Yes.
Q. Follow along with me if you wouldn't mind and tell me if I'm reading this correctly. And before I do, present at this meeting was Mike Clapp. George Krinke, what was his role?
A. He was a neuropathologist based in Switzerland.
Q. Okay. And Ted Lock, what did he do at Syngenta?
A. An investigative toxicologist based at CTL.
Q. Okay. And Chris Sheard?
A. A product toxicologist working alongside Mike Clapp.
Q. And Nick Sturgess?
A. An investigative toxicologist working with Ted Lock.
Q. And Nicola Wallis?
A. A pathologist based in CTL.
Q. And these are minutes and actions

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from the paraquat/Parkinson's disease task meeting at CTL on October 18, 2001, correct?
A. Correct.
Q. Okay. If we go down to 2, third paragraph, it says:
"It is known that PQ .."
Is that referencing paraquat?
A. PQ is paraquat.
Q. Okay.
"It is known that PQ can give rise to non-specific brain lesions in suicide cases but even in such patients (who are [currently] suffering irreversible multi-organ failure) there is no evidence of functional neurotoxicity. Diquat is known to cause brain item infarcts but, again, only following high, suicidal doses."
And then if we skip down, it says:
"On a 'weight of evidence' basis, the Advisory Committee on Pesticides has advised PSD ..."
What is that?
A. PSD is the Pesticides Safety Directorate which was the regulatory authority in the United Kingdom responsible for

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pesticides.
Q. Would that be roughly the equivalent of the EPA in the United States?
A. It's a much narrower remit, but, yes, a similar function.
Q. All right.
"... has advised PSD ... there is no basis to link PQ to neurotoxicity. The ACP has, however, recommended an epidemiological study to look at the possibility of a link between pesticides and PD."
What does that stand for?
A. PD stands for Parkinson's disease.
Q. Okay.
Now, if you go to the end of this, the last page, you'll see a reference to number 11.
Do you see that?
A. I do.
Q. All right. And it says "Proposal for" what? What word do they use?
A. Yeah, they use the term "influencing strategy."
Q. Okay. So this is the word you didn't like a few minutes ago when I was

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questioning you, right?
A. That's right, and I can explain that if you wish.
Q. Okay. So this committee says "influencing strategy" and here's what it says:
"A science-based approach to an influencing strategy was proposed. This should be supported by position statements. Position statements should support this. Any development of the strategy must consider how best to influence academia, and regulatory and NGO 'environments'."
Correct?
A. Correct.
Q. "It was agreed that a techno-regulatory team is required that can identify the threats to paraquat from ... [Parkinson's disease] [or] PD [referenced] hazard models. The team should promote a science-based understanding of the issues surrounding the implication of paraquat in [a] PD-like effects in man in order to maintain and safeguard paraquat registrations."
Is that what it says?
A. It does.

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Q. Okay. Let's make sure we're clear for the court and jury "maintain and safeguard paraquat registration" means your ability to continue to sell the chemical, doesn't it?
A. That's right.
Q. Because if you don't maintain and safeguard the paraquat registrations, it becomes unlawful to sell the product in the country, correct?
A. Correct.
Q. Okay. And so the action that was going to be taken from this document: MGLC [sic], what is that?
A. MJLC are the initials of Mike Clapp.
Q. So MJLC, Mike Clapp:
"... would set up an initial meeting with appropriate techno-regulatory input from individuals before the year-end, to discuss the key issues and start to formulate PQ influencing strategy."
Is that what it says?
A. It does.
Q. All right.
MR. TILLERY: Now, let's go to the

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next exhibit. Which is?
MS. BRUMITT: 54.
MR. TILLERY: 54?
MS. BRUMITT: 54.
MR. TILLERY: Number 54, Plaintiff's Exhibit No. 54 for counsel. This is SYNG-PQ-01023454. Plaintiff's Deposition Exhibit 54.
(Botham Exhibit 54 marked for identification.)
BY MR. TILLERY:
Q. Okay. Take a look at this. Let me know when you're ready to discuss it, sir.
A. Okay.
Q. Are you ready now?
A. I'm looking at it now.
Q. Okay, I'm sorry.
A. Do you want me to read all the way through this?
Q. This page, and I'm going to ask you one question in the minutes section.
A. Okay.
Q. Ready?
A. Yeah, ready.
Q. All right. Do you see there in the

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minutes this says the objective, and this -- let's identify the exhibit first. This is minutes of a June 9, 2003, what's that -- is it PO RDT?
A. PQ that is, paraquat.
Q. PQ, paraquat. "RDT - Regulatory science foresight," Parkinson's disease, right?
A. That's correct.
Q. All right. It has attendees and it lists a large number of people and identifies where they're from?
A. That's correct.
Q. These people are all -- these are all scientists associated with Syngenta, correct?
A. They are indeed, yes.
Q. Okay. Here we go to the minutes and if you look about halfway through the minutes, it says:
"The objective is to move from a situation where we were predominantly [reactive] in discrete scientific disciplines to a situation where we have a coherent strategy across all disciplines focussing on external influencing, that proactively diffuses

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the potential threats that we face."
Correct?
A. Correct.
Q. Would you agree with me that the threat they face that they were mentioning was not being able to sell paraquat?
A. That would certainly be one of the threats that was being implied here, yes.
Q. Actually, that was the primary threat that was being implied here, wasn't it?
A. Well, it may have been. I wasn't in this meeting, but it's -- I don't disagree with your interpretation.
Q. All right.
MR. TILLERY: Now let's go to Exhibit 55.
That's this one here.
MS. BRUMITT: Mmm-hmm.
MR. TILLERY: And this is SYNG-PQ-01655689.
(Botham Exhibit 55 marked for identification.)
BY MR. TILLERY:
Q. This would have been at a time when you were connected to the techno-regulatory

group?
A. Yes, I would have certainly been closer to this team by that point.
Q. And is it likely you would have been in attendance at the presentation of this PowerPoint for this meeting?
A. I may have been. I can't recall.
Q. Okay. Are you able to tell us who was present during this presentation?
A. Well, I can only tell you from the agenda who some of the people were. Unless there's a list somewhere.
Q. It is a meeting dated November 4, of the techno-regulatory group, or meeting group that we just talked about, right?
A. I believe that this would have been the group that was set up as indicated in the last-but-one document, yes.
Q. Right. So the earlier email we just referenced a few minutes ago was a prelude to the creation of this formalized group to deal with these issues. Is that a fair statement?
A. I think that's a fair statement, yes.

Q. All right. Do you know who the presenters were?
A. Okay. So I'm looking at the agenda, page 3. So BE is Barry Elliott, NS and LM are Nick Sturgess and Louise Marks. IW is Ian Wheals.
Q. Okay. Now, if you go to SYGN-000476941, do you see the topic "Influencing"?
A. Excuse me, I'm just getting there.
MR. NARESH: Sorry, what was that page number again? 941?
MR. TILLERY: Yes. I have it at 00476941.
THE WITNESS: That doesn't make any sense.
MR. NARESH: Yeah.
MR. TILLERY: Actually, let's go to SYNG-00476929, is it a different exhibit? And we'll call --
MR. NARESH: Okay, it must be a different exhibit.
MR. TILLERY: Yeah, we'll call that Exhibit No. 56.
(Botham Exhibit 56 marked for

identification.)
THE WITNESS: Okay, I've received this.
BY MR. TILLERY:
Q. And if you go to 941 of that, page 13.
A. Yes, I can now see a page which says "Influencing."
Q. All right. And under that topic, it says:
"Generate data - Allow vehicle for entering the debate through presentation and discussion."
Correct?
A. Correct.
Q. Attend conferences, correct?
A. Correct.
Q. "Present data; challenge others," and "Network."
Correct?
A. Correct.
Q. Okay. Now if we go to -- now if we go back to 73 -- I'm sorry, it's Exhibit 55, the one you had before. I apologize for the mix-up in the references. If you go back

to that and take a look at the last numbers 1655706.
A. So we're going back to Exhibit 55?
Q. Right. She'll pull that up.
A. Okay. I'm just opening it now, actually, from the -- yeah, so I'm now back on the techno-regulatory meeting, 4 November 2004.
Q. It's page 18 and the Bates number is 706, the last three numbers.
A. Tell me the Bates number again, please.
Q. Yeah, it's 706 is --
A. Okay.
Q. It would be 01655706.
A. Okay, just getting there. Sorry, I have to scroll up and down to see the Bates number all the time, that's why I'm -- yes, I'm now on 706.
Q. And what's the topic of that page, the title?
A. "Recent Literature Developments Of Concern."
Q. Okay. And, if you would, read in the first paragraph?

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A. "Two US based research groups have produced a series of publications since 1999 implicating paraquat in a Parkinson's disease animal model - work still on going."
Q. And the name below that?
A. Cory-Slechta group, Rutgers, New Jersey, University of Rochester, New York, and Di Monte group, Parkinson's Institute, Sunnyvale, California.
Q. And then it says:
"Using the C57Bl6 mouse model and i.p. dosing..."
That's intraperitoneal, correct?
A. Correct.
Q. And "i.p. dosing of PQ," that's paraquat, right?
A. Correct.
Q. 1-30 milligrams per kilogram, typically 3 weekly doses of 10 milligrams per kilogram.
Am I reading it correctly?
A. You are.
Q. "Looking at three biological endpoints as markers of toxicity: neuropathological - loss of neurones from

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substantia nigra ([based on] sterology); neurochemical - loss of dopamine from the striatum [of the substantia nigra portion of the brain]; and neurobehavioural - reduction in locomotor activity."
Is that what was produced and discussed at the meeting in reference to Dr. Cory-Slechta and Dr. Di Monte?
A. Yes, that is correct.
Q. Okay. And these were a series of publications from 1999 that were of concern to Syngenta, right?
A. That's correct.
Q. Okay.
Now, the Cory-Slechta group, that's really a reference to Dr. Deborah Cory-Slechta at the University of Rochester, New York, right?
A. Yes, it is.
Q. And the Di Monte group that's referenced here was a group at the Parkinson's Institute in California, correct?
A. That is correct.
Q. Specifically, both had found Parkinson's-like symptoms in the Charles River

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black mouse after injecting the mice with paraquat; is that right?
A. Symptoms in some cases. Pathology and other findings as well, yes.
Q. Incidentally, as you said earlier in the deposition, their work is what prompted Louise Marks's research with the Charles River black mouse. I think we covered that when we had the earlier part of the deposition in February.
A. We did.
Q. All right. You agree with that?
A. Yes, I do.
Q. All right.
So at this point in time, we're talking November 2004, Dr. Marks's research was still ongoing, wasn't it?
A. Yes, it was.
Q. Syngenta considered the work of Dr. Cory-Slechta and Dr. Di Monte groups to be threats, didn't it?
A. It was certainly important for us to understand whether those findings were reproducible and, hence, of concern, absolutely.

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Q. Of concern in that if those groups are right in their results, you shouldn't be selling paraquat because it caused people to get Parkinson's disease, right?
MR. NARESH: Objection to form.
THE WITNESS: If I may just add, as in the previous exhibit where we saw that approach that we were taking, we were entering the scientific discussion and debate more proactively to try to understand that situation.
MR. TILLERY: Well, I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. And if you'd answer my question. I said it would be of concern because if those groups were correct in their scientific analysis of the link between paraquat and Parkinson's disease, you shouldn't be selling the product. Would that be a fair statement?
MR. NARESH: Same objection.
THE WITNESS: If that was a real effect, we would then need to understand whether that -- the effects that they've seen, and possibly we also see, in the

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animal model were likely to have relevance to human beings. So this is just step one in a two-step process; animal toxicology, then looking for human relevance.

BY MR. TILLERY:

Q. Well, let's look to -- I think this is the same one. Let's go to 17 of that exhibit and this is headed "Paraquat & Parkinson's Disease," and that's at 705.

A. Yes. Sorry, it took me a while to get there. I'm there now.

Q. And that's entitled "Paraquat & Parkinson's Disease," right?

A. Yes, it is.

Q. And let's look at bullet number 2, read that into the record. What did the techno-regulatory team deem Dr. Cory-Slechta's research to present? What did they call it?

A. "Threats to paraquat from the recent scientific literature."

Q. All right, thank you.

Then if you go on to 708, which is three pages later in that same document, "Recent Literature Developments Of Concern."

Page 656

A. Yes.

Q. "Cory-Slechta very vocal in her calls for the risk to humans from paraquat exposure be reassessed owing to: The use of [paraquat] as a desiccant on cotton; Occupational exposure leading to contamination of workers and their families; Exposure to paraquat in residential areas from spray drift. Cory-Slechta connections with NGOs such as PAN."

What does that mean?

A. That means that at that time there was a belief that Dr. Cory-Slechta had some kind of relationship with a non-governmental organization, which is called Pesticide Action Network.

Q. Okay.

If you'd go now to 690, under "Objectives," and before you -- if you'd just identify it first.

A. Okay. So I'm going back here.

Excuse me, I'm just trying to get there. So it's 690. Yeah, sorry, I was one behind, I've just got one more to click.

Yes, I'm there now, thank you.

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Q. All right. If you take a look at that, please. The purpose of the techno-regulatory meeting in November 2004 was to lay out a strategy for responding to the emerging threat posed by the paraquat/Parkinson's research of the Cory-Slechta and Di Monte groups, wasn't it?

A. Yes.

Q. All right. And the objectives was to confirm the RDT definition of issue and threat, right?

A. Yes.

Q. Now, what is RDT an abbreviation for?

A. I'm pretty sure it was regulatory development team.

Q. Right. And the issue/threat is the one we've already talked about, correct?

A. That's correct.

Q. And that issue/threat posed by the paraquat/Parkinson's research of Cory-Slechta and Di Monte, correct?

A. That was certainly one important part of it, yes.

Q. And the potential for regulatory

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action or even a ban on paraquat from the US EPA, correct?

A. That will be one thing that was considered, certainly, yes.

Q. So another objective of the meeting was to confirm the RDT proposed management tactics, correct?

A. Yes.

Q. Were those tactics ever amended?

A. Well, I don't know that I can accurately answer that question. I would, though, take the opportunity to say that the tactics, as it says here, were increasingly, from this time onwards, to engage, as we said earlier, more proactively in understanding the science.

Q. Well, let's look specifically at the tactics, management tactics, in this Exhibit 55 and go to 692.

A. Yeah, I'm here.

Q. What is the title of that topic?

A. "Management Tactics."

Q. So one of those tactics was to develop a database of neurotoxicity studies to support the continued regulatory approval of

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paraquat, wasn't it?
A. That's right.
Q. Another tactic was to influence ongoing academic Parkinson's disease research, correct?
A. Correct.
Q. Another was to influence ongoing academic Parkinson's disease research, right? And that meant --
A. That's what it says here, yes.
Q. -- influence it in a way that supported the continued registration and use of paraquat. That's what it meant, wasn't it?
A. I think this is where the term "influence" is one which can be -- it can be defined in different ways. To me, and I think being part of this team, influence was -- is more about being able to engage with people like the academic community so that we can better understand what is actually happening here with paraquat and potential Parkinson's disease.
It was not meant to say we're trying to suppress or bad-mouth the research that has been done.

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Q. You wouldn't try to influence -- I got a lot of feedback. I'm sorry, let's withdraw that.
You wouldn't try to influence, as you say, or silence people who had academic differences with you, would you?
A. No, I would not.
Q. You'd never do that, would you?
A. No, sir.
Q. That wouldn't be part of your influencing team, right? You personally wouldn't approve that?
A. Personally, I would not approve of that.
Q. Okay. So let's go back to make sure we're clear. Let's go to that same page, number 2, and let's read into the record word for word, why don't you do it, and let's let the court and jury decide what is meant by that term back in 2004. Read number 2.
A. So number 2:
"Monitor, understand and influence ongoing academic PD research and manage the impact on paraquat registrations by putting published findings in context of the use of

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paraquat as a herbicide."
Q. Okay. Number 3, you want to read that?
A. "Support regulatory authorities in dismissing the hypothesis that paraquat is a risk factor for Parkinson's Disease in humans."
Q. So part of your management tactics is to make sure that regulatory authorities don't connect paraquat with Parkinson's disease. Is that a fair statement?
A. Yes, but based on number 1, which is making sure that we actually have the data to show whether or not that is appropriate.
Q. And number 4, it says:
"Seek to demonstrate the lack of independent regulatory expert [report] for the hypothesis that occupational paraquat exposure is a risk factor for [Parkinson's disease] in the sub-population of people exposed to [it]."
Did I read that correctly?
A. You did.
Q. And then the last one of your management tactics:
"Create an international scientific

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consensus against the hypothesis that paraquat is a risk factor for Parkinson's Disease in humans."
Right?
A. Correct.
Q. And this is all to counter the threat, correct?
A. Correct.
Q. And that threat was that paraquat would no longer be able to be sold, correct?
A. If the final scientific consensus was that there is a relationship or a causative link, then yes.
Q. Now, you just told me a minute ago you wouldn't do anything to sort of silence the scientific discussion or opposition. That's not what was meant; isn't that what you just told me?
A. I think I understand that that --
Q. You --
A. I think I said that that was my personal view, that I wouldn't -- not contemplate silencing people.
Q. You wouldn't, for example, take any action to make sure certain scientists were not

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appointed to regulatory positions, right?
A. No, I would not do that.
Q. Okay.
Now, I want to direct your attention to another topic. What is the FIFRA Scientific Advisory Panel?
A. FIFRA scientific advisory panels are panels set up by the United States Environmental Protection Agency, EPA. They are panels of independent experts, and also members of the EPA will be part of the process, to investigate issues of potential concern in human or environmental safety.
Q. I copied something from the website of the US EPA and I want to read it to you and ask you if you agree with it, okay.
"The Federal Insecticide, Fungicide & Rodenticide Act (FIFRA) Scientific Advisory Panel (SAP) provides independent scientific advice to the EPA on health and safety issues related to pesticides. The FIFRA SAP is comprised of biologists, statisticians, toxicoligists, and other experts."
Would you agree with that definition?

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A. I certainly would. I think it elaborated very well what I just indicated.
Q. So is that panel also referred to, then, as the SAP? And when we refer to in the deposition as SAP we know we're talking about the scientific advisory panel of the US EPA. Correct?
A. Yes, yes.
Q. And there's five members of that group, aren't there?
A. I don't know. I can't remember.
Q. So that panel would be responsible for giving scientific advice to the EPA on chemicals like paraquat, wouldn't it?
A. Yes, it would.
Q. For example, if paraquat's registration to be sold in the United States were being reconsidered, the SAP would review the scientific evidence about paraquat and make recommendations about whether it should be sold, correct?
A. I don't know whether it's the responsibility of the SAP to make recommendations as to whether a compound should be sold. I'm not certain about that.

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It would certainly be to provide a science-based -- independent science-based position to the EPA.
Q. And would you agree that very important for Syngenta to make sure people who have critical feelings on paraquat are not allowed on the SAP?
MR. NARESH: Objection to form.
THE WITNESS: I certainly wouldn't want to put it that way. Again, speaking personally, I don't think it would be something that we should be attempting to do, to say who or who should not be on a panel of that sort.
BY MR. TILLERY:
Q. Right. In other words, you would agree with me that a chemical company like Syngenta should not be involved in working behind the scenes to make sure certain people aren't appointed to the scientific advisory panel. Would you agree with that?
A. I mean, I, again, personally would feel that that's an action that I wouldn't feel comfortable with.
Q. Actually, you wouldn't feel

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comfortable with it because you would consider it to be, if not illegal, certainly highly unethical, wouldn't you?
MR. NARESH: Objection to form, foundation, scope.
THE WITNESS: I believe that it is not -- it is certainly not within the spirit of the code of conduct, for example.
BY MR. TILLERY:
Q. The Code of Conduct of Syngenta, it wouldn't be consistent with that, would it?
A. No, that's my interpretation of it certainly.
Q. Well, do you know of any laws that might be violated for a company, subject to the regulation of a federal regulator, to try to influence the membership of the advisory panel that oversees their products? Do you know anything about that?
MR. NARESH: Objection; form, scope.
THE WITNESS: I'm not sufficiently familiar with United States law to be able to answer that question.

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BY MR. TILLERY:
Q. Okay. Well, I want, before we get into the next line of questions, to clarify something about the status of certain employees of Syngenta.
Greg Watson, what is his job in 2005 at Syngenta?
MR. NARESH: Objection; foundation, scope.
THE WITNESS: Greg Watson was in the United States, in the Syngenta United States regulatory team. He was the -- I believe he was the lead regulatory expert for herbicides.
BY MR. TILLERY:
Q. Mike Clapp?
MR. NARESH: Steve, just for the record, I don't have a problem with you asking these questions in his personal capacity. I just have a standing objection on scope.
MR. TILLERY: You do, sir.
BY MR. TILLERY:
Q. Go ahead.
A. Thank you.

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Mike Clapp was the product toxicologist at the Central Toxicology Laboratory in the United Kingdom. The product toxicologist for paraquat.
Q. Barry Elliott?
A. He succeeded Mike Clapp in that same role.
Q. Tim Pastoor, what was his job in 2005?
A. Tim Pastoor at that time would have been the head of human safety in the United States Syngenta health assessment organization.
Q. And Ian Wheals?
A. Ian at that time was in -- either in the global or the European regulatory team, based either in the UK or in Switzerland. I'm not sure exactly where at that time.
Q. Lewis Smith, what was his job?
A. Lewis Smith had been the head of CTL, and at some point he then transferred to the head of development in Basel; and, again, the dates, precise dates, I can't recall.
Q. And then Nick Sturgess?

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A. He was an investigative toxicologist based at CTL.
Q. And John Doe?
A. John Doe took over from Lewis Smith as the head of CTL. John was already in another leadership position in CTL before that.
Q. Okay.
MR. TILLERY: I want to direct your attention to -- and this is the first one --
MS. BRUMITT: 57.
MR. TILLERY: -- which would be number 607.
MS. BRUMITT: Yeah, Exhibit 57.
MR. TILLERY: I'm sorry?
MS. BRUMITT: 57.
MR. TILLERY: This is Plaintiff's Deposition Exhibit 57, and this is SYNG-PQ-04206065 through 067.
If you'd take a look at these, please.
(Botham Exhibit 57 marked for identification.)
///

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BY MR. TILLERY:
Q. And when you're finished looking at them, I'm going to ask you some questions about them.
A. Okay, go ahead.
Q. Okay. This is a series of emails between the individuals that I had you identify, correct?
A. Yes, it is.
Q. And 042065 -- I'm sorry. 0426065, if you look at that, I think that's the first page.
A. Yes.
Q. Do you see it?
Greg Watson sent an email to some of the other men about Dr. Deborah Cory-Slechta, correct?
A. Correct.
Q. And that was dated December 7, 2005 [sic]?
A. Correct.
Q. Okay, do you see that?
A. Yes, I do.
Q. And Mike Clapp responded to Nick Sturgess, Lewis Smith and John Doe, right?

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A. Yes, he did.
Q. Read his email into the record, please.
A. So Mike Clapp said:
"In case you have not seen ..." --
Sorry, I think the document is ...
MR. NARESH: Yeah. Steve, I think you have it in presentation mode and it's moving up and down, at least from my perspective. It might be easier for the witness if it's not in presentation mode.
MR. TILLERY: Okay. I didn't understand what it was you're saying. If it's not in presentation mode?
THE WITNESS: Yeah, because I can't see the top of the document now.
MR. TILLERY: Okay --
MR. NARESH: Yeah, he can't control the document in the --
MR. TILLERY: Oh, I'm sorry. Yeah, can you let him have access to it? Yeah. I'm sorry.
BY MR. TILLERY:
Q. Do you have it now, sir?
A. Yeah, okay, I can see the top of

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the document now. So Mike Clapp wrote, "Gentlemen ..." --
Q. Actually, Mike Clapp is at the beginning, right?
A. Yes, he is.
Q. Okay. So it starts down a little ways, doesn't it?
MR. NARESH: It's still showing up for me in presentation mode. I can no longer -- oh, here we go. It's out now.
BY MR. TILLERY:
Q. So if you'd look at the earlier one. The way emails read, the earlier ones are at the bottom and they go closer to the top time-wise as we copy, don't they? You understand that?
A. Yeah, yeah. Yeah.
Q. The same the way they would on a computer screen, if you had a long exchange with your friend, they would -- your earliest emails would be at the top.
So if we look down here to the one from December 7, 2004 from Greg Watson, he sends that to Mike Clapp, Barry Elliott, Tim Pastoor and Ian Wheals, Cc's Jerry Wells,

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right?
A. Yes.
Q. And he references subject, "Inside EPA story on last week's SAP - comments ..." right?
A. Yes.
Q. And he says:
"Folks, Wanted to pass your way ... given that Cory-Slechta was on the ..."
And how do you pronounce that word?
A. Dimethoate.
Q. "... dimethoate SAP FQPA Science Review Board, raises her paraquat studies [in] a different level with EPA. Brings stronger focus on the need to have our follow-up on developing our technical influencing plan, tox panel/external expertise, & a potential future SAP - as I believe Ian stated at our last meeting at CTL needs to be a priority for our next meeting."
Correct?
A. That's correct, that's what that says.
Q. That's what it says. And then the top, it has an email response from Mike Clapp

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to Nick Sturgess, Lewis Smith and John Doe, referencing "Cory-Slechta now on EPA SAP":
"Gentlemen ... Cory-Slechta now EPA SAP. Not good news - but no indication of activity on paraquat yet. Nick, Barry and I will consider the next steps. Mike."
Were you aware of this?
A. No. As you can see, I wasn't copied into this, so I don't --
Q. You weren't -- you weren't part of this exchange, right?
A. No.
Q. Is this the first you're hearing about any of this?
A. Well, directly, yes, but, I mean, indirectly, I know that there were discussions about the potential for an SAP on paraquat.
Q. Okay.
MR. TILLERY: So let's do this, if we can, let's go to -- and this is exhibit ...
What number?
MS. BRUMITT: 58.
MR. TILLERY: 58, Plaintiff's Deposition Exhibit 58, and this is

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SYNG-PQ-05705351 through 5352.
(Botham Exhibit 58 marked for identification.)
MR. TILLERY: We release that to you to look at.
THE WITNESS: Okay, that's come. Okay. So I've read that.
BY MR. TILLERY:
Q. All right. This is a two mail -- strike that.
This is a two-page email string involving even more people, isn't it? Even more Syngenta people.
A. Yes.
Q. It starts at June 22, 2005, correct?
A. Yes.
Q. And let's identify those people. Charles Breckenridge, Janis McFarland. Who is Charles Breckenridge at that point?
A. Charles Breckenridge was a senior toxicologist in the Syngenta health assessment group in North America.
Q. And Janis McFarland, right?
A. Was the head of regulatory affairs in North America for Syngenta.

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Q. And Tim Pastoor?
A. The head of health assessment in the Syngenta US team.
Q. Jennifer Shaw?
A. I believe Jennifer was in the corporate affairs group of Syngenta in the US.
Q. Beth Carroll?
A. Likewise, same as Jennifer.
Q. And then Phil Botham. Is that you?
A. Yeah. That's me.
Q. You're involved in this personally, right?
A. I was certainly copied into this, and this is why, as I said earlier, I was aware of the SAP debate.
Q. This email exchange started because of an email Charles Breckenridge received from Ray McAllister which starts on the page before. Can you look at that?
A. Yes.
Q. And Ray McAllister was with CropLife America, wasn't he?
A. He was.
Q. Very close friends with Syngenta, right?

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A. Well, I wouldn't --
MR. NARESH: Objection to form.
THE WITNESS: -- put it that way. He was certainly very actively engaged in professional activities with us.
BY MR. TILLERY:
Q. Okay. And Mr. McAllister was warning Syngenta that Debbie Cory-Slechta had been nominated to fill a vacancy on the EPA Scientific Advisory Panel, correct?
A. Correct.
Q. He followed the formal notice of her nomination?
A. Correct.
Q. By the Science Foundation. Did you know that she was nominated by the Science Foundation?
A. Well, I don't recall that but, again, as I said earlier, I was aware of these activities going on.
Q. Okay.
And the first email is 05705351, Charles Breckenridge advises Janis McFarland and Tim Pastoor of this development. That's the first one, okay?

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You see that?
A. Yes.
Q. And what does he say?
A. Charles says:
"This is important. We do not want to have Cory-Slechta on the SAP core panel. What action can be taken."
Q. Okay. And then there is a response. From whom? Tim Pastoor?
A. That's right.
Q. And he says:
"We should move on this, but I'm not sure how best to do so. Suggestions? Phil ...," he says.
And that's referencing you, right?
A. That's correct.
Q. "... we are mindful of the sensitivities and need to feed our objections in through effective channels."
Do you see that?
A. Yes, I see that.
Q. What's he mean by that, do you know?
A. Well, I -
Q. What did you take that -- you got that email. What were your effective channels

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you were going to use to feed in your objections to Dr. Cory-Slechta's appointment to the scientific advisory panel of the United States EPA? What were they?

A. Well --

MR. NARESH: Objection; form, foundation.

THE WITNESS: -- this was absolutely the discussion that I recall because I was mindful, and when he says there "mindful of sensitivities" I likewise was mindful of the fact that we should not be trying to directly influence the appointment of people to the science advisory panel. But as I did not understand the process by which that happened, this was starting a discussion about whether we could better understand that.

BY MR. TILLERY:

Q. Okay. So we'll go -- let me just explain to you, there's more emails coming, okay.

So let's go to the top. There's a Jennifer Shaw response, Wednesday, June 22,

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2005. Do you see that?

A. Yes.

Q. And she's To Tim Pastoor and Beth Carroll. And to who Cc? You.

A. To me. Yes, to me.

Q. Right?

A. Mmm-hmm.

Q. Okay. And she says what? Read her entire comment into this record.

A. "Ray has a tough job to do in providing comments that don't come back to haunt CLA [CropLife America] and be used against us. My suggestion would be provide Ray with comments that are not seen to be critical of the person but rather objectively focus on the person's work products and experience in the context of quality and relevancy."

Q. So she had hatched a plan and she was going to use Ray. And that's Ray McAllister, right?

MR. NARESH: Objection to form.

THE WITNESS: Ray is Ray McAllister, correct.

///

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BY MR. TILLERY:

Q. And then CLA is CropLife America, right?

A. That's correct.

Q. So you were going to use Ray and CropLife America to send information to the EPA against the nomination of Dr. Cory-Slechta, weren't you?

A. That was what was being considered here, yes.

Q. Right. And that was being considered. Now -- hold on a second.

MR. TILLERY: What is the next one? That's 548.

MS. BRUMITT: 59.

MR. TILLERY: Let's go to Exhibit 59. This is SYNG-05705349 through 50, Exhibit 59.

(Botham Exhibit 59 marked for identification.)

BY MR. TILLERY:

Q. Again, it starts off at the bottom, so if you'd look at that.

A. Yes. Okay, I've read that.

Q. All right.

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So the following day, on -- is it June 29 that you're looking at?

A. I'm looking at June 28.

Q. 28th, Tuesday?

A. Yeah.

Q. And you respond to everybody, don't you?

A. I do.

Q. And on Tuesday, June 28, you respond to Jerry Wells, Jonathan Akins, Tim Pastoor, Donna Houghton, John Doe, Mike Clapp, Elliott Barry, Beth Carroll, John Street, Greg Watson on "Comments on SAP nominations" and you mark it urgent.

Do you see where you did?

A. Yeah, I didn't make that mark urgent. That was just a copy from somebody else who put "urgent" further down.

Q. Okay. Okay. And you say:

"I've been trying to find out the best way of doing this. The attached e-mail from Jenny Shaw last week seemed like a sensible approach ... I'm assuming you're now trying to provide such comments to Ray?"

Is that what it says?

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A. Yes, that's what it said.
Q. So you endorsed Jennifer Shaw's approach of using Ray McAllister through CropLife America to effectively ghost this for Syngenta with the US EPA, right?
MR. NARESH: Objection to form.
THE WITNESS: So, as I said earlier, I was trying to explore if -- the process through which nominations on to this SOP -- SAP were approved, and the advice that I was getting from my US team is that it would be a legitimate way forward, if we wished to do so, to question whether a person had the appropriate background to be a member of the SAP.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Did you or did you not approve Jennifer Shaw's recommendation that we just went over?
MR. NARESH: I'll object --
THE WITNESS: I said --
MR. NARESH: I'll object to the

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form.
Go ahead. Sorry. I'm sorry.
THE WITNESS: Yeah. What I said here is it seemed like a sensible approach. This is not constituting an approval.
MR. TILLERY: Okay.
BY MR. TILLERY:
Q. So you said:
"I've been trying to find out the best way of doing this. The attached e-mail from Jenny Shaw last week seemed like a sensible approach. Tim - I'm assuming you're now trying to provide such comments to Ray?"
And that was to Tim who?
A. Tim Pastoor.
Q. Tim Pastoor. So you say it's a sensible approach and say now to Tim, "I'm assuming you're putting those comments together for Ray?"
That's your response, right?
A. That's right.
Q. Did you say any more to them at that time?
A. I've got no recollection of whether

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I might have said anything more.
Q. Okay.
MR. TILLERY: Now, let's go to Exhibit 60, and that is SYNG-PQ-05707254.
(Botham Exhibit 60 marked for identification.)
BY MR. TILLERY:
Q. This is an email from Greg Watson. Do you see it?
A. I do.
Q. It's dated June 29, 2005, and it's to Ray McAllister. And he says, "Confidential - Comments on SAP Nominations. Importance: High."
Do you see that?
A. Yes.
Q. And he says, "Dear Ray."
Let me read this in, the first sentence, into the -- the first paragraph into the record. You tell me if I'm reading it correctly.
"I would ask that you handle our comments with care & in such a way that they cannot be attributed to Syngenta. Ray, I am not aware of the common practice in these cases

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- but it seems to me that this should be submitted informally & NOT placed on the public docket."
Is that what it says?
A. Yeah, it does say that.
Q. Okay. So let's make sure everybody knows what that means. That means your Syngenta representative is suggesting that this comment go to the US EPA informally and not be publicly filed, correct? Is that what it says?
A. That is what this is suggesting, yes.
Q. All right.
And then, if you look on, it says -- he says:
"I enclose some comments on Dr. Cory-Slechta from the perspective of researchers who are close to ... Parkinson's disease ... which has been a major focus of her research effort."
Then he says -- if you look on, he proposes a language to her. If you look down in the third paragraph, he proposes the language that CropLife America's Ray McAllister's going to use to send in in this

private communication with the US EPA that's not placed on the public docket, doesn't he?
MR. NARESH: Objection to form.
THE WITNESS: Yes, that's correct.
MR. TILLERY: Exactly what he did. Now, let's move on to the next, and this is 61. This is SYNG-PQ-00353198 through 3204.
(Botham Exhibit 61 marked for identification.)
BY MR. TILLERY:
Q. We'll give you control of this document. You take a look at it, please.
A. Okay. I can see what it is now.
Q. All right. Now if you go to the very last page of that string, and that's 3204 -- actually, the last two pages. In the bottom of the page before, it says a reference to Stephen Knott. Do you see that?
A. Not quite there yet. Oh yes --
Q. Stephen Knott
A. Yeah. Stephen Knott, yes, US EPA.
Q. Okay. So this is an assistant executive secretary, FIFRA Scientific Advisory Panel, and he's with the United States EPA,

isn't he?
MR. NARESH: Objection; form.
THE WITNESS: This is what this suggests, yes.
BY MR. TILLERY:
Q. Yeah, and it's US EPA Headquarters, Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, DC. Right?
A. Yes.
Q. "Dear Steve ..." Now, who signed that letter?
A. Ray McAllister.
Q. From CropLife America, right?
A. Yeah.
Q. And he's got a section on Deborah Cory-Slechta, doesn't he?
A. That's right.
Q. And read that because you'll find it to be very, very, very familiar, I believe, Dr. Botham.
A. Yes.
Q. That is the language that Greg Watson told him to write, isn't it? Do you want to compare it?
A. It's -- yeah, no, it has

similarities, I agree.
Q. So that's the -- he did exactly what you wanted; Greg Watson sent this letter on to the US EPA, the language you wanted about Deborah Cory-Slechta, and what does he say at the very last sentence:
"... Cory-Slechta is not an appropriate candidate for the scientific advisory panel, based on these reservations."
Is that what he says?
A. That's what it says.
Q. He did exactly what you asked him to do, right?
MR. NARESH: Object to form.
THE WITNESS: Well, not me personally, no.
BY MR. TILLERY:
Q. So are you now in this or out of this? Which way are you now?
MR. NARESH: Objection to form, argumentative.
THE WITNESS: If you remember, my question was if we -- can we understand the process through which members of the SAP are appointed, and

I was seeking advice about whether there was a way in which we could provide input to that, and the way in which that was interpreted by my US colleagues was to take this route. But, of course, as you've seen, actually I was never copied into the final versions of this so I didn't see the final product, so that's why I said, you know, it wasn't me that was involved in the final part of this process.
BY MR. TILLERY:
Q. Okay. So you just told them to do it?
A. No, I said -- I repeat. I was seeking advice from my US team for what the process might be to query the membership of SAPs, and that resulted in -- that was a question to Tim Pastoor and the chain of emails that followed resulted from that.
Q. So when -- in fact, when this was sent in to the US EPA after a national science foundation nominated her, there was a little bit of pushback, wasn't there, okay, and they were asking -- they came back to -- if you read

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this exchange, they came back to Mr. McAllister and said could you give us some more information about Debbie Cory-Slechta, didn't they?

MR. NARESH: Objection to form.

THE WITNESS: Yes, that's correct.

BY MR. TILLERY:

Q. Okay. And he came back to his friends at Syngenta and said can you give me more information about her, right?

MR. NARESH: Objection to form.

THE WITNESS: That is correct.

BY MR. TILLERY:

Q. Okay. And that's all laid out in this exchange. And they went to different people within the organization to find out what could be said.

Now, if you'd go to 3200 of same exhibit and look at the bottom where it says Nick Sturgess.

Do you see that?

A. Yes. Yes, I'm there, yeah.

Q. Nick Sturgess writes on September 16, 2005, "Guys," and he's referring to Barry Elliott, Mike Clapp, Greg Watson,

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"Comments on SAP nominations."

Do you see that?

A. Yes.

Q. He says:

"Guys, It is going to be very difficult to pin something really specific on D C-S ..."

That means Deborah Cory-Slechta, doesn't it?

A. It does.

Q. "... since it is more of an overall perception in her presentation style and language which is not strictly objective and lacks the complete story which would actually put her findings [in] a more relevant perspective. That said there may be some angles as follows ..."

And then, if you go to the page -- next page of his email, he says she has made verbal comments when presenting and answering questions following her presentation at different scientific meetings, one of which was at the 20th International Neurotoxicology Conference in Little Rock, and the 21st International Neurotoxicology Conference in

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Honolulu in February 2004.

Is that what he references?

A. Yes.

Q. And her -- the objection to her was -- he puts it in quotes, from listening to what she said, "'Our data support the need for the PQ [that's paraquat] human health risk assessment to be re-evaluated.'"

Right?

A. Correct.

Q. And she says:

"'Our data are in support of anecdotal evidence from e-mail communications I have had with farmers and their families [which] have used PQ and have subsequently developed Parkinson's disease.'"

Is that what Mr. Sturgess says?

A. It is.

Q. And he also comments similar things she said in other presentations, correct?

A. Correct.

Q. Okay.

MR. TILLERY: Now, let's go to the next exhibit, and that's to --

MR. NARESH: Steve, do you have

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a while longer on this line of questioning or are you reaching the end of it?

MR. TILLERY: I'm just about at the end of this, okay.

MR. NARESH: All right.

MR. TILLERY: All right.

MR. NARESH: Can we take a break after this line of questioning?

MR. TILLERY: Yeah. I'm about -- right at the very end of this, with three or four more minutes and we're done, then we'll take a break, okay?

MR. NARESH: Okay.

MR. TILLERY: Okay. All right. What is this one?

MS. BRUMITT: 62.

MR. TILLERY: 62?

MS. BRUMITT: Yes.

MR. TILLERY: All right. Let's go to Plaintiff's Deposition Exhibit 62, if you could look at that.

(Botham Exhibit 62 marked for identification.)

THE WITNESS: Yeah, okay, I can see

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that.
BY MR. TILLERY:
Q. In this email, Watson summarizes what Syngenta has asked McAllister to write in response to this as a follow-up inquiry from the US EPA, right?
A. Yes.
Q. He says Debbie Cory-Slechta, this is what we've done, and he tells them exactly what to write. Okay.
Now, Syngenta was successful, wasn't it?
MR. NARESH: Objection; form.
THE WITNESS: Successful in what?
BY MR. TILLERY:
Q. Well, were you aware that Dr. Deborah Cory-Slechta's SAP nomination was defeated?
A. To be honest with you, I may well have known that at the time, but I'd forgotten that.
Q. Oh, you'd forgotten, okay.
By defeating her nomination, Syngenta removed a threat to their continued sale of paraquat, didn't they?

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A. They -- we believe that, as this says, Dr. Cory --
Q. Can you answer my question. Can you answer my question, sir? I know you want to answer something else but -- I'll ask it again.
A. Mmm.
Q. I'm asking a specific question. By defeating Dr. Debbie Cory-Slechta's nomination to the scientific advisory panel of the US EPA, Syngenta removed a threat to the continued sale of paraquat, didn't it?
MR. NARESH: I'll object to the form.
THE WITNESS: A potential threat, yes.
MR. TILLERY: Okay.
BY MR. TILLERY:
Q. Now, that really wasn't the end of the chapter about Dr. Debbie Cory-Slechta's appointment, was it?
A. Please elaborate.
Q. Well, she was nominated to the advisory panel five years later by the National Science Foundation.

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MR. TILLERY: Okay, let's go to -- this is exhibit what? Sorry?
MS. BRUMITT: 63.
MR. TILLERY: 63. Pull that up.
(Botham Exhibit 63 marked for identification.)
MR. TILLERY: And that's 552, right?
MS. BRUMITT: Yes.
BY MR. TILLERY:
Q. If you'd look at this exhibit.
A. Okay, I can see that.
Q. All right. If you see that, what this is is a August 3, 2010 email from Charles Breckenridge to Lewis Smith. And to who else on that line?
A. To me, yes. So this --
Q. Phil Botham.
A. This is indeed --
Q. Phil Botham.
A. Yes, that's right.
Q. Phil Botham, right. And to Alan Nadel, who is the head of the legal department for Syngenta Crop Protection, LLC, right?
MR. NARESH: Objection; form.

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BY MR. TILLERY:
Q. And for Jonathan Sullivan, who is a lawyer from Basel, right?
A. That is correct.
Q. All right. And what's it reference? "SAP nominees - comment period," FIFRA SAP nominations. What's he say? Read what he said.
A. "Note that Cory-Slechta has been nominated to become a permanent member of the USEPA SAP. We should discuss whether we wish to comment."
Q. Okay. And did you comment?
A. I've got -- I cannot remember whether we did or not.
Q. Okay. Well, let me refresh your recollection.
MR. TILLERY: Let's go to -- what would this exhibit be?
MS. BRUMITT: 64.
MR. TILLERY: 64. Pull that up for him.
(Botham Exhibit 64 marked for identification.)
///

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BY MR. TILLERY:
Q. Go ahead and refresh yourself there, too. The print is very small, Dr. Botham, but it's -- I think you can probably adjust it on your device to read it. This is how it was presented to us.
A. Okay.
Q. All right. And if you look on that exhibit at 192, which is the front page, there's an email that's dated September 3, 2010, correct?
A. Yes.
Q. And that's from Dan Campbell, right?
A. Correct.
Q. And it's referencing comments on SAP nominations. He sends that to Tim Pastoor, right?
A. Yes.
Q. And that -- he says:
"Do you agree with this?"
And he writes:
"CropLife America recommends that Dr. Deborah Cory-Slechta not be selected to serve on the FIFRA SAP. Dr. Cory-Slechta generally projects an anti-pesticide advocacy

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through her research program. Her research interpretations and views inappropriately identify causal effects without quality data, between pesticides and various diseases, notably neurodevelopmental diseases including ..."
What's that last word?
A. Parkinson's.
Q. Parkinson's disease, right, okay.
And he says:
"I think it works. Thanks. Dan."
Right?
A. Correct.
Q. All right.
MR. TILLERY: Now let's go to the next exhibit. Which one?
MS. BRUMITT: 65.
MR. TILLERY: Number 65.
(Botham Exhibit 65 marked for identification.)
BY MR. TILLERY:
Q. Take a look at that. This is a CropLife America letter, September 3, 2010. Correct?
A. Yes, correct.

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Q. And it's directed to Dr. Frank Sanders, US EPA, right?
A. Correct.
Q. It says, "Docket ID EPA... Nominations to the FIFRA Scientific Advisory Panel; Request for Comments," and he references those numbers. August 4, 2010.
Do you see that?
A. Correct.
Q. And if you look on the second page in the fourth paragraph, why don't you look at that and tell me if that isn't exactly word for word what Syngenta's Dan Campbell drafted and sent out, saying, "Do you agree with this? ... I think it works."
A. Yes.
Q. This is word for word.
A. Yes.
Q. So --
A. May I add at this point that this is a perfectly --
Q. No, I'm asking --
MR. TILLERY: Excuse me, I move to strike --
MR. NARESH: Steve. Steve --

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MR. TILLERY: Your counsel can raise it --
MR. NARESH: You can move to strike it --
MR. TILLERY: Your counsel can raise it --
MR. NARESH: He wants to --
MR. TILLERY: No, he cannot. It's my deposition.
MR. NARESH: You can move to strike --
MR. TILLERY: Not your deposition. It isn't --
MR. NARESH: You can move to strike it --
MR. TILLERY: It isn't. No, it isn't. No, it isn't. You're not doing it. Not with me.
MR. NARESH: Steve --
MR. TILLERY: I'm too old. Listen, we are not.
BY MR. TILLERY:
Q. What's going to happen is you're going to answer my questions and then he can raise them. That's what you do.

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MR. NARESH: Steve -- Steve, you've cut off the witness multiple times --
MR. TILLERY: No -- well, listen, I'm not --
MR. NARESH: Steve, you're not even letting me talk.
MR. TILLERY: Make your objection.
MR. NARESH: You're not even letting me talk.
MR. TILLERY: Make your objection.
MR. NARESH: My objection is you keep cutting the witness off. If you keep doing it --
MR. TILLERY: Well --
MR. NARESH: -- we'll have issues. Let the witness answer the questions. If you don't like the answers, then ask a different question or move to strike it, but you cannot cut the witness off time and time again.
MR. TILLERY: We've got an -- we've got an issue right now.
BY MR. TILLERY:
Q. Now I asked you a question. My question to you is very simple: Is that

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letter from CropLife America, on page 2, word for word what Syngenta drafted? That Mr. Campbell from Syngenta drafted, was that what they sent to the US EPA? Was it or not?
A. Well, I've not done a document compare but it is very similar, yes.
Q. You don't have any reason to suggest it isn't, do you?
A. No, but that was the whole part of the process; Syngenta was providing information for CropLife America legitimately to comment on recommendations to membership of the SAP.
Q. Why didn't you do it yourself? Why didn't Phil Botham write a letter, that letter, to the US EPA?
A. Because this was not my accountability. I was leading the Health Science Team, the science part of this, so that was not something that I was responsible for.
Q. You went through a third party so your identity could be hidden; that's the truth, isn't it?
A. Not at all.

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Q. That's the fact --
A. No. No, not at all.
Q. And what --
A. I --
Q. And what was your -- and were you successful again?
MR. NARESH: I'll object to this and the last three or four questions. I don't know what the pending question is. Could you please just ask whatever the pending question is so he can answer.
BY MR. TILLERY:
Q. Were you successful again? Was her nomination defeated? After the National Science Foundation of the United States of America nominated this scientist once again, did you defeat her nomination a second time?
MR. NARESH: Objection to form.
THE WITNESS: Well, I'm going to say the same as I did before because it's the truth. I can't remember, and I think that reflects that I was not directly involved in this process.
BY MR. TILLERY:
Q. All right. So let's abbreviate the

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third one. Were you aware of the fact that she was nominated five years later to the SAP of the United States Environmental Protection Agency?
A. Clarify, please, five years later than when?
Q. 2015. Nominated again. Were you aware of that, four years --
A. I may have been but, as I say, it's not an area that I've focused on at all in my role.
Q. Did CropLife America get involved for you again?
A. They may have done but I can't -- I can't recall that.
Q. Did you successfully beat back a threat to paraquat once more --
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. -- over a period of 2005, 2010, 2015, defeat a scientist nominated by the National Science Foundation? You defeated her nomination to one of the most important scientific panels in the United States. Would you agree with that, sir?

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MR. NARESH: Objection to form.
THE WITNESS: We were -- we were entitled, I think, to provide an input to that process on the basis, as it says here, of the way in which we feel -- we felt Dr. Cory-Slechta projected the implications of her research program.
MR. TILLERY: So we'll take a break right now, okay.
THE VIDEOGRAPHER: We are going off the record. The time is 3:13.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 3:33.
BY MR. TILLERY:
Q. Dr. Botham, who is Dr. Donato Di Monte?
A. He is a researcher in neurology who was formerly based at the Parkinson's Institute in North America. He is now at the German center for neurotoxicological research.
Q. Okay. When he was at the Parkinson's Institute in California he was the director of fundamental research for the institute, correct?

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A. That's correct.
Q. Dr. Di Monte has run research programs into paraquat in the Charles River black mouse at both the Parkinson's Institute and the German Center for Neurodegenerative Diseases, correct?
A. That's correct, yes.
Q. Dr. Di Monte's group at the Parkinson's Institute published several studies finding paraquat caused loss of dopaminergic neurons in the substantia nigra of the Charles River black mouse, didn't he?
A. He did.
Q. And his group also found a loss of striatal dopamine in paraquat-treated mice, correct?
A. That's correct.
MR. TILLERY: Can we go off the record on a technical thing, real quick. You don't have to stop the video.
(Off-the-record discussion.)
MR. TILLERY: Let's go to the next exhibit. Which is?
MS. BRUMITT: 66.
MR. TILLERY: 66. The next exhibit

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we'll refer to is SYNG-PQ-00486987. This is entitled "Update on Syngenta's Research Program."
THE WITNESS: Yes, I can see that.
(Botham Exhibit 66 marked for identification.)
BY MR. TILLERY:
Q. Okay. If you'd go to, on this document, 992 which is page 6 of the 47 pages.
Do you have control of the document, sir?
A. I do, thank you.
Q. All right. When you find it and get to that point, let us know so we can take it back off of that control so it can be videotaped.
A. Yeah, I'm there, thank you.
Q. All right.
Okay. This is a document I think we've referenced earlier. If we didn't, we looked at something very close to it. That is, if we look at this, it says "Several active research groups working on the paraquat mouse model."
Do you see that?

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A. Yes.
Q. And it says:
"Two US based research groups have produced a series of publications since 1999 using paraquat in a Parkinson's disease animal model - their work is still on going."
We've referenced Dr. Cory-Slechta before, but here we refer to Dr. Di Monte, formerly Parkinson's Institute, Sunnyvale California.
Do you see that?
A. I do.
Q. Then it says, at the very bottom:
"Other research groups are also actively working with PQ [or paraquat] in rodents."
Now, would you agree with me that part of the influencing strategy that we've talked about and that we've shown exhibits on includes reaching out to members of the scientific community and discussing this issue with them and trying to convince them of the position that Syngenta took? Would you agree with that?
A. I wouldn't put it that way.

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It's certainly reaching out to the scientific community to see if we can come to a better understanding of what the research is telling us.

Q. And in some ways to learn from those people in the scientific community, correct?

A. Absolutely, yes, yes.

Q. So a person like Dr. Di Monte, who you viewed as being an expert in this area, would that be correct?

A. That is correct.

Q. Okay, that you would reach out to her -- I'm sorry, strike that.

You would reach out to him and ask to consult with him and learn what his research has developed in terms of any correlation or connection or relationship between paraquat and Parkinson's disease; would that be fair?

A. That is a very fair way of stating it, yes.

Q. All right.

MR. TILLERY: Now, let's go to 74. Has that been marked? No, it hasn't. Next exhibit. What number is that? 67?

MS. BRUMITT: 67.

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MR. TILLERY: Plaintiff's Exhibit 67 I don't think you'll need to look at yourself.

(Botham Exhibit 67 marked for identification.)

MR. TILLERY: Just for the record for counsel, this is SYNG-PQ-01662351.

BY MR. TILLERY:

Q. It's entitled, is it, sir, Minutes of the June 9, 2003, "PQ RDT - Regulatory science foresight - PD."

Would you translate that, what that means, with all these abbreviations?

MR. NARESH: Steve, sorry to interrupt. Is this the same exhibit as Exhibit 54?

MR. TILLERY: I can't tell you the answer to that. It deals with --

MR. NARESH: I don't have a problem with you doing it a second time. Just for the record, I do think it's the same as an exhibit that you've already introduced.

MR. TILLERY: Okay, it might be. If it is, you know, we can deal with it

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administratively later.

MR. NARESH: Okay.

MR. TILLERY: Okay.

BY MR. TILLERY:

Q. Can you look at this, sir.

A. Yes, I'm looking at it.

Q. Okay. These are minutes of the Syngenta paraquat regulatory development team, right?

A. That's correct.

Q. And it's June 9, 2003?

A. Correct.

Q. And the meeting focused on regulatory science foresight with respect to paraquat and Parkinson's disease, didn't it?

A. It did.

Q. What does regulatory science foresight mean?

A. It's having an ability to predict what scientific developments may have implications for future regulation and also future regulatory status of substances.

Q. Okay. And who recorded the minutes, do you know?

A. I'm not sure who that might

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have been.

Q. If you turn to -- is it page -- excuse me. I'm sorry. Let's go to page 4 of that document, which is 354.

A. Yeah, okay. Yeah, so you have control at the moment so I ...

Q. Yeah. Do you see that?

A. I see what you're showing me, yes.

Q. Yes. And there's a reference to -- it says:

"Good contact with, and evaluation of, the key research groups have been established. Their predicted future research activity is being mapped."

Now, do you see the first one?

A. Yes.

Q. Syngenta characterized Dr. Di Monte's group as currently advocating paraquat as an academic, not a causative model, right?

A. Yes, I see that.

Q. And Syngenta characterized that the Di Monte group has "high scientific creditability," right?

A. Yes.

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Q. The second research group on that list was Dr. Cory-Slechta at Rutgers University, right?
A. Yes.
Q. And Dr. Cory-Slechta is characterized by Syngenta as "implicitly advocating paraquat as a potentially causative model of Parkinson's disease." That's what it says.
A. That's correct.
Q. Syngenta characterized her group as "considered to be making excessive claims from the available data."
A. Yes, that's correct, and that's what our concern was in our previous discussion about the SAP.
Q. Now let's look at page --
MR. TILLERY: I move to strike your answer as unresponsive, sir.
BY MR. TILLERY:
Q. Can we ask you again the question: Syngenta characterized Dr. Cory-Slechta's group as "considered to be making excessive claims from the available data."
Is that what it says?

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A. That's what it says.
Q. All right.
Now, let's turn to page 6, if you wouldn't mind, please, and that's 356.
A. I'm in your hands here because I don't have control of the document.
Q. Yeah. We'll give it to you in just a second.
MR. NARESH: And Dr. Botham, if you feel like you need to review any portion of the document in order to answer a question, obviously just please feel free to ask Mr. Tillery that.
MR. TILLERY: We're happy to do that and start over if you want and then direct you. Did you want to do that now?
MR. NARESH: It's your call, Dr. Botham.
THE WITNESS: Well, I think it will be good to make sure I can see all of this document so if you wouldn't mind.
MR. TILLERY: All right.
All right. No problem.
Give it back to him, please.
///

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BY MR. TILLERY:
Q. We're at SYNG-PQ-01662356.
A. Okay.
Q. And there's a section that says:
"The comments were made that it is in Syngenta's interests ..."
Do you see that? Find that?
A. Yes, I'm there, thank you.
Q. Okay. Do you see that?
A. Yes.
Q. All right. Now, let's go back on wherever that is.
Yeah, back down. Yeah, there we go, fine. Okay. If you see -- I'm having trouble with that one. I think we don't have it -- I see it. "The comments were made that it was in Syngenta's interest," do you see that at the middle of the page? The third bullet point says:
"If a third party emerged to figuratively act as a referee between the Di Monte and Cory-Slechta groups different perspective of PQ (academic model [versus] potentially ... contributory agent)."
Do you see that?

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A. I do.
Q. What was meant by that?
A. Well, what was meant by that is that we wanted, as part of our exploration of what the science was really telling us, to be able to -- to get a common view if possible from two very key and important research groups, namely those of Di Monte and Cory-Slechta, because we felt that they were really, as it says here, giving quite a different perspective on whether there was a clear relationship between paraquat exposure and Parkinson's disease.
Q. Right. My question, though, is who is the third party referenced? What's the third party?
A. I don't know who was intended because I don't believe I was in this meeting, so I can't comment exactly who may have been in mind, whether it was just a general description of the type of person or whether they had a particular person in mind.
Q. And what's the difference between an academic versus a causative model?
A. Well, a causative model is one

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where the researcher has as their hypothesis that a chemical agent, in this case paraquat, is responsible for/causative in a disease state, in this case Parkinson's disease. So they're generating data to confirm the hypothesis.

An academic model would be one where either that was a much more open hypothesis, in other words it's not clear what effect paraquat may have on the nervous system, including whether it could cause Parkinson's disease, or, alternatively, whether using the model as a way of describing the disease of Parkinson's disease, not necessarily saying that paraquat is causative in Parkinson's.

Q. Okay. Did Syngenta ask Dr. Di Monte to publicly comment on any aspect of Dr. Cory-Slechta's work with paraquat?

A. I don't recall having a conversation that said that.

Q. At the bottom of the page that we're looking at now -- and this, for the record, is SYNG-PQ-01662356 -- there are two action items coming out of the meeting, correct?

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A. Correct.

Q. One is to develop and implement a PD influencing strategy in the United States. Right?

A. Correct.

Q. "To include definition of the targets of the influencing program." Okay?

A. Right.

Q. Do you see that?

A. Yes.

Q. And it says:

"To clarify status of the ACP review and to work with Diane Castle to produce influencing strategy for the EU."

So what's the ACP there again?

A. That's the Advisory Committee on Pesticides which was the independent committee responsible for advising the Pesticides Safety Directorate, PSD, that we mentioned earlier on aspects of safety of pesticides in the UK.

Q. So these were the two targets of the influencing strategy coming out of this meeting, correct?

A. In the latter case it wasn't a direct influencing on the ACP as it says

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there; understanding the ACP review was part of the input to what was described as the influencing strategy for the EU.

MR. TILLERY: Okay. Let's go to 14. What number will that be, the exhibit number?

MS. BRUMITT: 68.

MR. TILLERY: We're going to Plaintiff's Exhibit 68 and that's SYNG-PQ-00034773.

(Botham Exhibit 68 marked for identification.)

BY MR. TILLERY:

Q. If you would take a look at this exhibit, sir. The title is "Paraquat Health Science Team." It's 17-18 September 2008, isn't it?

A. That's correct.

Q. And this was a meeting at the Harte and Garter Hotel, Windsor, UK, right?

A. That's correct.

Q. And present was Lewis Smith, Charles Breckenridge, Martin Wilkes, Kim Travis, Nick Sturgess, Andy Cook, Kersten Mewes and Dave Berry, right?

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A. Correct.

Q. Clive Campbell and John Tomensen participated by phone; and then Professor Colin Berry, Professor Nicotera were there as well, right?

A. That's correct.

Q. And then there's a guest speaker referenced, a Professor Donato Di Monte, right?

A. That's right.

Q. And the presentations were from Professor Di Monte and Dr. Martins, right?

A. That's right.

Q. Okay. Now, what function does the Paraquat Health Science Team serve?

A. Well, this was a team that was set up in 2007/08 to be responsible for generating a science program to look at the way in which paraquat may influence the ability for it to cause Parkinson's disease; so it was specifically a research program team.

Q. And Syngenta invited Dr. Di Monte to speak, correct?

A. Correct, yes.

Q. And actually paid him to come and speak, correct?

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A. I can't recall whether that was the case.
Q. Would that be the usual situation when you ask an outside scientist to come, you pay them an honorarium for their day?
A. We sometimes pay an honorarium, we sometimes just pay travel expenses. I don't know what happened on this occasion.
Q. And Dr. Di Monte gave a presentation on his research into paraquat in the mouse, right?
A. Yes, that's correct.
Q. And if we go to page 2, which is 34774, we can look at the main conclusions of Dr. Di Monte's presentation.
A. Yes.
Q. Okay. The first one is the administration of paraquat to mice causes a significant loss of nigral dopaminergic neurons, correct?
A. Correct.
Q. The loss is selective -- I'm looking at point number 2:
"[The] loss is selective and affects neuronal cell populations that are also

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targeted in PD."
That's Parkinson's disease, correct?
A. That's right.
Q. Okay. Then third is:
"The PQ model represents a valuable experimental tool for studying mechanisms of dopaminergic cell degeneration and neuroprotective strategies."
Do you see that?
That was another point.
A. Yes.
Q. And then it says ROS formation. What is ROS again? We talked about it earlier.
A. We did. This is reactive oxygen species, so this is the -- what paraquat does when it gets into cells, it generates something called a reactive oxygen species which can cause damage to the cell.
Q. Right.
"[Reactive oxygen species] formation is likely to play an important role in [paraquat]-induced neurodegeneration."
That's what he told you at that meeting, correct?
A. Correct.

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Q. He also said:
"Sensitivity to oxidative stress could explain vulnerability of sub-populations of dopaminergic neurons to [paraquat]."
Right?
A. Yes.
Q. Let's talk about that for a second. Sensitivity to oxidative stress, what does that mean?
A. What I think this meant was that not every cell in the body, not every neurone in the body would necessarily have the same sensitivity to or response to oxidative stress, or reactive oxygen species, as other cells may do.
So what was behind this is that it was -- we knew we needed to try to understand why it appears that not every dopaminergic neurone appears to be affected in some of these mouse models. It was only certain dopaminergic neurones. So that was a speculation that it might be their relative sensitivity to stress.
Q. So you reached out to an expert who had been studying this for a number of years --

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(Stenographer interruption.)
MR. TILLERY: Of course.
BY MR. TILLERY:
Q. So Syngenta reached out to an expert who had been studying this correlation between paraquat and Parkinson's for years and in his presentation, his very first presentation, he told you that sensitivity to oxidative stress could explain the vulnerability of certain subpopulations of dopaminergic neurons to paraquat, correct?
A. That's correct, yes.
Q. Then he says:
"An initial toxic exposure pre-disposes to damage by subsequent challenges."
Correct?
A. Yes.
Q. And then there's:
"Microglial activation (neuroinflammation) is a mechanism by which dopaminergic neurons could be 'primed' to toxic damage."
So when that term "microglial activation" is used, what does it mean?

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A. It means -- microglia are other cells that are found in the brain, for example, where -- which -- so this is not the dopaminergic neurones. They are cells that could be found surrounding those neurones and that it could be that the damage to the dopaminergic neurone comes because there is an inflammation due to an effect on these microglial cells.

Q. So the paraquat causes the -- I'll start that over. We got a lot of feedback.

So the paraquat causes an inflammation of the microglial cells which, in turn, causes damage to the dopaminergic neurons, correct?

A. It's not quite as simple as that. What he was saying is that the activation of the microglial cells, neuroinflammation, is known to occur, for example, in infectious disease. So bacteria can cause microglial activation. And he was indicating that if that was occurring, that's what he's calling a priming effect. It means that that could make neurones more susceptible to things

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like paraquat.

Q. Well, actually, what he says is that -- it does say "primed," sir. He says:

"Microglial activation ... is a mechanism by which dopaminergic neurons could be 'primed' to toxic damage."

A. Yeah, that's --

Q. That's exactly what he says. You agree with that --

A. I think that's what I was trying to say as well, yeah.

Q. You agree that's what he told you, right?

A. Yes, it is. Yes.

Q. Did Syngenta know that before he came?

A. I'm not sure that we had really fully understood that this -- it's more complicated than a direct -- necessarily a direct effect on dopaminergic neurones, no. I think this was part of the academic background, if you wish, that Dr. Di Monte was bringing us.

Q. So he knew more about this than you did is what you're saying, right?

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A. Absolutely. That was one reason why we wanted to talk to him.

Q. Because he'd been studying it. He'd been doing the studies, right?

A. You --

Q. Without doing the studies -- without doing -- I'm sorry, I interrupted you. Go ahead.

A. No, no, I -- no problem. No, absolutely, he -- but bear in mind that some of what he was saying was not necessarily fully experimentally proven. Some of this was hypothesis. But, yes, he certainly had -- he added to our body of knowledge.

Q. But he had done the studies that Syngenta hadn't done, right?

A. No, he'd done some -- he'd done some studies which were similar to the ones that Syngenta had done, but, yes, he had taken it somewhat further and, in turn, led us to do more work in this area ourselves.

Q. Did Syngenta know that sensitivity to oxidative stress could explain vulnerability of sub-populations of dopaminergic neurons to paraquat before Dr. Di Monte came?

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A. Yes, that piece we knew. I think we discussed that last time.

Q. Okay. And did Syngenta know that reactive oxygen species formation is likely to play an important role in paraquat-induced neurodegeneration before Di Monte appeared and spoke to you?

A. Yes. Yes, we did.

Q. Right. How long had you known that?

A. Oh, many years, probably ten years before that at least. Probably longer.

Q. Okay. And did Syngenta know that the loss of dopaminergic neurons is selective and affects neuronal cell populations that are also targeted in Parkinson's disease before Dr. Di Monte came to speak to you?

A. Yes, we did.

Q. How long had you known that?

A. Again, ten years or more.

Q. Okay. Did Syngenta know that the administration of paraquat to mice causes a significant loss of micro dopaminergic neurons before he came to speak to you?

A. Yes, we did.

Q. And how long have you known that?

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A. Same again; this was because the literature had started to appear in the late 1990s.
Q. Okay.
Now, he also told you that microglial could play a critical role in triggering paraquat redox cycling in promoting oxidative damage, didn't he?
A. Yes.
Q. You knew that, too, didn't you, before he came?
A. I don't know that we did. It may be that there's something on record which suggests that but I don't immediately recall that.
Q. So how did he learn that? Did he tell you in the presentation how he knew that microglial could play a critical role in triggering paraquat redox cycling and promoting oxidative damage?
MR. NARESH: Objection to form.
THE WITNESS: So, again, I don't recall the exact details of whether he had got experimental data which showed that or whether this was, at that stage,

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still a hypothesis that he was working on.
BY MR. TILLERY:
Q. Okay. Well he said -- he made this statement, if you look at the top of the page, it says, "[Dino Di Monte] main conclusions from the presentation."
Do you see that?
A. I can't actually -- yes, I can see that. But that's right, yes, that's what that says, yes.
Q. Okay. So did Syngenta know that or not before he came?
A. No, I don't know the answer to that. As I say, when it comes to the microglial activation, this was certainly an issue which became more prominent in our thinking -- not necessarily immediately after this meeting but as part of our ongoing research program.
Q. And he also told you that redox cycling of paraquat could be catalyzed by microglial NADPH oxidase, didn't he?
A. Yes.
Q. And you knew that before, too,

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didn't you?
A. Well, we knew that, yes, NADPH oxidase is important in the cycle of events that can lead to damage. I think this was perhaps a new dimension in that this was NADPH oxidase in the microglia rather than in the neurones themselves.
Q. And he knew that because he had done the studies, right?
A. That's the bit that I can't remember exactly what the nature of his experimental evidence was at that time.
Q. Okay. And he also told you that alpha-synuclein pathology is another important feature of the paraquat model. Did he tell you that?
A. Yes, he did.
Q. And you knew that as well, didn't you? I think you told me from the -- you knew that --
A. Yes, how we --
Q. How long had you known that?
A. Again, over the previous few years as publications were beginning to point this out, particularly including in human

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Parkinson's disease.
Q. And then he said that paraquat induced alpha-synuclein up-regulation, paraquat-alpha-synuclein interactions and reactive oxygen species formation could all contribute to alpha-synuclein pathology.
Did Syngenta know that before Dr. Di Monte came and made his presentation?
A. Well, this was something which we'd certainly discussed in outline but without, really, a clear understanding of this area. So alpha-synuclein was certainly one part of the science story which we were trying to explore and get a better understanding of.
Q. Well, did you -- so the answer is no or yes? I'm trying to understand; did you know it or not?
A. Well, we didn't have a full understanding of the role of alpha-synuclein.
Q. Have you ever done specific studies to measure alpha-synuclein as a reaction to paraquat?
A. No, we haven't.
Q. Okay. And that's up to June 2020, correct?

