

IN THE PHILADELPHIA COUNTY
COURT OF COMMON PLEAS
TRIAL DIVISION

IN THE MATTER OF:)
IN RE: PARAQUAT PRODUCTS)
Plaintiff,)
CASE NO:)
220500559)
Vs.)
(1) SYNGENTA CROP PROTECTION)
(2) SYNGENTA A.G.)
(3) CHEVRON U.S.A. Inc.)
(4) FMC Corporation)
Defendants.)

DEPOSITION OF: DR. TED LOCK

Wednesday, August 21, 2024

AT: 10:02 a.m.

Taken at:

Kirkland & Ellis

30 St Mary Axe, London EC3A 8AF

United Kingdom.

Court Reporter:

Georgia Gould
Accredited Real-time Reporter

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Case ID: 220300429
Control No.: 26064959

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2 A. Who was he? Sorry, I don't
3 understand what you mean by who was he.

4 Q. What was his role?

5 A. I mean, I presume he was one of
6 the -- a member of a team that were responsible
7 for paraquat business -- paraquat business.

8 Q. And you wrote in 1993:

9 "Following discussion with the Agrochemicals
10 business on the above topic[s] I would recommend
11 that the following studies should be undertaken.
12 The objectives of the work are:
13 "1. to determine whether paraquat can enter the
14 brain, [and] to ascertain at what dose(s) this may
15 occur and what effects it produces."

16 Correct?

17 A. Correct.

18 Q. And you wrote in the paragraph
19 below, or below number 2, you wrote that:

20 "It is also very important that a careful stepwise
21 approach is taken so as to give the business
22 confidence that our approach will benefit as
23 opposed to undermine their position on the
24 neurotoxic potential of paraquat."

25 Do you see that?

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2 A. Yes.

3 Q. And the business's position on the
4 neurotoxic potential of paraquat was that it was
5 not neurotoxic; right?

6 A. Mm-hm.

7 MR. HONG: Objection, calls for
8 speculation, lacks foundation as well.

9 BY MR. TRAVERS:

10 Q. So the purpose of your study
11 program was to not undermine that position;
12 correct?

13 A. The purpose of the study was to
14 find out how much of the paraquat given by a --
15 a normal route of oral administration or IP
16 actually entered the brain.

17 Q. And you wrote that your -- you
18 wrote:

19 "My starting position is that paraquat is toxic to
20 brain cells (neurotoxic) if sufficient of the
21 chemical is able to reach the brain."

22 Do you see that?

23 A. Oh, yes (sotto voce reads).
24 Correct.

25 Q. And that's true, if sufficient

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2 Q. And so in 1995 there was a CTL
3 paraquat project team's assessment that the monkey
4 would be the most appropriate animal model for
5 studying the neurotoxicity in paraquat?

6 A. It was my recommendation, and, yes,
7 it was -- my colleagues agreed in principle, yes.

8 Q. And you write:
9 "We wish to get the study, its planning and
10 Home Office licence approval as soon as is
11 practical."

12 Do you see that?

13 A. Yes.

14 Q. And who is Home Office or what is
15 Home Office?

16 A. Okay, let me tell you a little bit
17 about this study.

18 This study, as you will read, did not
19 happen, okay? My proposal was not approved by the
20 business.

21 Now, I -- all I can -- and you asked me
22 a second question about what is the Home Office.
23 In the UK you have to have -- an individual has to
24 have a Home Office license, that's a -- that's a
25 government regulatory body that issue licenses for

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2 A. Tab number?

3 Q. Tab 13.

4 And these are meeting minutes from a paraquat JMPR
5 preparation meeting; correct?

6 A. Correct. Can I just comment that
7 I was not present, I don't think.

8 Q. Yes, I had a question about that.
9 If you go to the last page, or second to last
10 page, at the bottom it says, "Circulation", and it
11 says:

12 "[To] Those present."

13 And then it lists -- lists your name on the next
14 page, EA Lock; correct?

15 THE EXAMINER: It's on page 94.

16 A. Yes, I don't know whether that
17 meant it was circulation for information or
18 whether I was actually at the meeting. I cannot
19 remember, sorry.

20 BY MR. TRAVERS:

21 Q. Okay. So --

22 A. Anyway, I've read it.

23 Q. So by "circulation" it means it
24 would've been sent to you?

25 A. It means -- it means that sometimes

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2 what happened in the company was that people would
3 have a meeting, and when the minutes came out they
4 would circulate them a little bit wider, perhaps.

