

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

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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 II (PAGES 216 to 360)
THURSDAY, MARCH 5, 2020

Reported by:
Anrae Wimberley, CSR No. 7778

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5 DIANA HOFFMANN, individually and
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10 Plaintiffs,
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12 vs. Case No. 17-L-517
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14 SYNGENTA CROP PROTECTION, LLC,
15 et al.,
16 Defendants.
17 _____/
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Transcript of videotaped deposition of
TIMOTHY PATTERSON, Ph.D., Volume II, taken at King &
Spalding LLP, 101 Second Street, Suite 2300, San
Francisco, California 94105, beginning at 9:04 a.m.
and ending at 2:37 p.m. on Thursday, March 5, 2020,
before Anrae Wimberley, Certified Shorthand Reporter
No. 7778.

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Page 225 1 E X H I B I T S (Cont'd) 2 EXHIBIT DESCRIPTION PAGE 3 Exhibit 34 Report entitled, "Paraquat 333 4 Poisoning: An Analytical 5 Toxicologic Study of Three 6 Cases"; Bates CUSA-00283683 7 thru 699 8 9 Exhibit 35 Autopsy Report dated 10/5/76; 336 10 Bates SYNG-PQ-04267141 thru 11 144 12 13 Exhibit 36 Report entitled, "Paraquat: 338 14 Lifetime Feeding Study in the 15 Mouse"; Bates CUSA-00020406 16 thru 552 17 18 Exhibit 37 Report entitled, "Paraquat: 350 19 Combined Toxicity and 20 Carcinogenicity Study in Rats"; 21 Bates CUSA-00241880 thru 193 22 --oOo-- 23 QUESTIONS WITNESS INSTRUCTED NOT TO ANSWER: 24 (None) 25 --oOo--	Page 227 1 plaintiffs. 2 MR. LEVIN: Jason Levin for Chevron. 3 MS. HARRIS: Holly Harris, also present. 4 MR. HOPP: Anthony Hopp representing GROWMARK. 5 MS. CECIL: Jennifer Cecil for Chevron. 6 MR. HOPKINS: Bryan Hopkins for Chevron. 7 MR. ORLET: Joe Orlet for Chevron. 8 TIMOTHY PATTERSON, Ph.D., 9 re-sworn as a witness by the Certified 10 Shorthand Reporter, testified further as follows: 11 EXAMINATION (Cont'd.) 12 BY MR. TILLERY: 13 Q. Is paraquat a neurotoxin? 14 A. Based on the conclusions that Chevron came 15 to after they evaluated paraquat for neurotoxicity 16 in relation to Parkinson's disease, the conclusion 17 was that it was not a neurotoxin. 18 Q. Is that your position today? 19 A. That is our position today. 20 Q. Would you agree that the death of 21 dopaminergic neurons in the substantia nigra portion 22 of the human midbrain is a pathologic hallmark of 23 human Parkinson's disease? 24 A. Yes, sir. 25 Q. Can you explain what the upregulation of
Page 226 1 THURSDAY, MARCH 5, 2020; SAN FRANCISCO, CALIFORNIA; 2 9:04 A.M. 3 - - - 4 THE VIDEOGRAPHER: Good morning. 5 We are going on the record. The time now 6 is 9:04 on March 5th, 2020. 7 This is Media Unit 1 in the video-recorded 8 deposition of Timothy Patterson, Ph.D., in the 9 matter of Hoffmann vs. Syngenta Corp [sic] 10 Protection LLC, Case No. 17-L-517. 11 This video deposition is being held at the 12 law offices of King & Spalding, 101 Second Street in 13 San Francisco. 14 My name is Ted Hoppe. I'm from the firm 15 Veritext. I'm the videographer. 16 Counsel, would you please voice-identify 17 yourselves and state whom you represent. 18 MR. TILLERY: This is a continuation of a 19 deposition that was started yesterday. 20 My name is Steve Tillery. I'm from the 21 law firm of Korein Tillery. I represent the 22 plaintiffs in this action. 23 MS. FIORILLO: Rosemarie Fiorillo, also for the 24 plaintiffs. 25 MR. CRAIG: John Craig, also for the	Page 228 1 alpha-synuclein means? 2 A. Related to alpha-synuclein, I understand a 3 little bit about its role in Parkinson's disease, 4 but -- I know that it's found in the Lewy bodies of 5 the dopaminergic neurons, but not specifically about 6 the upregulation of it, just that it's found. 7 Q. And that's the position of Chevron as 8 well; correct? 9 A. That's our understanding -- our current 10 understanding of Parkinson's disease. But, again, 11 sir, we have not had the reason to follow 12 Parkinson's disease or become -- or have any experts 13 on Parkinson's disease because it's not an etiology 14 that is currently associated with any of our 15 chemicals or our work force population. 16 Q. Move to strike your answer as 17 nonresponsive. 18 MR. TILLERY: Would you read the question back 19 to him, please. 20 (Record read by reporter as follows: 21 "Question: And that's the position of 22 Chevron as well; correct?") 23 BY MR. TILLERY: 24 Q. So I'm asking you, what you answered, is 25 that Chevron's position?

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Page 229 1 A. Sir, that is my position as an -- 2 understanding as a toxicologist, yes. 3 Q. Okay. And you're speaking here on 4 behalf -- 5 A. I'm speaking here on behalf of Chevron. 6 MR. ORLET: As I mentioned yesterday, we're 7 going to have expert testimony on that because, as 8 Dr. Patterson mentioned, the company is not 9 currently following Parkinson's disease literature. 10 MR. TILLERY: I understand, but I'm entitled to 11 ask some questions on this to test whether Chevron 12 knew or understood, knows in terms of research and 13 knows about in terms of this product. 14 BY MR. TILLERY: 15 Q. So can you explain the significance of 16 upregulation of alpha-synuclein in Parkinson's 17 disease? 18 A. No, sir, I can't. 19 Q. Do you know of any research ever 20 undertaken by Chevron to determine the significance 21 of alpha-synuclein with respect to paraquat? 22 A. No, sir. I'm not aware of any of that 23 research. 24 Q. Are you aware of Chevron ever doing any 25 scientific research, studies on alpha-synuclein in	Page 231 1 Q. Certainly Chevron never did that research; 2 correct? 3 A. Correct. 4 Q. Is Lewy body pathology a hallmark of 5 Parkinson's disease in humans? 6 A. That is my understanding, sir, yes. 7 Q. Do you know how alpha-synuclein misfolds 8 and comprises the majority of the proteins in human 9 Lewy bodies? 10 A. I'm aware that occurs, yes. How exactly 11 it folds, I'm not aware. 12 Q. Are you aware of any role that paraquat 13 plays in that process? 14 A. No, sir, I'm not. 15 Q. Has Chevron at any time ever undertaken 16 any research or investigation to answer that 17 question? 18 A. No, sir, we have not. 19 Q. What was the first work that Chevron did 20 to investigate the potential neurotoxicity of 21 paraquat? 22 A. Sir, Chevron, in conjunction with ICI, 23 throughout the distribution of paraquat conducted 24 multiple animal studies, both acute and chronic. 25 And through those means, we evaluated multiple organ
Page 230 1 Parkinson's disease patients? 2 A. No, sir. 3 Q. Has paraquat been shown to cause an 4 upregulation of alpha-synuclein in laboratory 5 animals? 6 A. Sir, up until the 1986 time frame, we were 7 not aware of any documents that were -- I'm sorry. 8 Would you please repeat the question. 9 Q. I'm asking you with no limitations on 10 time. 11 I'm asking you whether paraquat has been 12 shown to cause an upregulation of alpha-synuclein in 13 laboratory animals. 14 A. Sir, based on the documents that I 15 reviewed through 1986, I did not find any documents 16 that showed that alpha-synuclein was upregulated as 17 a response to paraquat. And since the 1986 time 18 period, we have not investigated that. 19 Q. Has paraquat been shown to cause an 20 upregulation of alpha-synuclein in nonhuman 21 primates? 22 A. Sir, up until the 1986 time period, in the 23 documents that I reviewed, there was no research 24 into that question. After 1986, we were not 25 following that research.	Page 232 1 systems, including the nervous system. 2 Q. And the brain? 3 A. And the brain, yes, sir. 4 Q. And when was the first one? 5 A. The first studies I'm aware of for the 6 chronic toxicity studies date back to around the mid 7 1960s. 8 Q. Were those done by ICI? 9 A. Yes, sir, I believe they were done by ICI. 10 Q. And you were made -- you, being Chevron, 11 were made aware of the results of all those studies? 12 A. Yes, sir, to support the registration in 13 the United States. 14 Q. And you had also been made aware of 15 studies that came afterwards; correct? 16 A. Yes, sir. 17 Q. And made aware of all the studies that you 18 told me yesterday -- in the public domain, the 19 public health community studies? 20 A. Yes, sir. 21 Q. So when you answer my question about 22 neurotoxicity studies, you're saying that they were 23 performed with ICI; right? 24 A. Yes, sir. They would have been studies 25 that Chevron -- throughout the time period in the

Page 233 1 early -- before 1970, they were primarily provided 2 to Chevron by ICI. And then as Chevron became more 3 involved with the advent of CHC and becoming more 4 involved with the toxicology related to paraquat, 5 they collaborated more closely with ICI in the 6 design, methodology, as well as interpretation of 7 various studies. 8 Q. And did Chevron ever do the studies 9 themselves? 10 A. Sir, as we discussed, there's a list of 11 studies that Chevron did themselves. May I please 12 consult that list? 13 Q. I asked about neurotoxicity studies. 14 Did Chevron ever do a neurotoxicity study 15 with paraquat by itself, namely, not including ICI? 16 A. Sir, to clarify, my understanding is that 17 specific neurotoxicity studies weren't a guideline 18 method until the 1990s. Instead, nervous system 19 toxicity was evaluated, such as liver toxicity, 20 kidney toxicity, as a whole organ approach. And 21 Chevron was part of, for example, reviewing and 22 interpreting those studies. 23 Q. Could you answer my question directly, 24 sir. 25 A. Please repeat the question.	Page 235 1 standards today in guideline studies. 2 Q. So in other words, so that we're clear on 3 the record, would you agree with me that Chevron 4 never conducted a specific neurotoxicity study of 5 paraquat? 6 A. Yes, sir, that's correct. 7 Q. If you were conducting a mouse 8 neurotoxicity study, what clinical signs would you 9 expect to see in the mice of neurotoxic effects of 10 the test product? 11 MR. ORLET: Object to the form. 12 Are you talking about paraquat test? 13 MR. TILLERY: You can do that. I kept it 14 generic to answer. 15 BY MR. TILLERY: 16 Q. But if you were testing neurotoxicity in a 17 study using laboratory mice, what clinical signs 18 would you expect to see in the mouse test population 19 of neurotoxicity of the chemical? 20 A. So there are multiple stages of 21 neurotoxicity that are evaluated. I believe you 22 referred to clinical signs and symptoms. 23 Q. Right. 24 A. So those could include ataxia, tremors. 25 Hunched posture might also be a sign. So those
Page 234 1 Q. My question to you was, did Chevron 2 itself, not with ICI -- did it ever conduct 3 neurotoxicity studies on paraquat? 4 A. Sir, I apologize. One clarifying 5 question. Are you referring to an OECD guideline 6 neurotoxicity study as an example? 7 Q. I'm not talking about any particular type 8 of study that you may have in mind. I'm talking 9 about a test or a study of any kind where you 10 assessed whether or not paraquat could cause 11 neurotoxic effects. 12 Did you ever do that type of study? 13 A. Sir, I would like to consult just real 14 briefly a list of studies that Chevron conducted. 15 Q. Okay. Of course. 16 (Witness reviews document.) 17 A. Sir, I'm referring to CUSA-00308485, which 18 we discussed yesterday. 19 Q. Right. 20 (Witness reviews document.) 21 A. Sir, there are multiple acute toxicity 22 studies where any signs or symptoms of nervous 23 system effects would have been noted in the study, 24 but those studies were not designed to specifically 25 test neurotoxicity, which is defined in current	Page 236 1 types of behavioral observations would be -- could 2 be related to signs of nervous system effects. 3 Q. Would that include agility problems? 4 A. Sir, my understanding is the agility is 5 specifically evaluated in, for example, functional 6 observational battery studies, which typically 7 occurs outside of the standard clinical 8 observations. 9 Q. So just so we're clear, you're saying that 10 in a mouse neurotoxicity study, the clinical signs 11 of neurotoxic effects of the chemical being tested 12 would not include agility? 13 A. Sir, to my knowledge, agility is not one 14 of the -- I think of agility more of as an 15 evaluation that could be quantified using the 16 functional observation battery approach. 17 Q. Did you talk to Mr. Cavalli about this 18 topic? 19 A. No, I did not. 20 Q. Would lack of motility be one of them? 21 A. Yes, sir, it would be. 22 Q. It would be one of the clinical signs? 23 A. It would be one of the clinical signs. 24 Q. Would decreased motor activity be one of 25 them?

Page 237 1 A. Yes, sir, it would be. 2 Q. And tremors you already mentioned. 3 A. Yes, sir. 4 Q. Okay. Hyperexcitability? 5 A. Yes, sir. 6 Q. Violent forced movements? 7 A. Yes, sir. 8 Q. And spasms? 9 A. Yes, sir. 10 Q. And just on this point . . . 11 (Plaintiffs' Exhibit 15 was marked.) 12 BY MR. TILLERY: 13 Q. Can you take a look at this document, 14 No. 15, sir. 15 A. Yes, sir. 16 Q. Take your time. 17 (Witness reviews document.) 18 A. Okay. Yes, sir. 19 Q. The document we're referring to is an 20 October 13th, 1976 memo or letter, isn't it? 21 A. Yes, it is. 22 Q. And it's numbered CUSA-00305753 and 5754; 23 correct? 24 A. Yes, sir. 25 Q. And it's written by R.D. Cavalli?	Page 239 1 Q. And this note or memo -- what are we going 2 to call it? A letter? 3 A. Yes. 4 Q. This letter was Mr. Cavalli's assessment 5 of some of the results of testing that had been done 6 by ICI; correct? 7 A. Yes, sir. 8 Q. Was this emetic ever used? 9 (Witness reviews document.) 10 A. Sir, I believe it was, but I would prefer 11 to check a document real fast just to confirm that 12 this was the emetic that Chevron used. 13 Q. Okay. Go ahead and do that. 14 (Witness reviews document.) 15 A. Sir, the document that I was thinking 16 about is not here. I know that there's a material 17 safety data sheet for paraquat that lists the exact 18 chemical structure of the emetic. Based on my 19 recollection, I do know that PP796 was considered. 20 Whether this was the final emetic that was used, I 21 would need to confirm. 22 Q. Let's go to the second page of the 23 document, sir, in the third paragraph. If you would 24 take a look at that, please. 25 A. Um-hum.
Page 238 1 A. Yes, sir. 2 Q. And copying H. Frank, Mr. Rodman and 3 Mr. Stelzer; correct? 4 A. Yes, sir. 5 Q. It is to -- J.N. Ospenson, Chevron 6 Chemical Company, is the addressee? 7 A. Yes, sir. 8 Q. Who was he? 9 A. I believe he was the -- at one point, he 10 was the manager of the Chevron Environmental Health 11 Center. 12 Q. Now, this involves a paraquat emetic, 13 doesn't it? 14 A. Yes, sir, it does. 15 Q. Again, for the record, what was this 16 emetic being used for or being considered for use 17 for? 18 A. The emetic was being considered to 19 accompany paraquat in the case of misuse such as 20 for -- if someone wanted to commit suicide or, in 21 case of accidental poisoning, if someone swallowed 22 paraquat, the presence of the emetic was intended to 23 make them vomit as an initial -- or a rapid reaction 24 to purge the system of paraquat to prevent 25 absorption.	Page 240 1 Q. In Mr. Cavalli's letter, he says, in that 2 paragraph, "The second area which concerns me is the 3 matter of the effects of ICI 63,197 itself, both in 4 man and animals. In man, the drug was associated 5 with angina pectoris (a symptom of cardiac injury), 6 worsening of psychic depression in depressed persons 7 and transient increased capillary fragility." 8 Then if you skip down, it says, "In 9 animals." 10 Do you see that? 11 A. Yes, sir. 12 Q. It says, "In animals, ICI 197 [sic] caused 13 a decrease in agility and motility" -- 14 Do you see that? 15 A. Yes, sir. 16 Q. -- "and potentiated both amphetamine and 17 barbitone . . . decreased sensitivity to pain and 18 heat and decreased appetite." 19 Do you see that? 20 A. Yes, sir. 21 Q. Now, skip down to the next paragraph, 22 second sentence where Mr. Cavalli says, "There is no 23 question that this compound has effects on the 24 central nervous system in both man and animals"; 25 correct?