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A. That's correct.
Q. Okay.
MR. TILLERY: Let's go to --
What's the next page number -- or exhibit number?
MS. BRUMITT: 69.
MR. TILLERY: 69, Exhibit 69, which is SYNG-PQ-01116217.
(Botham Exhibit 69 marked for identification.)
THE WITNESS: I think you may still have control so I can't see that yet.
MR. TILLERY: We'll get it over to you in just a second, please.
THE WITNESS: Okay, thank you.
MR. TILLERY: Just a second.
Pull that up and then turn it over to him.
THE WITNESS: Thank you. Got that.
BY MR. TILLERY:
Q. Okay. If you'd just look through that document, please. And I'm going to just initially direct your attention to 691 -- I'm sorry, 991 on one reference.
A. I'm not sure what 991 --

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Q. The last page.
A. It's not a number that's on this document.
Q. I'm sorry. I'm directing your attention to 6217. Do you see that first page?
A. Yeah, just going back. Hold on. Yes, thank you, I've got that.
Q. All right. Now, the only point I'm referencing here is if you look at this, this is a "Paraquat Health Science Team - Action Minutes for Marlow Meeting, 5, 6, 7, October 2009 - The Compleat Angler, Marlow, UK."
And it references the Health Science Team: Smith; Breckenridge; you, Mr. Botham, were there; Sturgess; Travis; Cook; McFarland, Berry, Mewes.
"External," it has a few other people. It mentions C.L. Berry. Who is that?
A. That's Sir Colin Berry, a retired independent pathologist who was a consultant, still is a consultant, to Syngenta.
Q. Okay. And then there's a Nicotera. Who is he?
A. That's Pierluigi Nicotera from the

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German Institute of Neurodegenerative Disease.
Q. All right. And then there's Tomensen?
A. John Tomensen is an epidemiologist who -- formerly of Syngenta/ICI, by that time an independent consultant.
Q. And then there is D. Di Monte. Who is that? Is that the same Di Monte?
A. That's the same Dino Di Monte, yes.
Q. So he is now an external consultant to Syngenta?
A. Yes, he was at that time.
Q. Okay. Is he still?
A. No, he's not.
Q. When did he cease being a consultant to Syngenta?
A. I'm afraid I can't give you a date of that just now.
Q. And then the last person there is Jeff C. Wolf. Who's he?
A. He is an external expert in pathology.
Q. Okay. All right.
So we're going to go back to Exhibit 42 which is a document that --

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I'm sorry, Exhibit 66, which is, let me give you the Bates number, SYNG-PQ-00486987. I think this is one you've seen already.
A. Do you want me to open that up here or are you sending me that again?
Q. We'll send it to you for you to look at.
A. Okay, I have that.
Q. This was previously identified on the record as 66.
Okay. Do you see that it is an update on Syngenta's research program, 13 February, 2012?
A. Yes.
Q. If you'd go to 991 of that. My point is this -- here, if we could take it back now.
So if you look at this second bullet point, the title of this page is "Understanding of mechanisms of nigrostriatal degeneration - the MPTP animal model."
The second bullet point says:
"Use of non-human primates (NHP) (marmosets & macaques) can include behavioural studies and considered more relevant to study

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PD in humans."
Why are they more relevant?
A. Because they're genetically more similar to human beings.
Q. And is it a good plan to try to get as predictive as you can be if you're really legitimately trying to assess the hazards of a chemical to the genetic profile of a human being?
A. In an ideal world, yes. You know, you might think you would do all your toxicology in that way in the nonhuman primate, but the reality is that's not a particularly ethical use of nonhuman primates to do it routinely, so it's reserved for where that's seen to be necessary for scientific or medical reasons.
Q. But when you're trying to determine whether or not a chemical could cause extreme harm, illness, injury or death to a human, using a nonhuman primate gives you probably the more accurate information about potential effects on a human, correct?
A. The experience from the pharmaceutical world says that that is

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sometimes the case, yes. Not always but sometimes.
Q. So have we established that the more species in which the adverse toxicological effects of a chemical are observed, the greater concern about that chemical's toxicity, particularly its toxicity to humans?
A. Yes, that could be the case.
Q. And does it matter in which species adverse effects are observed?
A. It doesn't always matter. The critical thing in toxicology is whether you can understand mechanistically whether the effects you have seen, in whatever species they may be, could be of relevance to man.
Q. The more biologically and physiologically similar a study animal is to humans, the more likely it is that any effects observed in that species are to be indicative of a similar effect in humans, correct?
A. As a general statement, that is true.
Q. Humans are primates and their nonhuman cousins, like monkeys, would,

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in general terms, be considered the best animals for studying toxicity to humans, correct?
A. Potentially the most relevant but not necessarily best when it comes to ethical use of animals.
Q. Well, of course, and that's the same thing; that's the reason we can't use human beings to test paraquat --
A. Yes. Yes, indeed.
Q. -- of course not.
A. Yes.
Q. But to the extent that you can use primates, you would agree that primates, like monkeys, are considered the best animals for studying toxicity in humans, correct? The most predictive?
A. They certainly can be, yes. Not a hundred percent of the time. There are exceptions to that, but that's why I say, as a general statement, I wouldn't disagree with that.
MR. TILLERY: Let's go to -- have we marked 57? What number is this?
MS. BRUMITT: 70.

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MR. TILLERY: 7-0? Now we're moving to Plaintiff's Deposition Exhibit No. 70. This is SYNG-PQ-01117480.
Open that and turn that over to him.
(Botham Exhibit 70 marked for identification.)
THE WITNESS: Okay, I've received that.
MR. TILLERY: All right. Let's turn that over to him for him to look at.
BY MR. TILLERY:
Q. You may have to try to work to enlarge it.
MR. NARESH: Dr. Botham, do you know how to do that? If not, we can go off the record for a moment and --
THE WITNESS: No, I can do that. I'm doing it now. That's fine.
MR. NARESH: Okay.
THE WITNESS: Okay. I can read it clearly now, thank you.
BY MR. TILLERY:
Q. If you wouldn't mind going down

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to the section -- it would be the fourth column over, counting the date, and it will be under the heading of "Minute/Actions" and under the "Slides not available," "Comments from ... Di Monte."

Do you see that? If you'd read that section.

A. Right. I'm just struggling to find that, sorry.

Q. Where it says "Comments from Prof Di Monte."

A. Is that on the first page or further down?

Oh, yes, I've got it now. I'm sorry, it's on -- yes, I can see it now. Thank you very much, got it.

Q. No problem.

A. Okay, yes, I've read that. Thank you.

Q. All right. So these are another set of minutes -- she's going to take this back.

MR. TILLERY: If you'd enlarge the paragraph to right there. Yeah, right there. Yeah, that one. Yeah. Perfect. Perfect. Thank you.

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BY MR. TILLERY:

Q. Do you see that?

A. Yes, I do, thank you.

MR. NARESH: I think it's getting cut off. At least on my screen, it's getting cut off on the very far right.

MR. TILLERY: Okay. She'll have to shrink it now a little bit.

BY MR. TILLERY:

Q. Can you still read it, Dr. Botham?

A. Yes, that's fine for me, thank you.

Q. Okay, sure.

These are another set of minutes from the Paraquat Health Science Team, correct?

A. Yes, they are.

Q. And this is from a meeting on April 20-21, 2009, right?

A. That's correct.

Q. And on the fourth row, and this is SYNG-01117480, there is an agenda item for paraquat study updates, correct?

A. Correct.

Q. Okay.

Dr. Di Monte gave a presentation of preliminary results from his studies with

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paraquat in squirrel monkeys, didn't he?

A. He did, yes.

Q. Were you there for that?

A. Yes, I was.

Q. Okay. And actually, it lists you at the top of the page, that you were present for this as part of the Health Science Team, along with L.L. Smith, Breckenridge, Sturgess, McFarland, Mewes, and others, right?

A. That's right.

Q. Okay. And there were some guest speakers that were there as well. That included Joan Abbott, David Brooks and Jeff Wolf. Correct?

A. Correct.

Q. Who was Jeff Wolf again?

A. He was a consultant pathologist.

Q. Okay. Let's take a look at what Syngenta recorded about Dr. Di Monte's presentation in the meeting minutes.

Dr. Di Monte treated four squirrel monkeys with paraquat, correct?

A. Correct.

Q. He gave the monkeys paraquat first at 5 milligrams per kilogram of their body

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weight, correct?

A. Yes.

Q. But at the 5 milligram doses, monkeys died due to lung toxicity after the second or third doses, correct?

A. That's right.

Q. Okay.

Now, lab mice and rats have tolerated doses greater than 5 milligrams per kilogram of body weight, haven't they?

A. Yes, they have. Yes.

Q. In your studies, lab mice have tolerated paraquat up to 25 milligrams per kilogram of their body weight; is that correct?

A. Yes, that's correct.

Q. But Dr. Di Monte's squirrel monkeys died at one-fifth of that dose, didn't they?

A. Yes, they did.

Q. So Dr. --

A. Can I say, it was a different route of administration. So this was subcutaneous. The other -- the studies you're referring to were intraperitoneal. That may have had an effect.

Q. We're going to talk about that

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later. But you would agree with me that Dr. Di Monte's squirrel monkeys died at one-fifth of the dose that the lab mice could tolerate, correct?
A. Yes.
Q. Okay. So Dr. Di Monte's squirrel monkeys were substantially more sensitive to paraquat's toxicity than rodents, weren't they?
A. Yes.
Q. And squirrel monkeys are primates, right?
A. Yes.
Q. You and I are primates, right?
A. Yes.
Q. Dr. Di Monte reported, as a preliminary assessment of his results, that primates are more sensitive to systemic toxic effects of paraquat. Correct, sir?
A. Correct.
Q. Dr. Di Monte lowered the dose to the squirrel monkeys to 2.5 milligrams per kilogram of body weight to keep the monkeys from dying?
A. That's what he did, yes.
Q. Okay. And no difference in the

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numbers of dopaminergic neurons was observed; is that what he said?
A. That's what he told us, yes.
Q. But alpha-synuclein was up-regulated in paraquat-treated animals, correct?
A. That's what he told us, yes.
Q. And you knew at that time the role of alpha-synuclein in Parkinson's disease, didn't you?
A. We certainly knew that alpha-synuclein was up-regulated in Parkinson's, yes.
Q. But as you told us I think a few minutes ago, Syngenta has never, at any time in its history, corporate history, ever undertaken an alpha-synuclein study with respect to paraquat, correct?
A. That is correct because we've never been clear exactly what the role of alpha-synuclein actually is.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Would you agree with me that at no time in Syngenta's corporate history has

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Syngenta ever undertaken a study of alpha-synuclein with respect to paraquat?
A. Yes, that is correct.
Q. All right.
MR. TILLERY: Now let's go to the next exhibit, please. What number is that?
MS. BRUMITT: 71.
MR. TILLERY: 71, as she is loading this document, is SYNG-PQ-01305484.
(Botham Exhibit 71 marked for identification.)
BY MR. TILLERY:
Q. We're going to give this to you. It's three pages. And then, please, if you wouldn't mind, take a look at it.
A. Yeah, okay, I've done that. Thank you.
MR. TILLERY: Take it back. Right there would be good enough, if you can hold it.
BY MR. TILLERY:
Q. So this particular exhibit, number 71, is a summary of the notes made during a presentation by Dr. Di Monte at the

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Marlow meeting regarding his findings with paraquat in the squirrel monkey. Correct?
A. Correct.
Q. It says the notes here were taken in the presence of Syngenta's legal counsel. We'll get back to that.
Do you see that?
A. I do.
Q. All right. Now, these notes were made by Nick Sturgess in April 2009, correct?
A. That's correct.
Q. And if you see the third paragraph, it says:
"Studies with [paraquat] PQ conducted to replicate the mouse PQ dosing regimen (3 x weekly doses of 5mg/kg PQ s.c.)"
What's the s.c. stand for?
A. Subcutaneous.
Q. Subcutaneous.
"... resulted in [at least] 50% [and it says] lethality."
It means death, right?
A. It means that the animals died, yes.
Q. So if you gave them that much,

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you'd kill them?
A. Yes.
Q. "Loss of striatal dopamine was noted in the dead animals, but this was not quantified."
Do you see that?
A. Yes, I do.
Q. That was not recorded in the Health Science Team minutes, was it?
A. No, that's correct.
Q. Okay. In the monkeys who were given the lower dose of paraquat, Dr. Sturgess noted that Di Monte did not observe a change in total TH+ neurons, right?
A. Yes.
Q. Where does it say that?
"No effect on PQ on the number of TH+ neurones was observed ..."
Do you see that?
A. Yes.
Q. Okay. But Dr. Di Monte did report that detailed histochemical analysis indicated a change in neuromelanin-staining phenotype of some neurons when examined post -- examined four weeks post dose.

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Do you see that?
A. Yes. Yes. I can't see it at the moment but I --
Q. That --
A. I'm sorry, I can't see it at the moment, but, having looked at the document, I know it's there. Sorry. You're still on page 1.
Q. Yeah. And that finding wasn't reported in the action/minutes either, was it?
A. No, the action/minutes don't go into the level of detail that's here.
Q. Okay.
Dr. Di Monte observed a change in the type of dopaminergic neurons in the substantia nigra pars compacta in paraquat-treated monkeys, didn't he?
A. He saw --
MR. NARESH: Steve --
THE WITNESS: Yeah. He saw a --
MR. NARESH: Sorry to interrupt but can you -- I don't know that the exhibit presentation is matching your questions.
THE WITNESS: Yeah, that's what

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I meant. Yeah. It does now.
MR. TILLERY: Okay.
THE WITNESS: You need to go -- it's on the next page as well.
MR. TILLERY: Okay. Let's go to the next page.
(Off-the-record discussion regarding electronic feedback.)
MR. TILLERY: So we're back on the record.
BY MR. TILLERY:
Q. Have you had a chance to look at this document as you would wish, sir, or is there more that you want to see?
A. No, I think we were in the middle of answering the question about the effect in the squirrel monkey. Do you want to repeat your question so that I can answer it fully?
Q. Yes, sir, I'll go back through it for you.
Dr. Di Monte reported a detailed histochemical analysis, indicated a change in neuromelanin-staining phenotype of some neurons when examined four weeks post dose.
A. Yes, he did, and -- so what you've

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got in front of you now is part of that. So there are two more lines on the next page.
So, yes, he reported to us that the TH-positive cells, which are the ones that are routinely measured in the mouse model, were unchanged, so the dopaminergic neurones that are normally assumed to be the focus in Parkinson's disease were unchanged.
The change was in --
Q. Right --
A. -- neuromelanin staining, and there was no clear conclusion about what the relevance of that was.
Q. Well, it says at the top of the page:
"The ratio of TH+ & neuromelanin staining neurons to neuromelanin only staining neurons changed in the group dosed with PQ and assessed 4 weeks post dose."
Do you see that?
A. Yes, that's right, and that's because --
Q. That's what he said?
A. Yeah.
Q. I'm asking if you see that.

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A. Yes.
Q. Is this what he reports to you?
A. That's correct, yes.
Q. Okay?
A. Yes.
Q. Dr. Di Monte observed a change in the type of dopaminergic neurons in the substantia nigra in paraquat-treated monkeys, right?
A. I think -- what I'm not -- I don't think we were clear about at the time, and I'm still not clear about now, is whether the cells stained with neuromelanin were actually dopaminergic neurones and whether they were different.
Q. Okay. In paraquat-treated monkeys there was an increase in neurons that contained neuromelanin only --
A. Yes, that's correct.
Q. -- correct?
A. That's correct.
Q. Those neurons were not immunoreactive for TH, correct?
A. That's right, yes.
Q. Okay. Which means they cannot

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produce dopamine; is that right?
A. Which is what I was inferring, yes, and therefore it says, as it says there, "The toxicological significance of this apparent ... change is unclear." So that's exactly what my memory was telling me as well.
Q. Well, it means they can't produce dopamine, right?
A. It means that it doesn't -- yes, first of all, they don't produce dopamine, and, secondly, partly as a consequence of that, their relevance to Parkinson's pathology is not clear.
Q. Well, as a scientist, you're aware that -- those that you would consider neuromelanin cells are considered -- strike the question.
There's a decrease in neurons that contain both TH+ and neuromelanin, right?
A. Yes.
Q. Neurons that contain both TH+ and neuromelanin can produce dopamine, correct?
A. That's possibly true, yes. I mean, I need to remind myself exactly of the detail here but I think that's right.

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Q. Compared to controls, paraquat-treated monkeys had fewer of these neurons that contained both TH+ and neuromelanin, correct?
A. Yes.
Q. Now, if you turn to the first paragraph on page 2, do you see that?
A. Yes.
Q. Dr. Di Monte reported that the ratio of neurons that contained both TH+ and neuromelanin, that the number of neurons that only contained neuromelanin changed with paraquat treatment, didn't he?
A. Yes.
Q. The ratio went down, didn't it?
A. Yes, because the number of cells which were neuromelanin only went up, so the ratio therefore went down.
Q. In the third paragraph, Dr. Di Monte's preliminary conclusions are noted, right?
A. Yes.
Q. Please read that paragraph.
A. To myself or out loud?
Q. The conclusion. Read it out loud.

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I can read it:
"The conclusion [Dr.] Di Monte drew from these experiments was that at the MTD in the Squirrel monkey, [paraquat] did not induce a lesion that resulted in neuronal cell loss in the SNpc [the pars compacta] (quite different [from] the mouse model), but that it may induce a change in histochemical phenotype in some of the neuromelanin containing cells. The toxicological significance of this apparent phenotypic change is unclear."
Do you see that?
A. Yes, and that's what I was mentioning earlier on, that he was indicating he did not understand the relevance of this finding, if indeed there is any relevance, to paraquat potentially causing Parkinson's disease pathology.
Q. Dr. Di Monte concluded that paraquat treatment caused a change in neuromelanin-containing neurons, right?
MR. NARESH: Objection to form.
THE WITNESS: A change does not necessarily mean that it's of toxicological significance, so you have

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to read that with the sentence that follows it.
BY MR. TILLERY:
Q. Well, did he suggest and conclude that paraquat treatment caused a change in neuromelanin-containing neurons?
A. Yes, that's clear.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. And paraquat treatment reduced the number of neurons that contained both TH+ and neuromelanin, and increased the number of neurons that contained only neuromelanin, correct?
A. That's correct.
Q. The last sentence in that paragraph is:
"The toxicological significance of this apparent phenotypic change is unclear."
Right?
A. Yes, because what you also have to look at with the left-hand column --
Q. I --
A. -- which is that the total number of TH-positive cells remained constant.

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So it wasn't -- there was no effect on the primary type of cell of concern, which is the cell expressing TH.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. The last sentence in that paragraph is:
"The toxicological significance of this apparent phenotypic change is unclear."
Right?
A. Yes.
Q. But Syngenta certainly knew that the toxicological significance of decreasing TH+ neurons and increasing neuromelanin-only-containing neurons is a loss of dopamine-producing neurons, correct?
MR. NARESH: Objection to form.
THE WITNESS: No, I don't think we do know that. I repeat what I've just said. There was no loss of the total TH-positive cells in this experiment, so I think it's really not possible to make the conclusion you just said.
///

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BY MR. TILLERY:
Q. So there are fewer neurons that contain TH+, right?
A. No, there are the same number that contain TH+ -- there are fewer which contain both TH and neuromelanin.
Q. And where did -- where did you get that conclusion, sir?
A. From the data that are above there, so you need to go to the previous page. You'll see that the total TH+ count does not change from the 61,000 that you can see there.
Q. Okay. We'll get to that in a second.
MR. TILLERY: Let's go to the next exhibit. And this is --
MS. BRUMITT: 72.
MR. TILLERY: This is 00669432?
MS. BRUMITT: Yeah. 72.
MR. TILLERY: 72.
(Botham Exhibit 72 marked for identification.)
BY MR. TILLERY:
Q. We can turn this document over to you.

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Are you familiar with this document, sir?
A. Yes, I've seen it in the past. I've not read it recently.
Okay.
Q. This is a study conducted by Dr. Di Monte, by Alison McCormack and others in his lab, right?
A. That's correct.
Q. And this study was published in 2004, correct?
A. That's right.
Q. And that's five years before he made his squirrel monkey presentation to the Health Science Team --
A. Yes.
Q. -- is that right? You're familiar with this study. You read it at the time, I presume?
A. Yes, we did.
Q. All right. And here, Dr. Di Monte was studying dopaminergic neurons in the substantia nigra pars compacta of squirrel monkeys, right?
A. Yes.

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Q. The same kind of animals that he was using for his analysis when he made the presentation, correct?
A. That's correct.
Q. Okay. And the results are given on page 390 of the original journal, and that's at SYNG-669435, if you would go to that section of the article, the Results section.
A. Okay. You've taken control, so ...
Q. We'll give it back to you and you can look at this. And that's 00669435.
Are you -- tell me when you're ready to answer questions.
A. Well, I'm sorry, I'm still waiting to receive the document. Nothing's happened.
Q. Oh, I didn't know that.
A. Sorry, I thought you were having problems at your end.
Q. No, no, no, we're not.
MS. BRUMITT: Do you want me to --
MR. TILLERY: I'm sorry?
MS. BRUMITT: Do you want me to present?
MR. TILLERY: Yes, present it.
Yes.

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All right. If you give it back to him and let him ...
BY MR. TILLERY:
Q. Sorry, we didn't understand each other, Dr. Botham.
A. No, okay. That's fine.
Q. What I was directing you to is the Results section, which is on that page right there.
A. Okay.
So I'm seeing the page that you're showing me but that's all.
MR. TILLERY: If you show him the next page, please, and go down a little further, at the bottom of that page.
Yeah, there we go.
BY MR. TILLERY:
Q. If you'd take a look at that "Age-related neurochemical changes," that paragraph, as well.
Okay?
A. Yes, okay.
Q. All right. Let's go back to the preceding page.
Now, if you look at the Results

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section, it says, "Age-related changes in nigral dopaminergic neurons."
Do you see that?
A. Yes, I do.
Q. The first paragraph starts off with:
"TH immunoreactivity and NM content were used as criteria for the characterization of dopaminergic neurons in the monkey substantia nigra. Based on these criteria, three distinct subpopulations were identified: (1) dopaminergic neurons with TH-positive cell bodies and neurites, but without [neuromelanin] NM (TH only cells)."
A. Yes.
Q. Number (2):
"Neurons characterized by both TH immunoreactivity and the presence of [neuromelanin] NM ..."
And then it says, "(TH/NM cells)."
Do you see that?
A. Yes.
Q. And (3):
"Nigral cells that contained [neuromelanin] but were not TH-immunoreactive (NM only cells)."

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Okay?
A. Yes.
Q. "Neurons were counted in monkeys of different ages using the optical fractionator, and the counts of TH only, TH/NM, and NM only cells were either added together to estimate the total number of nigral dopaminergic neurons, or considered separately in order to assess selective changes in these neuronal subpopulations."
A. Yes.
Q. Do you see that?
A. Yes, I do.
Q. Do you need more time to study that?
A. No, no. Go ahead. I think I'm okay so far.
Q. All right. All right.
So this paragraph tells us that Dr. Di Monte calculated total dopaminergic neurons to include three types: TH+ only neurons; TH+ and neuromelanin-containing neurons; and neuromelanin-only-containing neurons. Correct?
A. Yes.
Q. So when Dr. Di Monte uses the words

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"dopaminergic neurons," he's including neuromelanin-only-containing neurons as dopaminergic neurons, right?
A. Right.
MR. NARESH: Objection. Objection; foundation.
Go ahead.
BY MR. TILLERY:
Q. In these monkeys, the total number of dopaminergic neurons remained the same, right?
A. Well, the total number -- yes, with age, remained the same. That is correct, yes.
Q. But the number of each type of dopaminergic neuron changed with age, correct?
A. That's right.
Q. And the overall loss of TH+ neurons in these monkeys, right -- and there was an overall -- strike that.
And there was an overall loss of TH+ neurons in these monkeys, correct?
A. Yes.
Q. The very next page that I ask you to look at and we'll go to now --
A. Just before you do, I think it's

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important that we recognize that that decline was specifically due to a decline of TH-positive only cells. If you just go back.
Q. The very next page, do you see there, "Age-related neurochemical changes"?
Do you see that?
A. Yes.
Q. "The overall loss of TH-immunoreactive neurons in the substantia nigra was accompanied by a significant decline of dopamine in the putamen of aging squirrel monkeys."
Do you see that?
A. Yes.
Q. So in this study, the overall loss of TH+ neurons was associated with a significant decline in dopamine --
(Stenographer interruption.)
BY MR. TILLERY:
Q. In this study, the overall loss TH+ neurons was associated with a significant decline in the dopamine in the putamen of the squirrel monkeys, correct?
A. That's what that says, yes.
Q. So even though the total number of

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dopaminergic neurons remained the same, the loss of TH+ neurons caused a significant reduction in dopamine levels, correct?
A. Yes.
Q. Dr. Di Monte reported to the Paraquat Health Science Team that no difference in dopaminergic neurons was observed, right?
A. He said that there was no reduction in total TH-positive cells, yes.
Q. Okay. So let's go back to 57 --
MS. BRUMITT: 70.
MR. TILLERY: And that's Exhibit No. 70. I'm sorry. Plaintiff's Exhibit No. 70.
If you'd pull that up for him, please. If you just go to these groups and they're on -- yeah. Let him have the document and I'll direct his attention to them. And turn that over to Dr. Botham, please.
MS. BRUMITT: Okay. He needs to pull it up at his end. It's already been introduced.
BY MR. TILLERY:
Q. It should be introduced to you,

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Dr. Botham.
A. Yeah, I've got it but it's still in presentation -- ah, yeah, it's coming now, thank you.
Q. Where I'm going to direct your attention is to the table of neuron counts on pages 1 and 2 of Dr. Sturgess's notes.
A. Yeah, yeah. Okay.
Q. Bottom of page 1, top of page 2.
Do you see it?
A. Yes. Yes, I've got them.
MR. NARESH: Hang on, I think we're -- are you talking about Exhibit 70, because Exhibit 70 is not Dr. Sturgess's notes. 71 is Sturgess's notes and 70 is the minutes.
THE WITNESS: Yeah, I'm on Dr. Sturgess's notes. I think I was ahead of you there.
MR. TILLERY: Oh, it's 71, okay.
MS. BRUMITT: That's 70. That's 71.
MR. TILLERY: Okay, I'm sorry, 71. I thought it was ...
THE WITNESS: Yeah, so I'm now

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looking at Dr. -- at Nick Sturgess's notes.
MR. TILLERY: Let's make sure we're all using the same. Okay. Yes.
Thank you, Mr. Naresh, for correcting that for the record.
BY MR. TILLERY:
Q. We should be looking at Plaintiff's Exhibit 71. I made a mistake, I'm sorry.
Are you looking at the tables?
A. Yes, I am.
Q. You tell me when you're ready to talk, Doctor.
A. Yeah, I'm ready. Please go ahead. Sorry.
Q. Sorry. Okay.
Let us take back and turn on this document and you'll see a box at the bottom of the first page. That one right there, okay.
Here, when Dr. Sturgess -- these are his notes -- referred to total TH counts, do you see that?
A. Yes.
Q. Total TH counts neurons here, he meant total dopaminergic neurons as

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Dr. Di Monte used that term, correct?
A. Yes, I think that's right.
Q. All right. In the paraquat-treated monkeys here, just like in the aging monkeys we discussed, the total number of dopaminergic neurons remained the same, didn't they?
A. I think this is where we need to look carefully because I thought that the paper we've just looked at in aging monkeys said that the total TH-positive cell count went down with age, whereas here it's remained constant.
Q. Well, are you saying that -- you read it to mean that. Did you read it to mean that when you based your conclusions on this report? Is this what you understood?
A. I think this is where we were, overall, not necessarily very clear about the significance of these results because, yes, now that I've looked again at that paper, then I think -- and I think I've just re-read that, you would expect perhaps to see a reduction in total TH-positive counts, which is what happens in an aging animal where, of course, you become more susceptible to -- in a

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primate, a primate becomes more susceptible to Parkinson's disease.
Q. Well, it depends upon how you're counting them, and we went through at great detail how Dr. Di Monte counted them in his study with Dr. McCormack, didn't we?
A. Yes.
Q. And if you look at the definition that he gave and how he counted them in the paraquat-treated monkeys that were here in the study, or that he presented, and in the aging monkeys we discussed from his 2004 paper, the total number of dopaminergic neurons remained the same, according to his analysis, correct?
A. I'd need to look at that again. I think -- as I say, I was reading the piece -- with you having control of the document, I wasn't able to fully and completely read that, but I'm sure I read that total TH-positive counts went down with age.
Q. Well, he -- Dr. Di Monte saw a reduction in TH+ and NM to NM only; isn't that what you understood?
A. I would need to look at the paper

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again, I'm sorry.
Q. Okay. So you can't answer my questions?
A. Well, not without having the McCormack paper in front of me again.
Q. Well, let me ask you this: Let's assume that my interpretation of what that paper says is correct. Let's assume that's correct. Then the total of -- the total number of dopaminergic neurons would remain the same, wouldn't they?
MR. NARESH: Objection to form, foundation.
BY MR. TILLERY:
Q. 61,000, that number would stay the same?
A. I think this is where we may have some confusion. As I say, without having the paper in front of me, I think --
Q. Well, let's -- let's go back to it. You can look at the paper.
MR. TILLERY: Pull the paper back up for him.
MS. BRUMITT: Do you want me to give it back to him?

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MR. TILLERY: No. Take the paper from the preceding exhibit, which is SYNG-669435.
THE WITNESS: Yes, if I could just have a look at the results bit that you were focusing on in the paper last time, that would be helpful, thank you.
BY MR. TILLERY:
Q. We'll do that.
There's the Results section --
A. Yeah, okay, I'm -- if I may just say where I was reading before so that you're clear where I was going with this.
So at the bottom of page 4, you can see the bit that says:
"The number of TH-immunoreactive neurones (TH only plus TH/NM) significantly declined with age ..."
Q. Excuse me, sir. Excuse me. Pardon me, sir, where are you reading from?
A. From the bottom of the page that I can see now, on the left-hand side. The paragraph that begins, "The total cell number did not change ..."
Q. Okay. Okay, fine. Thank you.

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Go ahead.
A. And it says, at the bottom of that first paragraph, the number of TH-immunoreactive neurones significantly declined with age from 56,000 to 40,000 [sic], and then in the next sentence it says:
"This decline was due to a loss of TH only neurones."
That's what I was picking up. You would expect -- if this -- if the effect of paraquat was mirroring what happens in aging, then you would see a decline in TH-positive cells -- TH-positive-only cells, and you don't.
Q. So what you're saying is that your interpretation of Dr. Di Monte's cell analysis or count is inconsistent with what he put in this study, correct?
A. No, I'm not saying that. I think, actually, my memory serves me correctly; I think, actually, Dr. Di Monte and ourselves, in 2009, were saying the same thing, that the effects that he saw with paraquat were not the same as you see in animals that were aging, and therefore it wasn't necessarily possible

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to fully interpret them.
Q. Well, if the result is the same irrespective of the cause, whether it's paraquat or aging, would you agree with me, sir, that -- in other words, if it's either in the paraquat-treated monkeys in his presentation to you in 2009 or the aging monkeys he references in his 2004 paper that he wrote, the total number of dopaminergic neurons remained the same as he described and defined those in that first paragraph of his paper under Results?
A. Yes. The total number, yes.
Q. All right. And the total number of each type of neuron changed with paraquat treatment, the character?
A. I don't know that it did because we don't -- there isn't a column which says total dopaminergic neurones. The columns are total TH+ cells, total TH+ and neuromelanin+ cells, and neuromelanin only. There isn't a column which says total dopaminergic neurons in the McCormack study.
Q. You mean in the paper that Dr. Sturgess created, right?

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A. That's right. So in other words --
Q. Okay.
A. -- there's no equivalent to the 60,000 number here.
Q. But if you look at the Results section of his paper that he wrote, you can see exactly how he counts them.
If that's the case, the number of neuromelanin-only-containing neurons more than doubled, and that means the number of TH+ dopamine-producing neurons fell; correct?
MR. NARESH: Objection to form.
THE WITNESS: Well, we don't have those data so I don't know.
BY MR. TILLERY:
Q. And the loss of TH+ dopamine-producing neurons in the substantia nigra is an adverse finding, isn't it?
MR. NARESH: Objection to form, foundation, scope.
THE WITNESS: Well, I'll repeat: We don't have, as far as -- unless I'm missing something, we don't have, in Dr. Sturgess's notes, the data on total dopaminergic neurones.

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BY MR. TILLERY:
Q. If you go back to his study, the effects in the aging animal were due to a reduction in TH-only neurons, correct?
A. Yes. Correct, yes.
Q. But in the paraquat-treated monkey, there was a reduction in TH+ and NM neurons, right?
A. There was a reduction in TH and NM, yes, that sub-type of cells. Those that expressed TH and neuromelanin, that's where the reduction was seen.
Q. And the effect of both would be a result of a loss of TH+ function; isn't that correct?
A. That's a possibility --
Q. Yes.
A. -- but it would be a relatively small reduction.
Q. Well, you said you can't calculate it, sir.
A. No, I mean --
Q. Would you --
A. No, you can't, you can't.
Q. Would you agree with me -- would you

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agree with me that the effect would be a result of a loss of TH+ function, correct?
A. You are reducing the number of cells which express TH by a small amount, yes.
Q. And that means less production of dopamine, doesn't it?
A. It could translate to that, yes.
Q. Even though the total number of dopaminergic neurons remained exactly the same, per the way he counts them in his study, right?
A. Well, that, I think, is where the scientific debate still is, and remembering that in Parkinson's disease you need to see a significant reduction in dopaminergic cells, more than 70 percent reduction, before you see Parkinson's disease, and this is nowhere near that.
Q. So you're saying that this -- you're trying to compare this to the loss of dopamine-producing neurons in Parkinson's disease, and this --
A. Yes, in order to try and under -- excuse me.
Q. This, as you know, wasn't studying the onset of Parkinsonianism, it was studying

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the simple impact on dopaminergic cells.
So all we're pointing out is if you did this over and over and it happened more and more frequently, the total number would get to that 60 or 65 percent number that you think you need in order for the physical onset of symptoms of Parkinson's; isn't that correct, sir?
MR. NARESH: Objection; form.
THE WITNESS: Well, that is a possibility and, absolutely, that was the discussion we had with Dr. Di Monte, and the discussion was that, you know, he was not in a position in 2009 to come to a conclusion that you could extrapolate from those figures that we've seen in Nick Sturgess's notes to that conclusion.
BY MR. TILLERY:
Q. Well, let me ask you this, sir: Did you ever undertake any study at any time to sort of flesh out this confusion that you and the other scientists say you had?
A. No, we did not progress this route. We chose to focus on our rodent model because,

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of course, that was the work that we were investing in and which we've subsequently published.
Q. Well, were you confused at the time of your meeting with Dr. Di Monte?
A. Confused is not the right word. I think we were -- it was part of the scientific inquiry which we've frequently spoken about, and I think it was -- I think everybody left that meeting, Dr. Di Monte included, not yet clear about what the significance of the findings were.
Q. Okay. So why didn't you do your study, then, at that time of squirrel monkeys to determine exactly what the confusion was, try to solve it for yourself? You had the capability, didn't you?
A. Yeah, well, one thing that we were expecting, because Dr. Di Monte told us, was that he was going to continue his research in the nonhuman primate, and don't forget he was a consultant to us, and so our anticipation, whilst we were focusing on the rodent model, is that he would continue to answer, try to answer that very question that you've posed.

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Q. So you were expecting a third party to do this work, right?
A. He made it very clear -- he made it very clear that this was an area that he was still very interested in and that he would intend at some point in the future to publish the finding.
Q. And he, to your knowledge, was not a worldwide manufacturer or distributor of paraquat, was he?
A. No, of course not.
Q. Syngenta was, right?
A. Yes.
Q. And is. Okay.
So you were speculating that maybe he would go on and do some more work and studies and yet you didn't take it upon yourself to do the study that would be necessary to clarify if there was any -- truly any confusion about these results, correct?
MR. NARESH: Objection; scope.
THE WITNESS: No, I -- sorry.
No, I wouldn't put it that way.
We, as I said, believed that because we were collaborating, if you wish,

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to use the right word, that he would be continuing to take that line of research himself.
And given -- and that's why I mentioned it earlier. Given that you had to be very clear about the ethical use of animals, we wouldn't want to replicate -- use more nonhuman primates when they were going to be used, which we thought at the time, by Dr. Di Monte.
BY MR. TILLERY:
Q. So do you think, instead, it was okay to allow Carroll Rowan, Freemon Schmidt, Mr. Mills and Mr. Niebruegge to be the test animals?
MR. NARESH: Objection to form.
THE WITNESS: No, of course not.
That's --
BY MR. TILLERY:
Q. Okay. Well, weren't you --
A. That's not --
Q. Well, weren't you continuing to sell it?
A. We were continuing to sell it because --

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Q. Okay. Okay.
A. -- this work of Dr. Di Monte's, and the rodent work which we were then starting to be engaged in, had not come to a conclusion that paraquat was causative in Parkinson's disease.
Q. But you were continuing to sell the product. So you were waiting on some speculative test done by some other scientist who was a consultant. Was that test ever done or that study ever done?
A. Well, we believe that if it was, that it never reached the public domain because it was never published. There were some subsequent discussions with Dr. Di Monte and it's -- they didn't -- they did indicate that his arrival at the German Center for Neurodegenerative Disease had meant that his research interests had had to be modified.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Was the additional study ever done?
A. Well, that was my way of answering it. As far as we know, it was not.

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Q. All right. And you never did it either, did you?
A. No, we did not.
Q. Syngenta never did it?
A. No, we did not.
Q. Okay. But you continued to sell it, the product, while this ambiguity existed in your own minds, right?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. Is that right?
A. Ambiguity is something which you have to work with in science all the time and you take a judgment --
Q. Okay.
A. -- like you do with COVID-19 at the moment, for example. Scientific judgments are made, and our judgment at the time was that the overall weight of the evidence was still not pointing to a clearer causation and therefore we did not believe that it was the right course of action to withdraw paraquat from the market.
Q. Okay.
Dr. Sturgess noted in the header of

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that presentation that we've been discussing now for some period of time, that the presentation was given in the presence of Syngenta legal counsel.

Do you remember that?

A. Yes, I do.

Q. Is it the practice at Syngenta that a presentation given by an outside researcher in the presence of Syngenta's legal counsel is considered attorney work product?

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

You can answer in your personal capacity.

THE WITNESS: I'd have to be reminded exactly what the definition of attorney work product is. So would you mind just giving me your description of what you think that is?

BY MR. TILLERY:

Q. Well, let me just ask you this: Is it the practice at Syngenta to conceal adverse results, scientific results, about paraquat as attorney work product?

A. No, that's not the case.

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Q. Okay. So you're telling us that you've never been part of any effort to conceal scientific knowledge or information using attorney work product as an excuse, right?

A. The way in which we've been advised is to -- not to conceal work, no, we've never been instructed -- to answer your question directly, we've never been asked to conceal. We've been asked to carefully consider the way in which our work is presented and when it's presented.

Q. Okay. And you've never been asked to run your work through a lawyer to try to keep it from public scrutiny, right?

MR. NARESH: Objection to form.

THE WITNESS: Not to keep it from public scrutiny. Simply, as I said, to get advice on the best way of when and where to present.

MR. TILLERY: Okay. Pull up the next exhibit --

THE WITNESS: And how. And how I should say as well.

MR. TILLERY: What number is this?

MS. BRUMITT: 73.

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MR. TILLERY: The next exhibit is Plaintiff's Deposition Exhibit No. 73. This is SYNG-PQ-01739155.

(Botham Exhibit 73 marked for identification.)

MR. TILLERY: And if you'd hand this to the witness, please.

BY MR. TILLERY:

Q. Do you have it, sir?

A. I do have it, thank you.

Okay, thank you. I've read that.

Q. Okay. What is this?

A. This is the -- an email from Dr. Sturgess to Dr. Barry Elliott, recording a discussion with an organization called MOTAC Neuroscience.

Q. What is MOTAC Neuroscience?

A. To be honest with you, I can't remember exactly what the nature of MOTAC Neuroscience is, so -- I suspect that this was an organization -- a contract research organization.

MR. TILLERY: If you hand that document, if we take this document back.

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BY MR. TILLERY:

Q. The first bullet, do you see that one --

A. Yeah.

Q. -- where it says:

"Erwan has spoken this year to Prof Di Monte from the PI and has heard from him that paraquat resulted in neuronal cell loss (he assumes this was the end point) in monkeys, comparable to that seen in the C57B16 mouse. Figures of 30-40% loss were mentioned. Erwan did not know the specifics of the study design, but it appears that there may have been very few animals (1 or 2), and overt toxicity seen (... the usual toxicities expected with PQ). We should bear in mind that the lack of detail here, and not necessarily take this 'hearsay' (despite its source) as fact at present."

Did I read that correctly?

A. Yes, you did.

Q. All right. In May 2007, Syngenta learned that Dr. Di Monte had experimented with paraquat in squirrel monkeys and that his results were potentially adverse, correct?

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A. Yes, that's correct.
Q. Syngenta brought him in to speak at the 2008 Paraquat Health Science Team. We talked about that, right?
A. Yes.
Q. And over a year after Syngenta learned Dr. Di Monte was experimenting with paraquat in squirrel monkeys, right?
A. Yes.
Q. That was a year later. And so we know from this email, this is at 2007, that they were aware of it in 2007. We know that they'd brought him in 2008, right?
A. Yes.
Q. Now, Dr. Di Monte spoke on paraquat in the mouse at the September 2008 Health Science Team. We know that.
Who decided the topic of Dr. Di Monte's presentation?
A. This was a discussion between some members of the health -- internal Syngenta members of the Health Science Team and Dr. Di Monte.
Q. Okay. It wasn't until April 2009 that Dr. Di Monte presented to Syngenta the

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preliminary results of his study of paraquat on the squirrel monkey, correct?
A. Yes.
Q. And that's about two years after Dr. Sturgess's email that's marked as an exhibit here, right?
A. Yes. And I think I might be able to explain that.
Q. You know, if you can just bear with me. We're going to get to the end of this --
A. Mmm.
Q. -- in just a second.
But that's about two years after Dr. Sturgess's email about a potentially adverse result with paraquat in Dr. Di Monte's squirrel monkeys, correct? That's what the email says?
A. That's what this says, yes.
Q. And who decided the topic of Dr. Di Monte's April 2009 presentation. Do you know?
A. It would be the same. It would be a conversation between one or two members of the Syngenta team and Dr. Dr. Di Monte.
Q. Okay. When did Syngenta first

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contact Dr. Di Monte regarding his squirrel monkey study with paraquat?
A. I can't give you a date off the top of my head, I'm afraid.
Q. When did Syngenta first learn that Dr. Di Monte observed loss of striatal dopamine in paraquat-treated monkeys?
A. That would be at the Marlow health scientist team meeting.
Q. That was the first time?
A. It was the first time that I recall, and where it was properly -- if you like, properly presented. There may have been informal discussions before that with colleagues, but I'm -- I don't know whether that is the case.
Q. And when did Syngenta first learn that Dr. Di Monte observed up-regulation of alpha-synuclein in paraquat-treated monkeys?
A. I believe that was at the same time, at the Marlow meeting.
Q. When did Syngenta first learn that Dr. Di Monte observed a change in neuromelanin in paraquat-treated monkeys?
A. Again, I believe that it was at the

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Marlow Paraquat Health Science Team meeting.
Q. Okay.
MR. TILLERY: Let's go to the next, and this would be exhibit what?
MS. BRUMITT: 74.
MR. TILLERY: 74.
THE VIDEOGRAPHER: Mr. Tillery, this is Wendy here. We're getting quite low on media time so would it be possible to take a two-minute break while I change it, please?
MR. TILLERY: Yes, you sure can. We'll go off the record at this point.
THE VIDEOGRAPHER: Perfect. We are going off the record. The time is 5:26.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 5:35.
BY MR. TILLERY:
Q. Before we get to this new exhibit, I just want to clarify something that I thought of as we took a break here and I wanted to clarify some questions for you on the issue of Dr. Di Monte's presentation and his study in 2004.

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In terms of the presentation he made to you based upon the study of the squirrel monkeys, this was a short-term sub-acute study of the impact of paraquat on dopaminergic neurons in the primate substantia nigra, correct?

A. Yes.

Q. All right. You could extrapolate from this data that there was a potential loss of TH+ function, correct?

A. Well, I think you can extrapolate a number of things, that included, but that's not the only extrapolation you could make.

Q. But would you agree that you could extrapolate from the data that there was a potential loss of TH+ function?

A. Yeah, but don't forget that this was at a very high dose of paraquat, and in toxicology, you know, you often use very high doses as a surrogate for longer dosing.

So I --

MR. TILLERY: I'm sorry but I have to move to strike your answer as unresponsive.

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BY MR. TILLERY:

Q. Can you just answer me: You could extrapolate from this data that there was a potential loss of TH+ function, correct?

A. You could. I would not.

Q. But you could, couldn't you?

A. Well, as I've just said, you could, but my judgment --

Q. Yes.

A. -- would be that you wouldn't -- that I wouldn't do that.

Q. And a loss of TH function could result in a loss of dopamine production, correct?

A. Yes.

Q. All right. Is a loss of TH function a potentially adverse result?

A. In and of itself, it could be, but it's -- you would normally want to see other effects, including loss of dopamine.

Q. But it could be, couldn't it, in and of itself?

A. Yes. If you believe that that was a clear finding, then yes.

MR. TILLERY: All right. Now we're

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on to number 74, I believe.

(Botham Exhibit 74 marked for identification.)

(Off-the-record discussion.)

BY MR. TILLERY:

Q. Can you look at this. It covers two pages so feel free to take charge of it and look at the document.

For the record, this is SYNG-PQ-20736066 and it's Exhibit ...

MS. BRUMITT: 74.

BY MR. TILLERY.

Q. ... 74.

A. Yes, okay. Thank you.

Q. All right. What is this?

A. This is an exchange of emails which report some scientific findings which were presented at a neurotoxicology meeting in 2007.

Q. This is a chain between various people at Syngenta in the regulatory affairs and product safety section, right?

A. Yes --

Q. The first --

A. -- it was largely within -- yes,

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it was. Yes, it did include regulatory affairs, that's correct.

Q. The first email in the chain was sent on October 23, 2007; is that correct?

MR. TILLERY: Do you have that back yet?

MS. BRUMITT: No. Do you want me to take it?

BY MR. TILLERY:

Q. We'll go to the back of this document and open it up and we'll take it.

Okay. You see the first one is Eileen Kennedy?

A. Yes.

Q. Okay. All right. So this article claims a link between PQ, paraquat, and higher incidence of Parkinson's, right?

A. Yes.

Q. Okay. And then the next one is referencing "scary stuff."

And then there's Monty Dixon. What's his job at Syngenta?

A. Monty Dixon was, and still is, a regulatory expert in the North America regulatory team.

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Q. He sends this to Dennis Hackett at USGR. What's that stand for?
A. USGR is the United States Greensboro. It's their physical location.
Q. Okay. All right. What's his job there, Mr. Hackett's?
A. At that time, I'm not quite sure what role Dennis Hackett had, but certainly he was very much involved in, for example, the potentially referable findings process.
Q. Okay. So he says:
"Eileen Kennedy just forwarded this information to me. Can you please look at [this] information on page 5. I want to ensure proper steps are taken if this is reportable."
What does that mean?
A. Reportable under 6(a)(2) as a potentially referable finding.
Q. 6(a)(2), what you're saying is, is reportable to the United States Environmental Protection Agency as something that would be required under FIFRA to be disclosed to them as some adverse issue they should know about the chemical, correct?
A. Correct, yes.

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Q. All right. Okay. And how does this email exchange progress?
A. So you'll need to scroll up for me.
Q. Sure.
A. Okay. So Dennis Hackett, in that capacity as the technical secretary for the PRF Committee in the United States, sent it to Bob Parr-Dobrzanski, who was the technical secretary for the approach committee that discussed findings to make recommendations as to whether they could be reportable under 6(a)(2).
Q. And did he make a recommendation, do you know?
A. Well, if you scroll up.
Yes, that confirms what I already knew, that it was agreed that this should be discussed by the PRF Approach Committee that I've just mentioned.
Q. And you're listed on these emails, aren't you?
A. On some of them, I suspect, yes.
Q. Yeah, along with Lewis Smith?
A. Mmm.
Q. I'm wondering, what was your

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recommendation about disclosing this information?
A. Well, we discussed it in the PRF Approach Committee. I was a member of that. I may have even been the chair at the time. I would need to be reminded of that. I suspect I was. And we discussed what we had heard at the time. But I don't have the record in front of me. This is in 2007; I can't remember exactly how that went.
Q. Okay.
Yes, go up. Okay. That's the last entry on the document. Do you see that?
A. Yes.
Q. Okay. And it doesn't tell you what happened to this, and whether there was a report made, does it?
A. No, it doesn't. No.
Q. Okay.
Tim Pastoor was a member of the PRF Approach Committee, right?
A. Yes, I think he was at that time.
Q. The news article reported that:
"Three new studies presented earlier this month at the Collaborative Centers for

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Parkinson's Disease Environmental Research ... meeting combined information from human and animal studies, thus strengthening the alleged link between the disease and exposure to pesticides, scientists say."
Right?
A. Yeah, I'm not sure where you're reading that from, but -- that is from further down the document --
Q. We can lower the -- actually go down a little further on the article, if you want.
A. Yeah, okay. Yeah, I've got that, thank you.
Q. Okay. It also says:
"One study examined 80,000 licensed pesticide applicators and their spouses and found that farm workers exposed to the pesticide paraquat had twice the expected risk of developing Parkinson's than others."
Right?
A. Yes.
Q. It also says:
"A second study found that rodents exposed to paraquat had a build-up of protein alpha-synuclein in their brains. The protein

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has been linked to Parkinson's in the past, and the third study found that the build-up of alpha-synuclein ... destroys dopamine producing cells - the same cells that die in people afflicted with Parkinson's."

Right?

A. That's what that says, yes.

Q. And the article had a quote from Dr. Di Monte of the Parkinson's Institute, right?

A. Yes.

Q. And Dr. Di Monte said:

"'This increase in alpha-synuclein in the brain could be the missing link between the exposure to this agent and how this agent causes the disease."

Right?

A. Yes.

Q. And that was when, 2007?

A. Yes.

Q. Thirteen years ago?

A. Yes.

Q. So the missing link is the alpha-synuclein, and you told us here today in this deposition that the -- unequivocally,

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that in the history of your company you have never investigated alpha-synuclein deposits, protein deposits in the midbrain secondary to paraquat, have you?

MR. NARESH: Objection to form.

THE WITNESS: No, we haven't.

And the important word here is "could be," the "could," and that -- so that was purely hypothesis at that time.

BY MR. TILLERY:

Q. So you've -- can I get a clear answer: Have you ever done it?

A. No.

Q. All right.

And the agent that Dr. Di Monte was referring to is paraquat, correct?

A. Yes.

Q. That's what he was referring to? Yeah.

So Lewis Smith responds to Tim Pastoor's email and he said there:

"This appears to be the same as the press release some [time] ago."

I think, yes, you have it.

"As far as I can see it is the

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information and statements from the Parkinson's Institute."

He goes on to say:

"The new information which was given at the Neurotoxicology meeting is that non human primates given toxic doses of PQ show increases in alpha synuclein in the brain."

So Syngenta knew by, at the latest, November 2007 that Dr. Di Monte had observed up-regulation of alpha-synuclein in paraquat-treated monkeys, correct?

A. Yes.

Q. And Syngenta knew that the Parkinson's Institute had reported that the buildup of alpha-synuclein was shown to destroy dopamine-producing neurons, correct?

A. That's what was in that report, yes.

Q. And Syngenta knew Dr. Di Monte had suggested that the increase in alpha-synuclein could be the missing link between how paraquat exposure causes Parkinson's disease, correct?

A. Correct, and thus explaining why we thought it was very important for us to engage in conversations with Dr. Di Monte.

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Q. But not important enough to ever do alpha-synuclein studies yourself, correct?

A. Because we chose not to go down that route, for the reasons I explained earlier; in 2009 --

Q. Because --

A. -- we believed that was the research that he was doing.

Q. So on the supposition -- strike the question.

What did the PRF Approach Committee decide to do with this information after Dennis Hackett forwarded this email in November 2007?

A. I don't know what happened in 2007. I know that there was a further discussion in 2009. That, I do remember. But in 2007, I'm not sure what the PRF committee did.

Q. Well, let's find -- what did they do in 2009?

A. Well, we discussed what we'd heard at the Marlow meeting.

Q. Okay.

MR. TILLERY: And let's look at that 2009. Could you pull that document up. It's -- exhibit now?

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MS. BRUMITT: 75.
MR. TILLERY: 75. This is SYNG-PQ-02601795. Exhibit No. 75 for this deposition.
(Botham Exhibit 75 marked for identification.)
BY MR. TILLERY:
Q. We'll give you that document, sir, and it's two pages, and let you read it and then she'll take it back for the questions, okay?
A. Okay.
Q. Do you have it yet, sir?
A. Yes, I've got it and I'm just getting to the bottom of the appropriate section. So, yeah, fine, I've read that now, thank you.
Q. All right.
MR. TILLERY: Let's take it back and put it on the screen.
BY MR. TILLERY:
Q. Okay. This is the Syngenta Human Safety, Potentially Referable Findings Approach Committee, correct?
A. That's correct.

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Q. Minutes of a meeting held on 19 May 2009 and it's marked confidential, right?
A. That's correct.
Q. Who was the chairman of that meeting?
A. It was me.
Q. That committee?
A. Me.
Q. And who is Peter Hertl at that time?
A. He was the head of product safety in North America.
Q. And he was also a member of the Syngenta executive committee, wasn't he?
A. No, he was not.
Q. Was he ever?
A. No, he was not.
Q. Okay. And who was J. Akins?
A. He was a toxicologist in the human safety team reporting to Peter Hertl.
Q. Okay. And R. Lewis?
A. A toxicologist in the Europe human safety team reporting to me.
Q. And then there's N. Sturgess that we've talked about many, many, many, many times.

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A. Mmm-hmm.
Q. And then A. Cook, is that Andy Cook?
A. That's Andy Cook, yes.
Q. And then Mr. Davies?
A. Yeah.
Q. And then Mr. Parr-Dobrzanski, right?
A. That's right, correct.
Q. All right. Okay.
Dr. Di Monte made his squirrel monkey presentation in April 2009, right?
A. Yes.
Q. This committee met the next month, right?
A. Yes.
Q. You were the chairman?
A. Correct.
Q. One of the items the committee took up was the information provided by Dr. Di Monte, right?
A. Yes.
Q. The third item taken up by the committee that month was review of verbal presentation by Dr. Di Monte regarding preliminary findings from experimental studies with paraquat and MPTP in nonhuman primate

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squirrel monkeys, right?
A. Right.
Q. Okay. Nick Sturgess presented Dr. Di Monte's findings to the committee, right?
A. Correct.
Q. And the conclusion of the committee is presented here, isn't it, in this document?
A. Yes. You need to go to page 2.
Q. Okay. Would you do that, please. Do you see the conclusion in front of you, sir?
A. Yes, I do. If I can just --
Q. Okay.
A. Yeah, I can see that.
Q. Okay. And the committee concluded:
"The brain findings in the non-human primate were unanimously agreed as constituting new data."
Correct?
A. Correct.
Q. The up-regulation of alpha-synuclein in the squirrel monkey, that was one of them, right?
A. Correct.
Q. And the reduction in the ratio of

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neurons containing TH+ in neuromelanin to neurons containing only neuromelanin, right?
A. Correct.
Q. The committee goes on to say:
"The participants noted that the study had not yet been completed, peer reviewed or published and that the data, by Dr. Di Monte's own admission, required further verification."
Right?
A. Yes, indeed. As I indicated earlier.
Q. Okay. And it's your understanding that the preliminary data need not be reported as a potentially adverse finding under FIFRA 6(a)(2)?
A. No, that's not the definition of non-reporting, just the fact that it's preliminary data.
The definition is whether the new findings were interpretable in terms of whether they were adverse. And because of the uncertainties, which we've been discussing, the conclusion was that they were not reportable.

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Q. And let's be very specific on this. The exact reason for why they weren't reportable, tell us again. Very important.
A. Because they -- as it says there, for example, because there was no obvious adverse consequence of the findings in the brain, like we were discussing before, of was there clear evidence that dopamine levels had changed, that there were changes in motor function in the animals or other such outcomes, and because Dr. Di Monte himself -- and, more importantly, because Dr. Di Monte himself had told us he could not fully interpret those findings that we were discussing earlier.
Q. Now, where do you find that in the conclusion of this committee? Look --
A. It's at the --
Q. -- at the document where it says that and then read from this where it says what you just said?
A. Well, it said that, by Dr. Di Monte's own admission, required further verification and --
Q. That's what it says. That's what

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it says, doesn't it?
A. Yeah, and then the participants also noted that the toxicological significance of the apparent phenotypic changes, which is what I've just been -- that's what I've just said in a longer form, is unclear.
Q. Okay. Because it was unclear to you and the other scientists and because it required further verification, you did what? You made a decision not to report it, right?
MR. NARESH: Objection to form.
THE WITNESS: We did, and I would like to reinforce that that was largely on the basis of what we had heard from Dr. Di Monte himself.
BY MR. TILLERY:
Q. And you didn't report it? I want to make sure the court and jury knows you did not report this to the US Government. Is that correct?
A. I'm pretty sure that we did not.
Q. Okay.
The committee then concluded:
"On the basis of the preliminary nature of the findings and the lack of obvious

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adverse consequence of the findings in the brain the data do not meet the necessary technical criteria for a referral."
Is that what it says?
A. That's what it says.
Q. The last sentence? Okay.
The potential referable findings committee decided not to refer it to the US EPA or other regulatory bodies throughout the world, correct?
A. Yes. We -- but don't forget the ultimate decision was not taken by this approach committee, it was taken by the -- I believe that would be taken by the US PRF committee, which, you remember, we discussed that in the last deposition.
Q. And did they follow that recommendation?
A. That's what I think I said earlier. Yes, I believe that was the outcome.
Q. Okay.
The potentially referable findings committee concluded that a paraquat-induced reduction in dopamine-producing neurons and increase in neurons -- I'm going to move

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to strike that question.
The potential referable findings committee concluded that a paraquat-induced reduction in dopamine-producing neurons and increase in neurons that don't produce dopamine was not adverse. Correct?
A. That was our judgment from what we had seen and heard from Dr. Di Monte, correct.
Q. The Parkinson's Institute reported increased alpha-synuclein had been observed to destroy dopamine-producing neurons, correct? You knew that at the time?
A. That was back in 2007, yes.
Q. Right. So you'd known for two years at that time?
A. Yes. Interestingly, I don't recall that particular finding being discussed with us in our Marlow meeting.
Q. Right. But the Syngenta potentially referable findings committee concluded that paraquat's up-regulation of alpha-synuclein was not adverse, correct?
A. That's correct.
Q. Okay.

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When Dr. Di Monte made his squirrel monkey presentation to the Paraquat Health Science Team he agreed to share brain tissue with Syngenta to perform a residue analysis, didn't he?
A. He did.
Q. And the purpose of the residue analysis was to confirm the presence and concentration of paraquat in the squirrel monkeys' brains, wasn't it?
A. That's right.
MR. TILLERY: So if we can quickly pull up number -- this one here, number ...
MS. BRUMITT: 76.
MR. TILLERY: ... 76. This is SYNG-PQ-01188018.
(Botham Exhibit 76 marked for identification.)
BY MR. TILLERY:
Q. If you'd take a look at that, I have just a few questions about it.
Do you have it, sir?
A. I do, yes, thank you. Mmm-hmm.
Q. Okay.

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Instead of taking this back, I'm going to let you keep this for these questions, okay?
A. Okay.
Q. So you can follow along with me. It might make things go quicker because I know we have to let you out in ten minutes to get out of there, okay?
A. Yeah, that's fine. Please go ahead.
Q. All right.
This is a memorandum by Kim Travis, this is Plaintiff's Deposition Exhibit 76, proposing to collaborate with Dr. Di Monte in the analysis of paraquat concentrations in the brains of squirrel monkeys, right?
A. That's correct.
Q. Dr. Travis proposed that Syngenta analyze paraquat concentrations in brain tissue provided by Dr. Di Monte from his paraquat-treated squirrel monkeys, right?
A. That's right, and that was discussed at the Marlow meeting.
Q. Okay. In the last sentence of the second paragraph on page 1, if you have that.

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A. Mmm-hmm.
Q. Okay. Dr. Travis describes Dr. Di Monte's work with paraquat as:
"In essence, Dr. di Monte has established a primate analogue of the C57Bl6j mouse model ..."
Correct?
A. Yes.
Q. All right. The fourth paragraph begins:
"Dr. di Monte is interested in understanding [the] mechanisms [of action], and so of course are we."
Right?
A. Yes.
Q. Do you see that? All right. And that refers to mechanism of action of paraquat on dopaminergic neurons in the substantia nigra portion of the brain, correct?
A. Correct.
Q. Dr. Travis goes on to say:
"The squirrel monkey model is clearly more relevant to man than the C57Bl6j mouse model, due to genetic relatedness."
Correct?

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A. Yes, indeed, as we discussed earlier today.
Q. And that's consistent with what we've already talked about in this deposition?
A. Yes.
Q. And you agree that that's true?
A. Yes.
Q. Right?
A. Yes.
Q. Dr. Travis says:
"Therefore the results will help shed light on whether paraquat could partially result in effects in the brain [of] man ..."
Right?
A. Yes.
Q. And you agree with that as well, correct?
A. Yes.
Q. The last paragraph on page 2 says:
"Dr. di Monte indicated to me ... he was intending to publish the results."
Right?
A. Yes.
Q. Later in that same paragraph, Dr. Travis says:

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"If we conduct the paraquat analyses for him, then we must provide him with the full results, and we must expect him to publish them."
Right?
A. Yes.
Q. Okay.
MR. TILLERY: Now, let's go to this document, which is number 77, Plaintiff's Exhibit No. 77.
(Botham Exhibit 77 marked for identification.)
BY MR. TILLERY:
Q. If you would take a look at that exhibit, sir. Specifically, I'm going to look and ask you questions on page 18 of that document, 18 out of 22, and that's 858, after you've familiarized yourself with it.
And just for the reference, this is SYNG-PQ-01116841. It's Plaintiff's Exhibit 77.
A. Okay. And I've gone to page 18.
Q. Okay. So what is this document?
A. This is a set of slides broadly around the kinetics of paraquat in animal models, and this specific slide is about

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the analysis of paraquat in the brains from Dr. Di Monte's nonhuman primates studies.
Q. Okay. So slide 18 is analysis of paraquat in the brain from Di Monte's nonhuman primate studies. The slide notes, Syngenta has the option to analyze paraquat in the brain samples, correct?
A. Yes.
Q. And it says results would be shared with Dr. Di Monte. In the middle of the slide, the author says:
"If we did, the objective would be: To establish if a significant [paraquat] concentration was present in the brains ..."
Right?
A. Yes.
MR. TILLERY: Now, if we go to the next exhibit. Which is what number?
MS. BRUMITT: 78.
MR. TILLERY: 78. If you'd look at this one.
(Botham Exhibit 78 marked for identification.)
THE WITNESS: Okay, received and I'm familiar with this.

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BY MR. TILLERY:
Q. You're familiar with this study, aren't you?
A. Yes.
Q. This is the study of paraquat residues in the brain tissue of Di Monte's squirrel monkeys, isn't it?
A. Yes.
Q. And the report was dated January 21, 2011, right?
A. Correct.
Q. The study initiation date's reported as September 13, 2010.
A. Yes.
Q. That's more than a year after Dr. Travis requested permission to conduct the study. The study completion date is October 29, 2010, right?
A. That's correct.
Q. Okay. About three months before the final report was issued, right?
A. Yes.
Q. In the executive summary, it says:
"The study objective was to analyze paraquat residues in the brain tissues [of]

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Squirrel Monkeys exposed to paraquat in a laboratory setting. A total of 15 treated tissue samples and 1 control tissue sample [was] received from SRI International ... under the direction of Dr. Di Monte."

That's in the executive summary of this study, right?

A. That's correct, yes.

Q. The second paragraph in that section says:

"The monkey brain tissue samples exhibited paraquat residues which ranged from 0.007 micrograms per gram to 0.256 micrograms per gram, except samples 664, 666 and 732 which were [less than the Level of Quantification]."

A. That's correct.

Q. Correct?

A. That's correct.

Q. So Syngenta confirmed that paraquat was present in the brains of Dr. Di Monte's squirrel monkeys, didn't they?

A. They did.

Q. Okay.

If you look at the first page of that study -- I think you're looking at it --

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the section marked "Data Requirements: EPA Guidelines," does that mean that the study was performed in accordance with data requirements for residue chemistry studies issued by the US EPA?

A. Yeah, I guess that's right, yes, I wasn't involved in the --

(Stenographer interruption.)

BY MR. TILLERY:

Q. Does that mean that this study was performed in accordance with the data requirements for residue chemistry studies issued by the United States EPA?

A. Yes, I believe that's the case.

Q. But this study was never submitted to the US EPA, was it?

A. I don't know. I can't confirm that.

Q. And the results of the study were never disclosed, to this day, to the United States EPA, were they?

A. I can't confirm that.

Q. Or any other regulatory agency for that matter, right?

A. Again, I can't confirm that.

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Q. Well, let's go to the last page -- the last exhibit for this day and then we'll call it a day, okay?

A. Okay.

MR. TILLERY: And what number is this?

MS. BRUMITT: 79.

MR. TILLERY: 79 we'll pull up.

(Botham Exhibit 79 marked for identification.)

BY MR. TILLERY:

Q. Do you see it?

A. Yes, I do, thank you.

Q. I just have a couple of questions and then we'll finish, Dr. Botham, okay?

A. Okay.

Q. This is an internal Syngenta form Dr. Travis used to refer a potentially adverse finding with paraquat to the Syngenta Potentially Referable Findings Approach Committee for consideration of disclosure to regulatory authorities, including the US EPA, isn't it?

A. That's correct.

Q. And did you get a copy of this?

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A. Yes, I would have done, yes.

Q. And what is the subject matter of this potentially referable matter?

A. So this -- we're talking about the data that we've just been describing in the squirrel monkey brain samples that we received from Professor Di Monte.

Q. Yes, it's exactly that we just talked about.

A. It is.

Q. And in the subject matter, it says:

"We have also analysed samples of squirrel monkey frontal cortex from a study conducted independently by [Dr.] di Monte, which shows that the paraquat concentration did not measurably decline between samples ... to have been taken 2 and 8 weeks after a fixed program of paraquat dosing ..."

Then he says:

"Reported findings of increases in alpha-synuclein in the brains of squirrel monkeys dosed with paraquat in the same study referred above ... have also been considered by this committee."

Do you see that?

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A. Yes, I do.
Q. Okay.
And then on the next page, if you look at that, "PRF Committee Comments":
"Studies of the kinetics of paraquat in the brain ... were considered. The committee considered that the findings do not represent an adverse effect or a pre-cursor to an adverse event. Therefore the findings do not meet the technical criteria for referral... in the Product Safety PRF criteria ..."
So you didn't send it to the US EPA, did you?
A. That's correct, because the judgment would have been simply the presence of paraquat in the brain was (a) not a new finding and (b) not necessarily indicative of any adversity.
Q. So despite the references and findings on alpha-synuclein, despite the presence of paraquat in the brain of our closest genetic cousin, a squirrel monkey, or a nonhuman primate, your committee chose not to send this to the US EPA, correct?