5 Q. Oh, okay. So someone --

6 A. And as there was -- and it's
7 something to do with the work we were doing in
8 there, that's why I got it, I think.

9 Q. So it was important for you to have
10 a copy of these minutes?

11 A. Yes.

12 Q. And then on the third page of
13 these minutes there's a section called
14 "Neurotoxicity". Do you see that?

15 A. Yes.

16 Q. And the potential neurotoxicity of
17 paraquat was within your ambit at the company, or
18 was within your area of expertize at the company?

19 A. Yes.

20 Q. And in these minutes it was written
21 that at the 1999 RIM -- you know what RIM stands
22 for?

23 A. Yes, a regulatory impact meeting,
24 yes.

25 Q. And those are -- would you be

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2 an attendance at those meetings typically?

3 A. I -- if it was to do with paraquat
4 and the brain, yes.

5 Q. It says "... with the impending USA
6 DCI" --

7 A. What's a DCI, do you know?

8 Q. I do not know. Do you know?

9 A. Okay, that makes two of us.

10 Q. "... the impending USA DCI call for
11 neurotoxicity studies on all registered
12 pesticides, Zeneca debated whether to conduct
13 acute and subchronic neurotoxicity studies
14 proactively; this might have the effect of
15 deflecting some of the adverse speculation on
16 associations of pq with neurotoxicity."

17 Do you see that?

18 A. I do.

19 Q. And it goes on to state:

20 "At the time, the RIM recommendation was to not
21 conduct these studies, which, being in the rat, we
22 do not believe will contribute to the
23 understanding of any associations with
24 neurotoxicity."

25 Do you see that?

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2 A. Yes.

3 Q. And you would have been at that RIM
4 meeting discussing it?

5 A. I am not sure whether I was at the
6 meeting, but possibly. I can't -- honestly,
7 I don't remember.

8 Q. And --

9 A. I think -- I think the point here,
10 or they were talking about regulatory studies for
11 acute and subchronic neurotoxicity. Those are
12 regulate -- you know, required by regulatory
13 bodies to be done. And I don't think they'd
14 been -- they hadn't been enacted -- needing to be
15 done by the regulators. That was my understanding
16 at that time.

17 Q. And if they were conducted is it
18 your understanding at the time that they wouldn't
19 contribute to the knowledge of the neurotoxicity
20 of paraquat; right?

21 MR. HONG: Objection, calls for
22 speculation.

23 A. It -- in -- in the regulatory field
24 you have a number of requirements to do -- to get
25 your product registered. And more recent --

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2 sorry, let me go back.

3 And if there was any indication that the
4 chemical might have a possible effect on the
5 nervous system, as many -- many historical
6 compounds do, organophosphorus compounds and many
7 things like this, they would -- it would tick
8 a box to say you have to do acute and subchronic
9 neurotoxicity. Paraquat did not tick that box, it
10 was not necessary to do them. They were not done,
11 to the best of my knowledge.

12 I mean, that would not be done by me,
13 that's -- in our facility we had a separate group
14 of people that did -- did work with animals to
15 meet regulatory requirements.

16 Q. And those regulatory studies, they
17 don't examine loss of dopaminergic neurons?

18 A. No, no, not -- no.

19 Q. So they're not gonna be helpful for
20 the question here?

21 A. No, I don't think they would be.

22 MR. HONG: Objection, calls for
23 speculation.

24 A. It's speculation, but that's right,
25 I guess so. I can't tell, you know. Who knows,

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2 internal reports that -- that we have to write
3 on -- up on on projects. So they would have been
4 internal reports on work done by the
5 neurotoxicology project team that I led, yes.

6 Q. And it states:

7 "Research initially, but if successful, will need
8 to publish."

9 Do you see that?

10 A. That's right. I think either way
11 the outcome of that study, the company would be --
12 have been prepared for us to publish that, yes.

13 Q. So if -- so if it confirms that
14 paraquat cross the blood brain barrier and
15 decrease neurons in the substantia nigra, you'd
16 agree that would be published?

17 A. Well, if -- if -- if we were able
18 to, yes, repeat what others have reported in the
19 black 6 mouse, then I think the company would've
20 had to accept that we needed to publish that
21 information. And they may not have been happy
22 about it --

23 Q. Right.

24 A. -- but (unclear) published it.

25 Just the same as if we didn't find it, they would

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2 want it published, wouldn't they.