Page 241 1 A. Yes, sir. 2 Q. And he was relying upon the decrease in 3 agility and motility as signs and symptoms of a 4 central nervous system effect, wasn't he? 5 A. That appears to be the case, yes, sir. 6 Q. Would you agree with Mr. Cavalli on that? 7 Not necessarily his conclusions about the chemical, 8 because you haven't had a chance to do that, just so 9 much as that those are signs and symptoms of central 10 nervous impact. 11 A. Yes, those are signs and symptoms of 12 central nervous impact. 13 Q. Does that also include increased 14 salivation? Would that also be one in a laboratory 15 animal? 16 A. In a laboratory animal, increased 17 salivation -- it's used -- it's considered, but on 18 its own, it's not a symptom of central nervous 19 system effects because there's lots of things that 20 could cause salivation, and it depends on the 21 dosing. 22 For example, if you're gavaging the 23 animals, it includes sticking a tube down their 24 throat, and that alone has been known to cause 25 salivation.	Page 243 1 Specifically this is CUSA No. 00188894 2 through 98. Okay. Is that correct? 3 A. That's correct, sir. 4 Sir, may I unhook for a second to get my 5 reading glasses? The print is extremely tiny. 6 Q. Absolutely. Of course. Of course. 7 (Witness reviews document.) 8 A. I think I need more -- it's extremely 9 small writing. 10 Q. This is the way it was produced to us. 11 I'm sorry about that, but this is the way that 12 Chevron produced it to us. Okay. 13 MR. ORLET: Do you mind if I let him see it on 14 that? 15 MR. TILLERY: Absolutely not. 16 THE WITNESS: That will help. 17 BY MR. TILLERY: 18 Q. For any of these, please feel free to do 19 that. Okay. 20 (Witness reviews document.) 21 A. Okay, sir. Ready to proceed. 22 Q. Now, there was an acute toxicity portion 23 of the test and a subacute toxicity portion; right? 24 A. Right. 25 Q. And the subacute toxicity part of the test
Page 242 1 Q. And it's also -- it also has to be viewed 2 in the context of whether there's other signs of 3 central nervous system problems; correct? 4 A. Yes, sir. 5 Q. So if you had other signs of central 6 nervous system, the increased salivation would fit 7 into that -- 8 A. Right. 9 Q. -- as a sign of impact on the central 10 nervous system? 11 A. It would be something you would have to 12 consider based on the doses and the dose response 13 compared to controls. 14 MR. ORLET: Make sure you let him finish his 15 question. 16 THE WITNESS: Okay. Sorry. 17 (Plaintiffs' Exhibit 16 was marked.) 18 BY MR. TILLERY: 19 Q. Please take a look at Exhibit No. 16, sir. 20 And while you're doing that, I'll note for 21 the record this is a CUSA document. It came from a 22 folder that was given to us in discovery labeled, 23 first number, 0018814 through 00189125. And the 24 document here referenced starts on page 79 of that 25 folder.	Page 244 1 included applying paraquat after the hair was 2 clipped a day or so before the start of the 3 experiment; correct? 4 A. Yes, sir. 5 Q. And this was a 1963 study in which albino 6 rabbits were given subacute dermal doses of paraquat 7 on their shaved skin; correct? 8 A. Yes, sir. 9 Q. And the title of this study is what? 10 A. I believe it says, "Paraquat Dichloride." 11 Q. So the study was investigating paraquat 12 that we've been referring to in this deposition? 13 A. Yes, sir. 14 Q. And who did the study? 15 A. The only indication that I see is in the 16 upper right-hand corner where it says "PPL." 17 Q. So "PPL" would tell you -- 18 A. It was related to ICI. 19 Q. -- that was an ICI study, which you would 20 have been aware of? 21 A. Yes, sir. 22 Q. Now, just so we're clear, dermal exposure 23 or dermal application means they were taking the 24 paraquat and applying it to the skin. They weren't 25 injecting it into the animal, were they?

Page 245 1 A. Yes, sir. 2 Q. And they were not having the animal eat 3 the food; right? 4 A. Correct. However, under certain 5 circumstances, the animals can lick the material off 6 of their skin. 7 Q. Do you know if they did here? 8 A. I looked through it, and there was no 9 indication or notes saying if they did or did not. 10 Q. And that's something that a careful 11 investigator would note, wouldn't they? 12 A. In 1963, I don't know. I do recollect 13 seeing multiple rabbit studies that were conducted 14 again to ensure that that didn't occur. 15 Q. But this isn't one where you see any 16 evidence of an issue? 17 A. I don't see any evidence of an issue or if 18 they evaluated it or not. 19 Q. And if you would have, you sure wouldn't 20 have filed it with the U.S. Government; right? 21 A. Can you repeat the question. 22 Q. If there was a problem with the study, you 23 wouldn't have relied upon it with the U.S. 24 Government, would you? 25 A. Define the problem, sir.	Page 247 1 A. Yes, sir. 2 Q. And you told me just a few minutes ago 3 that weakness and unsteadiness are clinical signs of 4 central nervous system effects in animals in the 5 laboratory; correct? 6 A. Yes, sir. 7 Q. Now, at a daily dose of 12.5 milligrams 8 per kilogram for up to 21 days in the males, this 9 dermal exposure was followed by nervousness, 10 increased salivation and tremors. 11 Do you see that? And that's on 95. Look 12 at 12.5 ml and then look under "Effects." 13 A. Yes, sir. 14 Q. Okay. And you'll see that. 15 So people conducting this study noted that 16 the dermal exposure was followed by nervousness, 17 increased salivation and tremors. 18 Do you see that? 19 A. Yes, sir. 20 Q. Nervousness, increased salivation and 21 tremors are clinical signs of central nervous system 22 effects, correct, in laboratory animals? 23 A. Of those three, tremors for sure are an 24 indicator. Nervousness is more subjective, and it 25 depends on the person evaluating that.
Page 246 1 Q. I said if you had found a problem. I'm 2 not saying there is any. 3 I'm just saying if there had been a 4 problem with the protocol of the test or something, 5 that would have been noted? 6 A. Sir, I need to expand on that a little bit 7 because -- 8 Q. That's all right. I'll withdraw the 9 question. 10 A. Okay. 11 Q. At a daily dose of 3.15 milligrams per 12 kilograms for up to 21 days in the females, the 13 dermal exposure was followed by weakness and 14 unsteadiness. 15 Will you look at that? I think I can 16 point you to the page ending 97. 17 A. Yes, sir. 18 Q. And it's under the heading -- it says 19 "3.15 - Female." 20 Do you see that? 21 A. Yes, sir, I do. 22 Q. And then in the second, it says, "Systemic 23 Effects." 24 So weakness and unsteadiness were 25 observed; right?	Page 248 1 Q. But it would certainly be consistent with 2 the tremors as well, wouldn't it? 3 A. Yes, sir. 4 Q. Now, the daily dose of 6.25 milligrams per 5 kilograms for up to 21 days in males and females, 6 the dermal exposure was followed by incoordination 7 and decreased motor activity. 8 Do you see that? And that's 96. Go to 9 96, "6.25 Male" and "6.25 Female." 10 A. Yes, sir, I see that. 11 Q. Do you see where it says, "incoordination 12 and decreased motor activity"? 13 A. Yes, sir. 14 Q. And incoordination and decreased motor 15 activity are clinical signs of central nervous 16 system effects, aren't they? 17 A. Yes, they are. 18 Q. In this study, to reach the rabbit's 19 brains, the paraquat would have to be absorbed 20 through the skin and then into the bloodstream and 21 then cross the blood-brain barrier; correct? 22 A. Correct. 23 Q. As part of the study, did ICI make any 24 effort to measure the concentration of paraquat in 25 the rabbit's blood?

Page 249 1 A. In this study, I don't see any plasma or 2 blood measurements, sir. 3 Q. Okay. Let's go to . . . 4 (Plaintiffs' Exhibit 17 was marked.) 5 BY MR. TILLERY: 6 Q. Please take a look at Exhibit No. 17. And 7 this is a Syngenta PQ No. 00548877, and it ends on 8 8883; is that correct? 9 A. Yes, sir. 10 Q. And it's entitled, "The Toxicity of 11 Paraquat"; correct? 12 A. Yes, sir. 13 Q. And its authors are D.G. Clark, 14 T.F. McElligott and E. Weston Hurst; right? 15 A. Correct. 16 Q. And they're from the Imperial Chemical 17 Industries Limited, Industrial Hygiene Research 18 Laboratories, Alderley Park; correct? 19 A. Yes, sir. 20 Q. So those were ICI people? 21 A. Yes, sir. 22 Q. And this was published in the British 23 Journal of Industrial Medicine, 1966; would you 24 agree? 25 A. Yes, sir.	Page 251 1 A. That would have been the paraquat cationic 2 cells in the molecule. 3 Q. -- "in rats, the signs of poisoning varied 4 somewhat from animal to animal; most pointed to an 5 action of the substance on the central nervous 6 system." 7 Is that what it says? 8 A. Yes, sir, that's what it says. 9 Q. And this was 1966; right? 10 A. Yes, sir. 11 Q. Okay. And what is an intraperitoneal 12 injection? 13 A. So an intraperitoneal injection is an 14 injection directly into the body cavity of the 15 animal. So it bypasses the normal excretory routes. 16 If you put a chemical into an animal's stomach, it 17 would go through the liver, it would go through the 18 kidney to be excreted. So this puts the entire dose 19 into the animal directly compared to an oral gavage 20 dose. 21 Q. And Clark and his colleagues from ICI 22 stated that, in most of the animals, the injection 23 pointed to an effect on the central nervous system; 24 correct? 25 A. Yes, that's what the document states.
Page 250 1 Q. So if we went to the library, we would 2 find it at Volume 23, 126; right? 3 A. Yes, sir. 4 Q. Do you know what Mr. Clark's role was at 5 ICI? 6 A. No, sir, I don't exactly know. 7 Q. In this study, were rats and mice injected 8 intraperitoneally with acute 30 to 75 milligrams per 9 kilogram doses of paraquat? 10 A. Sir, I'll need to find the study design. 11 Q. I'm sorry? 12 A. I'll need to find the study design. 13 Q. Absolutely. If you look at 879. Under, 14 "Signs of Poisoning after Intraperitoneal Dosing." 15 A. Yes, sir. 16 Q. Just take a moment and read that to 17 yourself. 18 Do you see that? 19 A. Yes, sir. 20 Q. Does it say, under that section, "Signs of 21 Poisoning after Intraperitoneal Dosing," and I'm 22 quoting, "After a single large intraperitoneal dose 23 (30 to 75 milligrams)" and then it says, 24 "ion/kilogram" -- 25 What does that mean?	Page 252 1 Q. And if you continue in that same 2 paragraph, where it says, "most pointed to an action 3 of the substance on the central nervous system," it 4 says in the next, and I'm quoting, "In the earlier 5 stages, hyperexcitability, violent forced movements 6 flinging the animal about the cage, or a stiff and 7 incoordinate gait might be present. Spasms [may] 8 occur, or the limbs might be widely splayed." 9 Do you see that? 10 A. Yes, sir, I do. 11 Q. These observations are clinical signs and 12 symptoms of impact on the central nervous system, 13 aren't they? 14 A. Yes, sir, they are. 15 Q. Now, there's another reference on 79 to 16 subacute experiments. 17 MR. ORLET: 79? 18 MR. TILLERY: Yes, 8879. 19 BY MR. TILLERY: 20 Q. And if you can go to the top of the next 21 paragraph, in that one. Do you know where we were, 22 following that paragraph we were reading on 79, sir? 23 A. Yes. 24 Q. Go to the very next paragraph behind 25 that -- following.

Page 253 1 And it says, "In subacute experiments, 2 tremor and hyperaesthesia, and less frequently 3 excessive harderian secretion" -- 4 What does that mean? 5 A. I don't recall the term "harderian 6 secretion." 7 Q. -- "might be apparent during and soon 8 after the period of dosing." 9 Do you see that? 10 A. Yes, sir. 11 Q. Does that mean at 30 milligrams per 12 kilogram in the subacute? 13 A. It doesn't state there, sir -- 14 Q. You can't tell from the study? 15 A. You can't tell from the study the doses. 16 I would need to look at the methodology section. 17 Q. Go ahead. If you look at the paragraph 18 ahead of it, it mentions 30 to 75 milligrams, but 19 you can look and take your time if you want to. 20 (Witness reviews document.) 21 A. Sir, I don't see the dose related to this 22 experiment. 23 Q. All right. When you're looking at that, 24 the subacute dose mentions tremors as well, doesn't 25 it?	Page 255 1 A. Oh, yes. 2 Q. It says, "The delayed toxic effects of 3 paraquat occurring after the excretion of virtually 4 all of the material have caused it to be classed as 5 a 'hit-and-run' compound," referencing a 1968 Barnes 6 article, "that is a compound causing immediate 7 damage, the consequences of which are not apparent 8 until later." 9 Have I read that correctly? 10 A. Yes, sir. 11 Q. This statement means paraquat has both 12 immediate effects and effects that develop over 13 time, doesn't it? 14 A. Yes, sir, I believe that's what the 15 sentence implies. 16 Q. That's what ICI concluded in their study? 17 A. Yes, sir. They concluded that it causes 18 immediate damage and the consequences of that damage 19 are not apparent until later. So, sir, that could 20 mean that the damage -- the consequences of the 21 damage don't appear until later, but not necessarily 22 that the damage continues, is how I interpret that 23 sentence. 24 Q. It could also mean that the more time that 25 passes after exposure, the more effects will be seen
Page 254 1 A. Yes, sir, it does. 2 Q. And those are clinical signs of central 3 nervous system effects; correct? 4 A. Yes, sir. 5 (Plaintiffs' Exhibit 18 was marked.) 6 BY MR. TILLERY: 7 Q. The reporter has handed you what's been 8 marked as Plaintiffs' Exhibit No. 18, sir. Take a 9 look at it. 10 While you're looking at that, for the 11 record, I'll note that this is Syngenta 12 paraquat 00531061 through 1065. And the document is 13 entitled, "Paraquat and Related Bipyrindyls" by 14 D.M. Conning and K. Fletcher. 15 These are ICI scientists; correct? 16 A. That is my understanding, based on the 17 notation in the document, sir. 18 Q. Okay. The paper was published in the 19 British Journal in 1969; correct? 20 A. Correct, sir. 21 Q. If you look at the bottom of 62 . . . hold 22 on a second. I'm sorry, it's 64. Under the heading 23 "The Delayed Toxic Effects" -- I'm sorry. It's 24 under "Discussion." 25 Do you see that?	Page 256 1 too; correct? 2 A. It could be interpreted that way. 3 Q. What steps did Chevron undertake after 4 this study to investigate the effects of paraquat 5 that would develop over time, so-called latent 6 effects of the chemical? 7 A. So based on my review of the documents, as 8 well as discussing the toxicology of paraquat with 9 former Chevron toxicologists, such as Mr. Cavalli, 10 Mr. Ford and Mr. Zimmerman, Chevron invested a lot 11 of time and resources working with ICI and 12 communicating with ICI to understand specifically 13 related to the effects in the lung. 14 Because paraquat would cause a certain 15 type of lung cell to die. And based on the cell 16 death, there would be a phenomenon called fibrosis, 17 which was where the lung cells would try to 18 regenerate or recuperate the lost cells, but instead 19 these are fibrotic cells. 20 So based on speaking with former Chevron 21 toxicologists, that was their understanding of the 22 potential delayed effects, which was the result of 23 the pulmonary fibrosis. And they spent a lot of 24 resources and investigated that quite a bit to 25 understand how paraquat was acting.