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A. I just want to -- need to clarify that. The consideration here did not include -- although it was mentioned, it did not include the alpha-synuclein. This was specifically, as it says here, about the kinetics of paraquat in the brain. So the presence in the brain was the subject matter here.
Q. But you also noticed previously the reference to alpha-synuclein on the front page, right?
A. Yeah, it was mentioned but that was not the essence of the reason for the questions to the committee.
Q. Yes, but you understand the significance of something in a general sense whether it causes people to get sick. The question is whether or not you're dealing with a product that's potentially very dangerous to people. A regulatory body is looking out for the welfare of people like Carroll Rowan, Freemon Schmidt, Jerry Mills, Ronald Niebruegge.
Are you saying that just because it didn't fit in the right box you shouldn't

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turn it in?
A. No, no, we --
MR. NARESH: Object to form.
THE WITNESS: Let's restate.
We discussed the findings in the brain, including alpha-synuclein, in another PRF committee, which -- the one in 2009 that we'd looked at earlier, and in part because Dr. Di Monte himself had told us that the up-regulation of alpha-synuclein, interestingly, when it was caused by MPTP, actually resulted in a protection of effects caused by paraquat, which was an interesting finding.
It was part of him himself, Dr. Di Monte, saying he was not able to fully ascertain whether that finding was adverse.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Let's finish the deposition for today with this question: Did you report these findings to the US EPA or to any other regulatory body in the world?

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A. Could you please define which findings specifically?
Q. That were -- all of those findings set out in that PRF report. Did you report them?
A. In this report, this was regarding the kinetics, and I do not believe that these were reported to regulatory authorities.
Q. Have they ever been reported?
A. I'm not -- I don't believe they were.
Q. Okay. Up to this day they haven't, right?
A. Well, I think we would need to double-check that. I think that is the case but we would need to check.
Q. Is it Syngenta's position that paraquat is neuroprotective and it actually prevents problems in the brain?
A. No, no. And if you were referring to my previous comment, what I was saying there was that it appeared -- that it was MPTP that might have been neuroprotective, not paraquat.
Q. All right. Thank you, sir.

MR. TILLERY: No further questions for today. We will resume tomorrow at the time that your counsel tells us. Would that be 4:00 a.m. Central time, counsel?

MR. NARESH: That's fine. Same as today's fine with us.

MR. TILLERY: Thank you very much. Thank you, sir.

THE VIDEOGRAPHER: We are going off the record. The time is 6:17.

(The deposition concluded for the day.)

CERTIFICATE OF WITNESS

I, PHILIP BOTHAM, declare that I have read the entire transcript of Volume III of my deposition testimony, or the same has been read to me, and certify that it is a true, correct and complete record of my testimony given on Wednesday, June 17, 2020, save and except for changes and/or corrections, if any, as indicated by me on the attached Errata Sheet, with the understanding that I offer these changes and/or corrections as if still under oath.

Signed_____
Philip Botham

Signed and subscribed to before me.
this _____ day of _____, 20___.

_____
Notary Public

*** ERRATA SHEET ***
TRANSPERFECT DEPOSITION SERVICES
216 E. 45th Street, Suit 903
NEW YORK, NY 10017
(212) 400-8845
CASE: Diana Hoffmann, et al., versus Syngenta Crop Protection, LLC, et al.
DATE: June 17, 2020
WITNESS: Philip Botham REF: 27625

PAGE	LINE	FROM	TO

_____
Philip Botham

Subscribed and sworn to before me
this _____ day of _____, 20___.

_____
Notary Public

REPORTER CERTIFICATE

I, LEAH WILLERSDORF, Accredited Verbatim Reporter, Member of the British Institute of Verbatim Reporters (Accreditation No. 166) and Qualified Realtime Reporter (Level 2), International Participating Member NCRA (USA), do hereby certify that: PHILIP BOTHAM appeared remotely before me via Zoom on Wednesday, June 17, 2020, was sworn by me, and was thereupon examined by counsel; that the foregoing is true and accurate to the best of my knowledge, skill and ability; that the testimony of said witness was taken and reduced to stenotype writing before me; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and further, that I am not a relative or employee of any attorney or counsel employed by the parties thereto; nor financially or otherwise interested in the outcome of the action.

IN WITNESS WHEREOF I have hereunto set my hand this June 26, 2020.

_____
LEAH M. WILLERSDORF
Accredited Verbatim Reporter,
Member of the British Institute
of Verbatim Reporters - Accreditation No. 166,
Qualified Realtime Reporter (Level 2),
International Participating Member NCRA (USA)

IN THE CIRCUIT COURT

TWENTIETH JUDICIAL CIRCUIT

ST. CLAIR COUNTY, ILLINOIS

DIANA HOFFMANN, individually and as Independent Administrator of the Estate of THOMAS R. HOFFMANN, Deceased, et al.,	)	No. 17-L-517
Plaintiff,	)	
v.	)	
SYNGENTA CROP PROTECTION, LLC, et al.,	)	
Defendants.	)	

- - - -

CONFIDENTIAL PURSUANT TO PROTECTIVE ORDER

VIDEOTAPED ZOOM DEPOSITION OF

SYNGENTA CROP PROTECTION, LLC

PHILIP BOTHAM

(Volume IV - pages 835-1119 inclusive)

Thursday, June 18, 2020

Berkshire, England,
United Kingdom
(Deponent's location)

Reported by:
LEAH M. WILLERSDORF,
(AVR, MBIVR No. 166,
QRR2, International
Participating Member NCRA.)

Job No. 27627

June 18, 2020

10:15 a.m.
(British Summer Time)

Zoom videotaped deposition of SYNGENTA CROP PROTECTION, LLC - Philip Botham, Berkshire, England, United Kingdom, reported remotely via videoconference before Leah Willersdorf, Accredited Verbatim Reporter, Member of the British Institute of Verbatim Reporters (Accreditation No. 166), Qualified Realtime Reporter (Level 2), International Participating Member NCRA (USA).

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Mark Smith - Syngenta in-house counsel
Wendy Viner - Videographer

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EXHIBITS PREVIOUSLY MARKED

(On the record at 10:15 a.m.)

THE VIDEOGRAPHER: This is Volume IV of the videotaped deposition of Dr. Philip Botham, in the matter of Diana Hoffmann, individually and as Independent Administrator of the Estate of Thomas R. Hoffmann, Deceased, et al., versus Syngenta Crop Protection, LLC, et al. In the Circuit Court, Twentieth Judicial Circuit, St. Clair County, Illinois, Case No. 17-L-517.

This deposition is being held remotely via Zoom on June 18, 2020, at 10:15 a.m.

My name is Wendy Viner from TransPerfect, and I am the legal video specialist. The court reporter today is Leah Willersdorf, also with TransPerfect.

Counsel, would you please introduce yourself for the record.

MR. TILLERY: For the plaintiff, Stephen Tillery of Korein Tillery.

MR. NARESH: For Syngenta, Ragan Naresh, Kirkland & Ellis.

THE VIDEOGRAPHER: Thank you.

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Could I ask the court reporter to please swear in the witness and we can proceed.

PHILIP BOTHAM,

was duly re-sworn.

MR. TILLERY: Before we begin, we have a housekeeping matter to take up with Mr. Naresh. Today, in this outline, which is a continuation of what we started in the second half of the deposition yesterday, are contained about three or four of the documents that you seek to claw back, and that clawback comes, of course, about eight months after the documents were turned over to us and several months after a 502(d) agreement was reached and where the same documents, at least as far as I know, were disclosed pursuant to that same stipulation and order regarding 502(d) disclosures.

Now, on the eve of this deposition, Syngenta has sought to pull back documents that are important to this analysis, and I would think that would be very disruptive to the form of

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this deposition transcript and to my questioning were these documents to be pulled back and not used in this deposition.

I am trying to work out a resolution that's comparable with the good faith we used in negotiating the 502(d) order and to be able to use these documents.

There appear to be several options available to us. One would be to suspend this deposition and get an immediate court hearing today to get a ruling on your objections to our use and your attempted clawback of documents that we've held on our files for almost a year now.

The second would be to try to work around this and use those in this deposition, subject to adequate protections for Syngenta, until an order can be achieved or reached with the court by our presentation of the matter, or yours, whichever, in the coming week or two or three, whatever we need to do.

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It's a bad time for us obviously because of the disclosure of expert witnesses occurring on July 10. We would, however, endeavor to present this to the court as quickly as possible.

So I see the other alternative being to have a hearing -- go through as far as we can this morning, alert the court and have a hearing this afternoon so it doesn't disrupt this deposition. It will disrupt my questioning because it's going to pause it. If you don't stipulate that I can question subject to adequate protections so that if the court rules against us, then that would impact the transcript sections applicable to that exhibit and the use of the actual exhibit.

So given the fact that these documents were in our hands now for literally three-fourths of the year, and then on the eve of the trial they're sought to be pulled back right after we've had Dr. Botham's deposition dates secured for now over a month, and his

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dep notice, seems to me something that I would think that I would like to present to the court.

So I enlist your response as to how you wish to proceed and we'll do whatever makes sense, but those are, I think, options. If you have other options, please let me know, okay.

What is your position on this?

MR. NARESH: Sure. You know, since we're on the record, I disagree with your characterization of the sequence of events but I don't know that we necessarily need to go through all that, given that we do have a limit in time on the deposition. But, for the record, I do disagree with that and I will note that our clawback was more than a week ago and it was your response that we received the day before the deposition; it was not our email to you the day before the deposition.

But, in any event, I think one -- a fourth option would be -- I don't know which documents you're intending to use.

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which documents are in your outline, but one alternative would be if you were to send those to us now, or give me the Bates numbers or whatever the numbers are now, I will -- I can -- my client is here with me on this call, I know he will be in and out today, but I could speak with him at a break about it, about which of the three options or if there are other options, but I don't agree to any of those three options without the benefit of knowing which documents you intend to use.

MR. TILLERY: Well, these are the Jeff Wolff memoranda, Fulbright & Jaworski memoranda, the ones that you basically have produced these multiple different times and ways and even produced them in the 502. It's the 2008 memorandum.

That -- and Mr. King is on this deposition and he could respond with others, but there are about three that you've sought to claw back in the last week or two. I think Friday before last

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you sent out a letter and said you want these back, and these were subject to a 502 stipulation. I mean, the whole idea of a 502 is you're turning over documents that fall into this category. Now, on the eve of this dep, you're pulling them back.

This will be disruptive and, you know, the only -- another alternative would be for you to agree to produce -- I will ask that Dr. Botham be produced again if we're not going to be able to use these documents in this deposition.

So if you want a break right now, I would suggest rather than waiting and disrupting the flow of my questioning, and talk to your colleagues, I'm happy to do that, but I think that otherwise we need to have a hearing.

Now, if the court can't afford us an opportunity to have an emergency hearing, then we're going to have to do one as early as he possibly can, perhaps tomorrow morning.

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But the fact is, is that we need to select one of the alternatives and one of the alternatives also, as I said, is we can work around those and not use them, but it's going to disrupt a whole -- two whole sections, which would be, I don't know, the major part of a day of questioning, and then if that's the case, then he certainly is going to have to have -- we're going to have to have him back to finish the dep.

Dr. Botham told me yesterday he won't be leaving the company until the early fall, I believe were the words he used, and we would accommodate his schedule for doing that, until -- that would allow you an opportunity to flesh out your concerns about those documents being used at all with the court.

But one of these alternatives needs to be grabbed and agreed to right now before we start this dep because that's right what I'm going into next. So --

MR. NARESH: So when you --

MR. TILLERY: -- I urge you to talk

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to your colleague. Let's go offline and see if we can't resolve it at this point in time.

MR. NARESH: Well --

MR. TILLERY: The other thing is it's 4:24 here, and in four hours I think one of the people here could reach out to the clerk and see if we could get time today to have this issue resolved with the court.

I just urge you to try to see what you can do and then we'll go offline and wait until you come back in and tell us you have some suggestion about how you wish to proceed. Okay?

MR. NARESH: Well, can I just ask you, Steve, when you say we need to select one of the alternatives and one of the alternatives is that we can work around those and not use them, can you just tell me so I understand what you're envisioning?

MR. TILLERY: Well, I don't know yet because I don't know how much that would disrupt the flow.

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As you know from the way I take Dr. Botham's deposition, I follow a pattern of sequential series of questions, that the questions at part 3 build upon questions of part 2 and part 1, and if you pull out the major sections it's going to disrupt this deposition.

Now, that means that I -- you know, I can't -- I effectively can't use the outline that's been prepared over the last 120 days. So the fact is, is that the answer needs to be resolved.

I'm open to any suggestions. We'll be reasonable with you in whatever you guys decide you want to do, but the -- but pulling these documents ten days or so before a deposition is resumed when it's pretty clear that these are documents that I want to question about, that is something that, you know, we need to resolve.

I mean, I don't know which of these you want to do, but we're willing to consider any of these options to make

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this work. We don't want to do, in any way, anything that will disrupt the court's order, and by you issuing a clawback letter for documents that were already in our hands under a 502 stip, that's a very unusual circumstance for the court. The whole purpose of the stipulation, as you know, was to avoid these issues, and then we get, before the dep, documents that are on the 502 stip pulled back, or clawed back.

I mean, forgive me for saying so but that appears -- has a very, very strong ring of gamesmanship to it and I don't want to sink to that level at this point because I'd like to do this amicably.

So I urge you to try to do this now or it puts us in the situation where we have to do something with the court as soon as possible.

Judges in this part are loath to do emergency hearings, so that's my reluctance to even make that call, because I don't want to do it, but okay.

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So I would prefer not to have to do that, I think all of us would, so let's try to work it out.

Would you mind taking a few minutes and speaking to Mr. Smith and seeing if you can reach accord on how you want us to handle it, okay?

MR. NARESH: Sure.

Wendy, would you mind putting us in our breakout rooms.

THE WITNESS: Ragan, do you need me to be in that breakout room or not?

MR. NARESH: No, you don't need to join this one.

THE WITNESS: Okay, thank you.

THE VIDEOGRAPHER: So the same breakout room as yesterday?

MR. NARESH: Yes, but, Phil, you don't need to join.

THE WITNESS: No, okay. So I'll just stand by.

THE VIDEOGRAPHER: Okay. We are going off the record. The time is 10:27.

(Off the record.)

(On stenographic record only at

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10:54 a.m.)

MR. NARESH: Steve, we had a chance to confirm, my client and I, and here's what we propose. A couple of things.

First, our view is that this is attorney work product, the memos that you referenced, and attorney work product is not covered by the 502(d) stipulation, so that's where we're coming from on that.

My understanding is that Dr. Botham doesn't know these documents anyway and that he's unlikely to be able to -- that he hasn't -- we certainly haven't shown him those documents in review or otherwise, and I don't believe that he received them previously, though I -- you know, I haven't read every email so I don't know what he could add to that.

All that said, I think that the path forward that we propose here is for you to try to work around those documents in your questioning and if, at the end of the deposition or the end of today, or even a lunch break, you feel like

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you've been deprived of a full and fair opportunity to question Dr. Botham, then we could discuss how best to present this to the court, whether it's in the next day or two or on a more reasonable time period, that we go that way. If that means that Dr. Botham needs to be available for a later deposition, depending on how the court rules, then we would make him available at a time suitable for everybody.

MR. TILLERY: Okay. As long as we're understanding that we could at least get some date between now and the next six weeks, because here's the reason: I know Dr. Botham's a busy guy and I want to make sure we get it done before we get in the middle of these expert depositions and all this.

I'm willing to accept those terms, not raise these or use these documents today and, to tell you the truth, I don't know, other than that one, I want to make sure and consult with Mr. King and make sure that there's nothing else in this

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outline that would be -- we certainly don't want to run afoul of the protective order or any ruling of the court. That's not our intention.

So we'll go ahead and work around them. It's going to disrupt it, but with the understanding that we can have him, depending on how the court rules. And it may be that we can't finish anyway. I think I have a very large amount of material to cover, and whether we finish or not tomorrow is another issue.

But I would certainly want an agreement that we have him by 1 August. We could do this, and my preference would be to do it in the first couple of weeks of July but it's going to take a while to present this to the court.

I think a more fulsome view of the court -- by the court would be the best way to do it where we present -- everybody presents their positions on these and then we get a ruling, but

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I would like an agreement that as soon as the court rules, we would be able to get his deposition.

MR. NARESH: The reason I asked for Mr. Botham to join that was to get a sense of his schedule and I think the back half of July or, you know, mid-to-late July would work for the various folks involved, if that works.

MR. TILLERY: Then we're willing to accept those terms. Okay, all right.

I will tell Dr. Botham, I have nothing against him personally, it's just that, you know, we've seen a lot of Dr. Botham; I'd like to get this thing wrapped up so that's all I'm asking, okay.

So let's proceed and I'll work around them. I will need a couple of minutes before we get started to avoid any even potential miscue by referencing those documents in this, and we'll just figure out a way to cut those sections out of the deposition.

So we'll have to go offline where

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I can speak. So if you wouldn't mind, put the plaintiffs in a chatroom so that I can speak directly to Mr. King. And that would be Mr. King and whoever else you have from yesterday. I don't know if Khaldoun Baghdadi is on the call, or Rosemarie Fiorillo, if she's on the call, but Mr. King, those people should go into our chat, please.

THE VIDEOGRAPHER: Okay. I'll do that right now.

(Off the stenographic record at 10:58 a.m.)

(On the stenographic record only at 11:14 a.m.)

MR. TILLERY: We've been through and we're able to do this: I think we can try to do a workaround. It's going to -- certainly, it's going to leave big sections open. So we think we can proceed without a hearing now and we can then leave out those sections and the whole line on all that, pending what the court rules later, and then instead of an emergency hearing, which I would very,

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very, very much like to avoid, then we can tee this up at the appropriate time in the next couple of weeks and have a hearing. Then, depending on how the court rules, then we'll resume Dr. Botham's deposition.

It may be we don't finish it anyway, so I think that's something we may need anyway. So we're willing to do that and we're ready to proceed with the deposition. Okay.

MR. NARESH: Okay. Stephen, can we agree to confer on -- after you've completed or gone through the end of the day tomorrow, confer on, say, Monday morning and we can see if we can work out a schedule for filing briefs and whatnot? Does that sound okay?

MR. TILLERY: Of course. Of course, yes. Now, Monday morning I have a deposition with you --

MR. NARESH: Right.

MR. TILLERY: And Mr. Oats -- and I'm sorry, I think it's Mr. Ouzt, I keep pronouncing it wrong. I'm happy to talk

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to you before. We'll be starting at 9 o'clock your time so we can discuss that early -- or Sunday is fine with me as well. Okay?

MR. NARESH: Okay.

MR. TILLERY: Either way.

So we're back on now. The videographer can start again, please.

THE VIDEOGRAPHER: We are back on record. The time is 11:15.

MR. TILLERY: Where is Dr. Botham?

THE WITNESS: I'm here.

EXAMINATION ON BEHALF OF PLAINTIFFS: (continued)

BY MR. TILLERY:

Q. Okay. We finally have you on the screen. All right.

Dr. Botham, are you ready to proceed with the deposition?

A. Yes. Yes, I'm ready.

Q. All right. All right.

As I started the deposition yesterday, I asked you, of course, where you are. You're at Jealott's Hill in the same facility, I think, right?

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A. Yes, I am.

Q. All right. And, again, we talked about what our expectations are, and just so we're clear, during the deposition you have the opportunity to speak to counsel at breaks, et cetera, and after the day. But while questions are pending, we have to assume that the deposition would take place in exactly the same way it would be if all representing counsel -- all counsel representing parties were present in that same room.

So can you assure us there's no electronic issues or communications or any kind of devices that would violate what we agreed to yesterday? Does that continue today?

A. I can reassure you that that is still the case.

Q. And is -- that also applies to the fact that there is nobody else there with you, right?

A. There is nobody else here with me in Jealott's Hill, no.

Q. All right.

So let's proceed, and I want to go

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back -- yesterday we were -- because you had to leave the building at a designated time, we didn't really take the time to go through, on the record, a couple of exhibits; not really questions so much as just identifying and looking at exhibits and to identify what those mean and show them on this record so that they can be seen.

I'm going to ask that Exhibit 77 be pulled up so you can take a look at this. We're going to pull it up page by page here and on the screen.

This, if you remember, was the -- what's called PQ Kinetic Study Program and it's dated June 2009. We referenced this yesterday. Do you remember?

A. I do, yes, and I can see that now, thank you.

Q. All right. Can you see that?

A. Yes, I can see this.

Q. All right. Just very quickly, I want to go through this study, okay. This was a presentation by Mr. Travis, wasn't it?

A. Yes, that's correct.

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Q. All right. So if we go -- were you at this presentation?
A. I believe I was.
Q. All right. If we could go to page 2 now of this document. What are we just seeing here generally?
A. This is a -- just a conceptual representation that in order for a toxicological effect to occur, you've got to actually have a biological mechanism by which that operates, the mode of action, and of course you need to have an amount of the toxicant present, a dose of the toxicant present, and that's the kinetic.
So it's a high-level conceptual representation.
Q. Over the next page, then. We're going to move through it rather quickly. Again, what's the gist of this page?
A. So this is looking specifically at the biological mechanism, not the kinetic side. So if there are effects seen in a toxicity study, do we understand -- MoA means mode of action, do we understand the biological basis for that. If we do, can

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we then start to establish if there's a relevance for human beings inasmuch as could the mode of action that's been described in animals actually take -- actually occur in humans.
And then finally, at the bottom, the kinetics comes back in. It may be plausible for this to happen, but are the concentrations, the doses that humans ever see mean that that would ever actually happen in practice.
Q. And then the next page, please.
A. So this is, again, just a conceptual representation of how you would go about measuring the kinetics component of this, how much material an animal would see in this particular case and how you would then relate the specific amount of chemical that gets into the brain to, in this particular case also, the loss of neurones in the brain.
So it's just to illustrate a concept rather than it being real data.
Q. And what was the purpose of this particular slide in terms of educating the overall group of scientists at the

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presentation?
A. As a way of describing how we would intend to approach conducting a kinetic study as part of our research program. So it was really just an educational briefing for the team.
Q. Okay. To the next slide, please. And what is this?
A. So this is measuring the amount of paraquat -- so this is -- I'm not sure if this is real data, I don't recall. But let's, for the sake of argument, say this is real data.
So if you give a single dose of paraquat to the mouse model, then this shows that if you take plasma samples, blood samples, at various points in time the levels of paraquat that you see in the plasma and that declines over time.
Q. All of this has really been discussing different types of analyses involved in paraquat, right?
A. It is, yes.
Q. Yes. So you're studying different types of analyses that could be used for determining the impact of paraquat and how you

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would measure it, right?
A. Yeah, this is specifically measuring how much paraquat and, yes, how and when you'd measure that.
Q. Okay. The next slide. What's here, please.
A. Now we've moved on from a single dose to giving three doses, three weekly doses which, if you remember, is the dose regimen used in some of the studies that we have been talking about in the past that others have used and we had used. So three weekly doses of either -- of either 10 or 1 milligram per kilogram of paraquat, and what happens here to the levels of paraquat in the plasma or in the brain, and this, in this particular case, is the brain.
Q. If you wouldn't mind at this point going to the next page, please.
A. And then this is, again, looking over a longer period of time, so three times a week, then two times a week, for 7 to 36 doses. So, again, it's a representation of the way in which paraquat levels would be seen, predicted and observed in that kind of

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multiple application in an animal model.
Q. If you could move forward to 858. And if you would look at this. That's from the same exhibit and this is page 18 of that PowerPoint presentation.
Could you tell us again what is represented here, please, sir.
A. So, yes. At this time, where we had become aware from discussions with Dr. Di Monte that we had the opportunity, with his agreement, to analyze paraquat in the brains of his nonhuman primate animals that had been dosed with paraquat, and so this was a slide which was setting out options for how we might do that.
Q. All right. And these were descriptions of different ways you could analyze the monkey brains that he had, right?
A. Yes, that's -- that's correct, yes.
Q. All right. Let's go through the second line there where it starts number 6 x 2.5 milligrams per kilogram. Explain that.
A. Right. That was the dosing regime that was used by Dr. Di Monte. So if you remember, a higher dose level of 5 milligrams

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per kilogram was toxic to the nonhuman primates, so the study proceeded at this lower dose of 2.5, and so this is simply a representation of the protocol for his study that we discussed later.
Q. So the first several lines reference how he did his studies and how he dosed the monkeys, correct?
A. That's correct.
Q. And then at the middle of the page, it says:
"If we did, the objective would be: To establish if a significant PQ concentration was present in the brains; The results would be shared with di Monte and published; [and] More elaborate kinetic objectives are tempting, but problematic ..."
Okay. And then recites those samples, okay?
A. Mmm.
Q. And it says:
"The results would be shared with di Monte, and published."
Do you see that line?
A. Yes, I do.

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Q. What does that mean?
A. Well, we had already reached that agreement, I think in the Marlow meeting that we were talking about yesterday, so this -- the basis on which Dr. Di Monte had agreed we could do that analysis is obviously we would let him have the results, and he had indicated his intention to publish his study and that that would include the brain analysis that we're talking about here, the paraquat analysis in brain.
Q. Was it ever published?
A. No, it appears that it was not ever published.
MR. TILLERY: Now let's move to 861.
MS. BRUMITT: The slide number?
MR. TILLERY: Sorry?
MS. BRUMITT: The slide number.
MR. TILLERY: Oh, 21.
BY MR. TILLERY:
Q. This references the human microdosing study. What is this?
A. So in this -- just to go a step back a minute, this whole presentation was

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actually a discussion of potentially -- of a number of potential options for how we conduct particularly kinetic studies in the future as part of our research program.
So what you see here is one option that was being considered. Rather like we said yesterday, the issue, of course, is that we are looking at a disease, Parkinson's disease, which affects humans, and whilst the nonhuman primate may be a better model of that disease state than the rodent, if there was a way in which we could have -- get more information from the human being, then clearly that would be potentially advantageous and --
Q. So --
A. -- this is -- therefore, this was a potential study design that we could adopt if we wanted to look at a kinetic study in human volunteers.
Q. So this would take six human beings/volunteers and you would dose them with small doses of paraquat, correct?
A. That's correct, yes.
Q. Okay. And where would you find six

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people like that?
A. I can't really answer that question right now because obviously we didn't go forward with this, as the record shows. This would have required a lot of questions to be asked and answered, including that one that you mention.
So there are precedents for microdosing in human populations, but from an ethical perspective, which is one of the considerations I was talking about, then there would be -- it would not have been straightforward. So we didn't get to the point of asking where we would get volunteers from.
Q. But you certainly considered a human microdosing study, didn't you?
A. In this meeting, yes. Yes, we did.
Q. Okay. And does this cover all the suggested topics for that microdosing study or were there more discussed?
A. I don't recall whether there was anything else discussed. I --
Q. And if you -- excuse me for interrupting you. Could you tell me, just in

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general terms, what that study, had you gone forward and used six human beings --
A. Mmm.
Q. -- to dose them with paraquat, would have included? What would the protocol for the study have been? If you could explain to people who aren't scientists like you, sir.
A. Mmm. So it would involve giving extremely low doses of paraquat. So as this slide shows, we're talking about micrograms per kilogram compared to milligrams per kilogram that we see applied in the animal studies, so one-thousandth of the concentration that is given to animals.
The way in which that would be applied would be either -- sorry, beginning with intravenous injection potentially, then an oral ingestion and then potentially dermal application, and that the amount of paraquat that appeared in plasma by taking a blood sample and the amount that was excreted in urine, so a urine sample would be taken, would be -- those samples would all be analyzed to give us an understanding of how paraquat was being handled in humans, and of course --

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Q. And -- sorry.
A. Just to finish. So when it says that it would give a good prediction of brain concentrations, of course we would not in any way be measuring that directly; that would be a mathematical calculation extrapolating what we see in plasma to what might be in the brain.
Q. And that's really -- you anticipated my next question, Dr. Botham. That's what I was going to direct you to, was under the Benefits, where it says, point 2:
"Good prediction of brain concentrations and safety margins."
I wanted to ask you about that. How were you going to measure brain concentrations and safety margins?
A. So this is a well-known technology. It's called PBPK modeling. So because we would have, as part of what we were talking about in the earlier slides, kinetic studies in animal models, you would be able to use those data and compare the plasma and urine levels of paraquat in the human volunteer study, in a mathematical model, this PBPK

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model, where you've actually measured the amount of paraquat in the animal model but obviously you can't do so in the brain but the mathematics would allow you to extrapolate to how much might be getting into the human brain.
Q. Did anybody at this meeting stand up and say, oh, what about redox cycling if even a molecule of the stuff gets into the substantia nigra?
A. I don't recall whether that was the conversation that was had, but -- and, to restate, we're talking here about a very, very minute dose of paraquat, which is highly unlikely to have such an effect.
Q. Okay. But, to your knowledge, no one stood up and mentioned redox cycling in this meeting, right?
A. I don't recall whether that was said.
Q. Okay. Let's move to Exhibit 78 from yesterday. This is towards the very end again, we were moving through these very quickly and I wanted to come back to them.
A. Okay. Yes, I can see that.

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thank you.
Q. Do you remember this exhibit, sir?
A. I do.
Q. All right. Instead of me asking questions, why don't you take a look at this and tell us what it is.
A. So this is the final report of the analysis that was conducted, that we were talking about earlier, of the amount of paraquat in samples of brain taken from the nonhuman primates study conducted by Dr. Di Monte.
Q. And the author of this is a William Ray, PhD, right?
A. That's correct.
Q. Where was Dr. Ray located?
A. He was in the Syngenta laboratories in Greensboro, North Carolina.
Q. Is that where the analysis took place?
A. That is where the analysis was done.
Q. And what is his job at Syngenta?
A. At that time, he was engaged in analytical chemistry.

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Q. Did he conduct the study or was he just the author of this paper?
A. I believe he actually conducted the study but I would -- I would need to double check that.
Q. Okay. So if we go to the rest of that page, please.
So the laboratory project ID, it's indicated; the performing laboratory is in Greensboro; the sponsor is Syngenta Crop Protection, LLC, a defendant in this case.
Correct?
A. Correct.
Q. Okay. And this is the report that indicates a study objective was to analyze paraquat residues in brain tissues from squirrel monkeys exposed to paraquat in a laboratory setting. Correct?
A. That's correct.
Q. And this is based upon a total of 15 treated tissue samples and one control tissue sample that were received from Dr. Di Monte, correct?
A. That's -- yes, I think that's my recollection too, yes.

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Q. Okay. And all --
MR. NARESH: Steve, I think -- you know -- I know there's some technical issues in terms of the presentation mode, but if you're reading from part of the study, I would just ask that the presentation mode follow along to where you're reading from so that --
MR. TILLERY: Okay.
MR. NARESH: -- the witness isn't trying to remember from memory.
BY MR. TILLERY:
Q. If you look at the Executive Summary, 1.0. Do you see that, sir?
A. Yes, I can.
Q. All samples were analyzed for residues of paraquat according to Syngenta method, and it leaves a number of -- it lists a number of numbers. The Limit of Quantification [sic] for paraquat is indicated, and the current method for recovery of paraquat brain tissue was indicated. Okay?
A. Yes.
Q. This looks like it was done according to the laboratory methods that you

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would have expected under these circumstances?
A. Yes, it was.
Q. Okay. Then if we go to the Materials and Methods section.
This tells us, under "Materials and Methods," "Test Substances," what was used and what was measured in the analysis, correct?
A. That's correct.
Q. All right. And the results were that you found paraquat on the brain to the animals, right?
A. We did, yes.
Q. All right.
I think the conclusion -- I'll just read it so we don't have to go there. It's one sentence:
"... Squirrel Monkey brain tissues were successfully analyzed for paraquat residues as determined by a concurrent method recovery sample."
Correct? That makes sense?
A. Yes, I can't see that but that seems to be my recollection --
Q. That's what you remember?
A. Yes, that is.

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Q. Yes. Let's go to Exhibit 79 now.
Let's walk through this so that the court and jury sees exactly what we're talking about, okay. This is a form that's used at Syngenta, isn't it?
A. It is, yes.
Q. And how long has this form been in existence?
A. I would say 20 years.
Q. Okay. And the form is to capture a FIFRA 6(a)(2) reportable finding, correct?
A. This is a form to capture the input to the POTENTIAL REFERABLE FINDING approach committee.
Q. All right. So let's walk through the methodology that Syngenta employs to do this. Number one, you have a person -- let's pick, for example, Kim Travis, who is a PhD. He's in England, right?
A. Yes, he is -- he was, yes, yes. He is in England but he's left the company now.
Q. All right. And Dr. Travis sent this form -- he would have been the one, if you go to the bottom of this page, do you see,

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who says "Name of study manager originator"?
A. Yes.
Q. Okay. And that's Kim Travis, right?
A. That's correct.
Q. Okay. And it says the date is June 28, 2011?
A. Yes.
Q. And how does that correspond in terms of time with the completion of his analysis of the Di Monte squirrel monkey brain tissues?
A. So the report we were just looking at was January 2011.
Q. So it's four or five months later than that report, right?
A. That's right.
Q. So there'd been plenty of opportunity to evaluate the results of that report, to consider it. And Kim Travis, who had charge of that project, sent this on to a potential referable findings committee, correct? Is that where it went?
A. Yes, it went to the Potential Referable Findings Approach Committee.
Q. Approach committee. Now, why don't

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you tell us the difference between a Potentially Referable Findings Approach Committee and then the step up from there.
A. Sure. The approach committee is a committee that resides within what was at that time called the human safety organization of Syngenta, and it was -- it included senior toxicologists in the human safety department, and it was the role of that committee to look at findings in studies of a number of different types, to make a judgment about whether the findings could potentially be required to be reported under the FIFRA 6(a)(2), but it was not there to make a decision on that.
After the approach committee had done its analysis of a study and its findings, it would send the outcome of that discussion to the actual PRF Committee itself, which makes those decisions, and that is a committee that's -- for the United States, for FIFRA purposes, is based in the United States.
Q. And then after they make -- strike that. We had a lot of feedback. Let me withdraw that.

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After the FIFRA committee in the United States makes a decision, is there any further evaluation?
A. I don't believe so, no.
Q. Okay. Who was on the approach committee in 2011 in June?
A. I would need to see the minutes of that meeting to check that, but probably I would certainly be on that committee and some of my toxicology colleagues.
Q. You were the chair, weren't you?
A. At that time, yes. That's why I think it's very likely that I would have been in the -- on the committee at this time.
Q. Okay. Do you have any recollection of who else would have been on the committee with you?
A. Well, the sort of people that would be there would have been my senior toxicology colleagues. The membership changed as people moved into different roles; so in 2011, I can't give you an exact list of people.
Q. Okay. How many people?

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A. It was a group, generally speaking, six to eight people.
Q. Did you physically meet or did this just get exchanged electronically after receiving this request from Kim Travis?
A. It was nearly always a physical meeting.
Q. Where did you have your meetings?
A. In the product safety -- or human safety building. By 2011, that would be in Jealott's Hill.
Q. Where you are now?
A. That's correct.
Q. And this form, you said, had been around for 20 years. Would then -- after you've made your decision, would this form be sent to the PRF Committee in the United States or would just your conclusions and recommendations of your approach committee be sent?
A. I believe that the form that we see now, plus the recommendations of the approach committee, would have been sent by the technical secretary of the approach committee to the technical secretary of the US PRF

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Committee for him to --
Q. And that --
A. -- decide.
Q. And that group in the United States would have included Montague Dixon?
A. Again, as we are talking about a particular point in time, I would need to look at the minutes of that meeting to have that confirmed.
Q. At this point in time for 2011, you're unable to tell me who was on the US approach committee, right?
A. Yes. Because, again, the membership changed from time to time so I can't precisely tell you who was on the committee at that -- in June 2011.
Q. Is there a similar form to this one for the UK or for the European Union or for any other of the countries where Syngenta does business?
A. The findings of the approach committee that we've just been talking about will be submitted to other PRF committees in other regions, depending on whether it's relevant to a particular region. For this

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particular one, I couldn't tell you whether it went to -- for example, to the European committee, but that was always an option.
Q. And would there have been a reason to send it to the European committee given the fact that it was not lawful to sell paraquat dichloride in the European Union at the time of this period?
A. Well, quite, which is why I was indicating that it may not have been relevant on this -- for this particular one, so I don't know that it wasn't sent but that may well have been the judgment.
Q. Well, let me ask you this: As chairman of this committee, are you aware of any country where this report was made from the findings that we just discussed from Dr. Di Monte's squirrel monkey brain residues?
A. I'm not aware of that, no.
Q. Okay.
So let's look more closely at the document, please. And then it says -- if you look at the first paragraph, do you see that? The very first paragraph in the block, it says in the second sentence:

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"This document concerns the emerging data on the kinetics of this small amount of paraquat in the brain."
Do you see that?
A. Yes.
Q. All right. And then it discusses in the next paragraph how this was done. Then if you go to the very bottom, do you see the sentence that says:
"We have also analysed samples ..."
Do you see that?
A. Yes.
Q. "We have also analysed samples of squirrel monkey frontal cortex from a study conducted independently by [Dr.] di Monte which shows that the paraquat concentration in the brain samples did not measurably decline between samples reported to have been taken 2 and 8 weeks after a fixed program of paraquat dosing ..."
That's Ray 2011 and Di Monte 2000.
What is that referring to?
A. That's referring to the study that we were talking about a few minutes ago, the Di Monte protocol.

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Q. Okay. This is what's referenced here, you're referencing the same study result, correct?
A. Yes, that's correct.
Q. Okay. Then you go to the next paragraph, and it says:
"Reported findings of increases in alpha-synuclein in the brains of squirrel monkeys dosed with paraquat in the same study referred to above ... have also been considered by this committee."
Now, what's that referencing?
A. That's referencing to a previous discussion within the PRF Approach Committee, which I believe we talked about yesterday where the findings -- not the kinetics but the findings in Dr. Di Monte's study, the histology and, as it says there, the changes in alpha-synuclein, were discussed as to whether they could also -- whether they could be potentially referable.
Q. And the same resolution was reached, wasn't it, that they weren't referable to the US EPA, correct?
A. That's correct, because, as we said

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yesterday, Dr. Di Monte himself, in that personal communication that's referenced here, had indicated that there was still some doubt in his mind, and certainly also in ours, as to the way in which his findings could be interpreted -- should be interpreted from a technical perspective.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. My question was, and I'll read it back to you:
"And the same resolution was reached, wasn't it, that they weren't referable to the US EPA, correct?"
A. Yes, that's correct.
Q. All right. Now, if we go to the next page, there's a section 1c and it says:
"Comments from project leader, including purpose of study and reason for referral (or non-referral) ..."
And it says:
"Has been agreed with the project leader, P Botham, to refer to the approach committee for consideration."

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What does that mean?
A. So before a study manager or a study -- or a project leader, as it's described in this case, brings a finding to the approach committee, sometimes a step is taken to confer with others to get a second opinion.
This is what happened here; so Dr. Travis conferred with me, as the overall project leader of the Health Science Team, as to whether the findings in -- the kinetic findings in Dr. Di Monte's study should be brought to the approach committee.
And in line with what I nearly always said, which is if there's any question about whether we should or shouldn't, we should always take them to the approach committee; that was my recommendation.
Q. And what was your vote?
A. What was my -- excuse me, I missed that. Please say again.
Q. Yeah, let's start over because we got a lot of feedback.
What was your vote in this committee?

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A. We don't vote. We have a discussion and we try to achieve consensus. So I -- the consensus of the experts, my experts who were with me on that occasion, was that because this was, as it says here, a kinetic study, which was not indicating, in itself, whether the presence in the brain was an adverse effect, that this did not meet the criteria for referral.
Q. Okay. And actually, if we go to what you say, the 2a, "PRF Approach Committee Comments." Do you see that section --
A. Yes, yes. Yes, I do, yes.
Q. It says, I'm reading for the record:
"Studies of the kinetics of paraquat in the brain across a range of species were considered."
Do you see that?
A. Yes.
Q. What does that mean?
A. Well, it means as well as the specific study that we had done -- when we had done the analysis of paraquat in the brain of non -- the nonhuman primate, the squirrel

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monkey, for Dr. Di Monte, we'd also, by that time in 2011, done or started to do some of the kinetic studies that were subsequently presented and published in rodents.

So this discussion actually, I believe, was a more general discussion about whether kinetics, just the presence of a chemical -- in this case paraquat -- in an animal model, whether it's the brain or anywhere else, whether that was -- those kind of data, kinetic data, whether they are actually referable under the criteria of 6(a)(2), and the judgment was that we believed that they were not. That was the judgment at the time.

Q. And that took a fair knowledge of the FIFRA regulations to understand that, didn't it?

A. That's right, yes, it did.

Q. And as president or chairman, leader of that committee, you had to be the one that had a good, solid knowledge of those regulations and the interpretation of FIFRA reporting obligations; is that correct?

A. Yes, and the way that they were

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codified within the criteria document that's referred to in the paragraph that you're now looking at. But of course we were always completely reliant on getting advice on this from people in the United States who were the true experts, the real experts in PRF criteria.

Q. But you understand that Syngenta has not designated a person to talk to me later today about 6(a)(2) obligations under FIFRA from the United States? Do you know that?

A. Yes.

Q. You know that you're the guy that they've selected to speak on behalf of not only Syngenta AG in Europe but Syngenta Crop Protection, LLC. You were the one they selected. You understood that, right?

A. Of course I understand that, yes.

Q. All right. Now, when you did this analysis that's discussed under paragraph 2(a), PRF Approach Committee, and you considered, as you said, a range of species, did you consider at that point disclosing Louise Marks's studies that she did, the first mouse study, three after her failed one, from a poor

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optional fractionator?

A. No, the scope of this discussion was limited to studies of kinetics, not to studies of effects, which the Louise Marks studies were toxicological effect studies, not kinetic studies.

Q. Okay, so her name didn't come up, right? Her studies didn't come up?

A. I'm pretty sure it would not have done, no.

Q. All right. Now, continuing on this paragraph, it says:

"The committee considered that the findings do not represent an adverse effect or a pre-cursor to an adverse event. Therefore the findings do not meet the technical criteria for referral as described in the Product Safety PRF Criteria for Referral Guidance Document (version 4 dated 16th February 2009)."

Correct?

A. Correct.

Q. Did I read that correctly?

A. You did.

Q. And that was the conclusion of the committee, right?

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A. Correct.

Q. All right.

And then let's go to the following page, which is the last page of the document. If we look under 4d, it says, "Current finding submitted to [the] US EPA under TSCA 8(e) or FIFRA 6(a)2" and then it says:

"No new information in the studies - Not reportable."

No new information, right?

A. Yes.

Q. So you knew that -- at that time, your committee knew that paraquat got in the brains of primates?

A. Yes.

Q. Okay. And you knew that. From the level of exposure that was given, you knew that it would get into the brains of primates, right?

A. Yes.

Q. Okay. And that's why you said you didn't report it?

A. Because this was the interpret -- the interpretation of the PRF criteria is that you need to go beyond the finding of, in this

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case, paraquat in the brain to have an understanding of whether that was likely to have created an adverse effect, and a kinetic study in and of itself, which is what we are talking about here, did not allow you to do that.

MR. TILLERY: I move to strike your answer as unresponsive.

BY MR. TILLERY:

Q. My question is simple. You knew, from the level of exposure that was given, that it would get into the brain of primates at that time, correct?

A. Correct.

MR. NARESH: I'll just object to the form on that.

BY MR. TILLERY:

Q. And that's the reason you listed for why you didn't disclose this, because it wasn't new information, correct?

A. Yes.

Q. Now, how long had --

A. I --

Q. How long had you --

A. I'm sorry --

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Q. How long had you known this information?

A. Which information?

Q. The fact that paraquat got into the brains of primates. How long had you known it?

A. Well, since the studies that we were discussing earlier, so -- which were reported in 2011.

Q. So you knew from 2011. And the date of this is when?

A. This is also in 2011.

Q. Okay. So you're referring to the studies from Dr. Di Monte?

A. I'm referring to the primate study of Dr. Di Monte, yes.

Q. Well, now, wait a minute. We have a little catch-22 here, don't we? You put down that this is not new information because you already knew this, it wasn't reportable. So that means you had to know it before Dr. Di Monte's residue studies.

When did you learn it? What study?

A. Well, we learnt it from the analysis that was done by Dr. Ray which was conducted or reported in 2011.

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Q. Okay. So you're telling me, Dr. Botham, that you did a residue study that was reported in 2011 and that was referred to your committee by Kim Travis for evaluation as a potential referable finding to the US EPA. You analyzed it and said, we don't have to report it because we just found out about it?

A. No, no, we didn't have --

Q. You are --

A. What I said -- no, what I said is we don't have to report it because it was our interpretation of the FIFRA guideline, as was written down in the guidance document that was referred to in the earlier part of this document, that the presence of a chemical was, in and of itself, not reportable.

Q. What did you put as the conclusion for why? 4d, what's -- read it to me?

"No new information in the studies ..."

That's what it says.

A. Yes. And actually, I believe that that part, 4d, was actually placed into this document by the US PRF Committee technical

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secretary, who is Dennis Hackett, which is why you can see his name mentioned here.

Q. Well, where does he sign this document?

A. Well, there is no signature as such, but it -- so I -- you know, I can't answer that question as to where exactly he fitted in on this occasion.

Q. So you're trying to say that you didn't have anything to do with this, right?

A. Well, I'm not -- I'm trying to say that I don't know that we, in the approach committee, wrote "No new information in the studies - Not reportable."

I don't recall who wrote that, but there's a suggestion here that might have come in from the US committee but we'd need to check that.

Q. Well, you know, maybe you could check it but, you know, this is my opportunity to ask you questions and it's my opportunity to get to the answer.

You have an approach committee, or a potentially referable approach committee. We had a form filled out by a scientist who had

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charge of this study. He sent it to your group, you looked at it, made a decision and the form was filled out. And that form says "no new information."

What was the prior information you had before this residue study that paraquat got into the brains of primates?

A. Yeah. I believe that this -- when it says "no new information," that that's perhaps not an accurate representation of what we were saying in that approach committee; that of course the analysis that was done of the amount of paraquat in the brains of Dr. Di Monte's studies -- study, was new because that analysis had not been done before.

Now, there are two possibilities here: either the way in which this was written here, "No new information in the studies - Not reportable," was an incorrect representation of what it said on the previous page, which is that the reason for them not being reportable is not because they're not new but because they don't rep -- they're not necessarily representing an adverse finding.

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Or, at that time, and I don't recall, somebody was telling us that we -- it was already known that paraquat gets into the brain of nonhuman primates from previous publications, and that bit I don't recall.

Q. Well, that's what I'm asking; if you have any studies you're relying on that you did that showed that paraquat got into the brains of nonhuman primates, what were they?

A. Well, I don't believe that Syngenta or its predecessors would have had any previous studies that it had done that showed that paraquat got into the brain of nonhuman primates as part of that discussion, so I -- but, again, I may be not recalling the facts fully here, but that would be what I would say today.

Q. All right. So this, then, was decidedly a new finding, wasn't it?

A. It was a new finding; that's certainly one interpretation, yes.

Q. Okay. Well, do you have a better interpretation --

A. No, I --

Q. -- as for why --

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A. I'm happy to describe it as a new finding.

Q. All right.

A. I've said to you the reason why it was not reportable, however.

Q. All right.

MR. TILLERY: Let's take a two-minute break if we can, okay.

THE VIDEOGRAPHER: We are going off the record. The time is 12:08.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record. The time is 12:12.

MR. NARESH: As we said off the record, for the record Syngenta will mark yesterday's, today's and tomorrow's deposition transcripts as confidential pursuant to the terms of the protective order, and the witness will also reserve the right to read and sign for all three days.

BY MR. TILLERY:

Q. Dr. Botham, what is the Federal Insecticide, Fungicide, and Rodenticide Act, FIFRA for short?

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MR. NARESH: And Steve, may I have a standing objection to the extent this line of questioning is calling for legal conclusions?

MR. TILLERY: You can. The issue, though, of a referable committee puts that into a very questionable stance, but the fact is I'll agree to a continuing objection to the extent that you think these are calling for legal conclusions. Okay.

BY MR. TILLERY:

Q. Do you understand the question or do you wish to have it read back?

A. So the question was what is FIFRA. So that is the legal requirements in the United States that govern the registration and sales of plant protection products and pesticides.

Q. And are there similar rules in other countries?

A. There are.

Q. And how many countries -- in how many countries does Syngenta sell paraquat?

A. The figure today, I don't have that

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to hand so I would need to be given notice of that if you need an accurate answer.
Q. Okay. Syngenta is certainly familiar with what is commonly referred to as section 6(a)(2) of FIFRA, right?
A. It is.
Q. And would you agree that, in general, 6(a)(2) creates a reporting obligation for pesticide registrants?
A. It does.
Q. And what is your understanding of a pesticide registrant under the US EPA rules?
A. An organization, a company that is engaged in the manufacture, sales and marketing of pesticides.
Q. And that's the one who's primarily responsible for the registration of that chemical, right?
A. That is correct.
Q. And since 1965, including the corporate predecessor ICI for Syngenta, has Syngenta been, either by itself or in cooperation with Chevron, the registrant for paraquat in the United States?
A. It has.

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Q. And that's from the first date of sale of the chemical in the United States, correct?
A. I believe so.
Q. And that registrant position imposes duties and obligations on Syngenta, doesn't it?
A. It does.
Q. Before we get into the details of this discussion, I'd just like to talk about it from a 30,000-foot section if we can, okay.
A registrant's duties are to assist an agency that has supervision over literally thousands of different chemicals, doesn't it?
MR. NARESH: Let me also just add a scope objection. I believe that there's a different witness designated on EPA-related topics, so I don't have a problem with you asking Dr. Botham about these in his personal capacity but I will note the scope objection on the record.
MR. TILLERY: Well, just so we're clear, and I'll note your objection and allow it to be continuing if you wish, but the fact is that all of the 6(a)(2)

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violation topics or 6(a)(2) interpretation of discussion points were reserved for him, with the exception, as you said, of the one pulled back for Mr. Dixon as to US EPA, but all the 6(a)(2) discussions were left with Dr. Botham under his topics.
But, anyway, we'll go forward.
BY MR. TILLERY:
Q. Do you want that question read back?
A. Please do, yes. Please read back.
MR. TILLERY: Ms. Reporter, would you mind reading back that question to Dr. Botham.
(Whereupon, the record was read back by the stenographer.)
THE WITNESS: Yes, it does.
BY MR. TILLERY:
Q. And to follow up on that, that means that EPA officers don't have enough people to sit in your laboratories or to supervise you directly; they depend upon you to have an affirmative reporting obligation, correct?
MR. NARESH: Objection; form and foundation.

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THE WITNESS: Yes, they do.
BY MR. TILLERY:
Q. So you keep, I would imagine, extremely tight security in your laboratories, don't you?
A. Security in what sense are you meaning here?
Q. In that I would imagine if I drove into Jealott's Hill where you were and decided I wanted to take a peek into your laboratories, that probably wouldn't be accepted, would it?
A. It would be allowable if you were officially invited to do so.
Q. Right. Otherwise you would escort me off the property, right?
A. Yes, that would be one possible outcome.
Q. All right. Which means that you're preserving the integrity of your research, just like other companies are doing, right?
A. That's right.
Q. Nothing unusual or untoward or improper. This is what you do, what companies do.
A. Yes.

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Q. I'm not suggesting otherwise. Okay. So the bottom line is that you're the master and have the knowledge about your findings in your laboratories?
A. Yes.
Q. Right?
We just finished talking about monkey residue studies. There was no EPA representative sitting in that lab or in that PRF Committee, were there?
A. No.
Q. None of them knew anything about what Kim Travis was doing or Dr. Ray was doing in Greensboro, were they?
A. No.
Q. They're relying upon your affirmative obligation, a good faith obligation, to fully disclose what you know, right?
A. Where we believe that that is required under FIFRA 6(a)(2), yes.
Q. Do you know of any -- we're going to go through all of these FIFRA obligations today. But do you know of any single time it says, in any of the FIFRA regulations, that

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you're given discretion based upon what you believe compliance is? Can you point me to a single one of those regs that say that where Phil Botham believes we don't have to report it, he's good to go, he doesn't have to report this finding?
MR. NARESH: Objection to form.
THE WITNESS: We -- I wouldn't say that that is the right question to ask here. We follow the detail of that guidance that is available under 6(a)(2).
BY MR. TILLERY:
Q. I mean, you understand that because there are so many companies and so many thousands of chemicals, that an administrative agency, no matter how big it is, it's impossible for them to do this affirmatively on their own, right?
A. Of course.
Q. And you know that means, and it's set out very clearly in the EPA's regulations, FIFRA, very clearly that they depend upon the honesty and integrity of the chemical companies to come forward about their pesticides, speak the truth, speak all of the information they

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know, to the extent that it could fall within the scope of these regulations. Correct?
MR. NARESH: Objection to form.
THE WITNESS: Yes. In principle, that is correct.
BY MR. TILLERY:
Q. All right.
Now, what does 6(a)(2) require pesticide registrants like Syngenta to report to the EPA?
A. Our interpretation of the guidance on 6(a)(2) is it requires you to report -- and here we're talking about toxicological findings. It requires you to report new findings, but new findings are also further defined as being findings which indicate a new and potentially hazardous property associated with that chemical.
Q. Do you understand 6(a)(2) to require a registrant to report information regarding adverse effects on the environment of the pesticide?
A. That's right, yes.
Q. Okay. And do you understand FIFRA to define adverse effect to mean "any

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unreasonable risk to man or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide"?
A. Yes.
Q. Okay.
MR. TILLERY: Now, we're going to put on the screen Exhibit No. 80.
(Botham Exhibit 80 marked for identification.)
BY MR. TILLERY:
Q. This is FIFRA 6(a)(2) and it's also 7 U.S.C. section 136d(a)(2).
Do you see that?
A. I do.
Q. Is this what you understand 6(a)(2) to say regarding existing thoughts and information?
A. Well, I don't recall having read this document very recently, so I accept that what you say is correct.
Q. And how is it that you received your training and education on the PRF Committee about FIFRA 6(a)(2) reporting obligations?
A. We received guidance on that,

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education on that, as you put it, from our experts on 6(a)(2) in the Syngenta United States offices.
Q. Are those lawyers?
A. No, they would be technical people.
Q. Okay. So you used scientists or other regulatory people to tell you this but not lawyers?
A. Well, I'm talking about how we directly receive that education. So when I use "technical," that includes regulatory. They, in turn, will undoubtedly, I'm sure, have received guidance from lawyers.
Q. And do lawyers sit in on the PRF Committee meetings?
A. Not on the PRF Approach Committee that I was responsible for. I would need to be reminded as to whether a lawyer sat on the US PRF Committee. I don't have that information to hand at the moment.
Q. Is it common to have lawyers sitting in on scientific meetings at Syngenta?
A. It's not commonly done. It is done under certain circumstances.
Q. Is it common when you're dealing

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with paraquat and Parkinson's disease issues?
A. We, generally speaking, have, when we've been having our discussions on paraquat and Parkinson's, to have a lawyer with us, yes.
Q. But not when you're dealing with other chemicals, right?
A. Not generally speaking. Some of the chemicals, that has occurred, but, generally speaking, not.
Q. Okay. And you even go so far as to have outside counsel present; not just your in-house people like Mr. Nadel or Mr. Solomon. You'd even have outside people present, wouldn't you?
A. Not always. Sometimes.
Q. Who would those people be?
A. They would be lawyers employed by external counsel who had been appointed by our own internal counsel.
Q. Okay. And that would again be when you have scientific discussions about paraquat and Parkinson's disease, right?
A. I -- yes, but I reiterate only some of those discussions. Many would not include

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external lawyers.
Q. And how many years have you had lawyers, in-house lawyers and outside lawyers, sitting in on your paraquat/Parkinson's disease scientific discussions and meetings? How many years you been doing that?
A. Well, in my experience, specifically for paraquat and Parkinson's disease, that has been since around 2007.
Q. Okay. Was there something that caused you to start having lawyers present at that time?
A. We were advised by our internal legal department that we should do this for some of our meetings.
Q. Involving paraquat and Parkinson's disease, correct?
A. Correct.
Q. Okay.
Is there any of these FIFRA sections that you're aware of that Syngenta does not have to follow?
A. I'm not aware of any such sections.
Q. So we're going to go through a number of sections. To your knowledge, have

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you ever been told by anyone, anybody at the EPA or anybody at legal department, any advice whatsoever, any person in your operation ever discussed with you that Syngenta gets a pass from FIFRA on any section?
A. The discussions we've had have been only -- have been limited to getting a proper interpretation of what those FIFRA guidelines say so that we can operate them in practice in our committees.
Q. Yeah, let's go back to my question, okay. Do you know of any reason why any section under FIFRA doesn't apply to Syngenta?
A. No.
Q. All right.
MR. TILLERY: Now let's go to Exhibit 81.
(Botham Exhibit 81 marked for identification.)
MR. NARESH: And Stephen, I just remind you that we need a break at some point in the next ten minutes or so.
MR. TILLERY: You tell me when, Ragan --
MR. NARESH: Yeah, I just --

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if you're going to -- you know, if the question on this exhibit is under 10 minutes, I think let's do this exhibit, and if it's not going to be 10 minutes, let's --

MR. TILLERY: Okay. All right. We'll do this exhibit, it's fairly quick, and then we'll finish.

BY MR. TILLERY:

Q. Are you familiar with this definition? This is 7 U.S.C. 136(bb), "Unreasonable adverse effects on the environment."

Do you see that?

A. Yes, I do.

Q. Okay. It imposes on the registrant, and this is what I wanted to raise with you, a duty to keep the administrator informed about the registrant's pesticide projects, doesn't it? Do you see that?

A. Yes.

Q. Did you understand that when you were having that PRF meeting about the monkey residue?

A. We did, because we were -- this is

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where the term "unreasonable adverse effects" was part of our conversation.

Q. Okay. So you knew all that time you were keeping these sections in mind when you had your meetings, right?

A. Yes, and the way in which we did that was through the way in which these requirements had been placed into our guidance documents for potentially referable finding.

Q. Do you have a policy in the company about referable findings?

A. We do. We have a policy and a guidance document.

Q. Okay. And that guidance document was created to explain or give guidance about what you have to do under the FIFRA reporting obligations?

A. That's correct, yes.

Q. Have you disclosed that as a reliance document for this deposition?

A. I don't -- I can't answer that, I'm sorry.

Q. Have you looked at that guidance document recently?

A. Not in the last few weeks, no.

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Q. Okay.

MR. TILLERY: I'm moving on to a more lengthy section. If you want to break here, that's up to you. Is that fine?

THE WITNESS: I think that probably would be helpful if we could.

MR. TILLERY: All right, we will. How long did you want for your lunch? Thirty minutes?

THE WITNESS: Could we take 40 minutes this time? I --

MR. TILLERY: Yes.

THE WITNESS: That would be appreciated, thank you.

MR. TILLERY: Yes, we can.

THE WITNESS: Thank you.

MR. TILLERY: Forty minutes.

THE WITNESS: Okay.

MR. TILLERY: All right. Thank you.

THE VIDEOGRAPHER: We are going off the record. The time is 12:32.

(Lunch break taken.)

THE VIDEOGRAPHER: We are back on

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the record. The time is 1:15.

BY MR. TILLERY:

Q. Dr. Botham, are you ready to proceed, sir?

A. I am.

Q. Okay.

We're back to FIFRA and that discussion. Sections 12(a)(2)(N) and (Q) make it unlawful for a registrant to fail to file reports required by this chapter, and that's -- the full cite of that is 7 U.S.C. section 136j(a)(1)(2)(N) and (Q).

Did you understand that to be a FIFRA obligation?

MR. NARESH: I'll have the same standing objection on calling for a legal conclusion.

MR. TILLERY: And we agree with that.

BY MR. TILLERY:

Q. Did you understand that was required, sir?

A. Well, this is down to a level of detail where I can't comment on the specific sub-clauses but, again, as a general

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principle, of course, yes.
Q. Well, you understood that it was unlawful to fail to file the reports that FIFRA called for, let's put it that way?
A. Yes. As I say, as a general principle, that's correct, yes. I understand that.
Q. Okay. And it's also unlawful to falsify all or part of any information related to the testing of any pesticide. Did you understand that?
A. Yes, I do.
Q. Did you understand it was unlawful to falsify any part of any information, including the nature of, any observation made or conclusion or opinion formed, which is submitted to the administrator? Did you understand that?
A. Yes.
Q. Okay. Or, even broader, that the person, like you, knows it's going to be furnished to the administrator. Did you know that?
A. That bit I don't understand, I'm sorry.

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Q. Let's just put it this way. Let's say Montague Dixon signs the papers in the United States with the disclosures, and let's say you know what those disclosures are as chair of the potential referable findings committee, or what did you call it, the specific --
A. It's the PRF Approach Committee.
Q. Approach committee. As head of that committee, if you know this is going to be submitted, did you understand that to the extent you know that this information being sent to Mr. Dixon is going to be filed in a form that you know is wrong, you understood that was also improper and against the law in the United States?
A. Yes, that's -- that makes sense.
Q. Okay. And Syngenta also understands that FIFRA provides criminal penalties for knowing violations of FIFRA, right?
A. Yes.
Q. And that's in prison and up to one year, correct?
A. I can't remember that but I take your word for it.

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Q. Now, aside from FIFRA, were you also aware from your manual -- your Syngenta policy manual regarding reporting obligations, which we're going to talk about in a minute -- that there's a general false statement statute applicable in the United States?
MR. NARESH: I'll object on scope grounds as well on top of the prior ones, and have a standing objection to this one as well.
MR. TILLERY: Yes.
THE WITNESS: I'm not sure whether I was aware of that.
MR. TILLERY: Well, let's pull up 82 at this point.
(Botham Exhibit 82 marked for identification.)
MR. TILLERY: Perfect.
BY MR. TILLERY:
Q. And this is 18 U.S.C. section 1001(a). Do you see where it says:
"... whoever, in any matter within the jurisdiction of the executive, legislative, or judicial branch of the Government of the United States, knowingly and willfully -

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falsifies, conceals, or covers up by any trick, scheme, or device a material fact."
Do you see that?
A. Yes.
Q. Or:
"... makes any materially false, fictitious, or fraudulent statement or representation ..."
Do you see that?
A. Yes.
Q. "... or makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement ..."
Do you see that?
A. Yes.
Q. This is the false statement rule or statute. Did you have any understanding one way or another whether that governed your behavior in terms of reporting or failing to report to the US EPA?
A. I'll take this opportunity to restate that the legal obligation as I understood it was with the US PRF Committee and not with the PRF Approach Committee.

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We were informing the US PRF Committee but not actually accountable, if you like, for the final part and the important legally based part of the process. That was my understanding.

Q. Well, did Dr. Travis go to the United States and make a pitch about the monkey residue studies?

A. I'm not -- I don't believe that he did, no.

Q. Was Syngenta aware of this statute, whether or not you personally were not?

A. Yes, I'm sure it was, yes.

Q. Okay.

Now, the EPA has written much more specific reporting requirements that implement 6(a)(2), don't they?

A. Yes.

Q. You're aware of that?

A. Yes.

MR. TILLERY: We can take that one down.

BY MR. TILLERY:

Q. You've mentioned you have, at Syngenta, a policy or policies for

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compliance with section 6(a)(2). Are those written policies?

A. They are.

Q. And what do you call them?

A. Well, we have an overarching policy which basically says we will comply with legislation of this sort, and then below that we have guidance documents, which are more technical and are guidance literally to the technical people in functions like the one I was responsible for, for how you might -- how you identify a potentially referable finding.

Q. And what do you call that? A guidance document?

A. Guidance document, yeah.

Q. Okay. Do you have it there with you?

A. I do, actually. I actually brought it out in the break to have a quick -- another look at.

Q. Okay. And feel free, of course, if you have the guidance document there with you, to look at it if you need to. Okay?

A. Okay.

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Q. For example, does it give you a general premise that Syngenta is to follow the 6(a)(2) reporting obligations to the team?

A. Yes, that's right. Yes, it does.

Q. Okay. And can you hold that up into the camera so we can see what it looks like.

A. Well, there are various versions of it. The first one I'm showing you is actually here, which is -- it's actually not called a guidance document at this stage. It was called "Health Assessment Criteria For Potentially Referable Findings."

So later versions of this were entitled "Guidance Documents." There were also training modules.

So there's a -- I've got a file full of documents here which I could show you --

Q. Okay.

A. -- which are the way in which we tried to help our staff to follow that legal requirement.

Q. Does that policy that you just held up specify the kinds of information the company should report?

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A. It does, yes.

Q. Okay. What are the -- in general -- strike that.

In general, what are the kinds of information Syngenta's policy requires the company to report to the US EPA?

A. So these documents describe in -- at a high level, they describe that the type of information is that which is related, in large part, to toxicological study findings, and there's an equivalent for environmental study/eco-toxicology findings. And they go through each of the different kinds of toxicology study types to describe the interpretation of what may be reportable.

Q. Does Syngenta reporting policies specify the kinds of information the company does not report to the US EPA?

A. No, it's not explicit in that sense, no.

Q. Okay. Are there various different updates or iterations of that policy?

A. There are, yes. So -- I mean, I didn't have time to find everything during the break but the latest version I found was

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in 2015.
Q. Okay.
MR. TILLERY: Let's pull up number 83, please. This will be Plaintiff's Exhibit No. 83, sir.
(Botham Exhibit 83 marked for identification.)
MR. TILLERY: For the record, this is 40 C.F.R, Code of Federal Regulations, section 159.158(a).
BY MR. TILLERY:
Q. Is Syngenta familiar with this document?
A. Yes, I'm sure Syngenta is familiar.
Q. What's your understanding of the purpose for the EPA requirement that a registrant report relevant inclusions or opinions of a person "employed or retained (directly or indirectly) by the registrant"?
MR. NARESH: I'll object to the form.
THE WITNESS: Well, my interpretation of that would be to -- that this would include not just people on the payroll but also people who

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might be retained as consultants.
BY MR. TILLERY:
Q. Okay. So you understand that the reason for that reporting requirement is that the conclusions or opinions of a registrant's own employee would carry added significance because reportable information would not be against the registrant's own commercial interest.
Do you see that?
A. Yes.
Q. All right. And if you look at this further, what's your understanding of the purpose for the second requirement that a registrant report relevant conclusions or opinions of a person "for whom the registrant requested the opinion or conclusion in question."
Do you see that?
A. Yes.
Q. And --
A. That --
Q. And likewise, do you understand the reason for that reporting requirement is that the conclusion or opinion of a registrant's

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consultant would, again, carry added significance because reportable information would not be against the registrant's own commercial interest? Do you understand that?
MR. NARESH: Objection to form.
THE WITNESS: Yes, I understand, yes.
BY MR. TILLERY:
Q. All right. Do you know how the EPA defines "a qualified expert"?
A. I can't give you a rendition of that from memory, no.
Q. All right.
MR. TILLERY: Let's pull up Exhibit 84, please.
(Botham Exhibit 84 marked for identification.)
BY MR. TILLERY:
Q. Exhibit 84 is 40 C.F.R., that's Code of Federal Regulations, section 159.153(b). I'll just go through this with you but you can follow along with me if you see that.
"'Qualified expert' means one who, by virtue of his or her knowledge, skill, experience, training, or education, could be

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qualified by a court as an expert to testify on issues related to the subject matter on which he or she renders a conclusion or opinion."
Do you see that?
A. I do.
Q. And would you understand the reason for that reporting requirement is that the conclusions or opinions of a qualified expert carry added significance because the expert's conclusions and opinions are intrinsically important? Would you agree?
A. Yes, I agree.
Q. Okay. Would you agree, and I'm referring to you as Syngenta now, with the following statement: As a general matter, the EPA frequently relies on the weight of evidence in making pesticide regulatory decisions and it considers expert opinion that tends to confirm or validate otherwise reportable information. In this context, expert opinions can play an important role in agency decision-making?
MR. NARESH: Objection to form, foundation.
THE WITNESS: I -- and the question

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was do I agree with that? Yes, I do.
BY MR. TILLERY:
Q. Do you agree with that statement?
A. Yes. Mmm-hmm.
Q. There's a difference between section 159.158's reporting requirement for a registrant's employees and consultants on the one hand, and for qualified experts on the other hand, isn't there?
A. Again, because I don't study the -- have never studied the detail of these documents, I take your word for that.
Q. Okay. And the difference is that section 159.158's reporting requirement for qualified experts is that it is not limited to experts with a relationship to the registrant.
Do you understand that?
A. Okay. That makes sense, yes.
Q. So, in other words, if a registrant comes into possession of reportable information from a qualified expert, the registrant must report that information to the EPA regardless of who that expert is, correct?
A. Yes.