3 Q. And it would be good scientific
4 practice to publish these findings even if they
5 didn't benefit the company?

6 A. That would be my perspective, but
7 I can't speak for Syngenta. You understand.

8 Q. Yes, from your perspective it would
9 be unethical to not publish those studies?

10 A. Yes.

11 Q. And that was a yes?

12 A. Yes, that was a yes. Sorry, my
13 microphone came off.

14 Q. So I'm gonna mark as exhibit 9,
15 this will be tab 25.

16 A. Okay.

17 **(Exhibit 9 marked for identification)**

18 Q. And at the bottom email chain
19 there's an email from you, Dr. Lock, to
20 John Foster and Stephen Duffell dated April 15,
21 1999; correct?

22 A. Correct.

23 Q. And who is Stephen Duffell?

24 A. Both of those people were
25 pathologists in our department -- well not -- in

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2 A. That's correct, yes.

3 Q. And --

4 A. Which didn't happen, by the way.

5 Q. I was about to ask that. So, all
6 right, and you did -- now we'll just go to
7 exhibit 12.

8 A. Tab?

9 Q. Yes, tab 12 actually.

10 A. Tab 12 as well. Right, okay.

11 Q. Sorry for jumping around.

12 **(Exhibit 12 marked for identification)**

13 Q. So you had recommended a study to
14 try to follow up on the Keiko findings; correct?

15 A. I'd -- I'd thought it was a good
16 idea and that it was something that we should
17 follow up on, but I think at -- all I can say is
18 that later -- that was about a time when I was in
19 transition, and being as I was not leading the
20 program any more, probably in 2001 or 2, that the
21 decision was made as well, we'd been talking about
22 that, to focus on the mouse.

23 So I mean if I was running it then one --
24 I would've wanted to understand the penetration of
25 paraquat in a mouse, and also ask a question about

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2 whether that work was repeatable. And it was
3 repeated by other people in the published
4 literature I've discovered.

5 Q. Okay.

6 A. So what did you wish to ask me in
7 this?

8 Q. So, yes, no, that's a helpful
9 response.

10 We -- so yes, there's an email down here from
11 Dave Berry.

12 A. Yes.

13 Q. And you are copied on it; correct?

14 A. Yes, yes.

15 Q. Dated June 12, 2000. And it
16 states:

17 "Ted Lock has been in discussion with Prof
18 Crossman, Manchester University, who is setting up
19 an incubator programme which will compliment and
20 extend the areas of investigation we are currently
21 undertaking here at CTL: The work will involve
22 immunochemistry and investigations into dopamine
23 transport systems."

24 So would this proposed collaboration with
25 Dr. Crossman, would that be examining the neut --

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2 the neutral amino acid transport system?

3 A. Not so much, no. I think it -- I
4 mean, at that time it would have been -- it
5 would've been a possibility to explore that. But,
6 again, just to let will you know, I mean this
7 didn't happen. We did -- had discussions with him
8 and everything else, but it -- at the end of the
9 day events overtook it and it was not conducted.

10 Q. Okay.

11 A. They didn't let me do everything
12 I wanted to do.

13 Q. Right.
14 And, again, we discussed Professor Crossman.

15 A. Yes.

16 Q. He was an esteemed expert in --

17 A. Yes, he worked on these -- this --
18 in the area of neuroscience, yes.

19 Q. And, do you know, this email was to
20 Stephen Sankey, do you know who that is?

21 A. No. I don't, no.

22 Q. And again, it's a study,
23 a collaboration you would've liked to do, but you
24 weren't permitted to; correct?

25 A. Correct.

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2 Again, I don't know why, but it was not allowed.
3 Not supported.

4 Q. Then I want to go to exhibit 14,
5 and this is tab 15. Sorry, exhibit 13 in tab 15.

6 **(Exhibit 13 marked for identification)**

7 Q. And so the metadata from the
8 production we got from Syngenta indicates that
9 this was your -- indicates this is likely your
10 PowerPoint. Do you recall creating this at all?

11 A. No, I don't -- I don't think it
12 would be my PowerPoint. I mean, when I read this
13 I -- this -- this was not familiar to me.

