

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

--oOo--

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

Plaintiffs,

vs.

Case No. 17-L-517

SYNGENTA CROP PROTECTION, LLC,
et al.,

Defendants.

VIDEOTAPED DEPOSITION OF TIMOTHY PATTERSON, Ph.D.
VOLUME I (PAGES 1 to 215)
WEDNESDAY, MARCH 4, 2020

Reported by:
Anrae Wimberley, CSR No. 7778

Page 2 1 IN THE CIRCUIT COURT 2 TWENTIETH JUDICIAL CIRCUIT 3 ST. CLAIR COUNTY, ILLINOIS 4 --oOo-- 5 DIANA HOFFMANN, individually and 6 as Independent Administrator of 7 the Estate of THOMAS R. HOFFMANN, 8 Deceased, et al., 9 10 Plaintiffs, 11 12 vs. Case No. 17-L-517 13 14 SYNGENTA CROP PROTECTION, LLC, 15 et al., 16 Defendants. 17 _____/ 18 19 20 21 22 23 24 25 Transcript of videotaped deposition of TIMOTHY PATTERSON, Ph.D., VOLUME I, taken at King & Spalding LLP, 101 Second Street, Suite 2300, San Francisco, California 94105, beginning at 9:03 a.m. and ending at 4:47 p.m. on Wednesday, March 4, 2020, before Anrae Wimberley, Certified Shorthand Reporter No. 7778.	Page 4 1 For Defendant Chevron U.S.A. Inc.: 2 HUSCH BLACKWELL LLP 3 BY: JOSEPH C. ORLET, ESQ. 4 BRYAN HOPKINS, ESQ. 5 JENNIFER A. CECIL, ESQ. 6 190 Carondelet Plaza, Suite 600 7 St. Louis, Missouri 63105 8 (314) 480-1500 9 joseph.orlet@huschblackwell.com 10 bryan.hopkins@huschblackwell.com 11 jennifer.cecil@huschblackwell.com 12 13 For Defendant GROWMARK, Inc.: 14 STEPTOE & JOHNSON LLP 15 BY: ANTHONY G. HOPP, ESQ. 16 227 West Monroe Street, Suite 4700 17 Chicago, Illinois 60606 18 (312) 577-1249 19 ahopp@steptoe.com 20 21 22 23 24 25
Page 3 1 APPEARANCES: 2 For Plaintiffs: 3 KOREIN TILLERY, LLC 4 BY: STEPHEN M. TILLERY, ESQ. 5 JOHN C. CRAIG, ESQ. 6 ROSEMARIE FIORILLO, ESQ. 7 One US Bank Plaza 8 505 N. 7th Street, Suite 3600 9 St. Louis, Missouri 63101 10 (314) 241-4844 11 stillery@koreintillery.com 12 jcraig@koreintillery.com 13 rfiorillo@koreintillery.com 14 -and- 15 WALKUP, MELODIA, KELLY & SCHOENBERGER 16 BY: KHALDOUN A. BAGHDADI, ESQ. 17 650 California Street, 26th Floor 18 San Francisco, California 94108 19 (415) 981-7210 20 kbaghdadi@walkuplawoffice.com 21 22 23 24 25	Page 5 1 ALSO PRESENT: 2 JASON LEVIN, ESQ., with Steptoe & Johnson 3 LLP 4 5 HOLLY HARRIS, Senior Counsel 6 Chevron U.S.A. Inc. 7 6001 Bollinger Canyon Road 8 San Ramon, California 94583 9 10 WANITA BRUMITT, Paralegal with Korein 11 Tillery, LLC 12 13 VERITEXT LEGAL SOLUTIONS 14 DAVID OSGOOD, VIDEOGRAPHER 15 16 17 --oOo-- 18 19 20 21 22 23 24 25

Page 6 1 I N D E X 2 EXAMINATION BY: PAGE 3 MR. TILLERY 12, 114 4 5 --oOo-- 6 E X H I B I T S 7 8 EXHIBIT DESCRIPTION PAGE 9 Exhibit 1 Amended Notice of Video 20 10 Evidence Deposition of Chevron 11 U.S.A. Inc.; 30 pages 12 13 Exhibit 2 Chevron U.S.A. Inc.'s 21 14 Supplemental Designation of 15 Witnesses and Identification 16 of Documents in Response to 17 Plaintiffs' Rule 206(a)(1) 18 Notice of Video Evidence 19 Deposition; 15 pages 20 21 22 23 24 25	Page 8 1 E X H I B I T S (Cont'd) 2 EXHIBIT DESCRIPTION PAGE 3 Exhibit 7 Memo dated 11/6/81 from Chevron 73 4 Chemical Company to Imperial 5 Chemical Industries PLC; Bates 6 CUSA-00099528 thru 530 7 8 Exhibit 8 Addendum to License Agreement 74 9 dated 4/15/75 between Imperial 10 Chemical Industries PLC and 11 Chevron Chemical Company; Bates 12 CUSA-00099531 thru 577 13 14 Exhibit 9 Letter dated 12/10/86 from Wong 115 15 to Byrne w/attachments; Bates 16 CUSA-00308485 thru 488 17 18 Exhibit 10 Paraquat study spreadsheet; 115 19 Bates CUSA-00265716 thru 720 20 21 Exhibit 11 U.S. Patent No. 2,972,528; 139 22 4 pages 23 24 Exhibit 12 Article entitled, "The Viologen 149 25 Indicators"; 15 pages
Page 7 1 E X H I B I T S (Cont'd) 2 EXHIBIT DESCRIPTION PAGE 3 Exhibit 3 Agreement dated 5/4/64 between 48 4 Imperial Chemical Industries 5 Limited and California Chemical 6 Company Ortho Division; Bates 7 Chev-PM_0004876 thru 891 8 9 Exhibit 4 License Agreement dated 61 10 4/15/75 between Imperial 11 Chemical Industries Limited 12 and Chevron Chemical Company; 13 Bates CUSA-00075147 thru 152 14 15 Exhibit 5 Distributorship Agreement 65 16 dated 4/15/75 between Imperial 17 Chemical Industries Limited and 18 Chevron Chemical Company; Bates 19 CUSA-00118611 thru 628 20 21 Exhibit 6 Distributorship Agreement 70 22 dated 4/15/75 between ICI 23 United States Inc. and Chevron 24 Chemical Company; Bates 25 CUSA-00075161 thru 196	Page 9 1 E X H I B I T S (Cont'd) 2 EXHIBIT DESCRIPTION PAGE 3 Exhibit 13 Index; 4 pages 187 4 5 Exhibit 14 Letter dated 11/14/85 from 206 6 Ospenson to Sullivan 7 w/attachments; Bates 8 CUSA-00343002 thru 010 9 --oOo-- 10 11 QUESTIONS WITNESS INSTRUCTED NOT TO ANSWER: 12 (None) 13 14 --oOo-- 15 16 17 18 19 20 21 22 23 24 25

3 (Pages 6 - 9)

Page 10 1 WEDNESDAY, MARCH 4, 2020; SAN FRANCISCO, CALIFORNIA; 2 9:03 A.M. 3 - - - 4 THE VIDEOGRAPHER: Good morning. 5 We are going on the record at 9:03 a.m. on 6 March 4th, 2020. 7 Audio and video recording will take place 8 unless all parties agree to go off the record. This 9 is Media Unit 1 of the video-recorded deposition of 10 Mr. Tim Patterson -- Dr. Tim Patterson. 11 Chevron U.S.A. Incorporated in the matter 12 of Diana Hoffmann, et al., vs. Syngenta Crop 13 Protection LLC, et al., filed In The Circuit Court, 14 Twentieth Judicial Circuit, St. Clair County, 15 Illinois, Case No. 17-L-517. 16 This deposition is being held at 17 101 Second Street, Suite 2300, in San Francisco. 18 My name is David Osgood and I'm the 19 videographer and notary public with Veritext Legal 20 Solutions. And the court reporter is Anrae 21 Wimberley, also with Veritext. 22 Counsel, would you please state your 23 appearances for the record. 24 MR. TILLERY: For the plaintiffs, Steve Tillery 25 of Korein Tillery.	Page 12 1 Okay. I guess they are in agreement. 2 For the record, I'll note that this is a 3 deposition of an adverse party or agent, a corporate 4 designee deposition. I'll be conducting this 5 deposition in accordance with Section 2-1102 of the 6 Illinois Code of Civil Procedure, Citation 7 735-ILCS 5/2-1102. 8 TIMOTHY PATTERSON, Ph.D., 9 sworn as a witness by the Certified 10 Shorthand Reporter, testified as follows: 11 EXAMINATION 12 BY MR. TILLERY: 13 Q. For the record, would you state your name, 14 sir. 15 A. Timothy Patterson. 16 Q. What's your date of birth? 17 A. June 24th, 1979. 18 Q. And what's your home address? 19 A. 496 Gray Court, Benicia, California 94510. 20 Q. And your business address? 21 A. Business address is 6001 Bollinger Canyon 22 Road, San Ramon, California. 23 Q. Have you ever given a deposition before? 24 A. Yes, I have. One time before. 25 Q. And what was that in connection with?
Page 11 1 MS. FIORILLO: Rosemarie Fiorillo for the 2 plaintiffs. 3 MR. CRAIG: John Craig for the plaintiffs. 4 MR. LEVIN: Jason Levin for Chevron. 5 MR. HOPP: Anthony Hopp for GROWMARK. 6 MR. BAGHDADI: Khaldoun Baghdadi, Walkup 7 Melodia, for plaintiffs. 8 MS. CECIL: Jennifer Cecil for Chevron. 9 MR. HOPKINS: Bryan Hopkins for Chevron. 10 MR. ORLET: Joe Orlet for Chevron. 11 MS. HARRIS: Also present, Holly Harris. 12 THE VIDEOGRAPHER: Okay. Thank you very much. 13 Would Anrae please swear in the witness. 14 (Witness sworn.) 15 MR. TILLERY: Before we begin, we should 16 probably announce an agreement or stipulation to 17 waive the necessary requirements of reading by the 18 videographer into the record pursuant to Illinois 19 Supreme Court Rule 206. 20 Is Chevron okay with that? 21 MR. ORLET: Yes. 22 MR. TILLERY: Is GROWMARK okay with that? 23 MR. HOPKINS: Yes. 24 MR. TILLERY: And is Syngenta in agreement with 25 that?	Page 13 1 A. It was in connection to benzene. 2 Q. As an employee of Chevron? 3 A. Correct. Sorry. As an employee of 4 Chevron U.S.A. 5 Q. Were you a corporate designee at that 6 time? 7 A. Yes, I was. 8 Q. So this is your second go at being a 9 corporate designee? 10 A. Correct. 11 Q. What is your highest degree in -- 12 educational degree you've achieved? 13 A. I have a Ph.D. in pharmacology and 14 toxicology from the University of California at 15 Davis. 16 Q. And what is your current job title and 17 responsibility at Chevron? 18 A. I'm a senior toxicologist at Chevron 19 responsible for conducting evaluations on chemicals, 20 primarily for the lubricant additive business, which 21 includes conducting toxicity assessments, the 22 necessary animal toxicology testing, as well as 23 preparing the notification and registration for 24 global commercialization and registration of those 25 chemicals.

Page 14 1 Q. And when did you start working at Chevron 2 or any related entity of Chevron? 3 A. I first started working at Chevron in 4 April of 2007. 5 Q. And could you give me your employment 6 history before 2007. 7 A. Before 2007, I was a graduate student at 8 UC Davis followed by about a three- or four-month 9 postdoctoral research position, also at UC Davis. 10 Q. Working for Chevron was your very first 11 full-time position? 12 A. Correct. 13 Q. What was your first job at Chevron? 14 A. My first job was also as a toxicologist, 15 similar to the responsibilities I have now, but 16 they've all grown over time since then. 17 Q. What entity did you start your employment 18 with at Chevron? 19 A. I'm sorry. Can you please clarify. 20 Q. What was the name of the corporate entity 21 or company that you worked for? 22 A. Within Chevron, it's Energy Technology 23 Company. It's an internal Chevron business 24 operating company that's responsible for providing 25 toxicology and other scientific consulting services	Page 16 1 learning about it in my standard coursework at 2 UC Davis as an undergraduate. 3 Q. What year would that have been? 4 A. It would have most likely been in 1999 5 during my junior year when I was taking toxicology 6 courses. 7 Q. And after that, what was your next 8 connection with paraquat? 9 A. My next interaction with paraquat would 10 have been in preparation for this deposition, and 11 that would have started in the middle of January. 12 Q. Okay. So we're clear, in a course in 13 school in 1999, you studied something about 14 paraquat? 15 A. Correct. 16 Q. And then there was a hiatus of roughly 21 17 years; correct? 18 A. Correct. 19 Q. Okay. And then you started working with 20 counsel, presumably, preparing to answer questions 21 in this deposition? 22 A. Correct. 23 Q. And that started in the middle of January? 24 A. I believe I was asked by e-mail on 25 January 9th, and I started looking into paraquat and
Page 15 1 throughout Chevron. 2 Q. In other words, your separate company 3 services all of the separate corporate entities 4 under the Chevron umbrella? 5 A. Correct. 6 Q. Is it a standalone separate legal 7 corporation? 8 A. I don't believe so, but I would need to 9 double-check to make sure. 10 Q. So the name of the company that you get 11 your check from is? 12 A. The name of the company I get my check 13 from is Chevron U.S.A. 14 Q. Chevron U.S.A.? 15 A. Correct. 16 Q. When was the first time that you had any 17 connection with paraquat? 18 A. Would you please clarify if you're 19 referring to my time at Chevron or -- 20 Q. At any time, when you studied it or when 21 you maybe did research with it, maybe you worked 22 with it, maybe you applied it. 23 What was your very first connection or 24 association with the chemical paraquat? 25 A. My first recollection of paraquat was	Page 17 1 doing -- and starting my reviews shortly thereafter. 2 Q. Okay. Would it be fair to say you've 3 never, ever worked with paraquat? 4 A. Until this deposition, when I was 5 reviewing it, that is correct. 6 Q. When I say "work" with it, I mean as a 7 product manufactured by the company you work for. 8 A. That's correct. Chevron has been out of 9 this business for quite a long time, so there would 10 have been no reason to work with it. 11 Q. Now, in the interim from your first 12 employment at Chevron until now, what jobs have you 13 occupied? Briefly, please. 14 A. So I was a toxicologist up until about 15 2011, when I took over as toxicology team lead for 16 about six months supervising a group of about 10 17 other toxicologists. 18 In 2012, I left Chevron and worked as a 19 toxicologist at Boeing. 20 And then I returned to Chevron in 2013, 21 also as a technical team leader supervising 22 toxicologists up until about three years ago when I 23 returned to being a purely technical contributor as 24 a toxicologist. 25 Q. What was your work at Boeing?

Page 18 1 A. So my work at Boeing was also related to 2 toxicology of chemicals, such as flame retardants, 3 paints, fire extinguishing materials. 4 Q. What kind of materials do you work with 5 generally at Chevron? 6 A. In general, I'm primarily responsible for 7 chemical additives, so lubricating additives. An 8 example of that is the Techron fuel additive at 9 gasoline stations. So when you see the "Chevron 10 with Techron," I evaluate the -- those fuel 11 additives and lubricant additives that go into the 12 car engine oils. 13 Q. Have there been other products you've 14 worked with, or is that generally what you've worked 15 with at Chevron? 16 A. That's generally what I've worked on, but 17 being a senior toxicologist, I've also helped other 18 toxicologists, either through peer review on other 19 chemicals and products that are relevant for 20 Chevron, such as the upstream business and 21 downstream business, such as gasoline and 22 manufactured products. 23 Q. Do you understand that you're testifying 24 today as the corporate designee of Chevron? 25 A. Yes, sir, I do.	Page 20 1 Q. Do you understand that? 2 A. I do. 3 Q. Okay. Can we agree then to refer to all 4 three of these entities as "Chevron" for purposes of 5 this deposition? 6 A. Yes, sir. 7 Q. So when I use the word "Chevron," I mean 8 to include all of the Chevron entities I mentioned 9 that had anything to do with paraquat. 10 A. Yes, sir. 11 Q. All right. You understand that Chevron's 12 designated you to speak about certain topics; right? 13 A. Yes, sir. 14 Q. And this is not new to you. You indicated 15 you had done this before. 16 A. Quite a while ago, but, yes. 17 Q. And you understood -- you were probably 18 given topics to look at and research and provide 19 information for and then gave a deposition with 20 respect to those particular subject matter topics; 21 correct? 22 A. Correct. 23 MR. TILLERY: This is the notice of deposition. 24 (Plaintiffs' Exhibit 1 was marked.) 25 BY MR. TILLERY:
Page 19 1 Q. What did you understand your role to be in 2 that capacity? 3 A. I understand my role to present what 4 Chevron knew about the toxicology and related 5 matters related to toxicology of paraquat prior to 6 1986, when they stopped distributing paraquat 7 starting in the 1964, '65 time period. 8 Q. Do you understand that when I use the word 9 "Chevron," I also mean to include Chevron U.S.A.'s 10 corporate predecessors? 11 Do you understand that from the notice? 12 A. Yes, sir. 13 Q. And that includes Chevron Chemical Company 14 LLC and Chevron Phillips Chemical Company LP, do you 15 understand that? 16 A. I understand that Chevron Chemical. 17 Regarding Chevron Phillips, that does confuse me a 18 little bit. 19 Q. What I mean to do is to include all 20 aspects of Chevron's work with paraquat and ICI and 21 the formulation distribution of paraquat in the 22 United States. And I mean to include that with 23 respect to any other entity that preceded them in 24 this business. 25 A. Yes. I understand. Thank you.	Page 21 1 Q. Handing you what's been marked as 2 Plaintiffs' Exhibit No. 1. This is your amended 3 notice of video evidentiary deposition in this case. 4 Do you see that? 5 A. Yes. 6 Q. And you notice in the back there are a 7 number of topics that are attached to it; correct? 8 A. Correct. 9 MR. TILLERY: And then there was a designation 10 made by Chevron, and we'll call that Exhibit No. 2. 11 (Plaintiffs' Exhibit 2 was marked.) 12 BY MR. TILLERY: 13 Q. And this is a designation by Chevron, in a 14 supplemental form, of the topics that you would 15 respond to. 16 A. Correct. 17 Q. And then I understand that that's been 18 amended somewhat because you've adopted two or three 19 more topics from Gina Lee's group? 20 A. Yes, sir, that's correct. 21 Q. And what are those numbered topics? I 22 guess 2, 4 and 6, was it? 23 A. I would need to double-check the numbers. 24 Q. Go ahead and look at them. 25 MR. ORLET: These are the old ones.

Page 22 1 MR. TILLERY: Right. She sent an e-mail, so I 2 just wanted to confirm the topic numbers. 3 MR. HOPKINS: This is the notice, the exhibit. 4 MR. ORLET: Look on -- 5 MR. HOPKINS: Exhibit 1. 6 MR. ORLET: Go back to 1. It's got it. It's 7 on here. 8 THE WITNESS: Okay. 9 Yes, sir, 2, 4 and 6. 10 BY MR. TILLERY: 11 Q. 2, 4 and 6 and the remaining topics on 12 Exhibit No. 2? 13 A. Yes, sir. 14 Q. Is that correct? 15 A. Yes, sir. 16 Q. You've reviewed those topics at length, 17 haven't you? 18 A. Yes, sir, I have. 19 Q. Can we, for purposes of this deposition, 20 refer to those topics as "the designated topics"? 21 A. Yes, sir. 22 Q. Do you understand that in testifying for 23 Chevron on the designated topics, you're required to 24 answer not based solely on information known or 25 available to you personally, but also on information	Page 24 1 Q. Do you understand that in testifying for 2 Chevron on the designated topics, the matters on 3 which you're required to testify cover the entire 4 period of Chevron's involvement with paraquat? 5 A. I do, yes. 6 Q. Did you take that into account in 7 preparing to testify? 8 A. Yes, I did. 9 Q. Are you prepared to testify on the 10 designated topics about matters that cover the 11 period from the beginning of Chevron's involvement 12 even before they first started distributing the 13 product, early 1960s? 14 A. Yes, there are documents that I reviewed 15 that were -- before the 1964 time frame, and so I'm 16 capable of commenting and representing those 17 documents, yes, sir. 18 Q. Do you understand that in testifying for 19 Chevron on the designated topics, the matters on 20 which you're required to testify, are not limited to 21 the knowledge and actions of Chevron, but also 22 include the knowledge and actions, with respect to 23 paraquat, of any predecessor entity or related 24 entity? 25 A. Would you please clarify.
Page 23 1 known or reasonably available to Chevron? 2 A. Yes, sir. 3 Q. Did you take that into account in 4 preparing to testify on the designated topics, sir? 5 A. Yes, sir. 6 Q. Are you prepared to testify for Chevron on 7 the designated topics based on information known or 8 reasonably available to Chevron? 9 A. Yes, sir. 10 Q. Do you believe your preparation has given 11 you sufficient information to testify for Chevron in 12 each of the designated topics? 13 A. Yes, sir. 14 Q. Okay. So there are none of the topics, as 15 far as you know, for which you believe you don't 16 have sufficient information to testify; is that a 17 correct statement? 18 A. Can you please clarify. 19 Q. Yes. 20 Do you believe your preparation -- strike 21 that. 22 So there are none of the topics for which 23 you believe you don't have sufficient information to 24 testify? 25 A. I agree, correct.	Page 25 1 Q. Let me explain it to you this way: The 2 group that you're involved with, which services the 3 entire corporate structure of Chevron, including 4 many different subsidiary or affiliated companies, I 5 mean to include anything where research or science 6 or any other part of the umbrella of Chevron 7 companies contributed to knowledge that you might 8 rely upon in answering questions about the 9 designated topics. 10 A. Yes, sir, I understand. And that's 11 correct. 12 Q. And you've taken that into account in 13 preparing to testify on the designated topics; 14 correct? 15 A. Yes, I have. 16 Q. Did you have any documents available to 17 you personally that you reviewed in preparation for 18 your testimony that weren't given to you? 19 A. Yes, sir, I did. 20 Q. What were those? 21 A. Well, the first thing I did was consulted 22 my old toxicology textbooks to refamiliarize myself 23 with paraquat, the toxicology of paraquat. And then 24 I also looked for regulatory evaluations on 25 paraquat.