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Q. All right.
A. If we believe that the information that's provided is indeed relevant to the reporting requirements with --
Q. Where --
A. -- under the legislation, yes, of course.
Q. Okay. Where do you see the words in any of the FIFRA reporting obligations that puts in "if Dr. Botham believes the information's relevant"? Do you know that part?
MR. NARESH: Object to the form --
MR. TILLERY: Can you direct me to that section?
MR. NARESH: I'll object to the form --
THE WITNESS: I can't direct you to --
MR. NARESH: -- and I'll also object to the foundation. I also think it's unfair to --
MR. TILLERY: You've done it twice. Let's start over.
Agree. I stipulate. You did it.

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BY MR. TILLERY:
Q. Where does that section, "Phil Botham doesn't think it's relevant," where do I find that in the code?
A. No, no, I -- if I may just elaborate on what I mean by that, the --
Q. No, I'm asking you -- no, excuse me. I'm asking you to answer my question. Where is that contained in the code? Where does it say, "If Dr. Botham and the potential referable committee thinks it is not relevant, we don't have to report it"? Where does it say that?
A. It doesn't say that, and I would like an opportunity --
Q. All right.
A. -- if I may to explain what I mean by this.
Q. You'll get your chance because your counsel has an opportunity. I want just direct questions, sir, to my -- I'm sorry, direct answers to my questions.
So when Dr. Louise Marks worked for Syngenta, she was a qualified expert within the meaning of US EPA's definition, wasn't she?
A. Yes.

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MR. NARESH: Object to the form.
BY MR. TILLERY:
Q. And she was both a Syngenta employee and an expert, wasn't she?
MR. NARESH: Same objection.
THE WITNESS: Yes.
BY MR. TILLERY:
Q. And because Dr. Marks was a Syngenta employee, Syngenta would have been required to report any of Dr. Marks's conclusions and opinions if "the information was relevant to the assessment of the risks or benefits" of paraquat, correct?
MR. NARESH: Objection to form.
THE WITNESS: Correct.
BY MR. TILLERY:
Q. Okay. And the fact that Dr. Marks was an expert is another independent reason Syngenta would have been required to report any of Dr. Marks's conclusions and opinions if "the information was relevant to the assessment of the risks or benefits" of paraquat, right?
MR. NARESH: Objection to form.
THE WITNESS: Yes, and that is where we have internally done our own

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guidance as to what the word "relevant" means.
BY MR. TILLERY:
Q. Okay. And your -- strike that.
And 16 years after her studies were done, you sent them to the US EPA, didn't you?
A. That is correct. Yes, in 2019 information on those studies was sent to the EPA.
Q. And did you know that followed my letter to counsel saying that I was going to send them myself if they weren't sent in? You knew that, too, right?
A. I was made aware of that.
Q. Yes. In that 16-year period, the fact that she was an expert, the fact that Dr. Marks was an employee didn't matter, did it? It wasn't sent in.
MR. NARESH: Objection to form.
THE WITNESS: It wasn't sent in because of the way in which we had defined "relevant" at the time the studies were done.
BY MR. TILLERY:
Q. Did you redefine "relevant" in

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December 2019?
A. I did not, no.
Q. Okay. So somebody redefined the word "relevant." Suddenly, Dr. Marks's reports became relevant in December 2019, right?
MR. NARESH: Objection to form, foundation.
BY MR. TILLERY:
Q. Right?
A. That was the opinion of some of my Syngenta colleagues, yes.
Q. Okay. Do you know if any word changed in the FIFRA obligations or any of FIFRA rules about what the word "relevant" meant in that period of time?
A. I don't believe that any fundamental change was made, no.
Q. Okay.
And Dr. Dino Di Monte, he, too, was a qualified expert within the meaning of the EPA's definition, wasn't he?
MR. NARESH: Objection to form.
THE WITNESS: He was.
BY MR. TILLERY:
Q. So Dr. Di Monte would have been both

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a Syngenta consultant and an expert, correct?
MR. NARESH: Same objection.
THE WITNESS: Correct.
BY MR. TILLERY:
Q. And because Dr. Di Monte was a Syngenta consultant, Syngenta would have been required to report any of Dr. Di Monte's conclusions and opinions if the information was relevant to the assessment of the risks or benefits of paraquat, correct?
MR. NARESH: Same objections.
THE WITNESS: Correct, and that would have been the case even if he had not been a consultant. So if he was -- if he had not been engaged in that way, even then there would have been some potential relevancy.
BY MR. TILLERY:
Q. Okay. And the fact that Dr. Di Monte was an expert is another independent reason Syngenta would have been required to report any of Dr. Di Monte's conclusions and opinions if the information was relevant to the assessment of the risks or benefits of paraquat, right?

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MR. NARESH: Same objections.
THE WITNESS: Correct.
MR. NARESH: Steve, I don't know if you saw, there are some comments in the chat about microphone feedback that others are hearing. I'm not hearing it but it sounds like --
MR. TILLERY: I'm hearing a lot of --
THE VIDEOGRAPHER: Yes.
MR. TILLERY: I'm getting a lot of feedback.
THE VIDEOGRAPHER: Yeah.
MR. NARESH: And I'm --
MR. TILLERY: And I don't know what's causing it. We don't get it when it's during the chat periods but -- we're not hearing it now but everything's turned off.
THE WITNESS: Yeah, I've been getting it at this end as well.
THE VIDEOGRAPHER: Yeah, I've been getting it here as well and it's obviously on the recording.
MR. TILLERY: Is that on the

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recording as well?
THE VIDEOGRAPHER: It is, unfortunately, yes. It's like a very high-pitched squeak. I don't know if everybody else is hearing the same.
MR. TILLERY: Yeah. Well, we're going to -- if it continues, we'll have to stop for a bit to see if we can ferret out what's going on. There is no electronic equipment anywhere near the devices so it's certainly not here. I just --
THE VIDEOGRAPHER: And every --
MR. TILLERY: It could be the microphone itself in the device could be failing.
THE VIDEOGRAPHER: Yeah --
MR. TILLERY: I don't know what it is.
THE VIDEOGRAPHER: Okay. I'll keep an eye on it. I'll listen in and let you know.
MR. TILLERY: All right. Okay.
BY MR. TILLERY:
Q. Let's talk about Syngenta's policies

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for compliance with section 159.158. Has Syngenta ever had a company policy or other --
MR. TILLERY: Yeah, there it is again. Yeah. Do you know if he can replace this?
We're going to go off right now, if we can, to solve this technical problem to see what we can do, okay.
THE VIDEOGRAPHER: Okay.
MR. TILLERY: We'll go off the record.
THE VIDEOGRAPHER: Yeah, that's great.
THE WITNESS: I'll take a five-minute break if that's the case just to go to the bathroom.
MR. TILLERY: That's fine, thank you. Thanks.
THE VIDEOGRAPHER: We are going off the record. The time is 1:40.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 1:45.
///

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BY MR. TILLERY:
Q. Does Syngenta have a policy or some other safeguard to ensure compliance with section 158 -- or section 159.158's requirement to report the opinions and conclusions of Syngenta's employees or consultants?
MR. NARESH: Objection to form.
THE WITNESS: Within our guidance it has both. Yes, it sets out very clearly the responsibilities of employees and also how we deal with opinion from consultants and other external opinion, even from those who are not consulting.
BY MR. TILLERY:
Q. And does the policy or safeguard that you mentioned, does it take the same position that we've discussed in this deposition so far; that is that those employees or those experts or those consultants that you're working with are -- who are employed at Syngenta, have to be disclosed, the information for them has to be disclosed to the EPA if it otherwise meets the filing requirements?
MR. NARESH: Objection to the form.

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THE WITNESS: Yes, and the guidance document, I think as I've said before, says how to interpret the information that may be given to us in those situations, such that it complies with the full definition of potentially referable findings in the legislation.
BY MR. TILLERY:
Q. Has there been any change, to your knowledge, in the last 20 years in the reporting obligations set out in that policy or safeguard that you mentioned with respect to employees, experts or consultants?
A. I think, as I, again, mentioned earlier, our internal guidance documents are modified at a regular -- on a regular basis, and some of that comes from feedback from our US experts in PRF legislation, but these are relatively small changes, if you like, in quite -- in the detailed technical criteria that are used.
Q. All right. So in the absence of a formal statement of a policy that covers exactly what we said, whether it exists or doesn't exist, Syngenta knows that it must

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report the conclusions and opinions of employees or consultants of Syngenta if the information is relevant to the assessment of the risks or benefits of a pesticide like paraquat, correct?

A. It does, yes. With the definition of how we -- with the guidance on how we define "relevant," yes.

Q. Has Syngenta ever made a report to the EPA specifically to comply with section 159.158?

MR. NARESH: Objection; foundation.

THE WITNESS: I wouldn't know how to answer that question.

BY MR. TILLERY:

Q. You don't know the answer?

A. No.

Q. Has Syngenta ever made a report to the EPA because the reportable information was the conclusion or opinion of a Syngenta consultant?

A. I'm sure we have, yes.

Q. About paraquat?

A. I can't recall immediately an example for paraquat.

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Q. Okay. Has Syngenta ever failed to make a report to the US EPA when Syngenta possessed reportable information that was a conclusion or opinion of a Syngenta employee or consultant?

MR. NARESH: Objection to form.

THE WITNESS: I don't believe that we have, when we have used, as I've said several times, our own criteria about how to determine the relevance of effects or opinion.

BY MR. TILLERY:

Q. So when you apply your own definition of relevance, then you've made the determination that you don't have to report it, correct?

A. There are -- when we use our internal definition of relevance, which has come from expert opinion on this legislation that we have received, there are some -- there is some information which is determined to be not reportable.

Q. And who is the expert you're relying on?

A. Largely, these will be regulatory

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and legal people based in the USA.

Q. Okay. Do you know any names of them?

A. One of the main people that we relied on has been Dennis Hackett, who is the technical secretary of the United States PRF Committee.

Q. Okay. And he has given you a definition of relevancy to follow, right?

A. He has given us an input in order for us to generate the kind of detailed guidance that I was holding up to you earlier on.

Q. How does his definition of relevance compare to the definition that the US EPA uses?

A. I think I'm not really able to make that comparison.

Q. So when in doubt you follow Mr. Hackett's definition of relevance, not the one that the FIFRA statutes and regulations apply, right?

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

THE WITNESS: I wouldn't put it that way. I'll restate that our internal

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guidance has been put together on the basis of our best understanding of those FIFRA requirements.

BY MR. TILLERY:

Q. So then -- it then -- can you tell me that you have followed FIFRA in your reporting obligations, without qualifying it that you used your own internal definition of relevancy?

A. Well, I think every organization has to do what I've said, which is to take a complex set of legislation and translate it for a large number of people, whether they're employees or consultants, so that, in their day-to-day work, they can and we can, in supporting them, comply, to our best endeavors, with the legislation.

MR. TILLERY: What's the next exhibit number?

MS. BRUMITT: 85.

MR. TILLERY: 85?

MS. BRUMITT: Yeah.

MR. TILLERY: Let's put up number 85, Plaintiff's Deposition Exhibit 85 on the screen.

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(Botham Exhibit 85 marked for identification.)
MR. TILLERY: We'll adjust this a little bit.
BY MR. TILLERY:
Q. Okay. Do you see this, sir?
A. I do.
Q. Okay. This is 40 Code of Federal Regulations, section 159.165(a), and this is Exhibit 85. Do you see that?
A. I do.
Q. All right. Are you familiar with this regulation? Syngenta familiar.
A. Very familiar.
Q. Okay.
A. Very familiar.
Q. And you understand the purpose of this regulation is to make sure the EPA knows about the toxicity studies that reveal new adverse information about the toxicity of the chemical; is that right?
A. That is correct.
Q. To make sure the EPA knows about toxicity studies that reveal new adverse effects in a different organ, right?

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A. That is one of the criteria, yes.
Q. Or a different tissue, right?
A. That is correct.
Q. Or a new adverse effect at a higher incidence, right?
A. Yes.
Q. Or a frequency, right?
A. Yes.
Q. Or in a different species of test organism, right?
A. Yes.
Q. Or in a different strain of test organism, right?
A. Yes.
Q. Or in a different sex of test organism, correct?
A. Correct.
Q. Or in a different generation of test organism, correct?
A. Correct.
Q. What is your understanding of why new adverse effects in different specie, strain, sex or generation of test organism is important for the US EPA to know about?
A. Because it -- those effects could

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be of relevance to human safety and may have implications for the current registration of a pesticide. They could mean that a different risk assessment or risk management would be required.
Q. And would you agree they also mean that the more species or the more strains, both sexes, or generation of test organism adversely affected, the more generally toxic the chemical is, right?
A. No, that's -- I wouldn't agree with that statement. It doesn't mean it's more toxic. It might mean that we understand more about the nature of the toxicity and potentially the relevance to man.
Q. Well, what I'm pointing out is simply this: that if one mammalian species has a problem with this and many, many other test animals or species do not, that's different than having a homogenous reaction to a chemical that impacts all of them, isn't it, sir?
A. It could be, but --
Q. And it -- and it's more predictive in terms of its impact on other mammalian species, isn't it?

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A. No, I think that's too general a statement. There's much more judgment involved in assessing relevance to humans than the way in which you describe it.
Q. Okay.
Would you agree that a poison that adversely affects more species is likely to be -- have an effect on humans?
MR. NARESH: Objection to the form.
THE WITNESS: Not necessarily, for the reasons I said before.
BY MR. TILLERY:
Q. So you wouldn't accept that premise as a fair interpretation of this regulation, right?
A. That's not necessarily what is behind this regulation. It is, to restate, that toxicology where different species are used is a way of building up an overall weight of the evidence, to allow you to understand relevance to humans.
Q. So the fact that it impacts frogs or mammals, or different kinds of mammals and all other kinds of animals, you think is not predictive in any way and that's not what

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underlies the importance of reporting for the US EPA? Is that your understanding?
A. No --
Q. Is that what Syngenta's understanding is?
A. No. No, no, you're putting it in a different way again, which is not what I'm trying to say. I'm saying that -- what I'm disagreeing with is -- what I understand you to be saying is that the more species you see an effect in, the more of a likelihood is that that toxicity, or whatever it is that you're talking about, will happen in human beings.
I'm saying that's not necessarily the case. It may be the case but it isn't necessarily the case. But what I'm saying is that testing in different species, strain, sex, generations, is a way in which you can build up a much greater overall understanding of the likely effects or potential effects a chemical might have on human health.
Q. Irrespective of whether you and I could ever agree on the real reason for that, the fact is is that Syngenta knew that if it

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did affect any of these different species or frequency or different tissues or different strains of a test organism, you had to report it, correct?
A. We do, and we don't report the weight of evidence. So, you know, we certainly do report individual effects in different specie, strain, sex and generation. So we don't wait until we have that overall weight of evidence before we report.
Q. Right. So the difference between a squirrel monkey and a mouse, right?
A. Right.
Q. Those would be majorly different species, wouldn't they?
A. They are, yes.
Q. Yes. So if you did studies showing damage to dopaminergic neurons in mice and then found that paraquat got into the brain of squirrel monkeys, that would be certainly a different species, wouldn't it?
MR. NARESH: Objection to form.
THE WITNESS: There's a difference between seeing effects' damage to neurones in a mouse and finding paraquat

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in the brains of nonhuman primates, and I think that's one of the reasons why different decisions are sometimes made on reportability.
Certainly when you see adverse effects, which is what this is talking about, as you see in line 2 here, "adverse effects," that's very clear. Presence of chemical is not necessarily an adverse effect.
BY MR. TILLERY:
Q. So that fell into the -- to the Syngenta relevancy definition, right --
A. Exactly.
Q. -- it wasn't relevant?
A. Exactly, so --
Q. You made it -- you determined they didn't need to know about this. When in doubt, if it's not relevant don't give them the information, right?
A. Let me expand on that.
Q. Can you answer -- can you answer that question?
A. We will not report if we believe that the effects are not considered to be

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adverse, in the sense that that is one critical criterion to determine relevancy.
Q. As you define it at Syngenta, right?
A. That's the way in which we have been advised to interpret it, yes.
Q. Okay.
A. A finding should be new and adverse.
Q. Has Syngenta ever had a company policy, other safeguards to ensure compliance with section 159.165(a)'s requirement for reporting toxicological studies?
A. Yes, we do have a policy that we would apply.
Q. What is the policy? What is the policy?
A. There is an overarching policy which talks about our require -- the need for us to comply with legislation such as the FIFRA 6(a)(2).
Q. Do you have a policy at Syngenta for all of the member companies under the Syngenta umbrella that says when in doubt -- if there's any question about whether this should be reported, we'll report it to the US EPA?

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A. We had a policy -- we have a policy that if there is any doubt in the minds of our employees, particularly about any findings that they become aware of in our own toxicological studies for example, they should bring them to our PRF Approach Committee, and then that approach committee, as we have described before, will, in many cases, then submit them to the US PRF Committee who would then determine whether they meet the criteria of 6(a)(2).

Q. Let me ask you this: Just from a lay perspective -- we've used a lot of fancy scientific language in our days of depositions in this. I just want to take this to a level of understanding where everybody here understands it.

Is getting paraquat in the brain of a primate a good thing or a bad thing?

MR. NARESH: Objection to form.

THE WITNESS: The answer to that question, in simple terms, is it will depend how much paraquat gets in there and for how long it stays.

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BY MR. TILLERY:

Q. So getting in there itself, you don't have any problem with; is that right?

A. No, I --

Q. As long as -- as long as it's not at a certain level, right?

A. This is one of the fundamental principles of risk assessment. The dose --

Q. Okay, so --

A. The dose makes the poison so you have to understand --

Q. Okay, so -- so just a little bit isn't a problem, right?

A. It might not be, but that is a judgment that is made which is very specific to the chemical that you're looking at.

Q. When does it become a problem? How much do you have to get in your brain of paraquat before it's a problem for Syngenta?

MR. NARESH: Objection to form.

THE WITNESS: Well, this is really at the heart of a lot of the work that we've been doing. So we understand the -- let's take the animal model studies that we've done. We understand

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how much paraquat we give them. We understand how much of that paraquat gets to the brain, and at what point the levels of paraquat that get into the brain don't do any damage. So there is a threshold of effect.

We then say, using good toxicological practice, that you can -- you apply what's called a margin of safety. You say that as long as a level of paraquat doesn't exceed that margin of safety, then that is not deemed to be a problem for human health.

The whole of regulatory risk assessment is built on that premise. So the EPA and other regulatory agencies would use that premise.

BY MR. TILLERY:

Q. Okay. So what is the threshold limit for how much a human can have of paraquat in their brain before they have a problem? What's that threshold?

A. I can't give you a -- I can't give you a number off the top of my head.

Q. Well, does Syngenta not know?

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You're selling paraquat all over the world. Syngenta doesn't know how much paraquat you get in a human brain before you have a problem?

A. We --

MR. NARESH: Objection to form.

THE WITNESS: Yes, we have been doing those calculations and we looked at a document, I think, in my last deposition which was our internal document that provided some of those calculations, and we've continued to do studies to help us to refine those numbers.

So the reason for not giving it to you now is I haven't got that number to hand.

BY MR. TILLERY:

Q. So you, today, can't tell me how much Syngenta believes that a human being could get into the brain -- we're talking about paraquat -- before they have a medical issue, right?

MR. NARESH: Objection to form.

BY MR. TILLERY:

Q. A hazardous condition. Can you tell

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me?
A. I can't give you that number right now and, as I say, this is a number which is a calculation based on mathematical modeling built on real data in animal models.
Q. Okay. So there is some amount that can get in the brain. You can't tell me the amount, but there is some amount that can get into the brain that is, in your view, acceptable. Right?
A. And that is absolutely normal toxicological practice accepted by regulatory authorities all over the world. Not just for paraquat.
Q. Okay.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Would you please listen to my question, sir. So there is some amount of paraquat that can get into the human brain that is an acceptable level for Syngenta; is that correct?
A. I think -- I wouldn't use the term "acceptable to Syngenta." I'm -- as a

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toxicologist, I'm talking about a level which is unlikely to do harm.
Q. Okay. So let's change this. There is some level of paraquat that can get into the human brain that is unlikely to cause harm, according to Syngenta. Is that a correct statement?
A. Yes, exactly.
Q. Okay.
A. In --
Q. And that falls below, within, let's say -- strike the question.
And that amount falls within the so-called margin of safety that you referenced, correct?
A. Yes, we have a margin of safety which says we believe that if a human being is exposed to a level which is below that number, which is derive -- which is called the margin-of-safety number, would be expected to cause no harm.
Q. Okay. And what is that margin-of-safety number? If I'm going to go out and spray your product in the fields and I'm going to inhale it and it's going to get

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into my brain, how much of it can I get in my brain where I'm just fine, no health problem, no Parkinson's disease? How much?
A. Well, that's -- we have done a -- we have done some calculations which say that -- you know, we have come to a number that can be derived in that way, and that that number is -- it is highly unlikely that people using paraquat would ever be exposed to something anywhere close to that.
Q. Well, what is the number? I keep asking you what the number is and you keep saying in nebulous ways there's a number or there's a threshold. What is it? Give it to us.
A. I don't have -- I don't have it with me right now, I'm sorry.
Q. But whatever it is, it's more than they'd ever get in their brains, right?
A. That's -- yes.
Q. Whatever that number is that you can't tell me? Okay. You know it's there within their margin of safety; you just don't know what that is.
MR. NARESH: Objection to form.

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BY MR. TILLERY:
Q. Right?
A. We do know what that is. You're asking me to try --
Q. What is it?
A. -- and give you --
Q. What is it?
A. -- a number right now.
Q. What is it?
A. I don't have it to hand. I repeat again --
Q. Why don't you give me a ballpark. What's the range?
A. I'm sorry, I'm not prepared to do that. I'm a scientist. I would rather go back and provide you with a proper thought -- you know, a proper number, not something that I'm vaguely remembering.
Q. Well, let me drill down on this just a little bit. Did you ever have a number?
A. Yes. You might remember we looked at a document in my last deposition where we were doing those kind of calculations.
Q. Okay. So you remember in our last deposition that you gave us the amount of

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paraquat that can get in the brain within a margin of safety for the human being, right?
A. Yes.
Q. That's what you remember?
A. Yes.
Q. Okay. And you think that that's in the prior deposition, correct?
A. It is, yes.
Q. And that is already set out there, right?
A. It was in the -- it was in one of the documents that was part of that previous deposition.
Q. And just so we can, at the next break, look at that, any of the documents, which document was it set out in?
A. It was a document which was entitled -- the reference -- I think it had "reference dose for paraquat" in the title.
Q. A reference dose for paraquat?
A. Yes.
Q. And that reference dose was based upon your own studies at Syngenta?
A. That's right, yes.
Q. And when did you do those studies?

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A. Those were studies that we've been doing since 2007 and have been doing right up to this day.
Q. Okay. So you knew that information, then. Did you know that information in 2011?
A. It was still a work in progress at that time. We were still in the middle of our research program.
Q. Well, when did it become fixed in your corporate knowledge that you could get paraquat in the human brain within a margin of safety that didn't exceed a certain threshold, and the person would not have adverse health outcomes? When did that happen?
A. Well, we began to write those documents about -- the reference dose documents in -- I can't remember when the first one was. It was, say, around 2010, thereabouts, and we revised that document several times as new information became available.
Q. Okay. And can you tell me the range of how much you can get in the brain today without looking at the document?
A. No.

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Q. Okay. But if we pull that document out at the next break and start that section of the deposition, you'll be able to reference that particular document and tell the court and the ladies and gentlemen of the jury how much paraquat can enter the human brain within a margin of safety so that the person doesn't develop any adverse health effect, correct?
A. This is the -- you know, the number which you calculate from the information you have available, which is giving you the best possible prediction of that, yes.
Q. And do you know if redox cycling was contemplated when you did that analysis?
A. Well, redox cycling is behind the way in which paraquat can damage cells. So, yes, let me say that that document was making the assumption -- because it was a very conservative document in that sense. It was making the assumption that the effects that had been seen by some, and by us as well if you include the Marks studies and the early Breckenridge studies, the effects seen in the mouse in the brain really were, if you like, real effects, this is an effect of paraquat.

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So it was making that assumption and then calculating these margins of exposure, these reference doses with that in mind.
So it was not built on the basis of a denial of that possibility.
Q. So you were factoring in -- just so we're clear, you were factoring in redox cycling characteristics of the chemical paraquat when you created this document and calculated the margin of safety and the threshold of paraquat that's safe within the human brain, correct?
A. We were factoring in that paraquat, potentially through redox cycling, was capable of damaging neurones in the brain, as a conservative assumption.
Q. Did you calculate how many neurons in the human brain it was safe to kill or damage?
A. No.
Q. Did you ever calculate how many neurons, dopaminergic neurons, in the substantia nigra you could kill with paraquat before the onset of Parkinson's symptoms?
A. In the human being?

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Q. Yes.
A. No.
Q. Okay. Did you calculate it with respect to any nonhuman primate?
A. No.
Q. So you calculated --
A. Other people --
Q. -- it with other animals?
A. No. We -- yes -- well, yes, sorry. Obviously we calculated -- we measured the number of neurones that were damaged in the mouse model.
Q. Okay. And you assume that if certain number of neurons in the human brain were killed, are rendered incapable of producing dopamine and it didn't reach a certain level, it was within the margin of safety to use?
A. No. In making our extrapolations to humans, we didn't say you have to have a certain number of neurones dying before that could lead to Parkinson's disease. We were saying what levels are you unlikely to get any damaged cells.
Q. So your margin of safety or

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threshold was a certain amount, which we're going to -- you're going to tell us later today what that amount is when you look at this document; that you reached a certain amount and that amount would not give rise to either any damage to, or death of, a dopaminergic neurone in the substantia nigra portion of the human brain, correct?
A. Correct, yes.
Q. All right.
Syngenta knows that it must report the results of the toxicity of a pesticide to humans if, relative to all previously submitted studies, they show an adverse effect in different species, correct?
A. Correct.
Q. Has Syngenta ever made a report to the US EPA to comply with section 159.165(a) that deals with that exact point --
MR. NARESH: Objection to form, foundation.
BY MR. TILLERY:
Q. -- and knowledge?
A. I'm sorry, I don't really understand what that means in practice.

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Q. Well, you have in front of you on the screen 40 C.F.R. 159.165. Do you see that?
A. Yeah, sorry. I need to go back to that, yeah. Mmm-hmm.
Q. Okay. And it talks about the fact that a registrant, like Syngenta, must report the results of a study of the toxicity of a pesticide to humans --
A. Mmm.
Q. -- if, relative to all previously submitted studies, they show an adverse effect in a different species.
Do you see that?
A. Yes.
Q. Okay.
A. And we do that all the time.
Q. All right. And you've made a report to comply with that with respect to paraquat?
A. We have certainly submitted a number of toxicological and environmental studies on paraquat, yes, we have certainly done that.
Q. On that section?
A. On that section, yes.
Q. Okay. And what was the different

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species that you reported?
A. Well, I'd have to go back and look at the detail. I was answering that in terms -- in general terms. We have certainly submitted reports of adverse findings associated with paraquat that meets some of these criteria.
Q. Has Syngenta ever made a report to the EPA because the results of a study of the toxicity of a pesticide to humans, if relative to all previously submitted studies, shows an adverse effect in a different species?
MR. NARESH: Objection; form.
THE WITNESS: Yes. Again, in general terms, we do that. We have done that.
BY MR. TILLERY:
Q. With respect -- you've done that with respect to paraquat?
A. Again, I would have to go back through all the files that we've done to be very specific about that.
Q. You don't remember ever doing it specifically with respect to paraquat; is that

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what you're saying?
A. Well, you asked -- this was about a different specie, so --
Q. Yes, it was.
A. That's the bit that I would need to check.
MR. TILLERY: Now let's pull up the next exhibit, please. Which number is that?
MS. BRUMITT: It will be 86.
MR. TILLERY: Dr. Botham, we're going to look at Plaintiff's Deposition Exhibit 86 at this time.
(Botham Exhibit 86 marked for identification.)
MR. TILLERY: If we can go off the record for just one second. Everybody stay put.
THE VIDEOGRAPHER: We are going off the record. The time is 2:20.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 2:21.
BY MR. TILLERY:
Q. Can you see plaintiff's --

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I'm sorry.
This is Plaintiff's Deposition Exhibit 86, Dr. Botham. It's section 40 C.F.R. section 159.195. Okay?
A. Yes, I can see that.
Q. Are you familiar with this?
A. I'm less familiar with this because it's outside of my normal technical oversight.
Q. Why don't you take a minute and refresh yourself of it.
A. Okay.
Q. Do you understand the purpose of this section, it's a catch-all to make sure that the EPA knows anything about a pesticide not covered by the agency's regulations that might materially bear on its continued registration or the terms of its registration.
Do you understand that?
MR. NARESH: Object to the form.
THE WITNESS: Yes.
BY MR. TILLERY:
Q. So, in other words, if the information would be relevant to an agency decision or the continued registration of the pesticide, or to the proper terms of its

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registration, the registrant is required by section 6(a)(2) to submit the information to the US EPA, correct?
A. Correct.
Q. And as of August 23, 1978, in the Federal Register this quote was printed:
"If the information would be relevant to an Agency decision on the continued registration of the pesticide, or to the proper terms and conditions of the pesticide's registrations and the other requirements for section 6(a)(2) are satisfied, the registrant is required by section 6(a)(2) to commit the information to the Agency."
Were you aware of that?
MR. NARESH: I'll object to the form.
THE WITNESS: Well, I don't recall having read those precise words myself, but that's fine, it sounds reasonable.
BY MR. TILLERY:
Q. And you understand from the written regulations within Syngenta that that compliance is required?
A. Yes. Again, as a general principle

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I do.
Q. Okay. And that doesn't -- strike that.
Has Syngenta ever had a company policy/other safeguards to specifically comply with that section?
A. I'm not aware of that.
Q. Have you ever had any kind of training session or discussion with, as you said, the people who are trained about this particular compliance requirement to learn what that section means?
A. I don't immediately recall a training which has been focused on that.
Q. Okay. Has Syngenta ever made a report to the EPA specifically to comply with that section that's up there right now, Plaintiff's Deposition Exhibit 86, 159.195?
A. Again, I anticipate it may have done but I couldn't give you categorical evidence for that today.
Q. Well now let's refer back to the Louise Marks's studies that we have discussed earlier in this deposition; not today but earlier in the deposition.

The first one of those I want to talk about, and for counsel on the deposition I'm referring to SYNG-PQ-00116782. That's referenced as pages 1 through 57.

This is in reference to the Louise Marks's research report dated June 21, 2007, regarding the report of paraquat neurotoxicity in the Charles River C57 black mouse, study number is XM7258.

Do you remember that we went over that in great length?

A. Mmm.

Q. Do you remember that, Dr. Botham --

A. I do.

Q. -- in the earlier days of this deposition?

A. I do.

Q. Do you remember? All right.

Just to recap, the purpose of the study was to determine whether the results of Dr. Marks's first study, the one that it found paraquat had no effect on dopaminergic neurons in the black mouse, whether those results could be reproduced -- let's start over and stop right now.

MR. TILLERY: Don't answer the question.

We have a return of our problems and that's because our IT guy walked towards the door.

(Off-the-record discussion.)

MR. TILLERY: Let's go off the record, please.

THE VIDEOGRAPHER: Okay. We are going off the record. The time is 2:27.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record. The time is 2:30.

BY MR. TILLERY:

Q. And just to recap, Dr. Botham, the purpose of Dr. Marks's study was to determine whether the results of her first study, the one that had found paraquat to have no effect on dopaminergic neurons of a black mouse, whether those results could be reproduced. Is that correct?

A. That's correct.

Q. But in the second study, Dr. Marks reported a statistically significant reduction in dopaminergic neurones, didn't she?

A. That's correct, and I believe that's because this is a study where she had modified the methodology.

Q. She had an upgraded stereology device, correct?

A. That's correct.

Q. And as we discussed earlier, Dr. Marks reported in the second study that the researchers "used one of the most widely used and accurate stereology systems currently available and the methodology was refined to further improve the accuracy of the cell count," not the automated older stereology software used in the first study, right?

A. That's correct.

Q. Dr. Marks's finding of a statistically significant reduction in dopaminergic neurons in the substantia nigra of the Charles River black mouse is "information regarding unreasonable adverse effects on the environment of the pesticide," isn't it?

MR. NARESH: Objection to form.

THE WITNESS: If it is a new finding, yes.

///

BY MR. TILLERY:

Q. So you -- okay. If it's a new finding, you agree with that statement, don't you?

A. Yes.

Q. Okay. And that finding is information about an unreasonable risk to man or the environment posed by paraquat, isn't it?

A. Yes. Such a finding could be, indeed, captured by that definition.

Q. And therefore FIFRA 6(a)(2) obligated Syngenta to report that finding to the US EPA, didn't it?

MR. NARESH: Objection to form.

THE WITNESS: It did not because it would -- it also requires it to be a new finding, i.e. it would allow the EPA to be able to make a different judgment about the safety of paraquat. This was not new; it was replicating what other researchers had found.

BY MR. TILLERY:

Q. And that's why you say you didn't report it in 2003 or '04 when the study was done?

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A. That's the reason why we didn't report it at that time, yes.
Q. Then tell me why it suddenly became relevant in December 2019 --
A. Well, this was a decision that was taken by my --
Q. -- when you sent it in.
A. Yeah. This was a decision that was taken by my colleagues in Syngenta. I honestly cannot speak on their behalf as to exactly why it was the right course of action to report it at that time.
Q. But you can see that Syngenta did, 16 years later, report it, right?
A. Yes. That did occur, yes.
Q. After I demanded they do it, right?
MR. NARESH: Objection to form.
THE WITNESS: That was undoubtedly one of the reasons why they took that action, yes.
BY MR. TILLERY:
Q. Right, exactly.
Dr. Marks's finding was also relevant to the assessment of the risks or benefits -- strike this. Hold on. Let's see

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what we can do here. We're having more trouble.
(Off-the-record discussion.)
MR. TILLERY: Go back on. It's very bad now. We don't need the video on at this point because we've got to deal with this problem, it's distorting everything.
So we can go off the record at this point.
THE VIDEOGRAPHER: We are going off the record. The time is 2:36.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 2:43.
BY MR. TILLERY:
Q. Dr. Marks's finding of a statistically significant reduction in dopaminergic neurons in the substantia nigra of the Charles River black mouse was relevant to the assessment of the risks and benefits of paraquat, wasn't it?
MR. NARESH: Objection to form.
THE WITNESS: It's relevant, yes.
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BY MR. TILLERY:
Q. Okay. And earlier we established that 40 C.F.R. 159.158 required Syngenta to report any of Dr. Marks's conclusions and opinions if the information was relevant to the assessment of the risks or benefits of paraquat because she was an employee, correct? Didn't we conclude that?
A. That is one of the stipulations, yes.
Q. But we did conclude that earlier in the deposition?
A. Yes. We did, yes. Mmm.
Q. And we also established that that same section required Syngenta to report any of Dr. Marks's conclusions or opinions if the information was relevant to the assessment of the risks or benefits of paraquat because she's a qualified expert. Do you remember that?
A. Yes.
Q. Okay. So because Dr. Marks was a qualified expert required Syngenta to report Dr. Marks's finding of a statistically significant reduction in dopaminergic neurons in the substantia nigra of the Charles River

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black mouse, correct?
MR. NARESH: Objection to form.
THE WITNESS: We believed, and with the advice that we have taken on 6(a)(2), that because this was not a new finding, it was replicating what other laboratories had found, that this was not -- we did not need to specifically report Dr. Marks's study at this time.
BY MR. TILLERY:
Q. So the fact that it had been done somewhere else -- where else had it been done, by the way?
A. Well, we're talking about the work that's been done in Dr. Di Monte's and Dr. Cory-Slechta's labs, for example.
Q. Okay. Because it had been done by Dr. Deborah Cory-Slechta, that's the same lady that we talked about who was nominated for membership on the Scientific Advisory Panel, correct?
A. That's the same person, yes.
Q. Okay. Because it had been done by her, the fact that Dr. Marks was a qualified

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expert and an employee but got what you deemed to be the same kind of results meant that she did not -- her results did not have to be reported to the US EPA, correct?

A. Yes, the explanation that we are provided for that is because the work in this case of Dr. Cory-Slechta has already been made available to the EPA by virtue of it being in the public domain and through a peer-reviewed publication, that we do not need to further submit our studies.

Q. So you thought Dr. Cory-Slechta's work was reliable, was consistent with Dr. Marks's work, and was information of a scientific type that should and was reported to the US EPA and known to them, and that's why you didn't report it, right?

MR. NARESH: Objection to form.

THE WITNESS: We did not report it because we believed that that finding, the nature of it, in that strain of mouse, was already known to the EPA because of the work of Dr. Cory-Slechta and others.

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BY MR. TILLERY:

Q. You didn't report it in any of the years when she was doing the study -- strike the question.

Now, unlike the second study, did Syngenta submit Dr. Marks's first study?

A. No.

Q. Okay.

Let's talk about Dr. Marks's next study, XM73731. Do you remember that one as well?

A. If this was the third study, yes.

Q. Yeah, this is number 3, and we had marked this in the deposition as Exhibit 29, okay. And the title of that study was "Investigating reported paraquat-induced dopaminergic neurotoxicity in the Charles River C57 black mouse: The neurochemical, neuropathological and neurobehavioral effects of increasing the dosing frequency of paraquat."

Do you remember that?

A. Yes, I do.

Q. And as you've previously testified, the purpose of the third study was to

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investigate whether the loss of dopaminergic neurons in the substantia nigra observed in her second study could be further enhanced by increasing the frequency of dosing --

A. Yes.

Q. -- correct?

A. Yes.

Q. And, again, Dr. Marks found that increased dosing frequency did not result in greater magnitude of cell loss, confirming the findings of her second study, right?

A. Correct.

Q. Dr. Marks's finding, confirming her earlier study and demonstrating that paraquat induces nigral but not striatal toxicity, is information regarding unreasonable adverse effects from the environment of a pesticide, isn't it?

A. Yes. We've agreed that that is, in principle, true, yes.

Q. And that finding is information about an unreasonable risk to man or the environment posed by paraquat, isn't it?

A. Yes.

Q. And the reason Syngenta did not

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report it, even though it met those criteria, is because you say it had already been done?

A. Yes. If I've got the chronology right, this wasn't the study that we did report, I think that was the next one, unless I -- not having them in front of me again, so -- obviously, one study we did report to the EPA. I can't remember if it's what we call study 3 or study 4.

Q. Well, this is study 3. This is study number 3. So this wasn't reported. Do you remember your reason why you didn't report it?

A. If this one was not reported, it's because, again, the conditions of the study, the numbers of exposures given and the time at which the observations were made were identical to information that was already in the literature, which was available to the EPA.

Q. Dr. Marks's finding was relevant to the assessment of the risks or benefits of paraquat, too, wasn't it, sir?

A. Yes.

Q. In that study?

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A. Yes, yes.
Q. And because she was a qualified expert, the study under section 159.158 required reporting of Dr. Marks's third study as well, didn't it?
MR. NARESH: Objection to form.
THE WITNESS: It did not require reporting if it was not a new finding.
BY MR. TILLERY:
Q. Okay. And would you mind giving me your interpretation that you relied upon on the newness requirement in 159.158? Is there a newness requirement there?
A. I don't know the answer to that question. The new finding comes from the education, the guidance that we received from our US-based experts in 6(a)(2).
Q. So if the interpretation Syngenta relied upon is incorrect and there is no newness requirement in 159.158, as you keep saying, then Dr. Marks's finding was reportable simply because it was the finding of a qualified expert or by a Syngenta employee, correct?
MR. NARESH: Objection to form.

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THE WITNESS: Well, again, I'm not an expert in how that translation was done but I would imagine that what was done here was to say if information of this sort -- we're now talking about Dr. Marks's studies -- was not providing the agency, EPA, with information that change -- could change their view on the hazard of the substance, in this case paraquat, that it is not referable. And that's where I think the "new" came from.
BY MR. TILLERY:
Q. But you wrote into that section 159.158 a newness requirement, didn't you?
A. Well, I didn't personally. That was the advice that we received.
Q. Okay. And what I'm trying to get from you is that if that newness requirement that you've built in is not actually in 159.158, then the fact that she was an expert and the fact she was an employee made it reportable to the US EPA, correct?
MR. NARESH: Objection to form.
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BY MR. TILLERY:
Q. Even if it was a new -- even if Dr. Cory-Slechta had already done the work, as you say, and had already been reported to the US EPA, the fact that your employee, who was an expert, reached the results she reached in her second and third studies made it reportable?
A. Well, that's your interpretation of 6(a)(2). I'm giving you my interpretation as it was provided to me.
Q. Okay. And if your interpretation is wrong and that there is no newness requirement and you're incorrect, then there was a reporting obligation, wasn't there?
MR. NARESH: Objection to form.
THE WITNESS: If the advice I received was incorrect, then that is potentially the case, but this is advice that has been consistently given to myself, my predecessors and people who have followed me, over a 20-year period.
BY MR. TILLERY:
Q. Would it change the EPA's view if the registrant, that is Syngenta, found adverse

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information that previously had been reported only from independent researchers with no interest in the product?
MR. NARESH: Objection; foundation.
THE WITNESS: Would it change the view of the EPA? I don't real -- if it was from somebody --
BY MR. TILLERY:
Q. Do you understand the difference? Do you understand the difference?
A. Please restate that question so I fully understand it, if you could.
Q. Well, let's go back over this. We talked about why it was significant, for reporting purposes, that the person was an employee of a company that made large amounts of a chemical that was sold all over the world. If that chemical company had an employee or employed an expert who made these findings, we talked about the significance of that and you agreed with me as to why that was so important to report to the United States EPA. Do you remember?
A. Yes.
Q. All right. You think that based

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upon that reason alone, the fact that if this person, Dr. Marks, was both an expert and an employee of Syngenta, would add the kind of credibility to this study that they would want to know about, that the reporting obligation was required. That's the point.

A. Well, all I can restate is that we were under the advice that a finding of this sort, which was not new, it was entirely replicating what other people had found, was not reportable.

Q. So as long as somebody else had done something close to it -- and, by the way, would it be fair to say that Syngenta took great objection to the results of Dr. Cory-Slechta?

A. No, we --

Q. It --

A. No, we never took exception to Dr. Cory-Slechta's results. We had views on the way in which Dr. Slechta chose to use those results in some of her public communications.

Q. Do you agree with her results?

A. At that time we agreed with her results because we had replicated them.

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Q. Wouldn't Dr. Marks's results also go to the weight of the evidence that paraquat is neurotoxic in mice?

A. Well, look, the study that followed, I think it was the fourth study which you've not come onto yet, we did report those findings to the EPA.

Q. Okay.

A. And we reported them even though there was a relatively small difference --

Q. Okay.

A. -- in the conditions of the study. But because that small difference meant that they were different from, different to Dr. Cory-Slechta's and others' work, we did report them.

So I believe that we were absolutely keeping within the spirit of the law of 6(a)(2).

Q. And when did you report them?

A. The study that I just referred to was reported in -- I think we went through this in my last deposition. So -- was it 2006? Shortly after the study was finished anyway.

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Q. All right. We'll go through that.

MR. TILLERY: Before we go through this next section, which -- can we take about a five-minute break, please. And can you put us plaintiffs in a chat, please.

THE VIDEOGRAPHER: Of course.

We are going off the record. The time is 3:00 p.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record. The time is 3:24.

MR. TILLERY: Before we go on with our questioning, we're going to pull up one exhibit that we've looked at before and that's Plaintiff's Deposition Exhibit No. 83.

BY MR. TILLERY:

Q. Do you remember this one?

A. Yes, I do. Mmm-hmm.

Q. All right. Now, let's go over this more carefully. It says:

"General. Information which is reportable under this part must be submitted ..."

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Must. What do you understand that to mean?

A. It's obligatory.

Q. Okay. You have no discretion; do you understand that? Right?

A. Yes.

Q. Must. Okay, no discretion.

"... must be submitted if the registrant possesses or receives the information, and the information is relevant to the assessment of the risks or benefits of one or more specific ... registrations currently or formerly held by the registrant."

Would you agree so far, the Marks studies meet all of those definitions, right? So far?

A. They do but the key bit is the "relevant to the assessment of the risk."

Q. Okay. We're going to talk about that but let's make sure we get my questions answered.

MR. TILLERY: Let's go back after I move to strike your answer. Okay.

BY MR. TILLERY:

Q. Would you agree that up to that

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point, that is to -- where I ended up in 159.158 at the word "registrant" on the third line, that the Louise Marks meets -- those studies that we talked about meet that requirement, right?

A. They meet that requirement, yes. Yes.

Q. Okay. And "information relevant to the assessment of the risks or benefits" also includes conclusions or opinions of a person who meets any of the following.

So they have defined the word "relevant," haven't they?

MR. NARESH: Objection to form.

BY MR. TILLERY:

Q. "Information," look at the word. Look at it, "information relevant to the assessment of the risks or benefits also includes conclusion(s) or opinion(s) rendered by a person who meets any of the following ..."

A. Yeah, but I don't think that --

Q. And that's the person -- a person --

A. I would disagree that they have defined "relevant to the assessment of risks."

Q. Actually, they say very clearly:

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"Information relevant to the assessment of the risks or benefits also includes conclusion(s) or opinion(s) rendered by a person who meets ... the following."

And it says (1), (2) or (3) and we talked about who they are. One is an employee, one is a person from whom the registrant requested an opinion, like Dr. Di Monte, and the other is a qualified expert, and we talked about Dr. Marks meeting the definitions of (1) and (3).

Now, where is the newness requirement in that statute? Where is it? Point to it.

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

THE WITNESS: I can't point to it. I would reiterate that it is --

THE STENOGRAPHER: No. No, sorry. I didn't get the objection. Sorry.

I'll object to the form ...

MR. NARESH: Sure. I'm objecting to the form and the attorney commentary preceding the question.

But please go ahead and answer.

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Dr. Botham.

THE STENOGRAPHER: Thank you. Sorry, Dr. Botham.

THE WITNESS: That's fine. I can't point to the word "new," I agree. I can say again, however, that the definition of "relevant to the assessment of risks" has been provided to us in terms of our experts in this legislation, which says relevance means you are adding to the knowledge of the agency regarding risks.

BY MR. TILLERY:

Q. Okay. Well --

A. And Louise Marks's studies initially did not add to.

Q. Okay. Let's do it this way. You and I have a different interpretation of this regulation, don't we? Would you agree with that?

A. We do, yes.

Q. Okay. And you understand how I read it to mean, that the word "relevant" is defined very clearly in this as to include the information from any of those three categories.

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Okay?

A. Yes, I understand that.

Q. You understand that?

A. I understand your point, yes.

Q. Now, I -- yeah. And now I want you to assume that my interpretation of the word "relevant" is correct. Just assume it, okay. If "relevant" does not include a newness component that you interpreted, then Dr. Marks's second and third studies were reportable under this regulation, weren't they?

MR. NARESH: Objection to form.

THE WITNESS: Yes. Without any fuller definition of that, I would agree.

MR. TILLERY: All right. Okay. Now, let's go back -- I promised that we would have our chat about the documents that were marked earlier in the deposition when we started it some weeks ago. Let's go to Exhibit No. 38.

(Botham Exhibit 38 previously marked for identification.)

THE WITNESS: I'm not seeing -- yes, okay, it's just come through. Sorry for the delay.

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MR. TILLERY: Actually, we're experimenting here with something on our system.

Is there a way you can hand that document over to Dr. Botham?

MS. BRUMITT: Yes.

BY MR. TILLERY:

Q. Do you have the document, Dr. Botham?

A. Yes, I now have the document.

Q. All right. Here's what I would like you to do, is to look at that document. This is Plaintiff's Deposition Exhibit 38.

MR. TILLERY: Mr. Naresh, do you have the number, the exhibit that you can pull up?

MR. NARESH: I do.

MR. TILLERY: All right.

BY MR. TILLERY:

Q. So Dr. Botham, here's what I want you to do. You told me earlier that there were exhibits in this deposition that explained how much paraquat could enter the human brain safely, below a -- I think you said a threshold or a margin of safety.

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I want you to go to this document -- and there were two of them, I think 38 and 39, but I think this may be the one you're referring to -- and show me the section of the document, and we'll put it on the screen as we go through it, but show me the page number and then we'll take it back and put it on the screen for everyone to see.

A. So let me -- this is why I didn't want to just give you a number last time because it's not -- it's not as straightforward as that.

What this document describes, and this is -- perhaps I should also say that this is a document that has been modified a number of times as we've been generating more data; so the version we have in front of us right now was written in 2009. Another exhibit that you saw was written in 2011, and the most -- the latest one we have is sometime after that, in 2018.

These documents have been built on during that time as more information is available about the effects of paraquat on the brain in the mouse model and the amount of

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paraquat that gets into the brain.

It does some calculations -- and let's not try and point at a particular point in the document at this time. It does some calculations which became more sophisticated with time -- so this is an early version, so that's why it doesn't contain all the data -- which calculates -- which extrapolates, I should say, from how much paraquat got into the brain in the mouse and damaged neurones in the brain of the mouse, in our early studies and in other people's studies, and it calculates what the equivalent concentration could be in the brain in humans.

But then, most importantly, and the number that is described in these documents is -- so how much does that -- what -- how much paraquat can a person be safely exposed to as a spray operator, as a farmer, or in their food, be safely within that margin of safety that I was describing. So that's why it's not as straightforward. There is not a number which says this level in the brain is safe and this level in the brain is not. A much more helpful number that comes from

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these documents is to say when paraquat is being used, if it's being used to -- whereby people are exposed below a certain level of paraquat, then there can be an expectation that the amount of paraquat that reaches their brain and potentially causes damage will not happen.

That's what this document described.

MR. TILLERY: I move to strike your answer as unresponsive.

BY MR. TILLERY:

Q. Now, answer my question. Show me in the document where you referred when you said that there was a margin of safety or a threshold number for the amount of paraquat that could safely enter the human brain. Show me it and we'll go to that page.

A. Right. Well, I apologize -- obviously you were pressing me on this point. The one reason for my hesitancy is that I was trying to recall exactly how we were expressing those numbers, so I can't point to that number. That's not how this -- and my long explanation which was nonresponsive was

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trying to explain what this document actually did.
Q. All right. So why don't you point to me to anything in this document that might even be related to the calculation of the amount of paraquat that can enter the human brain safely?
A. Sure. Well, I mean, for example, if you look at page 6 of this document --
Q. Why don't you do this first and just tell us which pages you're going to reference because we're going to take it back and show it on the screen.
It's number 6?
A. So this is -- yeah, page 6.
Q. Number 6?
A. Number 6, yes.
Q. Is there another page?
A. Well, not at the moment, no, because I'm still working through this. This is just to identify --
Q. Why don't you take the -- go ahead, sir, and I do not mean to rush you here. So you take your time through it, please.
A. Yeah.

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Q. And let me know when you're ready to speak about it.
A. Right. So if you turn to page 6 -- I'm looking at a live version of this rather than the one that's on eDepoze so I'm trying to do two things at once here.
Q. All right. So hold on just a second, please, and we'll tell you if this is it -- or you'll tell us if it's it.
A. Yeah, that's exactly right. So, for example, you can see here that there are words in the bottom of that large paragraph at the top where it says the maximum concentration of paraquat in the brains of mice following three weekly doses of 1 and 10 mgs per kg are 0.05 and 0.5 micrograms per gram respectively.
And it then says in the next paragraph:
"The next step is to estimate the single ip dose that would result in this concentration of paraquat in the brain. A single 10 mg/kg ip dose resulted in a maximum paraquat concentration in [the] brain of 0.22 [micrograms per gram] ..., therefore

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it is presumed that a single i.p. dose ... would result in a maximum brain concentration of 0.0165 [micrograms per gram]."
So that is why it's not straightforward. I'm just pointing out a particular part of this document which illustrates how we go about doing the kind of calculations that I was trying to say in perhaps too simplified a way previously, that you then have to extrapolate it to humans and then back-calculate to what, if you like, the equivalent dose to a human being might be.
Q. Okay. So what I'm trying to figure out is where I go in this document to start the process of calculating what Syngenta thinks is a safe dose of paraquat in the human brain that's within the margin of safety and below a threshold where brain damage won't occur. That's what I'm looking for.
Can you tell the ladies and gentlemen of the jury and the judge how you would calculate how much is a safe dose in the human brain?
A. Yeah, we've calculated that in the way in which I explained a moment ago,

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by extrapolating from the data we've got in the mouse and where we've done two things: one where I've just shown you how much paraquat gets into the brain; and, secondly, relating that to doses of paraquat given to those mice which we, with the Marks studies and others like Cory-Slechta, showed caused neuronal cell loss, assumed that that effect is real, and then we've said, well, in the mouse it looks like this level of paraquat in the brain is the threshold which results in that neuronal cell loss.
We've done some calculations, which is not in this document because this is an early version, okay. So in later versions we've extrapolated that to humans, but the output is actually not a safe level in the brain; it's a safe level for exposure because the thing that matters, the thing that's critical to protect human beings -- and this was our own document to provide ourselves with a risk assessment, to tell us whether people who are using paraquat are -- can use it safely. So the number that we eventually used was the exposure to paraquat, from whether

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it's -- from spraying it in a field or being exposed to it in residues in food, what -- is there a level above which we would have concern.

And when we looked at that, the margin of safety was such that it was highly improbable that people exposed to paraquat under normal circumstances, except when people deliberately ingest paraquat for example, it would be highly unlikely that people would be exposed to sufficient paraquat to generate enough paraquat in the brain to cause the toxicity.

Q. But that analysis contemplates that there is some amount that can get in the brain that is below the threshold to cause damage, correct?

A. Yes, of course. We're not saying -- absolutely. We're not saying in any circumstances you never get some paraquat in the brain, and that's true of everything that we're exposed to in our world.

Q. Okay.

A. We go outside, we stay in our offices, and we're -- there's tons of stuff in

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our brain at low levels.

Q. So you would contemplate that a user who is using it as contemplated by Syngenta and who is out spraying this in his farm fields is going to get some amount of this in their brain. It's hard to avoid that, correct?

A. Yes, absolutely. We would not deny that some chemical gets into the body, yes, include -- and therefore into the brain.

Q. Yes. And into the brain.

So the issue is how much gets in the brain before sufficient damage to the brain occurs to be, let's say, problematic for that person, correct?

A. That's correct, yes.

Q. Am I saying that right?

A. You're saying it perfectly, sir, yes.

Q. And that -- how long has that been known by Syngenta?

A. Well, we started those calculations in 2009 actually, as that exhibit indicates, as we were starting to generate the data.

Q. All right.

A. And so all we've done over that

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period of time is to further refine that as more data have been generated. Throughout that refinement we have never reached a different conclusion, other than the one that I have indicated, that small amounts that may get into the brain are well below the threshold that would be expected to cause any neuronal cell loss, even if we assume that that is a real possibility, which we are doing as a conservative assumption.

Q. And would you also assume that consuming food that's been exposed to paraquat could likewise end up getting some small amount into the human brain?

A. Indeed, and the document also includes that scenario.

Q. All right. So the real question from Syngenta's perspective, then, comes down to how do you determine how much can get into the brain before damage occurs to dopaminergic neurons sufficient to give rise to the onset of Parkinson's disease, right?

A. Indeed, a principle of risk assessment which we always apply, correct.

Q. Now, when you do that risk

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assessment -- and the focus here, of course, has been primarily Parkinson's disease -- you're doing it focused upon oxidative stress that's applied to the dopaminergic neurons, right? That's really what you're looking at?

A. Yes, we're assuming that paraquat may have that effect.

Q. And also, we could go through -- you and I could walk through the steps, the inflammatory process, the glial cells and all this. We could get through all of it and walk it, but the bottom line is it comes down to one central theme, and that's oxidative stress that either weakens and sickens the dopaminergic neurons or kills them, and where they quit producing dopamine.

Would you agree with me?

A. Yes.

Q. All right. And that determination would then lead to the loss of dopamine to a certain level where a person would develop some symptoms, right?

A. Yes.

Q. All right. But there's yet another component to this, isn't there, of Parkinson's

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disease?
MR. NARESH: Objection to form.
THE WITNESS: Which is what, please?
BY MR. TILLERY:
Q. That's the part of the alpha-synuclein in the brain causing damage to those same cells by leaving clumps of protein in the alpha -- in the substantia nigra, isn't it?
MR. NARESH: Objection to form.
THE WITNESS: That certainly is a view that alpha-synuclein plays some kind of role. But, as we've said in previous discussions, we don't believe that that is yet fully clear.
BY MR. TILLERY:
Q. All right. Well, let's assume that the rest of the medical science group that deals with this every day disagrees with you. We won't need to argue about this but I'll start my question and say this: Just assume that it does, that alpha-synuclein plays a significant role in the development of Parkinson's disease.

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Now, if that assumption is correct, let me ask you, what part of this risk assessment that you've done here includes the calculus for alpha-synuclein playing a role?
MR. NARESH: I'll object to the form.
THE WITNESS: It doesn't, and I would ascertain that it doesn't need to, because we have been looking at the ultimate endpoint, which is loss of dopaminergic neurons, which, as you rightly say, could result in loss of dopamine.
Although we don't believe that that actually is a reproducible finding, we have taken the assumption that it could occur, so we've factored in things like alpha-synuclein and the impact that could have because we've been looking at the final effect, which is death of neurones.
MR. TILLERY: Well, let me move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. And ask you this, sir: Have you

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taken into account the effect in the substantia nigra of alpha-synuclein as one of the hallmark characteristics of Parkinson's disease?
MR. NARESH: I'll object to the form.
THE WITNESS: In terms of doing a risk assessment, we do not -- we feel we do not need to specifically look at alpha-synuclein. It's just one of the component parts that might add up with others to result in the pathology.
BY MR. TILLERY:
Q. So you -- would the answer be you have not looked at that at all, right?
A. Now you're asking a different question, which is whether we have actually looked at alpha-synuclein rather than assuming that it may have a role to play in the pathology, and the answer to have we looked at it is, as I said yesterday, no, we have not looked at that ourselves.
Q. All right. And so would you agree with me that in your analysis you've not taken into account any aspect of the effects of alpha-synuclein, right?

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A. No, I wouldn't agree with that because, as I've said twice now, we -- if alpha-synuclein is part of the pathology, part of the reason why paraquat may kill dopaminergic neurones, we've included that in our conservative risk assessment assumptions.
Q. Because you assume that if they're impacted from this, it includes all sources of impact, right, that's what you're --
A. That's right, yes.
Q. Okay.
A. That's exactly right, yes.
Q. All right. That's what you were saying, right?
A. Yes, that's right.
Q. But if I look at Exhibit No. 38, your risk assessment, are any of the iterations of it in 2011 or anything else, I'm not going to find any references to alpha-synuclein, am I?
A. No, you're not.
Q. You've never done a study on alpha-synuclein, have you?
A. We have not, no.
MR. NARESH: Objection to form.

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BY MR. TILLERY:
Q. You understand that paraquat causes the up-regulation of alpha-synuclein. Dr. Di Monte told you at a meeting that you attended; do you remember?
MR. NARESH: Objection to form.
THE WITNESS: Yes.
BY MR. TILLERY:
Q. You've known that for two decades, haven't you?
A. We've known that for certainly, yes, 15 years.
Q. Two decades. Yes, okay.
Now, let's go back to the April 2009 presentation Dr. Di Monte gave to Syngenta's health, science and legal teams.
Do you remember that?
A. Yes.
Q. That was the meeting in Marlow, England, where Dr. Di Monte gave a presentation of preliminary results with paraquat in the squirrel monkeys, right?
A. Correct.
Q. And you testified earlier, at that meeting Dr. Di Monte reported among his

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preliminary results from squirrel monkeys that he observed the loss of striatal dopamine, right?
A. Correct.
Q. And that may be associated with Parkinson's disease, right?
A. Correct.
Q. The up-regulation of alpha-synuclein, right?
A. Correct.
Q. And that, as we discussed, is a major constituent of Lewy bodies and a pathogenic hallmark of Parkinson's disease, isn't it?
A. That is correct, yes.
Q. He also noted a change in neuromelanin, and an accumulation of neuromelanin in dopaminergic neurons is suspected to play a role in the development of Parkinson's disease as well, isn't it?
A. Yes. That's been speculated.
Q. Yes. More than speculated, hasn't it. You use --
A. That is --
Q. -- the word --

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A. Yes --
Q. Yes.
A. It's part of the hypothesis of what may happen in Parkinson's disease, yes.
Q. All right.
And as you testified, 40 C.F.R. 159.165 requires a registrant like --
(Stenographer interruption.)
BY MR. TILLERY:
Q. And as you've previously testified, 40 C.F.R. 159.165 requires a registrant like Syngenta to report to the EPA the results of toxicological studies if they show an adverse effect in a different species, correct?
A. Correct.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. And you also testified that reporting results in a different species is important because the more species a chemical adversely affects, the more likely it is to affect humans, right?
MR. NARESH: Objection to form.
THE WITNESS: Well, I did qualify that to say not necessarily always the

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case but sometimes.
BY MR. TILLERY:
Q. But in general you would agree with the statement?
A. I think that is part of the judgment that one makes in toxicology and risk assessment.
Q. I don't have any idea what that meant. You just said that --
A. It basically means that you look at the totality of the evidence across species, as we discussed this morning, in making a judgment about relevance to human health.
Q. But the EPA has to have some uniformity for people complying; you understand with as many chemical companies as there are in the world, as many toxicologists as there are in the world, they have to have some uniformity so that they know that there aren't 10,000 different people around the country interpreting their rules and regulations differently.
You understand that?
A. Yes, indeed. That's very clear.
Q. You agree with that, right?

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A. Yes.
Q. Okay. Now, you also testified that for purposes of evaluating a chemical's toxicity to humans, nonhuman primate toxicity studies are gold standard in animal research.
MR. NARESH: Objection to form.
THE WITNESS: They can be but not always. Sometimes the nonhuman primate is the gold standard because it's the closest to human beings.
BY MR. TILLERY:
Q. And when you say closest, you mean closest genetically to us?
A. Closest genetically, correct.
Q. Squirrel monkeys are nonhuman primates, aren't they?
A. They are.
Q. After learning about these adverse effects Dr. Di Monte observed in squirrel monkeys, Syngenta did not report that information to the EPA, did it?
A. It did not, for the reasons that I indicated yesterday, which is that we took the evidence presented by Dr. Di Monte and his expert opinion, which is critical. As we've

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been discussing today, his expert opinion was that those data were not yet fully interpretable in terms of whether they were adverse.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. But after learning about these adverse effects that Dr. Di Monte observed in squirrel monkeys, Syngenta did not report that information to the EPA, did it?
A. We did not.
Q. Okay. But Syngenta should have reported that information, shouldn't it?
MR. NARESH: Objection to form.
THE WITNESS: We believe that we did not need to report because the findings were still not possible to interpret fully, which is an important part of the requirements.
BY MR. TILLERY:
Q. And was that because they weren't complete, they were just a part?
A. In part because they weren't complete but I think much more importantly

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because the expert, the external expert, told us that this was still something that he didn't fully understand himself.
MR. TILLERY: Let's, at this point in time, pull up 563 KT. Whatever number that is. That's 89 or --
MS. BRUMITT: 87.
MR. TILLERY: 87.
Dr. Botham, this is going to be Plaintiff's Deposition Exhibit 87.
(Botham Exhibit 87 marked for identification.)
MR. TILLERY: Keep that up. Could you raise that for him just a little on the screen, towards the top, so he can see the whole thing.
MS. BRUMITT: You're not --
MR. TILLERY: Oh yeah, you have --
THE WITNESS: I've got control, Mr. Tillery, so ...
BY MR. TILLERY:
Q. Dr. Botham, I'm one of those people that you'd call a dinosaur when it comes to newfangled electronics.
A. I'm not far behind you.

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Okay, I can see this.
Q. All right. Let's make sure we're clear on the record what we're all looking at. This is a document which is section 159.165, "Toxicological and ecological studies: Adverse effects information must be submitted as follows."
And this is 40 C.F.R. 159.165, section (d), okay?
A. Yes.
Q. All right. And you see the part that says "Incomplete studies"?
A. Yes.
Q. Okay. Now, earlier you testified that Syngenta's familiar with this regulation, I believe, right?
A. Yes.
Q. And the fact that a study is incomplete or aborted is not necessarily a justification for withholding preliminary results from the EPA, is it?
A. That's correct.
Q. Dr. Di Monte did not complete the study; is that what you're saying?
A. No. Dr. Di Monte, when we saw the

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study, had (a) not necessarily completed the study, and (b), even in the bit that he had completed, was not in a position to fully understand the implications of the findings.

MR. TILLERY: I move to strike your answer as unresponsive.

BY MR. TILLERY:

Q. I said -- asked you, Dr. Di Monte hadn't completed the study, right?

MR. NARESH: I'll object --

THE WITNESS: It was our belief that he had still more work to do.

THE STENOGRAPHER: Sorry, I --

MR. TILLERY: Okay, you thought --

THE STENOGRAPHER: Sorry, I didn't get -- Mr. Naresh, I'm really struggling to hear your objection.

MR. NARESH: Yes, I'm sorry.

Dr. Botham, if you wouldn't mind, pause just a minute some of the time so that I can get objections in. I'm talking over you a few times.

THE WITNESS: Yeah, sorry. I think it's because I'm -- you're quite indistinct at the moment, Ragan. I do

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apologize.

MR. NARESH: Maybe it's the switch to the telephone here, but ...

I'm objecting to the question on form grounds.

But please go ahead and answer if you remember the question.

MR. TILLERY: I'll restate it so we're clear.

BY MR. TILLERY:

Q. You had told us earlier that Dr. Di Monte had conducted a preliminary data analysis or gross pathological analysis but that the exam was not finished. I think that's what you said. Correct?

A. Sorry. I was just pausing in case Ragan was trying to get in. Yes.

So, yes, we believed that he may have more work to do and -- but whether it would be on that particular study or whether he intended to do another study wasn't entirely clear.

Q. Okay. But if Dr. Di Monte's study were completed and if the results were comparable to Dr. Di Monte's preliminary

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conclusions that he reported to you, which we've talked about in this deposition, those results would clearly be reportable to the EPA, wouldn't they?

MR. NARESH: Objection to form.

THE WITNESS: That's why I said previously that it wasn't just about the study being complete or incomplete, or preliminary or fully finished; it was that in the form that he told us about the study, his expert opinion was that he did not fully understand what the implication of his findings were, and that's the reason why we did not report the findings.

BY MR. TILLERY:

Q. So you're relying upon Dr. Di Monte and what he said as a basis for not sending the nonhuman primate data to the US EPA, right?

A. And, indeed, as we said this morning, the views of an independent expert whose study it was are really important in this situation.

Q. Right. And the findings, scientific findings, are more important than the views,

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aren't they?

A. Well, scientific findings have to be properly understood and interpreted. There are lots of findings which may be of absolutely no relevance to human health, and this is normal practice to interpret.

Q. Did you tell Dr. Di Monte that you were relying upon him and what he said as a reason for not sending the nonhuman primate data to the US EPA?

A. I don't know if that kind of conversation was had. It certainly isn't something that I said to him.

Q. You didn't say it, did you?

A. No, I didn't say that to him.

Q. Do you know if Dr. Travis said it?

A. I don't know if Dr. Travis said that.

Q. Or do you know if Dr. Sturgess told him?

A. I don't know if Dr. Sturgess told him.

Q. Okay. Do you think if you were relying upon a comment he made at a science meeting about his work as a basis for not

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reporting these sorts of scientific findings to the United States Environmental Protection Agency, that it would have been appropriate to tell the scientist?

MR. NARESH: Objection to form.

THE WITNESS: I don't know that it's necessarily appropriate not to tell him. It is incumbent, as I understand FIFRA 6(a)(2), and you may want to tell me I'm wrong, that it's the registrants, the people who receive that information who have the accountability to refer to the EPA.