Page 257 1 Q. I move to strike your answer as 2 nonresponsive. 3 MR. TILLERY: Would you read back my question 4 to him, please. 5 (Record read by reporter as follows: 6 "Question: What steps did Chevron 7 undertake after this study to investigate 8 the effects of paraquat that would develop 9 over time, so-called latent effects of the 10 chemical?") 11 THE WITNESS: Chevron spent a good deal of 12 resources and time understanding the toxicology 13 effects of paraquat, which included -- 14 BY MR. TILLERY: 15 Q. It's the same answer. I'm talking about 16 this specific study. 17 Are you telling me, sir, that in response 18 to this specific study, they undertook an evaluation 19 of the latent effects in reference to the findings 20 of this study? What you are talking about, 21 pulmonary fibrosis, that's not what we're talking 22 about here, is it? 23 So what I'm saying to you is this: Did 24 Chevron undertake any specific research after this 25 study to learn any more about the so-called latent	Page 259 1 time now is 10:04. 2 (Recess taken.) 3 THE VIDEOGRAPHER: Back on the record. The 4 time now is 10:07. 5 BY MR. TILLERY: 6 Q. And if you would look at 1064 under 7 "Discussion" again. And this, again, is the 8 document entitled, "Paraquat and Related Bipyridyls" 9 by ICI scientists. 10 A. Um-hum. 11 Q. If you would look down into that 12 paragraph, where the authors say, "It must be 13 admitted that non-epithelial tissue, such as liver, 14 cardiac muscle and, with very large doses, brain, 15 can show signs of damage, but in general these tend 16 to be transitory." 17 Do you see that? 18 A. Yes, sir, I do. 19 Q. And this would indicate that ICI and 20 Chevron were faced again with another study that 21 showed that paraquat could get into the brain, 22 weren't they? 23 A. Yes. And I spoke with the Chevron -- the 24 former Chevron toxicologists about this. 25 Q. But if you could answer my question.
Page 258 1 effects that were described in the study? 2 A. Sir, to clarify, because of this Barnes 3 study -- 4 Q. Because of this study called "Paraquat and 5 Related Bipyridyls." Barnes is referenced in it. 6 This is a study by Conning, Fletcher and Swan. 7 (Witness reviews document.) 8 A. Sir, based on my conversations with the 9 former Chevron toxicologists and the documents, I 10 don't know if their actions were an indirect 11 consequence to the study or not. 12 Q. You can't answer that question; right? 13 A. I know Chevron was doing stuff; I just 14 don't know if it was in response to this specific 15 study. 16 Q. Okay. Now, if you look at 1064. 17 A. Sir, I'm sorry. Can we take a break? 18 It's been about an hour. 19 Q. Yes, very quick. If you don't mind, given 20 the amount of time we took on breaks yesterday, if 21 we can keep them very short so we can get as much 22 done -- 23 A. Just a short bathroom break. 24 Q. All right. Thank you. 25 THE VIDEOGRAPHER: Going off the record. The	Page 260 1 Does this study show to Chevron in 1969 2 that paraquat could get into the brain? 3 A. This is in the "Discussion" section. It's 4 an indication that this would be something that 5 would need to be looked into, yes, sir. 6 Q. Well, does it say that it gets into the 7 brain or not, sir? 8 A. This is in the "Discussion" section. I 9 would need to go back and see why they're saying 10 that. 11 Q. Okay. Whether or not you have to research 12 it further, does this study discussion by the ICI 13 scientists say, "It must be admitted that 14 non-epithelial tissue, such as liver, cardiac muscle 15 and, with very large doses, brain, can show signs of 16 damage"? 17 Does it say that? 18 A. Yes, sir, that's what it says. 19 Q. All right. And so they knew by 1969 that 20 it caused injury to the brain, damage to the brain; 21 correct? 22 MR. ORLET: Object to the form. 23 BY MR. TILLERY: 24 Q. That's what this study shows. 25 A. This study shows central nervous system

Page 261 1 effects. 2 Q. And brain -- damage to the brain. That's 3 part of the central nervous system; right? 4 A. Repeat the question, please. 5 Q. The brain is part of the central nervous 6 system; right? 7 A. Yes, the brain is part -- 8 Q. And it shows damage to the brain; right? 9 A. That's what it says in the discussion, but 10 I don't see where they actually, in the study 11 itself, said that they were evaluating the brain. 12 Q. Well, let me ask you this: Did Chevron 13 ever challenge this study? 14 A. Not that I'm aware of. 15 Q. Accepted it at the time, didn't they, to 16 your knowledge? No indication they didn't. 17 Do you understand my question, sir? 18 Did you find -- when you talked to 19 Mr. Cavalli or when you did all your research into 20 these records, did you ever see any record, a memo, 21 a note or any document that said they didn't accept 22 this study? 23 A. No, I didn't. 24 Q. All right. Did Chevron ever warn paraquat 25 users that very high doses of paraquat could cause	Page 263 1 the record, I'll note this is a document entitled 2 "The Tissue Distribution of the Bipyridylum 3 Herbicides Diquat and Paraquat in Rats and Mice"; 4 correct? 5 A. Correct, sir. 6 Q. Is this a 1973 study? 7 A. Yes, sir, it is. 8 Q. And the Syngenta number is PQ-01980124; 9 correct? 10 A. Would you please repeat that. 11 Q. Yes. 12 It's 01980124. 13 A. Yes, sir. 14 Q. And it goes through to 135; right? 15 A. Yes, sir. 16 Q. This is a study by M. Litchfield, 17 J.W. Daniel and S. Longshaw; right? 18 A. Yes, sir. 19 Q. They were all ICI employees, weren't they, 20 to your knowledge? 21 A. To my knowledge based on the document, 22 yes, sir. 23 Q. This is a study that would have been 24 shared with Chevron at the time it was done; right? 25 And it was in the public domain.
Page 262 1 brain damage? 2 A. No, sir, they did not. 3 Q. Did Chevron do any studies to investigate 4 how much smaller than a very high dose would have to 5 be for paraquat to avoid brain damage [sic]? 6 A. Chevron did not conduct any studies. 7 Q. Chevron knew in 1969, when this study was 8 released, that people mixed, loaded and applied 9 paraquat or were nearby where paraquat was being 10 applied and were being exposed to it, didn't they? 11 A. Please repeat the question. 12 Q. Chevron knew in 1969, when this study was 13 released, that people who mixed it, applied it, 14 loaded it were around paraquat? 15 A. Yes, sir. 16 Q. That was the whole idea. This was sold to 17 be applied in fields. 18 A. Correct. 19 Q. Did Chevron do any studies in or after 20 1969 to investigate how much brain damage could 21 occur from exposure to paraquat? 22 A. Chevron did not conduct any studies. 23 (Plaintiffs' Exhibit 19 was marked.) 24 BY MR. TILLERY: 25 Q. While you're looking at this document, for	Page 264 1 A. Sir, I do recognize this reference. I 2 believe that Chevron has referenced this paper in 3 some of their evaluations. 4 Q. Right. Actually, with some of the filings 5 with the government; right? 6 A. I would need to confirm that. 7 Q. Do you recognize this as a radiolabeled 8 study? 9 A. Part of it was a radiolabeled study and 10 part of it wasn't. 11 Q. Let's just explain to the ladies and 12 gentlemen of the jury and to the court what a 13 radiolabeled study is. 14 A. So a radiolabeled study is when you have a 15 molecule that you radiolabel. The most typical 16 radiolabel is carbon-14, and then another one that 17 could be done is tritiated hydrogen. And I believe 18 in this case it was carbon-14. Yes, it says it was 19 carbon-14 radiolabeled diquat. 20 So the idea is you inject the 21 radioactivity into the animal. And because it's 22 radiolabeled, you can use detection methods to more 23 easily follow and identify the chemicals in the 24 body. 25 Q. Where it winds up in the body; right?

Page 265 1 A. Yes, sir. 2 Q. So you can use a technology, they call it 3 something like an x-ray, which effectively allows 4 you to take a picture and see where that chemical is 5 located; right? 6 A. Yes, sir. 7 Q. And then it eliminates a lot of guesswork 8 and lab work because you can show -- including when 9 the animal is alive; correct? 10 A. Yes. That's my understanding, sir, yes. 11 Q. So the radiolabel allowed them to detect 12 paraquat in various tissues of the mice by taking 13 x-rays and inspecting the x-ray film images; is that 14 a fair statement? 15 A. Yes, sir. 16 Q. And this included giving mice intravenous 17 injections of 20 milligrams per kilogram of 18 radiolabeled paraquat; correct? 19 A. 20 milligrams per kilogram, yes, sir. 20 Q. And at various points in time after the 21 paraquat was injected, they killed the mice and then 22 took x-ray films; right? 23 A. Yes, sir, that's my understanding of this 24 study. 25 Q. In mice killed after 24 hours, the	Page 267 1 Actually, if you look under "Summary" in the second 2 paragraph, sir. 3 "Rats were administered diets containing 4 50, 150 [sic] and 250 parts per million paraquat ion 5 and 250 parts per million diquat ion for 8 weeks." 6 Do you see that, sir? 7 A. Yes, sir. 8 Q. Those rats dosed at 120 parts per million 9 for eight weeks didn't show signs of general 10 toxicity, did they? 11 A. No, sir, they did not. 12 Q. And that's important to know that; right? 13 A. Yes, sir, it is. 14 Q. And if you look at the graph -- or the 15 table at 132. 16 A. Yes, sir. 17 Q. Okay. Look at the table where it shows 18 findings of the brain. And it shows paraquat. And 19 we'll just focus on paraquat. Okay? 20 A. Yes, sir. 21 Q. Paraquat in the brain, less than .1; 22 right? 23 A. Yes, sir. 24 Q. And it goes across all the way to 120, if 25 you see where it says, "120."
Page 266 1 scientists found that they could detect paraquat in 2 the brain and spinal cord, didn't they? If you look 3 on 129. That's the Bates number in the lower right 4 hand, 0129. 5 And it says, "One significant feature." 6 Do you see that? 7 A. I do. 8 Q. I'll read it into the record. You tell me 9 if I'm reading it correctly. 10 "One significant feature of the 24-hour 11 autoradiograms from paraquat-treated mice was the 12 presence of radioactivity in the lung. There was in 13 addition evidence of the presence of radioactivity 14 in both the brain and spinal cord." 15 Do you see that? 16 A. Yes, sir, I see where it says that. 17 Q. And did they also feed a Wistar albino rat 18 or rats, multiples, 50, 120 and 250 parts per 19 million of paraquat for up to eight weeks as part of 20 this study? 21 A. Yes, sir. 22 Q. And after eight weeks at the 23 120-part-per-million dose, they detected paraquat in 24 the brains of the rats, didn't they? 25 If you find that in the graph on page 125.	Page 268 1 A. Yes, sir. 2 Q. And that reflects 120-parts-per-million 3 dosage; correct? 4 A. Correct. 5 Q. And under eight weeks, what is that 6 number? 7 A. 0.2. 8 Q. 0.2. And if you look at where it is in 9 the blood at that time, at eight weeks in blood, it 10 says, "Not determined" -- 11 A. Not determined, correct. 12 Q. -- correct? 13 A. Correct. 14 Q. So it's .2; correct? 15 A. Correct. 16 Q. In the brain at that time. 17 A. Sir, related to the -- 18 Q. I don't have a question on the table at 19 this point, sir. 20 These animals didn't die, did they? 21 A. No, sir. There were no deaths noted. 22 Q. So it wasn't a general toxicity-type study 23 that would kill the animals, designed to take it to 24 a dose that ultimately was a lethal dose; right? 25 A. Correct, sir.

Page 269 1 Q. So this 1973 study is consistent with 2 ICI's previous 1969 study in that it found paraquat 3 in the brains of mice and rats, didn't they? 4 A. Yes, sir. It's consistent that it's found 5 in the brain, but there's also other data points 6 that I believe should be considered in the overall 7 assessment. 8 Q. Right. Could you answer my question, 9 though. 10 Is it consistent with the finding of 11 paraquat in the brain from the prior study? And 12 that finding alone that it was -- paraquat entered 13 the brain, that's all I'm asking you. 14 A. Sir, regarding the previous study, this 15 study didn't actually study whether it was in the 16 brain. It was just mentioned in the discussion that 17 it was in the brain. 18 Q. Okay. Well, we've been through that one 19 before, and I think we left off with the assumption 20 that you said you may want to read this further. 21 I would agree that the discussion says 22 that it shows not only the presence in the brain, 23 but brain damage, according to the researchers in 24 that prior 1969 study. 25 Now, what I'm asking is, is this study,	Page 271 1 Q. Before they ever sold the chemical? 2 A. Yes, sir. 3 Q. Do you have any reason as to why Chevron 4 would not have known by no later than 1969 that 5 paraquat would not undergo redox cycling in the 6 brain? 7 A. Yes, sir. Based on my discussions with 8 Dr. Cavalli and Dr. Ford, they had looked -- they 9 had looked -- they had evaluated and they were aware 10 of the central nervous system effects that was 11 occurring in these studies that were at lethal or 12 near-lethal doses. 13 And based on that, they concluded that it 14 wasn't a specific neurological effect, but, rather, 15 related to the general system failure that 16 undergoes -- that occurs when the animals are dying 17 or under extreme -- that have been -- animals that 18 are dying. 19 Q. Of course, you know, and you just admitted 20 to me, that in the very last exhibit, these animals 21 didn't die. They weren't given lethal doses, were 22 they? 23 A. These animals were not given lethal doses. 24 Q. And the material was found in their 25 brains, wasn't it?
Page 270 1 the one before you, which is Exhibit No. 19 -- is 2 that at least consistent in that it found paraquat 3 in the brains of mice and rats? 4 MR. ORLET: Object to the form of the question. 5 THE WITNESS: This study indicated that at 6 certain time points, paraquat was found in the 7 brain. 8 BY MR. TILLERY: 9 Q. And Chevron knew about this study as well; 10 right? 11 A. Yes, sir, they reference this study. 12 Q. Chevron knew about paraquat's high redox 13 cycling potential at the time of the '69 study, 14 didn't it? 15 A. I'm sorry. Please repeat the question. 16 Q. Chevron knew about paraquat's high redox 17 cycling potential at the time of the '69 study, 18 didn't it? 19 A. In a general sense, they knew that 20 paraquat could undergo redox cycling by that time. 21 Q. They knew -- 22 (Reporter interruption.) 23 Q. They knew that by at least 1963, didn't 24 they? 25 A. Yes, sir.	Page 272 1 A. In the 1973 study, there were indications 2 that it was in the brain. And Chevron, in their 3 1986 evaluation, a document they wrote, they did 4 review this study and they concluded, based on all 5 the data points that are present in the study, that 6 paraquat had poor distribution to the brain. 7 Q. Okay. I move to strike your answer as 8 nonresponsive. 9 MR. TILLERY: Would you read my question back. 10 (Record read by reporter as follows: 11 "Question: And the material was found in 12 their brains, wasn't it?") 13 BY MR. TILLERY: 14 Q. That's all I'm asking you. 15 Paraquat was found in their brains? 16 A. In which study, sir? 17 Q. The last one, the one in front of you, 18 No. 19. 19 A. Yes, sir, paraquat was found in the brain. 20 Q. Now, what studies did Dr. Ford and 21 Dr. Cavalli do, after they heard about these studies 22 and read them and saw that the paraquat got into the 23 brain, to confirm that there was no central nervous 24 system effect or neurotoxicity? 25 What studies did they do?