Page 26 1 And so, for example, there's an EPA 2 pesticide registration document. There's a document 3 from Australia. There's also a European Union 4 document assessing paraquat. So I looked at those 5 documents as well. 6 Q. And who wrote your old textbook on 7 paraquat? 8 A. So -- 9 MR. ORLET: Object to the form. 10 Go ahead. 11 THE WITNESS: So the one I looked at the most 12 was Goodman and Gilman, which is a toxicology book. 13 BY MR. TILLERY: 14 Q. Is that the one you used in school? 15 A. That was one of the ones I used in school. 16 Q. Goodman -- 17 A. Goodman and Gilman is one of them. 18 Q. Okay. Was there any other personally 19 available document that you consulted or relied upon 20 in preparation for this deposition? 21 A. There were articles that I found that I 22 would have looked at as I was reviewing paraquat. I 23 don't recall exactly what they were, but there were 24 various references, for example, that the EPA would 25 have used when they were doing their assessment that	Page 28 1 company in the mid 1980s, to understand if he was 2 aware of anything with paraquat. 3 I also spoke with Andrew Glickman, who's a 4 retired Chevron toxicologist and was a unit manager 5 of my group. And he started in the early 1980s as a 6 Chevron toxicologist. 7 I spoke to Janette Cushman, who is a 8 retired Chevron toxicologist, who also started in 9 the early 1980s in the testing group. 10 I spoke to Heidi Erickson, who is an 11 epidemiologist at Chevron. 12 I spoke with John Ford, who is a retired 13 toxicologist from Chevron. 14 I spoke to Richard Cavalli, also a retired 15 toxicologist. 16 And I spoke to Richard Zimmerman, also a 17 retired toxicologist. 18 And I apologize, John Ford, Richard 19 Cavalli and Richard Zimmerman were all in the -- 20 around the '70s, early '80s time frame. 21 And I believe that's a complete list, but 22 there might be one or two that I don't recollect at 23 the current time. 24 Q. Who was the person you spoke to first? 25 A. The person I spoke to first was Katherine
Page 27 1 I would have at least reviewed very briefly just to 2 understand a little bit more of what the EPA was 3 referring to. 4 Q. Did you collect or make notes of the 5 documents and data that were available to you 6 personally that you reviewed in preparing to testify 7 on the designated topics so that Chevron's attorneys 8 could produce those documents and data to us? 9 A. I didn't take notes on those documents. 10 No, I did not take notes on those documents. 11 Q. In preparing to testify on the designated 12 topics, did you communicate with anyone to obtain 13 information that wasn't known or available to you 14 personally? 15 A. Yes, sir, I did. 16 Q. Give me the list of the people you talked 17 to. 18 A. Would you like their titles as well? 19 Q. Yes. 20 A. Okay. So I first started out speaking to 21 the Chevron toxicologist. Her name is Katherine 22 Kraft. And she is the toxicologist that has been at 23 Chevron the longest in her current capacity. 24 I also spoke to William Gala, who is an 25 environmental toxicologist, but started in the	Page 29 1 Kraft. 2 Q. And which of these people -- by my notes, 3 you've listed about nine different people. 4 Which of these people had direct 5 experience working with paraquat? 6 A. That would have been Richard Zimmerman, 7 John Ford and Richard Cavalli. Janette Cushman 8 also -- one of the reasons why I talked to her was 9 because she was listed on a toxicology testing 10 report with a paraquat formulation. So by that, I 11 took it that she was at least involved in the 12 testing part of it, but she did not recall ever 13 doing anything, other than the testing, related to 14 paraquat. 15 Q. And what was Mr. Cavalli's job, 16 responsibility, title when he was at Chevron? 17 A. I believe his job title was toxicologist. 18 I don't know the specific job title he would have 19 had other than a Chevron toxicologist. 20 Q. Do you know what his responsibility was? 21 A. So I know towards the end, he was more of 22 a manager, but during the late -- well, the early 23 '70s -- around 1970 is when he told me that he 24 started to get involved with paraquat. So he was 25 closely involved and connected with the toxicity of

Page 30 1 paraquat through the '70s and into the '80s. 2 Q. Did you rely upon information that he gave 3 you? 4 A. Yes, sir, I did. 5 Q. To help you answer questions related to 6 which topics? 7 A. Related to the toxicology of paraquat, as 8 well as decisions made regarding any testing that 9 would have been done by Chevron related to paraquat, 10 as well as for a better understanding of the 11 relationship between Chevron and ICI during that 12 time period. 13 Q. And do you think, from all of the 14 discussions you've had with these scientists, 15 whether they're current or former employees of 16 Chevron, you have a good, solid, complete and 17 accurate understanding of the tests and studies that 18 were undertaken by Chevron with respect to paraquat? 19 A. Yes, sir, I do. 20 Q. You mentioned a Mr. Ford. 21 A. Yes, sir. 22 Q. When did he retire from the company? 23 A. I don't recall when he retired. 24 Q. What was his title or responsibility when 25 he was at Chevron?	Page 32 1 Q. Is that where Mr. Cavalli and Mr. Ford 2 were located? 3 A. I don't know for sure, but I believe they 4 were in Richmond, but I would have to double-check. 5 Q. And you mentioned Mr. Zimmerman. 6 What was his role with paraquat? 7 A. So Mr. Zimmerman had -- was the contract 8 testing supervisor at Chevron, but he also was 9 involved with the paraquat toxicology. So he was -- 10 he had projects across both a product toxicology 11 group as well as a testing group. 12 So he would have been responsible for 13 any -- a lot of the testing that was done 14 externally, ensuring that the testing was done 15 appropriately and auditing the lab. And then he was 16 also providing support to Mr. Cavalli and Mr. Ford 17 in terms of the paraquat toxicology. 18 Q. Do you know who Mr. Zimmerman was 19 technically employed by when he was there? 20 I should withdraw the question. 21 Do you know who Mr. Zimmerman was 22 technically employed by when he was at Chevron? 23 A. I don't know. I know who he reported to, 24 but I don't know exactly -- I'm sorry. I don't 25 know.
Page 31 1 A. He was a toxicologist in the products 2 group responsible for product support and toxicology 3 assessments. 4 Q. And did Mr. Ford -- strike that. 5 Do you know, in terms of what his 6 relationship is -- was with Mr. Cavalli, whether he 7 was a superior or reported to Mr. Cavalli? 8 A. I believe that Mr. Ford reported to 9 Mr. Cavalli. 10 Q. Okay. And can you tell me what the chain 11 of command was at that time in terms of Chevron 12 employees with respect to the toxicology, the 13 testing, the health science of paraquat? 14 A. I don't recall the hierarchy in terms of 15 the structure of the business. I do know that in 16 the late '70s, there were essentially two toxicology 17 groups. One was the product toxicology side, and 18 that is where Mr. Ford and Mr. Cavalli were; and 19 then there was a testing -- essentially a testing 20 laboratory and a contract testing group that was 21 responsible for doing the actual toxicology studies. 22 Q. So where were they located? 23 A. They were -- I believe both groups were in 24 California. I know that the toxicology testing was 25 located in Richmond, California.	Page 33 1 Q. And what is the Chevron Environmental 2 Health Center? 3 A. The Chevron Environmental Health Center is 4 a group of toxicologists, and that would have been 5 the group that Richard Cavalli and John Ford would 6 have been a part of. 7 Q. Now, have we discussed -- withdraw that. 8 What information did Mr. Ford provide you 9 in terms of your ability to answer particular 10 questions about designated topics? 11 A. So I discussed with Mr. Ford similar 12 topics as I did with Mr. Cavalli. With Mr. Ford, it 13 was also related to the poison control line that he 14 was instrumental in setting up in the early '70s and 15 I believe came online in 1974. 16 So I spoke to him about that, as well as 17 the interactions that he had with ICI and the 18 interactions that Chevron had with ICI when they 19 were discussing the toxicology of paraquat, 20 including related to the antidotes and the 21 preventative measures, which is what one of 22 Mr. Ford's major focuses was on. 23 Q. And you said he was in charge of the 24 poison control line. 25 A. That was my understanding. I know he was

Page 34 1 instrumental in setting it up, and I believe he was 2 in charge of it at least at the start. But while he 3 was in charge of it, my understanding is that most 4 Chevron toxicologists would have participated in 5 terms of taking turns on being on call, so to speak, 6 on that line. 7 Q. What is the poison control line? 8 A. So the poison control line is a number 9 that was put on all labels. And not just for 10 paraquat, but on any of the Chevron chemicals' 11 labels, as well as MSDSs. And if there was an 12 exposure or a question for exposure, someone would 13 call that line and get in touch with a Chevron 14 toxicologist. 15 And that poison control line is still part 16 of our toxicology group today. And if you were to 17 go to, for example, a gas station, you can find the 18 Chevron number to call to get in touch with a 19 Chevron toxicologist. 20 Q. Did you talk to any other former employees 21 of Chevron? 22 A. I believe I gave you an exhaustive list, 23 but I'm going off of my memory and I might have 24 missed someone. 25 Q. Okay. Were there any other people that	Page 36 1 what you would get by looking it up and researching 2 it or reading it. In other words, did he take care 3 of sick people who ingested paraquat? 4 A. No, he did not. 5 Q. Has he had any treatment connection with 6 the chemical paraquat? 7 A. Not to my knowledge. What he told me was 8 that he did not. 9 Q. Why don't you tell me what he told you his 10 involvement with paraquat was. 11 A. He didn't have any involvement with 12 paraquat. We actually didn't really discuss much 13 directly about paraquat. I was asking him more 14 about general physiology related to the brain. 15 Q. Were you asking him about Parkinson's 16 disease? 17 A. I wasn't asking him specifically about 18 Parkinson's disease in terms of the etiology. It 19 was more about the physiology of, for example, the 20 blood-brain barrier. 21 Q. And was he knowledgeable of the 22 blood-brain barrier? 23 A. Yes, sir, he was. 24 Q. And has he done research on the 25 blood-brain barrier?
Page 35 1 you haven't told us about that you talked to about 2 the designated topics? 3 A. Yes, sir. There's one person that I 4 remember. He's a medical doctor. His name is 5 Dr. James Allen, and I also spoke to him. 6 Q. And who is Dr. James Allen? 7 A. So he is an M.D. at Chevron. And he 8 was -- throughout his time at Chevron was -- had 9 numerous roles, such as medical director of various 10 business units that Chevron has, foreign -- so he's 11 responsible for the health and well-being of the 12 employee -- of the foreign employees. 13 And recently he came to the health and 14 environmental safety group, where the toxicology 15 group sits, as a consultant to general Chevron 16 health questions and policies that he's trying to 17 answer. 18 Q. When did he start at Chevron? 19 A. I do not know, sir. 20 Q. Did he ever work with paraquat? 21 A. No, he did not. 22 Q. Did he have any personal information about 23 paraquat? 24 A. Would you please clarify "personal." 25 Q. Well, any kind of connection other than	Page 37 1 A. No, I do not believe so. 2 Q. His information comes from his knowledge 3 and training and education -- 4 A. Yes, sir. 5 Q. -- what he's read, effectively? 6 A. Yes, sir. 7 Q. All right. And where did you 8 get -- strike that. 9 What was the source of your information 10 about the disease known as Parkinson's disease? 11 A. So my source of information for 12 Parkinson's disease -- I really didn't look too much 13 into Parkinson's disease. That's not my expertise. 14 So I only have a peripheral understanding of 15 Parkinson's disease, which I got from reading in my 16 toxicology textbooks. 17 Q. But you understand those are topics that 18 you're here to speak about today; right? 19 A. Yes, sir. 20 Q. And you're prepared to answer my questions 21 about those? 22 A. I have a general understanding of 23 Parkinson's disease. 24 Q. Now, these other people, Cushman, Kraft, 25 Glickman, Erickson and there's -- I couldn't

Page 38 1 understand the name. Vallas or Ballas? 2 A. William Gala, G-a-l-a. 3 Q. Gala. 4 A. Gala. 5 Q. I'm sorry. Thank you very much. 6 A. Sorry. 7 Q. Did they have direct work experience with 8 paraquat? 9 A. So Katherine Kraft, Will Gala, they did 10 not. And Heidi Erickson, I don't believe that she 11 did either. 12 Q. So that leaves Glickman? 13 A. Andrew Glickman, he stated that he was -- 14 he provided some support, but only support, he said, 15 related to developing the emetics and different 16 preventative treatments in terms of understanding 17 how the toxicology would change with those being 18 added to paraquat, but he said he only spent a 19 little bit of time and was only a support role. 20 Q. Did he have responsibility for the 21 production of an emetic to apply to paraquat? 22 A. No, sir. He indicated that he was more of 23 a peer reviewer and support for the other 24 toxicologists. 25 Q. Which Chevron toxicologists were	Page 40 1 using emetics. I don't recall reviewing those in 2 the documents. And based on my recollection, 3 Chevron started placing an emetic in a product they 4 called Ortho Paraquat Plus, and I believe that was 5 around 1983. 6 Q. Until 1983 -- from '65 to '83, the product 7 was sold without an emetic; is that your 8 understanding? 9 A. That's my understanding, correct. 10 Q. And an emetic was added -- for the ladies 11 and gentlemen of the jury and for the court, an 12 emetic was added to cause people to vomit when they 13 ingested the chemical; correct? 14 A. Yes. 15 Q. And an emetic is a safety tool that's used 16 by toxicologists, chemists, others designing and 17 making products so that they can force what doctors 18 refer to as reverse peristalsis. 19 Do you understand that term? 20 A. Yes. 21 Q. And they use that to try to save the life 22 of a person who ingests a chemical which would 23 otherwise possibly or likely kill them; is that a 24 fair statement? 25 A. That's a fair statement.
Page 39 1 responsible for producing the paraquat emetic? 2 A. So my understanding, based on the 3 documents that I read and reviewed, was John Ford 4 and Richard Cavalli in conjunction with the research 5 that ICI was doing. That was how they came up with 6 the best emetics or deterrents for paraquat. 7 Q. So it was Cavalli and Ford who researched 8 and produced the emetic that was applied to 9 paraquat; correct? 10 A. From the Chevron side, that's correct. 11 That's my understanding. 12 Q. When you say "from the Chevron side," was 13 there another side to the production of an emetic? 14 A. A lot of that research was done in 15 conjunction with ICI, as well as, I believe, ICI was 16 doing just the research from an early time frame on 17 preventative measures. 18 Q. When was an emetic first placed in 19 paraquat? 20 A. I'm sorry -- 21 MR. ORLET: Object to form. 22 BY MR. TILLERY: 23 Q. When did either ICI or Chevron first add 24 an emetic to paraquat products? 25 A. I don't recall when ICI would have been	Page 41 1 Q. Now, before we leave this group of folks 2 that you talked to and relied upon in terms of 3 information, were there others that worked at 4 Chevron, with respect to paraquat, that are still 5 employed here that we haven't talked about what they 6 told you? 7 A. To the best of my knowledge, there's no 8 one at Chevron that worked with paraquat at that 9 time frame. 10 Q. That's here today? 11 A. That's here today. 12 Q. And so Mr. Cushman didn't provide any 13 information to you? 14 A. Mrs. Cushman. 15 Q. Mrs. Cushman. 16 A. Sorry. She didn't remember anything other 17 than that she said that she might have tested 18 paraquat formulations, but that's all that she 19 remembers. 20 Q. Other than Dr. James Allen and all these 21 other toxicologists, was there anyone else you spoke 22 to in preparation for this deposition? 23 A. Sir, I don't believe so. I'm doing my 24 best to remember. I believe that that is an 25 exhaustive list.

Page 42 1 Q. Okay. And did you read any documents in 2 preparation? 3 A. Yes, sir. I read many documents in 4 preparation. 5 Q. Okay. And those are what are referred to 6 as reliance materials. 7 You understood that? 8 A. I understood the reliance materials. 9 Q. You brought them here with you? 10 A. Yes. 11 Q. So did you also read depositions? 12 A. Yes, sir. 13 And just to further clarify on your 14 previous question. 15 Q. Sure. 16 A. I'm sorry. 17 So the reliance materials, I read those, 18 but I also read a lot more documents than just the 19 reliance materials. I just wanted to clarify that. 20 Q. Did you rely on those other materials in 21 forming your answers to my questions? 22 A. Yes. There may be other documents that 23 would have helped formulate my assessment and 24 review. 25 Q. Are those here with you?	Page 44 1 A. My understanding is that all of those have 2 been turned over to you, but most of the reliance 3 material is a subset of the broader set of 4 documents. 5 Q. Here's what I want to make sure, is that 6 there's not something you're relying upon that has 7 not been disclosed to us. That's what I'm trying to 8 find out. 9 A. To the best of my knowledge, that's 10 correct, sir. 11 Q. Have you read any depositions? 12 A. I have -- I have reviewed some depositions 13 by John Ford and Richard Cavalli. 14 Q. And where were those depositions taken? 15 A. Sir, I don't remember. I apologize. I 16 wasn't -- I didn't look at where they were being 17 taken. 18 Q. Do you have copies of those depositions? 19 A. They would be in the documents provided to 20 you, those depositions. 21 Q. So those are your reliance materials; 22 right? 23 A. So they're not in here. The depositions 24 are not documents that I selected to put in my 25 reliance materials.
Page 43 1 A. Those are not here with me, no. 2 Q. Do you have a list of them so that we 3 can -- 4 MR. ORLET: Steve, it's the other ones that 5 are in -- it's all the other ones that are listed 6 back here. 7 BY MR. TILLERY: 8 Q. So your attorney here today is indicating 9 that the other documents you relied upon have been 10 disclosed to us in discovery in the case. 11 Is that your understanding? 12 A. That is my understanding, sir, correct. 13 Q. And you indicated those documents so they 14 were supplementally disclosed to the other counsel 15 in the case; is that your understanding? 16 A. I'm sorry. Can you clarify -- 17 Q. They were sent to us just last week. 18 Do you understand that? 19 A. Sir, I don't understand when they were -- 20 I don't know when they were sent to you. I 21 apologize. 22 Q. Okay. So you know you found some other 23 documents. You disclosed those to your counsel. 24 It's your understanding those -- all of those have 25 been turned over to us?	Page 45 1 Q. Then explain to me how it is that you came 2 to read them. 3 A. So -- sir, so when I started the 4 evaluation and review, I started with many 5 documents. I believe there were hundreds of 6 documents. And I read through those. And because 7 there were so many documents, to be able to best 8 review and understand and draw conclusions from 9 those documents, I started to narrow them. 10 Because a lot of documents said similar 11 things. A lot of documents had some information, 12 but I focused on those documents that I felt were 13 most helpful and most relevant to what I was 14 preparing for. And so that is how I came to collect 15 my reliance material. 16 Q. Who gave you the depositions? 17 A. It was Chevron attorneys. 18 Q. Okay. You didn't have those in your 19 file -- 20 A. No, sir. 21 Q. So they were given to you to look at? 22 A. They were given to me as an initial set of 23 documents from the attorneys to evaluate. 24 Q. And you can't tell us which case they were 25 in at this point; right?

Page 46 1 A. I can tell you the approximate years. 2 Q. That's fine if you could do that, please. 3 A. So it was Ford from '81, '82 time frame. 4 Then there was a Cavalli from 2003 and I believe 5 also a Ford from 2003. 6 Q. And in what context were the depositions 7 taken? 8 A. I'm sorry. Can you please clarify. 9 Q. Yeah. 10 Was there a lawsuit pending? 11 A. That's my understanding, correct. 12 Q. And what did the lawsuit involve? 13 A. I believe one was related to lung damage 14 caused by paraquat. 15 Q. And the other? 16 A. The other I don't recall. I would have to 17 go back to those and understand -- I apologize. 18 I've reviewed many documents. And the depositions I 19 really just scanned through to ensure that Mr. Ford 20 and Mr. Cavalli's understanding of the toxicology 21 was consistent with the documents that I was 22 reviewing. 23 Q. Did you read any other depositions? 24 A. I believe in the folder of documents that 25 the attorneys first gave me, there was a deposition	Page 48 1 have spoken to or obtained information from to help 2 you answer questions here today? 3 A. Sir, I'm doing my best to remember. I've 4 talked to a handful of people. 5 No, sir. I don't recollect anyone else. 6 Q. Okay. 7 (Plaintiffs' Exhibit 3 was marked.) 8 BY MR. TILLERY: 9 Q. I've handed you a document marked 10 Plaintiffs' Exhibit No. 3. Would you mind taking a 11 look at that, please. 12 A. Yes, sir. 13 (Witness reviews document.) 14 Q. This is a copy of a written agreement 15 dated May 4th, 1964 between Imperial Chemical 16 Industries Limited and California Chemical Company 17 Ortho Division entitled, "Agreement Relating to 18 Paraquat and Herbicidal Formulations Containing 19 Paraquat," isn't it, sir? 20 A. Yes, sir. 21 MR. TILLERY: Counsel, I'm going to go 22 through -- as I told you on Monday, when I called 23 you, I'm going to go through some basics about the 24 relationship, but nothing in detail at this point. 25 Just preliminary to the other questions that I'm
Page 47 1 by Lorin Stelzer. But I didn't really focus on that 2 very much. I don't recall if I actually read it 3 through. I just recall seeing that there was 4 another deposition, but I didn't -- I wouldn't have 5 taken anything from that in terms of my 6 understanding. So I don't think I read that 7 deposition, but that's another one I'm aware of. 8 Q. Approximately what year was that 9 deposition done? 10 A. I believe it was also in 2003, but it may 11 have also been from the early '80s. I can't recall. 12 I apologize. 13 Q. Were there any other depositions that you 14 read? 15 A. No, sir. 16 Q. Did the depositions you read supply any 17 information to you that would help you answer 18 questions about the designated topics? 19 A. There were things in the deposition that 20 were consistent with other themes and conclusions 21 related to paraquat. I would need to go back to 22 those documents to look specifically and see if 23 there's anything there, but nothing specifically. 24 Q. Okay. Now, so we're clear, have there 25 been any other people, to your knowledge, that you	Page 49 1 going to ask. 2 MR. ORLET: And obviously he's not an attorney. 3 So can I have a standing objection -- 4 MR. TILLERY: That would be the other person 5 you've designated. That's not my purpose here. 6 This is just to lay the foundation for sharing of 7 information and knowledge from ICI to Chevron. 8 MR. ORLET: A standing objection to any legal 9 conclusion. 10 MR. TILLERY: Oh, sure. Of course. 11 MR. ORLET: Okay. 12 BY MR. TILLERY: 13 Q. For simplicity's sake, can we refer to 14 this as "the '64 agreement"? 15 A. Yes. 16 Q. And can we refer to Imperial Chemical 17 Industries Limited as "ICI"? 18 A. Please. 19 Q. They were referred to as ICI here, weren't 20 they? 21 A. Yes. 22 Q. Did the 1964 agreement provide that 23 Chevron would consult with ICI about ICI's 24 development of the toxicology information necessary 25 for the approval and registration of paraquat in the

Page 50 1 United States? 2 A. Could you please repeat that. I'm sorry. 3 Are you reading from the contract, sir? 4 Q. I can refer you to it. And that would 5 be -- if you look at the Bates number -- and I'll 6 explain something to you at the beginning of the 7 deposition. You're going to see some documents. 8 And for your purposes, when they were produced to 9 us, they were produced by folders. So the outside 10 folder may have one Bates number. 11 Within those folders might have been a 12 dozen or two dozen separate and distinct documents. 13 So I'll refer to the Bates number that applies to 14 that specific page, and direct you to it, which 15 would be a Chevron document, 0004876. 16 Do you see that? That's the first page 17 number. 18 A. Yes. 19 Q. Now, if you go to page 5 of that document, 20 there's a letter "(b)" at the bottom of the page. 21 A. On page 5? 22 Q. That's actually page 4. It's Bates 23 No. 4880. 24 A. Yes, sir. 25 Q. Do you see that?	Page 52 1 A. Um-hum. 2 Q. -- "of toxicology information necessary 3 for approval and registration by the United States 4 Department of Agriculture." 5 A. Yes, sir. 6 Q. That was the predecessor in terms of 7 registration of pesticides before the EPA, wasn't 8 it? 9 A. Yes, sir. 10 Q. And then it says, "the United States Food 11 and Drug Administration." 12 Do you see that? In the rest of the 13 sentence. 14 A. Yes, sir. 15 Q. What was the role, as you understood it, 16 that the U.S. Food and Drug Administration played in 17 terms of the registration or approval of chemicals 18 at that time? 19 A. I'm not too familiar with the regulatory 20 requirements prior to EPA. I have a general 21 understanding of what was required. I did look in 22 the literature to try to better understand that, 23 but -- and I also talked to the retirees. 24 But I don't have a clear answer for you or 25 an understanding of how the Food and Drug
Page 51 1 A. Yes, sir. 2 Q. All right. And you see -- can you read 3 that? 4 A. Yes, sir. 5 Q. Read that into the record. 6 A. So under 3-2, Subsection (b), "Counsel 7 with P.P.L. in respect of P.P.L.'s development 8 pursuant to Article 3-3(a), below, of toxicology 9 information necessary for approval and registration 10 by the United States Department of Agriculture and 11 the United States Food and Drug Administration of 12 paraquat as an economic poison." 13 Q. Now, who was P.P.L.? 14 A. I believe that stands for Plant Protection 15 Limited, and I believe that's a part of ICI. 16 Q. It was a corporate predecessor affiliate 17 of ICI, wasn't it? You would agree with that? 18 A. Honestly, I don't know the historical 19 structures of ICI. 20 Q. But that's your best understanding from 21 these documents you've reviewed? 22 A. That's my best understanding. And based 23 on frequently encountering P.P.L., yes, sir. 24 Q. And let's go ahead with the rest of that. 25 And it says, "Article 3-3(a)," in parentheses --	Page 53 1 Administration would have been a part of the USDA as 2 far as the registration. 3 Q. So you don't know which one of them had to 4 approve the chemical? 5 A. I believe it was the Department of 6 Agriculture, based on the documents that I've read. 7 I had seen that the FDA was mentioned in some of the 8 documents, which is why I researched to try to 9 understand their role, but I couldn't find anything. 10 But my understanding was it was the Department of 11 Agriculture. 12 Q. So what did the U.S. Food and Drug 13 Administration have to do with the approval? 14 A. Sir, I don't know. 15 Q. Now, continuing on, if you -- under this 16 1964 agreement, ICI was to develop or have developed 17 and furnished to Chevron the toxicology information 18 needed to meet the requirements for obtaining 19 approval; correct? 20 A. Correct. 21 Q. Did they do that? 22 A. Yes, sir, they did. 23 Q. Did Chevron produce any toxicology 24 information necessary to meet the requirements for 25 obtaining approval and registration of paraquat in

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Page 54 1 the United States? 2 A. Sir, I would need to consult a document 3 that I have just to make sure I give you an accurate 4 response. 5 Q. Fine. Go ahead and consult it. And when 6 you consult it, if you would, for purposes of the 7 record, indicate the title of the document and the 8 Bates range and the specific page you're relying on. 9 A. Yes, sir. 10 (Witness reviews document.) 11 A. Sir, the Bates number that I'm referring 12 to is CUSA-00283893. 13 Q. Okay. Go ahead. 14 A. And this is a list of toxicology studies 15 that were submitted in support of the registration. 16 Q. And were they all performed by ICI? 17 (Witness reviews document.) 18 A. They were predominantly performed by ICI. 19 There is a study related to paraquat gen. studies, 20 which I do not believe is a toxicology study, that 21 was a Chevron Chemical Company report. 22 And then there was -- 23 Q. What's the title of that one? 24 A. It is Paraquat Gen. Study Chevron Chemical 25 Report.	Page 56 1 scanned into a database." 2 All of what documents? 3 A. My understanding is the documents related 4 to this case were scanned in, but I don't have a 5 good knowledge of what was taken from the archives 6 or not. That's -- I believe it was everything 7 related to toxicology and paraquat, but I don't know 8 for sure. 9 Q. And how many documents are in this 10 database? 11 A. There's hundreds of documents, possibly -- 12 there's a lot of documents, in the hundreds for 13 sure. 14 Q. Now, if you'd go to the same document, 15 page 4881, those are the last Bates numbers of the 16 page. I believe that's page 6 -- I'm sorry -- 17 page 5. 18 Do you see that? 19 A. I'm sorry. Would you repeat that, please. 20 Q. Yes. 21 If you look at Bates range No. 4881 in the 22 bottom right-hand corner. 23 A. Um-hum. 24 Q. Did the contract that we're talking about, 25 the 1964 agreement that we've referenced, indicate
Page 55 1 Q. And year? 2 A. It does not have a year. 3 Q. What about the other studies; do they have 4 years specified when they were done? 5 A. Yes, sir. Most of the years have years 6 specified. 7 Q. What years? 8 A. This was in the time frame of '64 to '65. 9 Q. So those studies were done just before the 10 registration process? 11 A. Yes. So this is the information that I 12 found that was, I believe, based on my review, what 13 was submitted for the initial registration. 14 Q. Where did you find this document? 15 A. I found this document in -- originally I 16 found this in a compilation of documents that was 17 provided to me by my attorneys. 18 Q. You didn't go to the archives of Chevron 19 to get it. It was given to you; correct? 20 A. This particular one was given to me. I 21 did, however -- not necessarily go to the archives, 22 but my understanding is all the documents were 23 scanned into a database. And I did review that 24 database and look for certain topics on my own. 25 Q. You said, "all [of] the documents were	Page 57 1 that P.P.L. or ICI would, at their expense, 2 "develop, or have the same developed for it, and 3 furnish the necessary toxicology information 4 required to meet and satisfy the requirements for 5 obtaining federal registration of paraquat"? 6 A. I'm sorry. Are you reading from -- 7 Q. Reading from (a), if you look at 3-3(a) -- 8 A. Yes, sir. That's what the document says. 9 Q. That's what it says. 10 And it also says, under (b), "Furnish to 11 Ortho paraquat, cost free F.O.B. point of 12 manufacture, as required." 13 Furnish paraquat, in other words; correct? 14 A. Yes, that's my -- 15 Q. Do you see right below it, (b)? 16 A. Yes, sir. 17 Q. Okay. Why don't you just read it so our 18 record is clear. What does (b) say in the 1964 19 agreement? 20 A. It says, "Furnish to Ortho paraquat, cost 21 free F.O.B. point of manufacture, as required by 22 Ortho for its operations pursuant to Article 3-2." 23 Q. And this was for registration purposes, 24 wasn't it? 25 A. That's my understanding.