BY MR. TILLERY:

Q. Who have the responsibility and legal obligation, correct?

A. Indeed, if they meet the criteria, yes.

Q. And if they don't do it, it's a violation of the law and there's a criminal sanction for not doing it, right?

MR. NARESH: Object to the form.

BY MR. TILLERY:

Q. Right?

A. Yes. If we deliberately withheld,

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knowing that they met the criteria but we didn't -- that was not the case here.

Q. Did you ever see the word "deliberately" in any of these documents we looked at this morning? Did you see the word "deliberate"?

A. No, I'm -- this is part of the interpretation piece that we're talking about here.

Q. Well, so look at the section (d)(2). Do you see this?

Can we put this up on the screen so that people can see it. Is that it? All right.

Do you see (d)(2)?

A. Yes, I do.

Q. Okay. Let's walk through that. Long-term studies. Was his a long-term study?

A. I would have classed this as not being a long-term study.

Q. Okay. So it wouldn't go for 90 days?

A. No, it certainly didn't go for a 90-day dosing period.

Q. So do you think his study was not

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subject to (d)(2)?

A. I would have described it as more a short-term study.

Q. Okay. A short-term study. A study -- let's look at (d)(1):

"A study using a test regimen lasting 90 calendar days or less, and all of the following conditions are met: All testing has been completed; A preliminary data analysis or gross ... [exam] has been conducted; Final analysis has not been completed ..."

Would that be accurate; no final analysis?

A. Yes, correct.

Q. All right. Only preliminary data analysis had been done and gross pathological analysis had been conducted, so we're okay there, right?

A. Yes.

Q. And a reasonable period for completion of the final analysis, not longer than 90 calendar days has lapsed. It has certainly, right?

A. Mmm-hmm. Yes.

Q. Comparable information concerning

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the results of a completed study would be reportable, right?

A. Yes.

Q. So looks like we hit every single one of those, doesn't it?

MR. NARESH: Objection to form.

THE WITNESS: Well, yes, it does, but you can't -- the advice that we have received from our experts in 6(a)(2) is that you can't take these words in total isolation. You have to add to that a -- the definition of relevance, as we were discussing earlier, relevance to understanding the risk of a product and --

BY MR. TILLERY:

Q. Where does it say that? Where does it say that? Show me that.

A. Well, we looked at that earlier, didn't we, when we were looking at relevance -- in the previous screenshot you gave me, relevance to risk as to -- I can't remember exactly the words. Relevance to risk assessment.

Q. So you're saying all the way back

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to the same point, the word "relevance" gives Syngenta sort of a key because if Syngenta decides it's not relevant, then none of these regs, it doesn't matter how many of things we go through, does it, because none of them are going to be applicable to Syngenta's reporting requirements because if you decide it's not relevant, none of them apply, right?

MR. NARESH: Objection to form.

THE WITNESS: No, I really wouldn't put it that way. We have chosen, in order to do -- I think as you said, to make sure that we are providing consistency in the way in which we interpret FIFRA 6(a)(2), for the many hundreds of people who are involved in generating studies and data, a basis on which to make those judgments, one of which is that the data have to be properly understood as being adverse.

MR. TILLERY: I move to strike your answer as unresponsive.

BY MR. TILLERY:

Q. Can you answer the question or do you want me to restate it?

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A. Please restate it.

Q. I'm looking for just answers to my questions, not some other statements that you want to make. In a trial you get the chance to do that but I'm just answering -- looking for questions to be answered that I asked.

Now, my point is this: You've read into a relevancy component to 159.165(d) on incomplete studies, haven't you?

A. Yes.

MR. NARESH: Objection to form.

BY MR. TILLERY:

Q. Okay. And you agree with me that the Di Monte presentation in 2009 meets all of the requirements of 159.165(d), doesn't it?

MR. NARESH: Objection to form.

THE WITNESS: Yes.

BY MR. TILLERY:

Q. And if we go to (2), and if it's a long-term study, you want to look at that, it meets all those as well, doesn't it?

A. Yes.

Q. All right. So what you're saying is it doesn't matter because, as you view this and as you've been educated and instructed by

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people at Syngenta, this data is not relevant, correct?

A. That's what I'm telling you, yes.

Q. All right. Okay. Let's move on.

MR. TILLERY: Now, I think we're going to go to Exhibit 36 in the deposition -- I'm going to show you an exhibit, sir, that we had marked previously in the deposition, just to orient you to the line of questions, simply for that reason, okay.

This is Plaintiff's Deposition Exhibit 36. Counsel, it's SYNG-PQ-00105713.

(Botham Exhibit 36 previously marked for identification.)

MR. TILLERY: Actually, it's -- we'll have to -- we have a little technical issue with the way it's loaded, Dr. Botham --

THE WITNESS: Yes.

MR. TILLERY: -- so I think we'll come back to this. We'll come back to this after a break, okay.

Can you go to number 15 at this

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point? What number would that be? What exhibit number?

(Off-the-record discussion.)

MR. TILLERY: 88, okay. This will be Plaintiff's Deposition Exhibit 88. This is KT15, number 15. And just that front page.

I don't know that we even need the exhibit, I think. You'll remember it because we spoke of it at great length today, and that is the residue study. Do you remember that? We started our deposition today talking about those exhibits, remember? The Di Monte residue studies.

MR. NARESH: I don't remember. Could you give me -- do you have a Bates number if it's not --

MR. TILLERY: Yes, and this would be SYNG-PQ-00044965, and this is the Bates reference for "Paraquat - Analysis of brain samples from paraquat-exposed squirrel monkeys for residues of paraquat."

THE WITNESS: Yes. So you're

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referring to the report by Dr. Ray?
MR. TILLERY: That is exactly right. These are the January 21, 2011 report by Dr. Ray on the residue studies.
BY MR. TILLERY:
Q. This is the brain specimens from the squirrel monkeys by Dr. Di Monte, remember?
A. Yes, indeed.
MR. NARESH: Just to help the witness, I think that's Exhibit 78, I believe.
MR. TILLERY: I referred to it as 88 but I don't know -- I think we've also previously referred to it as an exhibit this morning and we marked it so I don't know that we -- let me see if I have it.
MR. NARESH: I have it up as Exhibit 78. I don't have an 88 on eDepoze.
MR. TILLERY: Okay, hold on. It's 78, and you are absolutely correct.
MR. NARESH: Dr. Botham, can you navigate to 78?
(Stenographer clarification.)
MR. NARESH: I'm just asking if

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the witness can navigate to Exhibit 78, if he knows how to do that.
THE WITNESS: Yeah, I'm doing that, and I've done so. Thank you, Ragan. I'm there. I can see 78. The Dr. Ray report is in front of me now on eDepoze.
BY MR. TILLERY:
Q. Yeah, all I'm asking is just an orientation question. I'm just trying to orient you for these questions and that's all there is, okay?
A. Okay.
Q. It's just simply referencing that which you and I discussed at greater length this morning, okay?
A. Yes.
Q. You testified that in this study Syngenta confirmed that paraquat was present in the brains of Dr. Di Monte's squirrel monkeys, right?
A. Yes.
Q. And Dr. Travis referred the finding of this study to Syngenta Potentially Referable Findings Approach Committee, which you were the chairman of, right?

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A. Yes, correct.
Q. And he did that in compliance with Syngenta's internal corporate policy of having potentially referable information or reportable information reviewed by the PRF Committee, correct?
A. That's correct, yes.
Q. So it would appear that Dr. Travis thought the finding was at least potentially reportable or referable, correct?
A. Correct, and he also did that in discussions with myself, as that record shows.
Q. Okay. We also looked at Exhibit 79, which was the report that we went over line and verse, which was the form that the potentially referable approach committee filled out. This was the one that Dr. Travis filed.
Do you remember that?
A. Yes. Yes, I do.
Q. Oh, yes, okay.
The people who worked on this study, including Dr. Travis, were all Syngenta employees, weren't they?
A. I believe they were, yes.
Q. And you would also agree that they

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were probably qualified experts within the meaning of EPA's definition, right?
A. I would agree.
Q. And certainly, Dr. Travis was a qualified expert within the meaning of the EPA regulation, wasn't he?
THE WITNESS: Could I just point out, Ragan, I can't hear you at all now. I think I heard you saying -- mouthing something then, but ...
MR. NARESH: Can you hear me now?
THE WITNESS: Yeah, I can hear you now.
MR. NARESH: Okay. I'm just objecting on form.
MR. TILLERY: Did you object to the question -- did you --
THE STENOGRAPHER: Mr. Naresh, can I just say, if I can't hear it but I can see it, the video won't be even hearing it or seeing it.
MR. NARESH: Okay. I think my --
THE STENOGRAPHER: So just to point that out.
MR. NARESH: I think my audio cut

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out. My audio might have cut out.
THE WITNESS: Yeah, Ragan, your audio is cutting in and out, I think that might be the problem, so I may be missing entirely some of your objections.
MR. NARESH: I'm watching it on realtime and I think that they are coming in, though my objections to the last two questions did not show up on the transcript.
THE WITNESS: Yeah, that's what I thought.
MR. TILLERY: I'm stipulating that you're free to make sure that those are included in the transcript now on behalf of plaintiffs, okay.
MR. NARESH: Thank you. Please proceed.
MR. TILLERY: You're welcome. All right.
BY MR. TILLERY:
Q. The people, including Dr. Travis, were scientists. We talked about that, right? They're scientists?
A. Yes.

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Q. They were qualified experts within the EPA's definition, right?
A. Yes.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. And I think we talked about Dr. Travis was a qualified expert within the meaning of the EPA definition, right?
MR. NARESH: Same objection.
THE WITNESS: Yes.
BY MR. TILLERY:
Q. And because the scientists were Syngenta employees, their adverse findings were reportable to the EPA under section 159.158(a), weren't they?
MR. NARESH: Objection to form.
THE WITNESS: If --
BY MR. TILLERY:
Q. For that purpose at least?
A. If the findings were adverse.
Q. Okay. Well, you don't dispute that they were adverse, do you?
A. Well, we're talking about levels of paraquat in the brain, and I think, as I explained this morning, levels of paraquat

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in the brain are not, in and of themselves, necessarily adverse.
Q. Okay. And also because the scientists were qualified experts, their adverse findings, if they were, were reportable to the US EPA under section 159.158(a), correct?
MR. NARESH: Objection to form.
THE WITNESS: Yes. Again, if they were adverse.
BY MR. TILLERY:
Q. Okay. But as we've already discussed, Syngenta's Potentially Referable Findings Approach Committee decided to withhold these findings of paraquat residue in the squirrel monkey brains and not report them, right?
A. Well, I've double-checked that during the break and my understanding, from what I can see, is that it wasn't the approach committee that made that judgment; they were indeed sent, using the appropriate process, to the US PRF Committee.
Q. Well, but the report itself we went over. You're not -- did you change the report

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after we looked at it?
A. No. I'm pretty sure that what happened here, which is what I thought happened, is where it says, under 4d on that report, "No new information in the studies - Not reportable," I'm pretty sure, from looking this up, that that was put in after there had been a discussion in the US PRF Committee, so that was not applied by the approach committee.
Now, we would need to double-check that. That's what my record shows in the short time, short time I had to check that today.
Q. So it was the US guys who did this, not the British guys who did it, right?
A. That's what my record suggests. I think it would be helpful --
Q. All right.
A. -- to double-check that, yes.
Q. Well then, let's see what else the British guys did under paragraph 2a. Look at that one. Because there is no question that's on your watch, right?
A. Yes.

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Q. Take a look at that.
A. Yes. Yes.
Q. That one's yours, right?
A. Yes.
Q. You're not going to say the Americans did that, right?
A. No, no, absolutely. No, it's -- yes.
Q. Okay. All right. Okay. So let's take a look at this:
"Studies of the kinetics of paraquat in the brain across a range of species were considered. The committee considered that the findings do not represent an adverse effect or a pre-cursor [as] an adverse effect. Therefore the findings do not meet the technical criteria for referral as described in the Product Safety PRF Criteria for Referral Guidance Document ..."
Right?
A. Yes, that's what we wrote. That was our belief. Mmm.
Q. That is what you told the US group who made the final decision, right?
A. Right. And let me explain. If --

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Q. Excuse me --
A. No, it's important.
Q. Excuse me --
A. It really is important. We did nevertheless let the US people know because whenever there's any element of doubt about whether our judgment is correct, because they are the experts in FIFRA 6(a)(2), we did let them know about this, even though we believed that our judgment was probably correct.
Q. So you let them know not to report it?
A. We let them know about the findings and then they made their judgment. It was they that actually used the phrase "no new information" -- sorry --
Q. You didn't write in there -- you didn't write in that conclusion paragraph, "We're uncertain about this. We're going to send you all the information."
A. No, I agree.
Q. Okay.
A. Yeah, I agree, we didn't do that but the record suggests that that was actually -- what actually did go on.

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Q. And the reason Syngenta did not report the findings of paraquat in the monkey brains was because "the findings do not represent an adverse effect or a precursor of an adverse event."
A. Yes.
Q. That's what you said, right?
A. That's what we said.
Q. Okay.
Now, could you tell me where studies had previously been done demonstrating that paraquat gets into monkey brains, before Dr. Di Monte's study?
A. Right now, I can't remember what the literature is on that subject. So I think there are studies but I can't immediately bring them to mind.
Q. Can you remember one for the ladies and gentlemen of the jury, one study?
A. Not at the moment, no. I would need to check my files on that.
Q. Okay.
MR. TILLERY: I'm not leaving but I just need to take about one minute to look for something here, okay.

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THE VIDEOGRAPHER: We are going off the record. The time is 4:25.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 4:26.
BY MR. TILLERY:
Q. Dr. Botham, you've acknowledged that FIFRA defines an adverse effect as:
"Any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."
Right?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. Isn't that correct?
MR. NARESH: Dr. Botham, you're on mute.
THE WITNESS: Yeah, I'm sorry about that. I went on mute during that break. Apologies.
And again, Ragan, we couldn't hear your objection then.
MR. NARESH: I'm objecting to the form.

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THE WITNESS: And I replied yes.
BY MR. TILLERY:
Q. Your answer is yes.
MR. TILLERY: For the stenographer, should we do that all over again? Let's do this over, okay. Let's do this --
THE STENOGRAPHER: I did it -- yeah, okay.
MR. TILLERY: The record is very convoluted and we should do this where it makes sense.
BY MR. TILLERY:
Q. Dr. Botham, you have acknowledged that FIFRA defines an adverse effect as:
"Any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."
Correct?
MR. NARESH: Object to form.
THE WITNESS: Yes.
BY MR. TILLERY:
Q. And in May 2009, before Syngenta conducted its monkey brain residue study,

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the same Syngenta committee, the Syngenta Human Safety Potentially Referable Findings Approach Committee, that same committee had already concluded that Dr. Di Monte's brain findings in the nonhuman primate were unanimously agreed as constituting new data, hadn't they?
A. They were new data, yes.
Q. Okay. And the quote, the brain findings in the nonhuman primate were unanimously agreed as constituting new data.
You don't dispute that. That was a committee you chaired. That's correct?
A. I agree they were new, yes.
Q. All right. And the reason the committee gave for not reporting Dr. Di Monte's monkey brain findings was that "that the study had not been completed, peer-reviewed or published and that the data, by Dr. Di Monte's own admission, required further verification."
Correct?
A. That's correct.
Q. Even though the EPA regulations on the incomplete studies required that adverse effects information be reported, correct?
MR. NARESH: Objection to form.

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THE WITNESS: Correct, and -- correct, and the key bit there was the verification. He needed verification. That's what I was mentioning earlier.
BY MR. TILLERY:
Q. But two years later, when Syngenta scientists completed their study of those same monkey brains and they found paraquat in that brain tissue, the committee no longer justified withholding that information due to the incompleteness of the study, did it?
A. No, it was for a different reason.
Q. Instead, the very same committee that had already concluded, in 2009, that Dr. Di Monte's brain findings in nonhuman primate were unanimously agreed as constituting new data stated two years later, in 2011, that Syngenta's own findings of paraquat in the monkey brains was because "the finding do not represent an adverse effect or a precursor to an adverse event."
Correct?
A. That's correct.
Q. In fact, Syngenta's 2011 findings of paraquat residue in the brains was reportable

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then, wasn't it?
MR. NARESH: Object to the form.
THE WITNESS: We said that they were not reportable because presence of chemical in the brain is not the same as adversity.
BY MR. TILLERY:
Q. Okay. And that's because you believe that just having paraquat in your brain, that doesn't reach a certain threshold and is within -- the term I think you used was "margin of safety," doesn't create an adverse event reportable to the US EPA; is that correct?
A. We were not saying that it was because -- about the -- it was not to do with the levels of paraquat. We were not making a risk assessment judgment. We were saying that, as a matter of principle -- and it wasn't just the nonhuman primate studies, it was also, if you look at the report, the 2011 PRF Approach Committee talked about the kinetic studies we did in rodents as well. It said that kinetic studies -- kinetic studies, as a whole -- are not reportable

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because they are simply measuring presence and not adversity.
BY MR. TILLERY:
Q. Let me ask you this: How long have you known, at Syngenta, that in the normal and ordinary use of paraquat by a farmer spraying it on his crops that some amount was going to wind up in his brain? How long have you known that?
A. Well, we've probably assumed that that's the case, that that is the case for quite a long time, because even back in the 1990s when studies were being done in animal models and it was possible to see some paraquat in the brain, it was not an unreasonable assumption that some may also appear in the human brain.
Q. And that's just from breathing it or getting it somehow on their skin or something in normal use, correct?
A. Correct.
Q. All right. And likewise, if you consumed some kind of vegetable or some kind of fruit or something else that had been sprayed by this, you could get incremental amounts of

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it that would enter into, ultimately, the bloodstream and then into the brain, correct?
A. That is conceivable, yes.
Q. So the issue as you see is not whether or not it gets into the brain but how much of it that gets there is problematic, correct?
A. Yes.
Q. And problematic means causing an illness or condition that is what? Where does the line get drawn to where the scientists at Syngenta become alarmed, concerned, worried -- you pick the term -- about the damage to the human brain?
A. Well, it's -- I'll answer that with a general response. This is what risk assessment is about, you -- and that's why when we were talking about that reference dose document, the key is how do you relate external exposure, as we call it, what you're exposed to in your diet or what you're exposed to if you're a farmer, we say at what point do those levels exceed that margin of exposure which we've calculated from our risk

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assessment.
The same applies here as in -- with paraquat and Parkinson's.
Q. Would you think that a loss of dopaminergic neurons under 10 percent, that all of us would agree would not give rise to Parkinson's symptoms, would be an acceptable amount of paraquat in the brain?
MR. NARESH: Object to the form.
THE WITNESS: Is your -- can I just make sure I understood your question? Are you saying under 10 percent of loss of cells is acceptable?
BY MR. TILLERY:
Q. Yeah. I'm saying -- you and I agreed at some point in the past that probably somewhere between 50 and 75 percent, I don't know what number you used, of loss of dopaminergic neurons is necessary before you have the onset of physical components of Parkinson's disease, right? More than 50 percent, less than 100 percent?
A. That's correct, yes.
Q. Yes. What I'm saying is is that if paraquat in the brain causes, say, less than

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10 percent, which we know won't give rise to these symptoms, would that be an amount that would be an acceptable level below the threshold?
A. No, no --
MR. NARESH: Objection to form.
THE WITNESS: Thank you, Ragan, sorry.
No. Our margins of exposure are based on an assumption that there should be no damage, not 10 percent damage.
BY MR. TILLERY:
Q. When you say no -- when you say no damage, you mean no loss of TH+ cells?
A. Yes, indeed. I mean, we believe, as with all risk assessments, we should be doing no harm, and not making an assumption that it's okay to damage yourself a little bit.
Q. Okay. So what you're saying is that the amount of paraquat in the brain at this threshold level causes no cellular death; is that what you're saying?
A. Indeed, because it was based on the

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extrapolation from the animal studies where people like Deborah Cory-Slechta had not only seen the effect but had actually determined that there was a dose in the mouse, which is called the "no effect level," where no cell loss was seen. So our calculations were based on that no effect level with no --

Q. Let me ask --

A. -- signs.

Q. Let me ask you something, and I think this is something you and I have not talked about.

Have you, at Syngenta, factored in time in the calculus regarding how long it takes if you follow an animal or test subject for a long period of exposure, chronic exposure, in small amounts? Have you done that?

MR. NARESH: Object to the form.

THE WITNESS: Well, we've done a 90-day study and this was a 90-day study done in the diet of mice. So, unlike the studies we have been talking about mostly today, which have been intraperitoneal or subcutaneous injection

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with a few doses over a few weeks, we dosed for a longer period of time, 90 days, which is, again, by good toxicological practice, a length of dosing which is meant to give you information to protect from longer-term exposure.

BY MR. TILLERY:

Q. Okay. So do you understand that paraquat -- strike that.

What do you understand, sir, in terms of this scientific analysis, that the length of time from paraquat exposure to the onset of Parkinson's disease is?

A. Well, in the human situation, again not talking about paraquat but in human Parkinson's disease, the onset of the disease can take 10 or 20 years from whatever it is that may be the initial cause.

Q. Okay. So this is sometimes referred by doctors as the latency period?

A. That's correct, yes.

Q. All right. And do you understand the latency period, then, to be from -- as you say, whatever it appears to be the cause, and

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I'm saying it's paraquat, to be 10 to 20 years from exposure before the onset. Right?

MR. NARESH: Object to the form.

THE WITNESS: Well, yes, first of all, you have to assume that paraquat is causative. You also have to assume that it's only paraquat and not a combination of paraquat and other factors, including genetics.

I think that what -- you're representing it too simplistically and I don't think you can say if paraquat is causative, that it takes 10 or 20 years to develop the disease. We don't know the answer to that question. Science doesn't know the answer to that question.

BY MR. TILLERY:

Q. Well, let's just -- let's do it this way, if we can. Let's assume, just for purposes of the discussion, that paraquat is the cause. You're not admitting it, I'm not asking you to admit it. I'm asking you to accept that assumption for purposes of my question. Okay?

A. Fine.

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Q. And that there's a latency period from exposure to the onset of Parkinson's symptoms where a diagnosis of the condition would be made.

Do you understand what I'm saying so far?

A. Yes, yes.

Q. All right. And let's assume that latency period is, as you suggest, between 10 and 20 years. Okay?

A. Okay.

Q. Have you done any studies at Syngenta to replicate that real-life situation just to test whether or not that could occur?

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

THE WITNESS: No, we've not done what you might call a chronic study or a delayed-dosing study. We have gone to a 90-day duration in the work that we've done. That's as long as we've gone.

But, again, 90 continuous days of dosing is, again, exaggerating the exposure. So it's, in part, trying

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to overcome the fact that you can't always fully replicate how human beings might be exposed.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Here's my question: Have you done any studies at Syngenta to replicate that real-life situation that I just described?
MR. NARESH: I'll object to the form.
THE WITNESS: No.
MR. TILLERY: Okay.
Let's take a break here at this point in time because I'm about to move into a new area. Okay.
THE VIDEOGRAPHER: We are going off the record. The time is 4:41.
(Off the record.)
THE VIDEOGRAPHER: We are back on record. The time is 5:01.
BY MR. TILLERY:
Q. Dr. Botham, are you ready to proceed?
A. I am ready.

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MR. TILLERY: I want to show you what we'll call Plaintiff's Deposition Exhibit No. 88, and this is -- for the record, this is SYNG-PQ-00481037. It's page 1 of an 18-page document. Give us a second, please, to pull that up.
(Botham Exhibit 88 marked for identification.)
BY MR. TILLERY:
Q. Would you care to look at this document to refresh yourself.
A. Yes, I'll do that. I can see it.
Q. The questions I'm going to be referring to, I think, exclusively are on page 3 but take your time with the document.
Just tell me when you're finished and ready to talk.
A. Okay. Yeah, I've refamiliarized myself with this slide set, so please go ahead.
Q. All right. We're going to take it back and show it on the screen.
So this document, Exhibit 88, is a Syngenta PowerPoint slide set, isn't it?

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A. That's correct.
Q. Were you present at this?
A. I don't remember whether I was present.
Q. You may have been or you may not have been, right?
A. That's correct, yes.
Q. All right. And it's entitled "Parkinson's disease - What can Syngenta say about the issue?"
Right?
A. That's right.
Q. All right. If we go to page 3 of that document -- we're going to do that for you -- this is what the report says. Can you tell who wrote this?
A. I don't know who wrote this.
Q. Okay. This is what's reported as what Syngenta cannot say. And I presume what you cannot say means what you cannot say publicly, correct?
A. I don't know if that was the implication here. It may be that it's saying, from a science perspective, we're not able to say, rather than --

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Q. Right.
A. -- gagging ourselves from saying what we can't say to the public.
Q. Okay. So, in other words, it may mean that based upon what we know of the science, it is not good, honest science to say other than these things. Would that be a fair assessment? Whether that's public --
A. That would be my -- yes, that --
Q. Yeah.
A. -- would be my assessment, as you put it, yes.
Q. And we'll talk about the rest of this as we go through these points. But number 1, the first one says:
"Paraquat does not enter the brain."
So, in other words, Syngenta knew, at the time of this point, that paraquat does enter the brain, correct?
A. That's correct, we did.
Q. And you couldn't say that paraquat does not cause any changes in the brain because you knew that paraquat does cause changes in the brain, right?
A. That's right, from the evidence

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that was available at that time, yes.
Q. Paraquat only, it says, causes effects in the mouse, right?
A. Yes.
Q. So, in other words, if you use the active agreement of paraquat by itself, it will cause effects in the mouse. That's what that means, correct?
A. I think this might mean that paraquat -- we're talking here about Parkinson's-like pathology, isn't -- the effects are not just seen in the mouse. I think it may have been referring to the fact that there were studies in the rat, for example, in the literature.
Q. Oh, okay. That's correct, and I appreciate you pointing that out because it demonstrated -- you have already demonstrated that paraquat with rats doesn't seem to cause any effect, correct?
A. Yeah, in our hands we didn't see an effect with the rats but --
Q. So you --
A. -- obviously other people did.
Q. Okay. But your study showed that

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you could do this. So what you, in 2007, concluded, that paraquat only causes effects in the mouse in your test animals, not in the rats, correct?
A. Well, this is what we cannot say. So we can't say that paraquat only causes effects in the mouse because other researchers, although we didn't find anything in the rat, had found effects in the rat. That would be my interpretation here.
Q. All right. And the next one says: "The mouse data on paraquat are not relevant to humans."
You can't say that either, right?
A. At that time, that was absolutely right, yes.
Q. Because mouse data was relevant to humans, correct?
A. The mouse data could be relevant to humans, yes.
Q. And it wouldn't be appropriate to say that it wasn't. That's what this says?
A. That's right.
Q. Okay. And you couldn't say people aren't exposed to paraquat either, could you?

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A. Certainly not, no.
Q. Because you knew by then, and you'd known for some period of time back, as you said, in the '90s, I think in your earlier part of the deposition you'd indicated maybe even earlier, that people using this, mixing it, loading it, applying it, were certainly exposed to paraquat, correct?
A. Yes, that's correct.
Q. All right.
"There are no data reporting that paraquat may be associated with PD in humans."
You can't say that either, right?
A. Yes, we can't say that because there were some epidemiology studies with association.
Q. And that you can't say that the data showed that paraquat does not cause PD in humans either, can you?
A. In 2007, with the evidence in front of us, that was certainly something that is clear; we could not say definitively that paraquat does not cause Parkinson's disease.
Q. All right.
MR. TILLERY: Now, can we go to

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KT566, and this is -- we're going to pull up now --
MS. BRUMITT: 89.
MR. TILLERY: -- Exhibit No. 89.
(Botham Exhibit 89 marked for identification.)
BY MR. TILLERY:
Q. Okay. Do you see that? Do you want to --
A. Yeah.
Q. Would you mind taking that document, sir, and looking -- refreshing yourself. This is SYNG-PQ-13131087.
A. Okay. I can see that and I'm just looking through it, if that's okay?
Q. Yeah. Focus on page 8, if you wouldn't mind. Look at the whole document as you wish but focus on 8.
A. Okay, thank you. I've read the -- up until slide -- or up until page 10. Is that sufficient for me for now?
Q. It is. I think that's plenty. And if you'd go to the Conclusion page.
A. Okay. That's page 8.
Q. All right. The first conclusion is:

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"We have developed a deeper understanding of Parkinsonism and Parkinson's Disease."

Do you see that?

A. Yes.

Q. And I got ahead of myself. Let's identify the document. It's called a "Paraquat Update." And this is Jonathan Sullivan, Lewis Smith, and Gerardo Ramos.

Who is Gerardo Ramos?

A. He's pronounced Gerardo Ramos, and Gerardo was the head of crop protection research.

Q. Worldwide?

A. Yes, global head. Yes.

Q. Global head. And what's the Syngenta Executive Committee?

A. That was the senior leadership team chaired by the chief executive officer at Syngenta.

Q. So this was a presentation to the highest-ranking -- really, highest-ranking people below the board?

A. That is correct.

Q. All right. Getting back to the

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conclusions again, it says:

"We have developed a deeper understanding of Parkinsonism and Parkinson's Disease; We have demonstrated that [paraquat] will cross the blood brain barrier."

Correct?

A. Could you just go to the right page, please? I can only see page 1 at the moment.

Q. Page 1. Okay.

A. Yeah, you've taken control so I just need to be able to go to page 8. Thank you. Thank you.

Q. Do you see page 8?

A. Yeah, I can now see it, thank you.

Q. If you look at the fourth bullet point:

"We have demonstrated that [paraquat] will cross the blood brain barrier."

In other words, paraquat gets into the brain, consistent with the very last exhibit we talked about, the "We can't say" document. Remember?

A. Yes.

Q. All right. Now, despite recognizing

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internally what I've shown you in the last two exhibits, the document marked Exhibit No. 88 and Exhibit No. 89, Syngenta's public position was that paraquat would not readily cross the blood-brain barrier, correct?

A. Yes. I think we discussed this in my previous deposition, that the public commentary at that time had not caught up with the science that had been done.

Q. And that's a very polite way of saying that you weren't telling the people on the website what you knew scientifically about the chemical, correct? You weren't actually reporting it?

A. No, I wouldn't put it that way. It's not that -- it wasn't a case that we weren't telling them. I think the process for updating that was not necessarily at that time working as quickly as perhaps it should have done.

MR. TILLERY: Let's go to the next exhibit. This would be number 90. That's 567.

(Botham Exhibit 90 marked for identification.)

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BY MR. TILLERY:

Q. Do you know what this document is? And this, just for the record, is SYNG-PQ-00477567.

A. Okay. So this is a technical position document on the subject of paraquat and Parkinson's disease, written by the health assessment function of Syngenta, which I was a part of.

Q. This is a 2007 document, right?

A. I don't have that date in front of me, so -- yes, it sounds about right.

Q. Okay. I could refer you to page 21 of that document where it has the date. We can look at it if you want to, and --

A. That's fine. No, that's fine.

Q. Okay. To whom would this document have been distributed?

A. I don't know to whom this might have been distributed. This was quite a long time ago so I'm not sure what list of people was included.

Q. Would you agree this was designed, from the looks of it, to be distributed outside of Syngenta?

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A. Normally, these position documents would not be for external use.
Q. So this would be an internal-use document only?
A. Yes, that would normally be their purpose.
Q. Well then, we'll move on, okay, if that's the testimony.
Would you agree that as of 2008, after these exhibits we've marked and shown as 88 and 89, Syngenta was telling the public on its Paraquat Information Center, paraquat.com, that paraquat does not cross the blood-brain barrier easily, meaning that it does not reach the specific location in the brain necessary to produce Parkinson's symptoms?
MR. NARESH: I'll object to the form.
Stephen, I'm not sure if you misspoke with the year or the exhibit number. I think it got confused.
BY MR. TILLERY:
Q. Let me refer you to SYNG-PQ-1586601, and for you, if you're looking, this is a

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massive document and it was delivered to us in a paged document that was 490 pages long and we're just referencing one. It's from the Paraquat Information Center, Paraquat Frequently Asked Questions: Answers to Your Frequently Asked Questions About the Human Safety of Paraquat from the Paraquat Information Center.
MR. TILLERY: We've lost Dr. Botham from our end, on the ...
THE WITNESS: I'm still here. Can you hear me?
MR. TILLERY: Yes, we sure can. We can hear you.
I presume that we're getting a recording, at least a video recording.
MR. NARESH: I'm sorry, I'm not trying to interrupt, but could you give me the Bates number again, and --
MR. TILLERY: Absolutely. I'm going to give you the Bates number for this specific document. It's SYNG-PQ-1586601.
Give us a second here, Dr. Botham, so you can see it.

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(Botham Exhibit 91 marked for identification.)
MR. NARESH: We don't have a Bates number in our production but -- or a document starting with that Bates number --
MR. TILLERY: Are they all that number?
MR. NARESH: No, I just -- I can search our database by production/Bates beginning number and I don't have a document starting with 1586601.
MR. TILLERY: It was 495 pages. It was a compilation of a number of documents. That's what the front page looks like but we can show you on the screen in a second.
MR. NARESH: Okay.
MR. TILLERY: Well, 490 pages. This is on page 485, and we'll pull it up for you. That's the one right there.
BY MR. TILLERY:
Q. Dr. Botham, this will be Exhibit No. 91.
A. Okay. I can see page 485 on my

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screen.
Q. Okay, you can. On page 485, all right. And do you see this says -- at the very top, it says:
"Paraquat FAQs: Answers to Your Frequently Asked Questions About the Human Safety ..."
And then it goes off.
And at the top, the heading, it says, "Answers to Your ... Questions About the Human Safety of Paraquat from Paraquat Information Center."
Okay?
A. Yes.
Q. Do you see that?
A. Yes, I do.
Q. Okay. All right. I think this was 2008 is what our record -- yes, it is, January 18, 2008, in the lower right-hand corner.
Do you see that?
A. I can't see that. Now I can, yes.
Q. Yes. All right. Then let's look here. It says, "Does paraquat cause ..."
One of the questions is, Is paraquat

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safe to farmers and their families? What is the safety of paraquat to farmers from use long term? And one of them is, Does paraquat cause Parkinson's disease?

Doesn't it? Right?

A. Yes.

Q. And the answer that was given was, and I'm quoting now:

"There is no scientific or reliable epidemiological evidence so far to link paraquat with Parkinson's Disease. Previous studies have demonstrated that paraquat does not cross the blood-brain barrier easily, meaning that it does not reach the specific location in the brain necessary to produce Parkinson's symptoms. Epidemiology studies in areas of high and long-term paraquat usage have shown no increase of neurotoxic incidents."

Do you see that?

A. Yes, I see that.

Q. Was that correct on January 18, 2018 -- 2008, sorry?

A. I think in 2008 that certainly had some inaccuracies, I would agree. So, as I said earlier, it appears that this

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communication had not had a chance, for reasons which I can't fully explain, to catch up with the science that was still emerging.

Q. Why was Syngenta telling the public that paraquat does not cross the blood-brain barrier, while acknowledging internally that paraquat does cross the blood-brain barrier?

MR. NARESH: Object to the form.

THE WITNESS: I'm afraid I can't answer that. I don't -- I honestly don't know why that was still on paraquat.com at that time.

BY MR. TILLERY:

Q. Why was Syngenta telling the public that paraquat does not reach the place in the brain related to Parkinson's symptoms?

A. Again, I can't answer that. I don't know how that --

THE STENOGRAPHER: Sorry, Mr. Naresh, I saw your lips move but I didn't hear you. Sorry.

THE WITNESS: Yeah, I didn't hear you either, Ragan, sorry.

MR. NARESH: I'm objecting to the form.

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BY MR. TILLERY:

Q. Go ahead and answer, sir.

A. Okay, thank you. Yeah. So, no, I can't -- I don't know why that was appearing here.

Q. Do you understand that Syngenta still claims on its website that:

"Paraquat, even at the maximum tolerated dose, does not cause dopaminergic neuronal cell loss in the area of the brain associated with Parkinson's disease"?

Were you aware of that?

A. So to clarify, that is what we're saying today?

Q. Yes.

A. Right. And that is, overall, still our view because of the extensive work that we have done in the animal model up to the maximum tolerated dose, where we've been unable to replicate the earlier findings that we've been discussing extensively over the last few days.

Q. In other words, the Marks findings, right?

A. What I'm describing now are the --

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is all the work that was done in the Breckenridge, et al. publication, in the Minnema, et al. publication and in the Smeyne, et al. publication, which is when the --

Q. Right.

A. -- the research work that's been done since 2008.

Q. Well, let's look at it this way. If you look at the Marks studies 2, 3, 4 that she did, is that statement correct?

A. In isolation, no.

Q. Okay. Do you mention anywhere that we have also done three studies to show that this statement is just absolutely flat wrong? Do you say that anywhere on paraquat.com?

MR. NARESH: Objection to form.

THE WITNESS: We don't say that because that statement is not flat wrong. It is based on the weight of evidence which we have spoken about quite a lot. We have done many more studies in much greater detail since Marks did her studies and we have been unable to replicate the finding of damage to dopaminergic neurones.

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MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. If you apply just the Marks studies, you agree with me, sir, don't you, that that statement is simply not correct, right?
MR. NARESH: Object to the form.
THE WITNESS: Yes, it's correct, but I don't know why you would apply it to just a small part of the literature. That's not how science works. That's not how science is communicated.
MR. TILLERY: Move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Would you agree with me, sir, that if you look just at the Marks studies 2, 3 and 4, that that statement is not correct?
MR. NARESH: Objection to the form.
THE WITNESS: If you look at those studies only, that is correct. It isn't --
BY MR. TILLERY:
Q. Okay.
A. Yes, that's not a correct

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statement.
Q. All right. And when you look at that statement, is it important to tell the public that you, at a minimum, have had mixed results with respect to the findings?
A. No. In my judgment, it's important to tell the public what we believe the totality of the evidence is showing and where the weight of the evidence is taking us, and the weight of the evidence is now taking us to the statement that now appears on the website.
Q. Well, let's make sure we're clear on what you're basing that statement on the website on. You're basing that on, you said, the Smeyne study, the Breckenridge study, the Minnema study. And what else? Anything else?
A. No. Those are the three main studies, yes.
Q. Those are the studies you're basing your conclusions on, correct?
A. That is correct.
Q. Okay. So if this same statement went out in 2012, a year before the Breckenridge study was published, you would

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agree with me that that would have been a bald-faced lie, right?
MR. NARESH: Objection to form.
THE WITNESS: No. No, because by 2012 we'd generated the data. It took quite some time to get the data published, so by 2012 we had done the studies that were reported in Breckenridge, et al.
BY MR. TILLERY:
Q. So, well, then what year? 2011? Is that when you did it?
A. Again, off the top of my head, I can't give you exact dates but, certainly, it would be, yes, in the preceding two to three years. It was quite a long-term program of research.
Q. Okay. Before the Breckenridge study, let's put it that way, and relying upon Dr. Marks, we both agree that that statement was clearly not correct, right?
A. Before we did our work which culminated in Breckenridge and the subsequent papers, yes, the weight of evidence was different.

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Q. Okay.
When I took your testimony back in February, you testified it would be inappropriate for lawyers to be telling Syngenta scientists which experiments they should or should not be conducting. Correct?
A. Correct.
Q. You testified:
"We would not expect them to be saying you do this experiment and not that experiment."
Do you remember saying that?
A. I do.
Q. And you stand by that today, don't you?
A. I would certainly stand by that, yes.
Q. It would be highly inappropriate for lawyers to be dictating what scientific studies are undertaken at Syngenta, correct? That's what you said?
A. That's my view. That is my view, yes.
Q. And it was then and it is now, right?

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A. That is correct.
Q. It hasn't changed over the last couple of months, has it?
A. Nothing has changed as far as I'm concerned.
Q. All right.
In other words, it would be inappropriate for lawyers to be advising Syngenta scientists on matters of science, right?
A. On matters of science and what we -- how we conduct the science, that is true, yes.
Q. And changing scientific reports, right?
A. I would certainly not expect lawyers to be giving us any advice which changed the way in which the science was being interpreted. Certainly not.
Q. Right. And because the scientists, to the extent that they can possibly prevail in it, wished to maintain autonomy from any influence of any kind from performing and conveying accurate empirical information from the study. That's the pursuit, isn't it?

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A. That's -- you described that well, yes.
Q. And actually replicable science that everybody else can get the same result; a good, solid, honest laboratory that gets the same results as another good, solid, honest laboratory, correct?
A. Yes. And science sometimes -- just to clarify that a little more. Sometimes a good, solid, reliable laboratory will get a different result from an equally good, solid one because -- sometimes for reasons we don't understand. But that's science for you; you can get different results.
Q. But eventually what happens, after enough science is undertaken, is that the results start becoming homogenous and they become accepted scientific facts, don't they?
A. Yes. Usually you'll get a degree of convergence and a consensus emerges.
Q. And that's really what you call the scientific method, isn't it?
A. It is.
Q. And that's what you learned in graduate school, I presume. I'll bet your

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teachers told you exactly that, didn't they?
A. Yes, indeed.
Q. All right.
Now, who is Jeff Wolff?
A. Well, there are actually two Jeff Wolffs. So there's a Jeff Wolff --
Q. Not the scientist, the other one.
A. Yeah, okay. Jeff Wolff was an external legal counsel.
Q. Okay. And he's an American lawyer from Texas, isn't he?
A. I don't recall exactly which state he was from, so certainly from the US.
Q. And he's with the law firm called Fulbright & Jaworski, right?
A. Yes, that's correct.
Q. And when did his association begin with Syngenta?
A. I can't give you an accurate date. It was somewhere around the time that the Health Science Team was formed.
Q. Now, when you and I met in February, you testified that in 2008 Syngenta was being -- the words you used were "very transparent" about Dr. Marks's paraquat Charles

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River mouse research.
Do you remember that?
A. Yes.
Q. And you said that Syngenta was being very transparent at a Syngenta meeting in Atlanta, Georgia, in February 2008.
Do you remember that?
A. Yes.
Q. And I think this is Botham Exhibit 36 that we've referenced. Let me see here. Actually, I don't think we need to call that up.
That meeting I think we discussed was February 13 and 14, 2008.
Where was that meeting conducted in Atlanta?
A. Sorry, it's too long ago for me to remember exactly where it was.
Q. Was that at the Fulbright & Jaworski law firm?
A. I don't remember it being there, but, as I say, it's 12 years ago.
Q. All right. And as late as January 25, 2008, the organizers of that Atlanta meeting intended it to be a meeting of

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scientists to discuss science, didn't it? Do you know?
A. Yes, that was my understanding of what that meeting was being set up to do.
Q. You were there, weren't you? You went there?
A. I was. I was there.
Q. You flew to America and went to Atlanta and went to that meeting. Okay.
MR. TILLERY: If we can, please, pull up the next exhibit, and that's 572.
MS. BRUMITT: Number 92.
MR. TILLERY: This will be Plaintiff's Exhibit 92.
(Botham Exhibit 92 marked for identification.)
MR. TILLERY: Why don't you give the witness that document so he can familiarize himself with that document.
BY MR. TILLERY:
Q. Do you have it, sir?
A. I can see page 1 but it's under your control, I think, at the moment.
MR. NARESH: Is this supposed to be a one-page document or is there more than

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one page?
MR. TILLERY: It's a one-page document.
MR. NARESH: Thank you.
THE WITNESS: Okay, thank you. I can see the whole document now.
MR. TILLERY: I don't remember reading the Syngenta number in the record. Did I do that?
MS. BRUMITT: No.
MR. TILLERY: I think this is SYNG-PQT-ATR-16995053, Exhibit 92.
BY MR. TILLERY:
Q. Can you see it?
A. I can see the document, yes.
Q. Yeah, it says "Agenda for PQ Scientific Review Meeting."
Actually, it does say -- it was not at their office, it was at the Westin Peachtree Plaza Hotel, Tower Room, Atlanta, Georgia. Right?
A. Yes. And that now meets my memory of it. I thought it was in a hotel but I wasn't sure when you asked me the previous question.

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Q. All right. And it says Lewis Smith was there, right?
A. Correct.
Q. Janis McFarland. What was her job?
A. Head of regulatory affairs in North America.
Q. And that included Canada, United States and Mexico, right?
A. Correct.
Q. Okay. Then you have Martin Wilks. What was his job?
A. He was what was called product medical advisor, so he was medically qualified to deal with medical aspects of potential toxicity to our products.
Q. And Lewis Smith's job or responsibility at that time was what?
A. 2008, he was probably -- he was either still head of central toxicological laboratory or he was -- he had moved on to be head of development in Basel. I can't remember which of the two.
Q. And Dave Berry, what did he do?
A. He was a product toxicology -- a junior product toxicologist supporting

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paraquat at that time.
Q. And Phil Botham is you.
A. That was me.
Q. And then Nick Sturgess. We've talked about him in this deposition several times. Kim Travis we have, too, and Charles Breckenridge, right?
A. Yes.
Q. That's from the R&D department, right?
A. Yes.
Q. And then the legal department's there at a scientific meeting. So it says "Agenda for the PQ Scientific Review Meeting." But you've got a bunch of lawyers, and that's Jonathan Sullivan, Beth Quarles, Alan Nadel. Are they all Syngenta lawyers?
A. They are. Or were.
Q. Then you have Syngenta public relations, Sherry Ford, Basel representative, okay, "to be determined." Was there a Basel Switzerland representative there, too?
A. I don't know if there eventually was one. We'd have to look at the minutes of the meeting.

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Q. And then we have a reference to outside counsel. That means a lawyer who is not employed by Syngenta, who is privately retained, right, as far as you know?
A. Yes.
Q. And that person was Jeff Wolff, Fulbright & Jaworski, correct?
A. Correct.
Q. And then you had outside experts, Jim Simpkins, Jack Mandel, Phil Cole. Who are those gentlemen?
A. They were academic experts. Jim Simpkins is from a university in north --
Q. I think we had some feedback --
A. Sorry about that, yeah, could we --
Q. If you wouldn't mind answering that again, please, for the reporter.
A. Yes. Jim Simpkins, an academic toxicologist from the United States. Jack Mandel, again, an external expert I think, at that time, from a consultancy company. And Phil Cole, another academic expert.
Q. So this was dated January 25, a draft, and then at the meeting, February 13,

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this became not just a PQ scientific review committee meeting but a PQ scientific and legal claims review meeting, right?
A. It was a science meeting with legal people there to give advice on aspects of how to conduct our business.
Q. And that was because you were going to talk about paraquat and Parkinson's disease, right? That's what this was about?
A. That was certainly one reason given as the explanation for their presence, yes.
MR. NARESH: I'll give a belated objection on form. Sorry about that.
BY MR. TILLERY:
Q. And despite that change, the primary purpose of the meeting remained scientific in nature, right?
A. That's right, and that indeed was my recollection of how the meeting did play out in practice.
Q. So Mr. Wolff wasn't just attending the Atlanta meeting, he was actually a participant, right?
A. Yes, he was, and that agenda describes some of the more precise ways in

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which he made his input.
Q. Had he attended any other paraquat Health Science Team meetings before February 2008?
A. I don't recall whether he did or not, I'm afraid. We would need to check the record.
Q. And within the first 15 minutes of this mostly scientific meeting, Mr. Wolff and another lawyer, Jonathan Sullivan, presented for 45 minutes, didn't they?
A. That was the intention, yes.
Q. And if you look on the agenda, that's what it shows, doesn't it?
A. Yes. An agenda is an intent, of course. How long they spoke for, I don't know.
Q. And the agenda item for Mr. Sullivan says "Discussion of overall government's framework." What does that mean? What did he talk about?
A. So this would have been to describe how -- what this group, which soon after this became known as the Paraquat Health Science Team, so it was not called that at this point

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in time, how that Health Science Team and its work should report, within the internal structure of R&D and the company more broadly, to people that we would need to keep informed and to seek counsel from as our work progressed.
Q. And then Mr. Wolff talked for half an hour about attorney-client privilege and communications management, right?
A. Yes.
Q. So there were a whole lot of scientists, mostly talking about science at a science meeting, starting off their meeting with a lecture on attorney-client privilege, right?
A. That's correct.
Q. What is communications management?
A. Well, this, if I remember correctly, as it says in brackets there in the words in italics, was, for example, to do with how we should be taking notes of the meeting, how we would be best advised to record what was in our own notebooks or what would appear in minutes, so that they -- this was done in ways in which, if we needed to, attract

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attorney-client privilege and in further communication it would do so.
Q. Right. And, in fact, the point of this, getting to the bottom line, is that the lawyers at the meeting were reminding Syngenta scientists to keep their communications secret using attorney-client privileged communications. Wasn't that really what this was about?
MR. NARESH: Objection to form.
THE WITNESS: No, I think that's not the way I would put it. It was to ensure that our ability to communicate, so management of communications, was being properly managed, effectively managed. Not to say the whole thing had to be secret; that was not the intention.
BY MR. TILLERY:
Q. Well, are you telling me -- we're going to look at a number of additional exhibits, I'm just giving you fair warning.
Are you telling me that you didn't learn from these lawyers how to run the documents through a central lawyer to try to

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keep them from public scrutiny? Is that what you're telling me?
MR. NARESH: Object to the form.
THE WITNESS: No, I'm not saying -- I'm not telling you that. That was part of the way in which the management of our recordkeeping was -- we were asked to comply with.
BY MR. TILLERY:
Q. Well, in fact, Jeff Wolff told the scientists at the 2008 meeting that if they sent emails only to lawyers, then they would be privileged, didn't he?
MR. NARESH: Objection to form.
THE WITNESS: I can't recall if that's what he said.
BY MR. TILLERY:
Q. And he said that merely Cc'ing the lawyers -- excuse me. Excuse me. Let me start over. Withdraw that.
He said that merely Cc'ing the lawyers or copying them on email, that wouldn't be good enough; they had to send the emails only to the lawyers in order to keep them secret. That's what he told you, wasn't it?

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MR. NARESH: Objection to form.
THE WITNESS: I certainly recall that he was giving us guidance on how to communicate. I don't know whether he used the word "secret." I don't recall if he used that word or not.
BY MR. TILLERY:
Q. And he told the label -- strike that.
He told the scientists the label they should use is work product and attorney-client privilege on their subject matter label, didn't he?
A. Yes, I certainly remember that we were given guidance on the use of those terms.
Q. And Mr. Wolff also told the scientists that if an outside lawyer like him requested work by the scientists, then they would have a higher level of privilege than if an in-house Syngenta lawyer requested the work, right?
MR. NARESH: Objection to the form.
THE WITNESS: I don't remember precisely whether he said that, so you --

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it may appear in the minutes but I can't confirm that.
MR. TILLERY: Well, let's go to the next document to see if I can refresh your recollection.
Is that 93?
MS. BRUMITT: 93.
MR. TILLERY: Okay, this is Plaintiff's Deposition Exhibit 93.
(Botham Exhibit 93 marked for identification.)
MR. NARESH: Before we get into this document, I see this was produced pursuant to rule -- or 502(d) stipulation, so I, as a general matter, don't object to questioning on this document; however, I reserve the right to object to any specific question on privilege or work product grounds, so long as we have an agreement that your questioning here is done pursuant to the 502(d) stipulation, i.e. Syngenta is not waiving the ability to object to the production of any testimony related to this document under 502(d).

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MR. TILLERY: We agree to that -- we agree to that, counsel. Right.
BY MR. TILLERY:
Q. Can you look at that document, sir, and that's 502(d)-010660.0001. It's a two-page --
THE STENOGRAPHER: Sorry, Mr. Tillery, could you say those numbers again, please? Sorry.
MR. TILLERY: Do you want me to say it even faster? Sorry. Okay. 502(d)-0106660.0001. Okay?
THE STENOGRAPHER: Thank you.
MR. TILLERY: You're welcome.
BY MR. TILLERY:
Q. That's a two-page document, sir.
MR. NARESH: Hang on. Hang on. I think there's something getting confused because the document you just identified is not the document that's on the screen.
MR. TILLERY: You're right.
MR. NARESH: My little speech earlier was related to the document that's on the screen. It may be the same

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for the document that you're intending to ask about but I --
MR. TILLERY: No, you're right. You're right. I gave you the wrong number. I apologize, sir. Excuse me.
Yes, I'm sorry, I gave you the wrong number.
Leah, the correct number is 502(d)-022360.0001.
Thank you.
BY MR. TILLERY:
Q. Do you have that on your screen, Dr. Botham?
A. I do. I don't have control on the document now but I can see part of the first page.
MR. TILLERY: Okay. Why don't you turn that over to him and let him --
THE WITNESS: No, it's okay. I did see the full document up until this point so you don't need to do that. Please go ahead.
MR. TILLERY: Okay. Can you put it back for display, please. All right, thank you.

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BY MR. TILLERY:
Q. This is a document called "Action Notes from Atlanta Meeting 13-14 February 2008."
Right?
A. That's correct.
Q. And these are the same people that we referred to earlier who attended the Atlanta meeting, right?
A. Yes, with a couple of additional people.
Q. And you're on that list, Dr. P.A. Botham, right?
A. That's correct, that's me.
Q. Okay. From looking at this, these look to appear to be the notes summarizing what was said at that meeting, correct?
A. That's correct.
Q. Now, would you read for the record what that second bullet says. Do you see the second bullet there?
A. Under the "General housekeeping rules"?
Q. Yes.
A. Okay. What that says is:

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"Internal communications with internal or external counsel should make it clear that the correspondence is privileged and that it is for potential paraquat PD litigation."
Q. This whole thing was about paraquat PD litigation; is that what this was?
A. What do you mean by "the whole thing"?
Q. This meeting.
A. No, it was not the whole thing. It was not just about litigation. It was the start of the Health Science Team work, which continued for many years afterwards, and still is continuing, with one aspect that we needed to understand, being the potential for paraquat/PD litigation, but --
Q. And that's why --
A. -- I don't --
Q. Sorry. Go ahead and finish. I'm sorry.
A. It was not driven by the litigation.
Q. Okay. So when it says "internal communications with internal or external

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counsel," that would be Mr. Wolff, right? Right?
A. He would be external counsel, yes.
Q. Right.
"... should make it clear that the correspondence is privileged and that it is for potential paraquat PD ..."
Does that stand for Parkinson's disease?
A. Yes, it does.
Q. "... litigation."
That's what the document actually says, doesn't it?
A. That's what that says, yes.
Q. Yes. You don't dispute that that's a summary, a good summary, of what was spoken at that meeting either, do you?
A. No, I don't, and this was about communication rather than the content of what we were discussing.
Q. Okay. Now let's look at the fourth and fifth bullets. If you'd look at those, it says:
"Study work should be labelled Work Product Doctrine Material - Confidential, and

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carry the Attorney Client Privilege statement."
Right?
A. Yes.
Q. And the next one:
"Information cc'd to external Counsel is not privileged."
Do you see that?
A. Yes.
Q. So, in fact, Jeff Wolff did tell you scientists at the 2008 Atlanta meeting that if they sent emails only to lawyers, they would then be privileged documents, didn't he? That's what he told you?
A. That's what this says, certainly.
Q. And he did say that merely Cc'ing the lawyers, copying them on email, wouldn't be good enough; that he had to send the emails only to the lawyers in order to keep them secret. Correct?
MR. NARESH: Objection to form.
THE WITNESS: In order to keep them -- to have the ability for them to carry the attorney-client privilege statement, yes.
///

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BY MR. TILLERY:
Q. And he did tell you scientists to label your work as work product and attorney-client privilege, didn't he? You didn't know that without him telling you, did you?
A. No. This was something that we were being given guidance on, the first --
Q. And Mr. Wolff did tell you scientists that if an outside lawyer like him requested work, then that would have a higher level of privilege than if an in-house Syngenta lawyer requested it too, didn't he?
A. No. This is -- my understanding of this is this is nothing to do with him requesting work. This is if we are communicating about study work, that it should correspond with this guidance.
Q. In 2008, you were a member of Syngenta's paraquat health science group, right?
A. Yes.
Q. And that's what this group of scientists that are on this document really made up, that particular group; correct?

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A. Yes. As I said earlier, this meeting led to roughly the same group of people becoming what was known as the Health Science Team.
Q. And in late February 2008, as a result of the discussions at the Atlanta meeting, someone at Syngenta drafted a document called "The Paraquat Health Science Group Strategy Discussion Document."
Correct?
A. Well, I think -- I take your word for it. I haven't -- I can't recall exactly that document now.
Q. Do you know who would have been the author of the document?
A. No, I don't, so if you're able to show it to me I might be able to help.
Q. We're going to do that.
MR. TILLERY: Is this 597?
MR. NARESH: Just for the record, it's about 6 o'clock in the UK now and I know that there's a little bit of grace period built in, but I just wanted to let you know that Dr. Botham needs to wrap up in the next 10 to 15 minutes or so.

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BY MR. TILLERY:
Q. Dr. Botham, you tell us when, okay?
A. Yeah. Fifteen minutes would be a good target to reach, if we could.
Q. Well, I'm about to start a new area there so I'd like, if we could, to switch signals here and let me ask you a question about something else. Hold on just one second, sir.
MR. NARESH: I don't know if it's me or if it's anybody else, but Steve's video pane is frozen for me. Everybody else is moving but Steve is frozen.
THE WITNESS: Yeah, Steve has been frozen for quite some time actually.
MR. TILLERY: Well, it's probably because the camera gave out at my image, but ...
Is it frozen for you?
MS. BRUMITT: It is.
MR. TILLERY: Yes, it is, I see it. Well --
THE WITNESS: Is that a matter for the record, Wendy?
THE VIDEOGRAPHER: Sorry?

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THE WITNESS: Does the fact that Mr. Tillery's image has been frozen for the last ten minutes matter for the record?
THE VIDEOGRAPHER: Absolutely not. I'm just focused on you.
THE WITNESS: Okay, that's fine. Thank you.
THE VIDEOGRAPHER: I can only see you.
THE WITNESS: Right.
THE VIDEOGRAPHER: Thank you.
BY MR. TILLERY:
Q. I just want to clear up something that has nothing to do with what we have been talking about while we've had just a few minutes left to clarify something, and we're going to switch topics. We'll come back to this tomorrow, where we were, okay.
Do you know anything about what's called the Deep Store documents?
A. I do.
Q. Okay. And what are they?
A. These are archived documents from Syngenta, from a number of Syngenta

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facilities. Deep Store is the name of an organization and it's called that because the storage is actually in a salt -- a disused salt mine in the United Kingdom, underground.
Q. Okay. And what documents are stored there?
A. Documents such as reports, study files, lab notebooks, pathology slides from toxicology studies but also from other R&D departments, regulatory documents.
Q. Okay.
MR. TILLERY: Yeah, if you pull it up.
BY MR. TILLERY:
Q. The one I wanted to talk to you about, of the recitation of items that are stored there, is laboratory notebooks. And Syngenta stores thousands of lab notebooks there, doesn't it?
A. Yes, it does.
Q. And have you ever personally needed to retrieve a lab notebook from Deep Store?
A. No, I haven't.
Q. If you needed to retrieve a lab notebook from Deep Store, how would you

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identify the notebook you wanted to retrieve?
A. Well, I would go to our archive expert with either the person whose lab notebook it was, a name, or a department, or even a subject that it might refer to.
Q. All right. Let's show you a document. All I'm doing is just showing you this to illustrate what we've been given and I just need to clarify some things.
MR. TILLERY: Just pull it up.
You know, Ragan, I don't honestly think this needs to be a deposition exhibit. It's a demonstrative and I'm just trying to get some answers to some questions.
This is -- is that our number or theirs?
MS. BRUMITT: I don't --
MR. TILLERY: Let's just put it on the screen for them to see.
This is something you gave us but I just wanted to -- I wanted to ask him about what we would ask for.
BY MR. TILLERY:
Q. Let me know when you can see the

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exhibit, Dr. Botham.
A. Well, I can see an Excel spreadsheet now.
Q. That's all it is. I'm not going to get into -- there's no particular reason for this page being used. It's just a reference page, okay.
What I'm trying to find out is, and we've made requests for some documents, how you would search for specific study notebooks. If we wanted to know, for example, the notebooks referable to a particular study, how would we get those -- how would you get them? What would you ask for, what information would you seek and how would you know what you're getting?
A. Well, from my own experience, I would normally start with a study report, and rather like the study report we were looking at from Dr. Ray earlier on, to see if there was a reference to a study number. If you have a study number, then it's possible to find, in our spreadsheets like this one, whether the study file is available in Deep Store, and where it might be located.

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The study file can be --
Q. So --
A. -- can include a number of different items.
Q. Well, I'm just looking, are there more -- where is the reference to the study number on this document? I'm showing you --
A. Just go back the other way for a minute.
Q. All right, sure. We have date of report or study. Do you see that?
A. Yes.
Q. And then we have -- we're trying to be able to work with Mr. Naresh to find out which ones of these we want.
A. Yeah, I -- I mean, this is not my area of expertise, but I think it's possible, from one of these categories, to be able -- you can certainly link a report to study number and hence to study file. I can't tell you exactly how you get to that from this spreadsheet. Like you, I can't see the study number here, but that information should be available.
Q. If you had a study number, how does

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that correspond with Category A Control? What does that mean?
A. I don't know, I can't answer that.
Q. And then list, do you know what that is?
A. Well, list looks like it's what it is. When it says study or miscellaneous data, that looks like a descriptor of the number, so -- and then it's present in an archive. The content is present in that box number, which has a barcode attached to it.
Q. And the barcode is an archival fingerprint for the box, presumably?
A. Yeah, that's right. That much I do know, yes.
Q. All right. And then box code, do you know what that is?
A. I don't know what the difference between box code and the barcode is for the box number, no.
Q. There appears to be missing a reference to the study. So what I'm wondering is this: If you want the Marks data or some other data that's been done --
A. Mmm.

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Q. -- let's pick one of the studies -- how do we identify that from this reference code, or where would you go and what would you ask to get the data?
A. Yeah. So I think that's fairly straightforward. So if I know the study number -- so forget what's on this spreadsheet. I'm pretty sure that if I know the study number -- which, in the case of the Marks studies we do, it's XM and four numbers, as we said earlier. If I went to my archive specialist, she would be able to locate the data from Deep Store.
Q. And that would include the lab notebooks as well, wouldn't it, sir?
A. It would -- it should include all the raw data, the information that relates to that study.
Q. Okay.
MR. TILLERY: All right. Thank you very much, and we'll resume tomorrow at the same time, okay. Thank you.
THE WITNESS: Okay, thank you.
MR. TILLERY: Off the record.
THE VIDEOGRAPHER: We are going off

the record. The time is 6:09.
(The deposition concluded for the day.)

CERTIFICATE OF WITNESS

I, PHILIP BOTHAM, declare that I have read the entire transcript of Volume IV of my deposition testimony, or the same has been read to me, and certify that it is a true, correct and complete record of my testimony given on Thursday, June 18, 2020, save and except for changes and/or corrections, if any, as indicated by me on the attached Errata Sheet, with the understanding that I offer these changes and/or corrections as if still under oath.

Signed_____
Philip Botham

Signed and subscribed to before me.
this _____ day of _____, 20___.

_____
Notary Public

*** ERRATA SHEET ***
TRANSPERFECT DEPOSITION SERVICES
216 E. 45th Street, Suit 903
NEW YORK, NY 10017
(212) 400-8845
CASE: Diana Hoffmann, et al., versus Syngenta Crop Protection, LLC, et al.
DATE: June 18, 2020
WITNESS: Philip Botham REF: 27627

PAGE LINE FROM TO

_____
Philip Botham

Subscribed and sworn to before me

this ____ day of _____, 20___.

_____
Notary Public

REPORTER CERTIFICATE

I, LEAH WILLERSDORF, Accredited Verbatim Reporter, Member of the British Institute of Verbatim Reporters (Accreditation No. 166) and Qualified Realtime Reporter (Level 2), International Participating Member NCRA (USA), do hereby certify that: PHILIP BOTHAM appeared remotely before me via Zoom on Thursday, June 18, 2020, was sworn by me, and was thereupon examined by counsel; that the foregoing is true and accurate to the best of my knowledge, skill and ability; that the testimony of said witness was taken and reduced to stenotype writing before me; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and further, that I am not a relative or employee of any attorney or counsel employed by the parties thereto; nor financially or otherwise interested in the outcome of the action.

IN WITNESS WHEREOF I have hereunto set my hand this June 28, 2020.

_____
LEAH M. WILLERSDORF
Accredited Verbatim Reporter,
Member of the British Institute
of Verbatim Reporters - Accreditation No. 166,
Qualified Realtime Reporter (Level 2),
International Participating Member NCRA (USA)

IN THE CIRCUIT COURT

TWENTIETH JUDICIAL CIRCUIT

ST. CLAIR COUNTY, ILLINOIS

DIANA HOFFMANN, individually and as Independent Administrator of the Estate of THOMAS R. HOFFMANN, Deceased, et al.,	)	No. 17-L-517
Plaintiff,	)	
v.	)	
SYNGENTA CROP PROTECTION, LLC, et al.,	)	
Defendants.	)	

- - - -

CONFIDENTIAL PURSUANT TO PROTECTIVE ORDER

VIDEOTAPED ZOOM DEPOSITION OF

SYNGENTA CROP PROTECTION, LLC

PHILIP BOTHAM

(Volume V - pages 1120 - 1420 inclusive)

Friday, June 19, 2020

Berkshire, England,
United Kingdom
(Deponent's location)

Reported by:
LEAH M. WILLERSDORF,
(AVR, MBIVR No. 166,
QRR2, International
Participating Member NCRA.)

Job No. 27626

June 19, 2020

10:12 a.m.
(British Summer Time)

Zoom videotaped deposition of SYNGENTA CROP PROTECTION, LLC - Philip Botham, Berkshire, England, United Kingdom, reported remotely via videoconference before Leah Willersdorf, Accredited Verbatim Reporter, Member of the British Institute of Verbatim Reporters (Accreditation No. 166), Qualified Realtime Reporter (Level 2), International Participating Member NCRA (USA).

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Jerry Brown - Korein Tillery, LLC
John Craig - Korein Tillery, LLC
Mark Smith - Syngenta in-house counsel
Wendy Viner - Videographer

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(On the record at 10:12 a.m.)
THE VIDEOGRAPHER: This is Volume V of the videotaped deposition of Dr. Philip Botham, in the matter of Diana Hoffmann, individually and as Independent Administrator of the Estate of Thomas R. Hoffmann, Deceased, et al., versus Syngenta Crop Protection, LLC, et al., in the Circuit Court, Twentieth Judicial Circuit, St. Clair County, Illinois, Case No. 17-L-517.
This deposition is being held remotely via Zoom on June 19, 2020, at 10:12 a.m.
My name is Wendy Viner from TransPerfect and I am the legal video specialist. The court reporter today is Leah Willersdorf, also with TransPerfect.
Counsel, would you please introduce yourselves for the record.
MR. TILLERY: For the plaintiffs in the case, Stephen Tillery of Korein Tillery law firm.
MR. NARESH: For Syngenta, Ragan Naresh from Kirkland & Ellis.

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THE VIDEOGRAPHER: Thank you. Could I ask the court reporter to please swear in the witness and we can proceed.
PHILIP BOTHAM,
was duly re-sworn.
EXAMINATION ON BEHALF OF PLAINTIFFS
(continued)
BY MR. TILLERY:
Q. Dr. Botham, before we get started, are you ready to proceed?
A. I'm ready.
Q. All right. Rather than me going through the entire preliminary statement yesterday, your situation in Jealott's Hill is precisely the same as it was for the preceding two days, correct?
A. It is.
Q. In terms of in the room. Okay. All right.
MR. TILLERY: Do we have any appearances for GROWMARK or Chevron?
MR. HOPP: Yes. Anthony Hopp for GROWMARK.
MR. TILLERY: Okay. And anybody --
MR. ORLET: Joe Orlet for Chevron.

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MR. TILLERY: I'm sorry -- Joe Orlet for Chevron, okay.
BY MR. TILLERY:
Q. All right. A couple of housekeeping matters from yesterday, Dr. Botham, one of which is that we referred to a piece of a website and I don't think we made an accurate record of that. That was where I asked you some questions about a particular sentence, if you remember, on that website. I'd like to put that up.
MR. TILLERY: We're going to refer to this as Plaintiff's Deposition Exhibit No. 94, and we'll put it on the screen.
(Botham Exhibit 94 marked for identification.)
THE WITNESS: Yes, I can see that.
BY MR. TILLERY:
Q. Okay. Take a look at that if you wouldn't mind. This is directly off paraquat.com. It's what I think we were referring to yesterday during the deposition.
MR. TILLERY: Is this in display, the main capture?