14 Q. No.

15 A. But then, when I saw something else
16 later, I had to accept that at least I was aware
17 of it.

18 Q. Oh, okay.
19 And what was that you saw that you were aware --?

20 A. Well, because this -- this was work
21 that was -- was to do with liver injury, and that
22 would have been done by a colleague of mine, not
23 me, he was the liver expert.

24 But I noticed in the second one that my
25 name is down there, so I must have produced

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2 BY MR. TRAVERS:

3 Q. Sure, sounds good.

4 This was comments -- and this is comments by you
5 on the paper, "Paraquat, a useful tool for in vivo
6 study of mechanisms of neuronal cell death
7 Corasaniti et al, 1998."

8 Correct?

9 A. Correct.

10 Q. And you wrote, the last paragraph:
11 "Overall, not a lot of new findings of concern,
12 but it raises the profile that neurotoxic effects
13 of paraquat, as seen at high doses and non
14 relevant routes of exposure. Overall there is not
15 [a] doubt that some paraquat can enter the brain
16 of rats, probably by routes which lack a blood
17 brain barrier."

18 You go on to write:

19 "This will continue to give us problems over the
20 coming years as we cannot refute it categorically.
21 A pharmacodynamic model of human versus rodent is
22 probably one of the best approaches, this will
23 require blood level measures in spray workers to
24 put into any model to help assess the risk.

25 You go on to write:

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2 "Again the Parkinson's link will not diminish, we
3 are stuck with it.!"

4 Correct?

5 A. That's what I wrote, yes.

6 Q. And that was in 2000, August 2000;
7 right?

8 A. That was in -- yes, 2000.

9 Q. And do you recall at your time
10 there of Syngenta ever doing blood level
11 measurements in spray workers?

12 A. No. I don't -- no, that would not
13 be done by me. If anybody did look at that, that
14 would have been in epidemiology studies that the
15 company obviously did conduct.

16 Q. And you had never seen any studies
17 of blood level measures in spray workers during
18 your time at Syngenta?

19 A. I don't think so, but I have seen
20 measurements in urine.

21 Q. Okay.

22 But here you recommend that blood -- blood level
23 measurements are required; right?

24 A. Well, that was my speculation, yes,
25 but again not -- not everybody ...

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2 Q. Yes, all right. If we could take
3 a break.

4 THE VIDEOGRAPHER: Going off the
5 record, the time is 1:19 p.m.

6 (1:19 p.m.)

7 (Lunch recess.)

8 (2:04 p.m.)

9 THE VIDEOGRAPHER: We are back on
10 the record. The time is 2:04 p.m.

11 BY MR. TRAVERS:

12 Q. Welcome back Dr. Lock.

13 A. Thank you.

14 Q. Let me enter exhibit 15 and this
15 will be tab 29.

16 (Exhibit 15 marked for identification)

17 Q. The document should be titled
18 "Comments on paper published on paraquat". Do you
19 see that?

20 A. Correct, yes.

21 Q. And these are more comments from
22 you on published papers from paraquat; correct?

23 A. Correct.

24 Q. And I am going to ask on the second
25 page.

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2 A. The second page.

3 Q. Yes. These are -- you have
4 comments on the paper called "Paraquat-induced
5 free radical reaction in brown brain microsomes";
6 do you see that?

7 A. Yes.

8 Q. What you wrote about this paper,
9 you wrote:
10 "This is an interesting paper, all the work has
11 been conducted in vitro."

12 A. Yes.

13 Q. What does in vitro mean?

14 A. It means -- it means it's not whole
15 animal work, it's done in the test tube cells or
16 tissue. I'm not sure in this case. But this case
17 it was microsomes, which are a component of the
18 brain. In other words, if you -- if you take
19 a brain from an animal, in this case, then -- and
20 you homogenize it, I suppose, you know, like smash
21 it all up, and then you -- you can -- you then put
22 it in a centrifuge and you spin down some of the
23 particles and you can pull out a fraction that's
24 called the microsomal fraction, and that fraction
25 is involved in -- primarily one thinks of that as

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2 being involved in the metabolism of chemicals.

3 Q. And went on -- went on to write:

4 "Two key findings are reported in this short paper
5 (1) that paraquat can accumulate or be taken up
6 into nerve terminals isolated from mouse brain
7 cortex."

8 Correct?

9 A. Yes.

10 Q. And:

11 "(2) that paraquat can redox cycle and cause lipid
12 peroxidation in the presence of mouse brain
13 microsomes, NADPH and ferrous ion."
14 Sorry, and ferrous ion.