15 (Pages 269 - 272)

Page 273 1 A. Based on my conversations with Dr. Cavalli 2 and Dr. Ford, they evaluated the entirety of the 3 data that they had in front of them, and they did 4 not believe that there was any specific 5 neurotoxicity effects that needed to be further 6 evaluated. 7 Q. Okay. I move to strike your answer as 8 unresponsive. 9 My question is this, very simple: What 10 studies did they do, after they got all the 11 scientific information, to verify that there was no 12 neurotoxicity effect? 13 What did they do, specifically, Chevron? 14 A. In terms of studies? 15 Q. Yes. 16 What studies did they undertake to confirm 17 that their suspicions that this was from general 18 toxicity and not from neurotoxicity from the 19 chemical? What studies did they undertake to prove 20 that? 21 A. Based on their evaluation of the entirety 22 of the effects, they did not conduct any studies. 23 Q. No studies were ever done, were they? Is 24 that a correct statement? 25 MR. ORLET: Object to form.	Page 275 1 Q. Did Rose and Smith work for ICI? 2 A. Yes, sir. 3 Q. And did Dr. Rose and Dr. Smith say that 4 this study implies that uptake of paraquat involves 5 active transport across cell membranes? 6 A. Do you have a specific section that you're 7 referring to? 8 Q. Yes. 9 If you would go to the first page, second 10 paragraph, "We have demonstrated an energy-dependent 11 accumulation of paraquat in slices of rat lung --" 12 A. Yes, sir. 13 Q. -- and continuing on. Okay. 14 So did they say that this implies the 15 uptake of paraquat involves active transport? Was 16 that the gist of this study, from what you could 17 tell? 18 A. Yes, sir. 19 Q. So what relationship, if any, is there 20 between paraquat accumulation being energy-dependent 21 and uptake of paraquat involving active transport 22 across cell membranes? 23 A. Could you repeat the question. 24 MR. TILLERY: Could you read it back to him, 25 please.
Page 274 1 BY MR. TILLERY: 2 Q. No such neurotoxicity studies were ever 3 done by Chevron; correct? 4 A. Please repeat the last question. 5 Q. No studies were ever undertaken by Chevron 6 to confirm the neurotoxicity, either way, of 7 paraquat; correct? 8 A. That's correct, sir. 9 (Plaintiffs' Exhibit 20 was marked.) 10 BY MR. TILLERY: 11 Q. Exhibit No. 20 is a report by M. Rose and 12 Lewis Smith entitled, "Evidence for Energy-Dependent 13 Accumulation of Paraquat Into Rat Lung"; is that 14 correct? 15 A. Yes, sir. 16 Q. And this is Syngenta PQ-02122207 through 17 08; correct? 18 A. Yes, sir. 19 Q. About a page and a half document. 20 A. Yes, sir. 21 Q. In this study, if you would look at it, 22 paraquat accumulation was found to be 23 energy-dependent and to follow saturation kinetics; 24 right? 25 A. Yes, sir.	Page 276 1 (Record read by reporter as follows: 2 "Question: So what relationship, if any, 3 is there between paraquat accumulation 4 being energy-dependent and uptake of 5 paraquat involving active transport across 6 cell membranes?") 7 THE WITNESS: Sir, my understanding is that, in 8 the lung, there's an active transport system where 9 paraquat is actively taken in by a diamine transport 10 into specific cell types that have that diamine 11 transport system. 12 BY MR. TILLERY: 13 Q. The study shows that paraquat can be 14 transported across cell membranes even though it's a 15 charged molecule; correct? 16 A. I'm sorry. Would you please point me to 17 where it says that. 18 Q. If you read the study -- it doesn't 19 necessarily say those words, but if you just look at 20 the study and tell me if you think that's what the 21 gist of this is from what the authors conclude. 22 While you're looking at that, I'm looking 23 back at your answer to the prior. 24 You said a "diamine transport" in the 25 lung; right?

Page 277 1 A. Yes, sir, that is what you said. 2 Q. Aren't you effectively saying the same 3 thing? This allows the transport in those tissues. 4 That's what I'm trying to -- I'm trying to cut to 5 the chase on this one. I've got a couple of 6 questions for you. 7 Is there anything about this, if you could 8 see, that would tell you that the study shows that 9 paraquat can be transported across cell membranes 10 even though it's a charged molecule? 11 A. Yes, sir, based on the active transport 12 system. 13 Q. And do the findings in this study show 14 that paraquat does not pass through cell membranes 15 by passive diffusion? Does it say that? 16 A. This study does not exclude that. This 17 study is designed to determine whether there's an 18 active transport system involved. 19 (Plaintiffs' Exhibit 21 was marked.) 20 BY MR. TILLERY: 21 Q. This is a CUSA document entitled, 22 "Paraquat: Accumulation Tissue in Species 23 Specificity" by M.S. Rose, E.A. Lock, L.L. Smith and 24 I. Wyatt dated July 1975; correct? 25 A. Correct, sir.	Page 279 1 slices." 2 Q. "And energy is required for this uptake"; 3 right? 4 A. "And energy is required for this uptake." 5 Q. Now, please review the table. I think 6 it's No. 3 at 754, please. 7 It's entitled, "Paraquat Concentrations in 8 Rat Tissues After Oral Administration." 9 A. Yes, sir. 10 Q. Let me know when you're ready. 11 A. I'm ready. 12 Q. Does that table show that, at two hours 13 after dosing, the concentration in the brain was 14 6.8 -- and what is that measurement, nm over g? 15 A. That would be nanomoles. 16 Q. Nanomoles per gram wet weight tissue; 17 correct? 18 A. Yes, sir. 19 Q. Then at four hours after dosing, the 20 concentration in the brain was what? 21 A. 0.81. 22 Q. So it had gone down? 23 A. Yes, sir. 24 Q. All right. And at 18 hours, what was it? 25 A. 1.5.
Page 278 1 Q. It's Bates No. 00088741; right? 2 A. Correct. 3 Q. If you would look at the 8758 page. I 4 think it might be the last page. 5 A. Yes, sir. 6 Q. It shows it was circulated to Dr. Cavalli 7 and Dr. Ospenson; correct? 8 A. Yes, sir. I see their names here. 9 Q. At Chevron; right? 10 A. Yes, sir. 11 Q. And this study involved Wistar rats orally 12 dosed with 680 micrograms [sic] per kilogram of 13 paraquat; right? You can find that on 745, the 14 Bates number. 15 A. Sir, yes, I see 680 micromoles per 16 kilogram. 17 Q. Study found "Paraquat was markedly 18 accumulated by lung slices and significantly 19 accumulated by brain slices," didn't it, if you 20 would look at 748. 21 Do you see the first full paragraph, 748? 22 Starts with "Paraquat"? 23 A. Yes, sir. I see it in the lung slices, 24 which is a non-animal in vitro study. The study 25 states it was "significantly accumulated by brain	Page 280 1 Q. It was going back up; right? 2 A. Sir, it would be hard to know with an 3 experimental variability if that's significant. 4 They did not do a statistical significance test on 5 this, so whether or not it's different, it cannot be 6 concluded. 7 Q. Is 1.5 greater than .81? 8 A. Yes, sir. 9 Q. Almost twice as high; right? 10 A. Yes, sir. 11 Q. Okay. So you would agree with me that at 12 two hours, it was 3.2; and then it went, at four 13 hours, to .81; and then, at 18, it went to 1.5; 14 right? 15 A. Yes. From -- 16 (Reporter seeks clarification.) 17 A. So at two hours, 6.8; at four hours, 0.81; 18 and then at 18 hours, 1.5. 19 Q. Then let's look at what happened when you 20 go all the way up to 30 hours. 21 What is the number now? 22 A. 3.1. 23 Q. Now it's gone up almost -- over doubled 24 again; right? 25 A. Yes, sir.

Page 281 1 Q. So paraquat's concentration in the brain 2 was increasing over time, wasn't it? 3 A. Not necessarily, sir. If you extrapolate 4 from 2 to 30, it's actually decreasing over time. 5 So it's hard to know what the 4- and 18-hour time 6 points mean in the entire context. 7 Q. So you're telling me that when it goes 8 from 6.8 down to .81, then increases to 1.5 and then 9 doubles at 30 hours, it's not increasing? 10 A. Yes, sir, that's what I'm saying. 11 Q. Okay. 12 (Plaintiffs' Exhibit 22 was marked.) 13 BY MR. TILLERY: 14 Q. Exhibit No. 22 is a document entitled, 15 "Notes on Discussions with Chevron San Francisco" 16 dated March 28th and 29th, 1974; right? 17 A. Yes, sir. 18 Q. And this is a document Syngenta produced 19 called 13119252; right? 20 A. Yes, sir. 21 Q. Do the notes recount what was discussed at 22 a meeting about Ortho paraquat label? 23 A. Yes, sir. The title is "Formal 24 discussions on the Ortho paraquat label." 25 Q. And Chevron had present Mr. Ospenson, Nils	Page 283 1 A. Yes, sir. 2 Q. How many times a year did ICI and Chevron 3 meet to discuss issues relating to paraquat? 4 A. Sir, later in the '70s and in the '80s, I 5 believe it was twice a year, as laid out by the 6 contracts. Before that, I don't know if it was ever 7 agreed to how many times a year they would meet. 8 Q. ICI -- it references specifically PPL, but 9 this is an ICI group -- had requested the meeting 10 after a February meeting when a Dr. Calderbank was 11 advised that Chevron intended to submit a revised 12 paraquat label to the EPA; correct? 13 A. I'm sorry, sir. Would you please point me 14 to where that is in the document. 15 Q. I think if you read the document, you can 16 understand. Just look. "The meeting was held at 17 PPL's request." This is right after the attendee 18 list. 19 Do you see? 20 I'll read from the document. 21 "The meeting was held at PPL's request 22 following advice to Dr. Calderbank during an earlier 23 visit (end [of] February 1974) that Chevron intended 24 to submit a revised paraquat label to the EPA 25 containing, among other things, the phrase 'when
Page 282 1 Ospenson; right? 2 A. Yes, sir. 3 Q. Dr. Cavalli. Carl Tanner, national 4 marketing manager. Warren Lewis, supervisor market 5 development. Dr. Lemac Hopkins, technical advisor 6 environmental quality. Gerry M. Doppelt, vice 7 president legal. Loren Stelzer, product 8 registration. Donald F. Searle. And Dr. Frank 9 Kamienski, regulatory specialist. 10 Right? 11 A. Yes, sir. 12 Q. And then PPL had Jenkins and Schumacher; 13 right? 14 A. Correct. 15 Q. And then there was also Dr. Fletcher. 16 All three of those were there from ICI; 17 correct? 18 A. That's my understanding, yes, sir. 19 Q. Okay. All right. Ortho paraquat was one 20 of the products that Chevron distributed in the 21 United States under the agreement with ICI; right? 22 A. Yes, sir. 23 Q. Chevron formulated Ortho paraquat using 24 paraquat active ingredients manufactured by ICI; 25 correct?	Page 284 1 spraying, wear goggles and a respirator to avoid eye 2 contact and nasal, throat and respiratory tract 3 irritation'." 4 Am I reading that correctly? 5 A. Yes, sir. 6 Q. Dr. Calderbank was an ICI person; correct? 7 A. That's my understanding, sir. 8 Q. Now, would you read the third paragraph 9 for the record. 10 A. Beginning with "Dr. Lemac Hopkins"? 11 Q. Yes. 12 A. "Dr. Lemac Hopkins' job is to keep abreast 13 of State legislative opinion. The major problem of 14 concern to State regulatory authorities is drift, 15 but Dr. Hopkins is also picking up adverse comments 16 related to paraquat's toxicity. Extreme examples 17 quoted were the proposal in California to require 18 workers to undergo a cardiopulmonary evaluation 19 before spraying paraquat, and a proposal from a 20 Mr. Stephenson of Georgia for a paraquat ban. In 21 both of these instances, the persons concerned were 22 persuaded not to proceed with their proposals. 23 Other comments from State officials indicate concern 24 about the possible long-term chronic effects of 25 workers licking small quantities of paraquat daily

18 (Pages 281 - 284)

Page 285 1 from their lips and/or breathing in low doses via 2 small droplets from spray mist. Some agricultural 3 commissioners have criticized the label for not 4 being clear." 5 Q. So would you agree that Chevron and ICI 6 knew in March of 1974 that California state 7 officials were concerned about, quote, "the possible 8 long-term chronic effects of workers licking small 9 quantities of paraquat daily on their lips and/or 10 breathing in low doses via small droplets from spray 11 mist"? 12 A. Yes, sir, that's what the document says. 13 Q. And then if you go to -- 14 A. Sir -- 15 Q. -- the next page. 16 A. -- just to confirm, these are Syngenta's 17 notes on the -- 18 Q. I don't know. I don't know -- this was a 19 document produced to us by Syngenta. And it says at 20 the top "Dr. Swan," if you see that handwriting, on 21 the front page. 22 A. Um-hum. 23 Q. It says, "Notes on Discussion with Chevron 24 San Francisco, March 28 and 29, '74, Paraquat 25 Label."	Page 287 1 had no experimental evidence to support the 2 contention that there is no chronic effect from 3 continual exposure to spray mist at subacute effect 4 levels." 5 Is that correct? 6 A. That's what the document says. 7 Q. And that is a document dated 1974; 8 correct? 9 A. Yes, sir. 10 Q. And then if you look, there was a Post-it 11 note -- 12 A. Sir, just from my understanding, I would 13 like to read that sentence one more time. 14 Q. Absolutely. Take your time. 15 (Witness reviews document.) 16 A. Okay, sir. 17 Q. That's what it says, what I read; correct? 18 A. That is what it says. 19 Q. There were no studies to support that 20 contention, that he knew of, Fletcher? 21 A. Correct. 22 Q. And if you look at the little note on the 23 handwriting on the side, it says, "i.e., we have 24 done no long-term inhalation studies." 25 Do you see that?
Page 286 1 A. I just wanted to clarify that this was an 2 ICI documentation of their meeting with Chevron, but 3 not a Chevron recount of the meeting. 4 Q. Do you have some reason to disbelieve the 5 accuracy of this statement? 6 A. No, sir, I don't, but I just -- I would 7 also want to see what Chevron's opinion of the 8 meeting was, of the same meeting. 9 Q. Do you have some reason to believe that 10 this report of the meeting was inaccurate? Did 11 somebody tell you this wasn't true? 12 A. No one told me this wasn't true. 13 Q. No one told you that this recitation about 14 state officials making these inquiries was not true; 15 right? 16 A. Yes, sir, that's correct. 17 Q. So if we could go on to 253, the next 18 page. And in the middle of the page, there's a 19 paragraph that says, "It was agreed." 20 Do you see that one? 21 A. Yes, sir. 22 Q. Go to the last sentence of that paragraph. 23 And it says -- see if I'm quoting this correctly -- 24 "Before the point was conceded by PPL, Dr. Fletcher 25 confirmed in answer to a direct question that IHRL	Page 288 1 A. Yes, sir, I do. 2 Q. Chevron knew that people working near 3 applicators were being exposed to particles of 4 paraquat at that time, didn't they? 5 A. Yes, sir, they did. 6 Q. What does "IHRL" stand for? I can tell 7 you from what -- 8 A. It's reference to Dr. Fletcher. 9 Q. Yeah, I think it's an abbreviation for a 10 practice group within ICI. And I'm happy to let you 11 talk to counsel to answer that question. The only 12 reason I'm asking -- it's not a test. It's just me 13 trying to get my record straight. 14 MR. TILLERY: Counsel, can you verify that's 15 what it is, part of ICI? 16 MR. ORLET: IHRL? 17 MR. TILLERY: Yes. 18 MR. ORLET: I'll have to look. 19 MR. TILLERY: Is it Industrial Hygiene Research 20 Lab? 21 BY MR. TILLERY: 22 Q. Was IHRL part of ICI? 23 MR. ORLET: There are documents -- 24 MR. TILLERY: I'm not asking for a legal 25 opinion -- I'm just --