Page 58 1 Q. Okay. Was the 1964 agreement preceded by 2 a May 9th, 1960 agreement between P.P.L., Plant 3 Protection Limited, and Ortho California 4 Spray-Chemical Corporation? 5 A. Sir, I'm not aware of a previous agreement 6 per se. I have come across documents before 1964 7 discussing -- where ICI and Chevron discuss 8 paraquat, but this was the first contract that I 9 recall seeing. 10 Q. Why don't you look at 4879 on that 11 document. 12 A. 4879. 13 Q. Under the Heading 2-1. 14 A. Yes, sir. 15 Q. 2-1. 16 A. Um-hum. 17 Q. It says -- 2-1, starting with "P.P.L.," 18 I'll read that into the record and tell me if I've 19 got it right. 20 "P.P.L. has, pursuant to an agreement 21 between P.P.L. and Ortho (California Spray-Chemical 22 Corporation) dated May 19, 1960, heretofore 23 furnished to Ortho certain information relating to 24 paraquat and paraquat-based herbicidal formulations 25 for Ortho's evaluation of the" --	Page 60 1 THE WITNESS: To the best of my knowledge, it 2 was. But I'm not too familiar with the pre-1964 3 dates. 4 BY MR. TILLERY: 5 Q. At some point after it entered into the 6 1960 agreement with P.P.L., California 7 Spray-Chemical Corporation changed its name to 8 California Chemical Company; correct? 9 A. That's my understanding, sir. 10 Q. And at some point after it entered into 11 the 1964 agreement with ICI, California Chemical 12 Company changed its name to Chevron Chemical 13 Company. 14 Did you understand that? 15 A. That's my understanding based on reviewing 16 the documents of how the names changed. 17 Q. For simplicity's sake, can we then agree 18 to refer collectively to Chevron Chemical Company, 19 its predecessors and their Ortho divisions as 20 "Chevron"? 21 A. Yes, sir, that's fine. 22 Q. In 1975, did Chevron enter into a license 23 agreement and separate distribution agreements with 24 ICI and ICI United States? 25 MR. ORLET: If you're going to a new topic, can
Page 59 1 Unfortunately I can't -- do you have the 2 document in front of you? 3 A. I do. I can't make out -- 4 Q. -- something "potential thereof in the 5 United States." 6 A. Yes, sir. That's what the document says. 7 Q. Okay. And have you located that 8 agreement? 9 A. I have not seen that agreement, sir, no. 10 Q. Okay. I think that word is "market 11 potential," if you would look at that phrase. 12 Does that make sense? 13 A. Yeah, I would agree with that. I think it 14 would say -- it could say "market." It's really 15 hard to make out. 16 Q. Right. 17 Now, as of May 19th, 1960, was Ortho a 18 division of California Spray-Chemical Corporation? 19 A. I couldn't say that with certainty, sir. 20 Q. You don't know the answer? 21 A. Would you please repeat the question. 22 Q. As of May 19th, 1960, was Ortho a division 23 of California Spray-Chemical Corporation? 24 MR. ORLET: Object to form. 25 You can answer.	Page 61 1 we take a break? 2 MR. TILLERY: Of course. Sure. 3 THE VIDEOGRAPHER: Off the record at 10:10. 4 (Recess taken.) 5 THE VIDEOGRAPHER: This begins Media Unit 2 in 6 the deposition of Tim Patterson. Going back on the 7 record at 10:25. 8 MR. ORLET: Steve, can I get a standing 9 objection to any questions about asking for a legal 10 conclusion while questioning on this document? 11 MR. TILLERY: Yes, you can. 12 MR. ORLET: Thank you. 13 (Plaintiffs' Exhibit 4 was marked.) 14 BY MR. TILLERY: 15 Q. Sir, would you take a look at Plaintiffs' 16 Exhibit No. 4. 17 A. Yes, sir. 18 Q. This is captioned as a "License 19 Agreement." 20 Do you see that? 21 A. I do. 22 Q. It's dated 15 April 1975? 23 A. Yes. 24 Q. Do you see the number -- at the bottom, it 25 says, "CUSA," C-U-S-A --

Page 62 1 A. Yes. 2 Q. -- Chevron U.S.A. 3 And it starts 00075147. 4 Do you see that? 5 A. I do. 6 Q. "CUSA" you understand is a Bates number; 7 right? 8 A. Yes. 9 Q. And it corresponds with all the pages in 10 that particular document. This was a document 11 produced by Chevron to us in discovery. 12 A. Yes, sir. 13 Q. In 1975, did Chevron enter into a license 14 agreement and separate distributorship agreements 15 with ICI and ICI United States? 16 A. Sir, I'm not an expert on the contracting 17 of it. But based on this document, it looks like 18 there was a licensing agreement. 19 Q. And you understand that Chevron was 20 licensed to formulate, sell and distribute ICI's 21 paraquat products; is that right? 22 A. Yes, that's my understanding. 23 Q. And when did they first start -- just for 24 clarification on this record, when did they first 25 start selling paraquat?	Page 64 1 I don't know. 2 Q. Let me rephrase the question for you and 3 see if it helps. 4 To your knowledge, did any other company 5 ever sell paraquat products from 1965 to 6 September 1986, other than Chevron and ICI? 7 A. To my knowledge, no. But I do recollect 8 in the documents seeing that there were other 9 companies trying to get into the market, but I don't 10 recall if they were selling or not. 11 Q. You don't have any information that any 12 other company, other than the two, Chevron and ICI, 13 sold paraquat in America during that time period 14 from 1965 to 1986; correct? 15 A. I don't have any information that I recall 16 off the top of my head. 17 Q. Now, under this agreement, if you go to 18 5149, 4.1. 19 Would you just read that into the record. 20 A. Page 5149, 4.1? 21 Q. Yes. 22 A. "Chevron on the one part and ICI and 23 ICI-US on the other part shall advise each other of 24 all pertinent patent rights and technical 25 information coming within Article II and Article III
Page 63 1 A. My understanding is -- I would need to go 2 back to the documents and double-check, but I 3 believe it was -- I believe it was 1965, 1966, but I 4 would need to go back and double-check. 5 Q. 1965. 6 And when did they stop? 7 A. They would have stopped distributing it in 8 1986. 9 Q. Were they the exclusive distributor in 10 North America for ICI's paraquat products? 11 A. Sir, my understanding is that they were 12 for some time, but closer to the early '80s, around 13 that time frame, I believe ICIA, the ICI Americas, 14 also distributed paraquat themselves. 15 Q. Okay. Strike that. 16 From the time period that the product was 17 first sold in 1965 in America until Chevron got out 18 of the paraquat business in September 1986, did any 19 other company, to your knowledge, sell paraquat 20 products other than ICI and Chevron in America? 21 A. Sir, I would need to -- in the documents, 22 I recollect that there were companies from other 23 countries trying to get into the market. I 24 recollect that. But I don't recall if there were 25 other companies that were selling into the market.	Page 65 1 hereof on a substantially current basis at the 2 convenience of both parties, but not less than twice 3 a year." 4 Q. Did ICI and Chevron also enter into a 5 partnership -- strike that. 6 Did ICI and Chevron also enter into a 7 paraquat distributorship agreement on April 15th, 8 1975? 9 A. Would you please repeat the question. 10 MR. TILLERY: This is No. 5. 11 (Plaintiffs' Exhibit 5 was marked.) 12 MR. ORLET: Steve, can I have the same standing 13 objection on this document as well? 14 MR. TILLERY: Yes. 15 MR. ORLET: Thank you. 16 BY MR. TILLERY: 17 Q. My question was, did ICI and Chevron also 18 enter into a partnership agreement or distribution 19 agreement on April 15th, 1975 with respect to 20 paraquat? And that's -- if you look at the exhibit 21 marked as No. 5 for purposes of that question. 22 A. Okay. 23 (Witness reviews document.) 24 A. This document is very difficult to read. 25 Q. Right.

Page 66 1 A. I'm sorry. Would you please repeat the 2 question. 3 Q. Let me just reference in this agreement, 4 on 8611, which is the beginning, and the 5 reference -- just to make sure we're clear on the 6 relationship, this references "Agreement made as of 7 the 15th day of April, 1975, by and between Imperial 8 Chemical Industries Limited, an English company," 9 and then it says, "(ICI), and Chevron Chemical 10 Company, a Delaware corporation," referenced 11 "(Chevron'). 12 "Whereas, ICI is currently selling 13 paraquat to Chevron in the United States and Chevron 14 wishes to become ICI's United States distributor of 15 paraquat; and, whereas, ICI wishes to have an 16 experienced and competent distributor for paraquat 17 in such market; therefore, intending to be legally 18 bound hereby, the parties hereto agree as follows." 19 Is that what it says? 20 A. Yes, sir, it does. 21 Q. And that's an agreement dated 1975. Okay. 22 Correct? 23 A. Correct. 24 Q. Did the '75 ICI distributorship agreement 25 require Chevron and ICI to meet at least once a year	Page 68 1 shall give all due consideration to, and not 2 unreasonably reject, ICI's views on such subjects, 3 including, full recognition of ICI's capital 4 investment in its production facilities, and of the 5 international implications of actions taken by 6 Chevron with regard to paraquat, but Chevron 7 reserves the right to act in accordance [within] its 8 own best judgment with respect to such matters." 9 Q. Do you know what that last sentence had 10 reference to when it referenced the words "Chevron 11 shall give . . . due consideration to . . . ICI's 12 capital investment in its production facilities"? 13 Do you know one way or another? 14 A. I'm sorry. Would you please repeat the 15 question. 16 Q. Yes. 17 Do you know what was contemplated or 18 intended by the parties when it said, "Chevron shall 19 give all consideration to, and not unreasonably 20 reject, ICI's views on such subjects"? 21 Do you know what "subjects" was mentioned 22 or referenced there? 23 A. No, sir, I don't believe I do. 24 Q. In all this research you did, did anybody 25 tell you what was intended by that line or comment
Page 67 1 to discuss: One, product toxicity and safety; two, 2 compliance with regulatory laws; and, three, 3 technical and general marketing strategy and 4 techniques, such as formulation, product packs, 5 product development, advertising and label contents? 6 A. Sir, is there a portion of the document 7 you can refer me to? 8 Q. Yes. 9 If you would look at starting at 8619 and 10 carrying over to the following page. 11 Where it says, "Meetings." And if you can 12 read that. 13 A. Out loud, sir? 14 Q. Yes. 15 A. Section 7, "Meetings. The parties hereto 16 shall meet at the reasonable request of either party 17 hereto, but not less frequently than annually, to 18 discuss aspects of product toxicity and safety, 19 compliance with regulatory laws, technical and 20 general marketing strategy and techniques, including 21 but not limited to formulation, product packs, 22 product development, advertising, label contents, 23 et cetera. Chevron shall provide ICI with a 24 detailed report of all sales by Chevron of 25 non-residual, non-selective herbicides. Chevron	Page 69 1 in this document? 2 MR. ORLET: Objection to the scope as well. 3 THE WITNESS: Sir, if you don't mind, I'll read 4 the -- 5 BY MR. TILLERY: 6 Q. You take your time, sir. 7 A. Thank you. 8 Q. Throughout this deposition, if I speak 9 over you, you stop me, and we'll start over. Or if 10 you need more time or you need to take a break, you 11 do that. Just let me know. 12 A. Thank you. 13 Q. Sure. 14 (Witness reviews document.) 15 A. Sir, I've reread the paragraph, and I'm 16 still unclear as to what that would refer to. 17 Q. No one told you what that referred to, did 18 they? 19 A. No, sir. 20 Q. All right. In that same paragraph, it 21 says, "Chevron shall give . . . due consideration 22 to," and then it says -- references, at the last 23 part of the sentence, "of the international 24 implications of actions taken by Chevron with regard 25 to paraquat."

Page 70 1 What was contemplated there? 2 MR. ORLET: Objection to the scope as well. 3 Can I get a standing objection on the 4 scope? 5 MR. TILLERY: Yes. 6 THE WITNESS: Sir, it's hard for me to know, in 7 terms of the order that this is written, what those 8 sentences are referring to. So I don't feel -- I 9 don't feel comfortable being able to decipher what 10 it's referring to. 11 BY MR. TILLERY: 12 Q. So no one that you spoke to in preparation 13 for this deposition who was present at the Chevron 14 company at that time, Mr. Cavalli, Mr. Ford, any of 15 these people, indicated what implications were 16 involved in "international implications of 17 [Chevron's] actions," what that meant? 18 A. Sir, I do not recall anything related to 19 international implications being discussed. 20 Q. Did Chevron also enter into a paraquat 21 distributorship agreement with ICI-US at the same 22 time, April 15th, 1975? And let me show you the 23 next exhibit, No. 6. 24 (Plaintiffs' Exhibit 6 was marked.) 25 BY MR. TILLERY:	Page 72 1 into the record after the word "Meetings" in this 2 distributorship agreement between ICI and Chevron. 3 A. Yes, sir. 4 "The parties hereto shall meet at the 5 reasonable request of either party hereto, but not 6 less frequently than annually, to discuss aspects of 7 product toxicity and safety, compliance with 8 regulatory laws, technical and general marketing 9 strategy and techniques, including but not limited 10 to formulation, product packs, product development, 11 advertising, label contents, et cetera." 12 Q. Okay. Now, when you discussed your 13 upcoming deposition with Mr. Ford and Mr. Cavalli, 14 did they tell you that they had frequent meetings 15 with ICI? 16 A. Yes, sir, they did. They did say that 17 they had frequent meetings with ICI. 18 Q. And they would meet in San Francisco. 19 They would meet in the UK at their research 20 facilities. 21 Where else? 22 A. Sir, that's my understanding, is that they 23 would usually meet twice a year and alternate 24 between locations, either in the Bay Area or 25 somewhere in the UK, but I don't have the exact
Page 71 1 Q. I've handed you what's been marked as 2 Exhibit 6. It bears the CUSA No. 75161 at the 3 beginning page. It's entitled, "Distributorship 4 Agreement"; correct? 5 A. Yes. 6 Q. April 15, 1975; right? 7 A. Yes, sir. 8 MR. ORLET: Same standing objection for this 9 document? 10 MR. TILLERY: Yes. 11 BY MR. TILLERY: 12 Q. Did the 1975 ICI-US distributorship 13 agreement require Chevron and ICI-US to meet at 14 least once a year to discuss: One, product toxicity 15 and safety; two, compliance with regulatory laws; 16 and, three, technical and general marketing strategy 17 and techniques, such as formulation, product packs, 18 product development, advertising and label contents? 19 And if you want the direct reference, that 20 would be 5173 to 5174. 21 A. Thank you, sir. 22 Q. Under the heading "Meetings." 23 Do you see that? 24 A. I do, sir. 25 Q. And would you read the very first sentence	Page 73 1 locations. 2 Q. Okay. 3 MR. TILLERY: No. 7. 4 (Plaintiffs' Exhibit 7 was marked.) 5 BY MR. TILLERY: 6 Q. In 1981, did ICI and ICI Americas, Inc., 7 formally ICI-US, enter into an addendum to the 1975 8 license agreement? And this is Exhibit No. 7 that I 9 just handed you. 10 Do you see that? 11 A. I do, sir. 12 Q. This addendum effectively extended the '75 13 licensing agreement, if you take a look at it; 14 correct? 15 MR. ORLET: Same standing objections? 16 MR. TILLERY: Of course. 17 THE WITNESS: The question is did it extend the 18 same licensing agreement -- 19 BY MR. TILLERY: 20 Q. The '75 agreement. 21 A. Based on the language in this document, 22 that seems to be the case, sir. 23 Q. All right. And the mutual obligation to 24 share technical information about paraquat continued 25 under the 1981 addendum as well, didn't it, sir?

Page 74 1 (Witness reviews document.) 2 A. Sir, I've read through it, and I do not 3 see additional references to the extending of any 4 toxicology or safety meetings. 5 Q. Was it your understanding that, in fact, 6 they continued to exercise that same experience and 7 share information? 8 A. Yes. It's my understanding, as I reviewed 9 the documents, there were meetings that continued 10 after 1981, yes. 11 Q. And that included product safety, 12 toxicology, all the information, presumably, that 13 the businesses needed that reference paraquat; 14 correct? 15 A. Yes, sir. 16 Q. And let's look at the next exhibit, which 17 is No. 8. 18 (Plaintiffs' Exhibit 8 was marked.) 19 BY MR. TILLERY: 20 Q. This is an addendum to license agreement. 21 Do you see this? 22 A. Yes, sir. 23 Q. Dated -- what's the date of the agreement, 24 sir? 25 A. It states in the first paragraph --	Page 76 1 top of the page, "Safety." 2 A. Sir, would you mind if I skimmed -- 3 Q. Of course. Yes, take your time. 4 (Witness reviews document.) 5 A. I'm now at No. 10. 6 Q. Do you remember my question, or do you 7 want me to repeat it? 8 A. Would you repeat it, please. 9 Q. Sure. 10 Under this 1981 distributorship agreement, 11 did Chevron and ICI agree that they would meet at 12 the reasonable request of either party, but not less 13 frequently than annually, to discuss aspects of 14 product toxicity and safety, compliance with 15 regulatory laws and technical matters? 16 A. Yes, sir. That's No. 10. 17 Q. As far as you know, they did that? 18 A. Yes, sir. 19 Q. And they shared information by letter and 20 other means, didn't they? 21 A. Yes, sir. There was other communications, 22 other than the meetings. 23 Q. Tell us how they communicated. 24 A. So there were various -- I saw a few 25 telegrams where they communicated, but most of the
Page 75 1 Q. I'm sorry. It's on the second page. I 2 apologize. That's the signature page. 3 It would be 99533. 4 Do you see where it says, "Agreement"? 5 A. I do, sir. November 6th, 1981? 6 Q. Yes. 7 And that says, "Agreement made as of the 8 6th day of November, 1981, by and between ICI 9 Americas, Inc., a Delaware corporation," referenced 10 as "(ICIA)", and Chevron Chemical Company, a 11 Delaware corporation," referenced as "(Chevron)"; 12 right? 13 A. Yes, sir. 14 Q. And under the 1981 distributorship 15 agreement, did Chevron and ICI agree to meet at 16 least annually to discuss aspects of product 17 toxicity and safety, compliance with regulatory laws 18 and technical matters? 19 I direct your attention to page 560 to 20 answer that question. 21 MR. ORLET: Same standing objection with 22 respect to this document? 23 MR. TILLERY: Yes. 24 BY MR. TILLERY: 25 Q. If you would look under the first -- the	Page 77 1 documents I reviewed were letters back and forth in 2 addition to these meetings. And I believe I saw in 3 the review that they would occasionally discuss 4 topics by phone as well. 5 Q. What kind of topics were they discussing 6 by phone? The whole myriad of topics about 7 paraquat, I guess? 8 A. I don't know. I would need to go back and 9 review the documents, but I just saw that -- in some 10 of the documents, I did see that -- for example, a 11 document would say, follow-up from what we discussed 12 on the phone, and then they would document what was 13 discussed. 14 But I would need to go through not just my 15 reliance materials, but all the documents produced 16 to find such examples, sir. 17 Q. So you wouldn't be able to add any 18 additional information to the documents that would 19 reference the calls themselves, would you? 20 A. No, sir. 21 Q. You would just be repeating what the 22 documents say? 23 A. Yes, sir. 24 Q. Now, who were the players during this 25 interval period from '60 to '86 in developing the

Page 78 1 product, evaluating the market in the United States 2 through initial sale in '65 through the time that 3 Chevron left in September 1986? Who were the key 4 players at Chevron? 5 A. Sir, going back from 1986, it was Richard 6 Cavalli and John Ford from the toxicology side, 7 which is where I focused my review. And my 8 understanding is that John Ford and Richard Cavalli 9 back to the early 1970s -- Richard Cavalli first, 10 about 1970, was the key toxicology contact. 11 And before the '71 -- 1970, around that 12 time period, I believe there were other Chevron 13 Chemical employees that were responsible for 14 communications with ICI, but I don't recall their 15 names. 16 Q. Do you know of anybody else, besides 17 Mr. Ford and Mr. Cavalli, who communicated with ICI 18 about paraquat? 19 A. Yes, sir. Based on the documents that I 20 reviewed and based on my conversations with Mr. Ford 21 and Mr. Cavalli, Mr. Zimmerman also attended at 22 least some of those meetings. And my understanding 23 is that also Judy MacGregor, who was a toxicologist, 24 also attended some of those meetings specifically as 25 it relates -- as it related to reviewing the	Page 80 1 preliminary stages, from 1960 until the '64 2 agreement was signed, that Chevron would undertake a 3 market potential evaluation for the United States. 4 I'm asking you who the people were who 5 were involved in that. 6 A. Sir, I don't know. I would have to review 7 the documents to find that. 8 Q. So no one told you who was involved? 9 A. No, sir, not to my recollection. 10 Q. And who was involved in working with 11 paraquat at Chevron when it was released into the 12 market in 1965 in America? 13 A. Sir, I don't recall the name. I would 14 need to go back to the documents and look at the 15 name. 16 Q. Were the licensing and distribution 17 agreements between ICI and Chevron terminated in 18 September 1986? 19 A. Sir, I understand that they were 20 terminated in 1986, but I don't remember the exact 21 month. 22 Q. And who terminated the agreements? 23 A. I would need to go back to the contract 24 and verify this, but I believe it was ICI that 25 terminated the agreements.
Page 79 1 protocols and method development for the toxicity 2 testing. 3 Q. Who at ICI were the principal -- 4 principals involved in the interrelationship with 5 Chevron? 6 A. Some of the names I recall were a Mr. Rose 7 and a Mr. Smith. And those were the toxicologists 8 that I remember from my review that were primarily 9 responsible for the paraquat toxicology, at least as 10 it related to the discussions with Chevron. And I 11 believe that would have been during the mid '70s to 12 the 1986 time period, but I would need to confirm 13 that. 14 And then a Mr. Swan -- in the documents I 15 reviewed from the late '60s, '67, '68, '69, time 16 period, I believe it was Mr. Swan that was the lead 17 toxicologist, so to speak, on the toxicology when 18 they were talking to Chevron. 19 Q. Who was involved at Chevron with the 20 initial market evaluation of paraquat? That would 21 have been prior to 1965. 22 A. Sir, can you please clarify "market 23 evaluation." 24 Q. Yes. 25 The documents reference that in the	Page 81 1 MR. ORLET: Object to the scope. 2 BY MR. TILLERY: 3 Q. So to recap, Chevron's dealings with ICI 4 involving paraquat began in 1960 and continued 5 through September 1986 or some month in 1986; 6 correct? 7 A. Sir, that's my understanding. 8 Q. Between 1960 and '64, do the records 9 indicate that Chevron evaluated the market potential 10 of paraquat in the United States and ICI provided 11 Chevron with information for that purpose? 12 A. Sir, would you please repeat the question. 13 MR. TILLERY: Can you read it back to him, 14 please. 15 (Record read by reporter as follows: 16 "Question: Between 1960 and '64, do the 17 records indicate that Chevron evaluated 18 the market potential of paraquat in the 19 United States and ICI provided Chevron 20 with information for that purpose?") 21 THE WITNESS: Sir, I would need to review the 22 documents specifically for that time frame. I do 23 know that there were market evaluations that were 24 done, but I would need to further consult the 25 documents to better understand what time frame they