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MS. BRUMITT: No.
MR. NARESH: Steve, for the record, are you making a representation that this is from the current website or from an historic --
MR. TILLERY: No. This is an historical version and I'm going to put the new one up in just a minute. Unfortunately, that's going to have to be in display mode because it's just on the website.
BY MR. TILLERY:
Q. But if you'd look at this.
Can you push it down just a little bit, under "Animal studies."
Have you had a chance to read that portion, sir?
Yeah.
A. I can read it now.
Q. All right. Okay.
A. I've read that section on animal studies that I can see.
Q. Now, what is paraquat.com?
A. It's an external website through which Syngenta is able to provide information

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on paraquat to the public, and particularly to farmer and grower and other users of paraquat.
Q. So the intended audience would be just about anybody in the public who had access to a computer, correct?
A. Yes, that's right.
Q. That would include scientists, it would include people like the plaintiffs in this case where they're able to know that it existed and log on and take a look at these statements, right?
A. That's right.
Q. All right. How long has paraquat.com been in existence?
A. I don't recall when it was originally launched. I believe it was in the mid-2000s but I haven't got an accurate date in front of me.
Q. When you say mid-2000s, are you saying 2004, '05, something like that?
A. My memory is not accurate but I would say that 2005 is around about the time, yes.
Q. All right. And who has charge of

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that particular website?
A. Well, today there's an internal owner who is a gentleman who is in the commercial part of our organization in Syngenta, and I believe it is still actually managed through an external provider who helps with putting the content on to the site.
Q. And the content is provided by different groups of people, depending upon their area of work and responsibility within the Syngenta umbrella organization, correct?
A. That is right.
Q. paraquat.com is an entity -- strike that.
paraquat.com is a website that applies to all Syngenta companies, correct?
MR. NARESH: Objection to form, foundation.
THE WITNESS: Could you just expand what you mean by "all Syngenta companies."
BY MR. TILLERY:
Q. Well, is this for Syngenta AG, is it for Syngenta Crop Protection, or does it apply to the term "Syngenta" and meant to include

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anybody who has business with Syngenta?
A. My understanding is this applies to all parts of Syngenta.
Q. All right. Now, when you have sections of this, like this particular displayed Exhibit No. 94 -- and that's what we're going to refer to it as, Botham Exhibit No. 94, okay.
When you have this and you look at various different components that include science, how does a person who is responsible for this get his or her information?
A. As you indicated a few moments ago, from the relevant expert or experts in the company.
Q. And as they're launching an update -- and I presume they are constantly monitoring this website, correct?
A. There is periodic review, yes.
Q. Right. How periodic?
A. I'm afraid I don't know how often that is done.
Q. Okay. You were designated -- just so you know, I'm not trying to embarrass you or put you on the spot anymore, but you were

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designated to speak to us about this topic on behalf of Syngenta, but I'll just say this to you: Would you say that this particular matter is updated on an as-needed basis? Would that be fair?
A. Yes, that's --
MR. NARESH: Objection.
THE WITNESS: -- been my understanding; it is as needed, yes.
BY MR. TILLERY:
Q. Okay.
Now, on this particular page, we have at the bottom a section called "Animal studies." Do you see that?
A. I do.
Q. And it says:
"Syngenta has undertaken a major research program using animal models to investigate the alleged link between paraquat and Parkinson's disease."
And that major research program would be the Marks studies, the Breckenridge study, the Minnema study and the Smeyne study; isn't that correct?
A. That is the main body of that

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research program on animal models, yes.
Q. Is there any other study that I am omitting?
A. This is still an ongoing research program. There are some other studies which have been undertaken and which are still in the process of being published.
Q. So you have other studies that are incomplete is what you're saying?
A. That's right, and I believe I mentioned this in my last deposition.
Q. Right. But of the published, completed studies where Syngenta's standing behind what you came up with by way of a result, the studies that I just described are the ones relied upon for this statement; would that be fair?
A. That is fair.
Q. All right.
The "Animal studies" section of this website page continues on and says:
"The research work has been, and will continue to be, published in peer-reviewed scientific journals and the results communicated to relevant regulatory agencies."

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Correct? Is that what it says?
A. That's what it says.
Q. "... and the results communicated ..."
I'm sorry.
"The key finding is that paraquat, even at the maximum tolerated dose, does not cause dopaminergic neuronal cell loss in the [substantia nigra pars compacta], the area of the brain associated with Parkinson's disease."
Correct?
A. Correct.
Q. And that was a statement made -- I think this was 2009 or '11, that statement, would that seem fair?
A. I think we would be making a statement like that around, more likely, 2011.
Q. Okay, so 2011. All right. When we go back here and we see "The research has been, and will continue to be, published in peer-reviewed scientific journals and the results communicated to relevant regulatory agencies," now we know that statement was just absolutely false when it comes to Louise

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Marks's work, wasn't it, with respect to her studies 2 and 3?
MR. NARESH: Objection to form.
THE WITNESS: Yes, we agree that the earlier Marks studies were not directly communicated to regulatory agencies.
BY MR. TILLERY:
Q. And they weren't published either, were they?
A. The first study was presented at an external scientific meeting but not published.
Q. The second one was not published, right?
A. That's correct.
Q. The third study was not published?
A. That's correct.
Q. And those studies were never sent on to relevant regulatory agencies, correct?
A. That's right. It was the fourth study that was communicated to the EPA.
Q. And only part of the fourth study; would you agree with me? Or should we go back through that? Only a part of it, only one

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finding.
A. Well, the finding that was relevant in terms of 6(a)(2) was communicated.
Q. All right. Only one, a very narrow section of that report, would you agree -- or do we have to go back through that? Would you agree that only the fourth one?
A. No. The key finding in that study was communicated.
Q. All right. Here we hear, in the last sentence, that the key finding is that paraquat, even at the maximum tolerated dose, does not cause dopaminergic neuronal cell loss in the substantia nigra, the area of the brain associated with Parkinson's disease, right?
A. Yes.
Q. And we know, of course, that Dr. Marks's second and third studies found exactly that, didn't they?
A. They did.
Q. They found that paraquat does cause dopaminergic neuronal cell loss in the substantia nigra and that is the area of the brain associated with Parkinson's disease, right?

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A. They did. As measured in that study, yes, that is correct.
Q. And you indicated I think yesterday that the reason that you did this was because there was a great weight of authority, or the weight of the evidence, scientific evidence, was against her studies. I think that's the reason you said you were able to say these things on your website. Remember?
A. No, I --
MR. NARESH: Objection to form.
THE WITNESS: Just to clarify, what I said is that --
THE STENOGRAPHER: Sorry, I didn't get the objection.
MR. NARESH: It was an objection to form.
THE STENOGRAPHER: Thank you.
THE WITNESS: Sorry, Ragan, you'll have to shout up again.
So, yes, the -- no, the reason why the statement is as it appears here on paraquat.com is because, in taking the totality of the weight of evidence, so when we include the studies that were

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subsequently published in Breckenridge et al., Minnema, et al., Smeyne, et al., where a much more thorough analysis of the pathology of the brain was conducted, even than in the Marks studies, then we were able to see that the loss of dopaminergic neuronal cells was not consistently seen and no other evidence of damage was seen.
BY MR. TILLERY:
Q. Okay. So it was the 2013, '14, '15 studies that you're talking about, right?
A. Those are the studies, correct.
Q. Would you explain to me how this statement was created before those studies were ever undertaken and concluded?
A. As I indicated, I think that if we were starting to make the statement earlier than all -- the final publication date of all those studies, which I'm sure is probably true, then that's because the publication, of course, is a -- can be a lengthy process, and we had generated the data, so we were -- for some of those studies, and so we were already clearer about what the weight of

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evidence was telling us.
Q. Dr. Botham, you know that you did not have any raw data from Charles Breckenridge by 2011, did you?
A. Well, that's why I would need to check the precise -- the precision of the date that we're talking about here, when we made this statement on paraquat.com, when we had generated those data; I don't have that in front of me.
Q. Are you telling the ladies and gentlemen of the jury that a 2011 statement, here, in your website, was predicated upon the results of a study not yet concluded in -- that was published in 2013? Is that what you're saying?
MR. NARESH: I'll object to this. Steve, you haven't made a representation as to the date of this website.
MR. TILLERY: It was 2009 or 2013. I'll get the date for you. Hold on.
Sorry, I don't have it on your website when this came out but I think it was Two Thousand --
///

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BY MR. TILLERY:
Q. I agree, I think it was 2011, what you said, Dr. Botham. I agree with you.
Now --
A. Well, I don't know when this was --
Q. All right. So --
A. -- because that's quite critical. That's quite critical to answering your question.
Q. Okay. So you're saying that you published a study -- strike that.
You're saying you published studies on paraquat.com, or references to studies, and conclusions that, even at a maximum tolerated dose, paraquat does not cause dopaminergic neuronal cell loss in the area of the brain associated with Parkinson's disease before the studies were even completed.
Is that a fair statement?
A. No --
MR. NARESH: Objection --
THE WITNESS: -- I'm not saying that. I don't know when --
MR. NARESH: Dr. Botham, let me just get my objections in before we

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go on.
Objection to the form. Objection to foundation.
Please go ahead.
THE WITNESS: No, I'm not saying that because you've not shown me very clearly when this statement first appeared on paraquat.com, and we would need to relate that to when we had generated the data from the Breckenridge study, which, again, I don't have to hand today.
BY MR. TILLERY:
Q. Well, here's my problem. So we filed a Notice for Deposition and we asked for the person most knowledgeable at Syngenta, all entities, Syngenta Crop Protection and Syngenta AG, to talk about paraquat.com, and guess whose name they gave me. Yours.
So it really isn't my job to answer your questions. So what I'm asking you is when did you make these statements on your website?
MR. NARESH: Hang on. I'm objecting to this. And, Steve, you've introduced an exhibit that doesn't have a

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date on it. If you'd like to give the witness an opportunity to review the entire document so that he can draw inferences from when this document was on the website, I think that would be an appropriate way to go forward. But right now you're showing him and directing him to a specific section of an undated document and suggesting that he doesn't know, based on that section, when this was published.
If you -- if this is important to you, then I suggest that the witness be allowed to review the entire document so that he can assess whether or not he can infer when this statement was on the website.
MR. TILLERY: Well, to speed this up so we don't just chew up time, because I'm limited today and I want to get through a lot of material today, Dr. Botham.
BY MR. TILLERY:
Q. Let's assume -- if this assumption's incorrect, then it's incorrect. The record

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will reflect that. Let's assume this was 2011 as you originally stated, okay.
Are you telling me that you knew in 2011 what the outcome of your studies in Minnema, Breckenridge and Smeyne were going to be before they were undertaken?
A. No, of course, and certainly know at that time the work that was published in Minnema and Smeyne had not even started, but the -- so the main work that was being done, which was initiated certainly before 2011, was the work that was ultimately published in Breckenridge, et al., which is really where, largely, I think this statement would refer to, more than the other two.
Q. Okay. So you're saying that the preliminary results of a study from Charles Breckenridge, two years before it was published, assuming this was 2011, was your basis for the last sentence in Plaintiff's Exhibit 94? Is that what you're saying?
A. If --
MR. NARESH: Objection to form.
THE WITNESS: If this was a 2011 version, then that is a possibility.

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I would need, though, to be really sure about exactly when the date of generation had been completed, but I certainly know that it was completed before 2013 because, as I say, the publication process took a long time.
BY MR. TILLERY:
Q. But you never mentioned anything about Louise Marks's work, did you --
A. No, because this --
Q. -- on paraquat.com?
A. No, because this was based on the weight of evidence. To repeat what I said earlier, the Breckenridge study had looked at not just neuronal cell loss as it was assessed in the Marks papers, but with four or five other techniques, pathological techniques, none of which showed a consistent loss of dopaminergic neuronal cells, so the weight of evidence had changed by that time.
Q. By 2011?
MR. NARESH: Objection to form.
THE WITNESS: By whenever we were -- we had completed that data generation.
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BY MR. TILLERY:
Q. Explain that last answer, sir. By whatever date you had done what?
A. By whenever we had completed the data generation, which is what I was saying earlier, I don't, to hand, have exactly the date when we had the data from the Breckenridge study to a point where we could interpret them.
Q. Well, you've testified, then, that this conclusion cannot be justified -- strike that.
You're saying that the conclusion's based upon the weight of the evidence, because the preliminary results in 2011 from Dr. Breckenridge's study told you more information and was -- provided the greater weight of the evidence?
Is that a fair statement?
A. That's a fair --
MR. NARESH: Objection to form.
THE WITNESS: That's a fair statement, but this statement, I think, would have been made when we were able to properly interpret those -- the data.

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So it's not that they were preliminary, it was that they were not published.
BY MR. TILLERY:
Q. Okay. But you're aware that Dr. Marks's study replicated a number of studies in the public literature, aren't you?
A. Yes, I am.
Q. Okay. As a matter of fact, yesterday you indicated that the reason you didn't turn her studies over to the US EPA is because they were redundant to, or replicated the studies that existed already in the scientific public literature, correct?
A. That is correct.
Q. And that would include Dr. Deborah Cory-Slechta's work, right?
A. That is correct.
Q. Dr. Alison McCormack's work, right?
A. Yes.
Q. Dr. Dino Di Monte's work, right?
A. Yes.
Q. And other similar studies in the paraquat literature that you were aware of, right?
A. Yes.

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Q. You're aware that there were, at times, 60 studies making similar findings. Were you aware of that?
A. Yes.
Q. Okay. So based upon Dr. Marks's replication of the many studies published in the scientific literature, Syngenta decided to consider neuronal cell loss as a potentially real effect of paraquat exposure. We saw that in the records. Didn't you?
A. We did.
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. And you can't deny that; there's neuronal cell loss. You knew that, right?
A. We were not denying that at that time, certainly not, no.
Q. As a matter of fact, we showed a list of things in 2009 I think it was, that indicated things "we cannot deny," right?
A. Absolutely, yes. That was very much our position.
Q. All right. Okay. That was it.
And you performed a preliminary risk assessment based upon the potential that

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paraquat is neurotoxic to cells in the substantia nigra, too, didn't you?
A. We did. We took the precautionary conservative approach, as I explained yesterday, that those findings were a real effect and that the risk assessment we did was on that basis, you're correct.
Q. And you conducted new studies, and that would be the Breckenridge, Minnema, Smeyne studies, right?
A. That's correct.
Q. These were, all three, Syngenta-sponsored studies, right?
A. They are.
Q. And based upon these three Syngenta-sponsored studies, you decided that Dr. Marks's work -- strike that.
And based upon just these three scientific studies sponsored by Syngenta, you decided that Dr. Marks's work and the approximate 60 similar studies in the published literature that she replicated did not represent a real effect, right?
MR. NARESH: Objection to form.
THE WITNESS: The studies that

you're referring to suggested that the effects that had been seen by Dr. Marks and others may not, indeed, be a true loss of dopaminergic neurones for methodological reasons, potentially.

MR. TILLERY: This is -- off the record for a second, please.

Not formally off.

BY MR. TILLERY:

Q. Did you identify any flaw in any of these Marks studies?

A. No, we didn't identify a flaw in the Marks studies, no.

Q. That's all I'm asking. Okay.

Yesterday we talked about Exhibit 38 and we discussed at great length how that particular study, or that document led to your conclusions and you told me that you were aware, Syngenta was aware, from the mid '90s that at least some amount of paraquat got into the brain of paraquat applicators, users, mixers, loaders, when they did their job applying the chemical, correct?

A. Yeah, we said that it was likely that small amounts would get into the brain.

Q. Right. Was that information ever conveyed to the farmers?

MR. NARESH: Objection to form, foundation.

THE WITNESS: I can't answer that.

BY MR. TILLERY:

Q. Are you aware of any evidence that that information was ever conveyed to them in any way?

A. I'm not aware of any such communication.

Q. Are you aware of any disclosure of that information being made to any regulatory body in the world?

A. No, I can't recall whether that would have happened.

Q. Well, I'm saying have you ever seen -- you've been to all the meetings. You're the immediate past worldwide head of science, global head of science, and I presume that means that you'd be aware of the kind of information that would be conveyed. You're also the designee for all regulatory bodies worldwide with the exception of the US EPA. Okay. You understand that?

A. Yes. I was trying to answer your question directly, but, I mean, certainly the knowledge that paraquat gets into the brain of experimental animals and, by extrapolation, could therefore get into the brains of humans in very low levels, yes, of course, that's been communicated to regulatory authorities.

So I was answering your question, do we directly say to regulatory authorities paraquat gets into the brain of humans. That -- I'm saying that information was conveyed, as would be normally the case when you have any kind of toxicological program.

Q. Okay. So you're telling me that you have told regulatory bodies throughout the world that Syngenta's product, paraquat, gets into the brain of users of your product when they're out applying it in their field, they're mixing, loading it and applying it? You've informed the regulators that it gets into their brain; are you telling me that?

A. Well, I'm trying to answer your question directly. So what I'm saying is that we have informed regulatory authorities, for example by indicating in the Breckenridge

study, which didn't just look at neuronal cell loss, it also had kinetic studies in there which clearly showed that paraquat gets into the brain of those same mice.

What I'm saying is that when we have communicated, which we have to a number of regulatory authorities, that information, they would have assumed, quite rightly, that that might indicate that small quantities of paraquat would get into the human brain.

MR. TILLERY: I move to strike your answer as unresponsive.

BY MR. TILLERY:

Q. The question is not difficult, sir. It's straight up and straightforward. Please answer my question directly. And it is this: Since the 1990s, when you've testified that Syngenta was aware that during normal, expected, anticipated use of their products in mixing, loading and applying paraquat in farm fields, that those people who used it got the chemical into their brain, that we discussed yesterday, have you ever directly informed any regulatory body in any direct

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way -- not through a study or not through some mouse study, but have you ever told them, "We believe paraquat gets into the brain of those applicators"? Have you ever done that?

A. I cannot comment whether people may have made that communication to regulators. I don't know the answer to that.

Q. Well, you're speaking on behalf of Syngenta today. You are the corporation for this deposition. Have you, to your knowledge, ever done what I just asked; directly tell the regulators paraquat gets into the brain, since the 1990s when you became aware of it?

A. Well, I have to repeat what I said before to answer that question, that we have informed the --

Q. I --

A. Well, it's the right answer to the question, Mr. Tillery; it is that we have informed regulatory authorities that paraquat gets into the brain.

MR. TILLERY: Okay. You're referring to studies. I'm asking you to answer my question directly and I move to strike your answer as unresponsive.

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Have you or have you not, Syngenta, sent a letter, an email, a direct communication saying, "By the way, when the purchasers/end-users of our product, farmers, applicators, use it, it gets into the human brain"? Have you done that?

MR. NARESH: Object to the form.

THE WITNESS: No, we have not sent such a direct communication, in the same way --

BY MR. TILLERY:

Q. All right.

A. -- that we don't send that for any other chemical or any other pesticide --

Q. All right. So --

A. -- which probably also gets into the brain.

Q. Okay. How many of your chemicals get into the brain of people?

A. I can't answer that directly but you would -- from a science perspective, you would expect that quite a number of chemicals could get into the brain.

Q. Have you ever told anybody else

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in any other regulatory body that people who eat fruit or vegetables sprayed with this chemical, throughout any of the areas of the world that use your product, can also ingest and get paraquat into their brain? Have you ever done that?

MR. NARESH: Objection to form.

THE WITNESS: Again, we would not have given that information directly because this -- it is always assumed that very low levels of any chemical, paraquat included, could get anywhere in the body, but these low levels are seen by regulatory authorities of not being of concern, unless there's a particular reason to think otherwise.

BY MR. TILLERY:

Q. Okay. Have you ever posted on paraquat.com website that when used as anticipated, as you said, from the 1990s at least, Syngenta knew that paraquat got into the brain of users? Have you ever done that?

A. I don't remember what we might have said on paraquat.com about entry into the brain over a period of time. I know that

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early on there was a statement which said that paraquat may not pass the blood-brain barrier very easily.

Q. Okay. If we could get a clear answer, sir. Are you aware one way or another -- as the designee for paraquat.com on behalf of both Syngenta defendants, are you aware of ever posting any warning or statement on your website telling users what you've known since the 1990s; that paraquat will get into the brain when they use it as anticipated? Have you ever done that?

A. I don't believe we would because we wouldn't feel that a warning was necessary because any small amount of paraquat getting into the brain would not necessarily be harmful.

Q. Okay. So it wasn't information they needed to know, correct?

A. That would have been the judgment, and if that judgment had ever changed, we would have done something differently.

Q. All right, okay. And it hasn't changed up to today's date, has it?

A. Well, our view at the moment is

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that the small amounts of paraquat that get into the brain are highly unlikely to cause damage to the brain.
Q. But yesterday we talked for a great deal of time -- we're not going to go do that again today -- that you don't know what that amount is, correct?
A. We can --
MR. NARESH: Objection to form.
THE WITNESS: Yes, what I was telling you yesterday is that we can do a calculation of the predicted concentration in the brain, and the document that I showed you yesterday was giving a more helpful number, which is what exposure a farmer can be -- can receive, to be sure that that level of paraquat was nowhere near exceeded.
BY MR. TILLERY:
Q. Did you come up with these answers over the night from yesterday to today? Do you have some new math that you didn't share with us that you learned about last night?
A. No.
MR. NARESH: Objection to form.

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BY MR. TILLERY:
Q. Okay. So should the court and jury -- so I don't have to go back to Exhibit 38 and spend too much time on this, should they look to your answers you gave yesterday and see if what you're saying today is consistent? Would that be fair?
A. Yes, what I said yesterday --
Q. All right.
A. -- was --
Q. That's what we'll do --
A. -- that there was not a figure in the brain in that document.
Q. All right.
MR. TILLERY: Now, let's go to Exhibit 93.
MR. NARESH: Is there any way to show 93 not in presentation mode?
MR. TILLERY: We're doing that now. In other words, to give it to the witness?
MR. NARESH: Yeah, and to me, frankly.
MR. TILLERY: Absolutely. We're doing that now.

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MR. NARESH: Are you done, Mr. Tillery, with Exhibit 94?
MR. TILLERY: Well, I don't know.
MR. NARESH: For the record, I'd like to move to strike the earlier testimony on Exhibit 94 in its entirety based on it being misleading as to the date of the document. I don't think that the representations as to the timing of that document were accurate, as reflected by the document itself, and I think the testimony elicited based on that representation is misleading, so I'll move to strike the testimony in relation to Exhibit 94.
MR. TILLERY: The information that's been given to me, Counsel, in response to your motion, is that the portion in my outline that I referenced was from a 2008 website.
MR. NARESH: Well, I will --
MR. TILLERY: That's all I know and we'll deal with this later, when we can. Can we move on to this exhibit at this point?

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MR. NARESH: In response to that statement, I think that if you look at the document, there are references in that document to studies published in 2013 and 2016 which indicate that that paraquat.com excerpt that you used was clearly not from 2011 and --
MR. TILLERY: Yeah, the excerpt, however, is what I'm referring to. I didn't comment on the entire thing. But let's move on, if we can. We can resolve it at the -- after the break.
MR. NARESH: The very studies that you were suggesting in your questioning as having been published after that website was put up are referenced in that document, including the 2013 Breckenridge study and the 2016 Smeyne study, so that's just not true and --
MR. TILLERY: Well, here's the -- here's the problem, we don't have archival websites. What we have is information. They're replaced. When a new website is created, you don't post your past websites; so we're stuck with

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what we have and what you have on your website or what you've produced. That's it. So that's the point.

The fact is that language, we believe, was apparent earlier.

So we're happy to actually go to court over it, happy to do that with you if you want, but let's go on with the dep. I'm trying to get through this.

MR. NARESH: Fine --

BY MR. TILLERY:

Q. Now, do you remember this from yesterday? Do you remember this from yesterday, sir? This is the action notes from the Atlanta meeting, right?

A. Yes. Yes, I remember.

Q. You -- I think, my recollection --

MR. NARESH: Can we have the same stipulation as yesterday, that any questioning relating to 502(d) documents is without waiver of Syngenta's objections on privileged grounds to testimony related to the documents and the documents themselves?

MR. TILLERY: Absolutely.

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Of course.

MR. NARESH: And I'm assuming that you'll have additional 502 documents, and can we have the same standing agreement both with respect to this document and the others, to the extent that you use them?

MR. TILLERY: We can, and that was, for the record, my intention to give you that yesterday, even. Okay.

MR. NARESH: And just finally, is there anybody on this call participating in the deposition that has any problem with that approach? If so, please speak up.

(No comment.)

MR. NARESH: Okay, thank you.

BY MR. TILLERY:

Q. Sir, this is Exhibit No. 93. Do you see it?

A. I do.

Q. Would you take a look at that exhibit, and take charge of the exhibit and go through it.

A. Okay, I've done that. Thank you.

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Q. All right, and we're going to -- have you gone through all of the pages? I think there's three pages, right?

A. Yes. I looked at it also yesterday so I've briefly looked at it again this morning.

Q. All right. Let's go back, if you'd take back the display, the first page. Just for the record again, that's 502(d)-022360.0001, Exhibit 93.

We see here -- we went over this yesterday -- who was at the meeting from the science perspective. Then if you go down a little bit on the exhibit and show the bottom of that first page -- yes, that's perfect.

If you look at that, we went over these things I think, and the second bullet point we talked about. Remember? There's no sense in going over it. And the fourth bullet point we talked about, right?

A. Yes.

Q. Study work should be labeled Work Product. And then the sixth or seventh one, it says:

"Work requested by external counsel

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has a higher level of privilege ..."

Remember that?

A. Yes.

Q. We went through that.

All right. Now let's go to page 2. These are the action items. It says "Introduction to Paraquat Toxicity."

Who gave that talk?

A. I would need to check back on the agenda who was doing that. I don't recall.

Q. Okay. Who talked about the introduction to Parkinson's disease?

A. Again, it would be useful if we could just have a look at the agenda because I wouldn't want to give the wrong name.

Q. Well, let's go back to the page before. Take a look at the agenda, then, and see --

A. That would be a different document.

Q. Do you have the agenda -- oh, that would be a different --

A. Yes, that's right, it's embedded.

Q. All right. Well, frankly, to move on, then, let's just say this, if you go back

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to the page you were on, page 2. It wouldn't matter -- your information would be a reflection of what was contained on that other exhibit, right? Whoever it said presented it is what you'd give me in the answer, right?
A. Yes.
Q. So we don't need to take the time because whatever it says on there is what you'll tell me that presentation was, right?
A. Yes.
Q. All right. And then there was epidemiology and animal studies, right?
A. Yes.
Q. Do you see that, on top of that?
A. Yes, yes.
Q. And that of course related to paraquat and Parkinson's disease, right?
A. That's correct.
Q. All right. And then it says:
"MFW to check Liou data on the Pedersen summary table [versus] results in the original paper."
What does that reference?
A. That was for Martin Wilks, who was one of the scientists present, to check the

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data which appeared in an external publication, the first author of which was Liou.
Q. Okay. And what was the reason you were taking action with respect to that?
A. I would be fairly sure that it would be what we did in all of our meetings, which was to look in detail at some of the external publications on the subject of paraquat and Parkinson's disease to make sure we fully understood what was in those papers.
Q. All right. Then look at DJB, look at that action, "to prepare graphs of papers per year associating paraquat with [Parkinson's disease]." Right?
A. Yes.
Q. There were enough of them that you had to assign somebody to prepare graphs of them for the whole group, right?
A. That's right. That was to give a flavor for the amount of literature that was available and that we may need to look at in detail.
Q. Okay. Amount of literature associating paraquat with Parkinson's disease,

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right, in the public domain?
A. Yes, correct.
Q. All right. And then it says that CB made a presentation. That's Charles Breckenridge, right?
A. Yes, that's correct.
Q. He made arguments that may be raised by adversaries. Adversaries were the people who were linking Parkinson's disease to your paraquat product, weren't they?
A. I imagine that that would be what was represented here, yes.
Q. Okay. And then JW, Jeff Wolff, right?
A. Yes, I think that's probably Jeff Wolff.
Q. That's the lawyer from Fulbright & Jarwoski we talked about, right?
A. That's the person, yes.
Q. And he is mapping potential claimants. He's telling you who you think you might -- should be focused on who might bring lawsuits against you, right?
A. He was giving us the background to why there was potential litigation and

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claim, yes.
Q. All right. So he was telling you who the potential people are; Parkinson's victims, right?
A. I don't --
Q. Is that what he told you?
A. I don't know, I can't remember exactly what he told us. I don't think he would have been talking about individuals, individual people with disease. I imagine he would be -- that he was telling us about where potential litigation could come from.
Q. Well, he says -- let's just read the plain language of the action item, "Mapping of potential claimants." He's telling you where in the country they might come from, or where in the world, right?
MR. NARESH: Objection to form.
THE WITNESS: Without seeing the presentation to remind me, I don't know exactly what the content was there to define claimants.
BY MR. TILLERY:
Q. And then let's skip down. It says:
"Action - Need to consider doing

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health surveys at relevant manufacturing plants."

Who is MFW?

A. That's Dr. Wilks. Martin Wilks.

Q. He's to discuss with chief medical officer who will lead. Who was the chief medical officer?

A. Dr. Clive Campbell.

Q. And Dr. Clive Campbell did lead, didn't he?

A. He did indeed, yes.

Q. Okay. So you, at this meeting in 2008, came up with a plan that he was to lead a survey at the manufacturing plants, right?

A. That's where this was initiated, that is correct.

Q. That's where the plan was created, was with these people on this meeting in 2008 in Atlanta, Georgia, right?

A. That's correct.

Q. All right. And that ended up in what's called the Widnes study, correct?

A. It did, yes.

Q. And that was a study we're going to talk about in a few minutes that followed

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from this meeting, correct?

A. That is correct.

Q. Okay. And then if you continue on, it says at the bottom of the page:

"... continue with proposal to commission and publish a critical review of all risk factors associated with [Parkinson's disease]."

What does that mean?

A. In order for us to be able to fully understand the bigger picture around Parkinson's disease and not simply focus on paraquat, we thought it would be helpful, for our own benefit and also for the benefit of the outside world, that there was a critical review of the many risk factors that could be associated with Parkinson's disease, not just pesticides, not just paraquat.

Q. And you did that, too, didn't you?

A. We also did that, that is right.

Q. All right. And that was to display or publish so that there was an effort to explain that it wasn't just paraquat that could cause this; it could be 5 percent of these people who are under -- especially the

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young people who get the disease may have a genetic link, right?

A. Yes. That's one other factor, yes.

Q. All right. So you looked at that. So you were creating a defensive mechanism for the charge against Syngenta that paraquat could cause Parkinson's disease? This was the defense of the chemical, wasn't it?

A. This was --

MR. NARESH: Objection to form.

THE WITNESS: This was an action to provide an objective, critical review of all possible risk factors so that the risk of paraquat could be seen if it was within -- not just within the narrow confines of being -- as it's shown in other publication.

MR. TILLERY: Move to strike your answer as unresponsive.

BY MR. TILLERY:

Q. Was this effort here -- where you're coming up with explanations of other possible alternatives for cause of paraquat, was it in defense of your product, paraquat, sir, or not?

A. It was to support our understanding

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of the potential for paraquat to cause Parkinson's disease.

Q. Okay. And then at the bottom of that second page, it says:

"... request a feasibility study on conducting a case control epidemiology study."

Right?

A. Yes.

Q. And what was the epidemiology study that eventually grew out of this?

A. What we were discussing here was whether it was feasible to conduct our own epidemiology study, not just looking at a manufacturing plant, as a way, again, of showing our proactive approach to this issue, as to whether we could find a feasible way in which we could do a longer-term epidemiology study, perhaps looking at farmers and growers who were using paraquat.

Q. Did you do that?

A. No, because we were never able to find a way in which we could do that feasibly because that would have required a very big population and a very long period of time.

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MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. My question was simply this: Did you do that study?
A. I believe I've just answered that and the answer was no.
Q. All right.
And then on the next page, it says:
"It was agreed that the 14 day kinetic study in mice should proceed, with slides being read in 2 labs."
What study was that?
A. Well, these, back in 2008, we were doing a number of preliminary studies that ultimately led to the publications with longer studies, more detailed studies that we'll be referring to later. So this was the very early work in this case on kinetics.
Q. So which publication of the three you talked about: Smeyne; Minnema; or Breckenridge? Which one?
A. This would be a preliminary study to the kinetics that were included in Breckenridge.

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Q. All right. So this was the beginning, the plan to initiate the Breckenridge study, right?
A. That's correct. This was one initiation for it.
Q. Right. And then below that, it has:
"KT to provide bullet point protocol for LLS to take to ... Steering Group, identifying any risks to the business."
Who is KT?
A. Yes, just -- could you just go back to the --
Q. Rather than take the time, it's an abbreviation -- it's the initials of one of the people on that list, right?
A. Yeah, yeah, I'm sorry, my brain has just gone into relapse --
Q. Mine too, but I'd rather not even spend the time.
A. Right.
Q. It's somebody on that list, okay?
A. Yeah, yeah.
Q. That's who it is.
A. Mmm.
Q. All right. And LLS is the same,

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it's an abbreviation, it's initials of the people on the list.
A. Yes, that's correct.
Q. So KT was to provide a bullet point to take to the steering group. What's the steering group?
A. Right. LLS is Dr. -- is Lewis Smith. At that time, as part of the internal governance which any organization has in R&D, it was to ensure that some more senior people in R&D were aware of our proposals to conduct all the work that we've just been talking about.
Q. So he was getting approval from the upper parts of the company to do this, right?
A. From a more senior group, yes.
Q. Yes, and he was identifying any risk to the business, correct?
A. That's right.
Q. And the risk to the business was losing paraquat as a product that you could sell, correct?
A. Of course, because this is science, and science of course could go -- could take it in any direction. If it confirmed that

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paraquat was causative in Parkinson's disease, of course that would be a risk to the business as described.
Q. Okay.
MR. TILLERY: So I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Would identifying any risk to the business mean potentially losing paraquat as a product that the company could sell?
A. Absolutely, and that was a risk we were prepared to take because we engaged in the research.
Q. Okay.
And then the next is:
"MFW to consider whether we can ... use the Sri Lanka and Korean survivor database for further neurological assessment."
Now, the Sri Lanka and Korean survivor database are the people who survived -- were lucky enough to survive having ingested paraquat, weren't they?
A. That's correct, yes.
Q. Because a large percentage of people who ingest it intentionally or accidentally

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die, correct?
A. Sadly, that is the case.
Q. There are no antidotes for this, correct?
A. There is treatment but no antidote.
Q. Right. So if you take a teaspoonful or thereabouts -- what did you tell me in the first dep? Two teaspoonfuls, you are likely going to die, correct?
A. That is right, depending on the concentration of paraquat.
Q. Right. So you were going to consider using the Sri Lankan/Korean survivor database for further neurological assessment. Did you do that?
A. We did, and this was what led to the publication by Brent and Schaeffer.
Q. Brent and Schaeffer?
A. Yes.
Q. And that's where they got their -- did they get their database from there primarily?
A. I would need to go back and double check whether it was just Sri Lanka and Korea. It may have been wider than that but

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it would have included Sri Lanka and Korea, so ...
Q. Okay. And then it says -- so this was where the Brent study was really originated? The brainstorm was this meeting, correct?
A. That's right.
Q. All right. What was the other study you said?
A. Which other study did I mention? I don't recall mentioning another study.
Q. Okay. So this was Brent?
A. Yes.
Q. That line applied to the Brent study.
A. Yes.
Q. So far we've gotten Breckenridge, we've gotten Widnes. Now we're at Brent, okay, from this meeting --
A. Yeah.
Q. -- right?
A. Yes.
Q. Okay. All right.
And then it says JM -- I think that's Janis McFarland, right?

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A. That's correct.
Q. "... to confirm if PQ is used as a desiccant on food crops ..."
Do you see that?
A. Yes.
Q. Okay. And a desiccant on food crops would tell you how many people throughout the world had potentially consumed products that contained paraquat, wouldn't it?
A. That information could be used, certainly, yes.
Q. And that was one of the concerns, wasn't it?
A. This would, I believe -- again, this is from memory, would be again to make sure we understood how widely and under what circumstances paraquat was used.
Q. Okay. Now, I've got to -- I'm trying to move forward a little quicker because we've spent more time than I anticipated on some of these projects.
But I wanted to ask you generally, and perhaps our general discussion can obviate the need to go through a number of exhibits. I just want to ask you this: Were you aware

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that Jeff Wolff was editing scientific papers and presentations at Syngenta? And when I say Jeff Wolff, I mean the outside counsel at Fulbright & Jarwoski.
Were you aware of that?
MR. NARESH: Objection to form.
THE WITNESS: No, I was not aware of that.
BY MR. TILLERY:
Q. Okay. And when I say papers, I mean those perhaps that would include presentations to the Syngenta executive committee by Lewis Smith. Were you aware that he had done that?
MR. NARESH: Objection to form.
THE WITNESS: No, I was not aware of that.
BY MR. TILLERY:
Q. Was that something you personally would approve of?
A. I guess it depends what the purpose of that editing was and what the nature of the editing was.
Q. Well, I'm talking about a substantive scientific point. If I ask you to assume that it was a substantive scientific

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matter, is that something that you would approve of?
MR. NARESH: Objection to form.
THE WITNESS: It depends on the nature of what edit was being proposed, if it was --
BY MR. TILLERY:
Q. Okay.
A. So I can't comment on it unless I have a specific.
Q. Okay. So it may be that using an outside attorney who isn't even employed by the company directly, paid from a -- as you would any lawyer you hired in America, that this lawyer, his edits to scientific presentations, scientific statements would be appropriate depending upon the context. Is that what you're telling me?
A. What I'm saying is that if it didn't -- if his edits did not detract from the scientific message that was meant to be conveyed, that would not be, for me, a major issue.
Q. Okay. So you would submit it to the outside lawyer. You wrote scientific articles

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for him to change words, right?
MR. NARESH: Object to the form.
THE WITNESS: It was common practice for me to get -- seek advice from lawyers when making presentations, but at no time was that advice meant or indeed ever taken to say that the scientific content, the essence of the content should be changed.
BY MR. TILLERY:
Q. But you were getting advice about paraquat publications and presentations, weren't you?
A. Yes, the team received advice about how to make communications but the scientific publications were absolutely written with the words of the scientist.
Q. Did you run certain documents through lawyers to be able to assert attorney-client or attorney work-product privilege?
MR. NARESH: Objection; form.
THE WITNESS: Well, we passed documents to lawyers where they requested them to do so, the purpose of which was

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really their professional duty and input. So I didn't pass them because I wanted to do that. It was certainly not part of the scientific process. It was lawyers providing us their advice on best practice on documentation.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Did you or did you not run documents through lawyers, including Mr. Jeff Wolff, for the purpose of asserting attorney work client privilege or -- I'm sorry, attorney work-product privilege or attorney-client communication privilege? Did you do that?
MR. NARESH: Objection to form.
THE WITNESS: Documents were passed mainly to internal counsel. I can't comment as to what was sent to external counsel.
BY MR. TILLERY:
Q. Did you even send notes to the counsel telling them that you wanted them to convey them to other scientists but sent them to the lawyers so that the work-product

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or attorney-client privilege could be asserted? Did you do that as well?
A. I don't remember. There may have been examples where, if we were wanting to communicate, we were given advice about how to do that. But, again, let me reiterate, this was not in any way to change the science content of any communication.
Q. It was to hide it, wasn't it?
MR. NARESH: Objection to the form.
BY MR. TILLERY:
Q. It was to protect the communication.
A. It was to protect it according to the advice given to us by our legal team.
Q. Okay. Well, whether it was by advice or not -- I'll admit that you were told to do this by lawyers. I'll admit that. We agree. You told us in February 2008 you went to Atlanta and a lawyer named Wolff from Fulbright & Jarwoski sat down and laid out the whole plan. We get it.
But I'm trying to say you carried out that plan, didn't you, in part?
MR. NARESH: Objection to form.
THE WITNESS: Yes, of course,

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we took the advice from internal and external counsel about how we communicated.
BY MR. TILLERY:
Q. And that communication advice included when you wanted to take documents that were sensitive relating to paraquat and Parkinson's disease, communications about those, to run them through lawyers and assert attorney work product or attorney-client privilege; is that a fair statement?
MR. NARESH: Objection to form.
THE WITNESS: That is a fair statement.
BY MR. TILLERY:
Q. All right.
MR. NARESH: Steve, if you're shifting topics or changing your line of questioning, would now be time for a break? We've been going for about an hour and 20.
MR. TILLERY: Of course, sir. Of course.
MR. NARESH: Okay.
MR. TILLERY: Fine. Thank you.

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We'll go in a breakout room, please.
THE VIDEOGRAPHER: Okay, I'll set those up.
We are going off the record. The time is 11:20.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 11:40.
MR. TILLERY: This is 575, right?
(Botham Exhibit 95 marked for identification.)
MR. TILLERY: Let's look at Exhibit 95.
BY MR. TILLERY:
Q. Can you look at that document, sir.
A. Thank you, yes. Just received and looking at it now.
Q. You tell me when you're ready to speak about it.
MR. TILLERY: While he's finishing, for the record, this is document 502(d)-0107074.0001.
THE WITNESS: Okay, this is quite a lengthy document but I think the second

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part of it is an inclusion of a document we discussed yesterday.
BY MR. TILLERY:
Q. Right, it is. And then all I was -- the point I wanted to make with you is that this is global product registration meeting notes, right? I think the second page refers to draft notes of PS/GPR meeting, July 10, 2008.
Do you see that?
A. Yes, I do.
Q. All right. And that's Phil Botham, at the top, Angela Brady, Andy Cook, Roland Dieterle -- and for the reporter, that's D-i-e-t-e-r-l-e -- John Doe and Kersten Mewes, right?
A. Yes, that's right.
Q. What was this group meeting about?
A. It was a meeting between representatives of product safety and global product registration on a number of aspects related to paraquat and Parkinson's disease.
Q. Now, have these draft notes been circulated among the lawyers?
A. I can't comment on --

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MR. NARESH: Objection; form.
THE WITNESS: I can't comment on that, I don't know.
BY MR. TILLERY:
Q. Well, look at the front page, the very first page.
A. Right. Okay, so, yes, that's -- the front page indicates that the attachments were sent by Dr. Sullivan, yes.
Q. So they went by there. And who did they copy?
A. Well, they went to Jeff Wolff and Alan Nadel, copied to Christoph Maeder.
Q. So Christoph Maeder was who?
A. He was on the executive committee, so he was Jonathan Sullivan's boss.
Q. Okay. So these set of notes went through the lawyers, copied to outside counsel, Jeff Wolff at Fulbright & Jaworski, to Alan Nadel, who is the head counsel in the United States, "Subject: Paraquat," and it was Cc'ing Christoph Maeder --
A. Yes.
MR. NARESH: I'll object to the form.

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MR. TILLERY: Okay.
THE STENOGRAPHER: I'm really sorry, Mr. Tillery, but I just lost that question. I didn't get it, sorry.
MR. TILLERY: Okay. Let me start over. Sure.
BY MR. TILLERY:
Q. This document, which we have marked as Exhibit No. 95, and the front page is a communication of proposed edits from Jonathan Sullivan to Jeff Wolff at Fulbright & Jarwoski, correct?
A. Correct.
Q. All right. So he's editing a scientific summary of a group and the draft notes from this meeting on July 10. Let's look at the clarification points, down, that might be adjusted, on page 2.
Pull that up, please.
Where it says:
"Clarification of specific points during the discussion lead to the following executive summary which will be included in the next version of the PS document."
What is a PS document?

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A. I believe that that would refer to what we were calling yesterday the "reference dose" document.
Q. Okay. And "reference dose" meaning that which was discussed in Plaintiff's Deposition Exhibit 38?
A. That is correct.
Q. All right. And it says here, and follow along with me, please:
"The one consistent finding in animal studies is the loss of dopaminergic neurons in the substantia nigra C57BL6J mice."
Correct?
A. That is correct.
Q. "This finding is judged to be real, to be related to treatment and to be adverse in nature."
Right?
A. That is correct.
Q. So it would meet all those criteria we walked through for reporting to the US EPA, so long as you deemed it relevant under your definition at Syngenta, correct?
MR. NARESH: Objection; form.
THE WITNESS: At that time in 2008,

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that is correct.
BY MR. TILLERY:
Q. All right. And it says next:
"In the absence of evidence to the contrary, it is prudent to assume that this finding is potentially qualitatively relevant to man."
Correct?
A. Correct.
Q. And for the folks who don't have PhDs like you and have spent years and years in training and education and science, what that really means is that the findings they're seeing in these mouse studies indicate that paraquat gets into the brain the same way, or in generally the same way; right?
MR. NARESH: Objection to form.
THE WITNESS: What this says is that the findings of dopaminergic neuronal loss in mice cannot be ruled out as something that could happen in man if paraquat were to get into the brain of man to a sufficient concentration.
BY MR. TILLERY:
Q. And the way it would happen would be

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the way you and I talked yesterday, the so-called mode of action, which would be to create oxidative stress and damage, weaken or kill dopaminergic neurons, correct?
A. That is correct, yes.
Q. All right.
Now, were minutes of meetings like these, in your view, things that should be edited by lawyers, outside lawyers?
A. I don't -- didn't have a view on that. As I said earlier, we were happy to accept advice to -- from lawyers with regard to the way in which we documented our communications.
Q. Well, do you think that a scientific meeting like this one that's draft notes of this meeting, talking about purely scientific matters, should be sent to lawyers for edit first? Is that something that you think is a standard scientific protocol?
A. It's not a --
MR. NARESH: Objection to form.
THE WITNESS: It's not a standard scientific protocol, of course, but in the situation that we were in with

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potential litigation, we were happy to receive appropriate advice, as long as --
BY MR. TILLERY:
Q. Well, where --
A. -- as long as the scientific position was not altered.
Q. Where was the potential litigation coming from? Where did you hear that?
A. Well, if you remember, Dr. -- sorry, Mr. Wolff had made a presentation in the meeting that we were looking at earlier.
Q. And he told you, if you continue to sell this product you're probably going to get sued, didn't he?
MR. NARESH: Objection to form.
THE WITNESS: I can't remember the detailed nature of what he told us but he said there was potential litigation.
BY MR. TILLERY:
Q. And litigation means a lawsuit, just for everybody's terms, right?
A. Correct.
Q. And you're going to get sued over Parkinson's disease victims being exposed

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to paraquat; that's what he told you, wasn't it?
MR. NARESH: Objection to form, foundation.
THE WITNESS: Yes, that was the essence of what he said.
BY MR. TILLERY:
Q. And he said that in 2008, didn't he, 12 years ago?
A. Yes.
Q. And for that reason you better get going and you better start defending yourself; and you had a meeting in Atlanta where you started that process and did just that, didn't you?
MR. NARESH: Objection to form.
THE WITNESS: I wouldn't put it that way. This was -- we did not get going, as you put it, because of the potential for litigation; we got going because it's a duty of care on the company, and always has been, for us to be clear about the potential dangers that could be associated with our product.

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BY MR. TILLERY:
Q. Didn't you just tell the ladies and gentlemen of the jury just a little bit ago, before the break, that this meeting in Atlanta was the creation location, that's where all of you got together and the Brent study was hatched, the Breckenridge study was hatched, the Widnes study was hatched; all of that came about as a result of that study, right --
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. As a result of that meeting.
A. Yes, it did, but that meeting was there as a launch pad for the team that was going to manage this proactive program of different scientific studies, and the fact that --
Q. Right, well --
A. -- that we had potential litigation was one bit of information that was part of that, not the main driver for it.
Q. Okay. And let me ask you, then, why in the world did you have all these lawyers there telling you to protect all your communications, if this wasn't about potential

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litigation, and the speech starting off the whole process was from an outside counsel talking to you about your potential litigation, and then you sat around and go through -- we went through that whole list of all the things you're going to do?
Are you trying to tell us with a straight face that this wasn't because you were trying to create the science to defend the product? Is that what you're telling us?
MR. NARESH: Objection to form.
THE WITNESS: I'm telling you that this science program was primarily to ensure that we were creating our own science evidence base to see whether paraquat could be a causative agent in Parkinson's disease. The prime driver was not potential litigation.
BY MR. TILLERY:
Q. Okay. So all of those things that I pointed out earlier that we read to the court and jury that talk about all these studies you're going to do, everything else, the threat of litigation, how you're going to create other alternative explanations for Parkinson's

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disease, they were never published in scientific journals, were they --
MR. NARESH: Object --
BY MR. TILLERY:
Q. These were changed -- designed to protect your product. You even sent people to the high leadership in the company telling them about the threat to the business of paraquat, didn't you?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. That all happened as a result of that meeting, correct?
MR. NARESH: Same objection.
THE WITNESS: I think I said before that people went to the senior leaders in the company to tell them about the proposed program, which was to do exactly what I've said, which is to try to get nearer to the scientific truth of what relationship there could be between paraquat and Parkinson's disease, and that the outcome of that science program could be a threat to the paraquat business if the science was taking us

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more in that direction.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. So before we leave this document, which is number 95, if you would take charge of the document, or, if you can, just go to .07 -- .007, which is about six pages back, and it's this page right here, "Product Safety Evaluation."
Do you see that, "Product Safety Evaluation of the Animal Studies"?
A. I do.
Q. You were there for this, weren't you? You were there for this meeting?
A. I was there at that meeting, yes.
Q. If we look at this, it says your meeting concluded:
"The one consistent finding from the body of animal studies ..."
Consistent finding. Consistent finding.
"... is the loss of dopaminergic neurones in the substantia nigra pars compacta of male C57Bl6J mice. This finding is judged

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to be real, to be related to paraquat treatment, and to be adverse in nature. It is not clear if neuronal cell loss in response to paraquat exposure is peculiar to this particular mouse model, but in the absence of evidence to the contrary, it is prudent to assume ... this finding is potentially relevant to man."
Do you agree with that statement, sir?
A. Absolutely. I stood behind that statement as it was believed to be the correct science position in 2008.
Q. Okay.
Did you, at that time in 2008, convey that particular statement to the United States Environmental Protection Agency?
A. I don't know whether any of our regulatory colleagues were having those kind of discussions with the EPA. I can't confirm that.
Q. Are you aware of them having done so? Have you ever seen documentation, any internal communication, where they conveyed that to the US EPA?

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A. As I say, I can't recall seeing anything which showed if that happened.
Q. Are you aware of that communication ever appearing on the paraquat.com website?
A. As we were discussing earlier, communications on the paraquat.com website depended on exactly what period of time we're talking about and how quickly the paraquat.com had caught up with the science.
Q. Dr. Botham, could you answer my question. Did you put that on the website or not?
A. I don't know if we put that on the website.
Q. You never saw it on the website, did you?
A. I don't recall seeing that on the website.
Q. Okay. All right.
MR. TILLERY: We're going to a completely different topic list now. If you could pull this one up.
We don't have to go off the record but we're switching gears to a new subject area so if you'd give us about -- actually, let's go

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off for two minutes or three minutes, okay, so we can get started on a completely different topic.

THE VIDEOGRAPHER: We are going off the record. The time is 12:00 p.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record. The time is 12:04.

BY MR. TILLERY:

Q. Dr. Botham, would you please confirm for this record that Syngenta is not legally allowed to sell paraquat in these 70 countries: Albania, do you sell it there?

A. You're now going to ask me about individual countries which I don't have that level of detailed knowledge of, so to save time, I'm sure -- I wouldn't want to dispute any list that you've got.

Q. Well, let me just say this to you. I sent to your counsel a list of countries that our research indicated that paraquat was not legal to sell in those countries. I sent them to them, and they came back and told me that as to those countries, two of them they disputed and I think actually one on my list, and that

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was Brazil.

A. Mmm.

Q. So let me read the list to you to save time and then you tell me if this recitation of 70 different countries where this product is not lawful to sell or to distribute or to use is accurate or inaccurate. And if it is, if you wouldn't mind making a note of which country you find in -- you have a dispute with, and stop me if I'm going too quickly, please. Okay? Are you with me?

A. Okay, yeah, that's fine. Happy to do that.

Q. Do we understand the assignment?

A. Absolutely. Please go ahead.

Q. All right. Thank you, sir.

So admit that you're not legally allowed to sell paraquat in: Albania; Algeria; Bosnia and Herzegovina; Cambodia; China; Benin; Burkina Faso; Cape Verde; Chad; Gambia; Guinea; Guinea-Bissau; Ivory Coast; Mali; Mauritania; Niger; Senegal; Tobo; Egypt; Austria; Belgium; Bulgaria; Croatia; Cyprus; Chechnya; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania;

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Luxembourg; Malta; Netherlands; Poland; Portugal; Romania; Slovakia; Slovenia; Spain; Sweden; Fiji; Kuwait; Laos; Lebanon; Libya; Macedonia (and I note that is now called the Republic of North Macedonia); Malaysia; Montenegro; Norway; Oman; Qatar; Saudi Arabia; Serbia; South Korea; Sri Lanka; Switzerland; Syria; Taiwan; Thailand; Tunisia; United Arab Emirates; United Kingdom; Vietnam; and Yemen.

Would you agree with those?

A. I have no information available to me that would allow me to disagree with any of those.

Q. Okay. And I will just tell you that the response was admitted to all of these countries; so in the court, that admission was made that Syngenta is not legally allowed to sell paraquat in those countries.

You don't dispute that, do you, sir?

A. I do not dispute that.

Q. All right.

Now, scientists often use laboratory animals to determine the effects of a chemical, don't they?

A. They do.

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Q. Scientists do not administer known toxic compounds to humans because of the fact that that would be unethical, correct?

A. That is largely true, yes.

Q. So if a scientist wants to study the effects of a chemical, he or she would put the chemical into the animal in some way and studies -- or study the effects it has on the laboratory mouse or rat or whatever animal they're using, correct?

A. Correct.

Q. Scientists develop animal models showing the effects of chemicals, right?

A. They do.

Q. Sometimes scientists use animal models in the course of studying a chemical to induce pathology that is similar to a human disease; is that correct?

A. Yes, they do.

Q. Again, that's because we obviously cannot induce that same disease in humans and then study its effects. That would be obviously grossly unethical, right?

A. Yes, that's correct.

Q. Scientists often need to recreate

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a human disease in an animal model in order to try to find medicines that will cure the disease, or to treat or lessen the effects of the disease; is that right?
A. That's right.
Q. So the disease is modeled in an animal, and if a chemical can induce the key hallmarks of the disease, these biological pathways are studied for possible cures.
Would that also be correct?
A. Yes, it would.
Q. To be sure a specific intended dose is delivered to the animal, injection is probably the most accurate means of administering the chemical, correct?
MR. NARESH: Objection to form.
THE WITNESS: Not necessarily, no.
BY MR. TILLERY:
Q. Tell me a method of delivery which is more accurate -- I use the word accurate -- in terms of administration of a dose.
A. It depends on the purpose of the model, a disease model. Sometimes it's important, for example, to give a chemical by inhalation because you want to give an

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accurate dose to the lung; so that was the reason for my response saying "not necessarily."
Q. So are you telling me that using an inhalation technique is more accurate than a measured dose of injected?
A. It can be as accurate, but I'm talking to you in general terms here about disease models. Disease models would want to create the pathology and sometimes they would do that using a route other than injection.
Q. Well, since we're going to come back and take your dep and finish it -- we won't have time today -- would you mind giving me your references for that, where you say using inhalation of a chemical is as accurate a means of administering a chemical as injection? I want to hear your references so I can go look them up. What are they?
MR. NARESH: Objection to form.
THE WITNESS: Well, I'm talking in very broad terms. I can't give you a reference off the top of my head.
///

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BY MR. TILLERY:
Q. Well, can you point me to a laboratory manual or to a book, a laboratory science, anything, anywhere, where that statement has ever been made by an authoritative source? Ever.
A. Well, we may be talking at cross-purposes here. I mean, if you are saying to me that the way in which you can be really sure about how much you get of a chemical you can get into an animal's tissues and cells throughout its body, then I would agree with you that intravenous dosing is the most accurate way of doing that. I --
Q. That's what I asked you, sir. That was my question.
Let me go back to my question. Maybe you answered a different one. I said, to be sure a specific intended dose is delivered to the animal, injection is the most accurate means of administering the chemical. Would you agree with that?
A. I don't think I want to disagree with you because I think we were talking at cross-purposes and I'm saying --

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Q. Right.
A. -- you can use other routes of administration and accurately calculate how much gets in there, but let's not take that any further. I don't think we need to.
Q. Well, you agree with me, don't you?
A. I'm -- yes. I'm saying I agree with you that intravenous dosing is the most accurate way of ensuring that you know how much chemical has got into a chemical [sic] generally internally.
Q. So injection, where you have a measured amount that you're injecting in an animal, is the most accurate means of administering the chemical; would you agree? Whether or not it's the most effective, whether it's the most appropriate, that's not the question.
It's the most accurate means of measuring the amount of chemical you're dosing to the animal; is that right?
A. Yeah. I'm happy to agree with you on that. We can move on, certainly, yes.
Q. All right.
A. Mmm.

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Q. Okay. Injection allows a scientist to ensure that the exact amount is being delivered to the animal, right?
A. Okay, yes.
Q. All right. This allows the experimenter to know what the effects may be at a specific dose, right?
A. Yes.
Q. All right. Scientists cannot always mimic the quantity of human/environmental exposures. That seems pretty obvious, doesn't it?
A. Yes.
Q. So scientists use a dose that may or may not be environmentally relevant when they do these tests, right?
A. They do, yes.
Q. And whether the dose is environmentally relevant or not, scientists are looking for a biological pathway that is the same as in the human disease, correct?
A. If they are trying to develop an animal model of the disease, that is correct.
Q. Right. Louise Marks's studies, for example, showed that the paraquat she used

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caused a loss of dopaminergic neurons in the substantia nigra and an up-regulation of alpha-synuclein. Correct?
A. Correct, yes.
Q. And those are two hallmarks of human Parkinson's disease, aren't they?
A. They are.
Q. Paraquat's ability to do that was through oxidative stress, as we've discussed before, correct?
A. Correct.
Q. The pathology that caused paraquat -- strike that.
The pathology caused by paraquat is consistent with human Parkinson's disease, correct?
A. That part of the pathology we've just spoken about is consistent, yes.
Q. So it was a similar pathway, correct?
A. It's assumed that the mechanism that that had been caused by was through the same pathway, yes.
Q. Paraquat can also be absorbed dermally, can't it?

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A. It can but very slowly.
Q. And paraquat spray mist can be inhaled, can't it?
A. It can, yes.
Q. Paraquat spray mist can be swallowed or ingested, too; if it's on your lips or you put your fingers in your mouth. Correct?
A. Correct.
Q. What route of paraquat administration was used in the Marks study?
A. That was intravenous injection -- sorry, intraperitoneal injection. Excuse me, intraperitoneal injection.
Q. It was what you refer to, scientists refer to, who hang around laboratories as an "ip use," right, intraperitoneal?
A. ip, yes, intraperitoneal.
Q. So when the court and the jury sees references in documents to "i.p.," you abbreviate that for intraperitoneal injection, right?
A. That's right.
Q. And that's to take a needle and stick it into what's part of the body and the belly of the animal called the peritoneum,

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in that area, correct?
A. Yes. It's the liquid surrounding the gastro-intestinal tract.
Q. Right. What route of exposure was used in the Breckenridge 2013 study?
A. That was also intraperitoneal.
Q. What route of exposure was used in the Minnema 2014 study?
A. It's what we call dietary exposure; so it was -- paraquat was part of what the animals were given to eat.
Q. So they eat materials/food laced with paraquat?
A. That's right.
Q. Okay, right?
A. Yes.
Q. And then they then ingest this and then digest the material and it works its way into the bloodstream, right?
A. That's correct.
Q. Okay. What route of exposure was used for the Smeyne 2016 study?
A. That was back to intraperitoneal.
Q. Right.
Now, applicators, mixers and loaders

of paraquat are those who are most exposed to paraquat. We've talked about that. Correct?
A. Potentially that is the case.
Q. All right. And can we call that occupational use?
A. That's fine.
Q. All right. Syngenta contends that occupational exposure to paraquat occurs mainly by dermal exposure, right?
A. Yes, that's right.
Q. So your position has been that dermal exposure -- and this is set out in Mr. -- or Dr. Breckenridge's 2013 study on page 2 -- that dermal exposure is the main route by which occupational users of paraquat get paraquat in to their system, right?
A. Yes, that's been our assumption based on, in some cases, real monitoring of people working in the field.
Q. Okay. You've done a lot of that, right?
A. We have.
Q. All right. So dermal absorption would potentially lead to systemic toxicity --

could potentially, right?
A. Yes, it could.
Q. And that means it gets into the bloodstream, right?
A. That's correct.
Q. What does an environmentally relevant route of exposure mean?
A. Well, it would be to use a route of exposure which was similar to the route of exposure that people using a product or being exposed to a product would receive.
Q. Okay. What is the environmentally relevant route of exposure for paraquat?
A. Well, it would potentially include the dermal route.
Q. Well, is it dermal? Is that what it is?
A. It could be dermal. It could be inhalation. It could be oral because of residues in food. There are a number of different routes which are relevant.
Q. And do you find one of them more relevant than others?
A. We believe that the route of giving it -- I would say dermal or oral or by

inhalation -- is certainly more relevant that intraperitoneal or intravenous.
Q. What does the EPA consider to be the environmentally relevant route of exposure for paraquat?
A. Well, it says much the same as I've said; it considers that oral ingestion, dermal absorption and inhalation exposure are all relevant.
Q. So is there any one of them that they consider to be more environmentally relevant than another?
A. I think that would depend on the nature of the risk that's being assessed. So if they are concerned about you and I eating food that may have residues, they would be saying that ingestion is the most appropriate route. If they're talking about farmers and growers, then it could be dermal or inhalation.
Q. So as they have evaluated the safety of paraquat, have they evaluated it more from the standpoint of farmer applicators or for the millions of people who eat products, food products, which have been sprayed with paraquat

and therefore ingest the paraquat; do you know?
MR. NARESH: Objection; foundation.
THE WITNESS: I believe, from what I've seen, that the EPA have more focused on the applicator of paraquat, so through dermal and inhalation absorption, but they've also certainly addressed residues on food.
BY MR. TILLERY:
Q. So the food residues would be the oral portion most likely because you don't expect the farmers to be drinking or swallowing this chemical, right?
A. That's correct.
Q. And the inhalation or dermal route would be the most likely for the farmer applicator, mixer, loaders, correct?
A. That's correct.
Q. All right.
Did Syngenta recommend to the EPA that the environmentally relevant dose of exposure to paraquat is the oral route?
A. I don't know whether we made such a recommendation.
Q. When paraquat enters the body,

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regardless of the route of exposure, is it metabolized?
A. No, it's not.
Q. Doesn't break down in the body, does it?
A. No, it does not.
Q. Okay. It doesn't break down into a different chemical, which is very common in cellular metabolism that happens frequently, correct?
A. That's correct.
Q. Let's explain this for the jury, if we can. A chemical can, because of its certain properties, be dumped out on to the ground, and because of the sun or because of wind or rain or whatever, it can go through a fate -- environmental fate impact which converts it to a metabolite, correct?
A. That's right.
Q. And that same thing happens to the human body; the chemicals in the human body sometimes work to cause chemicals to break down. Some pharmaceutical products are designed for that purpose, aren't they?
A. Exactly, yes.

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Q. They become effective when they break down and --
A. Exactly.
Q. -- the metabolites are what's re --
A. Yes.
Q. Right. But paraquat is different, isn't it?
A. Paraquat is not metabolized, that's correct.
Q. Paraquat stays paraquat, it does not change its characteristic. It stays in the body and until it leaves the body it's still paraquat, isn't it?
A. Yes.
Q. The chemical structure of paraquat that you and I talked about from 1933 in the --
THE WITNESS: We've lost the connection.
MR. NARESH: Okay. Yeah, I can't hear him either. Can we go off the record.
THE WITNESS: Wendy, can you hear us?
THE VIDEOGRAPHER: Yeah. I can hear you fine. It must be Mr. Tillery

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that's dropped off so we'll go off the record.
We are going off the record.
The time is 12:27.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 1:53.
BY MR. TILLERY:
Q. Dr. Botham, are you there? I can't see you.
A. Yes, I'm here. I can see you.
Q. There we go. All right.
Are you ready to proceed, sir?
A. I am ready.
Q. All right. Apparently I continued to talk after the system went down, and we were on the topic of the breakdown of paraquat in the body, and you had explained that it did not metabolize in the human body. Is that correct?
A. Yes, indeed, that's what we had indicated, that's correct.
Q. Okay. When paraquat is administered orally, it becomes systemic, doesn't it?
A. Some of it becomes systemic, yes.
Q. Some of it becomes systemic and some

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of it passes through the body without getting into the bloodstream, right?
A. Yes, that's right.
Q. All right. So to the extent that it would affect -- let's pick a target organ like the lungs, okay. To the extent that paraquat orally ingested affected the lungs, would you walk me through the physiology of how that would happen.
A. So paraquat would, if ingested, would go through the stomach into the intestines, the small intestine, where it is possible for molecules that are in your diet to be absorbed into the bloodstream at that point. How readily that happens depends on the chemical but some paraquat does enter the bloodstream that way, and once in the bloodstream it can circulate to an organ like the lung, get taken up into lung cells and potentially do damage to those lung cells.
Q. If the dermal route were the route of exposure, how would that happen?
A. So the skin has a pretty thick layer, or an impermeable layer, which means that chemicals like paraquat don't get across

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that layer very easily, so that's what's called dermal penetration, but some does get across. And when it does so, it can similarly get into blood vessels under the skin. Once there, it likewise can get transported around the body, including to the lung.

Q. Okay. And if it's inhaled, how does it happen?

A. So if it's inhaled, it depends on the size of the droplet. Some larger droplets will just go as far as back of the nose and maybe into the throat. It's possible that you can similarly then get transfer across into blood vessels. Smaller particles will get deeper into the lung, and again there, there's a ready blood supply which can take it elsewhere, as well as it doing direct damage to the lungs.

Q. And if it's by intraperitoneal injection, how would it get back to the lung?

A. If it's by intraperitoneal injection, likewise because you're already into the cavity around the intestines, those intestines have got an adequate blood supply around them so some can get from that

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peritoneal fluid into the blood vessels, just as I've described.

Q. Okay. And if it's by subcutaneous injection, how does it happen?

A. Subcutaneous injection is basically bypassing that dermal layer that I was talking about before in the skin, so you're injecting just below that into the subcutaneous fat, and that just gives you more ready access to the blood supply than directly on to the skin.

Q. And no matter how you cut it, really, it, through one route or another, gets into the blood stream and finds its way passing through body to the lung, right?

A. Yeah, and, depending on the routes, the amount that gets through will change.

Q. Right. But eventually, the means by which it gets to the lungs is the same, correct, through the bloodstream?

A. That's right, it travels through the bloodstream.

Q. All right. And now let's pick a target organ of the brain. Would each one of those be the same?

A. In terms of getting to the

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bloodstream, yes --

Q. Yes.

A. -- but there's -- yes, yes.

Q. So the route by which it got to the brain would be through the blood depending on, obviously, if you talk about absorption and passage through the blood-brain barrier. But beyond that, the method by which the chemical got to the brain would be through the bloodstream; is that right?

A. That's right, it --

Q. Irrespective --

A. Yeah, you don't --

Q. Irrespective of intraperitoneal injection or subcutaneous or oral ingestion or dermal absorption, it wouldn't matter, would it?

A. No. In terms of getting to the blood-brain barrier then, yes, it's the same. So getting across the blood-brain barrier is another mechanism which changes the amount of paraquat, of course, but that's another story which we've been into before.

Q. Right. So paraquat reaches the brain regardless of the route of exposure

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through the bloodstream, correct?

MR. NARESH: Objection to form.

THE WITNESS: It can get into the brain and the route of exposure will change how much gets there.

BY MR. TILLERY:

Q. But it does get there, that's what I'm saying --

A. Yes.

Q. -- regardless, yes.

A. Yes.

Q. Let me ask you a question. If I dose two mice with the same amount of paraquat using different routes of exposure and I then gave you their brains to examine, would you be able to tell me what route of exposure I used to dose each one?