15 A. I-R-O-N it should be. I-R-O-N,
16 yes, it's a typo there.

17 Q. Okay, thank you.

18 And you got, in the next paragraph, the second
19 sentence, you write:

20 "The implication of this is that paraquat, in vivo
21 could accumulate in nerve terminals and hence
22 concentrate in neurons. We know [that] paraquat
23 does not readily cross the blood-brain barrier,
24 but under condition where it was able too, it
25 might build up in selected nerve bundles such as

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2 those containing dopamine."

3 Correct?

4 A. It's speculation on my part, yes.

5 Q. And then you write:

6 "This finding is worth" --

7 Sorry, then you write:

8 "This finding is consistent with a paper from our
9 group back in 1976 showing some accumulation of
10 paraquat into rat cortical slices."

11 Correct?

12 A. Correct.

13 Q. That's the Rose 1976?

14 A. That's -- that's the Rose paper,
15 yes, which -- yes, which I conducted, yes.

16 Q. Okay.

17 And you go on to write:

18 "This finding is worth checking out, I will try to
19 repeat their findings then explore it a little
20 more."

21 Do you see that? Were you ever able
22 to --?

23 A. No, I never did, I never did
24 explore that.

25 Q. And then you go on to write:

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2 "The second finding is not new apart from the use
3 of neural tissue, thus, if paraquat can enter
4 neurons it will have the ability to redox cycle,
5 cause lipid peroxidation and oxidative stress to
6 neurons and glia."

7 Do you see that? That's what we talked
8 about earlier about the --

9 A. Yes, I mean that's -- I mean this
10 is all done in vitro, but we were just
11 extrapolating the bit here was when the chemical
12 is put into the brain and it enters into cells
13 then it will redox cycle and can damage those
14 neurons.

15 Q. Okay.

16 A. That's the hypothesis.

17 Q. Okay.

18 One part of your job also was to go to different
19 toxicology meetings and conferences and report?

20 A. To some, yes, yes.

21 Q. And I'm going to mark as
22 exhibit 16, and this is tab 33. This is a report
23 you wrote on Parkinson's disease and pesticides
24 following attendance at the Society of Toxicology
25 meeting from March 25-29, 2001 in San Francisco;

1 LOCK - TRAVERS

2 correct?

3 A. Yes correct.

4 **(Exhibit 16 marked for identification)**

5 A. There was a particular symposium
6 I've written here, you know, that was on the
7 environment in Parkinson's and in Parkinson's
8 disease, it says here. But yes.

9 Q. Okay.

10 And what is the Society of Toxicology?

11 A. It's -- it's the professional
12 society for -- it's society for all people in
13 America, it's not exclusive to America, but for
14 American toxicologists it's their -- their society
15 where they go to discuss their work. And they
16 have an annual meeting, a big annual meeting, with
17 many thousands of toxicologists gathering. And
18 I used to go to this sometimes.

19 Q. It would provide you an opportunity
20 to meet the scientists and talk?

21 A. To talk to -- yes, it was
22 an opportunity to meet some of the scientists, the
23 other scientists, and talk with them on their
24 findings and present work myself.

25 Q. Okay.

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2 And are you a member of the Society of Toxicology?

3 A. Yes. I'm an honorary member now,
4 I don't have to pay the fees because of my age.

5 Q. So again, it says the second
6 paragraph you write:

7 "The main research groups looking at the effect of
8 paraquat and paraquat plus other pesticides on the
9 brain [in particular the substantia nigra, the
10 area where dopaminergic neurons are lost in
11 Parkinson's disease] are led by Dr Dimonte at the
12 Parkinsons Institute in Sunnyvale, California and
13 professor Cory Slechta at the University of
14 Rochester in, NY."

15 You write:

16 "I know both groups and have visited them to
17 discuss their interests in paraquat in the past."

18 Correct?

19 And you go on to discuss some of the
20 posters presented, and states:

21 "There were 4 posters of relevance in the main
22 meeting (copies in the post to MJC)."

23 What --

24 A. Michael -- Michael Clapp was the
25 project manager for paraquat at that -- about that

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2 time, I guess.

3 Q. And:

4 "The major one of concern was poster 1132, which
5 reports for the first time that paraquat alone at
6 1, 5 or 10mg/kg given ip, once a week for three
7 weeks to 8 week old C57BL/6 mice results in loss
8 of neurons in the substantia nigra."