Page 82 1 were from. 2 BY MR. TILLERY: 3 Q. So right now you can't answer that 4 question; correct? 5 A. No, sir, I cannot. 6 Q. Chevron then had licensing and 7 distribution agreements with ICI from May 1964 8 through September 1986; correct? 9 A. Yes, sir. 10 Q. All right. Can we refer to Chevron's 11 dealings with ICI involving paraquat from 1960 12 through September 1986 as "Chevron's paraquat 13 business with ICI," for purposes of this deposition? 14 A. Sir, based on my lack of recollection of 15 the 1960 to '64 time frame, I don't feel completely 16 comfortable with including that time frame 17 necessarily. 18 Q. So you don't really know what Chevron was 19 doing before '65; right? 20 A. I would need to refresh my memory on the 21 documents. 22 Q. During Chevron's paraquat relationship 23 with ICI, did ICI share information relating to 24 paraquat and paraquat-based herbicidal formulations 25 with Chevron for its evaluation of paraquat's market	Page 84 1 but the toxicology studies and related information, 2 which I would refer to, sir, as a broader bucket in 3 terms of not just toxicology, but safety and 4 exposure and that type of information, is what I 5 know ICI was providing to Chevron. 6 Q. Did it provide anything else, is what I'm 7 asking you? 8 A. Sir, I would have to go back and review 9 the documents. I was focusing on the toxicology. 10 Q. Your answer is you don't know; is that 11 correct? 12 A. Sir, I don't recollect seeing anything in 13 the documents, so I don't know. 14 Q. Do you know what act, if any, Chevron took 15 to investigate paraquat prior to selling it in 1965? 16 A. My understanding is that Chevron would 17 have received the toxicology information from ICI, 18 but there was no documents that I found of a formal 19 assessment on that data prior to the registration. 20 Q. And the registration was in what year? 21 A. I would need to go back and check the 22 exact year. I thought it was in 1966, but I would 23 need to double-check. It might have been -- 24 Q. Look at your documents if you want to. 25 (Witness reviews document.)
Page 83 1 potential? 2 MR. ORLET: Object to form. 3 THE WITNESS: Would you please repeat the 4 question. I apologize. 5 BY MR. TILLERY: 6 Q. Okay. During Chevron's business 7 relationship with ICI regarding paraquat, did ICI 8 share information relating to paraquat and 9 paraquat-based formulations with Chevron for its 10 evaluation of paraquat's market potential? 11 A. I reviewed documents that were looking at 12 the market potential, but I do not recall whether 13 ICI provided any information. So I don't believe I 14 could speak to that. 15 Q. Did it supply paraquat and 16 paraquat -- strike that. 17 Did ICI provide Chevron with information 18 relating to the registration of paraquat in the 19 United States? 20 A. ICI provided toxicology information in 21 support of the registration. 22 Q. Did it supply any additional information 23 regarding paraquat for registration besides the 24 studies you referenced, the toxicology studies? 25 A. I would have to go back to the documents,	Page 85 1 A. Sir, it's not in my reliance material, but 2 I do recall it was in the '65 to '66 time period 3 when it was registered. 4 Q. Prior to the registration of paraquat, did 5 ICI provide to Chevron information about the 6 chemical characteristics of paraquat? 7 A. I don't recall reviewing those in the 8 documents that I reviewed. 9 Q. So your answer would be that you don't 10 know? 11 A. I don't know. 12 Q. Okay. To the extent Chevron requested 13 information about the chemical characteristics of 14 paraquat, do you know whether ICI provided the 15 requested information? 16 A. I do know that Chevron, based on the 17 documents that I reviewed, understood and did 18 characterize the chemical information, so I would 19 assume that they got that information. But I don't 20 recall, in any of the documents that I reviewed, 21 that -- an explicit transfer of that information 22 from ICI. 23 Q. So which document told you that Chevron 24 knew the chemical characteristics of paraquat prior 25 to the registration of the chemical?

Page 86 1 A. So prior to the registration of the 2 chemical -- I'm sorry, sir. I thought you meant in 3 a general time frame. 4 Q. So prior to the registration of paraquat 5 in the United States, what documents did you refer 6 to in your preparation for the deposition that told 7 you that Chevron understood the chemical 8 characteristics of paraquat? 9 A. My answer was in response to a broader 10 time frame. 11 Q. I'm asking -- this is a new question. 12 A. A new question. I apologize. 13 I don't recollect any documents prior to 14 the 1964, '65 time frame that had that information, 15 but I would need to go back and review. 16 Q. So today in this deposition, you can't 17 tell me if Chevron had any knowledge or 18 understanding one way or another about the chemical 19 characteristics of paraquat prior to the 20 registration of the chemical in the United States? 21 A. Based on the documents that I reviewed, I 22 don't recall one that had that information. 23 Q. Okay. Would Chevron sell a chemical 24 product like paraquat without knowing its chemical 25 characteristics?	Page 88 1 A. Correct. 2 Q. And it sold other products? 3 A. They had sold, to my knowledge -- to my 4 knowledge, they did sell other pesticides, yes. 5 Q. What other pesticides did the Chevron 6 Chemical Company sell? 7 A. This was well before my time. In talking 8 to the former Chevron toxicologists, they mentioned 9 a couple of chemicals, a couple of pesticides. One 10 was, Captan, that they referred to, but I'm not too 11 familiar with many of the other pesticides that 12 Chevron Chemical was selling. 13 Q. So other than that one, you can't tell me 14 what they sold? 15 A. Correct, sir. 16 Q. During Chevron's relationship with ICI 17 concerning paraquat, what information, to your 18 knowledge, about the chemical characteristics of 19 paraquat did ICI provide to Chevron? 20 A. Can you please repeat the question. 21 MR. TILLERY: Can you read it back, please. 22 (Record read by reporter as follows: 23 "Question: During Chevron's relationship 24 with ICI concerning paraquat, what 25 information, to your knowledge, about the
Page 87 1 A. I believe that Chevron would have 2 understood the chemical characteristics based on the 3 product literature that they provided accompanying 4 paraquat, so, for example, when to use it and how to 5 use it. So based on that information, I believe 6 that Chevron understood and knew the chemical 7 characteristics of paraquat. 8 Q. And how did they learn those chemical 9 characteristics? 10 A. I know that Chevron also had an 11 agricultural chemical business, so I don't know if 12 it's work that Chevron did to understand the 13 chemical characteristics or if it's information that 14 they received from ICI or if it's information they 15 received from the published literature. 16 But based on the extensive literature that 17 I did review in terms of the labeling and the use, 18 it seemed clear to me that Chevron understood the 19 chemical characteristics before they were selling 20 the material. 21 Q. And what was the name of the other 22 agricultural chemical business that it had? 23 A. I was referring to the Ortho company, 24 Ortho Chemical Company. 25 Q. That became Chevron Chemical?	Page 89 1 chemical characteristics of paraquat did 2 ICI provide to Chevron?") 3 THE WITNESS: So regarding the chemical 4 characteristics, what I take that to mean are things 5 like the physiochemical properties. And so, for 6 example, that would be vapor pressure. So based on 7 my understanding of the documents, ICI would have -- 8 I did see discussion about -- for example, related 9 to the vapor pressure of paraquat being discussed 10 between ICI and Chevron. 11 However, I don't recall ever seeing a 12 document that laid out the physiochemical properties 13 of paraquat. However, there were discussions 14 related to those properties and how they influenced 15 the toxicology. And those were in the documents, 16 and that is what I recollect reviewing. 17 BY MR. TILLERY: 18 Q. Would they have -- strike that. 19 Would ICI have at least shared with 20 Chevron how the chemical worked in killing plants? 21 A. I was not a part of the marketing or the 22 investigation into the marketing. I focused on the 23 toxicology as opposed to the function as an 24 herbicide, but I'm generally aware of paraquat's 25 properties as an herbicide.

Page 90 1 Q. Right. You may be now. 2 But what I'm asking you is, what did 3 Chevron know about its mode of action in killing 4 plants when it started selling the product in 1965? 5 A. Well, I do -- I did see documents, in what 6 I reviewed, that did discuss how paraquat acted as 7 an herbicide in plants. So that information was 8 available in the documents that I reviewed. 9 Q. And what years were those documents? 10 A. I believe those documents were -- I would 11 need to double-check the years on those documents, 12 but I believe there were some older studies. 13 Q. You can't answer my question? 14 A. I'm trying to remember back to what the 15 years might be. But I do recollect some studies 16 that were done well before 1970 and even well before 17 1960, if I remember correctly, that was looking at 18 the herbicidal properties of paraquat even -- and 19 even into the '30s. 20 Q. When did you first see the 1933 article 21 that you're referencing? 22 A. '33 article. 23 Q. When did you first see that? When you did 24 this preparation? 25 A. It would have been when I did this	Page 92 1 sir -- I apologize. I thought I was interrupting 2 you. Okay. 3 I don't necessarily know the timeline and 4 the chronology of when the hypothesis of redox 5 cycling in plants was generally accepted. 6 Q. Did you believe that redox cycling was a 7 hypothesis in 1933? 8 A. I would need to refer back to the article. 9 Q. You're not able to answer me without 10 looking at the article? 11 A. I don't know if in 1933 they had concluded 12 on that hypothesis. 13 Q. Okay. Did Chevron obtain information 14 about redox cycling characteristics of paraquat from 15 ICI before it registered paraquat in the United 16 States? 17 A. Sir, I don't recollect when ICI would have 18 provided information, but there are documents that I 19 reviewed where Chevron knew about the redox cycling 20 properties and how it acted as an herbicide in the 21 '60s that I reviewed. 22 Q. When you say "in the '60s," you're talking 23 about before it went on the market? 24 A. I can't place it necessarily before the 25 market when those papers were either published or
Page 91 1 preparation. 2 Q. So since January? 3 A. Yes, sir. 4 Q. You hadn't seen that before; right? 5 A. No, sir, I had not seen it before. 6 Q. Is it your understanding that Chevron 7 understood the mode of action of paraquat before it 8 released it onto the market? 9 A. Sir, would you please clarify "mode of 10 action." Related to plants? 11 Q. Exactly. 12 When I ask you "mode of action," could you 13 tell me in what way paraquat works to kill plants. 14 How does that happen? 15 A. So based on the articles that I read, it 16 appears that paraquat is taken up into the green 17 tissue, the green parts of the plant, where -- so, 18 again, I'm not a plant biologist, so this is a 19 little bit outside my area of expertise, sir, but 20 what I read is that there are three factors that -- 21 well, two important factors, the amount of oxygen as 22 well as the amount of light for photosynthesis, that 23 influences how effective and rapid paraquat acts. 24 And that then influences the amount of redox cycling 25 that paraquat undergoes to kill the plant. But,	Page 93 1 reviewed by Chevron. 2 Q. And what papers are you referring to? 3 A. I'm referring to literature that I read 4 related to the action of paraquat as an herbicide. 5 And I would need to go back and refresh -- I've read 6 many documents, so I'm trying to place them in my 7 head, but -- 8 Q. I understand that you may need to go back, 9 but my time is today and tomorrow to take your 10 deposition. And what I need you to tell me is 11 whether or not you can answer my question today. 12 You've made numerous references that you would have 13 to go back. If you can't answer my question, just 14 tell me. Okay? 15 A. Yes, sir. 16 Q. So -- 17 MR. ORLET: Steve, is this a good time to take 18 a break? 19 MR. TILLERY: Sure it is. 20 THE VIDEOGRAPHER: Off the record at 11:16. 21 (Recess taken.) 22 THE VIDEOGRAPHER: This begins Media Unit 3 in 23 the deposition of Dr. Tim Patterson. Going back on 24 the record at 11:32. 25 BY MR. TILLERY:

Page 94 1 Q. Just to clarify the discussion we've been 2 having, okay, what information about the redox or 3 redox cycling potential of paraquat did ICI provide 4 to Chevron? 5 A. There are a few documents related to that 6 early time period, and I can go through them real 7 fast and see -- 8 Q. Just tell us if you can answer my 9 question. If you need to reference documents, fine. 10 What did they tell them? 11 A. I need to reference the documents. 12 Q. Go ahead. Tell us the document you're 13 referencing. 14 A. Yes, sir. 15 (Witness reviews document.) 16 A. Sir, the document -- it's CUSA-00006857. 17 Q. And what's the document entitled? 18 A. It's an Ortho/P.P.L. meeting in England. 19 Q. And the date? 20 A. May 13th, 1963 is the meeting, and I 21 believe these are notes from June 10th, 1963. 22 Q. All right. Please proceed. 23 A. And then on 6858, here it talks about the 24 mode of action, where it says, "Both diquat and 25 paraquat are believed to interfere with the	Page 96 1 believe it's a Johnston, a Padwick. I can't read 2 that one. 3 MR. ORLET: Mayer [phonetic]. 4 THE WITNESS: Mayer. Boone. Swan from 5 toxicology and Calderbank from biochemistry. 6 BY MR. TILLERY: 7 Q. Were there any other documents, other than 8 this one, that you were relying upon to answer my 9 question? 10 A. I would need to double-check, sir. 11 Q. How would you double-check? 12 A. I need to look at additional documents to 13 see if -- 14 Q. Are you looking at an index? 15 A. Yes, I'm looking at an index. 16 Q. What is the index? What is that? 17 A. So the index is a table of contents for 18 the documents that are present in my reliance 19 material. 20 Q. Did you prepare the index? 21 A. I prepared the documents. I did not 22 prepare the binder or the index. 23 Q. Okay. So go ahead, if you can, and look 24 through your documents to see what additional 25 information ICI provided to Chevron about the redox
Page 95 1 photosynthesis process by a reversible process 2 involving the intermediate formation of free 3 radicals from the quaternary, which are then 4 converted to radical ions by reduction, and this 5 also yields free peroxide radicals, which interfere 6 with the photosynthesis chain." 7 Q. And who was present at the meeting? 8 A. Sir, there's a list of names. Many of 9 them are very hard to make out. 10 Would you like me to read off the list? 11 Q. Yes, please. 12 A. So the last names are Goodner [ph]. I 13 can't make it out. Toland, of Ortho Division, 14 California Chemical Company. And then -- 15 Q. You said, "Toland"? 16 A. Toland, yes. W.G. Toland. 17 Q. Do you know who that is? 18 A. No, sir, I do not. 19 Q. Anyone else? 20 A. I believe the next group of names are the 21 Plant Protection Limited personnel. 22 Q. Those are the ICI people; right? 23 A. Correct. 24 Q. And who are they? 25 A. The document is very hard to read. But I	Page 97 1 or redox cycling potential of paraquat. 2 A. Are you still referring to the 3 pre-registration time frame? 4 Q. Yes, I am. 5 (Witness reviews document.) 6 A. Sir, I believe that is the only document I 7 found mentioning redox cycling from that time frame. 8 Q. Do you have any other information that you 9 could use to answer my question besides that 10 document? 11 A. Besides that document, I don't recollect 12 anything else. 13 Q. Did ICI provide information to Chevron pre 14 U.S. registration about paraquat's herbicidal mode 15 of action? 16 A. Yes, sir. In that same document that we 17 discussed, they were talking about the herbicidal 18 mode of action related to the redox cycling. 19 Q. Was the material that you read in answer 20 to that question as well? 21 A. Yes, sir. 22 Q. Effectively, how it kills the plants? 23 A. Yes, sir. 24 Q. And was there any other information that 25 Chevron was given by ICI, other than that document,

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Page 98 1 regarding the mode of action? 2 A. Based on my recollection of the documents 3 I reviewed, that is the only one that I recall. 4 Q. And no one else supplied any additional 5 information to help you answer that question; right? 6 A. No, sir. 7 Q. Okay. To you -- strike that. 8 To the best of Chevron's knowledge, did 9 ICI provide all of the information it had about how 10 paraquat kills plant cells that was relevant to 11 Chevron's evaluation of paraquat's market potential? 12 A. Sir, I don't believe I can answer that 13 related to the market share or mode of action. 14 Q. Okay. Did ICI provide all the information 15 it had about how paraquat kills plant cells that was 16 relevant and material to Chevron's registration of 17 paraquat? 18 A. Related to the mechanism of action -- 19 would you please repeat the question. 20 MR. TILLERY: Can you read it back to him, 21 please. 22 (Record read by reporter as follows: 23 "Question: Did ICI provide all the 24 information it had about how paraquat 25 kills plant cells that was relevant and	Page 100 1 provide it? 2 A. ICI provided multiple toxicology documents 3 and assessments throughout the time frame where 4 Chevron was distributing paraquat. So to provide 5 you an accurate assessment of what and when, I could 6 reference my materials and tell you what they 7 provided. 8 Q. Right. 9 And I would like to know when they did it 10 first, in other words, their first sharing of 11 information, and the information they gave you. 12 Walk us through all of that information. 13 A. Okay. 14 (Witness reviews document.) 15 A. So based on the documents that I have, 16 sir, the first one is from May 17th, 1962. It's 17 Chevron U.S.A. No. 00190402. 18 Q. Would you say that again a little slower. 19 A. Sorry. 00190402. 20 Q. Okay. 21 A. And this is a communication describing -- 22 communication from ICI on the dermal toxicity of 23 diquat and paraquat. So that's one piece of 24 information that was provided. 25 Q. Okay. The next one.
Page 99 1 material to Chevron's registration of 2 paraquat?") 3 THE WITNESS: Sir, based on reviewing the 4 documents, there was -- there's no way for me to 5 know whether ICI provided all the documents. I 6 didn't see anything where Chevron confirmed that it 7 was all the documents, and I did not speak to any of 8 the retirees about the herbicidal properties. 9 BY MR. TILLERY: 10 Q. So the answer is you don't know? 11 A. The answer is I didn't do the research to 12 be able to answer the question related to the 13 herbicidal properties and registration. 14 Q. And -- which means you can't answer that 15 question; correct? 16 A. Which means I can't answer the question 17 unless I was able to do more research. 18 Q. During Chevron's business relationship 19 with ICI concerning paraquat, did ICI provide 20 Chevron with reports or data from any studies of 21 paraquat's toxicity to mammals or other animal 22 species? 23 A. Yes, they did. 24 Q. What and when they did -- strike that. 25 What did they provide and when did they	Page 101 1 A. So the next one I believe is from . . . 2 the document is from June 10th, 1963 and the 3 Chevron U.S.A. No. 0000, so four zeros, 6857. And 4 it's an Ortho and ICI meeting in England where the 5 discussion of toxicology is being discussed 6 specifically related to a reproductive toxicity 7 study. 8 Q. So it was a study that had already been 9 done? 10 A. It was a study . . . 11 (Witness reviews document.) 12 A. It's a study that's in progress. 13 Q. So at that time, they did not supply 14 Chevron with the study itself, just a discussion of 15 what the study involved? 16 A. Yes, sir, that's my understanding. 17 Q. The next one, please. 18 A. On January 27th, 1965 -- the 19 Chevron U.S.A. number is 00200671. And it's an ICI 20 document by a Dr. Toland. 21 Q. Spell his name, please. 22 A. T-o-l-a-n-d. 23 And it is evaluating the hazardous spray 24 operators from paraquat. 25 MR. ORLET: I think you misspoke. It's to

Page 102 1 Toland; right? 2 THE WITNESS: Oh, I apologize. Yes. 3 It is from Swan to Toland. 4 BY MR. TILLERY: 5 Q. And was that a completed study? 6 A. Yes, sir. It's a field investigation 7 study that was completed. 8 Q. What's the next one? 9 (Witness reviews documents.) 10 A. The next document I have is -- the Chevron 11 U.S.A. number is 00283893. And this is a list of 12 toxicity studies that were submitted for the 13 registration of paraquat. 14 Q. And this is the document you referenced 15 before; correct? 16 A. Yes, sir, it is, correct. 17 Q. And these documents -- strike that. 18 These studies had all been sent to Chevron 19 by ICI; correct? 20 A. Yes, sir, correct. 21 Q. And who was the primary registrant for 22 paraquat in the United States in 1965? 23 A. That would have been Chevron, Chevron 24 Chemical Company. 25 Q. Was ICI's name included on any of those	Page 104 1 What I'm trying to do is to find out what 2 ICI shared with Chevron about paraquat. 3 A. Understood, sir. 4 (Witness reviews document.) 5 Q. And as you look through this, is there any 6 compendium document -- 7 A. That's what I'm looking for. 8 Q. -- that would -- yes. 9 Which would shorten up our discussion and 10 obviate a lot of these questions. 11 MR. TILLERY: And, Bryan, if you have that, 12 feel free to announce it on the record, and that 13 will take care of the problem. 14 MR. HOPKINS: It's the 1984 EPA document that 15 you have in here of the bibliography with all the 16 studies. 17 THE WITNESS: So there's data compensation. 18 The data compensation ones would have -- 19 MR. HOPKINS: Right, they would as well. 20 BY MR. TILLERY: 21 Q. I'm more than happy to have you work with 22 your counsel right now to try to answer it. We're 23 just trying to get the answer. So however they can 24 help you, I'm happy to accept that. 25 MR. HOPKINS: If you go to Tab 8, 73765.
Page 103 1 filing documents? 2 A. Sir, I would need to look at the filing 3 documents to determine that. 4 Q. Did Chevron remain the primary registrant, 5 until September 1986, of paraquat in the United 6 States? 7 A. That was my understanding, yes. 8 Q. Did Chevron ever sell paraquat chemicals 9 outside of the lower 48 states of the United States? 10 A. Based on the documents that I reviewed, I 11 did not see any reference to selling paraquat 12 outside of the U.S. I believe that ICI was 13 responsible for selling paraquat outside of the 14 U.S., based on the documents that I read. 15 Q. That would include the whole world, the 16 rest of the world; right? 17 A. Correct? 18 Q. As far as you know? 19 A. As far as I know, correct. 20 Q. Right. 21 If you could continue on, sir. 22 A. Just to confirm I am on the right track, 23 you would like me to go through the toxicity studies 24 up until the '86 time frame? 25 Q. Yeah, if you wouldn't mind.	Page 105 1 THE WITNESS: Tab 8? 2 MR. HOPKINS: Yes. That's the actual start of 3 the bibliography and then you go to 73767. 4 THE WITNESS: Maybe we're looking at different 5 things. 6 MR. HOPKINS: Is it okay if I -- 7 MR. TILLERY: Absolutely. 8 THE WITNESS: Here's my Tab 8. 9 MR. HOPKINS: Right. And then here is where 10 they start listing all the studies. 11 THE WITNESS: You're talking about the EPA fact 12 sheet? 13 MR. HOPKINS: Yes. And then the other one, 14 I'll find it, is the one you mentioned before -- 15 MR. ORLET: Why don't you go to that one first. 16 Talk about that one first. Can do the compendium. 17 THE WITNESS: I want to start with this one. 18 So one document that summarizes the 19 studies that were conducted. However, there may be 20 also some Chevron studies that were included in 21 this, but there are summaries of the complete 22 toxicity data packages that were, for example, 23 submitted to EPA. And that is a June 22nd, 1987 24 document. And the Chevron U.S.A. number is 25 00121658.