Page 289 1 MR. ORLET: There are documents that would 2 reflect where Dr. Rose worked. 3 MR. TILLERY: That's right. Okay. 4 BY MR. TILLERY: 5 Q. So as of 1974, when Chevron had been 6 selling products that were formulated from paraquat 7 manufactured by ICI for nearly 10 years, Chevron 8 knew that no long-term studies on the effects of 9 inhaling paraquat spray mist had been done; correct? 10 A. Correct. 11 Q. And by the time of this meeting, Chevron 12 had not done a long-term inhalation study itself; 13 correct? 14 A. Correct. 15 Q. And if you would look at the second . . . 16 where is that? At 54. "Ospenson said" -- who is 17 Ospenson? 18 A. He's the manager. 19 Q. At Chevron? 20 A. At Chevron. 21 Q. He said -- I'm quoting that page. And 22 that's the third page of the document. 23 It says, "Ospenson said that if Chevron 24 were concerned by lack of evidence on toxicological 25 hazards of paraquat, they should consider	Page 291 1 BY MR. TILLERY: 2 Q. Exhibit 23 is a document entitled, "Notes 3 on Meetings Held at CTL 6 through 9 October 1975"; 4 correct? 5 A. Correct. 6 Q. And "CTL" stands for Central Toxicological 7 Laboratory, and that's a part of ICI, to your 8 knowledge; correct? 9 A. Yes, that's my understanding, sir. 10 Q. Do you know what CTL's role was with 11 respect to ICI? 12 A. Not specifically, sir. 13 Q. And this is a document -- Syngenta 14 document, 02491648 through 02491652; correct? 15 A. Correct. 16 Q. And if you would look on the fourth page 17 of this document, you'll see who was present. 18 A. Sorry. Are you asking me to read who was 19 present? 20 Q. Yes, if you would look at that, and then 21 I'll read it for the record. I just want you to 22 have time to read it. 23 A. I see it. 24 Q. The "Meetings with: Dr. Ospenson." 25 He's Chevron; right?
Page 290 1 undertaking their own studies. They would give 2 consideration to that." 3 Did they ever do a chronic study of the 4 subacute effects of spray mist of paraquat? Did 5 Chevron ever do that? 6 A. Sir, I would need to consult the list of 7 studies. 8 Q. Right. 9 (Witness reviews documents.) 10 A. Sir, Chevron did not, but based on my 11 recollection of the documents -- 12 Q. I'm just asking you if Chevron did it. 13 A. Chevron did not do the study. 14 Q. Nothing, to your knowledge, prevented 15 Chevron from doing any of the toxicological studies 16 it wanted to do, correct, could have done? 17 A. To my knowledge, no. 18 Q. To your knowledge, to make sure the record 19 is clear, there was nothing that prevented them from 20 doing that; right? 21 A. To my knowledge, Chevron would have worked 22 through ICI to do the toxicity studies, but there 23 was nothing that would prevent them from conducting 24 their own studies. 25 (Plaintiffs' Exhibit 23 was marked.)	Page 292 1 A. Correct. 2 Q. Dr. Cavalli -- it says, "Standard Oil 3 Company," but that's Chevron; correct? 4 A. Correct. 5 Q. And Dr. Swan, CTL or ICI; correct? 6 A. Correct. 7 Q. Dr. Fletcher, the same? 8 A. Correct. 9 Q. And A. Waitt of PPD. 10 Do you know what that is? 11 A. I don't recall PPD. 12 Q. Meeting lasted for three days. 13 And if you would look at the very last 14 page and under "Chronic Toxicity," I want to read 15 this, and you tell me if I'm reading it correctly. 16 "Chronic toxicity. Chevron are concerned 17 on the chronic effects of paraquat sprays resulting 18 from four cases reported by the State of California. 19 The syndrome is reported as injury to the CNS" -- 20 Is that central nervous system? 21 A. Yes, sir. 22 Q. Reading on: 23 -- "non-specific liver/kidney injury. It 24 is said the syndrome can be confused with heat 25 effects from working in the sun. However, prompted

Page 293 1 by Ida Honaroff, a journalist, one of the four is 2 suing Chevron. Refutation of this claim is 3 extremely difficult and Chevron would like more 4 positive data to use in litigation cases. It is 5 suggested that a critical epidemiology study is 6 carried out and a long-term toxicity study using 7 sprays on animals. These proposals are to be 8 discussed at future meetings." 9 Is that correct? 10 A. Yes, sir, that's what the document states. 11 Q. So an epidemiology study was referred to 12 as critical, but hadn't been done yet; is that a 13 fair statement? 14 MR. ORLET: Object to the form. 15 THE WITNESS: My understanding is that there 16 were studies looking at workers that was conducted 17 in 1969 by Swan. So I'm aware of that study. 18 BY MR. TILLERY: 19 Q. Well, does this say -- what I read 20 suggest, quote, "It is suggested that a critical 21 epidemiology study is carried out and a long-term 22 toxicity study using sprays on animals"; isn't that 23 what he says? 24 A. Correct, that's what it says. 25 Q. And a year had passed since the previous	Page 295 1 Now, go to paragraph 6, which is the -- on 2 the same page, 1652. And it's entitled, "Activity 3 of Paraquat on CNS." 4 That's central nervous system; right? 5 A. Correct. 6 Q. It says, "In a recent autopsy on a 7 paraquat poisoning, the pathologist discovered 8 lesions on the motor neurons." 9 Am I reading that correctly? 10 A. Yes, sir. 11 Q. And that is referring to lesions on the 12 motor neurons in the brain; correct? 13 A. I'm not sure it says from the brain. 14 Q. Where else do you think that reference is 15 to in the human body? 16 A. In the central nervous system, there can 17 be motor neurons. 18 Q. Did Chevron do any studies after that 19 statement -- after this meeting to investigate 20 whether paraquat may have been responsible for the 21 lesions on the motor neurons in the brain? 22 MR. ORLET: Object to the form. 23 THE WITNESS: Sir, I believe this is a Syngenta 24 document, so I'm not familiar with the actual case 25 or what Chevron -- if this was a report to Chevron
Page 294 1 meeting when it was noted that no long-term study 2 had been done to investigate the effects of inhaling 3 paraquat. That study still hadn't been done; right? 4 A. That appears to be the case. 5 Q. Are non-human primates the best animal 6 models for investigating the potential toxicity of 7 substances to people? 8 A. In many cases they are. The non-human 9 primates are usually considered the best animal 10 model, but it's not 100 percent always the case. 11 Q. And the reason for that is simple. That's 12 because people, human beings, share a significant 13 amount of their DNA with non-human primates; right? 14 A. Correct. 15 Q. Spider monkeys, chimpanzees, different 16 groups of non-human primates have very, very, 17 very -- near identical amounts of DNA. So the 18 impact from a toxicant on them is something that can 19 be extrapolated with more reliability than other 20 animal studies; correct? 21 MR. ORLET: Object to the form. 22 THE WITNESS: Can you please repeat the 23 question. 24 BY MR. TILLERY: 25 Q. That's okay.	Page 296 1 or if it was a report to ICI. 2 BY MR. TILLERY: 3 Q. You're not disputing the accuracy of what 4 ICI reported from meeting with Chevron, do you? 5 A. This is a report from ICI to Chevron. 6 There's nothing that indicates that this is not 7 accurate, but I do not recall reviewing anything in 8 the Chevron documents related to this issue. 9 Q. Well, look at the circulation at the 10 bottom of that same page. I mean, circulated 11 basically throughout the entire operation of ICI, 12 wasn't it? And it was also circulated to Chevron. 13 So you're not saying that anything in this 14 report of that three-day meeting is inaccurate, are 15 you, sir? 16 MR. ORLET: Object to the form. 17 THE WITNESS: I'm sorry, sir. Can you 18 please -- 19 BY MR. TILLERY: 20 Q. Yes. 21 My question is, you're not saying anything 22 about this report summary of a three-day meeting is 23 inaccurate, are you? 24 MR. ORLET: Object to form. 25 THE WITNESS: I would not be able to conclude

Page 297 1 whether it's accurate or the context of how this was 2 discussed because I don't have the Chevron notes 3 about this. 4 BY MR. TILLERY: 5 Q. I'm saying, do you have any basis to 6 believe there's anything inaccurately reported on 7 this document? 8 A. These are ICI's notes, and there's nothing 9 to make me question that this is what ICI thought. 10 Q. Nothing to question the legitimacy of this 11 document, right, or the accuracy of the document? 12 A. There's nothing for me to question what -- 13 this is what ICI wrote. 14 Q. Now, who was the "Fisher" that was 15 mentioned there? Do you see a Mr. Fisher mentioned 16 in paragraph 6? 17 A. Yes, sir, I do. I do not know who 18 Mr. Fisher is. 19 Sir, after this next round, can we take a 20 break? 21 Q. We can do that now if you want to. 22 A. After this next round is fine. 23 Q. Okay. 24 (Plaintiffs' Exhibit 24 was marked.) 25 BY MR. TILLERY:	Page 299 1 of May 21, made no mention of whether or not you 2 have ever had reports, confirmed or not, of injury 3 such as Mr. Fales claims to have suffered. Anything 4 you have on the question of permanent injury from 5 paraquat, or any follow-up evaluations several years 6 after spraying would be of benefit to us. Fales and 7 several others have alleged permanent CNS effects 8 from paraquat. Several papers prescribe transient 9 CNS-type effects following administration of 10 paraquat in the rat. Also, the pathologist who read 11 slides of spinal cord from Thomas Paul found 12 evidence of acute degenerative process similar to 13 that seen in anterolateral sclerosis (ALS). This 14 patient was also heavily curarized for at least 10 15 days. There was no history of signs or symptoms 16 relating to ALS, and the pathologist felt that the 17 lesion was recent. She is not 'convinced' that it 18 was due to paraquat, but she is suspicious. Have 19 you seen anything like this? Your opinion and 20 supporting data would be very valuable to me. This 21 appears to be a growing problem in a litigation area 22 and is of concern to state and federal regulatory 23 agencies." 24 Q. This letter indicates that a Mr. Fales, 25 F-a-l-e-s, alleged permanent injuries to his central
Page 298 1 Q. Exhibit 24 is a CUSA document, 00189884 -- 2 A. Correct. 3 Q. -- right? 4 A. Correct. 5 Q. And this is a letter from R. Cavalli to 6 Ken Fletcher dated July 9th, 1975; correct? 7 A. Correct. 8 Q. Mr. Cavalli, again, was a toxicologist at 9 Chevron; right? 10 A. Yes, sir. 11 Q. And Mr. Fletcher's role at ICI was what? 12 A. I believe he was a toxicologist. 13 Q. Now, if you go to 189885. 14 A. Yes, sir. 15 Q. That's the second page of the document; 16 right? 17 A. Yes, sir. 18 Q. This is a letter; correct? 19 A. Yes, sir. 20 Q. Would you read that letter, that 21 paragraph, into the record for us, please. 22 A. The one that begins with "Mike's May 30 23 letter"? 24 Q. Yes. 25 A. "Mike's May 30 letter, in answer to mine	Page 300 1 nervous system from the effects of paraquat; is that 2 correct? 3 A. Yes, sir. And I spoke with the -- 4 Q. Would you just answer my question. 5 Is that what it says? 6 A. Yes, that's what it says. 7 Q. And in the letter, Mr. Cavalli -- or 8 Dr. Cavalli asks Dr. Fletcher for any information he 9 may have on the question of permanent injury from 10 paraquat, doesn't he? 11 A. Yes, sir, that's what it says. 12 Q. He asks for follow-up evaluations several 13 years after spraying, doesn't he? 14 A. Sir, would you please clarify the 15 question. 16 Q. He asked if ICI had follow-up evaluations 17 of people for several years after spraying. 18 A. Yes, sir, that's what he says. 19 Q. By the time of this letter, ICI had been 20 manufacturing paraquat active ingredient and selling 21 it to Chevron for formulation and distribution in 22 the United States for 10 years; correct? 23 A. Yes, sir. 24 Q. And then the sole distributor of paraquat 25 in the United States was Chevron; right?

Page 301 1 A. Yes, sir, at this time. 2 Q. And after 10 years, Chevron was asking the 3 manufacturer of the active ingredient for any 4 information it might have about whether long-term 5 use of paraquat could cause health problems; right? 6 A. Yes, sir. 7 Q. And the letter also indicates that a 8 pathologist who examined a Thomas Paul found a 9 lesion in his spinal cord. 10 Do you see that? 11 A. Yes, I do. 12 Q. The letter also says that she was 13 suspicious it was due to his exposure to paraquat; 14 right? 15 A. Yes, sir. 16 Q. What, if anything, did ICI do to follow up 17 on this report, to your knowledge? 18 MR. ORLET: ICI? 19 MR. TILLERY: Yes. 20 THE WITNESS: I believe they're in the 21 documents. Not in my reliance materials, but I saw 22 a response from ICI to Chevron. 23 BY MR. TILLERY: 24 Q. To Chevron? 25 A. Yeah, to Cavalli.	Page 303 1 marked as Plaintiffs' Exhibit No. 25. 2 This is a CUSA document, 00189805, isn't 3 it? 4 A. Yes, sir. 5 Q. And it goes to 806, so it's a two-page 6 document. 7 A. Yes, sir. 8 Q. And this is a letter from Dr. Fletcher in 9 response to the letter from Dr. Cavalli that we 10 talked about earlier; right? 11 A. Yes, sir, it is. 12 Q. And you'd seen this before, hadn't you? 13 A. Yes, sir, I have. 14 Q. In your preparation for the deposition? 15 A. Yes, sir. 16 Q. So you had seen before the reference on 17 paragraph No. 4. And I'll read that into the 18 record. 19 I may have already said this, but it's a 20 July 21, 1975 letter exchange; correct? 21 A. Yes, sir. 22 Q. And No. 4 says, "I am sorry not to be more 23 helpful with your legal problems. To my knowledge, 24 no one here has followed up a case of recovered 25 paraquat poisoning for more than a few weeks. I've
Page 302 1 Q. A letter response? 2 A. Yes. 3 Q. Okay. Was that the sum total of their 4 response to this letter, a letter? 5 A. Yes, sir, that is my understanding. 6 Q. What, if anything, did Chevron do to 7 follow up on this report? 8 A. Chevron evaluated the cases to understand 9 what they meant in terms of whether paraquat was 10 acting on the central nervous system. 11 Q. Well, did it investigate whether paraquat 12 could cause spinal cord lesions? 13 A. In a study, they did not. 14 Q. Okay. 15 MR. TILLERY: Off the record. 16 THE VIDEOGRAPHER: Going off the record. The 17 time now is 11:16. 18 (Recess taken.) 19 (Whereupon, Mr. Baghdadi, Esq., entered 20 the deposition room.) 21 (Plaintiffs' Exhibit 25 was marked.) 22 THE VIDEOGRAPHER: Back on the record. The 23 time now is 11:36. 24 BY MR. TILLERY: 25 Q. The reporter has handed you what's been	Page 304 1 not heard of delayed sequela being attributed, 2 rightly or wrongly, to paraquat. Due possibly to 3 good publicity on our part, very few people here 4 believe that paraquat causes any sort of problem in 5 the field and we have the support of the official 6 side. Consequently, any allegation of illness due 7 to spraying never reaches serious proportions and 8 we've never had to defend this type of action. 9 Also, since it is not believed that paraquat causes 10 damage, there's been no study on long-term effects. 11 This would be very difficult in an uncontrolled 12 population." 13 Is that a correct statement? 14 A. Yes, sir, that's right. 15 Q. What I read? 16 A. Yes, sir, that's what the document says. 17 Q. So Dr. Fletcher, who wrote this, is a 18 toxicologist with ICI that manufactured paraquat; 19 right? 20 A. Correct. 21 Q. And he was telling Dr. Cavalli that no one 22 at ICI had followed up on a case of a recovered 23 paraquat poisoning for more than a few weeks; right? 24 A. Yes, sir, that's what the document says. 25 Q. And was this 10 years after the product

Page 305 1 had been sold in the United States? 2 A. Nine or ten years. 3 Q. And he says, continuing, "Due possibly to 4 good publicity on our part, very few people here 5 believe that paraquat causes any sort of problem in 6 the field and we have the support of the official 7 side"; correct? 8 A. Yes, sir. 9 Q. And he goes on to say, "Consequently, any 10 allegation of illness due to spraying never reaches 11 serious proportions and we have never had to defend 12 this type of action"; right? 13 A. Yes, sir. 14 Q. In short, he's saying maybe because of 15 good public relations work, most people, including 16 the government, believe paraquat doesn't cause 17 problems; right? 18 A. I think that would be a fair summary here. 19 Q. He goes on to say since it is not believed 20 to cause damage, no long-term studies on the effects 21 of paraquat. 22 A. Correct. 23 (Plaintiffs' Exhibit 26 was marked.) 24 BY MR. TILLERY: 25 Q. And Exhibit No. 26 is a one-page document,	Page 307 1 medically for several years." 2 Is that what he says? 3 A. Yes, sir, that's what the document says. 4 Q. ICI and Chevron knew before this letter 5 that paraquat had been found, after autopsies, in 6 the brains of people who had been poisoned by 7 paraquat, didn't they? 8 A. Would you please repeat the question. 9 MR. TILLERY: Would you read it back to him. 10 (Record read by reporter as follows: 11 "Question: ICI and Chevron knew before 12 this letter that paraquat had been found, 13 after autopsies, in the brains of people 14 who had been poisoned by paraquat, didn't 15 they?") 16 THE WITNESS: I'm not sure I recall an autopsy 17 report prior to 1979 that showed paraquat in the 18 brain. 19 BY MR. TILLERY: 20 Q. So you weren't aware of that from your 21 investigation; right? 22 A. Correct, sir. 23 Q. Okay. And no long-term studies had been 24 done by this date, had they? 25 A. Sir, please clarify. Are you referring to
Page 306 1 a November 11, 1975 letter from Dr. Fletcher to 2 Dr. Cavalli; correct? 3 A. Correct. 4 Q. And this is Bates No. CUSA-00189795. 5 Okay. 6 A. Correct. 7 Q. If you look at "Secondly," that paragraph, 8 please. They're referencing a study, correct, 9 proposed study? 10 A. In the second paragraph, where they're 11 talking about chronic effects? 12 Q. Yes. 13 He says, "Secondly, we discussed last week 14 about the point you raised about possible chronic 15 effects, which you see causing legal problems." 16 A. Yes, sir, that's what the document states. 17 Q. "This is quite a terrible problem and, 18 frankly, I do not believe a satisfactory 19 investigation can be made. However, I think some 20 plan can be made and, to be as definitive as 21 possible, any study must be as free from doubt as 22 possible. Ideally, we need a fairly large coherent 23 group (say 50) who are exposed to paraquat 24 frequently over a long period, who are exposed to no 25 other pesticide or herbicide and can be followed	Page 308 1 the inhalation studies? 2 Q. Yes. 3 None of those studies had been done of the 4 type that they reference here. 5 A. In this "Secondly" paragraph? 6 Q. Yes. 7 That study had never been undertaken? 8 A. Sir, I believe they're referring to an 9 epidemiology study. 10 Q. Has that ever been done? 11 A. Up until 1975, the epidemiology study I'm 12 aware is the '69 study by Swan. 13 Q. It's the only one? 14 A. The only one I recall at the time. 15 Q. Does Chevron rely on that Swan study? 16 A. Based on the review of my documents, 17 Chevron did consider the Swan study in understanding 18 the toxicity of paraquat. 19 Q. Did Chevron rely on the study in terms of 20 regulatory filings? 21 A. To the best of my knowledge, they 22 submitted that study, but I would need to confirm 23 that. 24 Q. And you think they submitted it to the 25 U.S. EPA, don't you?