A. Possibly. If you told me the concentration that you had given, it may be possible for us to predict that, yeah. Not necessarily 100 percent but it may be possible.

Q. Okay. And you talked about dermal absorption a minute ago. Do non-ionic surfactants increase dermal absorption?

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A. Yes, they can do.
Q. And what studies has Syngenta undertaken to determine what level of dermal absorption or what change occurs in dermal absorption of paraquat as a result of the addition of non-ionic surfactants to the chemical?
A. Well, we've done many dermal absorption studies, not just of the technical paraquat chemical but of paraquat with -- in its formulated product form where there are different surfactants, including ionic surfactants, as you describe.
Q. And have you published those studies?
A. Those have all been written up as what we call regulatory reports and submitted to regulatory agencies.
Q. And do you understand that the addition of non-ionic surfactants increases dermal absorption of paraquat?
A. Yes. We know that can happen.
Q. And you know that that means that it gets into the bloodstream faster when you add the non-ionic surfactants, right?

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MR. NARESH: Objection to form.
THE WITNESS: Yes. If you get greater dermal absorption, then you've got the potential for more to get into the bloodstream.
BY MR. TILLERY:
Q. And the reason for adding non-ionic surfactants to paraquat is what?
A. Because paraquat is a herbicide which needs to kill the weed and if you want to, for example, increase the absorption of paraquat across the cuticle of the plant, the outer layer of the plant, a surfactant will enable that to happen.
Q. Actually, not just the outer layer but the cellular membrane that you're trying to kill, correct?
A. It will help the paraquat to get to the site of action in the plant, yes.
Q. Okay. And what that does is facilitate the killing mechanism of paraquat on the plants that you're targeting, right?
A. It increases the concentration of paraquat inside the plant.
Q. Right. Okay.

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MR. TILLERY: Now, can we go to -- what will the next exhibit be?
MS. BRUMITT: 96.
MR. TILLERY: 96. We'll go to Plaintiff's Deposition Exhibit 96.
For counsel, this is 502(d)-002434.0001.
(Botham Exhibit 96 marked for identification.)
BY MR. TILLERY:
Q. Do you have it, sir?
A. Yes, it has just arrived, thank you.
Okay. I've read that.
Q. All right.
MR. TILLERY: If we'd open that up, please.
Excuse us just a second. We're logging in again.
BY MR. TILLERY:
Q. Okay. At the top it says Dave Berry, right?
A. Yes.
Q. Who is Dave Berry?
A. He was a junior product toxicologist, so he supported Mike Clapp and

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Barry Elliott and was based at CTL.
Q. And this is an email communication dated April 9, 2009, to Alan Nadel, Cc Lewis Smith, re Marlow meeting. Lewis Smith was at that time what at Syngenta?
A. Yeah, I think as we said yesterday, I can't exactly remember the chronology. I think he was no longer the head of CTL. I think by that time he was head of crop protection development.
Q. Okay. And the letter, or email, says it's confidential and privileged, just like we've been talking about before, right?
A. Yes.
Q. And it says:
"Alan, I spoke to Matthew Bayliss this morning who reminded me that all materials intended for display at the Marlow Meeting should first be cleared with yourself or Jeff Wolff."
Is that the same Jeff Wolff at Fulbright & Jarwoski we've been talking about?
A. Yes, I would -- I'm sure it would be.
Q. All right.

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"Two of the guest speakers, Prof Abbott and Prof Brooks will be giving (essentially) generic talks on PET imaging and BBB ..."

What is BBB?

A. Blood-brain barrier.

Q. "... though you should be aware that Prof Abbott will have put the PQ structure ..."

That's paraquat, right?

A. That's correct.

Q. "... through her computational model to assess the feasibility of [paraquat] crossing the [blood-brain barrier] and will report back on this."

Correct?

A. That's correct.

Q. "In addition, Prof DiMonte has offered to give us an update on his most recent work with [paraquat] and primates."

Right?

A. Correct.

Q. Okay. So Professor Joan Abbott would be presenting at the Marlow meeting, and that is the same one we've talked about previously, isn't it?

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A. Yes, this would be the meeting in the first half of 2009, correct.

Q. Okay. Now, who is Professor Abbott?

A. Professor Abbott is an academic research worker in the United Kingdom.

Q. And did you agree with Dave Berry's assessment of Dr. Abbott and Dr. Di Monte as eminent experts?

A. Yes. We -- I agree.

Q. Okay. And that's why you invited them, because you thought their research was leading and cutting edge and you wanted to hear about it, correct?

A. That's right.

Q. All right.

MR. TILLERY: So let's go to Exhibit 96, which is 588. 97, I'm sorry, Plaintiff's Deposition Exhibit 97.

While that's being pulled up, this is SYNG-PQ-04982646.

(Botham Exhibit 97 marked for identification.)

BY MR. TILLERY:

Q. I think you'd seen this document before perhaps. I think we did.

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A. I think this is --

MR. TILLERY: Can you open it?

THE WITNESS: -- the one we saw yesterday.

BY MR. TILLERY:

Q. I think so, and it just demonstrates -- I'm just orienting you so you understood what we were talking about, okay?

A. Mmm. Mmm.

Q. This is a document which contains the meeting agenda for who is talking and the order in which they're speaking, correct?

A. These are action minutes, not an agenda.

Q. Okay. But it tells you what they did and what they talked about, right?

A. That's correct.

Q. All right. And this mentions Dr. Di Monte's presentation of his monkey research at the Marlow meeting, right?

A. It does.

Q. Dr. Abbott's presentation about the meeting, right?

A. That's right.

Q. All right.

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MR. TILLERY: Now let's go to 589, which will be Exhibit 98.

(Botham Exhibit 98 marked for identification.)

BY MR. TILLERY:

Q. This is a quite substantial document and I'll represent to you, as it's being pulled up, that this is the entire presentation that Dr. Abbott brought with her for the presentation to all the Syngenta scientists in attendance, and it is 143 slides long.

So I'm not going to ask you to go through all of them but I'm going to direct your attention to at least the conclusions of this.

But first of all can you identify it? And this is SYNG-PQ-00471694.

Can you see it? "CNS barriers: critical interfaces for CNS entry of paraquat." Do you see that?

A. I do.

Q. What does CNS stand for --

MR. NARESH: Dr. --

MR. TILLERY: I'm sorry.

MR. NARESH: Dr. Botham, you

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certainly don't need to review the whole thing but if you do want to take a moment to just familiarize yourself with the document, please feel free. But, like Mr. Tillery said, I don't think you need to read the whole thing, but --

BY MR. TILLERY:

Q. And you're welcome to take as much time as you need to just go through it. It's her presentation. I think you were in attendance at the meeting, right?

A. I was, yes.

Q. All right. Can you take charge of this to see if you want to look at it and familiarize yourself with it?

A. I currently do have charge of it. It's going to take --

Q. All right, let me --

A. It's going to take a long time for me to go through it, though, because each slide is taking quite a long time to come up. So maybe -- can we just proceed and if I need to take some more time as your specific questions arise, I'd prefer to do it that way, otherwise I suspect I'll be spending a lot of

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time trying to --

Q. Right.

A. -- download the slides.

Q. Right. If you wouldn't mind, just go to 00471764. It's what's called Conclusions.

A. Right, okay. This will take a long time because it's -- to do it manually it's taking about 10 to 20 seconds per slide, so I can't -- it might be quicker for you to take control and go straight to it.

Q. All right. We'll do that, sir.

MR. TILLERY: So we're on -- it's 1764, this page right here.

BY MR. TILLERY:

Q. All right. Those are the conclusion pages that reference page 71 of 143.

Do you see that?

A. Yeah, I can now see that. Thank you.

Q. All right. Now, these were the conclusions that Dr. Joan Abbott presented to the Syngenta scientists during the Marlow meeting, weren't they?

A. They were.

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Q. All right. And she was invited, as we've indicated, because she was an expert in the blood-brain barrier and penetration into the brain by chemicals through the blood-brain barrier, correct?

A. That's correct.

Q. All right. So if we look at these, she told you in her conclusion, after 70 pages of analysis, she said:

"[Paraquat] enters rodent brain rapidly, and cleared slowly."

Doesn't she?

A. She does.

Q. And then she says blood-brain barrier -- that's BBB, right?

A. That's correct.

Q. "... uptake transporters L1 (+OCT? PAT?) + leak into CSF implicated."

And that CSF stands for cerebral spinal fluid, doesn't it?

A. It does, yes.

Q. All right. What does that second bullet point mean to you?

A. It means that -- Dr. Abbott is an expert in what are called transporter

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molecules in membranes, including at the blood-brain barrier, and she is suggesting that a compound like paraquat can cross the blood-brain barrier using these transporter molecules.

Q. And the transporter molecules provide sort of like a vehicle for transport across this membrane, correct? That's what she told you?

A. Yeah. That's right, yes.

Q. And then the next one she says, there's no metabolic breakdown in the CNS.

What does that mean?

A. That the paraquat, as we've been discussing, is not broken down or metabolized in the central nervous system.

Q. So as of the date of this presentation, Syngenta knew that once this chemical got into the brain, there was no metabolic breakdown of it, right?

A. That's right.

Q. And then it says, in the next bullet point:

"No clear efflux transporter from CNS."

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Do you want to explain to the court and jury what that means.
A. Okay. So the transporters we were talking about before were uptake transporters, so that means transporter molecules that could take substance into a compartment like the brain. An efflux transporter is a similar kind of molecule that would take a compound like paraquat out of the brain.
Q. But she couldn't find that. So while it got in the brain, she wasn't finding a clear efflux transporter from outside the central nervous system; is that correct?
A. Yeah, what she was saying is that she could find no evidence for paraquat getting out of the brain through the mechanism of an efflux transporter. That's not to say --
Q. All right.
A. -- she wasn't telling us that paraquat doesn't get out of the brain; she said there was no evidence for it hitching a ride on an efflux transporter.
Q. Why don't you look at the very next bullet point:

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"Very slow clearance suggests intracellular sequestering in [the central nervous system] - potential for long-term toxicity."
Would you agree with me that "very slow clearance" means once it's in your brain it stays in there a long time? Would you agree with that?
A. Yes. That's what that was suggesting from her work, and we subsequently measured that clearance ourselves very accurately.
Q. And so let's stay on Dr. Abbott, though, if we can here, okay.
A. Mmm-hmm.
Q. So "very slow clearance" suggests intracellular sequestering in the central nervous system, which means that it stays in the brain and intracellular sequestering means it accumulates in the central nervous system. That's what she was saying.
A. Yes, it does --
Q. Right?
A. Yes, it does mean that.
Q. It's an accumulation of this

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chemical.
Then it says -- the very last is most important for that. It says what? "Potential for long-term toxicity," doesn't it?
A. It does.
Q. Now, when you knew, putting the pieces together, that paraquat got into the brains of users of your product, like sprayers and applicators when they were using it as you intended for them to use it, you also learned here that when it got in their brains it was very slow to clear and there was a potential for long-term toxicity. Would that be a correct statement?
A. That would be correct.
MR. NARESH: Objection.
BY MR. TILLERY:
Q. All right. And did you tell the users, the end-users of the product, what you knew about that?
A. No, because this is still -- it's still very important to know how much gets in there in the first place. So this -- these measurements were all made using her experimental systems. There was no

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measurement at this point in exactly how much might get into the brain.
So, yes, it may get in there, it may come out slowly, but if there's only a small amount gets in there, even if it's only cleared slowly, what we didn't know is whether that potential for toxicity may actually be a real issue.
This was another reason why we wanted to continue with our science program, to try and answer some of these questions.
MR. TILLERY: I move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Doctor, did you tell the end-users of your products -- sprayers, applicators -- that once they used it, and in their normal use of the product, it would get in their brain and that it was very, very slow clearance and accumulated in their brain and that there was a potential for long-term toxicity? Did you tell them that?
A. No, we didn't --
MR. NARESH: Objection to form.

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THE WITNESS: No, we did not tell them that.
BY MR. TILLERY:
Q. Okay. And did you put that on your paraquat.com website?
A. No, we did not put that on paraquat.com because we still needed to understand that and put it into proper context.
Q. Did you ever tell any regulator, US EPA or any other regulator worldwide, that there was very slow clearance suggesting intracellular sequestering in the central nervous system and the potential for long-term toxicity. Did you ever tell them that?
A. As I said earlier, we had certainly told regulators that paraquat is able to cross the blood-brain barrier, but this issue here of slow clearance and potential for long-term toxicity was something which we were only just beginning to understand.
Q. Okay. Well, let's look at the next bullet. It says:
"Similarities between species in [central nervous system] barrier organization

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and uptake transporters mean it is likely that similar toxicokinetics and dynamics will apply in humans."
Correct?
A. Yes.
Q. She was telling you that the animal studies would be very predictive about how this chemical would react to human beings, too, wasn't she?
A. She was.
Q. And she says:
"Low dose [paraquat] bolus PET study in primates may not be sufficiently sensitive to show CNS distribution."
What does that mean?
A. So the other presenter that was referred to in this meeting, Dr. Brooks, was telling us about studies done by another group -- and I'm not sure whether Dr. Brooks was himself part of that group -- where people had done PET, which is a positron electron tomography. It's an imaging to look at paraquat in the brain of primates.
Q. She was suggesting that different types of studies would be more appropriate,

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correct?
A. Yeah, she was saying that that tomography, that imaging, may not be sufficiently precise to show exactly where in the brain chemicals like paraquat may get to.
Q. Then she says, in the next one:
"CNS [central nervous system] barriers more leaky/vulnerable in neonate ..."
That's like brand-new babies, right?
A. Yes.
Q. And possibly in old age. Right?
A. Yes.
Q. So you knew that people were more vulnerable when they were very, very young or when they were older, right?
A. Yes. This is a biological fact that was relatively well-known.
Q. And didn't you find with Dr. Di Monte's squirrel monkeys that paraquat was persistent in the brain?
A. It was still present at the time that we actually did the analyses, a week or two, I think it was, after he had administered paraquat, yes.

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Q. Well, Dr. Di Monte's squirrel monkeys, you found paraquat persisted in the brain beyond eight weeks. Do you want to be reminded of that?
A. Yeah, I'm sorry, I couldn't remember the -- several weeks, you're right, yes.
Q. So it was eight weeks. And wasn't it clear what Dr. Travis submitted to the PRF Approach Committee, that paraquat persisted in the brain longer than you had previously believed, correct?
A. Can you remind me exactly how you think we said that?
Q. I'm just saying that when you, as a -- on the PRF Committee, heard from Dr. Travis, Dr. Travis was indicating that this was one of the features that you were learning; that in Dr. Di Monte's squirrel monkeys the residue studies demonstrated that the paraquat persisted in the brain beyond eight weeks, right?
A. I don't think we were saying beyond eight weeks, were we?
Q. Actually, it wasn't on the PRF

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committee report, that's correct. It was in the study of the residue studies. You knew that it lasted beyond eight weeks, right?
A. We knew that it was still present in the samples that were taken the last time -- at the last time point, which you reminded me was eight weeks.
Q. Well, let's put it this way: The findings you had are consistent with what Dr. Abbott told you at the Marlow meeting, correct?
A. Indeed, yes.
Q. All right.
Now let's continue on, if we can. It says:
"Entry [paraquat] into [the] brain can be increased by other toxicants ..."
And then it says:
"Neuronal damage by [paraquat] exacerbated by LPS/infection - priming role of microglial activation."
Okay? And that was -- then she ends by referencing more studies, right?
A. Yes.
Q. All right. Did anyone take umbrage

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or offense or a different view at the meeting, during her presentation or afterwards?
A. I don't remember anybody doing so. My memory is that these were very important conclusions and hypotheses that we were hearing from Dr. -- from the doctor concerned.
Q. Abbott. Yes, Dr. Abbott.
A. Dr. Abbott, yes, yes. Dr. Abbott, yes.
Q. Yeah, yeah.
And were they accepted by the scientific team at Syngenta, as far as you know?
A. That's certainly my memory because we -- that's in part why we were designing our future studies to look at some of these challenges.
Q. Sure, okay.
We're going to switch topics just a little bit now, okay. Dr. Botham, paraquat is extremely toxic to mammals when it's ingested orally, isn't it?
A. Yes, it is.
Q. And that includes human beings, doesn't it?

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A. It does.
Q. ICI, the predecessor to Syngenta -- we've been referring to them collectively as Syngenta -- knew that paraquat was extremely toxic to mammals when ingested orally before it even began selling it in the United States in 1965, didn't it?
A. Yes. I think we had that discussion in the first part of my deposition.
Q. Correct. And they knew -- without trying to pin the date down, they knew certainly from testing, from animal testing, that it was extremely lethal, correct?
A. It's a very toxic molecule, yes.
Q. Okay. Just from a general standpoint, explain, when you ingest it, what it does to your body, to the human body.
A. When it's ingested, as we were saying a few moments ago, it then is able to cross from the intestine into the blood supply, into the blood vessels, be circulated around the body, and it primarily expresses this toxicity that we're talking about in two main organs of the body; the lung and the kidney. It's damage to those organs which

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most frequently causes the acute toxicity that you're referring to.
Q. And we have gone through, through previous depositions and earlier this week, references to postmortem analyses where you've pointed out that -- or acknowledged that it also gets into the human brain, doesn't it?
A. Yes.
Q. Now, 1967, A.B. Swan was the director of CTL's predecessor, that's ICI's industrial hygiene laboratories, from about 1963 to 1981, wasn't he?
A. He was.
Q. Is there an antidote for paraquat poisoning?
A. I'm not aware of an antidote, no; just treatment.
Q. Okay. ICI, Zeneca and Syngenta all collected information on the occurrence and circumstances of paraquat poisonings over the years, haven't they?
A. They have.
Q. As a matter of fact, during the meeting that you had in Atlanta, there was a reference on the many meeting minutes

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afterwards, or the summaries, that there was an entire database of people who had died from ingesting paraquat in Sri Lanka and Korea, correct?
A. Yes, those are two examples of such a database.
Q. Okay. And you keep that database for the entire world, don't you?
A. We do have a global database, and we also have access to databases that other people maintain.
Q. How many people worldwide have died from ingesting paraquat?
A. I'm afraid I can't give you a number off the top of my head.
Q. By that I mean accidental ingestion, intentional ingestion. There have actually even been cases of murder using paraquat as well, haven't there?
A. Yes, that's true.
Q. Now, would you -- knowing that paraquat has caused so many deaths around the world, would you think that number to be in the thousands?
A. It is of -- it is a high number.

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As I say, I can't give you the number right now.
Q. Okay.
ICI and Zeneca exchanged information with Chevron on the occurrence and circumstances of paraquat poisoning, didn't they?
A. Yes.
Q. And actually, Chevron exchanged information with ICI about this topic, didn't it?
A. Yes.
Q. And when it was first marketed in the United States, Chevron actually received from the pathologist's office in postmortem exams all around the country, of the United States, different tissue specimens and samples which they analyzed in their own labs because they were the sole distributor and formulator in the United States of your product, correct?
A. I believe so. I think that might have been some of the information we talked about earlier.
Q. That is exactly right. Some of the slides I'm representing to you, some of the

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slides were precisely that. They were slides of people whose doctors or pathologists had sent them on because they were the distributor of paraquat and they wanted them to be aware of the pathology associated with the ingestion of the chemical.
You're aware of that?
A. Yes.
Q. Okay.
Now, do Syngenta's current products of paraquat, formulated products, contain an ingredient called an emetic?
A. They do.
Q. Is an emetic a substance that induces vomiting?
MR. NARESH: I'll object here on scope and foundation.
MR. TILLERY: I'm looking at topic 31:
"The Methodologies, results, significance, and replication of, and Syngenta's internal and external communications about, studies investigating the health effects [and] other aspects of the safety of paraquat,

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or any paraquat product or formulation, whether published or unpublished ..."
To go further into that and other topics, it's mentioned more and more and more again. I can go over them all but there's multiple ones of them.
So I think it's clearly within the formulation of the chemical.
MR. NARESH: Steve, I haven't instructed the witness not to answer but I'm objecting on foundation and scope --
MR. TILLERY: Okay.
MR. NARESH: -- but if the witness knows the answer, he should feel free to answer.
MR. TILLERY: All right.
THE WITNESS: Okay. I'm willing to answer the --
THE STENOGRAPHER: Sorry. Mr. Naresh, I didn't get the end -- I didn't get --
MR. NARESH: I said I haven't instructed the witness not to answer. I'm objecting on foundation and scope but if the witness knows the answer,

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he should feel free to answer.
THE STENOGRAPHER: Thank you.
THE WITNESS: And I was just saying I'm willing to give an answer to that.
MR. TILLERY: Okay.
BY MR. TILLERY:
Q. And the question was is an emetic a substance that induces vomiting?
A. It is.
Q. Okay. Is the purpose of including an emetic in paraquat products to cause vomiting quickly enough after a person ingests the product to eliminate paraquat from the body before it absorbs a lethal dose?
A. That is the purpose, yes, to take paraquat out as quickly as possible.
Q. So, in other words, you want that poison out of the system before it gets to a position where it can do what we talked about before, that is to absorb into the bloodstream, reach vital organs and ultimately cause death, correct?
A. That's right, as much as possible.
Q. And the quicker that you do it, the more likely it is that the person who ingested

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the paraquat survives, right?
A. Yes, that's right.
Q. Okay. ICI first added an emetic to paraquat products it sold outside the United States in 1978, didn't it?
A. I can't give you a date. That's nothing -- something that I haven't got in my head, I'm afraid.
Q. I'll show you some information in a little bit and perhaps it will refresh your recollection. But I'll represent to you that that's what the documents say, but we'll get to that later.
The same emetic was added to the paraquat products that Chevron and ICI America sold in the United States beginning in about 1983. Would that sound right, sir?
A. Again, I take your word for it. I don't carry those dates in my head, I'm afraid.
Q. Yes. ICI first considered including an emetic in its paraquat products to prevent fatal poisoning by ingestion as early as 1968, didn't it?
A. Certainly that kind of thought was

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being considered around that time, I would agree. Again, I can't give you a precise date.
MR. TILLERY: All right. Let's pull up, if we can -- what exhibit number would this be?
MS. BRUMITT: 99.
MR. TILLERY: This is number 99. This is SYNG-PQ-02518325.
(Botham Exhibit 99 marked for identification.)
BY MR. TILLERY:
Q. If you would take a look at the document when you get it, sir.
A. Okay. Received and now reading. I can't read it now because you've taken it away from me.
Q. Okay, I'm sorry. Actually, can you read it from there?
A. Yeah, okay. As it's only one --
Q. I think that --
A. As it's only one page, I can read it, yes, thank you. Just give me a few more minutes to read it.
Q. Take your time, sir.

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A. Thank you.
Okay, thank you. I've read that now.
Q. Okay. So Dr. Swan was the director of IHRL at that time, right?
A. That's correct.
Q. Okay. And we've mentioned his name many times but it's been some time ago in the transcript so, one more time, acquaint us with -- acquaint all of us with who he was at that time?
A. He led the laboratory that was involved in doing the toxicology testing for ICI at the time. It was the predecessor of the Central Toxicological Laboratory which we've mentioned many times.
Q. All right. In that letter, Dr. Swan tells Mr. Darter in substance that a centrally acting emetic, one that induces vomiting by acting on the central nervous system, would act quickly enough to induce vomiting before a fatal level of paraquat could be absorbed. Correct?
A. That's what this says, yes.
Q. And in his opinion, an emetic would

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have to act within a few minutes in order to work?
A. That's what he's indicating here.
Q. He said that using a local emetic that would act quickly enough would not make economic sense in attempting to cope with a rare event, didn't he?
A. That's what it says in the middle of the second paragraph, yes.
Q. In other words, it would cost too much to try to prevent the rare event of people dying from paraquat poisoning, right?
A. That's what that says.
Q. All right.
MR. TILLERY: Let's go to Exhibit No. 100. This is SYNG-PQ-02517085.
(Botham Exhibit 100 marked for identification.)
BY MR. TILLERY:
Q. And let me know when you're ready to talk about it. I think this is a one-page document as well, sir.
A. Thank you.
Okay. I've read that, thank you.

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Q. This is another example of correspondence from one ICI employee to another on this subject, dated November 1970, isn't it?
A. Yes, although I don't -- I'm not familiar with either of the individuals.
Q. One of them is Nigel, or Nigel, Wright and he tells a Mr. Magee at ICI (Ireland) -- what was ICI (Ireland)?
A. That would be the marketing organization of ICI in the Republic of Ireland.
Q. Okay. He tells Mr. Magee at ICI (Ireland) that no emetic, no matter how powerful, would act quickly and strongly enough to prevent the absorption of paraquat following ingestion of a lethal dose, doesn't he?
A. That's what he asserts here, yes.
Q. He also says including a large enough quantity of the emetic in the produce would be commercially undesirable.
Correct?
A. That's what this says.
Q. Commercially undesirable means it just costs too much, correct?
A. That would be a reasonable

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interpretation, yes.
Q. So does Mr. Wright also note that paraquat itself is an emetic that induces vomiting?
A. He does.
Q. But paraquat doesn't induce vomiting quickly enough so that a person's life is saved, does it?
A. That's what -- that's what he's saying here, yes.
Q. And that's what you know, too, yourself, correct?
A. It is, which is why we eventually did put an emetic into the paraquat formulations.
Q. Right. We're getting to there.
MR. TILLERY: All right. Now we're going to Exhibit 101.
(Botham Exhibit 101 marked for identification.)
BY MR. TILLERY:
Q. Now, have you ever seen this report?
A. I have, yes.
Q. You're familiar with this one, aren't you?

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A. I am.
Q. This Exhibit No. 101, which is SYNG-PQ-14420786 for the record, is an ICI pharmaceutical report written by Dr. Bayliss, entitled "A summary of clinical results of the phosphodiesterase inhibitor ICI 63,197 in a variety of disease states."
Correct?
A. Correct.
Q. Does this report relate to an attempt by ICI Pharmaceuticals Division, in the late 1960s and early 1970s, to develop a compound called ICI-63197 as a therapeutic drug to treat asthma or other certain medical conditions?
A. That's correct.
Q. And that attempt was abandoned after ICI-63197 was found, during human-volunteer trials, to have no beneficial effects and numerous side effects, including vomiting, dizziness, et cetera, correct?
A. That's correct.
Q. Exhibit 101 is the report of the results of those studies, including all the data collected during the human trials, right?

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A. That's right.
Q. And over the years, did ICI refer to this same compound at various times as 63197, R-50796, and PP796?
A. That is correct.
Q. It's the same chemical?
A. It is.
Q. It's just used -- yes.
MR. TILLERY: Now let's go to Exhibit 102. Exhibit 102 is SYNG-13098675.
(Botham Exhibit 102 marked for identification.)
BY MR. TILLERY:
Q. Is Exhibit 102 correspondence between two ICI employees concerning the potential use of ICI-63197 in paraquat as an emetic?
A. Just let me read it. I'm not sure I've seen --
Q. Okay.
A. -- this particular memo before.
Q. Take your time, sir.
A. Yes, okay. I've read it. And please ask your question again.

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Q. Of course. Is this -- this is correspondence between two ICI employees about using it, 63197, as an emetic in paraquat, right?
A. Yes, that's correct.
Q. And the letter indicates Dr. Winchester's view that the emetic dose of ICI-63197 is between 4 and 8 milligrams, correct?
A. That's what this says, yes.
Q. And that information -- strike that.
That formulation of paraquat would have to include an amount of 63197 sufficient to ensure this 4-8 milligrams was taken in with whatever volume of paraquat was likely to be toxic, correct?
A. That's correct.
Q. All right.
MR. TILLERY: Let's look at Exhibit 103. This, while she's pulling it up, is PQ-02450187.
(Botham Exhibit 103 marked for identification.)
MR. TILLERY: Leave that up, please.

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BY MR. TILLERY:
Q. Can you see it, sir?
A. It just disappeared because you were taking control, so -- yeah, I've got it back now, thank you.
Q. Yeah, and while you're looking at it, the preceding exhibit, I said -- I misspoke. It was Davies's view, not Winchester's. I had the two people mixed up in my comment. I just wanted to clarify that for the record. I didn't mean to misspeak about that, okay.
A. Okay, thank you. All right.
Q. You're welcome. All right.
Now we're looking at number 70 -- 103, I'm sorry.
A. Okay.
Q. This is also correspondence between ICI employees regarding the inclusion of 63197 as an emetic in PQ products, right?
A. It is.
Q. And I should have said paraquat products instead of PQ.
In the first paragraph, Dr. Fletcher -- who is he?

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A. I believe this would be the same Dr. Fletcher we have discussed in the past. He would have been at the CTL IHRL laboratory.
Q. Right. Dr. Fletcher notes that ICI scientists had already considered and rejected including an emetic for a number of reasons.
Can you read those into the record?
A. Yes.
"(a) 'Gramoxone' itself is quite a good emetic, (b) there was no really suitable agent to add which would be effective, and (c) the expense would be prohibitive."
Q. Okay. In the second paragraph, Dr. Fletcher notes that an emetic dose of ICI 63,197 is about 10 milligrams, right?
A. Yes.
Q. And then he again mentions that one obstacle to incorporating it into paraquat products would be cost, right?
A. Yes.
MR. TILLERY: Let's go to Exhibit 104. While she's pulling this up, this is SYNG-PQ-13098673.
(Botham Exhibit 104 marked for identification.)

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BY MR. TILLERY:
Q. Tell me when you're ready to talk about it.
A. I can't see it at the moment.
Q. I'm sorry. We're having technical trouble.
A. Okay. I can now see this.
Q. Can you read it from there, sir?
A. I can, yes.
Q. All right. Take your time, read it, and let me know when you're ready to talk about it.
A. Okay, I can see that and have read that.
Q. And this is further correspondence between ICI employees on this subject, isn't it?
A. It is.
Q. From 1971, right?
A. The -- yes, I can see that now, yes. 1971, correct.
Q. Yes. Dr. Bayliss was from the clinical research department in the pharmaceutical divisions that ran the initial human trials on 63197 when it was being

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developed as a drug, right?
A. That's correct.
Q. Dr. Bayliss says that ICI 63197 has no clearly defined emetic dose, doesn't he?
A. That's what he says here, yes.
Q. And he said it would be very hard to settle on a dose that would be certain to induce vomiting in most individuals unless it's a very high dose, right?
A. That's what it says, yes.
Q. And he says also it'd take about 15 minutes for 63197 to induce vomiting, correct?
A. Correct.
Q. In his opinion, 15 minutes is too long because a toxic dose of paraquat would already have been absorbed in the human body, correct?
A. That was his assertion, yes.
Q. Dr. Bayliss concludes the 63197 would not be suitable for use as an emetic in paraquat and that including an emetic in paraquat generally would likely not be much benefit because paraquat is absorbed rapidly.
Is that a fair statement of what

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he said?
A. Yes, that's a fair statement of what he said here.
Q. All right. And you have no reason to dispute anything about that up to that point in time, do you?
A. No, not at that point in time.
MR. TILLERY: All right. Let's go to 105. This is SYNG-02469717.
(Botham Exhibit 105 marked for identification.)
MR. TILLERY: I don't know if this is a single page that you can see here or if it's more than that but we can -- let's try to pull it up -- no, it's 1 of 2.
Would you mind handing that to him so he can read it.
THE WITNESS: Yeah, I've got it now, thank you, Mr. Tillery. I can see it now.
MR. TILLERY: All right. You're welcome, sir.
THE WITNESS: Okay, thank you. I've read that.

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BY MR. TILLERY:
Q. All right. This is also correspondence between ICI employees, isn't it? We're putting it on the screen for display at this moment.
A. It is, yes.
Q. Dr. Fletcher is one of the people, right?
A. He is.
Q. All right. And he concludes that including a centrally acting emetic like 63197 in a paraquat formulation would be expensive and of marginal use because they take too long to induce vomiting, right?
A. Yes, reinforcing what had been said before.
Q. All right. If you go, I think, to 718, I think -- this is the 717, so if you go to the next page. Do you see where he says, that is Dr. Fletcher, K. Fletcher, that the only real way to reduce paraquat's toxicity is by considerable dilution.
Right?
A. Yes.
Q. What's he mean by that?

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A. By adding more water to the paraquat -- to the Gramoxone, which is the trade name for paraquat, when it is sold.
Q. So adding water to -- would dilute it and make it less toxic to the person who consumed it, correct?
A. That's correct, yes.
Q. Okay. And does he also say that if they do something sensible, even if not effective, they will be seen to be trying? Do you see that right at the very last paragraph?
A. Yes.
Q. "We have a considerable amount of sympathy for our position and if we do something sensible, even though it proves not to be very effective, we would be seen to be trying. At the moment I would sympathies with a registration authority ..."
"At the moment I would sympathise with a registration authority that said it was trying its best without very much support from ICI."
Do you see that?
A. I do.

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Q. So you got to look like you're making it safer whether or not you are or not; is that a fair statement of what he said?
MR. NARESH: Objection to form.
THE WITNESS: Well, I think you're reading into what was behind there. I couldn't comment if that's what he was really getting to.
BY MR. TILLERY:
Q. Well, call me stupid but what I read:
"We have a considerable amount of sympathy for our position and if we do something sensible, even though it proves not to be very effective, we would be seen to be trying."
Seems to be elevating form over substance is what I guess I'm saying.
MR. NARESH: Objection --
THE WITNESS: Yeah, I think -- I would interpret that to --
MR. NARESH: Let me just get my objections in.
Object to the form, please.
MR. TILLERY: Yeah.

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BY MR. TILLERY:
Q. Go ahead, sir.
A. Yeah. No, I would interpret that to say that it would -- he is suggesting that some work is done in this area, even if, in the end, it proves not to be something that is making a difference.
Q. Well, actually, it means that you would be perceived to be making a difference. "We would be seen to be trying," that's what it said --
A. Seen to be making best endeavors to try and do something, I think, yes, quite.
Q. We'd be perceived by people in charge that we're trying to do something even though we're not, correct?
A. Well, I don't know -- that's the bit that I would just be not so sure about.
You could say that this is to say it would seem to be worth trying to look for things that might have some benefit. I don't think it's saying we should try it knowing all along that it won't have any benefit.
Q. Okay. Well, I guess we disagree. We'll agree to disagree and move on, okay?

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A. Okay.
MR. TILLERY: Let's go to 106. Let's go to 106, and this is SYNG-PQ-02491713.
(Botham Exhibit 106 marked for identification.)
BY MR. TILLERY:
Q. You take charge of the document, look it over. I'm going to focus you on page 715.
MR. TILLERY: Does he have it?
THE WITNESS: I have got it now and I can read it, thank you.
BY MR. TILLERY:
Q. And take a look at 715, too.
A. Okay, that's quite difficult to read. It's small print and a little bit indistinct in places, if you're looking at Table 1.
Q. I am. That's exactly what I'm looking at. Can you enlarge that at all, or do you want us to try to do that?
A. No, I can enlarge it. If you want to look at certain parts, I can certainly enlarge it.

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Q. Okay. So if you would, just look at the columns. Do you see the columns?
A. I do, yes.
Q. All right. If you look at the sixth column, where it says "Containing emetics."
A. Yes.
Q. Can you enlarge that and read it out loud for the ladies and gentlemen of the jury and the court, the first paragraph.
A. So under "Containing emetics," in answer to the question "Is the formulation safer," is that what you'd like me to read out?
Q. It says "Is the formulation safer?" and then go to the seventh column over, "Containing emetics."
A. Yeah, got it.
Q. Can you read that?
A. It says:
"Would be safer if a suitable emetic existed. I.H.R.L. state that large quantities are required or they are too slow in action. I.H.R.L. advise there is little scope here."
Q. And then go over two columns where

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it says "Reduced uptake." Do you see that?
A. Yep. So under the same question --
Q. Read that first sentence. Read that first sentence.
A. "Leaving out wetters or changing to others can substantially reduce uptake into dogs."
Q. Okay. ICI was well aware of 63197's emetic properties when this was written, wasn't it?
A. Yes.
Q. And this says that paraquat would be safer if an effective emetic existed but that large quantities would be needed and they're too slow in acting, right?
MR. NARESH: Objection; I think you misspoke.
MR. TILLERY: I'm sorry? They're too slow-acting.
MR. NARESH: I don't think you did this on purpose but I think you misread the first --
MR. TILLERY: Okay.
MR. NARESH: You missed a word. Can you just start over, please?

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MR. TILLERY: Yeah, I will, thank you.
BY MR. TILLERY:
Q. Does it say there that paraquat would be safer if an effective emetic existed but that large quantities would be needed and they are too slow-acting?
Is that what that one column says?
MR. NARESH: I'll object to the form. I still think you're misreading the document.
MR. TILLERY: If you want to read it again, you can, but I thought that's what it said.
THE WITNESS: Well, it says -- my version says "would be safer if a suitable emetic existed. I.H.R.L. state that large quantities are required or they are too slow in action."
MR. TILLERY: Right. That's what I meant.
Now let's go to 107. This is SYNG-PQ-02508147.
(Botham Exhibit 107 marked for identification.)

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THE WITNESS: Okay. I'm looking at that document. Do you need me to look at any particular part?
BY MR. TILLERY:
Q. Actually, I may ask you, over all the pages, a few things.
Do you know generally from looking at this what it is?
A. Well, this is a Chevron document and it looks like it's the meeting of a -- involving people from Chevron toxicology, registration, R&D, and certainly at least one person from ICI.
Q. Right. This was one of their meetings concerning paraquat, wasn't it?
A. That would be the likely scenario here, yes, I agree.
Q. Okay. And the topic or title to the exhibit is "Notes of Meeting with Chevron Chemical Company, Richmond, on Wednesday, 27 February 1974."
Right?
A. Yes.
Q. "Paraquat toxicological problems in the [United States] and proposed label change."

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Is that what it says?
A. That's what it says.
Q. It indicates that Mr. Cavalli was there from Chevron, a toxicologist. It says a Mr. Kamienski was there, Ospenson was there, Lewis, and a Calderbank.
Who was Mr. Calderbank -- Dr. Calderbank?
A. Yeah, he was the person who I recognized as being from ICI, so from the plant protection part of ICI.
Q. And the basis of concern was:
"Increasing numbers of reports of toxicological effects of paraquat to applicators in the field."
Right?
A. Yes.
Q. "... growing concern amongst California State Officials brought about by ... fatal poisoning incidents (by swallowing) and drift damage."
And then third:
"It is believed that EPA are particularly influenced by California State Officials."

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And then goes down to (e):
"If incidents with paraquat continue, it is believed that officials may recommend Glyphosate when it is registered."
What is glyphosate?
A. Glyphosate is another herbicide.
Q. That's one that's not made by Syngenta, isn't it?
A. We do not -- no. We're not a principal registrant of glyphosate, that's true.
Q. Okay. And then it talks about a suicide, and it talks about a 17-year-old boy drinking from a beverage bottle and accidentally consuming this, and they're both dead, right?
A. Yes.
Q. And then the action taken by Chevron was to want to strengthen the label to say "May cause death if swallowed. Harmful if splashed in the eyes ..."
Do you see that?
A. I do, yes.
Q. All right.
MR. TILLERY: Now, can we go to

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page (ii) for him, please.
BY MR. TILLERY:
Q. If you go to (ii), do you see?
A. Yeah.
Q. The Department of Health has 20 poisoning incidents of paraquat for '73 by the Public Department of Health and forwarded to PPL by Carl Tanner.
Do you see that?
A. I do.
Q. Okay. Then, if you go down to (vi), it says:
"Chevron have a representative ... whose main function is to liaise with officials in California ..."
Then the last sentence:
"He learned in time of the proposal that farm employees should take a cardio-pulmonary medical exam. prior to using paraquat - which Chevron were subsequently able to hold off."
Do you see that?
A. I do.
Q. So ICI and Chevron feared that US regulators might cancel paraquat's

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registration in part because of poisoning problems, or recommend glyphosate as a safer alternative, correct?
A. Correct.
Q. Would you agree that's a fair -- yes, all right.
A. Yes, correct, that's fair.
Q. All right.
MR. TILLERY: That was Exhibit 107. Let's go to 108.
(Botham Exhibit 108 marked for identification.)
MR. TILLERY: This is SYNG-PQ-03719628.
BY MR. TILLERY:
Q. Please take your time looking at this. It's a one-page document. We can just pull it up so you can read it.
A. Okay. I've read that, thank you.
Q. Okay. And Dr. Winchester, who's he?
A. I'm not sure what Dr. Winchester's role was but he was obviously in the plant protection department of ICI.
Q. And he's sending a letter to Mr. Swan, whose name appears in a lot of these

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communications, the same Swan, correct?
A. That's the same Swan, yes.
Q. Okay. Dr. Winchester suggests here that it would be worth a substantial monetary investment, several hundred thousand British pounds, to try to develop a new, faster-acting emetic compounds, doesn't he?
A. Yes.
Q. And he was aware of the internal debate over 63197 at the time, wasn't he?
A. I assume he was.
Q. Did, to your knowledge, Syngenta or ICI ever do the research that Dr. Winchester suggested?
A. I'm not aware of any research on alternative emetics, but that may be a line of research that I was never involved in.
MR. TILLERY: Okay. Let's go to Exhibit 109. That's SYNG-PQ-02450112.
(Botham Exhibit 109 marked for identification.)
BY MR. TILLERY:
Q. This is a one-page exhibit, sir, so we can put it up and make sure you can read it. It may be -- thank you. Take your time,

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please.
A. Okay.
Yes, okay. I've read that, thank you.
Q. Who is Mike Rose?
A. Mike Rose was an investigative toxicologist in CTL.
Q. He worked there during the '70s, didn't he?
A. He did. He had come there from the pharmaceuticals division.
Q. Okay. And was he in charge of the department responsible for studying the mechanisms of pesticide toxicity at that time?
A. He was in charge at one point in time of what we call our investigative toxicology department, yes, which looked at effects of pesticides.
Q. In this letter, that's marked as Plaintiff's Deposition Exhibit 109, Dr. Swan suggests that instead of immediately jumping into the research to attempt to develop a new emetic for use in paraquat products, that Dr. Rose would hold a team or head a team into the feasibility of doing research instead.

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Right?
A. Yeah, I --
Q. I've not said that very well but you get the gist of what I'm saying?
A. Yeah, I --
Q. He suggested -- go ahead, sir. You'll say it better.
A. No, I read this to say that Dr. Swan was suggesting a group with Dr. Rose, which Dr. Rose would head, to look at the possibility of other emetics, essentially, that could be added to paraquat.
MR. TILLERY: All right. Let's go to Exhibit 110. This is SYNG-PQ-0319624 [sic].
(Botham Exhibit 110 marked for identification.)
BY MR. TILLERY:
Q. It is a one-page document. We'll pull it up for viewing on the record.
A. Okay, thank you. I've read that.
Q. Okay. Now, this is -- again, it's a Dr. M.S. Rose, right?
A. Yes.
Q. He wrote the letter. And who is

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he writing it to?
A. To some people from the company, from both the plant protection division and from the pharmaceuticals division, who I assume were being invited into the group that was asked to be formed in the previous memo.
Q. So in this document, Dr. Rose states that an emetic that induces vomiting within an hour might prevent the absorption of a fatal dose, doesn't he?
A. He does.
Q. He mentions an hour. The earlier correspondence that you reviewed just a little bit ago indicated variously that vomiting would have to be induced within a few minutes, or within 15 to 30 minutes to be effective, right?
A. It did, you're right.
Q. And Dr. Rose wrote in this letter, ICI didn't have any scientific data that supported the statement that an emetic that induced vomiting up to an hour after ingestion could be sufficient to prevent the absorption of a fatal dose, did it?
A. Yes. He's saying that -- he says

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there:
"... if an agent which caused emesis within [the] hour, could be added ... it might be possible to prevent the absorption of a lethal quantity of paraquat."
That's what this says.
Q. Yeah. What I'm asking you is was there any intervening scientific analysis that would be responsible for reducing that period of time from a few minutes to an hour, that you're aware of?
A. I'm not aware of anything that might have resulted in that change of time.
Q. Okay. ICI know -- strike that.
ICI knew when Dr. Rose wrote this letter that paraquat was rapidly absorbed in the human gut, didn't it?
A. Yes.
MR. TILLERY: Let's move to Exhibit 111. This is SYNG-PQ-03719623. It's a single-page letter.
(Botham Exhibit 111 marked for identification.)
BY MR. TILLERY:
Q. Please look at it, Dr. Botham.

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A. Okay, I've got that.
Q. In this letter --
A. Yes, I've read that, thank you.
Q. All right. In this letter, Dr. Foulkes, who is he?
A. Well, again, I don't know the person but the header would suggest that he was in the registration section.
Q. Of ICI?
A. Of ICI Plant Protection Division, excuse me.
Q. Right. And he sets forth ideal criteria for a PQ emetic, an emetic -- a formulation that would cause people to throw up to save their lives, right?
A. That's right.
Q. Get it out of their system?
A. Yes.
Q. All right. He says he can't imagine using a compound far removed from these criteria, doesn't he?
A. These seem to be the criteria that he believes to be important, yes.
Q. One of the criteria is that the emetic be effective in a lethal volume of

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Gramoxone, right?
A. Yes.
Q. Now, what's a lethal volume of Gramoxone for a person, say, your size?
A. It depends on the concentration of paraquat in the Gramoxone because that depends on the formulation, whether it's been diluted or not. But it can be as little as 15mls, 10 to 15mls, as we've discussed before; a couple of teaspoonfuls, as I think you indicated.
Q. Yeah, I'm not talking about diluted stuff out of a spray tank. I'm talking about stuff that's coming out of a two-and-a-half-gallon jug.
A. Yeah. So my answer reflects that situation.
Q. All right. Okay.
So another criterion is that it be an established emetic agent obviating the need for extensive toxicological testing, correct?
A. Yes.
Q. ICI would want to obviate the need for extensive toxicological testing because testing of that sort's very expensive, correct?

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A. It would be, yes. Yes.
Q. In effect, Dr. Foulkes was instructing Dr. Rose's team to focus on known emetics and not on the more expensive process for trying to develop new emetic compounds; would that be fair?
A. I don't think he was instructing. I don't think Mr. Foulkes, or Dr. Foulkes, in registration will be doing anything other than offering his opinion.
Q. Okay. Was he their boss?
A. I don't know exactly what his role would be but he certainly wasn't the boss of Dr. Rose or other people involved here.
Q. Do you agree that in order to be an effective emetic, the proper dose has to be determined?
A. Yes, you clearly do need to estimate what an effective dose is likely to be.
Q. Do you agree that the proper dose would be the dose that, after the ingestion of a minimally lethal volume of a paraquat formulation, induces vomiting within the time required to absorb a minimally lethal dose of

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paraquat?
A. Yes. You're describing the optimal, desirable properties, yes.
Q. Well, the optimal meaning trying to save the greatest number of lives?
A. Exactly.
Q. Okay.
MR. TILLERY: Let's move to Exhibit 112, and this is SYNG-PQ-02450023.
(Botham Exhibit 112 marked for identification.)
BY MR. TILLERY:
Q. This is a three-page letter so we'll give it to you. A four-page letter. We'll give it to you to read, please, if you'd look at this?
MR. NARESH: And Steve, I suggest that we -- we've been going for about an hour and a half. After this document, how about we take a break?
MR. TILLERY: Absolutely.
THE WITNESS: Okay, thank you. I've had a look through that.
///

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BY MR. TILLERY:
Q. Okay. According to this report, Dr. Rose's working party considered only existing emetics, right?
A. It did.
Q. One of which was 6397, right?
A. Yes. 63197, yes.
Q. And if you look at page 23, going on to page 24, Dr. Rose describes ICI 63197 as "a potent, centrally acting emetic, causing vomiting in man with oral doses of the order of 5mg."
Correct?
A. Correct.
Q. Do you see it -- okay.
You can't reconcile that statement with the earlier statements in the correspondence you received today that the emetic dose of ICI 63197 was between 4 to 8 milligrams, the dose was 10 milligrams, and there was no clearly defined emetic dose of 63197, can you, unless there's intervening signs?
A. Well, I assume that this dose has come from that original ICI report in the

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red cover that we saw earlier, which described the clinical trials, so this will be --
Q. Okay.
A. -- an estimate. This will be an estimate. These numbers -- these number of milligrams will be an estimate of the dose that caused emesis in those clinical trial studies.
Q. That's your assumption. It came from the Bayliss report --
A. Yes.
Q. -- is that what your assumption is?
A. That's my assumption.
Q. All right. The Bayliss report is the '73 report we've referred to earlier, right?
A. That's the one, yes.
Q. All right. There was and is no scientific date that supports that statement by Dr. Rose to a reasonable degree of scientific certainty that you're aware of other than that scientific report, correct?
A. Yeah, and I'm familiar with that scientific report we just described by Bayliss, and there are -- so I know the data

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in there don't give a very precise estimation of what that dose could be. There's an estimate of what it could be.
Q. Does Dr. Rose also state that ICI 63197 is fast-acting?
A. I can't remember whether he has said that.
Q. Well, let's assume he says it. We can look at it at the break.
A. Mmm. Okay.
Q. Okay. Is that term -- is that term -- is that term --
MR. NARESH: Well --
MR. TILLERY: I'm sorry?
MR. NARESH: Rather than making an assumption, I think the discussion of 63197 is only one paragraph. I would suggest that we read it rather than making an assumption and having to redo it.
BY MR. TILLERY:
Q. Go ahead and read it.
A. What are we reading here?
Q. We're looking for where Dr. Rose says it's fast-acting. Does he say that?

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A. Well, it says here that the compounds are examined for their suitability against the following criterion, including fast-acting.

It then says, under paragraph 4, "63197 was chosen as meeting all of the above criteria," so I think that's perhaps where the reference is that you're looking for.

Q. All right. Is that term defined anywhere in the report, to your knowledge?

A. By which you mean what does fast-acting mean?

Q. Yes, sir.

A. Well, I don't think I've seen a clear definition of what fact-acting might mean, no, not to date.

MR. TILLERY: Okay.

That's the end of that topic, Mr. Naresh, if you want to move on --

MR. NARESH: Yeah.

MR. TILLERY: -- to a very brief -- let's make a -- I'd like to get finished with this topic today before the end of the dep so let's make it a very brief break, sir, okay. Five minutes and we're

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back on, okay.

MR. NARESH: Wendy, can you put us in the breakout room. Thank you.

THE VIDEOGRAPHER: Of course.

We are going off the record. The time is 3:31.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record. The time is 3:40.

BY MR. TILLERY:

Q. And before we leave Exhibit 112, Dr. Botham, I just wanted to put on the record that the title of that document was "Report of Working Party on the feasibility of adding an emetic to Gramoxone," dated July 29, 1976, and it is listed at the top "Company Secret," "Highly Confidential," and it's composition of working party is a Mr. Davies, Mr. Samuels, Mr. Nicholls, Mr. Foulkes and Mr. Rose.

Those were all ICI people as far as you know, correct?

A. As far as I know, yes.

Q. All right.

MR. TILLERY: Let's go to Exhibit 113. This is a two-page document

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so we'll let you take a look at this and control it yourself.

(Botham Exhibit 113 marked for identification.)

THE WITNESS: Okay, thank you, I've read that.

BY MR. TILLERY:

Q. All right. This is a document SYNG-PQ-02450073, marked as Plaintiff's Deposition Exhibit 113.

The front page, does Dr. Foulkes say -- and that's the same Foulkes we've talked about before, it's F-o-u-l-k-e-s.

Does Dr. Foulkes say that the existing human data show that 0.05 grams per liter of the emetic in Gramoxone is likely to produce emesis following ingestion of 10 milliliters of Gramoxone?

A. Yes, that's what that says.

Q. At that time, ICI did not have any human data on the subject other than the data from the volunteer in clinical trials that we discussed was conducted by Dr. Bayliss, correct?

A. I believe that's the case, yes.

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Q. All right.

MR. TILLERY: Let's move to 114. This is a single-page document so we'll display it.

(Botham Exhibit 114 marked for identification.)

BY MR. TILLERY:

Q. It says, at the top, "Company Secret," "Highly Confidential." It's SYNG-PQ-0250068.

Have you seen this before?

A. I don't believe I have.

Q. At the bottom it's got "Monkey study being undertaken at Huntingdon." Do you see that?

A. I do.

Q. Okay. What is Complan? C-o-m-p-l-a-n.

A. I assume that that is the kind of dietary substance that is used to, in humans actually, to promote good digestion.

Q. Actually to add weight, too, right?

A. Mmm. Yes. Through better digestion, yes. Mmm.

Q. Why was Complan being used as

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a carrier in paraquat and paraquat plus emetic given to the dogs by oral gavage in the study?
A. I'm afraid I don't know the answer to that.
Q. Okay. Using Complan as a carrier would make the dosing solution thicker, or more viscose, wouldn't it, if you understand the characteristics of Complan?
A. It's possible, yes. Yes.
Q. Using Complan as a carrier would keep the solution in the stomach longer, delaying paraquat from reaching the parts of the digestive system where it would be more readily absorbed than it is in the stomach, wouldn't it?
A. I don't know whether that would be the case. I couldn't comment from a science perspective.
Q. Well, let's walk it through. You're the scientist and I know just a little bit about it. If it's a thick, viscose material that is highly adherent to the molecules of paraquat, would it -- without adhering any more, would it be likely to retain in the stomach before passage into the small intestine

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the chemical paraquat?
A. Well, you've made an assumption there that paraquat would essentially bind to Complan and I don't know whether that happens.
Q. Okay. So you don't know whether or not it binds or not, right?
A. I don't know.
Q. Do you know anything else of -- okay.
A. I don't know, sorry.
Q. If it does bind, if it turns out you leave the deposition and you find out that I'm right, that Complan actually binds with paraquat, then using Complan as a carrier would keep the solution in the stomach longer, delaying paraquat from reaching the parts of the digestive system, and that's primarily the small intestine as you indicated, where it is more readily absorbed than it is in the stomach; correct?
MR. NARESH: Objection to form.
THE WITNESS: That is -- that is a potential scenario, yes.
///

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BY MR. TILLERY:
Q. Okay. Using Complan as a carrier would also increase the effectiveness of vomiting if vomiting did occur, wouldn't it?
MR. NARESH: Objection to form, foundation.
THE WITNESS: And the basis for you saying that is what, may I ask?
BY MR. TILLERY:
Q. Reverse peristalsis, the methodology by which it occurs is if there's volume in the gut and reverse peristalsis occurs, it is a muscular reaction that forces the contents of the stomach upward, out through the esophagus, out of the body?
A. Yes.
Q. If there's volume there it takes the rest with it. You understand that part of it, right?
A. Yes. I understand that, yes.
Q. Does that make sense to you?
A. That does, yes.
Q. All right.
MR. TILLERY: Let's go to 115. This is a one-page document.

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Can you display the whole thing so he can see it. Yes, thank you.
Take your time reading this, Doctor. It's Plaintiff's Deposition Exhibit 115.
(Botham Exhibit 115 marked for identification.)
THE WITNESS: Okay, I've read that.
BY MR. TILLERY:
Q. Okay. Dr. Rose -- strike that.
Dr. Smith tells Dr. Rose the reason for using Complan is what?
"... in order to optimise the effectiveness of vomiting."
Right?
A. That's what that says, yes.
Q. Did ICI ever intend to put Complan in its formulated paraquat products?
A. I've never heard that before.
Q. Did ICI, to your knowledge, ever put Complan in its formulated products?
A. I don't believe so.
Q. Does Syngenta currently put Complan in its formulated paraquat products?
A. No.

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Q. Did ICI have reason to believe people were ingesting Complan along with paraquat in poisoning cases?
A. I doubt it.
Q. Okay. You had no anecdotal reports they were drinking a British product called Complan in America while they were also ingesting, accidentally, a mouthful of paraquat, were you?
A. No.
Q. All right. Then how well would adding Complan to dosing solutions in animal experiments help in modeling real-world poisoning incidents?
MR. NARESH: Objection; form, foundation.
THE WITNESS: Well, I'm not sure exactly why this was done, but whilst we have this -- because I've never seen this before.
Whilst we're looking at this, I would just point out the NB, which says that:
"I understand the LD50 in monkeys to be approximately 70 mgs/kg and when

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given in Complan to be approximately 80 mgs/kg."
Well, actually, as a toxicologist, that's pretty much the same. That's within the margin of error of those kind of studies, so that suggests to me that actually the presence of Complan doesn't affect the toxicity of paraquat.
BY MR. TILLERY:
Q. Well, it says here it optimizes the effectiveness of vomiting. Right?
A. Yeah, I guess I was reading that out in answer to the discussion or to build on the discussion we had a few moments ago, that Complan does not necessarily -- and any binding to paraquat doesn't necessarily seem to have an effect on the toxicity of paraquat.
Q. Okay.
A. So as I haven't seen that before, I thought I would just add that.
Q. If it doesn't do anything to the analysis, then why were they adding it to the test animals? Why?
A. I really don't -- I'm afraid, I'm sorry, I really don't know why.

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Q. Well, because they answered it for you, Dr. Smith said, because it increases the effectiveness of vomiting. It's a viscose material. When you have convulsive effect from vomiting, it increases the effectiveness.
That's what Dr. Smith said. That's what he told Dr. Rose, didn't he?
A. Yeah, I think I'm still --
MR. NARESH: Objection to form.
THE WITNESS: -- struggling to know why that -- how that would be the case, unless it was, in some way -- I don't know if this is what you were referring to, the presence of a bulk in the stomach somehow helps the process of vomiting, but I don't -- I honestly don't know what that statement was based on.
BY MR. TILLERY:
Q. And you don't know one way or another whether that's the case?
A. No, I really don't know. I'm sorry, I wasn't involved in the research at this stage.
Q. All right. But can you tell me how adding Complan to dosing solutions in animal

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experiments would help in modeling real-world poisoning accidents?
A. I would say, this is just purely hypothesis of opinion, it may be that in some way it's trying to mimic the reality that when human beings perhaps take paraquat, they will have eaten a meal so their stomach might be -- might contain undigested food.
Q. Is that your -- is that what you think they were doing this for?
A. No, I'm giving you my potential explanation. I honestly do not know why they did it, what their explanation was.
Q. It actually wouldn't help; it would hurt by making the experience unreflective of real-world incidence, wouldn't it? Adding Complan that doesn't exist -- or didn't exist in the United States, adding that to these test animals would create an experiment result that would not be reflective of real-world incidents, correct?
MR. NARESH: Objection to form, foundation.
THE WITNESS: Real-world situations would always be hugely variable, wouldn't

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they? What's in the stomach from one individual to another will be very variable, and so I don't know that you can say what you're saying is true, but, equally, I don't know whether they added Complan in some way to compensate for that. I think it's not possible for me to comment any further.

BY MR. TILLERY:

Q. So according to this, Dr. Rose was to conduct or have conducted animal studies in part to estimate the dose-response relationship of 63197, correct?

A. Yes.

Q. Is that right?

A. Well, this -- not the dose-response of 63197. Excuse me, I was still reading this document. This --

Q. Actually, it'd be the 63197/PP796.

A. Yeah. What I've just -- what I'm reading here, I'm just checking again my understanding, is that they are -- I assume that they've got a dose of emetic, PP796, which they've added to the paraquat and they have tested here two doses of paraquat.

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How they varied the emetic level, if at all, I don't think you can see from this telex here.

Q. Those studies were conducted in pigs, dogs and primates having a vomit reflex, correct?

A. That's the reason for choosing those species, yes, of course, so that they're able to vomit.

Q. Yes.

MR. TILLERY: Let's go to 116, please. This is SYNG-02450705. Please take a look at this one-page document, sir.

(Botham Exhibit 116 marked for identification.)

BY MR. TILLERY:

Q. If you wouldn't mind, as you read this, take note of the amount of the emetic that they were given.

A. Okay, so they were given 2 milligrams per kilogram of the emetic.

Q. Okay. Do you agree that the animals in these studies were given a far greater dose of the emetic in terms of

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milligram-per-kilogram body weight than the minimally lethal milligram-per-kilogram dose in humans that was used in setting the concentration of the emetic in Gramoxone?

A. So they were given -- just repeat that, sorry, so I can understand that again.

Q. Do you agree that the animals in these studies were given a far greater dose of the emetic, in terms of milligrams per kilogram of body weight, than the minimally lethal milligram-per-kilogram dose in humans that was used in setting the concentration of the emetic in Gramoxone?

A. So what concentration of emetic in Gramoxone do you think is being added to make that comparison --

Q. I'm asking -- yeah, I'm asking you if this dose was far greater than the dose that ended up in Gramoxone, by milligrams per kilogram for these test animals.

A. I'm just trying to remember what that dose is. So what dose do you think is added?

Q. Actually, I don't have it in my mind right now. We'll get to it down there.

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Without that reference -- and I'm not trying to test your recollection of it. You don't know what it is?

A. I think I just need to be -- these dose levels are often shown in different ways, so, yeah, let's just make sure we understand what that dose level in humans is.

Q. Okay. I don't have that number with me right now so I really don't often -- I think it's going to be apparent in the next line of questions.

A. Okay.

Q. We can mark this back if you want.

Do you agree that the animals in these studies were given a greater dose of the emetic in relation to the dose of paraquat they were given -- in other words, emetic to paraquat -- than the dose of emetic in relation to the dose of paraquat that was ultimately decided to be included in Gramoxone?

A. Well, for the same reason, I think it would be helpful to try and look at those data as we move through this so I can be sure that I'm answering --

Q. All right. So we'll --

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A. -- that I can answer your question accurately.
Q. We'll come back to 116, okay.
MR. TILLERY: Let's go to 117 at this time. This is a multipage document. If you would take a look at it, please.
(Botham Exhibit 117 for identification.)
THE WITNESS: Okay. Yeah, thank you, I can -- I'm familiar with what this document is now.
BY MR. TILLERY:
Q. All right. This is correspondence from ICI to Chevron enclosing a draft of Dr. Rose's report regarding his emetic testing in animals and his estimation of the emetic dose for humans, correct?
A. That's right.
Q. At the second page, the report states -- if we could pull up that second page and display it -- that at 5 milligrams in 10 milliliters, 0.05%, it is estimated that about 70% of those ingesting --
A. Sorry, I can't see what you're now reading.

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Q. All right. Let's go back to the document. Let me see if I can give you the exact -- actually -- yeah, where it says "Summary." It should be page 3, 444.
Do you see the summary information, sir?
A. Yes, I can see that, thank you.
Q. The report states that at 5 milligrams in 10 milliliters --
A. Yeah.
Q. -- or 0.05%. Do you understand that percentage, okay?
A. Yes.
Q. It is estimated that about 70 percent of those ingesting 10 milliliters of the paraquat formulation will vomit within an hour. Is that right?
A. Yes, that's what that says.
Q. All right.
MR. TILLERY: Now let's go to 118. This is CUSA-00088433.
(Botham Exhibit 118 marked for identification.)
BY MR. TILLERY:
Q. It's like a telex. We'll give it to you to look at.
The question I'm going to read -- give you the question --
A. Mmm.
Q. -- and then you can look for this as I go through it, okay, as you go through the exhibit.
A. Okay.
Q. This document here appears to be related directly to the exhibit we just saw, right?
A. Yes, I think that's probably true.
Q. And Dr. Cavalli we've talked about several times, of Chevron, states in this document that he had reviewed the studies provided by ICI and was concerned:
"... [an] argument for 5 milligrams being an effective emetic dose in man is weak and still does not support the statement that it will cause emesis in 85 percent by 15 minutes. I believe EPA will likely require actual data regarding effectiveness of dose recommended in humans."
Do you see that?
A. Yes.

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Q. And then Dr. Cavalli then suggests a volunteer human trial to evaluate the dose-response relationship for the emetic, doesn't he?
A. Yes.
Q. That trial was never done, to your knowledge, was it?
A. I have got no record of such a trial having been done, no.
Q. All right.
MR. TILLERY: Let's go to 119.
(Botham Exhibit 119 marked for identification.)
BY MR. TILLERY:
Q. Now, this is one lengthy, like a legal-sized sheet that was provided to us, so you'll probably have to go down the sheet when you take charge.
A. Yeah, I've not got -- I don't have charge of this document, sorry.
Q. Okay.
MR. TILLERY: Let's give it to him and let him look at it.
BY MR. TILLERY:
Q. Actually, looking at just the first

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half of the page for questions but take a look at the whole thing.
A. Okay. Can you give me control, please?
Q. Oh, I thought we did. It shows we did. I'm sorry.
A. I can still only see the top of this document.
MR. TILLERY: Why don't we just -- let's move it forward for him. It's one lengthy page. There we go. Just keep moving it down slowly for him to see. Keep going down now. If you go down until where the 1 is at the top. There, stop there for him.
THE WITNESS: Okay, I can see that bit.
BY MR. TILLERY:
Q. I'm not going to ask about number 2 but we can show it to you in case you want to see this.
MR. TILLERY: Advance it so he can see the rest of the letter. That's the end of it.
THE WITNESS: Okay.

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BY MR. TILLERY:
Q. Okay?
A. Yeah, sure.
Q. All right.
MR. TILLERY: If you would go back up to number 1, paragraph number -- that's it right there.
BY MR. TILLERY:
Q. This is Dr. Rose's response to Dr. Cavalli's concerns, isn't it?
A. Yes.
Q. And at 732, this first page here, he admits that the clinical data is certainly weak, doesn't he?
A. Yes.
Q. Does Dr. Rose go on to say:
"In the absence of hard evidence, I have produced a draft report making the case for addition at 5mgs in 10mls ... We believe this case adequate for proposed European registration."
Do you see that?
A. Yes, that's what that says.
Q. Is the belief that a regulator can be convinced to accept a claim, even though

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the evidence for it is certainly weak, a responsible and reasonable step that a prudent scientist would make under these circumstances, in your opinion, sir?
A. Well, as it happens, I mean, I relatively recently looked at those same clinical data myself. I agree that with today's standards of clinical trials you could describe them as weak. They're not perfect, but a reasonable estimate of effective dose was and could still be made. So it's not ideal but it was not -- not completely unreasonable.
Q. When did you look at them?
A. I've looked at them a couple of times in the last two years.
Q. Okay. What were the circumstances by which you started looking at emetics data back in the '70s? What caused you to do that?
A. Are you talking about me personally?
Q. Yes.
A. I wasn't looking at --
Q. Why did you start --
A. Sorry, I didn't look at them in the

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1970s.
Q. No, I said -- you said you started in the last couple of years looking at documents and one of these documents date back to the 1970s.
A. Yes.
Q. Why would you start -- why in the world would you start looking at archival emetics data?
A. Because we have been asked again if we could look at the evidence for the effectiveness of the emetic.
Q. Who was it that caused that? Who asked again?
A. We were asked by a former employee of ICI.
Q. And who was that?
A. Professor Jon Heylings.
Q. And why did he ask you to do this?
A. Because he felt that there were other ways in which those clinical data could have been interpreted.
Q. Okay. And he had a different interpretation than who?
A. Than, for example, Dr. Rose.

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Q. So did he have some position that he took with your company?
A. Did who have -- did Dr. Heylings have a physician?
Q. Yes, did he have something that was on his mind that he --
A. Oh, position --
Q. -- wanted to share with Syngenta?
A. Sorry, your question was did he have a position, not a physician?
Q. Yes, a position.
A. Yeah, yeah. Yes, he had a position that he believed that an incorrect interpretation had been made by Dr. Rose.
Q. Do you know or understand that Dr. Cavalli from Chevron looked at the data of 1976 and said that he didn't believe it supported 5 milligrams per kilogram? Were you aware of that?
A. No, I was not aware of that.
Q. Okay.
MR. TILLERY: Do you have the next one, 742? Okay. Let's go to -- what number's that? 120.
We'll go to Plaintiff's Exhibit

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No. 120, and that's SYNG-PQ-04262668 - 2695.
(Botham Exhibit 120 marked for identification.)
THE WITNESS: Okay.
BY MR. TILLERY:
Q. Do you have --
A. I can see it. Is there a particular part of the document you would like me to read?
Q. Actually, I don't think so.
This document sets forth ICI's worldwide strategy for the introduction of an emetic formulation of paraquat, doesn't it?
A. Yes, that's what that says.
Q. And this is the "Emetic Formulation of Paraquat: Proposed Strategy For Introduction Worldwide," EDC Paper No. 729. Correct?
A. Yes, correct.
Q. It says, at the top, "... Original report by M.S. Rose as appendix," right?
A. Yes, that's correct.
Q. And this author is P. Slade, right?
A. Yes.
Q. You are familiar with this document, aren't you, sir?