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Page 106 1 BY MR. TILLERY: 2 Q. That was an '87 document? 3 A. Correct, sir. 4 Q. So this document was generated after 5 Chevron was out of the business? 6 A. Yes, sir. It is related to compensation 7 costs for studies and work done on the registration 8 of paraquat. 9 Q. And just so the court and the ladies and 10 gentlemen of the jury understand what that means, is 11 that if you're the primary registrant and you do 12 studies, you're entitled to some compensation? 13 Is that what that's about? 14 A. Correct, that's my understanding, is that 15 they were discussing how they were going to pay for 16 the work that Chevron did in support of the 17 registration. 18 Q. Okay. And tell me, if you can, how many 19 studies are listed there? 20 A. There's quite a few studies. There's a 21 few pages of studies. 22 Q. Could you give us the Bates range of the 23 documents that you're referencing? 24 A. Yes, sir. 25 It is 00121664 through 00121678.	Page 108 1 ICI. 2 Q. So today you can't answer my question 3 about which ones of those on that exhibit were done 4 by Chevron; correct? 5 A. Correct. I couldn't specifically pull out 6 which ones were Chevron. 7 Q. Now, could you continue on by closing this 8 up and telling us the remaining studies, if there 9 are any, or does that include them all? 10 A. The best compendium of the studies is 11 going to be . . . it's going to be the EPA pesticide 12 fact sheet, which has a list of all the studies that 13 were submitted to the EPA to support registration of 14 paraquat. And the date on that is March 31st, 1986. 15 And the Chevron U.S.A. number is 00073577. 16 Q. Do the documents that you've now 17 referenced in the deposition include all of the 18 studies that were supplied to Chevron by ICI up 19 until the time that Chevron got out of the paraquat 20 business in '86? 21 A. To the best of my knowledge, these are the 22 studies that Chevron used for registration purposes 23 of paraquat. 24 Q. That doesn't directly answer my question. 25 Were there any other documents that you
Page 107 1 Q. Now, how many of those studies were done 2 by ICI? 3 A. So within the document, it also states, 4 "From 1969 to 1976, CHC was minimally involved in 5 acute toxicology studies. ICI and IBT handled." 6 Q. These were all done by ICI; correct? 7 A. Most of them were done, but there are some 8 Chevron studies that were done in that time frame. 9 Q. That are listed? 10 A. I believe so. 11 Q. Why don't you look and tell us what those 12 are on the record, please. 13 A. For me to tell you on the record, I would 14 need to go to a different document. 15 Q. Go ahead. 16 (Witness reviews document.) 17 A. Sir, there's a document that I recollect 18 seeing after my reliance materials -- after I put 19 the reliance materials together that does list the 20 Chevron studies that were conducted, as well as the 21 studies done by ICI in comparison. 22 But I found that after I put this 23 together, so I would need to go back and find that 24 document; otherwise, I couldn't specifically pick 25 out which studies were Chevron and which ones were	Page 109 1 received that weren't included in the filings with 2 the U.S. EPA? Trying to find out if there's any 3 other documents that are studies that were supplied 4 to you. 5 A. Based on my reviewing the documents, all 6 the toxicology studies, the exposure studies -- all 7 those were provided to the EPA, based on what I 8 reviewed in these documents. 9 Q. Okay. Were these acute toxicity studies 10 that you were referencing primarily? 11 A. I'm sorry. Can you please clarify which 12 studies. 13 Q. The studies that you mentioned and 14 referenced here, were they acute toxicity studies? 15 A. No, they were both acute as well as repeat 16 dose and lifetime studies. 17 Q. How many chronic studies were there? 18 A. Off the top of my head, I recall a 19 one-year dog study, a two-year rat and a two-year 20 mouse study. There was also a three-generation 21 reproductive toxicity study. And those are the ones 22 that I recall off the top of my head in terms of 23 chronic studies. 24 Q. Who performed those studies? 25 A. I would need to go to my reference

Page 110 1 material and double-check. 2 Q. Do you know of a single chronic study 3 involving paraquat that Chevron ever did? 4 A. Based on reviewing the documents, Chevron 5 did not conduct or have the studies conducted for 6 them. But I do know that they were part of 7 reviewing the methodology and assessing -- 8 interpreting and assessing the result of those 9 studies, at least for some of them, especially in 10 the late '70s and early '80s. 11 Q. I move to strike your answer as 12 nonresponsive. 13 Do you know of a single chronic study 14 involving paraquat that Chevron ever did? 15 MR. ORLET: Regarding paraquat? 16 BY MR. TILLERY: 17 Q. Regarding paraquat. 18 A. No, I'm not aware of a single study that 19 Chevron did, a chronic study, that would have 20 been -- I know of subchronic studies that Chevron 21 did, but not chronic studies. 22 Q. Again, I'm asking -- looking for a 23 straight answer to the question. I'll rephrase it 24 again for you. 25 Do you know of a single paraquat chronic	Page 112 1 withdrawn or which were rejected? 2 A. Regarding studies that were not validated, 3 specifically IBT studies, I do not believe that 4 those studies are included in the EPA fact sheet. 5 Q. So you don't know -- strike that. 6 You're telling me that none of the studies 7 on that EPA fact sheet were ever withdrawn or 8 rejected; correct? 9 A. Would you please clarify if you mean were 10 studies that were not validated by IBT or those not 11 submitted or -- 12 Q. Any study that was later withdrawn as a 13 study in support of that particular molecule. 14 A. Sir, this document was from 1986. And I'm 15 not aware of any studies that were withdrawn from 16 this document because we stopped following the 17 registration about the same time period. 18 Q. So you don't know one way or another? 19 A. Chevron was canceling its registrations 20 and stopped distributing in 1986. 21 Q. So would the answer to my question be that 22 you don't know one way or another? 23 A. Sir, Chevron was not following this 24 information in terms of what the EPA would have 25 rejected or come to reject later on after 1986.
Page 111 1 study ever performed by Chevron? 2 (Witness reviews document.) 3 A. This is mammalian, sir? So a rat, dog, 4 not necessarily like a bird or a -- 5 Q. You can pick. 6 If you have long-term studies that were 7 performed on any animals, let's talk about them, as 8 long as they were performed by Chevron. 9 (Witness reviews document.) 10 A. My recollection is there were no chronic 11 being defined as one-year, two-year studies that 12 were conducted by Chevron themselves that they 13 directly sponsored. 14 Q. Regarding paraquat? 15 A. Regarding paraquat. Thank you. 16 Q. You mentioned the EPA fact sheet. 17 Does the EPA fact sheet list studies that 18 were withdrawn or rejected? 19 A. Could you please clarify your question, 20 sir. 21 Q. Yes. 22 Does the EPA fact sheet of the sort that 23 you mentioned -- you referenced an EPA fact sheet. 24 A. Yes. 25 Q. Does it include studies that were later	Page 113 1 Q. Let me ask it just one more time and then 2 we can deal with it elsewhere. 3 Do you know whether any of the studies 4 that you referenced from an EPA fact sheet were 5 later withdrawn or rejected? 6 A. Sir, again, we have not followed the 7 registration of paraquat after '86. And so I don't 8 know of anything related to why -- or related to 9 whether the EPA has rejected anything from this '86 10 fact sheet. 11 MR. HOPKINS: Steve, if I could interject, I 12 don't want to step on your question, but I think you 13 may be talking past each other. So I just wanted to 14 clarify, but I don't want to in any way, shape or 15 form to coach the witness. 16 MR. TILLERY: Help me out. 17 MR. ORLET: Is this a good time to take lunch 18 because -- 19 MR. TILLERY: Sure. And you can talk to him. 20 MR. ORLET: -- because you guys are talking 21 past each other? 22 MR. TILLERY: Okay. We'll take a lunch break. 23 THE VIDEOGRAPHER: Off the record at 12:13. 24 (Lunch recess was taken at 12:13 p.m.) 25 //

Page 114 1 AFTERNOON SESSION 1:15 P.M. 2 - - - 3 THE VIDEOGRAPHER: Back on the record at 1:15. 4 EXAMINATION RESUMED 5 BY MR. TILLERY: 6 Q. Sir, back on the record. 7 Your counsel handed me this document that 8 indicated you had identified that might help answer 9 one of my prior questions. 10 Could you first identify the document. 11 A. Yes, sir. So these are two documents. 12 The first one is Chevron U.S.A. No. 00308485. It's 13 a December 10th, 1986 letter that attaches -- that 14 includes a list of all the studies that Chevron 15 conducted either internally or sponsored at an 16 external contract research organization laboratory. 17 And then the second document is CUSA 18 No. 00265716. And this document is a list of 19 studies that has the contract laboratory listed as 20 well as the date, and this goes up to 1977. 21 So these were the documents that I was 22 referring to earlier when I spoke about recalling a 23 document that outlined the studies that Chevron did 24 or didn't do that I did not have in my reliance 25 material.	Page 116 1 Q. All right. Let's talk about them. Let's 2 go to No. 9 first. 3 The cover sheet was sent to whom? 4 Z.A. Wong sent this to whom, H.D. Byrne? 5 A. Yes. 6 Q. And who is H.D. Byrne? 7 A. He was a part of Chevron Chemical Company. 8 Q. And what was the purpose for sending this 9 letter and the attachments? 10 A. The purpose was to summarize the available 11 studies that Chevron had conducted internally. 12 Q. Why did anybody want that particular 13 question answered? 14 A. I do not know the reason behind why this 15 document was created. However, if I read the last 16 sentence, it says, "Reasonable access to the 17 appropriate archives material will be granted to ICI 18 by mutual agreement with Chevron Chemical Company." 19 So it would just be speculation on what 20 that means, but it sounds like they're documenting 21 what studies they had conducted. 22 Q. With ICI. 23 A. I don't know if they're -- I'm sorry. 24 Could you clarify your question. 25 Q. The last sentence you just read references
Page 115 1 Q. Is there an overlap between these two 2 documents? 3 A. There is. So there's going to be -- up to 4 the 1977 time period, there should be an overlap 5 between the studies that Chevron conducted that's 6 also listed on CUSA-00265716. 7 Q. Okay. So let's make sure the record is 8 clear and put an exhibit sticker on these documents. 9 A. And then -- 10 MR. ORLET: Wait. 11 (Plaintiffs' Exhibits 9 and 10 were 12 marked.) 13 BY MR. TILLERY: 14 Q. So for purposes of clarifying the record, 15 identify Exhibit No. 9, please. 16 A. Exhibit No. 9 is Chevron U.S.A. 17 No. 00308485. 18 And Exhibit No. 10 is Chevron 19 U.S.A. 00265716. 20 Q. Those are the two documents you just 21 identified for me a minute ago? 22 A. Yes, sir. 23 Q. Do you have copies of those yourself right 24 there? 25 A. Yes, I do.	Page 117 1 granting access to ICI of the archived materials. 2 A. Right. 3 Q. So they were documenting this with ICI. 4 A. Right. 5 Q. So here's my question, if we can clarify. 6 Does this include, this document, No. 9, 7 all of the studies or do you have to go to No. 10 to 8 get all of the studies? 9 A. No. 9 -- 10 MR. ORLET: Object to the form. 11 Go ahead. 12 THE WITNESS: Would you repeat the question. 13 BY MR. TILLERY: 14 Q. Yes. 15 Does No. 9 capture all studies done by 16 Chevron on paraquat? 17 A. Based on what the document presents, this 18 is my understanding, that it does contain all the 19 studies that Chevron conducted on paraquat. 20 Q. And it includes studies that were 21 contracted out to be done; right? 22 A. Yes, sir. On the last page, there were 23 three studies that were contracted out to external 24 laboratories. 25 Q. Which ones are those?

Page 118 1 A. There is a dermal absorption study, which 2 is titled, "Percutaneous Penetration of 14C," which 3 would it be radiolabeled -- carbon-14 4 radiolabeled -- "Paraquat in Man." 5 And then there's also a "21-day Dermal 6 Toxicity Study in Albino Rabbits with Paraquat 7 Technical." 8 And then the third study is "Effect of an 9 Emetic on the Absorption and Acute Toxicity of 10 Orally Administered Diquat and Paraquat in Dogs." 11 Q. Those are the three studies conducted by 12 independent contractors? 13 A. Correct. 14 Q. And the rest of them were conducted by 15 Chevron? 16 A. Correct. 17 Q. At Chevron facilities? 18 A. At Chevron's internal laboratories, 19 testing facilities. 20 Q. If we can go back to those days, '86 and 21 preceding, say 10 or 20 years preceding that period, 22 where were the laboratories for Chevron located? 23 A. They were located -- they were named 24 Hilltop Laboratories in Richmond, California. 25 Q. And what types of facilities did they have	Page 120 1 A. Yes, sir. 2 Q. All right. Now, how many people in 3 toxicology or chemistry or other disciplines, 4 scientific disciplines, chemists, did Chevron have 5 in that era, generally? 6 A. I could not speak to that without 7 speculation. 8 Q. How many do you have today? 9 A. Today we do not have the toxicology 10 testing laboratory, so we only conduct studies at 11 outside contract research organizations. And our 12 toxicology group -- and the toxicologists at the 13 company are about 12 or 13 toxicologists. 14 Q. So at the time that this product was being 15 sold by Chevron, '86 and before, up to '65, you had 16 that laboratory -- 17 MR. ORLET: Object to form. 18 BY MR. TILLERY: 19 Q. -- correct? 20 You had the toxicology laboratory at 21 Chevron? 22 A. So the toxicology laboratory was created 23 in the late '70s to early '80s. And I believe they 24 were shut down sometime in the mid to late '80s. 25 Q. And how many years did you have the
Page 119 1 for laboratory work? 2 A. They had the standard toxicology testing 3 facilities with laboratory animal rooms, the dosing 4 prep that would be required to conduct the toxicity 5 testing. 6 Q. Was there any type of study that Chevron 7 could not have undertaken at that time had it wanted 8 to do it? 9 A. My understanding is that Chevron could 10 have conducted at least the rodent studies. I would 11 need to further inquire whether they conducted any 12 dog studies based on -- not related to this case, my 13 personal recollection is that there were no dog 14 studies, but I would need to confirm that. 15 Q. Did it ever do non-human primate studies? 16 A. Based on my recollection -- my knowledge 17 as a general Chevron toxicologist, we have never 18 done non-human primate studies. 19 Q. In terms of laboratory facilities, the 20 labs that were available were modern, up to date, 21 capable of handling most scientific analysis done in 22 the laboratory; would that be correct? 23 A. Yes, sir. 24 Q. Including state-of-the-art equipment 25 necessary; right?	Page 121 1 toxicological laboratory? 2 A. So based on that timing, I would say it's 3 approximately 10 years, but I would need to confirm 4 that to give you an exact. 5 Q. How did you do toxicological testing prior 6 to the creation of that laboratory? 7 A. Sir, would you please clarify if you mean 8 general or regarding paraquat? 9 Q. Both, paraquat and general, how did you do 10 it? 11 A. Well, for general, we would have gone to 12 an external laboratory to conduct the studies on our 13 behalf. And then for paraquat, as you can see, we 14 did the studies internally, all except for three 15 studies, which were the ones that we contracted at 16 an external laboratory. 17 Q. So you were doing studies in '69 here; 18 correct? Right? This report shows. 19 A. Yes, sir. 20 Q. You were doing them in '77. Looks like 21 you were doing them in '85. 22 And these were internal studies; correct? 23 A. Correct. That's what the document says, 24 which is a discrepancy with what I just said. And I 25 would need to better understand when the Chevron

Page 122 1 laboratory was created. Because the one I'm 2 familiar with, Hilltop Laboratories, was in the late 3 '70s. So I would need to further investigate that 4 to understand those three studies. 5 Q. Well, let's go through these, if we can. 6 The studies that you have that are set out 7 in here, the first one is a dermal study; right? 8 A. Yes, sir. 9 Q. And the next two are modified Buehler. 10 What kind of study is that? 11 A. Those are skin sensitization or allergic 12 contact dermatitis studies. So essentially it's 13 like poison ivy creates an allergic reaction on the 14 skin. It's testing whether the chemical can do 15 something similar. 16 Q. So these first three studies were testing 17 whether this chemical would cause skin-type issues; 18 right? 19 A. The acute dermal study, sir, is actually 20 an acute lethality study to determine the lethal 21 dose after dermal application. 22 Q. And were these studies published anywhere, 23 the dermal studies? Strike the question. 24 Let's go to the next one. 25 It says, "Acute oral"; right?	Page 124 1 Q. All right. And then on the next page, the 2 first study in '76 is acute oral and then acute 3 dermal and then an eye irritation, a skin 4 irritation, and then you did an acute inhalation 5 study? 6 A. Yes, sir. 7 Q. Do you know what that study is about? 8 A. The acute inhalation is also an acute 9 lethality study, which is essentially one dose 10 administered via the -- a respiratory route to 11 measure the lethality. 12 Q. And then you had a lethal oral in rats; 13 right? 14 A. Correct. 15 Q. And then acute inhalation screen? 16 A. Correct. 17 Q. Preliminary oral screen? 18 A. Correct. 19 Q. And then paraquat poisoning, effectiveness 20 of Amoco active charcoal as an antidote for paraquat 21 poisoning? 22 A. Correct. 23 Q. Effectiveness of various treatments for 24 paraquat poisoning was the next; right? 25 A. Correct.
Page 123 1 A. Yes, sir. 2 Q. And then another dermal. 3 A. Yes, sir. 4 Q. And then two eye irritation studies; 5 correct -- one eye irritation, one skin irritation. 6 A. I see one eye and then two skin 7 iterations. 8 Q. Right. 9 And then two -- one comparative oral 10 corrosion; right? 11 A. Correct. 12 Q. And then comparative skin irritation? 13 A. Correct. 14 Q. And then skin corrosion? 15 A. Correct. 16 Q. And then acute dermal? 17 A. Correct. 18 Q. Acute oral? 19 A. Correct. 20 Q. Acute dermal? 21 A. Correct. 22 Q. An eye irritation? 23 A. Correct. 24 Q. A skin irritation? 25 A. Correct.	Page 125 1 Q. Does that cover all of the ones that you 2 did at Chevron internally? 3 A. Yes, sir. 4 Q. What's the first study by this list that 5 you ever did, what year? 6 A. The first study would be an acute oral and 7 acute dermal in April of 1969. 8 Q. And that was four years or so after the 9 product was launched in America; right? 10 A. Yeah, three to four years. 11 Q. And do you see any record or have any 12 record of any study being done by Chevron prior to 13 the first sale of paraquat? 14 A. No, sir, I do not. 15 Q. Other than obtaining information from ICI, 16 what steps did Chevron take to evaluate whether it 17 should register and sell paraquat in the United 18 States before 1965? 19 A. Before 1965, based on my recollection of 20 the documents I reviewed, we were relying on ICI to 21 provide us the toxicology information. 22 Q. So the answer -- direct answer to my 23 question would be Chevron took no steps to evaluate 24 whether or not it should register and sell paraquat 25 other than relying on information from ICI; would

Page 126 1 that be a correct statement? 2 A. Based on my knowledge of reading the 3 documents, that's all I could find, is that they 4 were relying on ICI. 5 Q. So would that be a "yes" to my question? 6 A. Yes. 7 Q. Now, other than relying on information 8 from ICI, what investigation of the chemical 9 characteristics of paraquat did Chevron conduct 10 prior to 1965? 11 (Witness reviews document.) 12 A. Based on the documents that I have 13 reviewed, I only observed reliance upon ICI for the 14 chemical information. 15 Q. So the answer would be they took no such 16 steps; correct? 17 A. I cannot say that affirmatively, only 18 that, based on the documents I reviewed, I didn't 19 see any other instances where they would have taken 20 additional steps. 21 Q. They wouldn't have conducted any 22 additional investigation into the chemical 23 characteristics of paraquat before '65; would that 24 be a fair statement? 25 A. "Chemical characteristics" is a very	Page 128 1 ICI, information -- 2 Q. Yes. 3 A. I would need to go back and look at the -- 4 some of the early documents again before I can tell 5 you that. 6 Q. You can't answer that question, is that 7 right, right now? 8 A. No, I can't answer that question right 9 now. 10 Q. All right. Let's limit it then to 11 toxicology or health science issues, the propensity 12 of a chemical to cause people to become sick if 13 they're around it. 14 Do we understand each other? 15 A. Yes, sir, we do. 16 Q. All right. Now, in terms of that context, 17 what investigation or research about paraquat did 18 Chevron conduct on its own, not relying on ICI, 19 prior to 1965? 20 A. There's no research that I'm aware of that 21 Chevron conducted. 22 Q. What research did Chevron conduct 23 regarding redox cycling properties or potential of 24 paraquat prior to '65? 25 A. I'm sorry. Can you please repeat the
Page 127 1 broad -- very general. And I feel more comfortable 2 addressing the toxicology and related to toxicology. 3 Whereas, the chemical characteristics, it could mean 4 related to the herbicidal. So I don't feel 5 comfortable casting such a wide net on that 6 statement. 7 Q. I understand. But our topics include 8 herbicidal effects. So the topics included a 9 discussion of the herbicidal effects, the mode of 10 action of the chemical, how it worked killing 11 plants, what characteristics of redox cycling. All 12 of those are included. 13 What I'm asking you is if you can tell me 14 what steps Chevron took to assess those 15 characteristics, as I've defined them, about 16 paraquat prior to 1965. 17 MR. ORLET: Object to form. 18 THE WITNESS: I cannot -- I did not research 19 related to any chemistry or herbicidal properties 20 before 1965. 21 BY MR. TILLERY: 22 Q. So you can't answer to the extent that the 23 question includes herbicidal products -- aspects of 24 the chemical? 25 A. So we're still referring to outside of	Page 129 1 question. 2 Q. Absolutely. 3 What research or investigation of the 4 redox or redox cycling potential of paraquat did 5 Chevron conduct prior to 1965? 6 A. Related to toxicology or general 7 properties? 8 Q. Both. 9 A. Related to the toxicology, there's nothing 10 that I'm aware of related to redox cycling. 11 Regarding the herbicidal properties, I'm not 12 prepared to speak to that. 13 Q. Now, did Chevron sell any other product 14 that had a mode of action which included redox 15 cycling? 16 A. I would need to obtain a list of the 17 products and chemicals that Chevron has sold and 18 then do an evaluation of what Chevron knew about 19 those chemicals before I can answer that. 20 Q. So the direct answer to my question would 21 be you don't know; correct? 22 A. At this time, I would need to understand 23 what chemicals Chevron sold at the time. 24 Q. But, again, we're talking right today. 25 This is my chance to ask you.

Page 130 1 As of today, do you know the answer to 2 that question? 3 A. No, I do not know the answer to that 4 question. 5 Q. Okay. Did Chevron conduct its own 6 investigation of paraquat's toxicity to mammals 7 prior to 1965? 8 A. No, they did not. 9 Q. Did Chevron conduct its own investigation 10 of paraquat's toxicity to any animal species prior 11 to 1965? 12 A. No, they did not. 13 Q. Did Chevron conduct its own investigation 14 of paraquat's mode of action or potential mode of 15 action in animal cells prior to 1965? 16 A. No, they did not. 17 Q. Is paraquat the active ingredient -- I'm 18 talking about not a formulated product -- is it a 19 chemical compound? 20 A. Can you clarify what you mean by "chemical 21 compound." 22 Q. You're a Ph.D. in toxicology. How do you 23 define a chemical compound? 24 A. Chemical compound from a definition of a 25 chemical molecule.	Page 132 1 A. If I remember correctly, I think it was 2 the late '50s. 3 Q. So it does not exist in nature, but 4 paraquat has to be made in a laboratory or a 5 chemical manufacturing plant; would you agree? 6 A. Yes, sir, I would agree. 7 Q. Is paraquat also known as paraquat 8 dichloride? 9 A. Yes, sir. That is a more specific name 10 for the compound that is the chloride salt. 11 Q. Are methyl viologen dichloride and methyl 12 viologen also names that are used to refer to 13 paraquat? 14 A. Those are synonyms -- I'm sorry. Would 15 you please repeat the second one. 16 Q. Yes. 17 Methyl viologen. 18 A. Yes, those are synonyms that I have seen 19 associated in the literature with paraquat. 20 Q. Paraquat is a type of compound that 21 chemists call a salt? 22 A. The paraquat with the chloride would form 23 a salt. 24 Q. Salt is a chemical compound composed of 25 one or more cations and one or more anions; correct?
Page 131 1 Q. Right, chemical molecule. Is it that? 2 A. Yes, paraquat is a -- is a -- it's a 3 compound of the paraquat cation and, in most cases, 4 the chloride salt. 5 Q. It's a synthetic chemical compound, would 6 you agree? 7 A. I would agree it's a synthetic chemical 8 compound. 9 Q. It's man-made; correct? 10 A. Based on my knowledge, it's a synthesized 11 man-made chemical. 12 Q. When you did your research and you went 13 online and looked this up and went to your textbook 14 reading about the chemical for background 15 information, you found that it was first synthesized 16 in about the 1880s. 17 Do you remember that? Does that sound 18 right? 19 A. It was either the 1850s or 1880s -- 20 Q. Somewhere in there. 21 A. -- somewhere in there, yes, sir. 22 Q. We won't quibble over that period. It was 23 a long time ago. 24 And it was first recognized as having 25 herbicidal properties in the 1950s; correct?	Page 133 1 A. That is correct. 2 Q. Is a cation an atom or a group of atoms 3 called a molecule with a net positive electric 4 charge? 5 A. Would you repeat that. 6 Q. Sure. 7 Is a cation an atom or a group of atoms 8 called a molecule with a net positive electric 9 charge? 10 A. Yes, that's correct. 11 Q. And an anion is an atom or molecule with a 12 net electric charge, right -- net negative electric 13 charge? 14 A. That's correct. 15 Q. In a salt, do the charges contributed by 16 the cations and anions balance out such that the 17 salt has a net charge of zero or no net charge? 18 A. That is correct. 19 Q. Let's use an example. 20 Table salt is a chemical salt composed of 21 one sodium cation with a charge of positive one or 22 plus one, and one chloride anion with a charge of 23 negative one or minus one, which together net out to 24 zero or no net charge on the molecule as a whole; is 25 that correct?