Page 309 1 A. I would need to confirm that they did 2 submit it. I do have a list of documents that they 3 submitted. I could confirm that, if you wish. 4 Q. I'm just trying to determine whether you 5 believe they did. 6 A. My understanding is that they did, but I 7 would need to confirm the list of studies. 8 MR. TILLERY: This is the next document. 9 (Plaintiffs' Exhibit 27 was marked.) 10 BY MR. TILLERY: 11 Q. This is a Syngenta document, 02434742. 12 Do you see that? 13 A. Yes, sir. 14 Q. All right. And it's a document dated 17th 15 of February 1968; correct? 16 A. Yes, sir. 17 Q. And it's, "Fatal Case of Poisoning by 18 Paraquat (Gramoxone)"; correct? 19 A. Yes, sir. 20 Q. And it's by F.B. Bronkhorst and J.M. van 21 Daal and H.D. Tan; right? 22 A. Yes, sir. 23 Q. When did Chevron first learn that a person 24 had died from an oral dose of paraquat? 25 A. I don't recall the exact date.	Page 311 1 before? 2 MR. ORLET: (Nods head affirmatively.) 3 MR. HOPKINS: (Nods head affirmatively.) 4 BY MR. TILLERY: 5 Q. How many pages? 6 A. There are five pages, sir. 7 Q. Does that list all of the poisonings, 8 deaths from drinking paraquat? 9 A. This particular one goes until 1975, but 10 there are others that Chevron reported to the EPA 11 that goes beyond 1975. 12 Q. How many people died that are reported on 13 that list? 14 (Witness reviews document.) 15 A. Sir, I counted 16, but some of them were 16 questionable as to paraquat, but those were the 17 deaths. 18 Q. Do autopsies in known or suspected 19 poisonings typically involve macro- and microscopic 20 analysis of tissues and the detection and 21 measurement of the concentration of suspected 22 poisons in the tissues? 23 A. Sir, that is my understanding. 24 Q. And ICI and Chevron kept each other 25 apprised of adverse incidents occurring with
Page 310 1 Q. Do you have the year? 2 A. I believe -- I would need to double -- I 3 would need to check. It would probably just take me 4 a minute. 5 Q. Go ahead. 6 MR. ORLET: Steve, is it okay if I turn him to 7 it? 8 MR. TILLERY: Absolutely. 9 (Witness reviews document.) 10 THE WITNESS: Sir? 11 BY MR. TILLERY: 12 Q. Yes. 13 A. The first poisoning case that Chevron has 14 on record was from February of 1966, where someone 15 was supposed to have taken a brown jug and 16 accidentally drank from this jug, which contained 17 paraquat, and died. 18 Q. That was February 1966? 19 A. Correct. 20 Q. And what was the document that you were 21 referencing? 22 A. It is titled, "Summary of Paraquat 23 Injuries in the United States," and it's 24 CHEV-SJ0089843. 25 MR. TILLERY: Has that document been produced	Page 312 1 paraquat products, didn't they? 2 A. Sir, I don't know the extent to which ICI 3 and Chevron communicated about the specific 4 incidents, but in the documents that I reviewed, 5 they did discuss certain incidents. 6 Q. Chevron Environment Health Center did some 7 analyses of tissues after poisonings, didn't they? 8 A. Yes, sir, they did. Do you want me to 9 expand further on why they did that? 10 Q. No, I'm just asking -- you can later at 11 trial, if you wish. 12 In some poisoning cases, ICI or Chevron 13 received a report from the coroner, medical examiner 14 or another third party; right? 15 A. Yes, sir. 16 Q. And some of these cases were even reported 17 in the scientific literature, weren't they? 18 A. Yes, sir. 19 Q. Now, if you would look at the document 20 that has been marked as Exhibit 27 -- and I can't 21 remember if we put the Bates number in the record or 22 not on this document. No? 23 So this is a Syngenta-PQ-02434742; right? 24 A. Yes, sir. 25 Q. And it goes through 749; correct?

25 (Pages 309 - 312)

Page 313 1 A. Yes, sir. 2 Q. And we previously listed the title to the 3 document. 4 Is this a report of a poisoning in the 5 scientific literature from 1968? 6 A. Sir, I don't see what journal this was 7 published in. 8 Q. So you're saying you weren't aware of this 9 document? 10 A. I'm sorry. I believe you asked me if this 11 was available in the literature, and I didn't see 12 the -- I didn't see the journal that this was 13 published in. 14 Q. I asked if it's a report of a poisoning in 15 the scientific literature. 16 Is the report of a poisoning -- strike 17 that. 18 If you look at the top of the page, it's 19 been translated, but it references "Ned. T. Geneesk" 20 and it's "112, No. 7," published 17th February 1968, 21 "pages 310 through 313." 22 Do you see that? 23 A. Yes, sir, I do see that. That's what the 24 document states. 25 Q. Now, at page 8, the report describes	Page 315 1 BY MR. TILLERY: 2 Q. This is a document -- 3 (Discussion off the record.) 4 MR. TILLERY: And if we could mark this one as 5 well, sequentially, the next. 6 (Plaintiffs' Exhibit 30 was marked.) 7 BY MR. TILLERY: 8 Q. If you would look at all of these, just 9 read them in sequence, please. 10 (Witness reviews documents.) 11 Q. While you're doing that, I'll indicate on 12 the record the Bates ranges. 13 The first is a Syngenta document, 14 04263689. And it is a one-page letter from Ken 15 Fletcher. 16 And the second is Syngenta 04263571. And 17 I believe you also have as 30 -- so No. 30 is, for 18 the record, 04263571. 19 29 is 03720698, another Syngenta. 20 And 28 is Syngenta 04263689. 21 Do you see those? 22 A. Yes, sir, I do. 23 Q. Take your time and go over them. I have a 24 few questions about those exhibits together. 25 (Witness reviews documents.)
Page 314 1 postmortem observations of a man poisoned with 2 paraquat; correct? 3 A. Yes, sir. 4 Q. And the observations included perivascular 5 edema in the white matter of the brain. 6 Do you see that? 7 A. Yes, sir. 8 Q. "Areas in which the ganglion cells from 9 the cortex showed pyknosis of the nuclei." 10 Do you see that? 11 A. Where the original line is crossed out and 12 it's handwritten in? 13 Q. Yes. 14 A. Yes, sir, that's what it says. 15 Q. And so this autopsy report found 16 histopathological changes in the brain, including 17 cell death in the ganglion cells of the cortex, 18 didn't it? 19 A. Yes, sir, those appear to be the findings. 20 Q. Histopathology is the examination of 21 biological tissues in order to observe the 22 appearance of diseased or dead cells, isn't it? 23 A. Yes, sir. 24 (Plaintiffs' Exhibits 28 and 29 were 25 marked.)	Page 316 1 A. Sir, I have completed reading the 2 documents. 3 Q. So these are referencing an autopsy of a 4 Japanese woman, aren't they? 5 A. Yes, sir, that's my understanding. 6 Q. And the time that this occurred would have 7 been what year? 8 A. 1968, as best as I can make out. 9 Q. And Mr. Fletcher was of ICI. And what he 10 had to say about the tissue analysis was -- if you 11 look at the first document, which is No. 28, Exhibit 12 No. 28, he comments that there are "rather 13 higher" -- the results were "rather higher than we 14 would have expected, particularly in the brain, 15 considering the relatively small quantity that was 16 taken"; right? 17 A. Yes, sir, that's what the document says. 18 Q. What he's saying is that this woman 19 ingested a small amount of paraquat, by history, 20 died within 48 hours. That small amount 21 demonstrated, as he said, a rather higher amount 22 than expected in the brain; correct? 23 A. Yes, sir, that's what the document states. 24 Q. So ICI knew and Chevron knew that 25 swallowing a relatively small amount of paraquat

26 (Pages 313 - 316)

Page 317 1 would result in paraquat entering the brain; 2 correct? 3 MR. ORLET: Object to form. 4 THE WITNESS: Sir, I don't believe, especially 5 at this -- during this time period, that Chevron 6 actually measured the amount of paraquat in the 7 brain for their paraquat poisoning cases. They were 8 primarily measuring the paraquat in the urine to 9 make a -- 10 BY MR. TILLERY: 11 Q. I'm sorry. Go ahead and finished. 12 A. No, I'm done. 13 Q. Well, go to Exhibit 30. Okay. 14 Do you see where they did exactly that and 15 made those measurements? 16 MR. ORLET: Objection. 17 BY MR. TILLERY: 18 Q. They measured paraquat in the liver, the 19 kidney, the lung and the brain. 20 Do you see that? 21 A. Sir, I believe this is in -- Dr. Swan, so 22 it says ICI. 23 Q. Right. 24 Are you saying you didn't get this 25 information?	Page 319 1 mean it's not there; it just means I haven't come 2 across it, to my recollection. 3 Q. Let me take us back to earlier in the day 4 yesterday when we talked about the 1964 agreement 5 and the information sharing that was referenced. 6 And I asked you several questions about it. 7 Was this the kind of information Chevron 8 expected to receive from ICI as part of the 9 distribution agreement that was signed with ICI? 10 A. Yes, sir, I believe it would be 11 information that would meet that definition of 12 toxicology information that should be provided. 13 Q. Do you think this would be important to 14 know that after a small injection of paraquat, that 15 the autopsy finding showed this amount of paraquat 16 in the brain? Do you think that would be important 17 for Chevron to know at that time? 18 A. Sir, to an extent, yes. I would need to 19 understand what a "small dose" means. The person 20 did die, but any additional information would be 21 helpful in making the best conclusions on the 22 toxicity. 23 Q. Well, it was 100 milligrams per kilogram 24 of paraquat. 25 Do you see that?
Page 318 1 A. Sir, I've never seen this document before. 2 Q. Okay. Well, you're not suggesting they 3 didn't measure, because there's the measurement, 8.6 4 in the brain; correct? 5 MR. ORLET: Object to form. 6 THE WITNESS: Sir, to clarify, I'm unaware that 7 Chevron was measuring with their cases, with Chevron 8 cases in the United States. 9 BY MR. TILLERY: 10 Q. So you're saying Chevron didn't measure 11 the amount that was in the brain? 12 A. Not during this time period, that I'm 13 aware of. I would need to confirm when and if 14 Chevron was measuring paraquat in the brain 15 postmortem. 16 Q. But you could see here, clear as a bell, 17 that it was measured in the brain. Paraquat right 18 there; right? 19 A. By ICI, sir. 20 Q. Are you saying they didn't tell you about 21 this? 22 A. Sir, I don't know if they told us about 23 this or not. I have not seen this document in 24 our -- it's a Syngenta document. In the many 25 documents I reviewed, I didn't see it, which doesn't	Page 320 1 A. Yes, sir. I believe the lethal dose for 2 paraquat is around in the range of 30, 40, 3 50 milligrams per kilogram, if I recall correctly. 4 Q. In a human being? 5 A. In a human being. 6 Q. So 50 milligrams. 7 So this was enough to kill the person, 8 wasn't it? 9 A. Yes, sir. 10 Q. And the results show that a measured level 11 of 8.6 measured units in the brain. 12 Am I reading that correctly? 13 A. Yes, sir. 8.6 micrograms per gram. 14 Q. And that was -- that's in Exhibit No. 30. 15 A. And it says "Redacted - EU PII," so I 16 don't know -- I'm assuming that's the poisoning case 17 referred to in Exhibit 29 and 28. 18 Q. Yes -- well, this was redacted -- the way 19 it came to us by virtue of European rules. That's 20 how it was presented to us. 21 And if you would go to Exhibit 29. 22 This is the one that we marked as -- 23 identified as Syngenta 03720698; right? 24 A. Yes, sir. 25 Q. And this says from Litchfield; right?

Page 321 1 A. Yes, sir. 2 Q. To Swan, copies to Conning, Fletcher and 3 Gage, 5th March 1968. Okay? 4 A. Correct. 5 Q. And "Paraquat ICI Japan"; right? 6 A. I didn't see the "Paraquat ICI Japan." 7 Q. What's the title of the document? 8 A. It's in Japan. 9 Q. "Death Case with Gramoxone in Japan"; 10 right? 11 A. Yes, sir. 12 Q. "The amounts of paraquat . . . found in 13 the organs of the young woman were as follows: 14 Brain, 8.6 . . . M.H. Litchfield"; correct? 15 A. Yes, sir. 16 Q. Okay. So the autopsy report was certainly 17 brought to the attention of Litchfield, Conning, 18 Swan, Gage, Fletcher, all ICI scientists; right? 19 A. Sir, can I confirm that Litchfield was an 20 ICI scientist? 21 Q. Absolutely. 22 (Witness reviews document.) 23 A. Yes, sir, those all appear to be ICI 24 scientists. 25 Q. So all of them knew in 1968 that paraquat	Page 323 1 tissues were received on July 9th, 1974; correct? 2 A. Correct. 3 Q. And an analysis was done of those, wasn't 4 it? 5 A. Yes, sir. 6 Q. And paraquat was found in the cerebellum; 7 right? 8 A. Yes, sir, that's what it states. 9 Q. And the cerebellum is in a part of the 10 brain; right? 11 A. Yes, sir. 12 Q. Paraquat was found in the cerebrum; 13 correct? 14 A. Yes, sir. 15 Q. And that is also a part of the brain; 16 right? 17 A. Yes, sir. 18 Q. The reports of these tissue analyses were 19 sent to R.D. Cavalli on July 12th, 1974, according 20 to this document; correct? 21 A. Correct. 22 Q. Do you have any reason to dispute that 23 those reports were sent to Mr. Cavalli? 24 A. No, sir. 25 MR. TILLERY: Do you want to take a lunch break
Page 322 1 could enter the brain of a person exposed to it, 2 didn't they? 3 A. Yes, sir. 4 Q. Now, what did they do with that knowledge? 5 A. Sir, I don't know. I can't speak to ICI. 6 Q. You don't know what they did? 7 A. I can't speak to what ICI did. 8 MR. ORLET: Whenever you get to a good point. 9 MR. TILLERY: Okay. This next one is short. 10 (Plaintiffs' Exhibit 31 was marked.) 11 BY MR. TILLERY: 12 Q. 31 has a CUSA-00206717. 13 Can you identify this document? 14 A. Yes, it's -- appears to be a Chevron 15 document. 16 Q. It says, "Richmond, California. July 29, 17 1974," doesn't it? 18 A. Correct. 19 Q. Okay. And it was in reference to a person 20 who ingested 15 to 20 milliliters of paraquat on 21 June 29th, 1974; right? 22 A. Correct. 23 Q. Patient died July 3rd, 1974. 24 A. Correct. 25 Q. Samples were obtained of urine, and	Page 324 1 now? 2 MR. ORLET: Yes. 3 THE VIDEOGRAPHER: Going off the record. The 4 time now is 12:14. 5 (Lunch recess was taken at 12:14 p.m.) 6 (Nothing omitted or deleted. See next 7 page.) 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