9 Correct?

10 A. Correct.

11 Q. You write:

12 "The authors used a state of the art stereology
13 method to determine the total number of cells in
14 the substantia nigra and those that stained
15 positively for tyrosine hydroxylase (dopaminergic
16 neurons)."

17 Correct?

18 A. Correct.

19 Q. And state of the -- and did
20 Syngenta at the time have this state-of-the-art
21 stereology technique?

22 A. We did -- no, we did not do -- most
23 of our pathology was routine. This -- this is
24 a specialist technique, you know, where you are
25 trying to understand with stereology the picture

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2 Correct?

3 A. He -- it's correct that he
4 suggested that, but of course the -- what he was
5 really meaning -- and maybe that's my misusing
6 it -- but there's a close structural resemblance
7 to MPP+, which is the metabolite of MPTP.

8 Q. Okay.
9 Then Dr. Dino Di Monte, on the next page.

10 A. Yes. "Then gave a very lucid
11 talk."

12 Q. Yes, so you're right that he gave
13 a very lucid talk on paraquat and induced loss of
14 neurons in the substantia nigra of the black
15 mouse, as discussed earlier.
16 "He concluded that the findings were still at
17 an early stage and it did not prove that paraquat
18 caused PD, but suggested it might be
19 a predisposing factor."

20 Correct?

21 A. Correct.

22 Q. And by a "predisposing factor" it
23 means --

24 A. Well, it might be a contributory
25 factor, I suppose, predisposing. I mean,

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2 something that maybe have initiated something that
3 could -- could maybe trigger that process,
4 whatever it is, and we don't understand what
5 triggers Parkinson's disease.

6 Q. So he is suggesting paraquat could
7 be a contributing factor, is what you're saying?

8 A. He said -- I think you could say
9 here he said that it did not prove that it could
10 happen, but he was speculating that there -- it
11 might be a predisposing factor, yes.

12 Q. Then we've got Dr. Cory-Slechta,
13 and he reports she gave a rather poor talk with
14 complex slides and too much data.

15 A. Yes.

16 Q. So she was a little too technical?

17 A. Yes.

18 Q. And she -- in the -- in the third
19 paragraph under Dr. Selector's talk you write
20 there's, "A few general points are worth noting."
21 In the middle you write:
22 "She also keeps mentioning that they have good
23 inhalation facilities at Rochester (they do) and
24 that this might be a more relevant exposure route,
25 since people are giving her a hard time with the

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2 group --

3 A. My group --

4 Q. -- never did those studies; right?

5 MR. HONG: Same objection.

6 BY MR. TRAVERS:

7 Q. Is that a no?

8 A. No.

9 Q. Okay.

10 And then you go on to write:

11 "Lewis and a toxicologist from the company that
12 markets Maneb both have concerns about the failure
13 to put the findings into context with the in use
14 hazard of these pesticides and the total biased
15 attack on pesticides as the primary environmental
16 factor."

17 And did you agree with Lewis Smith that
18 these were totally biased attacks?

19 A. Yes, I think so, yes. I mean, it
20 was -- I really did. I mean, it was -- it was as
21 though people were deliberately doing an awful lot
22 of experimental work which was not relevant to the
23 in life exposure and making claims.

24 Q. Doing studies that Syngenta didn't
25 do.

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2 paraquat and MPP+ transport into the brain just
3 appeared in Brain Res (2001) ... indicating that
4 some paraquat may cross the blood brain barrier by
5 a neutral transporter."

6 Correct?

7 A. Correct.

8 Q. That would be the Shimizu study or
9 --?

10 A. Yes, that must be the Shimizu
11 study, I think if it's in 2001.

12 Q. Okay, then I'd like to go to
13 tab 35, and I'll mark this as exhibit 21..

14 **(Exhibit 21 marked for identification)**

15 Q. This is an email from Dr. Ray to
16 you, Dr. Lock, dated June 10, 2002; correct?

17 A. Correct.

18 Q. And he writes:

19 "Dear Ted.

20 "At the last SOT meeting we discussed the
21 possibility of using my 2-D radioactivity detector
22 to look at Paraquat permeation of the blood-brain
23 barrier in Maneb-dosed rats."