Page 134 1 A. That is correct. 2 Q. When we talk about an atom or molecule 3 having a charge of one or two, whether positive or 4 negative, we're talking about the strength of the 5 charge, aren't we? 6 A. One or two? 7 Q. Yes. As I said, netting it out. The 8 charge being a plus or a one, minus one, negative 9 one, when you -- you're balancing them out. So when 10 we talk about an atom or molecule having a charge of 11 one or two, whether positive or negative, we're 12 talking about the strength of the charge? 13 A. We're talking about the electrovalency of 14 the atom and the positive charge. So you can have a 15 positive two if it's lost electrons. So I guess I 16 don't fully understand the strength part of that. 17 Q. The charge of negative one isn't less 18 than, but it's the opposite of a charge of positive 19 one, like the negative and positive ends on a 20 magnet. 21 Would you agree with that statement? 22 A. Yes, I think that's a fair statement. 23 Q. A paraquat molecule has one cation and two 24 anions; correct? 25 A. So paraquat has two positive charges on it	Page 136 1 Q. Is the paraquat in paraquat dichloride 2 sometimes referred to as paraquat cation or paraquat 3 dication? 4 A. Yes, I have seen that referred to. 5 Q. Does the "di" in "dication" refer to the 6 charge of two? 7 A. Correct. 8 Q. For simplicity's sake, can we agree that 9 when we use the term "paraquat cation" today, we're 10 referring to the paraquat dication that has the 11 charge of plus two? 12 A. Yes, sir. 13 Q. In addition to one paraquat cation, does 14 paraquat have two chloride anions? 15 A. So there's -- paraquat does have two 16 chlorine atoms, but there are other forms of 17 paraquat as well. 18 Q. Well, tell me what's wrong or incorrect 19 about that statement. 20 Do you want me to read it again? 21 A. Yes, please. 22 Q. In addition to one paraquat cation, does 23 paraquat have two chloride anions? 24 A. What product are you referring to? 25 Q. I'm talking about general statements.
Page 135 1 because there's two -- so it's a plus two charge. 2 Q. It's one cation. And two -- 3 A. I'm sorry. 4 (Reporter seeks clarification.) 5 Q. Start over. 6 A paraquat molecule has one cation and two 7 anions; correct? 8 A. That wouldn't be how I would refer to the 9 chemical. 10 Q. But whether you would refer to it that 11 way, is that statement correct or not? 12 A. I look at paraquat as having a positive 13 charge of two. So it's a cation with a positive 14 charge of two. 15 Q. So tell me what is incorrect in my 16 statement. 17 A. Can you please repeat your statement. 18 Q. Sure. 19 A paraquat molecule has one cation and two 20 anions. 21 A. I agree. 22 Q. All right. Does the cation in a paraquat 23 molecule, the paraquat in paraquat dichloride, have 24 a charge of plus two? 25 A. Yes.	Page 137 1 MR. ORLET: He's talking about the chloride. 2 THE WITNESS: So paraquat CL? Because there's 3 also a paraquat that can be formulated with a 4 sulfate. 5 BY MR. TILLERY: 6 Q. Is my statement incorrect? 7 A. So paraquat can be formulated with the 8 chlorides or it could be formulated with other 9 anions as well. 10 Q. If it's formulated with chloride, is my 11 statement correct? 12 A. If it's formulated with chloride, your 13 statement is correct. 14 Q. Let's make the record clear, if we can. 15 In addition to one paraquat cation, does 16 paraquat have two chloride anions? 17 A. Yes. 18 Q. The two chloride anions are the dichloride 19 part of paraquat dichloride, aren't they? 20 A. Correct. 21 Q. Does each of the chloride ions have a 22 charge of minus one? 23 A. Yes, they do. 24 Q. So paraquat dichloride, or paraquat, as 25 we're referring to it, is composed of one paraquat

Page 138 1 cation with a charge of plus two, and two chloride 2 ions, each with a charge of minus one, which 3 together net out to zero, or no net charge on the 4 molecule as a whole? 5 A. Correct, sir. 6 Q. Do I have that correct? 7 A. That's correct. 8 MR. ORLET: Would you mind if we take a real 9 quick break? 10 MR. TILLERY: No. You have that choice 11 whenever you want to take a break. 12 THE VIDEOGRAPHER: Off the record at 1:48. 13 (Recess taken.) 14 THE VIDEOGRAPHER: Back on the record at 1:55. 15 BY MR. TILLERY: 16 Q. Is paraquat a room -- strike that. 17 Is paraquat a solid at room temperature? 18 A. Let me double-check that, sir. 19 Q. Okay. 20 (Witness reviews document.) 21 A. Yes, it is a solid at room temperature. 22 Q. Is paraquat, like a table salt, a 23 crystalline solid? 24 (Pause in proceedings.) 25 A. I would need to further research that.	Page 140 1 Q. And this is U.S. Patent No. 2,972,528, 2 correct, upper right-hand corner? 3 A. I see that. 4 Q. And it was issued on February 21st, 1961. 5 A. Correct. 6 Q. And the patent is titled, "Dipyridyl 7 Derivatives and Herbicidal Methods and Compositions 8 Containing the Same." 9 A. Correct. 10 Q. The inventors assigned that patent to 11 Imperial Chemical Industries Limited, London, 12 England; correct? 13 A. Correct. 14 Q. And that's the same entity that we're 15 talking about as ICI; correct? 16 A. Correct. 17 Q. Which is Syngenta in this case? 18 You understood that? 19 A. In this case it's Syngenta? 20 Q. Yes. 21 Did you understand Syngenta was a 22 defendant in this case? 23 A. I do understand that Syngenta is a 24 defendant in this case. 25 Q. All right. And the application for this
Page 139 1 I'm more familiar with paraquat as a liquid as 2 formulated. 3 Q. So the answer would be you don't know the 4 answer to my question. 5 A. I don't know the answer to your question. 6 Q. Okay. Is paraquat, like table salt, 7 highly soluble in water? 8 A. Paraquat is highly soluble in water, 9 correct. 10 Q. And water dissolves paraquat by breaking 11 the ionic bonds between the paraquat cation and the 12 two chloride anions; correct? 13 A. That is my understanding. 14 Q. You don't have any reason to disagree with 15 that statement, do you? 16 A. I don't have any reason to disagree with 17 that statement. 18 Q. Now I want to show you what's been marked 19 as No. 11. 20 (Plaintiffs' Exhibit 11 was marked.) 21 BY MR. TILLERY: 22 Q. No. 11 is the United States patent for 23 paraquat. 24 Do you see that? 25 A. Yes, sir, I do.	Page 141 1 patent claimed priority to the date of a patent 2 application in Great Britain to April 4th, 1956. 3 Do you see that, upper left-hand corner? 4 A. I do. 5 Q. Now, I'd like to direct your attention to 6 the first page, left column, third paragraph. And 7 the paragraph starts "We are aware." 8 Do you see that? 9 A. I do. 10 Q. "We are aware that certain of the 11 compounds of the above stated formula are known 12 compounds for example 4,4'-dipyridyl dimethiodide, 13 dimethochloride" 14 Do you see where it goes from there? 15 A. Yes, sir. 16 Q. Is the 4'-dipyridyl dimethochloride 17 another name for paraquat dichloride or, as we're 18 referring to it, paraquat? 19 A. I believe so, yes. 20 Q. And the statement in the patent that 21 paraquat was a known compound means it wasn't a new 22 compound created from scratch by the inventors; 23 right? 24 MR. ORLET: Object to the form. 25 THE WITNESS: I'm not very versed in patents,

Page 142 1 but that's what it says. 2 BY MR. TILLERY: 3 Q. You don't have any reason to dispute it? 4 A. I don't. 5 Q. And in your research, you would have found 6 that paraquat and its chemical properties have been 7 known to the scientific community for decades before 8 it was patented for use as a herbicide; correct? 9 A. Sir, "chemical properties" may encompass a 10 large category. Can you repeat the question. 11 Q. It will be the same one, but I'm happy to 12 read it back to you. 13 Paraquat and its chemical properties had 14 been known to the scientific community for decades 15 before it was patented for use as a herbicide by 16 ICI; correct? 17 A. So going back to the 19- -- either the '33 18 or the '38 document, I believe that had some of the 19 chemical properties. So going back to that time, 20 there were some chemical properties that were known. 21 Q. At least by 1933 it was known; would you 22 agree? 23 A. Some chemical properties, but we -- again, 24 that's a very -- "chemical properties" can mean many 25 different things.	Page 144 1 Q. Did you go on Wikipedia and look it up? 2 A. No, I didn't go on Wikipedia. 3 Q. Did you know that scientists had used 4 paraquat to catalyze the formation of reactive 5 oxygen species before ICI began investigating its 6 potential for use as a herbicide? 7 MR. ORLET: Object to the scope. 8 THE WITNESS: Can you please repeat the 9 question. 10 MR. TILLERY: Can you read it back to him. 11 (Record read by reporter as follows: 12 "Question: Did you know that scientists 13 had used paraquat to catalyze the 14 formation of reactive oxygen species 15 before ICI began investigating its 16 potential for use as a herbicide?") 17 THE WITNESS: I focused my research and 18 investigation on the 1964 to 1986 time frame, which 19 was relevant for when Chevron was evaluating 20 paraquat. 21 BY MR. TILLERY: 22 Q. I move to strike your answer as 23 unresponsive. 24 Can you answer my question, please. 25 A. Again, I only looked at the time period
Page 143 1 Q. We'll talk about that in a minute, that 2 study. 3 But you read that study in preparation for 4 this deposition, didn't you? 5 A. I reviewed it, but not in detail. 6 Q. Well, would you agree that chemists and 7 toxicologists knew about paraquat certainly before 8 it was originally patented in 1956? Based on the 9 1933 study that you read. 10 A. I may need to refresh myself on the 1933 11 study. 12 Q. We're just about to do that. We're going 13 to go there. 14 Is that the only thing you relied upon, 15 other than your textbook and that 1933 study? 16 A. Please clarify. Relied upon for? 17 Q. When you said you were aware of its 18 properties or you researched it in preparation for 19 the deposition, what else did you read about 20 paraquat? 21 A. I read -- in addition to the Chevron 22 documents and discussing paraquat with the retired 23 Chevron toxicologists, I did read my textbooks, as 24 well as the current regulatory evaluations related 25 to the toxicology of paraquat.	Page 145 1 from 1964 on. I did not research paraquat chemical 2 properties before that time period. So I would need 3 to do additional research to be able to fully answer 4 your question. 5 Q. So you can't answer it today; right? 6 A. I would need to do additional research on 7 the properties of paraquat before 1964. 8 Q. My question to you is, can you answer that 9 question today? 10 A. I cannot answer that question without 11 doing additional research. 12 Q. Do you know if Chevron was aware of 13 paraquat's mode of action in animal cells before 14 1960? 15 A. Before 1960, I'm not aware that Chevron 16 was looking at paraquat for its properties. And I 17 did not come across anything like that in the 18 documents. 19 Q. Was Chevron aware that scientists had used 20 paraquat as an oxidation-reduction indicator before 21 ICI began investigating its potential for use as a 22 herbicide? 23 MR. ORLET: Object to the scope. 24 THE WITNESS: The documents that I reviewed 25 were primarily focused on the 1964 to '86 time

Page 146 1 frame, so I don't know what Chevron was doing prior 2 to that time period. 3 BY MR. TILLERY: 4 Q. Or what the knowledge was? You don't know 5 and you can't -- you're speaking for -- as the 6 corporation today. 7 And I'm asking you if you knew, as the 8 representative for Chevron, what kinds of 9 experiments scientists were conducting using 10 paraquat as an oxidation-reduction indicator. 11 Did you know that? 12 A. To the best of my knowledge, Chevron 13 started looking at paraquat as a herbicide during 14 the 1964 time frame. So there's nothing that I came 15 across that indicates they were looking at paraquat 16 before that. 17 Q. Did you believe that it was not important 18 to know what the scientific community knew about 19 paraquat at the time Chevron began its relationship 20 with ICI? 21 MR. ORLET: Object to the form. 22 THE WITNESS: Please repeat the question. 23 BY MR. TILLERY: 24 Q. Was it important for Chevron to know what 25 the scientific community knew and understood about	Page 148 1 MR. ORLET: Objection to form. 2 THE WITNESS: No, sir. There's multiple 3 documents that I reviewed where Chevron discussed 4 with ICI the properties of paraquat and understood 5 the herbicidal properties. There's multiple 6 documents. But I would need to go back and look at 7 them. I did not put them in my reliance materials. 8 BY MR. TILLERY: 9 Q. Well, let me ask you: If they did know 10 these chemical properties, what did they know about 11 the scientists' use of paraquat as an 12 oxidation-reduction indicator before 1965? 13 A. Before 1965, I would need to go back to 14 the documents and query that specific question for 15 me to give an answer. 16 Q. So your answer today would be, I don't 17 know? 18 A. My answer today is I can go back to the 19 documents that Chevron has produced and find 20 anything related to -- if there is anything related 21 to redox cycling. 22 Q. But today you can't answer the question; 23 is that a fair statement? 24 A. Today I don't recall seeing those 25 documents. I do recall seeing multiple documents
Page 147 1 chemical characteristics of paraquat at the time it 2 started selling the product? 3 MR. ORLET: Same objections. 4 THE WITNESS: The "chemical characteristics" is 5 a very broad term. 6 BY MR. TILLERY: 7 Q. Let's try to identify that. 8 What's a chemical characteristic? 9 A. So a chemical characteristic can be the 10 form of a chemical, the physical properties of a 11 chemical, the chemical properties such as a 12 solubility, how it acts. So it can encompass 13 different aspects. 14 Q. Using that definition that you just came 15 up with, which I'll accept for purposes of this 16 question, do you believe that it was important for 17 Chevron to have known those chemical characteristics 18 of paraquat before it started selling it to the 19 American public? 20 A. Yes. 21 Q. Did they know them? 22 A. Yes. 23 Q. And they knew them from one document where 24 ICI had a meeting and gave it to -- this information 25 to them; right?	Page 149 1 where the properties of paraquat were discussed, the 2 herbicidal properties were discussed, but I don't 3 recall the exact Bates number for those, and I would 4 need to re-pull and look at them. 5 MR. TILLERY: Let me see this next one. 6 (Plaintiffs' Exhibit 12 was marked.) 7 BY MR. TILLERY: 8 Q. I'll direct your attention to Plaintiffs' 9 Exhibit No. 12. Would you look at that, sir. 10 A. Yes. 11 Q. Is this the article by Michaelis and Edgar 12 Hill dated April 7th, 1933 that you said you went 13 through before this deposition? 14 A. I've only briefly scanned this document. 15 Q. But you realized that it was important 16 enough for you to at least scan before the 17 deposition, didn't you? 18 A. I believe that I saw this document 19 referenced in other Chevron documents, which would 20 have let -- led me to at least scanning it. 21 Q. So which other Chevron documents included 22 the Michaelis paper of 1933? 23 A. I would need to go back and look through 24 the documents to find it. 25 Q. You can't tell me today; right?

Page 150 1 A. I don't believe it's in my reliance 2 material, but I could go through and look. 3 Q. You're telling me -- the answer is you 4 can't tell me today; right? 5 A. I know that I've seen this referenced in 6 Chevron documents, but I can't provide you this 7 exact Bates number right now. 8 Q. Okay. Now -- so this document is a paper 9 by an author named Michaelis published in the 10 Journal of General Physiology in 1933 entitled, "The 11 Viologen Indicators," isn't it? 12 A. Correct. 13 Q. The Michaelis paper reported the results 14 of studies measuring the redox potential and 15 determining the optical properties of the compounds 16 it referred to as viologen indicators, didn't it? 17 A. Yes. 18 Q. Paraquat, or methyl viologen, as Michaelis 19 refers to it, was one of the viologen indicators 20 whose redox potential and optical properties he 21 studied and reported on in this 1933 paper; isn't 22 that correct? 23 A. That is correct. 24 Q. Michaelis measured and reported the 25 results of studies measuring paraquat's redox	Page 152 1 derived from the Y,Y-dipyridyl have proven to be 2 useful as oxidation-reduction indicators of 3 properties very desirable for biological purposes, 4 especially because their potential range is very 5 negative," and it goes on from there. 6 Did I read that correctly? 7 A. Yes, you did. 8 Q. The viologen indicators Michaelis studied 9 are the same as the quaternary bases derived from 10 the Y,Y-dipyridyl that this sentence refers to, 11 aren't they? 12 A. That's my understanding, yes. 13 Q. And one of them is paraquat? 14 A. Yes. 15 Q. And the quote "their potential range is 16 very negative" in this first sentence means the 17 viologen indicators Michaelis studied, including 18 paraquat, have a very high potential to undergo; 19 correct? 20 A. Correct. 21 Q. Paraquat has a very high potential to 22 participate in redox reactions, doesn't it? 23 A. That's correct. 24 Q. What color is paraquat? 25 A. I believe it's purple.
Page 151 1 potential so scientists could use it as a yardstick 2 in studies to measure the redox potential of other 3 chemical compounds, didn't he? And you can take 4 your time and look through it if you need to to 5 answer my question. 6 (Witness reviews document.) 7 A. Could you repeat the question. 8 Q. Absolutely. As a matter of fact, I'll 9 direct you in this time period. It's not a test to 10 see how quickly you can read. I'm trying -- I'll 11 direct you to the parts that I think answer that. 12 So the question that I'd asked you before 13 is, Michaelis measured and reported the results of 14 studies measuring paraquat's redox potential so 15 scientists could use it as a yardstick in studies to 16 measure the redox potential of other chemicals, 17 didn't he? 18 A. Yes. 19 Q. And he determined and reported on its 20 optical properties so scientists could use it as an 21 indicator of redox reactions? 22 A. Correct. 23 Q. If you look at the very first sentence of 24 his study, the first sentence of the introduction to 25 the Michaelis paper reads, "The quaternary bases	Page 153 1 Q. Paraquat can undergo a redox reaction in 2 which the charge on the paraquat cation is reduced 3 from plus two to plus one, can't it? 4 A. Correct. 5 Q. Paraquat's very high redox potential means 6 this reaction occurs very readily and very quickly 7 if a suitable reagent is present, doesn't it? 8 A. Correct. 9 Q. The result of reducing the charge on the 10 paraquat cation from plus two to plus one is the 11 paraquat monocation; correct? 12 A. Correct. 13 Q. Does the "mono" in "monocation" refer to a 14 charge of one? 15 A. That's my understanding. It would be plus 16 one. 17 Q. Does it -- strike that. 18 Is paraquat monocation also known as 19 paraquat radical? 20 A. Correct. 21 Q. For simplicity and consistency's sake, can 22 we agree to refer to paraquat monocation as paraquat 23 radical for the purpose of this deposition? 24 A. Yes. 25 Q. What happens to the color of paraquat when

Page 154 1 paraquat cation is reduced to paraquat radical? 2 A. It changes color. 3 Q. What's it go to? 4 A. I don't remember, but it's in the article. 5 Q. It changes color? 6 A. Changes color. 7 Q. And is that how paraquat got the name 8 methyl viologen? 9 A. I never connected the methyl viologen name 10 to its color-changing ability, but it's an 11 interesting fact. 12 Q. Makes sense, doesn't it? 13 A. Yes. 14 Q. Is paraquat radical what is sometimes 15 referred to as a free radical? 16 A. Yes, I believe that's an appropriate 17 characterization. 18 Q. Free radicals are unstable, highly 19 reactive molecules, aren't they? 20 A. Correct. 21 Q. Can paraquat radical undergo a redox 22 reaction in which it's oxidized back to paraquat 23 cation? 24 A. In the presence of an electron donor, yes. 25 Q. And what happens to the color of paraquat	Page 156 1 in an uncharged state? Do you know? 2 A. No. 3 Q. That paraquat changes color depending on 4 whether it has a charge of two, one or zero is one 5 of the properties that makes it useful as a redox 6 indicator; correct? 7 A. Yes. 8 Q. When paraquat undergoes a redox reaction 9 in which paraquat cation is reduced to paraquat 10 radical, the reduction refers to the decrease in 11 charge from plus two to plus one, doesn't it? 12 A. Correct. 13 Q. That decrease in charge from plus two to 14 plus one occurs because paraquat gains an electron 15 in that redox reaction; isn't that correct? 16 A. Correct. 17 Q. And because an electron has a charge of 18 minus one, gaining an electron reduces the charge on 19 the paraquat ion from plus two to plus one; correct? 20 A. Correct. 21 Q. The electron paraquat gains when it's 22 reduced in a redox reaction -- strike that. 23 The electron paraquat gains when it is 24 reduced in a redox reaction is taken or -- strike 25 that. Excuse me. Pardon me. Sorry. Start over.
Page 155 1 when paraquat radical is oxidized back to paraquat 2 cation? 3 A. I believe it changes back. 4 Q. Goes back to the original color? 5 A. Yes. 6 Q. Can paraquat radical undergo a redox 7 reaction in which it's further reduced to an 8 uncharged state? 9 A. I'm sorry. Could you repeat the question. 10 Q. Of course. And I'm sorry. 11 Can paraquat radical undergo a redox 12 reaction in which it's further reduced to an 13 uncharged state? 14 A. To make sure I understand your question, 15 you're asking if the reduced paraquat, so the plus 16 one paraquat, can undergo further reduction? 17 Q. Well, to where it's in an uncharged state, 18 not positive, not negative. 19 Is that possible? 20 A. I'm not -- I don't know about that 21 question. 22 Q. Let me ask you to assume that it can. 23 Okay? 24 A. Okay. 25 Q. What color is paraquat that's been reduced	Page 157 1 The electron paraquat gains when it is 2 reduced in a redox reaction is taken from another 3 molecule; correct? 4 A. Yes. 5 Q. In taking an electron from another 6 molecular in a redox reaction, is paraquat acting as 7 what chemists and biologists refer to as an oxidant? 8 A. Yes, that's correct. 9 Q. And the other molecule, the one losing an 10 electron to paraquat, is acting as a reductant? 11 A. Correct. 12 Q. So an oxygen reduction or redox reaction 13 is a reaction where an electron is transferred from 14 a reductant to an oxidant? 15 A. Transferred from a reductant to -- 16 Q. To an oxidant. 17 A. Would you repeat that. 18 Q. Of course. 19 So an oxidation-reduction or redox 20 reaction is a reaction where an electron is 21 transferred from a reductant to an oxidant? 22 A. I believe it's the -- the agent that is 23 reduced is the one that gets the electron. 24 Q. So that means sense, doesn't it? 25 A. Yes.

Page 158 1 Q. You agree. 2 And we say that the oxidant is reduced and 3 the reductant is oxidized? 4 A. Correct. 5 Q. In the presence of molecular oxygen, O₂, 6 does paraquat radical undergo a redox reaction in 7 which it's oxidized back to paraquat cation? 8 A. That is correct. 9 Q. In that -- strike that. 10 In that reaction, O₂ is the oxidant that 11 takes an electron, and paraquat radical is the 12 reductant that loses one; correct? 13 A. That's my understanding. 14 Q. And so the products of redox reaction 15 between paraquat radical and O₂ is paraquat cation? 16 A. Correct. 17 Q. And the other product of that reaction, 18 the result in the reduction of O₂, is O₂ minus; 19 correct? 20 A. That's correct. Superoxide. 21 Q. O₂ minus is also known as, as you just 22 said, superoxide and it's also called superoxide 23 radical; correct? 24 A. Correct. 25 Q. Is superoxide a free radical?	Page 160 1 Q. The difference between the redox 2 potentials of paraquat radical and O₂ means the 3 redox reaction between paraquat radical and O₂ that 4 produces paraquat cation and O₂ minus occurs very 5 readily and very quickly. 6 A. It is thought to occur readily and 7 quickly. 8 Q. It makes sense? 9 A. It does make sense. It's just those terms 10 can be relative, "readily" and "quickly," but it 11 does happen readily and quickly. 12 Q. Have you read the reports about how fast 13 paraquat works on a weed? 14 A. I have read those reports, yes. 15 Q. In direct sunlight. 16 A. In direct sunlight with oxygen. 17 Q. In one day, you can see the plant die 18 right in front of your eyes. Have you heard that 19 before? 20 A. I've read that it happens very quickly, 21 yes. 22 Q. That redox cycling is occurring at a 23 breakneck speed, isn't it? 24 A. I believe it's occurring very quickly, 25 under the right conditions with oxygen and light.
Page 159 1 A. Yes. 2 Q. Is superoxide also referred to as a 3 reactive oxygen species? 4 A. Yes, it is. 5 Q. Could you very briefly, for the court and 6 jury, tell us what a reactive oxygen species is. 7 A. A reactive oxygen species is a molecule 8 that, by its name, is very reactive. And so it 9 could react with other molecules. And typically 10 what happens with the superoxide is it can further 11 undergo enzymatic metabolism, setting off a chain of 12 events that releases other radicals that could react 13 and bind to other molecules. 14 Q. And the difference between the redox 15 potentials of paraquat radical and O₂ means the 16 redox reaction between paraquat radical and O₂ that 17 produces paraquat cation and O₂ minus occurs very 18 quickly; correct? 19 A. Under what conditions? 20 Q. Well, the conditions where O₂ is present, 21 where the reagent is present for the redox cycling 22 to take place. 23 Do you want me to read the question back 24 to you? 25 A. Yes.	Page 161 1 Q. Right. 2 Can the paraquat cation that results from 3 a redox reaction between paraquat radical and O₂ 4 undergo again the first redox reaction that we 5 discussed in which it's reduced to paraquat radical? 6 A. In the presence of additional oxygen, yes, 7 sir. 8 Q. The cycle of reduction of paraquat cation 9 to paraquat -- start over. 10 The cycle of the reduction of paraquat 11 cation to paraquat radical in one redox reaction and 12 the oxidation of paraquat radical back to paraquat 13 cation in a second redox reaction will occur and 14 continue if both a reductant to participate in the 15 first reaction and O₂ to participate in the second 16 reaction are present, won't it? 17 A. Correct. 18 Q. Is the sequence of redox reactions that 19 transforms paraquat cation to paraquat radical and 20 paraquat radical back to paraquat cation an example 21 of what's called redox cycling? 22 A. That is an example of redox cycling. 23 Q. We have just gone through, through these 24 series of questions and answers over the last few 25 minutes, an example and explanation of redox