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A. You know, I don't know that I've actually seen this particular document.
Q. This was sort of how it was launched, wasn't it, worldwide, the emetic?
A. Well, that would suggest -- from the title it would suggest so, yes.
Q. All right. This document indicates that ICI intended to use its patents on PP796, the compound itself, and in formulations with paraquat to preclude competitors from entering paraquat markets around the world, by convincing regulators to mandate only emetic formulation of paraquat, doesn't it?
A. Well, I have not -- you have not pointed that out in the document so I can only confirm if you'll allow me to do that.
Q. Right. Well, you know, let me just say this, that if you're saying you don't know the document, you don't understand that or you've never learned of that or never known it as the worldwide or chief of science, and in all of the meetings you've had over Dr. Heylings's complaints in his reports worldwide about the number of deaths that have

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occurred unnecessarily over the years from not putting the appropriate emetic in this chemical paraquat, you're telling me you've not looked at this document, right?
A. I don't think I've seen --
MR. NARESH: Object --
THE WITNESS: -- this particular document.
I'm sorry, Ragan's saying something.
MR. NARESH: Please let me get my objections in.
I'm objecting to the form of the question.
Go ahead.
THE WITNESS: Yeah. So I do not believe that I have read this specific document. I don't recall having done so.
BY MR. TILLERY:
Q. Well then let me ask the question this way. Did ICI intend to use its patents on this emetic, which is referred to as PP796 here, which you identified is the same compound, correct?
A. Correct.

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Q. Did it intend to use these patents themselves in formulation with paraquat to preclude competitors from entering the paraquat markets around the world?
A. Well, I can't comment on that commercial strategy. I certainly know that it was important that PP796 could confer some commercial advantage. That's as much as I know from the information that I've been given.
Q. And how would commercial advantage be defined in that comment, sir?
A. Well, it could potentially include what you just said, but these are discussions that I was never a part of, and my recent investigation of this literature really didn't go into that -- into that part of the history.
Q. You wouldn't disagree with the notion that this was included for paraquat markets around the world as a formulated product with this emetic to maintain control over the paraquat market? You wouldn't disagree with that, would you?
A. I would say that the main reason, as we've been going through this this

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afternoon, was that we wanted to make paraquat a safer product.
Q. Okay. Would you also include as one of the reasons that by adding it in formulations with paraquat and patenting it, that it precluded competitors from entering the paraquat markets around the world?
A. Well, I'm not an expert on the implication of patenting on marketing, so, you know, I don't think it's right that I should speculate on an area which is not in my area of expertise.
Q. Okay. Do you have any information that says that I'm just wrong about that?
A. No, I'm not saying you're wrong. I'm just not able, from my knowledge base, to give you confirmation.
Q. Would you agree with me that ICI believed the prospects of competitors discovering suitable alternative emetics were remote --
A. Again, I can't --
Q. -- suitable to -- strike that. I'm striking the question.
Would you agree with me that ICI

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believed that the prospects of competitors discovering suitable alternative emetics to 796, PP796, were very remote?
MR. NARESH: Objection; foundation.
THE WITNESS: Again, I can't comment. I don't know.
BY MR. TILLERY:
Q. Would you agree that ICI's goal in introducing the emetic around the world, as set forth in this document, was to leverage the emetic to maintain ICI's monopoly on the market for paraquat products after its patents on herbicidal formulations of paraquat expired?
MR. NARESH: Objection; form, foundation.
THE WITNESS: Well, as I believe that I've never read this document, I can't, equally, give you an accurate answer to that question.
BY MR. TILLERY:
Q. Do you have any information from any source that what I just asked you is wrong?
A. No, I don't have any information which says that your interpretation is wrong.
MR. TILLERY: Okay. Let's go

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to 121. This is CUSA-00088398.
(Botham Exhibit 121 marked for identification.)
BY MR. TILLERY:
Q. This is a one-page document so she'll just display it for you, sir. I'll give you a second to look at it and then I have some questions.
A. Okay, I've read that.
Q. This is a letter to Chevron, enclosing a copy of Dr. Rose's final report, CTL/R/390, which is the report in which Dr. Rose determined the concentration of PP796 that was ultimately included as an emetic in paraquat products, correct?
A. Correct.
Q. In that report, Dr. Rose concluded that the emetic concentration should be 0.5 grams per liter in the standard 200 gram per liter Gramoxone product, correct?
A. Yes, that's correct.
MR. NARESH: Objection; foundation.
BY MR. TILLERY:
Q. He also concluded in that report that this concentration would be expected

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to produce vomiting within one hour in the majority of those people ingesting such quantity, which is the approximate minimum lethal dose of Gramoxone in man, correct?
A. That's correct.
Q. If you look up at this document, there's references to -- it says copies to Waitt, Calderbank, Foulkes, Barratt, Smith, Litchfield. Who are those people?
A. Well, starting from the bottom, Dr. Litchfield was a product toxicologist in CTL. Dr. Smith is the same Dr. Lewis Smith we have mentioned various -- many times. Dr. Barratt, I don't know who he was, but clearly it says he was in the United States for ICI. Dr. Foulkes we've talked about. Dr. Calderbank was in the plant protection division of ICI in Jealott's Hill. And Mr. Waitt, again, I'm not sure what his role was.
Q. Okay. He also concluded in the report that this concentration -- I'm sorry, strike that.
The conclusion that Dr. Rose reached was based on dose-response curves that he said

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showed that ICI 63197/PP796 was ten times more potent in man than in the three other vomiting animal species studied, correct?
A. Yes, indeed, that is correct.
Q. All right. And -- we'll wait until you're finished there, sir.
A. Yeah, okay.
Q. Are you --
A. I'm just making -- checking so I've got a record of some of these numbers.
Do go ahead.
Q. All right. Do you need to consult some other document to --
A. No, no, no, I'm just making sure I've got some of these figures to hand that we were talking about.
Q. All right. Okay. The human data on which Dr. Rose based the human dose response curve was some but not all of the data on vomiting as a side effect collected during the volunteer trials, and some but not all of the data on vomiting as a side effect collected in the ICI pharmaceutical trials, wasn't it?
A. That's correct.
Q. Scientists call the practice of

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selecting data to support a desired conclusion cherry-picking, don't they?
MR. NARESH: Objection to form, foundation.
THE WITNESS: Yes, that sometimes is an accusation.
BY MR. TILLERY:
Q. Okay. It's a practice that good scientists frown upon, don't they?
A. It is.
Q. What Dr. Rose did was cherry-picking, wasn't it?
A. Well, as we -- as you now have had confirmed by me, I've looked at those data with other colleagues more recently and we -- we actually think that Dr. Rose made a not unreasonable job of trying to find an appropriate dose response from those very -- I mean, they were described as weak data earlier. They were not particularly good data to try and do that.
Q. Was he cherry-picking or not? Can you answer straight up yes or no?
A. My judgment is that he was not cherry-picking.

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Q. Okay. That's what I needed to hear, one way or nothing.
There was no other human data on which Dr. Rose relied, was there?
A. I'm not aware of any other human data, no.
Q. No. For the main global product Gramoxone, containing 200 grams per liter of paraquat ion, ICI followed Dr. Rose's suggestion and set the emetic concentration at 0.05 gram per liter, or 0.05 percent, correct?
A. Did we not just say 0.5, not 0.05?
Q. It's 0.05 percent, 0.5 gram per liter.
A. Yes, yeah, I thought you'd -- I think you'd said 0.5 --
Q. The same measure -- it's the same measurement.
A. Yeah.
Q. If I misspoke, it's --
A. I think you -- yeah, 0.5 grams per liter, yes. 0.05 percent.
Q. 0.5 grams per liter is the same as 0.05 percent?
A. That's correct, yes.

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Q. Okay. All right.
The Rose report, an internal ICI report that was never actually published, is cited in the open literature, isn't it?
A. Yes, it is.
Q. For example, the Onyan and Bullins Human Toxicology, as evidence for the effective dose of an emetic in man, isn't it?
A. It is.
Q. Okay. The report was among data Chevron submitted to the United States EPA that helped convince the EPA not to put paraquat on a list of products subject to a rebuttable presumption against registration, wasn't it?
A. That bit, I'm not sure that I knew that directly.
Q. Were you aware of the fact that the number of deaths from ingestion had caused the United States EPA to consider putting paraquat on the list of rebuttable -- the list of products subject to a rebuttable presumption against continued registration in the 1970s?
A. No, because I wasn't around in the company at that time.
Q. Okay. In deciding not to put

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paraquat on that list, they call it the RPAR list, the EPA required that the emetic be included in Chevron's paraquat products, didn't it?
A. Again, I can't confirm that because I wasn't around at the time, I haven't seen the documentation.
Q. Okay.
MR. TILLERY: Let's go to the next exhibit. What number would that be? 122. We're going to 122 and 123. We'll go to 122. This is SYNG-PQ-01858013.
(Botham Exhibit 122 marked for identification.)
MR. TILLERY: Okay. We also ought to -- I think these are to be used together. He'll have to look at number 123 at the same time, and this is exhibit SYNG-PQ-01857812, and we'll call it Plaintiff's Deposition Exhibit 123.
(Botham Exhibit 123 marked for identification.)
BY MR. TILLERY:
Q. So we're going to have you look at

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these together. Look at the first one and then pull up the second one.
A. The first one is a 643-page document.
Q. That's correct. And what we're trying to do is just direct your attention to the beginning so you understand and can identify it.
And these exhibits, for your reference, sir, comprise Chevron's application for an exemption from tolerance for the inclusion of PP796 as an inert ingredient in paraquat formulations.
If you would look at that and confirm.
A. Right, well, I'm reading --
Q. This is --
A. I'm reading page 3. Is that the place where I would find that?
Q. Actually, yes. And if you look at page -- I think it's 015 in the first exhibit, you'll see, I think, that's the third page. It says to the United States -- to the Environmental Protection Agency, April 1, 1977.
A. Okay.

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Q. Do you see that?
A. You've taken control now so could you just go to the right page, please?
Q. We'll open it -- yes, we will.
MR. TILLERY: This page right here. It's -- it would be -- there's a blank and then this page, it'll be page 3.
BY MR. TILLERY:
Q. There we go.
A. Mmm-hmm. Okay, thank you.
Q. So "We are interested in obtaining clearance for ..." and then it describes the chemicals, and it describes this particular inert as "an inert ingredient for [inclusion] use as an emetic at not more than 0.1% in paraquat dichloride herbicide formulations."
Do you see that?
A. Yes, I do.
Q. And this was done by Chevron Chemical Company?
A. Yeah.
Q. Okay. And I'll ask you if the support for the application includes the Rose report and about 19 other ICI reports.
I think you'll find those, if you

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want to reference them, on the listing of documents on pages -- if you go to 020, which is right here, list of documents, and 021.

MR. NARESH: Steve, do you want him to confirm the Rose report or the number 19?

MR. TILLERY: Actually, he can do them all at the same time.

BY MR. TILLERY:

Q. And there's no mystery about it. I'm just asking you to confirm what's in the document. I'm not asking you to interpret it, Dr. Botham, okay.

A. Okay.

MR. TILLERY: Is that the first page, "Listing of Documents"? 020? If you go up just a little bit, take that down just a tiny bit. There you go. More.

BY MR. TILLERY:

Q. Okay, "Title of Document." "Listing of Documents," and it's got "Title of Document" and the first one, "Submission of Evidence to [the] Committee on Study of Drugs Prior to the Introduction to Humans of I.C.I. 63,197 ...

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Chemistry and Pharmacy. Imperial Chemical Industries Limited. July 1970."

Do you see that?

A. Yes.

Q. And then go to the -- push the page up a little further. And if you go to the bottom of the page, 8A, do you see that?

A. Yes. Yes.

Q. There. Thank you. All right. That's I.C.I. 63,197. Volume III; I.C.I. 63,197 Volume IV; Paraquat Emetic Formulation.

Do you see that?

A. Yes.

Q. Okay. Let's go to the next page. The first item, "The Effect of administration of an Emetic (PP 796) on Paraquat Toxicity in Dog and Monkey" by M.S. Rose, Report No. CTL/R/391. November 1976."

Do you see that?

A. Yes.

Q. Then let's take the page up a little further. And then you see where it says "ICI 63,197"?

A. Yes.

Q. That's another ICI document. The

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next one below it, "A Summary of Clinical Results of the Phosphodiesterase Inhibitor ..." Imperial Chemical Industries Limited.

The next one, "The Concentration of PP 796 ..."

Do you see that?

A. Yes.

Q. Next one, "The Emetic Effects of ICI 63,197 ..."

Do you see that?

A. Yes.

Q. These are documents that are created by ICI that Chevron used when they made this filing to the United States EPA for an order of clearance for listing this emetic in paraquat, for use in paraquat, right?

A. Okay, yes, fine with that.

Q. All right.

Would it have cost more to include a larger concentration of the emetic in paraquat products?

MR. NARESH: Objection; foundation.

THE WITNESS: I'm not an expert on those matters, but, yeah, common sense would tell you probably.

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BY MR. TILLERY:

Q. Was Zeneca, another corporate predecessor, another name of one of the entities preceding the formation of Syngenta?

A. It was.

MR. NARESH: Objection to the form.

MR. TILLERY: Okay.

MR. NARESH: Could you rephrase that question, please?

MR. TILLERY: Absolutely.

BY MR. TILLERY:

Q. Was Zeneca another corporate predecessor of Syngenta; and you said yes, okay?

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

And Steve, we have reached an agreement on discovery on topics like this, and so I'd asked you to --

MR. TILLERY: Yeah, yeah. I'm just confirming for this record because I'm going to ask him about Zeneca, okay.

MR. NARESH: Yeah, just ask him if it's the name.

MR. TILLERY: Right.

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BY MR. TILLERY:
Q. So in 1990, Zeneca or Syngenta estimated it would cost an additional £30 million per year to include an emetic dose ten times higher than the dose Dr. Rose and ICI settled on in 1976, didn't it?
A. I don't have that information to hand to confirm.
Q. Did you find that when you went back and looked at these historical documents recently --
A. I --
Q. -- after Dr. Heylings paid you a visit?
A. Yeah, I made -- I think probably one of my colleagues looked at that particular document. I was focusing on the technical documents.
Q. Okay.
A. So, yes, I think the answer is it was part of the information we were looking at again. I won't disagree with you.
Q. Okay. ICI's patents on the emetic formulations of paraquat made it commercially beneficial for ICI to lobby regulators to

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require an emetic in all paraquat products, didn't it?
MR. NARESH: Objection; foundation, form.
THE WITNESS: Yeah, the principal reason to add emetic was to improve the safety of paraquat. I think that needs to be reasonably stated.
BY MR. TILLERY:
Q. Well, do you agree with me -- the second document that we had in that list, of course, was Exhibit 123, and that is SYNG-PQ-01857812, and that's a document entitled -- well, we'll look at it in a second. I want you to identify it.
Let's go back to my question. ICI's patent on 63197 and on emetic formulations of paraquat made it commercially beneficial for ICI to lobby regulators to require an emetic in all paraquat products, didn't it?
MR. NARESH: Objection; form, foundation.
THE WITNESS: It may have done but I've not -- have never been involved in those commercial discussions so I can't

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personally confirm what you've said one way or the other.
BY MR. TILLERY:
Q. But you also can't deny it either, can you, sir?
A. No, I can't deny it.
Q. Okay.
Now, let's look at that next exhibit, if you'd pull that up. If you would, just look at the next page. This is a July 1970 document. And the only reason I raise it is for you to tell me what the document is and to confirm that it's the intellectual property protection for that emetic?
MR. NARESH: Objection to form; foundation, scope.
THE WITNESS: Well, I can't see what that is from the --
MR. TILLERY: Can you give it to --
THE WITNESS: -- page that I can see.
BY MR. TILLERY:
Q. She's turning it over to you now, sir.

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If you just take a look at it and then I'm going to direct your attention to a report that's referenced within that document.
A. So I still can't see it.
Q. Oh, you can't see the document, okay. It may be too large. It's a very large document. The title of the document is "ICI 63197."
MR. TILLERY: If you go to the next page -- oh, I'm sorry. To the next page, I apologize. Yes, there it is.
BY MR. TILLERY:
Q. This is what we have in the document. SYNG-PQ-01857814 is the page we're referring to and displaying on the record right now. It says, "Volume II - Pharmacology and Biochemistry."
I believe this was one of the documents contained in the file and referenced in that filing with the United States EPA that you just looked at and confirmed for me, okay.
MR. TILLERY: Now, if we could -- if you can find a way to get to 7957 and the following page, I just want to show

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those to Dr. Botham.
BY MR. TILLERY:
Q. Okay, do you see that?
A. Yes, I do.
Q. "The concentration of PP 796 required to produce emesis in experimental animals and an estimation of the emetic dose in man - M.S. Rose." That was one of the documents filed.
Let's go to the next page, which is the summary.
A. Yes, I can see that.
Q. It says -- would you read that into the record, please.
A. "From the limited evidence of clinical trials and data from experimental animals, it is concluded that PP 796 should be added to paraquat formulations at a level of 5mg in 10ml (0.05%). It is estimated that the majority of those ingesting 10ml of this formulation will vomit within an hour."
Q. And is it still your belief that one hour saves the average person if the chemical stays in their body for an hour?
A. No, we don't say that that would

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save everybody who invested paraquat. Again, it depends how much they take, how much they weigh, and so on; so we wouldn't make that claim, certainly not.
Q. But if you put more emetic in, they'd certainly vomit faster, wouldn't they?
A. That's a possibility.
Q. Yes. So the more emetic you put in, the quicker they vomit, the less chance it is for them to die; is that right?
A. Yes, although it's not quite as straightforward as that because if you put too much emetic in, then actually you can get what's called uncontrolled vomiting. And actually, you would then -- what happens is that you can then -- in the regurgitation process, you can start to inhale the vomit, so there are -- and that can cause severe problems, so you have to be very careful.
Q. This sounds like a product that's just incredibly dangerous, doesn't it?
MR. NARESH: Objection to form.
BY MR. TILLERY:
Q. Doesn't it to you? Doesn't it to you, Dr. Botham? Doesn't it make you

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think --
A. Well, of course it's --
Q. -- Gee, this stuff gets in your brain. It gets in your brain when you use it as intended, it passes through the blood-brain barrier, it hangs around in the brain for a long time, it redox cycles, if people accidentally ingest it, there's no antidote. What's this all add up to? You think you ought to be selling --
MR. NARESH: Object to the form.
BY MR. TILLERY:
Q. You think you ought to be selling this product, Dr. Botham?
A. This product can be sold --
THE STENOGRAPHER: Sorry. Sorry, Mr. Naresh, I saw your lips move but I didn't hear you. Sorry.
MR. NARESH: I said objection to form.
THE STENOGRAPHER: Thank you.
MR. TILLERY: Okay.
THE WITNESS: Okay.
This product, of course, is dangerous, particularly with respect

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to its acute toxicity, if it is accidentally consumed or if it is deliberately consumed.
We've taken enormous steps, made enormous investment to try to avoid that situation by adding things like the emetic but also all the labels that we've touched on before, all the training that's used for farmers and growers. So we have gone to great lengths to make sure that it's possible to use this very important herbicide safely.
BY MR. TILLERY:
Q. And have you added the amount of emetic that Dr. Heylings says you should add?
A. No, because it's not as simple as saying that Dr. Heylings's judgment of what that level is necessarily being the right level, and that's the more recent analysis that we've been doing and have confirmed that what Dr. Heylings has proposed is not necessarily a way in which you can make paraquat an awful lot safer.
MR. TILLERY: I move to strike the answer as unresponsive.

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BY MR. TILLERY:
Q. Have you added the amount of emetic that Dr. Heylings said you should add --
A. No --
Q. -- can you tell me yes -- all right, thank you.
I move to the next page, past Summary, and that's 959, if you look at that.
Do you see the paragraph:
"When PP 796 is included in a paraquat formulation in the amounts that will cause emesis within 1 hour in dogs and monkeys, the toxicity of the formulation in these species is reduced ... In order to reduce the toxicity of the paraquat formulation in man, therefore, it would be necessary to add sufficient PP 796 to cause emesis, in a volume of paraquat concentrate that would normally be lethal if ingested. A volume of 10ml of the 20% ... paraquat concentrate is considered to be the smallest amount containing a possible lethal [dose] of paraquat to man ..."
Is that all correct? Do you agree with --
A. That's all --

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Q. -- that, sir?
A. Yes, that's correct.
Q. And the next paragraph:
"An emetic dose in dogs, monkeys and pigs has been obtained in PP 796 over dose range of 0.1-1.0 mg/kg body weight. On this basis a dose of 2 mg/kg was chosen as one that would clearly ensure vomiting in dogs and monkeys, and this dose was, therefore, used for studying the effect of emesis on paraquat toxicity in these species ..."
Do you stand behind the accuracy of that statement today, sir?
A. Yes, we do.
Q. Okay. And after you're doing all your research and all your analysis of Dr. Rose's work and his analysis of the Bayliss study, correct?
A. Here we're talking about --
Q. You stand behind that?
A. Yeah, yeah, we're talking here about the study in dogs and monkeys.
Q. Okay. And I'm talking about all of the information he referenced that included this, you're standing behind it today, right?

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A. Yes.
Q. Okay. And:
"[The] clinical studies (Bayliss, 1973) have indicated that man is more sensitive to the emetic effects of PP 796 than the experimental animal studied, emesis being seen with doses in the range of 0.03-0.11mg of PP 796 per kilogram body weight (equivalent to total doses in the range 2-8mg)."
Do you see that?
A. Yes.
Q. And you see the rest of that paragraph, to the bottom of the page. Do you see that?
A. Yes.
Q. I want you to read it and tell me when you're finished.
A. Yes.
MR. TILLERY: Now give him the next page, put the next page on the screen.
BY MR. TILLERY:
Q. Now I want you to read that page and tell me if that's all correct information as well, and that which Syngenta stands behind today, after conducting all of this

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investigation into the allegations made by Dr. Heylings.
A. Yes. So we've looked at those clinical trials' data again, as you indicate, and as I mentioned earlier on, and those data, whilst not being great data to try to come to an accurate conclusion on this, certainly not by modern-day standards of clinical trial data, we were not able to say that -- well, what we -- putting it another way, we were able to say that Dr. Rose's interpretation was not unreasonable.
Q. Okay. To answer my question directly, you stand behind these words by Dr. Rose, right, today, and his analysis of the Bayliss data and all of the information he had? You stand behind it?
A. We are saying that it was not unreasonable but we equally say, because of the nature of those data, we can understand why Dr. Heylings, for example, said, well, you could interpret it a little bit differently.
But, you know, this is because the data was essentially a little weak.

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Q. Okay. What I'm saying to you is -- strike that.
I'm asking you, do you or don't you as a corporation -- you're speaking for Syngenta -- stand behind these statements of Dr. Rose in his calculation? Do you or don't you?
A. Yes, I do --
Q. All right. Thank you. Let's move on. You said you did. Let's move on. Let's go to the next page.
(Stenographer interruption.)
MR. NARESH: I wanted to note for the record my standing objection on scope to this line of questioning.
THE STENOGRAPHER: Thank you very much.
BY MR. TILLERY:
Q. Your answer was "Yes, I do," wasn't it, sir?
A. Yes, we can stand behind that data after our recent analysis.
THE STENOGRAPHER: Thank you.
BY MR. TILLERY:
Q. Let's go to the next page. It's

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before you, Table 1. The same question to you. Do you stand behind that data and those numbers that were submitted by Dr. Rose? The emetic action of PP796, do you stand behind those today after conducting this evaluation?
A. Well, yes, we did a check to make sure that the accuracy of those data -- these are not interpreted data, these are essentially raw data, so they appear to be sound.
Q. I'm sorry? So you stand behind those? I'm just asking you, you stand --
A. Yeah, yeah.
Q. And you conducted --
A. I mean, these are the data that were generated so they've not been manipulated or interpreted in any way.
Q. Okay. And who did this analysis at Syngenta?
A. It was led by my colleague, Dr. Kim Travis.
Q. Okay.
MR. TILLERY: All right. We're moving to -- what page -- what paragraph? 124? I'm sorry, what exhibit? 124.

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This is Plaintiff's Exhibit 124 and it is SYNG-PQ-13098668.
MR. NARESH: Steve, we have been going for about an hour and 20. I would like to take at least one -- well, one more break before we end the deposition in about an hour. So I don't know if now is a good time or if you want to ask questions about this document but I would like to take -- I don't want to power through for 2.5 hours.
MR. TILLERY: Here's what I've got. I would like to get through this today, if we can, so we can, before we move on, finish this topic area. It's not much, okay. So let me get through it --
MR. NARESH: I don't want the witness to go two and a half hours without a break.
MR. TILLERY: Yeah.
MR. NARESH: We've been going for an hour and 20 without a break so we could break now or we could break in ten minutes --
MR. TILLERY: We can break right

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now but I'd like to get through this today. So we'll break very quickly, okay, thank you.
THE VIDEOGRAPHER: We are going off the record. The time is 4:56.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 5:04.
BY MR. TILLERY:
Q. Dr. Botham, I'd like to direct your attention to Exhibit 124.
(Botham Exhibit 124 marked for identification.)
MR. TILLERY: This is SYNG-PQ-13098668.
BY MR. TILLERY:
Q. And, just very briefly, if you look at this, it's from -- it's an ICI document, if you can verify that, from the business area, P. Slade.
Do you see that?
A. I do.
Q. Okay. And the date of this is what?
A. 30 June 1976.
Q. 1976. If you'd go to the second

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page -- actually, just familiarize yourself with it. I want to make sure you understand what it's about. It's talking about an emetic formulation, isn't it?

A. Yes.

Q. If you look at the second paragraph, it says:

"The planned rate of addition of the emetic agent should ensure that 80% or more of the people who ingest [it] will vomit. The present indication is that this rate of addition will add approximately 6.5p ..."

What is that?

A. It's a UK pence, so it's .65 of -- 0.065 of a pound.

Q. "... to the cost of a litre of 'Gramoxone' ..."

Okay? Do you see that?

A. Yes.

Q. All right. Then let's go to the second page, first paragraph. Look at the last sentence. Read it, take your time, but I want to direct your attention to the first full paragraph, where it says "We believe ..."

Do you see that?

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A. Yes, I can see that.

Q. All right. Am I reading this correctly when I say:

"We believe that we should plan for a worldwide introduction as soon as possible. It is hoped that supplies of the emetic formulation will not be limited beyond 1977 but we should in any case establish which countries have priority for its introduction. In some cases, of course, delay in registration may be the limiting factor, [but] we shall need to know what is required for registration country by country."

And then here is the key sentence I want you to focus on:

"Needless to say, registration of an emetic formulation as the only permitted paraquat product would be highly desirable and we need to determine in which countries this might be achieved."

Do you see that?

A. I do.

Q. Is that a verification of what I was asking you before, that --

MR. NARESH: Object --

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BY MR. TILLERY:

Q. -- making this the only permitted, legally permitted, paraquat product to sell would be a very significant business achievement, correct?

A. Yeah, I think --

MR. NARESH: Objection; form, foundation.

THE WITNESS: I think -- I think we agreed that I couldn't disagree with you.

BY MR. TILLERY:

Q. All right.

ICI's US patent on paraquat as a herbicide expired February 1998.

Did you know that?

A. No, I don't think I did know that.

Q. You wouldn't disagree with that, would you?

A. Again, no, I'm happy to take your word for that.

Q. So that was about two years after Mr. Slade made these statements, right?

A. Yes.

Q. So that would mean that by adding

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this as the only lawful emetic in a formulated paraquat product, that it would extend the patent protection and the monopoly of the sale of paraquat in the United States for 17 more years, right?

MR. NARESH: Objection; form, foundation.

THE WITNESS: Again, I'm not an expert in the detail of this, so -- but what you say does not sound unreasonable.

BY MR. TILLERY:

Q. Okay. And eventually, of course, US regulators did indeed require that all paraquat products contain an emetic in the United States, right?

A. Yes, that's my understanding.

Q. And have you seen any patented emetic other than the one that you have?

A. Not to my -- in my experience, no.

Q. Okay.

Who is Jon Heylings?

A. Jon Heylings was an investigative toxicologist in the Central Toxicology Laboratory.

Q. Has Dr. -- do you pronounce

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it Hay-lings [phonetics], sir?
A. It's Hay-lings [phonetics], yes.
Q. I'm sorry. I was mispronouncing it. Has Dr. Heylings reported to Syngenta management that he believed the human trial data ICI and Chevron used to substantiate the effective dose of ICI 63197 and PP796 was fabricated?
MR. NARESH: And just for an abundance of caution, I'll have a standing scope objection to this line of questioning as well.
MR. TILLERY: Yes. Again, my response stands the same: It's very clearly formulated products in his outline, in his topics. But, anyway, I'll give you the objection.
MR. NARESH: If you're going to make that record, I will respond that in the 70 or so topics you have identified, the word "emetic" does not show up once.
MR. TILLERY: Yeah, though "formulated" does.
THE WITNESS: Could you ask the

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question again, please, Mr. Tillery.
BY MR. TILLERY:
Q. Absolutely, yes, I will, sir.
Has Dr. Heylings reported to Syngenta management that he believed the human trial data ICI and Chevron used to substantiate the effective dose of ICI 63197/PP796 was fabricated?
A. No, that's not entirely accurate. He believes that a small section of the data was in some way fabricated or manipulated. Not the whole study or the whole data set.
Q. And he said some of it was, right, would you agree with that?
A. Yeah, some datapoints, correct.
Q. And by whom was it -- does he say it was fabricated?
A. He believes that Dr. Rose manipulated some of those data.
Q. And he originally brought this issue to the attention of ICI's paraquat product manager in September 1990, 30 years ago, didn't he?
A. That's what he claimed, yes.
Q. Actually, you know, there's

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documentation showing this and we're going to show it in a minute.
He did that after Dr. Lewis Smith had recommended in 1984 that the concentration of the emetic in paraquat products be increased, didn't he?
A. Yes. There was an interchange of views at that time, we've seen those --
Q. And Dr. Smith recommended that it be increased, didn't he?
A. Yes, that was one thing -- at that time there was certainly a consideration from Dr. Smith that that could be -- that could be taken into account, yes.
Q. And the recommendation was never acted on by ICI, was it?
A. No, it was not.
MR. TILLERY: Now, let's look at number 125, Plaintiff's Exhibit 125, which is SYNG-PQ-26134258 - 4265.
(Botham Exhibit 125 marked for identification.)
BY MR. TILLERY:
Q. Now, we're going to give you this document to look at because of its length.

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My question is not going to be specific to the document. I'm reasonably sure you've seen this in your investigation of this matter, but you take a look and see if it looks familiar.
A. Yes, this is familiar.
Q. All right. You've seen this. All I want to do is to say this for the record: This is the document from J.R. Heylings, biochemical toxicology, to Dr. Smith, isn't it?
A. It is.
Q. And they were both ICI employees at the time, correct?
A. Correct.
Q. And it's at ICI Central Toxicology Laboratory, Alderley Park, and in Cheshire, right?
A. That's correct.
Q. And it's dated 19 January, 1990, so about 30 and a half years ago, right?
A. That's correct.
Q. And it's entitled "Emetic Concentration in Paraquat Formulations."
Do you see that?
A. I do.
Q. So we can go through and study

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it entirely, but if you look at the second paragraph, towards the end, "My conclusion ..." do you see that? Towards the end, the third line from the end in the second paragraph.

A. I think you have control of this, so ...

Q. Yeah, you can see it on the screen:

"My conclusion from studying the scientific evidence ..."

A. I can't see that at the moment. I can only see page 1.

Q. That's what I mean. That's what I'm looking at. It's page 1, the second paragraph. Do you see that?

A. The second paragraph, sorry.

Q. Yes. "My conclusion ..."

A. Yes. I'm sorry, yes, I can see that. Yes, thank you.

Q. Yeah.

"My conclusion from studying the scientific evidence from clinical studies with the emetic is that the concentration of PP796 recommended in 1976 is probably well below an effective emetic dose in man."

That's what he says, right?

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A. That is correct.

Q. They were saying this over 30 years ago.

Now, would it be an accurate summary of the document to say that Dr. Heylings reports to Lewis Smith that he has reviewed the scientific data underlying the original conclusion to set the emetic level at 0.05 percent and determined the data did not support the conclusion, that the level was too low to be an effective emetic in humans and that the amount should be increased tenfold.

Would that be an accurate assessment of this report?

A. It would be accurate, yes.

Q. All right.

MR. TILLERY: Then let's move on. This is Exhibit 126. And this is SYNG-PQ-26134270 - 4272.

(Botham Exhibit 126 marked for identification.)

BY MR. TILLERY:

Q. We'll give you this to look at yourself. It's another Jon Heylings letter, or memo, to Dr. Smith and it consists of three

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pages. If you'd take your time and look at it.

A. Yes, okay. Again, I had relatively recently seen this document so please go ahead.

Q. You're familiar with this one, I think, aren't you?

A. Yes, yes.

Q. All right. Now, if we go to the first page and if you look where he says, "I would like to point out ..." It's the fourth paragraph, under "Human data with paraquat emetic."

Do you see that?

A. Yes.

Q. He says:

"I would like to point out that the human data presented in Report CTL/R/390(R) is very misleading. In the attached table, I have presented two sets of data. Data presented by Rose in CTL/R/390(R) is shown at the top. The actual data presented by Bayliss in PH20992C is shown at the bottom. There are three important differences between the data from CTL/R/390(R) and PH20992C."

Do you see that?

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A. I do.

Q. And he then sets out those specific distinctions, doesn't he?

A. He does.

Q. All right. And did you look at the data to verify whether these comments were correct?

A. Yes. We've -- in our more recent analysis, we've been back to the original Bayliss data and done our own analysis of those data.

Q. Oh, so you redid the study of Dr. Bayliss, right?

A. No, we didn't redo the study. We went back and we looked -- we made sure we didn't rely just on the Rose data in R390. We went back to the original data to see whether there was any substance which we -- in terms of Dr. Heylings's interpretation which might mean that a different interpretation could be reached.

Q. What I'm wondering is did you go back and redo or re-analyze the Bayliss data or did you stick with the Bayliss conclusions and results?

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A. No, we looked again at the Bayliss data. This is what Dr. Travis did.
Q. Oh, so you -- you redid a study 46, 47 years after the fact. Is that what you're saying?
A. Well, I think the way you've put that is not quite right. We didn't redo the study; we simply took the data from that study and we tried to do our best with, again, some relatively weak data, as we've been saying throughout this, to see what Dr. Travis's calculation would look like with regard to the dose response, if you like, in an effective dose.
Q. So the scientist you assigned, your predecessors assigned to do this, who wrote a report in 1973, which was undisturbed until Jon Heylings raised this with you, what, recently, the last couple of years, right?
A. Correct.
Q. Was perfectly fine, reliable, sufficient to submit to the United States Environmental Protection Agency, absolutely fine in every other respect, and then when he raises this in -- let's see, let's just do

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the calculus here. It would have been 30 -- was it 36? 47 -- 46, 47 -- 45 years after the fact, you decided maybe it would be a good idea to re-look at the data. Right?
MR. NARESH: Objection to form.
THE WITNESS: Well, we had --
BY MR. TILLERY:
Q. Is that right?
A. We had received Dr. Heylings's communications about it and we thought that, again, being a science-based organization, we should take another -- a fresh look at it.
Q. Oh, so instead of relying on what Dr. Rose relied on, what the United States Government relied on, what the European Union relied upon, what the UK relied upon, when Dr. Heylings told you this was made-up data, you went back and redid the study? Is that what you're telling us?
A. No, I'm not telling you that. That's --
MR. NARESH: Objection; form.
BY MR. TILLERY:
Q. Okay.
A. That's really a misrepresentation.

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It was not made-up data, first of all. The accusation was that at some -- a small number of the data points he queried, and he believed that the way in which you use those data to calculate an effective emetic dose was not correct. We have looked at those same data, absolutely not changed the data, and we have come to a conclusion that that effective dose calculation that was done all those years ago was not unreasonable.
Q. Okay. Let me ask you this: Did you calculate the Bayliss data and come up with different conclusions than Dr. Bayliss did of his own study 47 years later?
A. No. We said -- Dr. Travis's analysis suggested that Dr. Bayliss had not -- Dr. Bayliss's conclusion was not unreasonable, but there are -- because the data was so weak, there is some margin of error in that, but it wasn't fundamentally wrong.
Q. Did you adjust any of the underlying facts of Dr. Bayliss's analysis of anything you relied upon, or assign different weights to that information?
A. No. All we simply did was -- and

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we did get the support of a professional statistician, who has experience of clinical trial data as well, to work with Dr. Travis; so we were simply using the expertise of a statistician, alongside Dr. Travis, to see what conclusion that brought us to.
And, as I say, it does not take us to a conclusion that is very far removed from what Dr. Rose concluded.
Q. You've read Dr. Bayliss's report, haven't you?
A. Yes.
Q. You're aware that he didn't do calculations or draw a conclusion? Did you know that?
A. Yeah, which is why I just said it was Dr. Rose's conclusion that we were not -- I said we didn't --
Q. So you -- you went back after Dr. Rose's, right?
A. We took the Bayliss data, we looked at them with -- in modern-day -- with modern-day expertise and said that the Rose calculations from the Bayliss data were not unreasonable.

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Q. Okay. Let's go on with this letter, and this is Exhibit 126. Let's move on and let's go to the next page. If you'd look at the second paragraph, Dr. Heylings says:

"However, on examination of the full data there is no such ... response. The minimal effects observed at 4 and 8mg PP796 suggest that 4-8mg doses are probably nearer threshold in man not maximal. [Therefore], the dose response curves in pig, dog and monkey are all very similar across the same dose range. I would suggest that the emetic dose response curve of PP796 in man is similar to these other species. Thus, I disagree with the conclusions in [the] report CTL/R/390(R), which suggest that the emetic is 10 times more potent in man."

Is that what he says?

A. That's what he said.

Q. All right. And now this was when he was a full-time employee in the -- at a biochemical toxicological section of ICI, correct?

A. Correct.

Q. He came to you as an employee who

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was concerned, based upon his own personal analysis as a scientist, of what he had seen, correct?

A. Yes.

Q. Okay. He wasn't making public statements or doing anything else. He was just very concerned about this and he wanted to bring it to the company's attention, correct?

A. Yes, indeed --

Q. All right, and --

A. -- which is very laudable.

Q. And that's what he did? And you understand --

A. Yes, and that's very laudable, yes, yes.

Q. And you understand him to be a respected scientist and a respected gentleman, don't you?

A. We do, absolutely. He's a long --

Q. All right.

A. He's a long-standing colleague of mine.

Q. All right.

MR. TILLERY: Now, let's go to

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Exhibit 127. And this is SYNG-PQ-02639780.

(Botham Exhibit 127 marked for identification.)

BY MR. TILLERY:

Q. And we're going to give this document to you to look at. I'm going to direct you to a few pages, page 6 and page 32. Since it is 45 pages, I'd like to move quickly because I've got just a few more questions for this deposition first -- a few more documents and we'll be finished.

A. Okay. Yes, I'm pretty familiar with the background to this.

Q. All right. You're familiar with this document, okay. Can I do this -- because of our time sequence here, can I say this, with respect to -- and I'll direct all counsel's attention to SYNG-PQ-02639785, and that's page 6 of this document if anybody wants to look at it.

Is it an accurate summary of this document that Syngenta knew that increasing the amount of the emetic in its paraquat products would increase their safety by two-

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to threefold but that introducing a product with such level of emetic would not be possible in all markets proactively due to, quote, "price erosion"?

And if you want to go to page 6 to verify that statement, please do so.

A. Maybe I can respond to that. The two-to-threefold safety factor was estimated from the results of further animal studies/experiments that were being conducted. So this is different to the issue we've been talking about previously.

Q. Well, why don't you look at 9785, okay. Do you see that? You're looking at the screen there.

"During the course of this work important conclusions have been reached regarding the role of emetic (PP 796). It has been found that increasing the concentration of emetic in 'Gramoxone' by a factor of 5 resulted in ... 2-3 fold safety factor over standard 'Gramoxone'."

Did you see that?

A. I do.

Q. All right.

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Now let's go to the next exhibit, which is on page -- it's page 26 of the document and it's found at SYNG-2639811 under "Strategy."

Do you see, under "Strategy," first paragraph?

A. Yes.

Q. Read that into the record.

A. "A proactive approach would demand promotion of the safer formulation in all markets. Price erosion has ensured that this is not now possible for the multiple emulsion formulations without loss of significant markets."

Q. Costs too much? Surprise, surprise, you'd lose the market. You can't add that much emetic. You can't make it two to three times safer because you'd lose market share.

A. No --

Q. Is that a fair statement?

A. I don't think that's entirely --

Q. Is that correct --

MR. NARESH: Objection, form.

THE WITNESS: I don't think that's entirely accurate. I think this is --

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what was trying to be developed here was a new type of formulation, so it wasn't just -- it wasn't simply increasing the level of emetic, it was adding other safening factors --

BY MR. TILLERY:

Q. Okay, well, either one, however you count it, you weren't going to do it -- you weren't going to make it two to three times safer because of the money, right?

A. Well, that's what this said here but, as the record will also show, this research program with safer formulations continued for many years and we did bring formulations based on some of this technology to the market.

Q. And then you got rid of them, and then you took them off --

A. Unfortunately, in some --

Q. -- because they continued to cost --

A. Unfortunately, in some of the cases because they'd had technical issues, nothing to do with the --

Q. Yeah, you --

A. -- safety or price.

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Q. Your Inteon, that's the product you're talking about, isn't it?

A. It is.

Q. Gramoxone Inteon?

A. It is.

Q. That's exactly what you're talking about. You added this, you made it a little safer but because of the cost you took it off?

A. No, incorrect. It wasn't because of the cost. It was because we were getting some technical problems with its use.

Q. As of the day this memo was written -- let's make sure we're clear for the ladies and gentlemen of the jury and the judge, okay -- "a proactive approach would demand promotion of the safer formulation in all markets."

So we don't kill as many people. We save thousands of lives.

"Price erosion has ensured that this is not now possible for the multiple emulsion formulations without loss of significant markets."

That's what it says. Those are the words, aren't they, sir?

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MR. NARESH: Objection to form.

THE WITNESS: That's right, but I would say that that has to be read within the --

BY MR. TILLERY:

Q. Are these the words -- are those the words I read correctly?

A. You did.

MR. NARESH: Objection.

BY MR. TILLERY:

Q. Yes. Thank you.

MR. TILLERY: Let's move on to the next document. This is Exhibit 128.

(Botham Exhibit 128 marked for identification.)

BY MR. TILLERY:

Q. It's a one-page document. It shouldn't take long to read.

Have you seen this document, too?

A. Yes.

Q. You're familiar with it, aren't you?

A. Yes.

Q. All right. Who is Dr. Jaggers, the recipient of this correspondence?

A. He was one of the three members of

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the senior executive group of CTL.
Q. This is SYNG-04262621.
Dr. Smith tells Dr. Jaggers, in response to the concerns that Dr. Heylings has been raising, that he, too, believes the amount of emetic in the PQ formulations needs to be increased -- paraquat formulations need to be increased with emetic, correct? That's what he's saying?
A. Yes.
Q. In response to Dr. Heylings's allegations that Dr. Rose "selected data to arrive at a conclusion," Dr. Smith says he thinks that "given the pressure at the time to arrive at a decision the apparent omissions in the arguments presented to the business were accidental."
That's what he says, right?
A. That's what that says.
Q. So Dr. Smith agrees with Dr. Heylings that Rose omitted data to reach his conclusion regarding the amount of emetic needed to be effective in animals but believes it wasn't intentional, correct?
MR. NARESH: Objection; form,

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foundation.
THE WITNESS: I mean, I can't put words into Dr. Smith's mouth here, but you're assuming that apparent omissions in the arguments might mean Dr. Heylings's accusation that there was falsification of data. I think it's not as simple as that.
BY MR. TILLERY:
Q. Well, I said that Dr. Smith interpreted as a mistake, that he omitted data to reach his conclusion, but because of the pressure at the time to arrive at a decision, this decision and this omission was not intentional.
Would that be a fair interpretation?
A. Yes. However you interpret that, that's right, it was accidental rather than intentional, correct.
Q. But he says, okay. That's Dr. Smith's evaluation.
MR. TILLERY: Now let's go to Exhibit 129.
(Botham Exhibit 129 marked for identification.)

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MR. TILLERY: This is SYNG-04262618.
BY MR. TILLERY:
Q. I think this is a three-page -- a two-page document. This is from Dr. Smith to Dr. Heylings, if you would take a look at this, sir.
A. Okay, I've seen the first page. You have control. So do you want me to see the second page as well?
Q. I do. I want you to look at the second page. There you go.
A. Thank you.
Q. Go ahead and read that. I'm sure you've read this recently as well.
A. Yes.
Q. All right. This exhibit -- I may have read the number out. If I didn't, I'm repeating it again, 04262618 -- is a memo from Dr. Smith to Dr. Heylings. It's dated November 6, 1990, again ICI Central Toxicology. Right?
A. Yes.
Q. And it's "Re: Human data with paraquat formulations containing PP796."

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Right?
A. Yes, yes.
Q. Confidential letter. Dr. Smith states to Dr. Heylings:
"It is clear from the data you presented that there was probably some misunderstanding or confusion in the way the case for the inclusion rate of 796 at 0.05% was arrived at. However, I am sure you will appreciate that in attempting to reconsider the thinking and knowledge in 1976 when this decision was taken is extremely difficult."
So, again, Dr. Smith does not disagree with Dr. Heylings's conclusions, does he?
A. No, he doesn't.
Q. Dr. Smith also indicates, after the time required for an emetic to work, that in the mid 1970s, "... we were still influenced by the data in rat which has an entirely different plasma paraquat profile to that of man."
That's what he says, right?
A. Right.
Q. Dr. Smith must have been unaware of the documents we have seen where ICI employees

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said that in the late 1960s and 1970s, that a fatal dose of paraquat could be absorbed within as few as 15 minutes.
Do you agree with that?
MR. NARESH: Objection; form, foundation.
THE WITNESS: You're suggesting that Dr. Smith was not aware of that?
BY MR. TILLERY:
Q. I am.
A. Well, I can't comment on that.
Q. Okay. Can you read Dr. Smith's conclusion on the next page into the record, please, for me.
A. "In conclusion, I do not intend to pursue any further the reasons for the inclusion of PP796 at 0.05% as decided in the early part of 1976. Rather, I wish to concentrate our efforts in agreeing a strategy with the Business that will prompt us to evaluate formulations of paraquat that are intrinsically less toxic and contain increased concentrations of emetic."
Q. So he was saying let's forget about the past and how this happened, whether it was

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a mistake that was the result of business pressure or whether it was intentional, and let's get this product fixed to where it's not toxic.
A. Absolutely.
Q. Right?
A. Absolutely, which is --
Q. That's what he was saying?
A. -- which is the same for the --
Q. That's what he was saying?
A. -- paraquat project. Yes, that's correct.
Q. Okay. All right.
Would you agree that a fair summary, then, would be that it would be fruitless to try to determine the reasons but they should focus on making paraquat safer in the future?
A. I would agree, and Dr. Heylings then became, actually, the project leader of part of that effort that followed.
Q. Right.
Since the original series of correspondence in 1990, how many times has Dr. Heylings raised the issue of the lack of effectiveness of the emetic in paraquat,

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the lack of data supporting Dr. Rose's conclusions and the fact that the level of emetic in Syngenta's paraquat products needed to be raised considerably to save lives? How many times?
A. Well, I can't give you an accurate number but what I can tell you is that from that period onwards, when, as I've just said, Dr. Heylings became, in part, a scientist leading our efforts to do exactly what it said here, a combination of something that was intrinsically less toxic and increased concentrations of emetic, he was involved in that for 10, 15, 20 years and didn't, in my knowledge, raise again the arguments that we've been talking about now until about two years ago.
MR. TILLERY: Well, let me -- let me move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Since that time, since the time you first raised this, how many times has Dr. Heylings come to the management of Syngenta or ICI and brought this issue to the attention

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of them, saying that people were unnecessarily dying because Syngenta would not pay to put the emetic at the proper level in the product? How many times did he say that to you? Over and --
MR. NARESH: Objection; form, foundation.
THE WITNESS: Well --
BY MR. TILLERY:
Q. Would it be safe to say he said that many times?
A. No, it would not be safe to say that. In my experience, he has made that point in the emails and the discussions we have had with him over the last two years.
So I wouldn't say that was many times. So we've had some discussions and some emails along that theme.
Q. He's actually made the point by filing objections with the United States Environmental Protection Agency recently, too, hasn't he?
A. Yes, he has.
Q. Last year?
A. Yes, he has.

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Q. And he filed it with the World Health Organization, telling them, too, right?
A. That's correct, yes.
Q. He's filed it with other people because he thinks it's so dangerous and lives are being lost needlessly because Syngenta keeps selling this product. That's what he says, doesn't he?
A. That's what he's been saying in the last two years, yes.
Q. And this is a man who worked in this company for many, many years and directed this project, and he's brought this to your attention and pleaded with you to either withdraw the product or fix it so thousands of people don't die unnecessarily.
Is that a fair statement?
A. He has -- he worked with us for the previous 20 years on trying to develop formulations of paraquat which did just that.
Q. Well, let's look at this.
MR. TILLERY: This would be 130, Plaintiff's Exhibit No. 130.
(Botham Exhibit 130 marked for identification.)

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BY MR. TILLERY:
Q. And these are documents that are emails of Dr. Heylings to a Mr. Cook regarding the emetic, with attachments, and it's SYNG-10783241. You've been copied with these, haven't you?
A. Yes, I've seen these emails.
Q. Many of these?
A. I've seen these emails.
Q. And -- right. And there's numbers of them, and we -- the point is is that you -- he's made -- in the last several years he's made constant efforts. He actually asked for a meeting with you, didn't he?
A. Yeah, and we have met with him.
Q. And you met with him and he made a presentation to you, didn't he?
A. He did.
Q. And the purpose of the presentation was to once again ask you to fix the product, wasn't it?
A. It was to lay out the reasons why he felt that there was a case in his mind to increase the level of emetic in paraquat.
Q. Let me ask you something. How many

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people have died as a result of not increasing the level of emetic in the product to the level he requested since he first requested it? Do you know --
MR. NARESH: Object --
BY MR. TILLERY:
Q. -- how many people around the world have died in all these databases you keep of people who die from ingesting this chemical? How many?
MR. NARESH: Objection; form, foundation.
THE WITNESS: I can't give you a number off the top of my head, no, so -- certainly specifically, you can't make a calculation that says how many people have died because we haven't taken Dr. Heylings's view into consideration.
BY MR. TILLERY:
Q. What do you think the regulators around the world would think if they knew that a scientist in your organization had come to you and literally pleaded with you to increase the emetic formulation of your product, when they find this out? What do you

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think the reaction would be?
MR. NARESH: Objection; form, foundation.
THE WITNESS: Well, as you indicate, we already know, for example, that the US Environmental Protection Agency have been informed and one of the facts of the matter is that paraquat, with the levels of emetic that are present, has met the requirements of the WHO, the other organization you describe, what's called the FAO specification.
So there are data which show that it has resulted in emesis/vomiting within the prescribed period of time in the specification of paraquat.
BY MR. TILLERY:
Q. Let me ask you something. How do you know -- how do you know that the US EPA's been informed?
A. Because our US regulatory manager has been informed.
Q. By whom?
A. I can't give you a name. I've not been involved in those discussions.

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Q. Well, I find it interesting that you knew this fact. You know why I find that interesting? Because it's never been made public.

So how is it that you got information from the United States EPA that isn't on the public docket --

A. No, I'm not saying --

Q. -- about Dr. Heylings's objection? How did you find that out? Who told you?

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

THE WITNESS: We found out first of all from Dr. Heylings, first --

BY MR. TILLERY:

Q. Where did you see that? It's not in any of his emails.

A. No --

Q. When did he tell you that?

A. Dr. Heylings told us that verbally.

Q. So there's no record now you know that he told you, right?

It wasn't the regulatory person in the United States who told you. The story drifts a little bit. Now it was Dr. Heylings

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who told you, right?

A. No, no --

Q. Is that right?

MR. NARESH: Objection to form and foundation.

THE WITNESS: Give me a chance to answer this properly. We were first told by --

THE STENOGRAPHER: Sorry, Dr. Botham.

I didn't get the objection.

MR. NARESH: Objection to form and foundation.

THE STENOGRAPHER: Thank you. Sorry, Dr. Botham.

THE WITNESS: So, yeah, let me answer this fully. We were first told by Dr. Heylings verbally about his intention to communicate to the EPA and -- actually, he gave us a name. I can't remember the name of the person but he gave us a name.

Subsequently, our North American regulatory manager received verbal confirmation, I think from the same

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person, that Dr. Heylings had been -- had actually been in communication.

BY MR. TILLERY:

Q. So somebody in the EPA called Syngenta and told them that a report had been filed, right?

A. I don't know if -- I don't believe it happened that way. I think it came up in a regular conversation that it had between our regulatory manager and the person responsible for paraquat at the EPA. Part of the regular calls that they have.

Q. I'm trying to understand how these communications take place when everybody else in America who looks at the US EPA docket is unable to see this communication. How is it that you knew that? Somebody called you and told you.

And let me ask you: Is it odd that it's never been placed in a public docket?

A. All right, two points --

MR. NARESH: Object to the form, foundation and scope.

BY MR. TILLERY:

Q. Let me ask you this, sir. Let me

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just ask you this --

A. Can I answer the question, please?

Q. Sure.

A. Just, first of all, to say it's not accurate, as far as I understand, that we were called by the EPA to tell us that. By all means check this. My understanding is that in a regular call between our regulatory manager and the EPA person, that that subject was mentioned.

Q. Let me ask you, did you or anybody working for Syngenta tell the EPA not to post Jon Heylings's objection about this chemical product and the emetic? Did you suggest that not be publicly filed and posted?

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

THE WITNESS: Having had a number of discussions with my colleagues in the United States, including the regulatory manager, I am almost as certain as I can be -- as I can be -- that no such conversation has been had because our regulatory manager has been regularly monitoring the public docket of the EPA,

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expecting to see that communication from Professor Heylings.
BY MR. TILLERY:
Q. And it has never appeared, has it?
A. It has never appeared and, as far as I am concerned and aware, that lack of appearance is not due to any action that Syngenta has taken.
Q. Okay.
MR. TILLERY: Now let's go to 795, please. Actually, let's go to 497.
I'm trying to get finished here in the last two exhibits, sir, so we get it concluded today, on this topic at least.
This is exhibit number what?
MS. BRUMITT: 131.
MR. TILLERY: 131.
(Botham Exhibit 131 marked for identification.)
BY MR. TILLERY:
Q. If you pull this up.
Okay. Are you familiar with this document?
A. I am.
Q. What is this document?

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A. Well, this is a report of the analysis that I was telling you about previously where Dr. Travis, with support from statisticians, has looked again at the original clinical data on the emetic properties of PP796.
Q. And this is where you reported that Dr. Travis -- strike that.
This is where you referenced Dr. Travis's conclusions or statements, correct?
A. That's right.
Q. All right. If you go to the discussions page at --
MR. TILLERY: If we could pull it up for him, please, he's familiar with it, 976, which is this page of the document.
BY MR. TILLERY:
Q. Under "Discussion." Can you read the discussion, that paragraph and the next one as it continues on to the next page, into the record.
A. "The human clinical data for the emesis caused by PP796 alone are not ideal for

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defining a dose-response. There are no dose groups of any significant size for which half or more of the people vomited. This is reflected in the very wide confidence intervals for the dose resulting in a 50% probability of vomiting at any time. At the second highest dose one out of two people vomited and ..."
Sorry, I can't see the rest.
Q. Yes. We'll get you the rest.
There you go.
A. "and" -- sorry.
"... at the highest dose one out of one vomited. These datapoints are suggestive of a steep dose response (see figure above), but the tiny numbers of people involved mean that these datapoints are highly uncertain and the fitted dose response is therefore also highly uncertain. The data for vomiting within an hour or within 30 minutes are weaker still, and do not support the fitting of a dose-response relationship."
Q. So Dr. Kim Travis also agrees with Dr. Heylings that the human data available to Rose at the time, at best, weakly supported

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Rose's conclusion as to the proper concentration of the emetic at 0.05 percent, correct?
A. I think I've said all along that we agree the data are weak.
Q. Okay. So you agree with the statement I just said, right?
A. I said that the data are weak and therefore you can understand why the conclusions reached by Rose were made in terms of the best endeavors to try and interpret it.
Q. Now why don't you read the next paragraph to yourself.
A. Yes, and the key bit there is to this extent, "despite the many differences in approach, the two analyses produce a similar best estimate of the effective PP796 emetic dose."
MR. TILLERY: I move to strike the question -- or the answer. There was no question on the table.
BY MR. TILLERY:
Q. I asked you to read the document to yourself. Remember.
Now, here's my question. Do you

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agree that a fair summary of this paragraph is that while the data at the time was "incapable of supporting a confident conclusion," that the inclusion of a 0.05 percent emetic would be effective, by luck or whatever you want to call it, experience has proven that Rose was correct --

A. Well --

Q. -- was incorrect.

A. Yeah, would you like to restate that. I don't think you --

Q. Yeah, I think -- experience has shown that Rose was incorrect?

A. No, I don't think -- this is not saying that Rose was incorrect. This whole document is saying that there is so much uncertainty in the data that the judgment that he made is not necessarily wrong.

Q. Okay. There was so much uncertainty, yet there was no indication of that when it was filed with the United States Environmental Protection Agency --

A. No, because at the time the view was that they had made their best effort -- or Rose had made the best effort to estimate

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that effective dose.

Q. Did ICI, Zeneca, Syngenta conduct hospital surveys of paraquat-poisoning incidents in the United Kingdom and --

THE STENOGRAPHER: Sorry, Mr. Tillery. Could you start that one again, sorry, please?

MR. TILLERY: Absolutely, Leah.

BY MR. TILLERY:

Q. Did ICI, Zeneca and Syngenta conduct hospital surveys of paraquat-poisoning incidents in the UK and Asia in the 1980s?

A. Yes, we did.

Q. Did those surveys show any improvement in terms of survival following paraquat ingestion after the emetic being included?

A. Yes. The analyses showed, for example in the United Kingdom, that the emetic was effective in terms of the FAO specification.

MR. TILLERY: Okay. Let's go to the next exhibit. What is it? 132. Let's look at Exhibit 132.

This is Plaintiff's

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Exhibit No. 132. It's SYNG-PQ-04262400.

(Botham Exhibit 132 marked for identification.)

BY MR. TILLERY:

Q. I think this is a document that you've seen recently, sir, probably, as well in your investigation. Have you seen this?

A. I'm not sure I have seen this particular one recently, but let's take a look. It may become more apparent as we look at it.

Q. Absolutely. It's a February 20, 1986 document, and this is SYNG-PQ-04262400.

A. Okay. Is there a particular part of the document you would like me to focus on?

Q. There is, sir. If you could go to 2409. And this is an analysis of ICI Japan Limited referencing the emetic, talking about survival rates, people who have been sick by ingesting it, correct?

A. Okay, yes.

Q. Okay. Why don't you now go towards the end of this, and the value of emetic in the product they sold in Japan, this Gramoxone product. And if you go to page 2409.

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A. Okay. Yes, I'm reading this now.

Q. All right. What's the first sentence say? And this is Dr. Smith speaking, if you want to verify that. The same Dr. Smith, okay.

Actually -- I believe it is. Maybe it's Dr. Calderbank.

A. I --

Q. Can you verify, before you speak, whether this is Smith or Calderbank speaking?

A. Well, could you go -- you need to go to the top of the document again.

Q. It may be -- yes, it's Calderbank, sir. It is Calderbank.

A. Yes.

Q. So if you look at this document, "Value of emetic in ..."

What is that word?

A. "... in Preeglox."

Q. Preeglox, is that what you called a --

A. Preeglox. Yes, it was the trade name.

Q. Trade name. For Gramoxone, right?

A. Yes, yes.

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Q. All right. And let's see what the conclusion here is:
"There is no good evidence that the presence of emetic in Gramoxone-100 (20% paraquat ion) has helped to improve survival of those ingesting the product."
This is 1986, right?
A. Yes.
Q. Ten years -- ten years -- after you started putting it in, correct?
A. Yes.
Q. This is your own doctor.
MR. TILLERY: Now, finally, let's go to 133.
(Botham Exhibit 133 marked for identification.)
MR. TILLERY: This is SYNG-PQ-03709695-9697.
BY MR. TILLERY:
Q. Please take a look at this document.
A. Yes, okay. I can see that and I'm reasonably familiar with the messages here.
Q. And you knew that the French had had a problem with ingestion of this chemical and

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had a lot of deaths, and they demanded a change in the product and one was done.
You knew that, right?
A. Yes.
Q. Do you remember that?
A. Yes, I do.
Q. And you remember that it made a dramatic change in the number of deaths, percentage change, correct?
A. Well, if you go to the second page -- I'm not sure that we -- yeah, here we go. If you just go up a little bit, it says here:
"I am unable to find evidence that paraquat poisoning in France ... has had no effect on reported poisonings or reported deaths ..."
So --
Q. Well --
A. -- I think there was some uncertainty about what the actual clinical data were. I think that's what I understood from this.
Q. Well, let's look at the front page, the very first page. The first paragraph:

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"As a consequence of our recent findings with paraquat formulations containing a higher level emetic PP796, we have examined the effect of the French formulation ... in the dog."
A. Yes.
Q. "This formulation contains 100g/L of paraquat ... and was supplied by ICI Sopra, France.
"This formulation was registered in France following CTL studies in 1986/7. These studies demonstrated that the acute oral LD50 in rats was similar to Gramoxone. However, as far as I'm aware no dog studies were carried out... Since we have identified that 1.5g/L PP796 effectively reduces the toxicity of Gramoxone in dogs by virtue of causing emesis within 30 minutes, we have now examine the safening potential of the French formulation in six dogs.
"... The time to first emesis for the French formulation was 15 +/- 6 minutes at 32mg/kg and 14 +/- 2 minutes at 64mg/kg. The data fits very well with the predicted paraquat AUC versus time to emesis... This is based on a

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curve fit of more than 100 Gramoxone/ Magnoxone ..."
How do you pronounce that? Magnoxone?
A. Magnoxone. Magnoxone.
Q. "... Magnoxone experiments with various levels of emetic."
Then on this next page, he says:
"I would suggest that a 200g/L version of this French paraquat formulation containing the same concentration of PP796 would be equally as safe in dogs and provide a safer ... concentration to Gramoxone.
Then the last sentence, he says:
"If increasing the level of PP796 by 3 fold in France has reduced the number of fatal poisonings, this information would help in resolving some of the technical, regulatory and toxicological issues we [could] face in the development of a Gramoxone or Magnoxone formulation containing 1.5g/L PP796."
Is that what he said to you?
A. Yes, that's right, and I think he was indicating that it was not possible, for whatever reason, to find direct evidence

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that the number of fatal poisonings had reduced.
MR. TILLERY: Move to strike your answer as unresponsive.
BY MR. TILLERY:
Q. Is that what he was reporting to you, what I read?
A. Yeah, and I'm trying to tell you in my response what I think he was saying there, yes.
Q. Right. Yeah, and what I was trying to do was get a straight answer.
Is that what he told you in this letter? Did I read that correctly?
A. You read it correctly, yes.
Q. All right. And do you agree that a combination of dilution prior to sale and higher emetic content would produce a much safer paraquat product and save lives?
A. Clearly, diluting paraquat would make it less toxic. I think the case for how effective changing the emetic is is not as clear, and there's lots of other evidence we could talk about which shows that.
Q. So you don't agree that increasing

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the emetic would make it safer, even after this time, correct?
A. It really isn't --
Q. Is that --
A. It really is not as clear as that. We have increased the level of emetic in other formulations around the world and it's not very obvious that it makes the same degree of safening in human beings as it appears to do in some of these animal models.
BY MR. TILLERY:
Q. How many people have died from intentionally or accidentally ingesting paraquat since you've put it on the market?
MR. NARESH: Objection; foundation.
THE WITNESS: You've asked me that several times and I can't give you a number, I'm afraid.
BY MR. TILLERY:
Q. You have a database, don't you?
A. We have our databases, yes.
Q. And are you saying that's not something you've looked at when you've investigated this issue, this issue that this man has pleaded with you about doing --

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changing? You've not looked at how many people have died?
A. There have been a number of estimates made of that figure, not just by us but by independent people.
MR. TILLERY: Let's go off the record for a moment.
THE VIDEOGRAPHER: We are going off the record. The time is 6:10.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 6:12.
MR. TILLERY: What's our exhibit number at this point? 134.
MR. NARESH: Can we go off the record for one moment, please.
MR. TILLERY: Absolutely.
THE VIDEOGRAPHER: We are going off the record. The time is 6:12.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record. The time is 6:14.
(Technical difficulties.)
THE WITNESS: We can't hear you, Ragan. We can't hear you too well.

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MR. NARESH: Can you hear me now?
THE WITNESS: That's better.
MR. TILLERY: We can.
MR. NARESH: Okay.
So to confirm what we said off the record, plaintiffs are ending for the day but intend to hold the deposition open. As I mentioned at the end of Dr. Botham's two days previously, we do have some redirect examination for this witness and Syngenta does object to the use of any or all of this deposition until we have had an adequate opportunity to do redirect, which I understand my opportunity is not now.
I just wanted to say that on the record.
MR. TILLERY: And Dr. Botham, just so we're just abundantly clear, you will -- you fully intend to maintain your employment through into the early fall, so that if we got something set up in July, that would be compatible with your schedule at Syngenta, correct?
THE WITNESS: That will be okay,

yes, that's correct.
MR. TILLERY: All right. Thank you very much.
Yes, thank you. We can close the record.
And we have people here to remain to help Leah if she needs help with any of the terms or letters, records, documents necessary to complete the record.
Thank you very much, and thank you, Dr. Botham.
THE WITNESS: Thank you.
THE VIDEOGRAPHER: This concludes the deposition. We are going off the record. The time is 6:16.
(The deposition concluded.)

CERTIFICATE OF WITNESS

I, PHILIP BOTHAM, declare that I have read the entire transcript of Volume V of my deposition testimony, or the same has been read to me, and certify that it is a true, correct and complete record of my testimony given on Friday, June 19, 2020, save and except for changes and/or corrections, if any, as indicated by me on the attached Errata Sheet, with the understanding that I offer these changes and/or corrections as if still under oath.

Signed_____
Philip Botham

Signed and subscribed to before me.
this _____ day of _____, 20___.

_____
Notary Public

*** ERRATA SHEET ***
TRANSPERFECT DEPOSITION SERVICES
216 E. 45th Street, Suit 903
NEW YORK, NY 10017
(212) 400-8845
CASE: Diana Hoffmann, et al., versus Syngenta Crop Protection, LLC, et al.
DATE: June 19, 2020 (Volume V)
WITNESS: Philip Botham REF: 27626

PAGE	LINE	FROM	TO

_____
Philip Botham

Subscribed and sworn to before me
this ____ day of _____, 20___.

_____
Notary Public

REPORTER CERTIFICATE
I, LEAH WILLERSDORF, Accredited Verbatim Reporter, Member of the British Institute of Verbatim Reporters (Accreditation No. 166) and Qualified Realtime Reporter (Level 2), International Participating Member NCRA (USA), do hereby certify that: PHILIP BOTHAM appeared remotely before me via Zoom on Friday, June 19, 2020, was sworn by me, and was thereupon examined by counsel; that the foregoing is true and accurate to the best of my knowledge, skill and ability; that the testimony of said witness was taken and reduced to stenotype writing before me; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and further, that I am not a relative or employee of any attorney or counsel employed by the parties thereto; nor financially or otherwise interested in the outcome of the action.
IN WITNESS WHEREOF I have hereunto set my hand this July 1, 2020.

_____
LEAH M. WILLERSDORF
Accredited Verbatim Reporter,
Member of the British Institute
of Verbatim Reporters - Accreditation No. 166,
Qualified Realtime Reporter (Level 2),
International Participating Member NCRA (USA)