Page 325 1 AFTERNOON SESSION 1:08 P.M. 2 --- 3 THE VIDEOGRAPHER: Back on the record. The 4 time now is 1:08. 5 (Plaintiffs' Exhibit 32 was marked.) 6 EXAMINATION RESUMED 7 BY MR. TILLERY: 8 Q. Would you please take a look at 9 Exhibit 32, sir. 10 A. Yes, sir. 11 Q. And this is a CUSA document, 00169412. 12 Let me know when you've had a chance to 13 take a look at it. 14 (Witness reviews document.) 15 Q. So you know, the blackouts or whatever 16 were -- the document was presented to us in this 17 condition in discovery. 18 A. Understood. 19 I've reviewed the document, sir. 20 Q. And you see the people who are referenced 21 on the document at the top? 22 A. Yes, sir. 23 Q. So this is a February 12th, 1974 document; 24 right? 25 A. Yes, sir.	Page 327 1 obviously the lungs are not a [particularly] target 2 organ" -- 3 Do you see that? 4 A. Yes, sir. I see that the document states 5 that. 6 Q. -- "as the paraquat concentration was only 7 slightly higher than in some other organs that are 8 also well supplied with blood"; right? 9 A. Yes, sir. 10 Q. So do you know if the brain -- if you look 11 on the other side of that document, you'll see that 12 the brain showed signs of paraquat. 13 Do you see that? 14 A. Yes, sir. 15 Q. The last line? 16 A. Yes, sir. 17 Q. Okay. So after you knew that the lungs 18 were not a specific target organ, did you do studies 19 to determine the effects of paraquat on organs that 20 were well supplied by blood? 21 MR. ORLET: Object to the form. 22 THE WITNESS: Sir, I don't know the context of 23 this letter. I don't believe any Chevron person is 24 on this, that I'm unaware of. I do understand that 25 this is a CUSA number, but I have not seen it or
Page 326 1 Q. At the top it says, "Dr. J. Berker." 2 Who was that? 3 A. I do not know who that was. 4 Q. And then over the others is 5 "Mr. Fletcher." 6 Do you see at the top right? 7 A. Yes, sir. 8 Q. Who's that? 9 A. Fletcher, I believe, is the ICI 10 toxicologist. 11 Q. And then it references "Paraquat 12 Poisoning." 13 A. Yes, sir. 14 Q. And this presumably was a letter 15 discussing a November 29th death of a woman from 16 ingestion of paraquat; correct? 17 A. Yes, sir. 18 Q. And he says, "We now have received a copy 19 of a letter from Merck . . . together with the 20 results of the analyses carried out by Merck"; 21 right? 22 A. Yes, sir. 23 Q. "In their letter, Merck [emphasized] that 24 these results confirm . . . findings on the 25 distribution of paraquat and they also mention that	Page 328 1 reviewed it. 2 BY MR. TILLERY: 3 Q. So it got into your archives, didn't it? 4 A. Yes, sir, it does have a CUSA number. 5 Q. And just so we're clear for the jury, that 6 means that these documents were Bates stamped from 7 the archives of documents that are maintained in the 8 ordinary course of business as business records of 9 Chevron. 10 A. Yes, sir, that's my understanding. 11 Q. So this document was here. 12 Do you have any reason to believe that it 13 was not sent at or near the time of the date of the 14 document? 15 A. I have no way to verify that, when it was 16 put in or why it was put into our document 17 collection. 18 Q. It certainly was here, wasn't it? 19 A. It was there, but I don't understand the 20 context or if there's -- 21 Q. Well, the context are that "the lungs are 22 not a [particularly] target organ." 23 That's what they say at Merck from this 24 analysis. 25 A. Yes, sir, that's what they say. However,

Page 329 1 I would dispute that based on the table they have in 2 the back. 3 Q. Well, the table in the back shows that the 4 brain had a paraquat reading of 12.41, in that 5 level; right? 6 A. Yes, sir, that's what the document states. 7 Q. Okay. 8 (Plaintiffs' Exhibit 33 was marked.) 9 BY MR. TILLERY: 10 Q. Now let's look at Exhibit No. 33. 11 And this is a document that's a CUSA 12 document, 00168423; correct? 13 A. Yes, sir. 14 Q. And this is a postmortem analysis of 15 Mr. Charles Lockwood; correct? 16 A. Correct, sir. 17 Q. And it's dated August 22nd, 1978; right? 18 A. Yes, sir. 19 Q. And it's a Chevron Chemical Company 20 document. It's on their letterhead. 21 A. Yes, sir. 22 Q. And it's to Mr. J.E. Ford. 23 Is he the same toxicologist Ford we've 24 been talking about? 25 A. Yes, sir, to the best of my knowledge, he	Page 331 1 A. So a limit of detection is determined by 2 your analytical method, and it's essentially what -- 3 the sensitivity of the equipment that you're using 4 to analyze a sample for chemical identity. 5 Q. And if it's below that level, it just 6 shows it nondetect? 7 A. Correct. 8 Q. So a postmortem analysis was then 9 performed on the brain, lung, liver and kidney; 10 right? 11 A. Yes, sir. 12 Q. And which organs showed a detectable level 13 of paraquat? 14 A. Based on what the document says, it's 15 states, "Only brain was found to contain paraquat." 16 Q. And the brain had a level of what? 17 A. 0.04 parts per million. 18 Q. That was the only one that showed a level 19 of detection; correct? 20 A. According to this document, yes. 21 Q. And paraquat had accumulated in the brain 22 as opposed to the other tissues; would you agree? 23 A. Sir, based on this, it's hard to know if 24 it accumulated or not in the brain without knowing 25 the tissue samples throughout the time course.
Page 330 1 is. 2 Q. And it's signed by James B. Leary; right? 3 A. Yes, sir. 4 Q. Who is he? 5 A. I do not recall who James Leary is. 6 Q. And it's cc'd H.G. Franke, L.R. Stelzer 7 and B.V. Tucker. 8 Do you know who those people are? 9 A. I recognize Stelzer, but not the other 10 names. 11 Q. Was Stelzer another toxicologist? 12 A. He was a manager. 13 Q. Okay. So Mr. Lockwood ingested 14 35 milliliters of paraquat CL on June 10th, 1978, 15 according to this; right? 16 A. Yes, sir. 17 Q. And a plasma sample was taken on 18 June 14th, and it had .06 parts per million 19 paraquat; right? 20 A. Yes, sir. 21 Q. Subsequent plasma samples were taken on 22 the 15th and 16th and were found to be below the 23 limit of detection; right? 24 A. Yes, sir. 25 Q. What's that mean?	Page 332 1 Q. The brain was the target organ for 2 paraquat in this analysis, wasn't it? 3 MR. ORLET: Object to form. 4 THE WITNESS: Sir, please clarify what you mean 5 by "target." In terms of -- the target in terms of 6 how paraquat was distributed to the brain or the 7 target for toxicity? 8 BY MR. TILLERY: 9 Q. Well, whichever. Why don't you answer 10 both. 11 A. Sir, I would need to look more closely at 12 the context of this case to understand what lung 13 effects were noted in this case. It appears the 14 patient did die, so I would need to understand more 15 about the time course of the effects and whether 16 there are any symptomology related to central 17 nervous system effects throughout -- between the 18 June 16th sample time and the July 21st postmortem 19 to make any such conclusions. 20 Q. You had access to this record before this 21 deposition, didn't you? 22 A. It's a Chevron USA number, so I would have 23 had access to it, yes, sir. 24 Q. Did you do any of that work that you just 25 suggested before the deposition in the two months --

Page 333 1 two and a half months you spent preparing for the 2 deposition? 3 A. Sir, just to correct you. I spent 4 approximately one and a half months to one and 5 three-quarters months preparing for the deposition. 6 But to answer your question, I do not 7 recall seeing this document. 8 (Plaintiffs' Exhibit 34 was marked.) 9 BY MR. TILLERY: 10 Q. While you look at this, Exhibit No. 34 is 11 a CUSA document, 00283683. And it's titled, 12 "Paraquat Poisoning: An Analytical Toxicologic 13 Study of Three Cases"; correct? 14 A. Yes, sir. 15 Q. And let's -- this was signed by -- or 16 written by Ronald D. Fairshter, William Richard 17 Smith and James Leary. Mr. Leary was at the Chevron 18 Environmental Health Center, right, Richmond, 19 California? 20 A. Based on this document, yes, sir. 21 Q. Had you seen this document before? 22 A. Sir, I do not recall seeing this document. 23 Q. Why don't you go to 686. 24 Do you see where it says -- Patient 1 25 accidentally ingested a mouthful of 29 percent	Page 335 1 than the lung; correct? 2 A. Correct. 3 Q. So over time paraquat accumulated in the 4 patient's brain, didn't it? 5 A. Sir, what I can deduce from this is that 6 it was found in the brain. I don't have a starting 7 concentration in the brain to determine whether or 8 not it was accumulated. 9 Q. Let's go back to page 4, that's 686, and 10 look at Patient No. 2. 11 Do you see Patient 2? 12 A. Yes, sir. 13 Q. This is a 16-year-old male who ingested a 14 mouthful of 29 percent paraquat. 15 Do you see that? 16 A. Yes, sir. 17 Q. He died 23 days after ingestion from 18 pulmonary fibrosis; right? 19 A. Yes, sir. 20 Q. And if you go back to page 695, Table 1 on 21 page 13 shows paraquat concentration in his brain, 22 23 days post ingestion, was .07; right? 23 Do you see that? 24 A. I do, sir. 25 Q. And comparing it to the kidney or the
Page 334 1 paraquat; right? 2 A. Yes, sir. 3 Q. "17-year-old Caucasian male was 4 transferred to the University of California Irvine 5 Medical Center five days after accidentally 6 ingesting a mouthful of 29 percent paraquat"; right? 7 A. Yes, sir. 8 Q. And he died 22 days post ingestion from 9 respiratory failure; is that correct? 10 A. Yes, sir. 11 Q. And then we see, if you go to the Table 1 12 on 695 -- do you see that? "Tissue Paraquat 13 Levels." 14 A. Yes, sir. 15 Q. It shows tissues were taken postmortem and 16 analyzed of the brain, the heart, kidney, liver, 17 lung and spleen. 18 Do you see that? 19 A. Yes, sir. 20 Q. What was the highest one? 21 A. The brain is the highest at 22 0.089 micrograms per gram of tissue. 23 Q. And it's multiple times higher than the 24 heart, it's higher than the kidney, it's higher than 25 the liver, four times higher, it's five times higher	Page 336 1 liver, it was more than twice higher; correct? 2 A. Yes, sir. 3 (Plaintiffs' Exhibit 35 was marked.) 4 BY MR. TILLERY: 5 Q. Exhibit 35 is a Syngenta paraquat, 6 04267141; correct? 7 A. Yes, sir. 8 Q. Is this a 1976 autopsy report by a 9 Dr. L. Henry in Sheffield, United Kingdom? 10 A. Yes, sir. 11 Q. And this is an autopsy report of a farm 12 worker who ingested paraquat; correct? 13 A. Correct, sir. That's what the document 14 states. 15 Q. Please turn to 143. It's page 3 of the 16 document itself. 17 Does the report there say that the 18 histological examination of his brain revealed, 19 quote, "degenerative changes . . . present in the 20 cells of the substantia nigra and the Purkinje cells 21 of the cerebellum"? 22 A. Sir, that is what the document states. 23 Q. Dr. Henry concludes, quote, "The gross and 24 microscopic findings in this case are consistent 25 with those found following the ingestion of

Page 337 1 paraquat." 2 Is that what he says? 3 A. Yes, sir, that's what he says in the first 4 sentence of the summary. 5 Q. The substantia nigra is the part of the 6 midbrain that controls dopamine production, isn't 7 it? 8 A. Yes, sir, it is. 9 Q. Loss of dopamine production causes motor 10 symptoms of Parkinson's disease, doesn't it? 11 A. Yes, sir, it does. 12 Q. Purkinje cells are neurons located in the 13 cerebellum, aren't they, sir? 14 A. Yes, sir. 15 Q. They release a neurotransmitter called 16 gamma-aminobutyric acid. 17 A. Yes, sir. 18 Q. I think it's called GABA. 19 A. GABA, yes, sir. 20 Q. Call it GABA because so many people have 21 trouble, like I do, pronouncing it; right? 22 A. Yes. 23 Q. And they regulate and coordinator motor 24 movements, too, don't they? 25 A. Yes, sir. I believe it's an inhibitory	Page 339 1 A. Yes, sir, that's what the document states. 2 Q. And he was also the study investigator; 3 right? 4 A. Would you please clarify what -- 5 Q. I'm just repeating from the document 6 itself on page 2, "Study Director," Litchfield -- 7 and he signed as study investigator? 8 A. Yeah. He signed for the study 9 investigator. And then for the remaining authors of 10 this -- or contributors of this study, I do not 11 recognize any of their names. 12 Q. If you turn to 0411 where it says, "An 13 assessment" and just read that paragraph to 14 yourself. 15 (Witness reviews document.) 16 A. I've read the introduction. 17 Q. This study was designed as a cancer study; 18 right? 19 A. Correct. 20 Q. It wasn't designed as a chronic 21 neurotoxicity study, was it? 22 A. No, sir, it was not. 23 Q. And if you turn now to page 7, that's 412. 24 It's "A total of 458 male and 438 female Specific 25 Pathogen-Free Swiss-derived mice of known parentage
Page 338 1 neurotransmission system. 2 (Plaintiffs' Exhibit 36 was marked.) 3 BY MR. TILLERY: 4 Q. You've read this document before, I 5 presume? 6 A. This exact document, I don't know. But I 7 have reviewed this toxicology testing report. 8 Q. This is a document, CUSA-00020406; right? 9 A. Yes, sir. 10 Q. And last page is 00020552; correct? 11 A. Yes, sir. 12 Q. All right. And it's entitled, "Imperial 13 Chemical Industries Limited, Central Toxicology 14 Laboratory, Alderley Park." 15 That's ICI, Syngenta; right? 16 A. Yes, that's ICI. 17 Q. And it's entitled "Paraquat: Lifetime 18 Feeding Study In The Mouse," June 22nd, 1981, 19 Jealott's Hill Report Centre; correct? 20 A. Correct. 21 Q. And it lists a number of people; Sotheran 22 Banham, Godley, Lindsay, Pratt, Taylor, Woollen. 23 Do you know any of those people? 24 A. So I recognize the name Litchfield. 25 Q. He was the study director, wasn't he?	Page 340 1 were supplied from the colony maintained at the 2 Animal Breeding Unit, Alderley Park, Cheshire"; 3 right? 4 A. I'm sorry, sir. Would you please tell me 5 the page again. 6 Q. I think it's -- 412 is the last three 7 numbers. CUSA and the last three are 412. 8 A. Yes, sir. 9 Yes, sir, that's what the document says. 10 Q. Okay. Now if you turn to page 10 of the 11 document. If you would look at 415. I had that off 12 by one. I'm sorry. Under 2.4, "Specification of 13 Diets, Diet Preparation and Diet Analysis." 14 Do you see that? 15 A. Yes, sir. 16 Q. The diets were supplied by BP Nutrition. 17 Do you see that? 18 A. Yes, sir. 19 Q. If you could just read that paragraph. 20 A. "The diets were supplied by BP Nutrition 21 (UK) Limited, Stepfield, Witham, Essex, UK in 22 25 kilogram sacks of meal which were pasteurised on 23 entry into the SPF Unit. During the 24 pre-experimental phase and until the week beginning 25 21 August 1978, Expanded Porton Rat Diet with a