Page 162 1 cycling, haven't we? 2 A. Correct. 3 Q. Do you know if all of what I just asked 4 you was known by the time of the 1933 Michaelis 5 paper? 6 A. Was all known by the -- 7 Q. By the time Mr. Michaelis wrote his paper. 8 A. I don't know. 9 MR. ORLET: Objection to the scope. 10 THE WITNESS: Sorry. Do you mind if we can 11 take another break? 12 MR. TILLERY: We can take a little longer 13 break. 14 THE VIDEOGRAPHER: Off the record at 2:32. 15 (Recess taken.) 16 THE VIDEOGRAPHER: Back on the record at 3:00. 17 BY MR. TILLERY: 18 Q. Going -- excuse me, sir. 19 Going back to the introduction to the 20 Michaelis paper, and that's Exhibit 12 in front of 21 you there, sir, does viologen indicators being 22 useful as redox indicators, quote, "of properties 23 very desirable for biological purposes," end quote, 24 mean they were useful as indicators in the kinds of 25 studies scientists did in the early to mid 20th	Page 164 1 BY MR. TILLERY: 2 Q. So you really couldn't answer it without 3 doing more research; right? 4 A. I would need to do more research. 5 Q. Chevron knew before it first sold paraquat 6 that -- about the potential of green plant cells to 7 take energy from the sunlight and store it by 8 transforming carbon dioxide and water into food; 9 would you agree with that? 10 A. I would agree that that would have been 11 common knowledge among scientists. 12 Q. If you went through high school science 13 courses? 14 A. Yes, sir. 15 Q. That's fundamental -- 16 A. Yes, sir. 17 Q. -- science. 18 This process is called photosynthesis; 19 correct? 20 A. Correct. 21 Q. And oxygen is a byproduct of 22 photosynthesis, isn't it? 23 A. Correct. 24 Q. Does photosynthesis occur in a green part 25 cell of the plant called the chloroplast?
Page 163 1 Century, as far as you know? 2 MR. ORLET: Object to the scope. 3 THE WITNESS: It's hard to know what context 4 that biological purpose is put into. 5 BY MR. TILLERY: 6 Q. His paper, though, in the very first 7 paragraph in his introduction in 1933, and I'm 8 quoting says, "The quaternary bases derived from 9 Y,Y-dipyridyl have proven to be useful as 10 oxidation-reduction indicators of properties very 11 desirable for biological purposes, especially 12 because [of] their potential range is very negative, 13 under certain conditions more negative than that of 14 any member of the series of indicators worked out by 15 W.M. Clark and his associates." 16 Do you see that? 17 A. I do. 18 Q. In your research, did you confirm that 19 this was of significance to scientists in the early 20 part of the 20th Century? 21 MR. ORLET: Object to the scope. 22 (Witness reviews document.) 23 THE WITNESS: To put that into context, I would 24 have to understand the Clark, W.M. reference and 25 what it's stating to better put that into context.	Page 165 1 A. Yes, it does. 2 Q. Is photosynthesis a series of electron 3 transfer reactions? 4 A. Yes, it is. 5 Q. Is the series of electron transfer 6 reactions in photosynthesis referred to as the 7 electron transport chain? 8 A. Yes, sir, it is. 9 Q. Chevron knew how photosynthesis worked 10 before it decided to investigate paraquat's 11 potential use -- strike the question. 12 Chevron knew how photosynthesis worked 13 before it decided to sell paraquat as a herbicide, 14 didn't it? 15 A. I assume so, yes. 16 Q. Does paraquat inhibit photosynthesis in 17 plant cells? 18 A. I would need to refer to my documents to 19 understand. 20 Q. You can refer to anything you want. 21 A. Okay. 22 (Witness reviews document.) 23 A. Sir, yes, in 1963, on CUSA-00006857, under 24 "Mode of Action," it says, "Both diquat and paraquat 25 are believed by interfere" --

Page 166 1 (Reporter seeks clarification.) 2 A. "Both diquat and paraquat are believed to 3 interfere with the photosynthesis process by 4 reversible process involving the intermediate 5 formation of free radicals from the quaternary which 6 are then converted to radical ions by reduction." 7 So, sir, your answer is, yes. 1963 is 8 when the documents indicate Chevron was aware of 9 this. 10 Q. And what you just read is another way of 11 describing redox cycling, isn't it? 12 A. Yes, sir. 13 Q. So paraquat inhibits photosynthesis in 14 plant cells through redox cycling; correct? 15 A. Yes, sir. 16 Q. And the redox cycling of paraquat in plant 17 cells produces superoxide radical, doesn't it, just 18 what you read? Go ahead and read that again. I 19 think that's what they said. 20 A. Yes, produces free radicals -- yes, sir, 21 free radicals are produced. 22 Q. Chevron knew paraquat was likely to 23 undergo redox cycling and produce superoxide 24 radicals in plant cells before it sold it then in 25 1963, didn't they?	Page 168 1 pass that electron onto the next link in the chain, 2 which is NADP+; correct? 3 A. That's correct, sir. 4 Q. And just for the record, can you tell us 5 what NADP+ is. 6 A. So NADP+ and its -- I suppose I'd call its 7 sister molecule NADPH are enzymatic cofactors that 8 are used in energy production, and they essentially 9 provide the electron for the reactions. 10 Q. And for the record, that stands for -- see 11 if I get this right. Correct my pronunciation, 12 okay -- nicotinamide adenine dinucleotide phosphate. 13 A. That's correct, sir. 14 Q. The paraquat cation intercepts that 15 electron by taking it from ferredoxin in the 16 analysis; correct? 17 A. I cannot state that, but the logic makes 18 sense. 19 Q. Paraquat cation, taking an electron from 20 ferredoxin, is the first type of redox reaction we 21 discussed earlier with paraquat cation as the 22 oxidant and ferredoxin as the reductant; correct? 23 A. Correct. 24 Q. That reaction, the transfer of an electron 25 from ferredoxin to the paraquat cation, reduces
Page 167 1 A. Correct, sir. 2 Q. Chevron knew paraquat was likely to 3 undergo redox cycling and produce superoxide 4 radicals in plant cells because: One, it knew that 5 paraquat has a very high potential to undergo redox 6 cycling in the presence of molecular oxygen and a 7 suitable reductant; and, two, it knew that 8 photosynthesis works through an electron transport 9 chain that involves reductant and generates oxygen; 10 fair? 11 A. I believe that's a fair statement, yes. 12 Q. In short, Chevron knew before it decided 13 to sell the product, paraquat, as a herbicide that 14 all of the conditions for paraquat to undergo redox 15 cycling and produce superoxide radical were present 16 in green plant cells; correct? 17 A. Yes, sir, that's correct. 18 Q. Is part of the electric -- strike that. 19 Is part of the electron transport chain in 20 photosynthesis the transfer of an electron from 21 something called photosystem I to a compound called 22 ferredoxin? 23 A. That's my recollection, yes. 24 Q. The way the electron transport chain in 25 photosynthesis normally works, ferredoxin would then	Page 169 1 paraquat cation to paraquat radical; correct? 2 A. Correct. 3 Q. And this happens in a chloroplast where 4 oxygen is present; correct? 5 A. Correct. 6 Q. So paraquat radical then loses an electron 7 to oxygen; correct? 8 A. Correct. 9 Q. Paraquat radical losing an electron to 10 oxygen is the second type of redox reaction we 11 discussed earlier where oxygen is the oxidant and 12 paraquat radical is the reductant? 13 A. Correct. 14 Q. And as we discussed earlier, the products 15 of that reaction are paraquat cation and superoxide 16 radical? 17 A. Correct. 18 Q. The regenerated paraquat cation that this 19 reaction produces is then able to react with 20 ferredoxin again in the same way it did before; is 21 that correct? 22 A. That's my understanding of what happened. 23 Q. So in plant cells, paraquat can cycle from 24 cation to radical, back to cation indefinitely as 25 long as photosynthesis is occurring?

Page 170 1 A. As long as photosynthesis is occurring and 2 there's the electron equivalence provided, yes, sir. 3 Q. By the reagent? 4 A. By the reagent, yes. 5 Q. And every time paraquat cycles from cation 6 to radical and back to cation, it both interferes 7 with photosynthesis by taking electron from 8 photosystem I and produces the reactive oxygen 9 species superoxide radical, doesn't it? 10 A. Yes, sir, it does. 11 Q. The production of superoxide radical 12 begins a cascade of reactions that create other 13 reactive oxygen species like hydrogen peroxide and 14 hydroxyl radical, didn't it? 15 A. Yes, sir, it does. 16 Q. Superoxide and these other reactive oxygen 17 species damage parts of the plant cells, including 18 the cell membrane? 19 A. That's correct. 20 Q. And it destroys biological systems in the 21 plant? 22 A. That's correct. 23 Q. Damages DNA? 24 A. Those free radicals, assuming -- those 25 free radicals can bind to DNA, yes.	Page 172 1 paraquat will undergo redox cycling in vivo being 2 reduced by an electron donor such as NADPH before 3 being oxidized by an electron receptor, such as 4 dioxygen, to produce superoxide, a major reactive 5 oxygen species? 6 A. Sir, I believe that that research related 7 to paraquat and redox cycling was first done in 8 vitro in 1968 when that information was first 9 hypothesized, followed by additional studies in vivo 10 to elucidate whether or not that could happen in an 11 animal model. 12 Q. Who did that first research? 13 A. I believe it was Gage in 1968. 14 Q. And what methodology did he use to do that 15 study? 16 A. I would need to go back to the -- I would 17 need to -- for the experimental conditions, I would 18 need to consult the documents, and I'm not positive 19 it's in here, but I could take a quick look. 20 MR. ORLET: I think it is. 21 THE WITNESS: Okay. 22 (Witness reviews document.) 23 THE WITNESS: I think that's a different study. 24 (Witness reviews document.) 25 THE WITNESS: It's a different study than that
Page 171 1 Q. And it interferes with enzymes in the 2 plant? 3 A. Yes, it does. 4 Q. So paraquat kills plant cells by 5 interfering with photosynthesis and producing 6 reactive oxygen species, oxygen-free radicals, that 7 damage cell membranes and other parts of the plant 8 cells; correct? 9 A. Yes, sir. 10 Q. Would you agree that as a result of redox 11 cycling, paraquat is highly toxic to animals as 12 well? 13 A. Could you repeat the question. 14 Q. Yes. 15 Would you agree that as a result of redox 16 cycling, paraquat is potentially highly toxic to 17 animals as well as plants? 18 A. So based on the potential for redox 19 cycling, if the conditions were similar such that 20 redox cycling could occur and the paraquat could 21 reach a target cell, then toxicity would be assumed 22 to occur. 23 Q. Okay. And using similar, but slightly 24 different terms for purposes of the animal versus 25 the plant model, another way to say it would be that	Page 173 1 one. 2 (Witness reviews document.) 3 MR. HOPKINS: Can I show him the document 4 number? 5 It's this one. Is that what you're 6 looking for? 7 THE WITNESS: So I found it. I don't believe 8 it's in these materials, but there's a reference to 9 the Gage study that I can tell you. And that was 10 the earliest that I found where there was an in 11 vitro, or a non-animal, study. 12 The reference is . . . so it's a 1968 13 study titled, "The Action of Paraquat and Diquat on 14 the Respiration of the Liver Cell Fractions." 15 So, sir, it was a study conducted in vitro 16 in liver cells. 17 BY MR. TILLERY: 18 Q. And where was Mr. Gage? Who was he 19 working for? 20 MR. HOPKINS: If you look at Tab 19, it will 21 tell you where he's employed. 22 THE WITNESS: So there's another study by 23 Mr. Gage, also from 1968, not related to this, but 24 he worked for ICI. 25 BY MR. TILLERY:

Page 174 1 Q. Okay. Would you agree that paraquat is 2 highly poisonous in even very small doses? 3 A. I would agree that paraquat is highly 4 poisonous, especially when ingested. 5 Q. Yes. 6 And one to one and a half teaspoons is 7 sufficient to kill a person? 8 A. My understanding is it's approximately 15 9 to 20 milliliters, which I've seen equated to about 10 a mouthful. And I would need to do the conversion 11 from milliliters to teaspoons. It's not a normal 12 unit of measure that we use. 13 Q. Would you agree that paraquat has been 14 involved in a number of adverse incidents, including 15 accidental ingestions, often leading to fatalities 16 as well as skin and eye contact due to occupation 17 spills, splashes, leaks, which can result in 18 damaging and often very severe acute injuries? 19 MR. ORLET: Object to form. 20 THE WITNESS: Would you please break down that 21 question. There was a lot of questions within 22 there. 23 BY MR. TILLERY: 24 Q. Right. 25 Would you agree that paraquat has been	Page 176 1 and the understanding that Chevron had during this 2 time period. 3 Q. Is that your belief today, based on every 4 bit of information you've read? 5 A. Yes, it is. 6 Q. Is NAD found in all living cells? 7 A. Yes, I believe it is. 8 Q. The energy required for cellular life is 9 partially provided by NADH or NADPH differing by a 10 single phosphate group, which can donate and accept 11 electrons as an energy source; would you agree? 12 A. I would agree to that, yes, sir. 13 Q. Examples are electron transport chain in 14 photosynthesis. That's an example of it, which we 15 talked about earlier? 16 A. In plants, yes. 17 Q. Yes. 18 Electron transport chain in cellular 19 respiration as well; right? 20 A. Yes, sir, it is. 21 Q. Those are two fundamental biological 22 processes upon which all life is supported; correct? 23 A. Correct. 24 Q. NADPH can donate an electron to an 25 acceptor, can't it?
Page 175 1 involved in a number of adverse incidents, including 2 accidental ingestions, often leading to fatalities? 3 A. Yes, I would agree to that. 4 Q. Would you agree that it's been involved in 5 a number of adverse incidents, including the skin 6 and eye contact? 7 A. So there have been cases for the skin. I 8 would like to break it down between the skin and the 9 eye. Based on my understanding of paraquat 10 toxicology, what I reviewed is, after skin exposure, 11 the typical response is irritation, possibly 12 irritation depending on the dose. 13 There are some incidents -- based on my 14 recollection of the documents, I believe there were 15 in total about 10 incidents where there were severe 16 exposures to either the concentrate through the 17 dermal exposure, which resulted in damage to the 18 skin and subsequent systemic absorption, or existing 19 damage to the skin in combination with high amounts 20 of exposure that led to systemic exposure and severe 21 adverse effects. 22 Regarding the eye, my understanding is 23 that the eye irritation and corrosivity that could 24 occur was typically treated and not permanent, and 25 resolved. And that's based on, again, the documents	Page 177 1 A. Yes, it can, sir. 2 Q. This acceptor, or a diaphorase, then 3 becomes the donor and can pass the electron to 4 another acceptor; correct? 5 A. Repeat that. 6 Q. Sure. 7 MR. TILLERY: Read that back to him. 8 (Record read by reporter as follows: 9 "Question: This acceptor, or a 10 diaphorase, then becomes the donor and can 11 pass the electron to another acceptor; 12 correct?") 13 THE WITNESS: Correct. 14 BY MR. TILLERY: 15 Q. Paraquat is an efficient electron 16 acceptor, do you agree? 17 A. Yes, I would agree to that. 18 Q. Paraquat is particularly potent because, 19 as a redox cyclor, one molecule of paraquat can 20 undergo hundreds, perhaps thousands, of rounds of 21 taking electrons from NADPH and transferring them to 22 oxygen to create superoxide; correct? 23 A. In what context, sir? 24 Q. In any context. We can talk about any 25 context you want, but the one I'm focused on are the

Page 178 1 gentlemen who have brought the lawsuit who have 2 either died or are dying. Okay. So that's my 3 context. But if you want to talk about other 4 context, we can pick a mouse brain if you want to do 5 that. 6 As a fundamental concept, do you agree 7 with that statement? 8 A. Would you please repeat it. 9 Q. Sure, I will. 10 Paraquat is a particularly 11 potent -- strike that. 12 Paraquat is particularly potent because, 13 as a redox cyclers, one molecule of paraquat can 14 undergo hundreds, perhaps even thousands, of rounds 15 of taking electrons from NADPH and transferring them 16 to oxygen to create superoxide? 17 A. In the context of a cell in the human 18 body, there are protective mechanisms that 19 counteract that. So there are free radical 20 scavengers, such as ascorbic acid, which is 21 Vitamin C. And there's also enzymes, such as 22 glutathione peroxidase, that is designed to 23 counteract the reactive oxygen species. Because 24 reactive oxygen species are used in a number of 25 cells for things such as cell signaling in the	Page 180 1 break? 2 Q. Go ahead. 3 THE VIDEOGRAPHER: Off the record. It's 3:31. 4 (Recess taken.) 5 THE VIDEOGRAPHER: This begins Media Unit 4 in 6 the deposition of Tim Patterson. Going back on the 7 record at 3:34. 8 BY MR. TILLERY: 9 Q. Your answer was that the body is equipped 10 with defense mechanisms against reactive oxygen 11 species. 12 A. Yes, sir. 13 Q. Is that referencing my question of a 14 single molecule, or does it matter the amount of the 15 paraquat that enters the mammalian species? 16 A. It would matter based on the amount of 17 paraquat that entered not just the human, but was 18 also distributed to the target organ. 19 Q. So how does that matter? 20 A. It matters because whether or not the body 21 could -- the amount of reactive oxygen species that 22 was being produced -- whether or not the body could 23 handle and detoxify those reactive oxygen species. 24 Because the literature has shown a no-effect level 25 for paraquat, including paraquat in the lung, which
Page 179 1 normal physiological process. 2 So relating to the part of your question 3 that mentioned the potency, it's difficult to equate 4 one molecule with a potent response because the 5 cells have evolved to counteract reactive oxygen 6 species. 7 Q. So which studies are you relying upon for 8 that statement that have told you that answer to 9 this question? 10 A. Sir, that is based on my general 11 toxicology knowledge and is present in multiple 12 textbooks and supported by the literature, but I 13 would need to get you specific references. But it 14 is a hallmark of toxicology, I would say. 15 Q. So a hallmark of toxicology is that 16 paraquat in a mammalian species, let's say, will not 17 undergo redox cycling; is what you're saying? 18 A. No, sir. That there are -- I'm referring 19 to the part of the question related to the potency 20 of one molecule. And even if redox cycling does 21 occur, the body is equipped with defense mechanisms 22 against reactive oxygen species. 23 Q. That's what I want to ask you about right 24 there. 25 A. Sir, do you mind if we take one more quick	Page 181 1 is one of the primary target organs, such that it 2 does demonstrate that the -- that a certain amount 3 of paraquat does not cause cell damage. 4 Q. So when you say literature effect -- 5 describing no-effect level, are you talking about 6 Syngenta's literature? Is that what you're talking 7 about, the studies that Syngenta has generated? 8 A. I would have to go back and look at 9 exactly the studies. 10 Q. Let me ask you this: Are you aware of any 11 independent science that supports what you just said 12 that wasn't connected with the manufacturers of 13 paraquat? 14 (Witness reviews document.) 15 MR. TILLERY: While he is searching, Joe, can 16 we get a copy of his index tonight? 17 MR. ORLET: Sure. 18 MR. TILLERY: Before we leave here maybe we 19 could take a copy of it. 20 (Witness reviews document.) 21 BY MR. TILLERY: 22 Q. So we're clear, you're still searching for 23 a study? 24 A. Yes, sir. 25 Q. We've been at it about 10 minutes. I

Page 182 1 don't know if -- are you getting close to finding 2 the study or -- 3 A. Yes, sir. 4 Q. Okay. 5 (Witness reviews document.) 6 A. Sir, the original document that I'm 7 referring to is CUSA-00266380. 8 Q. And what's the document? 9 A. It is a document prepared by Chevron 10 toxicologist Dr. Ford. And it's titled, "A Review 11 of the Findings Concerning Potential Health Effects 12 Associated with Agricultural Use of Paraquat." 13 Q. So this isn't the study itself that you're 14 talking about; right? 15 A. No, sir. 16 Q. You didn't find the study? 17 A. I'm getting to the study, sir. 18 Q. Okay. 19 A. On CUSA-00266383 of that document, it 20 refers to a study done by Wyatt, et al. And then 21 there's also a study by Zavala. And it's my best 22 recollection those are not ICI studies, but I would 23 need to double-check that. But I don't believe that 24 those were coming out of ICI. 25 And those are the studies where -- I could	Page 184 1 A. I would have to do additional -- 2 Q. Sir, just can you answer me. 3 Can you look at the summary in front of 4 you and answer my question? 5 (Witness reviews document.) 6 A. No, I cannot. 7 Q. Now, when did Chevron -- strike that. 8 Would you agree that by the time paraquat 9 was first sold in the United States by Chevron, 10 Chevron knew that paraquat would redox cycle upon 11 entry into oxygen-rich human lungs? 12 A. Based on the documents that I reviewed, 13 the state of the science was developing first with 14 the 1968 publication by Gage, and then later 15 investigations into the mechanism of action occurred 16 over the mid '70s. 17 Q. So I move to strike your answer as 18 unresponsive. 19 Would you agree with me that by the time 20 Chevron first sold paraquat in the United States in 21 1965, Chevron knew that paraquat would redox cycle 22 upon entry into the human lung? 23 A. That hypothesis was developed and 24 evaluated later than 1965. 25 Q. So are you saying they didn't know that at
Page 183 1 read you -- 2 Q. If you're reading a summary, it's of no 3 use. We can check that. 4 But you do not have the studies, do you? 5 A. My reference is in a summary to the study. 6 Q. The summary that you're reading is by a 7 Chevron person who read the study and commented 8 about the study; right? 9 A. Correct. 10 Q. Okay. The study itself you don't have; is 11 that true, sir? 12 A. They might be in the broader set of 13 documents outside of my reliance materials, but I 14 would need to double-check that, if they're within 15 the set of CUSA documents, Bates numbers provided. 16 Q. Do you know what the endpoints were that 17 were used to establish the no-effect level for 18 paraquat in the studies? 19 (Witness reviews document.) 20 A. I would have to look at the article more 21 carefully to confirm what the endpoint is. 22 Q. Right now you don't know? 23 A. I would need to look into this more. 24 Q. You can't tell from the summary article, 25 can you?	Page 185 1 that time? 2 A. The general scientific community didn't 3 know that at that time. 4 Q. Did Chevron know that? 5 A. Chevron -- based on the documents that 6 I've read, the earliest indication that redox 7 cycling could occur in a cell was 1968. 8 Q. So then let's change it to 1968. 9 So by 1968, did Chevron understand that 10 paraquat would redox cycle upon entry into the human 11 lungs? 12 A. So 1968 was the first time the hypothesis 13 was tested in an in vitro. And then later 14 studies -- and then, in 1974 and beyond, was 15 validating and investigating that hypothesis. So 16 before that hypothesis could be concluded on, those 17 studies needed to be done to confirm that. So it 18 evolved -- the hypothesis evolved over time. 19 Q. I move to strike your answer as 20 unresponsive. 21 By 1968, did Chevron know whether paraquat 22 would redox cycle in a human body? 23 MR. ORLET: Object to the form. It's been 24 asked and answered. 25 You can try it again.

Page 186 1 BY MR. TILLERY: 2 Q. If they didn't, just tell me they didn't. 3 That's all I'm looking for. 4 Did they or didn't they? 5 A. Chevron and the scientific community -- 6 the way that we approach problems is -- 7 MR. TILLERY: I'm going to move to strike this. 8 And I'm going to ask, Joe, for a court 9 order on this one. It's very important to the case, 10 and he's obviously not going to answer it, so we'll 11 bring it to the judge. 12 MR. ORLET: He's answered it. He's answered it 13 twice. 14 MR. TILLERY: We'll get an order, and he can 15 show up in Santa Clara County and answer the 16 question. Let's move on. Okay. 17 BY MR. TILLERY: 18 Q. If you don't want to answer it -- if you 19 don't want to answer it, that's up to you, but I'm 20 telling you what I'm going to do, just so you know, 21 is I'm going to ask the court to order you to appear 22 in court and answer that question. 23 MR. ORLET: He answered it two or three times. 24 MR. TILLERY: Yeah, I know. We'll see. We'll 25 take it to the judge.	Page 188 1 out from the greater set of Chevron -- CUSA 2 documents that I understand were provided by 3 Chevron's attorneys that I had evaluated and pulled 4 out as being the most helpful in my assessment and 5 review of the paraquat toxicology and related 6 information. 7 Q. And in answering questions regarding the 8 designated topics? 9 A. Yes, sir. 10 Q. Do all mammals have something called a 11 blood-brain barrier? 12 A. To the best of my knowledge, yes, they do. 13 Q. Would it be accurate to describe the 14 blood-brain barrier as a highly selective 15 semi-permeable border separating the contents of the 16 capillaries in the blood stream from the brain and 17 intracellular fluid in the central nervous system? 18 A. Yes, sir. 19 Q. So on the brain side of the blood-brain 20 barrier are the brain and the other parts of the 21 central nervous system and fluid that isn't 22 contained within the cells of the central nervous 23 system? 24 A. That's my understanding. 25 Q. And on the blood side of the blood-brain
Page 187 1 MR. ORLET: That's fine. 2 THE WITNESS: Can we take a break, sir? 3 MR. TILLERY: Sure. 4 THE VIDEOGRAPHER: Off the record. It's 3:53. 5 (Recess taken.) 6 THE VIDEOGRAPHER: Back on the record at 4:10. 7 (Plaintiffs' Exhibit 13 was marked.) 8 BY MR. TILLERY: 9 Q. Please take a look at Exhibit 13 and 10 identify it. 11 A. This is an index that was put together as 12 a table of contents for my primary reliance 13 information. 14 Q. And it has 76 entries? 15 A. Correct. 16 Q. Does that correspond with the 76 entries 17 in your binder? 18 A. Yes, sir. 19 Q. And these are the same documents in order; 20 correct? 21 A. Yes, sir. 22 Q. And you said your "primary reliance" 23 documents. 24 What's that mean? 25 A. So these are the documents that I pulled	Page 189 1 barrier are the blood and everything else that's 2 circulating in the blood stream? 3 A. Yes, sir. 4 Q. Did the blood-brain barrier protect the 5 brain by preventing certain molecules and toxins 6 from moving from the blood side to the brain side of 7 the blood-brain barrier? 8 A. Yes, sir. 9 Q. Do some molecules pass through the 10 blood-brain barrier by a process called passive 11 diffusion? 12 A. Yes, sir. 13 Q. Is passive diffusion a process where 14 molecules in solution move from areas where they're 15 more concentrated to areas where they're less 16 concentrated? 17 A. Yes, sir, that's accurate. 18 Q. Generally speaking, do hydrophobic 19 molecules, meaning molecules that tend to repel or 20 not mix with water, like O2, CO2 and hormones and 21 small polar molecules, tend to pass through the 22 blood-brain barrier by passive diffusion? 23 A. Yes, sir, that's my understanding. 24 Q. And molecules like blood-borne pathogens 25 and large hydrophilic, meaning water soluble,

Page 190 1 molecules tend not to pass through the blood-brain 2 barrier by passive diffusion? 3 A. Yes, sir, that is accurate. 4 Q. Can some molecules, such as glucose and 5 certain amino acids, pass through the blood-brain 6 barrier by a process called active transport? 7 A. Yes, sir, that's accurate. 8 Q. In active transport, the cells of the 9 blood-brain barrier transport use 10 specialized -- strike that. 11 In active transport, the cells of the 12 blood-brain barrier use specialized transport 13 proteins to move molecules through the blood-brain 14 barrier? 15 A. Yes, sir. 16 Q. Is the permeability of the blood-brain 17 barrier constant, or does it vary with conditions 18 and over time? 19 A. The blood-brain barrier permeability can 20 vary based on the condition of the organism, and my 21 understanding is that it also changes over time. 22 Q. And how long has Chevron known that? 23 A. I believe that's general knowledge that 24 I'm aware of. Based on the documents that I've 25 evaluated, I did not see any references where	Page 192 1 country and around the world knew that at a certain 2 time, can you think of a reason why Chevron 3 scientists wouldn't know that? 4 MR. ORLET: Would or would not? 5 MR. TILLERY: Would not have known it. 6 THE WITNESS: It depends on what Chevron was 7 evaluating at the time based on the chemicals they 8 had and the effects they observed. I can't 9 speculate as to why or why not they were evaluating 10 a certain topic. 11 BY MR. TILLERY: 12 Q. So they wouldn't have access to general 13 medical texts and journals, articles? 14 A. They would have had general access to the 15 texts and the medical journals. 16 Q. You had people whose job it was to monitor 17 the public literature regarding products that you -- 18 the company manufactures? 19 A. Based on my discussions with John Ford and 20 Richard Cavalli, as well as Mr. Zimmerman, they very 21 closely monitored the paraquat literature. 22 Q. And the paraquat literature included 23 so-called independent literature in the public 24 domain? 25 A. That's correct.
Page 191 1 Chevron had specifically looked at the age or 2 conditions of the blood-brain barrier over time. 3 Q. How long do you think that premise, about 4 the blood-brain barrier changing over time and with 5 conditions, has been known as a general scientific 6 premise? 7 A. So I did speak to retired Chevron 8 toxicologists, and they had understood the concept 9 that the blood-brain barrier can change with certain 10 insults. So I would assume that -- I don't 11 necessarily have a date, but it would have been most 12 likely, based on -- I don't know the exact date. 13 Q. Well, do you have a general date, not 14 necessarily an exact date? How long has that 15 premise been understood in human physiology? 16 A. I don't know. I didn't look at the 17 history of the blood-brain barrier over time. 18 Q. Well, let me ask you this: Whatever that 19 date was that doctors and physiologists understood 20 that premise -- and let's get the premise 21 straight -- and that is that the permeability of the 22 blood-brain barrier is not constant, that it changes 23 over the time and with conditions. That's our 24 premise. 25 Assuming the medical science in this	Page 193 1 Q. So when an article came out, it didn't 2 matter if it was written by ICI or Syngenta or 3 Chevron. If it affected paraquat, they read it? 4 A. That's correct. 5 Q. And they read it quickly; right? Got it 6 and read it? 7 A. I can't speak to how quickly, but I do 8 know that they were closely monitoring the 9 literature. 10 Q. And that was the case with all the 11 chemicals and products of Chevron's; right? 12 A. Based on my understanding, yes. 13 Q. Now, assuming that this was an issue for 14 them -- you're saying if it wasn't an issue, they 15 may not look it up; right? 16 A. Right. It had to be relevant to 17 understanding a toxicology issue or phenomenon for 18 them to look more closely into a certain physiology 19 and understand how that physiology interacts and is 20 relevant to the observed toxicity. 21 Q. Was whether or not the blood-brain barrier 22 was permeable, or changed over time and due to 23 conditions that might have changed, something that 24 was relevant in terms of paraquat before 1965? 25 A. Please repeat the question.

Page 194 1 Q. Sure. 2 Was whether the blood-brain barrier was 3 constant or whether its permeability changed over 4 time relevant to Chevron with respect to paraquat at 5 any time? 6 A. Prior to 1965? 7 Q. Well, just pick the time. At any time it 8 was selling the product. 9 A. Please repeat the question one more time 10 in the context of any time. 11 Q. Yes, in the context of any time. So let's 12 start off and make sure we have our terms right. 13 At any time that Chevron was selling 14 paraquat from 1965 through 1986, was the 15 permeability of the blood-brain barrier a matter of 16 relevance to Chevron? 17 A. Yes, sir. In the 1985, 1986 time period, 18 Chevron considered the blood-brain barrier as it 19 relates to paraquat toxicity and an article that was 20 written in 1985 questioning whether there's an 21 association between paraquat and Parkinson's-like 22 symptoms. 23 Q. Was it relevant to Chevron before 1985? 24 A. Before 1985, based on my discussions with 25 Mr. Cavalli, Mr. Ford and Mr. Zimmerman, as well as	Page 196 1 was relevant to paraquat? 2 A. Correct. 3 Q. Does the blood-brain barrier tend to 4 become more permeable as a person or other mammal 5 ages? 6 A. That is my understanding. 7 Q. Does the blood-brain barrier tend to 8 become more permeable in the presence of 9 inflammation? 10 A. That is my understanding. 11 Q. Does that tendency to increase 12 permeability occur whether the inflammation is on 13 the blood side, the brain side or the blood-brain 14 barrier itself? 15 A. I don't know. 16 Q. What other factors tend to increase the 17 permeability of the blood-brain barrier? 18 A. So disease state, general health can also 19 influence the permeability of the blood-brain 20 barrier. 21 Q. Are there illnesses -- 22 A. Illnesses. 23 Q. Does working in heat and humidity increase 24 the permeability of the blood-brain barrier? 25 A. I don't know.
Page 195 1 my review of the documents, there were no 2 indications that -- that paraquat was causing 3 neurotoxicity; therefore, they weren't focusing 4 their investigations on the blood-brain barrier. 5 Q. And never did do any research on the human 6 blood-brain barrier, did they, with -- vis-a-vis 7 paraquat -- 8 A. Paraquat. 9 Q. -- is that a fair statement? 10 MR. ORLET: Prior to '85? 11 MR. TILLERY: At any time. 12 THE WITNESS: At any time, Chevron itself did 13 not do any research on paraquat distribution into 14 the brain, which would be one way to evaluate 15 whether or not the blood-brain barrier was 16 permeable. 17 BY MR. TILLERY: 18 Q. Did it even try to measure paraquat in the 19 brain of animals? 20 A. There were multiple studies that Chevron 21 was aware of that did conduct those studies, sir. 22 Q. So can we conclude this part of the 23 questioning by saying that at no time did -- prior 24 to 1985 did Chevron believe that a study of the 25 permeability of the mammalian blood-brain barrier	Page 197 1 Q. Does head injury increase the permeability 2 of the blood-brain barrier? 3 A. I don't know. 4 Q. Does infection increase the permeability 5 of the blood-brain barrier? 6 A. Based on my discussions with Chevron's 7 medical doctor, Jim Allen, it does. 8 Q. Does stress cause increased permeability 9 of the blood-brain barrier? 10 A. I don't know. 11 Q. Does inflammation cause increased 12 permeability of the blood-brain barrier? 13 A. Based on my discussion with Dr. Jim Allen, 14 inflammation would increase the permeability. 15 Q. Does the blood-brain barrier protect the 16 entire brain? 17 A. Based on my understanding, there are parts 18 of the brain that are outside the blood-brain 19 barrier. 20 Q. Which ones? 21 A. I don't remember. I would need to 22 consult -- I would need to consult the physiology 23 book to remember. I looked at it, but I can't 24 remember their names right now. 25 Q. Do you understand the anatomy of the human

Page 198 1 brain? 2 A. At a very high level I understand the 3 anatomy of a human brain, but I didn't memorize all 4 the parts of it and so I don't recall right now. 5 Q. Are those areas that are not encompassed 6 within the blood-brain barrier bathed in cerebral 7 spinal fluid? 8 A. I would need to consult a physiology book. 9 I don't remember. I don't know. 10 Q. Can molecules that can't or tend not to 11 pass through the blood-brain barrier enter the brain 12 through areas that are not protected by the 13 blood-brain barrier? 14 A. Could you repeat the question. 15 Q. Sure. 16 MR. TILLERY: Can you read it back. 17 (Record read by reporter as follows: 18 "Question: Can molecules that can't or 19 tend not to pass through the blood-brain 20 barrier enter the brain through areas that 21 are not protected by the blood-brain 22 barrier?") 23 THE WITNESS: Other than the blood-brain 24 barrier, either by the passive diffusion that you 25 described or the active transport, I'm not aware of	Page 200 1 materials that talk about nose bleeds and soreness 2 in the nose from being in the area of the mist spray 3 of paraquat. 4 Have you seen those? 5 A. I've seen those, sir. 6 Q. Okay. Do you know what directly lies 7 behind your nose in the human brain? 8 A. Are you referring to the olfactory bulb? 9 Q. I'm talking about the olfactory bulb. 10 A. Yes, sir. 11 Q. Do you know if it's protected by the 12 blood-brain barrier? 13 A. I do not believe the olfactory bulb is 14 protected by the blood-brain barrier. 15 Q. Do you know if it provides a direct route 16 of access to the substantia nigra pars compacta? 17 A. I don't know that. 18 Q. Do you know whether the dopaminergic 19 neurons are primarily located in the substantia 20 nigra portion of the midbrain? 21 A. I would have to consult a physiology book 22 to better -- to more accurately state the physiology 23 of the brain before I could answer that. 24 Q. The answer is you don't know the answer to 25 my questions?
Page 199 1 any other ways in which a molecule can enter through 2 the blood-brain barrier into the brain. 3 BY MR. TILLERY: 4 Q. I asked you, actually, if they can enter 5 the brain through areas that aren't protected by the 6 blood-brain barrier. 7 A. Are you referring to the parts of the 8 brain that are outside the blood-brain barrier? 9 Q. Yes. 10 I asked if there were areas that are not 11 protected by the blood-brain barrier that provide an 12 avenue of access to the brain by external molecules 13 or toxicants. 14 A. To the brain that's inside the blood-brain 15 barrier? 16 Q. No, to any part of the brain. Let me 17 start over. 18 Can the olfactory bulb provide direct 19 route of access to the midbrain without penetrating 20 the blood-brain barrier? 21 A. Chevron would not have any reason to have 22 looked at the olfactory bulb as a means of delivery 23 of a chemical to the midbrain, so I'm not aware of 24 that. I don't know. 25 Q. You have multiple studies in your	Page 201 1 A. I don't know. 2 Q. Okay. Does the blood-brain barrier 3 protect the pineal gland in the brain? 4 A. I don't recall. 5 Q. You don't recall or you don't know? 6 A. I've reviewed it, but -- 7 Q. You don't know. Okay. 8 A. I've reviewed it, but I don't remember 9 right now. 10 Q. What about the hypothalamus? Does it 11 protect the hypothalamus in the brain? 12 A. The hypothalamus is not protected by the 13 blood-brain barrier because one of its main tasks is 14 to secrete hormones directly into the bloodstream. 15 So my understanding is that it's not part of the -- 16 not protected by the blood-brain barrier. 17 Q. So any kind of toxicant or molecule that 18 could cause harm that gets into the cerebral spinal 19 fluid can go directly to the hypothalamus, can't it? 20 A. Can you repeat the question. 21 MR. TILLERY: Read it back to him, please. 22 (Record read by reporter as follows: 23 "Question: So any kind of toxicant or 24 molecule that could cause harm that gets 25 into the cerebral spinal fluid can go

Page 202 1 directly to the hypothalamus, can't it?") 2 THE WITNESS: I don't know. I would need to -- 3 I don't know. 4 BY MR. TILLERY: 5 Q. Does the blood-brain barrier protect the 6 ventricles in the brain? 7 A. My understanding is that they do not. 8 Q. Does paraquat cross the blood-brain 9 barrier? 10 A. So Chevron addressed that in a document 11 that I could refer you to. 12 Q. Well, can you just answer my question 13 without -- if you rely on the document, we'll go to 14 it and read it ourselves. 15 But can you tell me or not, and we'll move 16 on? 17 A. I would prefer to rely on the document to 18 tell you Chevron's position. 19 Q. We'll move on. 20 Do you know what scientific studies -- no, 21 strike that. 22 Can you tell me the ways in which an 23 environmental toxicant can gain access to the 24 substantia nigra portion of the brain? 25 A. An environmental toxicant has a	Page 204 1 yes. 2 Q. Let me ask you this: Without looking at 3 that document or reading, can you remember the 4 answer? 5 A. I would prefer to look at my reliance 6 documents. 7 Q. So the answer would be, no, you can't; 8 right? 9 A. I wouldn't -- I need to look at my 10 reliance documents. 11 MR. ORLET: Steve, as far as Parkinson's 12 disease issues, those are going to be handled by our 13 experts because the company doesn't have any -- 14 isn't following that literature. And he can explain 15 that to you if you would like, but those issues are 16 going to be handled by our experts. 17 BY MR. TILLERY: 18 Q. Does Chevron have an official position 19 about whether paraquat causes or contributes to 20 cause Parkinson's disease? 21 A. Chevron wrote a document in 1986, which 22 was their position on whether or not paraquat is 23 associated to Parkinson's-like symptoms. I can 24 provide you the document number. 25 Q. Is that the -- strike that.
Page 203 1 possibility to make its way across the blood-brain 2 barrier if it fits certain criteria, such as those 3 criteria that were previously described, such as 4 lipid solubility, molecular size, or whether or not 5 it undergoes active transport. 6 So there are a number of characteristics 7 that indicate that a material might pass through the 8 blood-brain barrier. 9 Q. Do you know the causes of Parkinson's 10 disease? 11 A. I've read a little bit about the causes of 12 Parkinson's disease. And my understanding is 13 it's -- there's still a lot of research trying to 14 understand what those causes are. 15 Q. Okay. Do you know what the risk factors 16 for Parkinson's disease are? 17 A. So I understand age is a risk factor. 18 There are other risk factors that have been 19 hypothesized in the literature. 20 Q. What are they? 21 A. I would need to go back to my reliance 22 documents. 23 Q. So you would rely on a document that's in 24 this group of materials? 25 A. To make sure I accurately convey that,	Page 205 1 Could you refer us to that, please. 2 A. Yes. 3 (Witness reviews document.) 4 Q. Did you find it, sir? 5 A. I did. 6 Q. Would you tell us on the record. 7 A. So the CUSA number is 00073811. 8 Q. And what is the title to the document? 9 A. The title to the document is "Parkinson's 10 Disease in Paraquat." 11 Q. And who wrote it? 12 A. It was written by Russell White, a Chevron 13 toxicologist. 14 Q. Was it published? 15 A. No, it wasn't published, but it was 16 provided -- my understanding is it was provided to 17 different regulatory agencies that were inquiring 18 about Parkinson's association with paraquat. 19 Q. And what was the year of the document? 20 A. According to my records, it was written in 21 February -- from February 11th, 1986. 22 Q. And when did Chevron get out of the 23 business of selling paraquat? 24 A. Chevron was out in the end of 1986. 25 Q. By September?

Page 206 1 A. I would need to double-check the date of 2 my documents, but I believe it was towards the end 3 of 1986, yes. 4 Q. So did the connection between paraquat and 5 Parkinson's disease have anything to do with 6 Chevron's decision to get out of the sales of 7 paraquat? 8 A. No, sir. Chevron concluded at that time 9 that there was not an association between paraquat 10 and Parkinson's disease. And based on my reading of 11 the documents related to the contracts, there were 12 other problems with the business relationship and 13 the economics of the paraquat and ICI relationship 14 that led to ICI terminating the agreement. 15 MR. TILLERY: Mark this. 16 (Plaintiffs' Exhibit 14 was marked.) 17 MR. TILLERY: Exhibit 14 is a document marked 18 0343002 -- 19 THE WITNESS: Yes, sir. 20 MR. TILLERY: -- through 3010. 21 BY MR. TILLERY: 22 Q. Have you seen this before? 23 (Witness reviews document.) 24 A. I have seen CUSA-00343003. 25 Q. Okay. Which is the "Chemical	Page 208 1 communication. 2 Was that October 8th? 3 A. Yes, sir. 4 Q. Okay. And the document page marked 3004 5 says it says sent to Chevron Health Center. 6 Do you see that? 7 Do you see the stick -- the transmittal 8 communication where it references Ospenson, Cavalli, 9 all those folks? 10 A. Yes, sir. 11 Q. And so this was San Francisco, California, 12 October 14th, 1985. And it is in response to an 13 October 8th, 1985 note, which references an article 14 which appeared before that called "Parkinson's 15 Disease: An environmental cause?" 16 Correct? 17 A. Correct. 18 Q. And this letter says, "Attached are an 19 article from the July 19 issue of Science, 20 discussing recent evidence of environmental causes 21 of Parkinson's and portions of an article from 22 Chevron World's summer 1985 edition focused on the 23 important economic and ecological advantage of 24 conservation tillage using the herbicide, paraquat. 25 Chevron holds [the] sole U.S. marketing rights for
Page 207 1 Involvement/Parkinson's Disease"? 2 A. Correct. 3 Q. Is that what you were reading from? 4 A. No. There's a more extensive assessment 5 that was conducted in February of 1986. 6 Q. This is an exchange here -- an exchange, 7 isn't it? Series of documents. 8 A. Yes, this chemical involvement of 9 Parkinson's disease is an attachment with an 10 exchange. 11 Q. Okay. And one of the letters is signed by 12 a person named R. Gwin Follis. 13 Who was he at that time, on October 14th, 14 1985? 15 A. Sir, I'm not familiar who R. Gwin Follis 16 is. 17 Q. Do you know what his connection with 18 Chevron was at that time? Have you ever heard his 19 name? 20 A. No, sir, I don't recognize the name. 21 Q. Okay. And he's referring -- he's 22 communicating with somebody named G.M. Keller. 23 Do you know who that is? 24 A. That name does not sound familiar, sir. 25 Q. Well, let's start off with the first	Page 209 1 the product which is produced by ICI. Conservation 2 tillage is expected to become the major tillage 3 method [of] the country." 4 So far am I okay? 5 A. Yes, sir. 6 Q. Continuing on, "The article raises concern 7 that paraquat may be implicated because," below, 8 "Paraquat is chemically very similar to the 9 byproduct of synthetic heroin manufacture, MTPT, 10 which produces almost independent Parkinson's, by 11 killing dopaminergic neurons in the brain, and 12 paraquat is among the agricultural chemicals used in 13 the area of Canada in which an extraordinarily high 14 correlation of .967 was found between levels of 15 pesticide use and Parkinson's cases. The incidence 16 of the disease in the area was about 7 times the 17 rate in areas where use was low." 18 Is that all correct so far? 19 A. That's what the document says. 20 Q. And then continuing, "The bankruptcy of 21 the asbestos manufacturer, the Manville Corporation, 22 has highlighted the especially severe financial 23 risks involved in selling a product which 24 contributes to a chronic disease. Parkinson's can 25 go on for decades.

Page 210 1 "For the present, we can hope that another 2 chemical or cause will explain the correlation found 3 in the Barbeau study, but I trust that Chevron is 4 watching this closely, and, perhaps, doing a little 5 testing, for the sake of its customers and 6 shareholders." 7 Do you know who that "JGF" was? 8 A. The "JGF"? 9 Q. Yes. 10 A. I don't know what those initials stand 11 for. 12 Q. You don't know him. 13 A. It's not necessarily that I don't know 14 him, sir, it's I don't know what those initials 15 stand for. 16 Q. Okay. Then the next is a Chevron -- or a 17 response memorandum. And it references at the top 18 "Ms. Judy MacGregor." 19 And it says, "After discussed" -- "As 20 discussed, after the ICI meeting in early November, 21 please prepare a response for me to Mr. Keller that 22 would be a . . . transmittal [letter] to Mr. Follis 23 regarding his concern." 24 And then Mr. Follis, R. Gwin Follis, 25 responds. And he sends to G.M. Keller -- does that	Page 212 1 got out of this business within a year after that 2 letter was written? 3 A. Excuse me, sir. Would you clarify. They 4 what? 5 Q. Chevron got out of the paraquat sales 6 business within one year of that letter being 7 written? 8 A. So Chevron was out of the paraquat 9 business in -- at the end of 1986, correct. 10 MR. TILLERY: Joe, do you want to call this one 11 today and we'll get back here? 12 MR. ORLET: Sure. Can we start earlier 13 tomorrow? 14 MR. TILLERY: Yes. 15 MR. ORLET: 8:00? He's got to pick his kids up 16 at -- he'd like to get out of here by 3:00, if 17 possible. 18 MR. TILLERY: 3:00. Okay. 19 MR. ORLET: Can we start at 8:00? 20 MR. TILLERY: Yes. 21 THE VIDEOGRAPHER: This concludes Media Unit 4. 22 MR. TILLERY: The dep is not concluded; it's 23 just continued until tomorrow morning. 24 THE VIDEOGRAPHER: This concludes today's 25 deposition of Dr. Tim Patterson. Going off the
Page 211 1 seem to match the -- anything you see here? He 2 sends this letter. 3 And he says, "Dear George: I read the 4 article in Chevron World that outlines our 5 distribution of paraquat [with] great care which is 6 used to guard against poisoning by those handling 7 this product. The attached outlines an aspect of 8 the problem which differs from the normal dangers in 9 dealing with poisons - namely, long-term effects 10 that might not become apparent except after many 11 years. 12 "Since we don't want to take any chance of 13 facing an asbestos situation down the road, I am 14 sure your people are following this aspect of the 15 matter most closely. However, I thought I would 16 pass this on to you as I cannot think of anything 17 more horrible for us to bequeath . . . our 18 successors than an asbestos problem. 19 "Regards, R. Gwin Follis." 20 Do you see that? 21 A. I do see that, sir. 22 Q. And you don't know who that guy was who 23 wrote that; right? 24 A. No, sir, I don't. 25 Q. And would you agree with me that Chevron	Page 213 1 record at 4:47. 2 (Whereupon, the proceedings were concluded 3 at 4:47 p.m.) 4 ---oOo--- 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

1 ACKNOWLEDGMENT OF DEPONENT

2 I, TIMOTHY PATTERSON, Ph.D., do hereby certify
3 that I have read the foregoing transcript of my
4 testimony taken on 3/4/2020, and further certify
5 that it is a true and accurate record of my
6 testimony (with the exception of the corrections
7 listed below):

8 Page Line Correction

9 _____
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22 _____
TIMOTHY PATTERSON, Ph.D.

23 SUBSCRIBED AND SWORN TO BEFORE ME

24 THIS ____ DAY OF _____, 20__.

25 (NOTARY PUBLIC) MY COMMISSION EXPIRES:

Page 215

1 I, the undersigned, a Certified Shorthand
2 Reporter of the State of California, do hereby
3 certify:

4 That the foregoing proceedings were taken
5 before me at the time and place herein set forth;
6 that any witnesses in the foregoing proceedings,
7 prior to testifying, were administered an oath; that
8 a record of the proceedings was made by me using
9 machine shorthand which was thereafter transcribed
10 under my direction; that the foregoing transcript is
11 a true record of the testimony given.

12 Further, that if the foregoing pertains to
13 the original transcript of a deposition in a Federal
14 Case, before completion of the proceedings, review
15 of the transcript () was () was not requested.

16 I further certify that I am neither
17 financially interested in the action nor a relative
18 or employee of any attorney of any party to this
19 action.

20 IN WITNESS WHEREOF, I have this date
21 subscribed my name.

22 Dated: March 13, 2020

23
24


ANRAE WIMBEKLEY, CSR No. 7778