Page 341 1 Vitamin E Supplement (PRDE) was used. At this time, 2 a policy decision was made to change from PRDE to 3 Porton Combined Diet (PCD). PCD was fed from then 4 until the end of the study. The formulations of 5 both diets are given in Appendix 4 and the method of 6 the diet preparation is given in Appendix 5." 7 Q. Is vitamin E an antioxidant? 8 A. Based on my knowledge, I believe vitamin E 9 is an antioxidant. 10 Q. Does vitamin E bioaccumulate in fat cells? 11 A. Sir, I don't know. 12 Q. Well, let me ask you to assume that it 13 does for purposes of my question. 14 A. For purposes of your question, all right. 15 Q. That it does bioaccumulate and that -- 16 you've already said that it's an antioxidant. 17 Why would you add an antioxidant to a 18 feeding study? 19 A. Sir, I would need to read this a little 20 bit more, but my understanding was they were having 21 issues with infections in this study. So that may 22 have been the reason why. But I would need to 23 confirm. And hopefully that is documented within 24 the study report, which I would need to go through 25 in greater detail to find.	Page 343 1 Because it's an antioxidant that 2 bioaccumulates, increased levels of vitamin E in the 3 body of these test animals would reasonably be 4 expected to reduce the redox cycling effects of 5 paraquat. 6 A. That would be a question that you would 7 have to -- that you would have to ask yourself, is 8 what the contribution of vitamin E would be playing 9 to the toxicity. 10 Q. It may well effectively be reducing the 11 effects of the paraquat in terms of redox cycling; 12 correct? 13 A. It is a reactive oxygen species scavenger, 14 so one would postulate and need to understand and 15 address that. 16 Q. A higher level of vitamin E in the body 17 would reasonably be expected to provide more 18 protection from the destructive effects of reactive 19 oxygen species as well, wouldn't it? 20 A. Please repeat the question. 21 Q. A higher level of vitamin E in the body 22 would reasonably be expected to provide more 23 protection from the destructive effects of reactive 24 oxygen species? 25 A. Sir, I would need to evaluate that more.
Page 342 1 Q. Well, let me ask you, sir: Assuming for a 2 second that vitamin E bioaccumulates, because 3 vitamin E is an antioxidant and because it would 4 bioaccumulate, increased levels of vitamin E in the 5 body of these test animals would reasonably be 6 expected to reduce whatever effects the redox 7 cycling of paraquat would have otherwise; would you 8 agree? 9 A. Sir, I do agree that if there was a 10 reactive oxygen species scavenger present, then that 11 could decrease the toxicity. But I would need to 12 understand more about vitamin E, where it locates 13 within the body and what cells it's taken up into 14 specifically and in what doses to really dissect and 15 understand the specific protected mechanisms it 16 might have related to administration of a reactive 17 oxygen -- a chemical that causes reactive oxygen 18 species. 19 Q. Right. 20 But on at least a theoretical level, 21 without you knowing more or being part of this -- 22 this study was done years ago -- what I said is 23 true, isn't it? 24 A. Would you please repeat what you said. 25 Q. Sure.	Page 344 1 Because there's already vitamin E at a baseline in 2 the body, so I don't know how much of an increase 3 and how much that would actually translate to a 4 protective effect. It's a very complicated array of 5 signaling pathways and -- with reactive oxygen 6 species. And one needs to carefully evaluate very 7 many different variables and parameters before 8 concluding what the effects might be. 9 Q. Let me ask you, in the 29 years since this 10 study has been done, did anybody at Chevron ever do 11 what you just suggested? 12 A. No, sir. 13 Q. That just came up in this deposition as an 14 alternative; right? 15 Strike that. 16 Let's go to page 413. That's page 8 of 17 the study. 18 I'm sorry. It's 413. Are you seeing 19 that? 20 A. 2.3, "Experimental Design"? 21 Q. "During this study," that paragraph. 22 These mice were housed in cages with 23 stainless steel mesh flooring; right? 24 A. Yes, sir. 25 Q. And at page 12, if you look at that, I

Page 345 1 think that's at 417, do you see that urine was 2 collected in a pan at the bottom of the cage? 3 A. Page 12. 4 Q. I think that's at 17 -- 417. 5 We may have to go back to the study 6 protocol on 413 to answer it. I may have confused 7 you by that. 8 Do you see the line that says, "The cages 9 were suspended over collecting trays lined with 10 absorbent paper"? 11 A. Yes, sir. 12 Q. All right. And then the urine was then 13 analyzed for paraquat, wasn't it? 14 A. Yes, sir. 15 Q. If you now turn to 549. 16 Paraquat was found in the urine collected 17 from the cages that housed the control mice; right? 18 (Witness reviews document.) 19 A. Please repeat the question. 20 Q. The paraquat was found in urine from 21 control mice. Control mice were never given any 22 paraquat. 23 Do you see that? Page 144 of the 24 document. 25 A. Page 144 or 140?	Page 347 1 A. Would you repeat the question. 2 Q. Yes. 3 The test was using contaminated samples 4 from the housing units, weren't they? They were 5 effectively using contaminated samples. Were you 6 aware of this before today that I pointed it out to 7 you? 8 A. No, sir, I was not. 9 Q. Did you ever use this study and file it 10 with the United States Government, U.S. EPA? 11 A. I do believe that this was a study that 12 was provided to the U.S. EPA. 13 Q. Did you ever tell them that this was a 14 contaminated study? 15 A. Sir, I would need to go back and check the 16 documents, but I do believe we provided them the 17 entire study report for their review. 18 Q. And if you look at the urine samples 19 tested, ICI, who did it, couldn't distinguish 20 between mice that were in the treatment group that 21 got paraquat in their food as part of the study and 22 mice that were in the control group who didn't get 23 paraquat as part of their study and mice that 24 weren't in the study at all; correct? 25 A. Sir, can you please refer me to that part
Page 346 1 Q. Just look at -- if you wouldn't mind, look 2 at CUSA 471 and the table. 3 (Witness reviews document.) 4 Q. Do you see there under, "Period Weeks," 5 "13"? 6 A. Yes, sir. 7 Q. So the control mice, just so we're clear, 8 are the mice that are used as a comparison because 9 they weren't given paraquat, were they? 10 A. That's correct, sir. 11 Q. And they're showing here that urine 12 was -- strike that. 13 They're showing here that from the urine 14 collected, it was shown to have paraquat in it; 15 right? From control mice that were never fed 16 paraquat. 17 A. Sir, it's unclear, especially from 18 page 140, whether it's from the control mice or the 19 lack of proper cleaning of the pans that were used 20 to collect -- the pans that were used to collect the 21 urine. 22 Q. Isn't that exactly the problem, they 23 weren't cleaning the housing units carefully and 24 they were using contaminated samples? Isn't that 25 what happened?	Page 348 1 of the document? 2 Q. That is 20550, "Examination of 3 pre-experimental mouse," that paragraph. 4 (Witness reviews document.) 5 Q. Do you see where it says, "Subsequently," 6 that line, on 550? Are you reading from that page? 7 A. I'm reading from page 141, which is 550. 8 Q. "Examination of pre-experimental mouse," 9 do you see that? 10 A. Yes, sir. 11 Q. Read that last sentence into the record, 12 "Subsequently." 13 A. "Subsequently, ten urine samples were 14 obtained from mice not involved in the study and all 15 gave a positive result within the range 0.005 to 16 0.012 micrograms per milliliter." 17 Q. And they weren't even involved in the 18 study, were they? 19 A. Correct, sir. And the rest of the 20 document -- 21 Q. Can you answer my question? 22 Those mice weren't involved in the study, 23 were they? 24 A. No, those were control mice. 25 Q. Now, if you wouldn't mind, go to 551 on

Page 349 1 the conclusion. 2 ICI gave two possible reasons for the 3 control urine having paraquat added, didn't it? One 4 it was bad laboratory practice in washing the cages; 5 right? And the other was a bad analytical method, 6 meaning bad measurement; correct? 7 A. Would you please repeat the question. 8 Q. Yes. 9 ICI gave two possible reasons for the 10 control urine -- the mice having paraquat in it, 11 didn't it, two reasons? 12 A. Yes, sir. 13 Q. One was it was bad laboratory practice in 14 the way they handled and washed the cages; correct? 15 That was one explanation? 16 A. So the first explanation was that there 17 may have been contamination from not rigorous enough 18 cleaning. 19 Q. And the other was bad analytical method, 20 meaning bad measurement; correct? 21 A. Yes, they say there was interference with 22 the analytical method. 23 Q. Interference with the analytical method. 24 But there was one female control with 25 paraquat in her urine that neither of these	Page 351 1 Q. Yes, the introduction. 2 A. Okay. 3 Q. It says, "The purpose of this study was to 4 assess the chronic effects of paraquat, a herbicide, 5 and its influence on the incidence of neoplasms 6 during its prolonged administration to rats via the 7 diet. The study was extended beyond the original 8 duration of 104 weeks because of the low number of 9 deaths on the completion of that period." 10 Do you see that? 11 A. Yes, sir. 12 Q. The study was designed to find chronic 13 effects of paraquat toxicity with an emphasis on 14 cancer, wasn't it? 15 A. Yes, sir. 16 Q. It wasn't designed to necessarily 17 investigate neurotoxicity, was it? 18 A. Sir, it would have evaluated some 19 neurological parameters. 20 Q. And you would have expected it to do that, 21 right, as part of the study; right? 22 A. As part of the study, you would typically 23 look at multiple organ systems. 24 Q. And there would be no reason, to your 25 knowledge, to exclude any; right? Wouldn't you
Page 350 1 explanations could account for, wasn't there? 2 A. Yes, sir. 3 Q. Did Chevron ever report that to the U.S. 4 EPA? 5 A. Sir, to the best of my knowledge, the 6 entire report would have been reported to the U.S. 7 EPA. 8 (Plaintiffs' Exhibit 37 was marked.) 9 BY MR. TILLERY: 10 Q. Sir, directing your attention to 11 Plaintiffs' Exhibit No. 37. This is CUSA 12 No. 00241880; correct? 13 A. Correct. 14 Q. And it goes through 242192 -- I'm sorry -- 15 193; correct? 16 A. Correct. 17 Q. And this is a combined toxicity and 18 carcinogenicity study in rats; correct? 19 A. Correct. 20 Q. Who did this study? 21 A. This study appears to be conducted by Life 22 Science Research on behalf of ICI. 23 Q. Okay. If you'll please turns to 899, 24 where it describes purpose of the study. 25 A. The introduction?	Page 352 1 agree? 2 Strike that. 3 Does Chevron believe the results of this 4 study show paraquat is not neurotoxic? 5 A. I would have to review the document much 6 more carefully. 7 Q. Why don't you turn to page 899. 8 Treatment was initiated on April 6th, 9 1978. 10 Do you see that? 11 A. Would you please repeat the CUSA number. 12 Q. I think it's 899. 13 Treatment was initiated on April 6th, 14 1978; right? 15 A. Correct. 16 Q. Certainly ICI knew -- we've looked at 17 documents verifying it -- that paraquat entered the 18 brains of experimental animals by that time; 19 correct? 20 A. Yes, sir. There were documents that 21 showed that paraquat was found in the brain. 22 Q. And Chevron knew that as well, didn't 23 they, by that time? 24 A. Yes, sir. 25 Q. Now, if you turn to page 35, which is

Page 353 1 1914. 2 What organ systems did they study? 3 A. Sir, based on Sections 4.3.2 and 4.3.3, 4 they studied the brain and other, what I would say, 5 standard organs related to morphology and pathology. 6 Q. Look at the paraquat tissue levels under 7 4.3.5. 8 Do you see that? 9 A. Yes, sir. 10 Q. Which organs did they take tissues of? 11 A. There were six tissues that were taken to 12 evaluate the paraquat levels. 13 Q. From which organs? 14 A. Liver; lungs; kidneys; skin; plasma, 15 3 milliliters of plasma; and the urine. 16 Q. Do you see the brain listed anywhere? 17 A. No, sir. The brain's not listed. 18 Q. They didn't take any samples from the 19 brain, did they? 20 A. Sir, tissue levels -- 21 Q. Can you just answer my question. 22 Do you see any measurement from the brain 23 in this study? 24 MR. ORLET: Object to form. 25 THE WITNESS: Tissue levels for analytical	Page 355 1 through those documents and to tell me the general 2 subject matter that they pertain to with respect to 3 the designated topics that you're speaking of. 4 Okay? 5 A. Okay. 6 Q. And can you do that on your own or do you 7 need individual questions? Can you do that by just 8 going through the list for this on the record? 9 A. I can do that by going through the list. 10 Q. That's fine. Thank you. Please do that. 11 A. So the first category of documents are 12 related to toxicology. And these include the 13 numbers which are the reference numbers, the first 14 column of Exhibit No. 13 -- 15 Q. Okay. 16 A. -- 5, 6, 7, 18, 19, 24, 25, 29, 30, 36, 17 38, 39, 45, 46, 47, 56, 59, 60, 61, 66 and 69. 18 Q. And, again, that topic was toxicology? 19 A. Correct, sir. 20 Q. So that would encompass what subject 21 areas? 22 A. Areas related to toxicity testing, 23 toxicity studies, emetics, anecdotes as well as 24 treatment. 25 Q. Okay. Go ahead, sir.
Page 354 1 verification aren't a standard requirement in 2 studies. 3 Sir, can we take a one-task -- 4 MR. TILLERY: Of course we can take a break 5 right now. No, go ahead. We'll go off the record 6 now and take a break. 7 THE WITNESS: Thank you. 8 THE VIDEOGRAPHER: Going off the record. The 9 time now is 1:57. 10 (Recess taken.) 11 THE VIDEOGRAPHER: Back on the record. The 12 time now is 2:31. 13 BY MR. TILLERY: 14 Q. Yesterday we marked an exhibit, No. 13, 15 which is the index of the reliance set that you have 16 in front of you in the binder; right? 17 A. Yes, sir. 18 Q. And that includes 78 referenced documents; 19 correct? 20 A. Yes, sir -- 76. I'm sorry. 21 Q. 76. I'm sorry. Yeah. 22 And this index contains a list of those 23 documents and it has a column for the Bates range 24 and then a brief description of the documents. 25 And what I'd ask you to do is to go	Page 356 1 A. The next section is redox cycling. 2 Q. Okay. 3 A. And that is Reference No. 5. 4 Q. Okay. 5 A. The next category is related to exposure. 6 And this is Reference No. 3, which has a mistake on 7 the index. It's actually a 1983 study supporting 8 the registration of diquat, not 1963. 9 Q. Okay. 10 A. The remaining numbers are 27, 42, 44, 47, 11 51, 52, 55, 74, 75 and 76. 12 Q. Okay. 13 A. The next set is related to reporting under 14 FIFRA and EPA. And these reference numbers are 1, 15 4, 12, 15, 17, 18, 22, 25, 31, 35, 39, 41, 53, 62 16 and 69. 17 The next category is related to labels and 18 warnings and packaging of paraquat. And the numbers 19 are 4, 20, 21, 25, 26, 32, 36, 40, 43, 47 and 48. 20 The next topic is nervous system, which is 21 9, 16, 28, 34, 53 and 54. 22 The next set are regulatory evaluations, 23 such as EU and EPA. And these reference numbers are 24 2, 8, 71, 72 and 73. 25 The next set is competitive products,

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1 which is Reference No. 4.
 2 The next set is ICI communications between
 3 ICI and Chevron. And the reference numbers are 22,
 4 30, 49, 50 and 67.
 5 The net category is communications with
 6 regulators as well as external parties, such as
 7 university collaborators. And the reference numbers
 8 are 10, 13, 23, 65 and 68.
 9 And the final category is contracts and
 10 sales, which are Reference Nos. 11, 14, 33, 37, 49,
 11 50, 57 and 58.
 12 And that completes the categories.
 13 Q. Does that include all of the documents in
 14 the 76?
 15 A. Yes, sir, it does.
 16 Q. All right.
 17 MR. TILLERY: Well, then, by agreement of
 18 counsel, we will suspend the deposition at this
 19 point to renew it at another time by mutual
 20 agreement on a new date to complete the deposition.
 21 THE WITNESS: Understood.
 22 MR. TILLERY: All right. Thank you.
 23 THE VIDEOGRAPHER: Go off the record then?
 24 Going off the record. The time now is
 25 2:37.

Page 358

1 (Whereupon, the proceedings were concluded
 2 at 2:37 p.m.)
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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 3/5/2020, 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 _____
 10 _____
 11 _____
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 13 _____
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 16 _____
 17 _____
 18 _____
 19 _____
 20 _____
 21 _____
 22 TIMOTHY PATTERSON, Ph.D.
 23 SUBSCRIBED AND SWORN TO BEFORE ME
 24 THIS ____ DAY OF _____, 20____.
 25 (NOTARY PUBLIC) MY COMMISSION EXPIRES: _____

Page 360

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 18, 2020
 23
 24
 25 
 ANRAE WIMBERLEY, CSR No. 7778