24 Do you see that?

25 A. Yes.

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2 Q. And in the next paragraph he writes
3 to you stating:

4 "You said that, although Syngenta could not fund
5 a study at present, you might be able to
6 collaborate with me and provide radiolabelled
7 Paraquat for a preliminary study."

8 Do you see that?

9 A. Yes.

10 Q. And what is radiolabeled paraquat?

11 A. It's -- it's basically
12 radioactivity. So, in other words, it's very easy
13 to -- two things. When you're wanting to look at
14 a chemical, once it gets into the body it can
15 change, it can be metabolized as something else.
16 But we know that -- luckily, in paraquat, that
17 doesn't seem to happen. And so all we really did
18 was tag it with a carbon 14 radiolabel so that you
19 can then follow where it went.

20 And most of that work that you've seen,
21 and I've provided you with in our papers, you
22 know, where we did the autoradiography on the --
23 and slice through the whole rat, you know, the --
24 that was done with radiolabel. And you can detect
25 the radio label by putting a camera film on top of

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2 it and it shows up.

3 Q. And is it --

4 A. And he had a -- he had a tricky
5 piece of equipment that seemed to be more
6 sensitive and was two-dimensional.

7 Q. Okay.

8 So more advanced?

9 A. Sorry?

10 Q. More advanced equipment?

11 A. Yeah, more advanced equipment,
12 perhaps you could say, yes.

13 Q. And is radiolabeled paraquat
14 difficult to obtain for an average scientist?

15 A. Radiolabeled compounds are more
16 expensive than the cold material with no
17 radiolabeled associated with it because it's
18 special -- special chemical synthesis. I don't
19 know what the costs are so I can't talk, but
20 I think, if you want me to speculate, he'd
21 recently moved laboratories to Nottingham, and
22 that he may not have had perhaps enough money to
23 do it or -- and he thought he could catch some off
24 of us.

25 Q. Oh yeah. And --

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2 A. But -- sorry.

3 Q. No, but -- and that's something --
4 you wanted to give him the radio --

5 A. Well, I thought it was not
6 an unreasonable request at that time.

7 Q. And now I'd like to go to tab 36,
8 this exhibit 22.

9 **(Exhibit 22 marked for identification)**

10 This is an email dated July 26, 2002, from you to
11 David Ray; correct?

12 A. Correct. No, it's from me -- oh,
13 which one are you looking at?

14 Q. The top one.

15 A. "Dear David", so that's from me.

16 Q. Yes. And you write:

17 "Dear David.

18 "I had the chance to have a word with Lewis about
19 the work we had discussed on PQ and maneb and he
20 was not supportive."

21 Do you see that?

22 A. Yes.

23 Q. Lewis, is that Lewis Smith?

24 A. Lewis Smith was the director of the
25 institute at the time. And he had done a lot of

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2 work in his career on paraquat, yes.

3 Q. And --

4 A. And so I knew -- we knew -- I can't
5 just hand out radiolabeled compounds to any old
6 body, you have to -- you know, he asked for it and
7 it was refused.

8 Q. And you go on to write:

9 "He would rather that we did not get involved in
10 the work and certainly not supply you with any
11 radiolabelled paraquat.
12 "It is nothing personal ..."

13 A. Nothing personal, that's right.
14 I mean --

15 Q. "... just that PQ/PD area is very
16 business sensitive at the current time."

17 Correct?

18 A. **(Nods head.)**

19 Q. And so is that -- and by "business
20 sensitive" you mean the results of a study by
21 Dr. Ray could affect the paraquat business?

22 MR. HONG: Object to the form.

23 A. I think -- I think there was enough
24 work being done on paraquat by lots and lots of
25 other people that I -- that I suspect, and I can't

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2 speak for Lewis, that he felt that he didn't
3 really want anybody else to look -- you know, if
4 he had some -- he had maybe a reservation about
5 sending that compound to David Ray.

6 BY MR. TRAVERS:

7 Q. And -- if we go to tab 37, this
8 will be exhibit 23.

9 **(Exhibit 23 marked for identification)**

10 Q. And this is an email from --

11 A. David Ray.

12 Q. From David Ray to you, Dr. Lock,
13 on July 30, 2002; correct?

14 A. Mm-hm, yes.

15 Q. And he writes back:

16 "Thank you for the message. It is disappointing
17 but since the latest Cory-Slechta paper on
18 paraquat alone is more controversial, I can see
19 why Lewis may wish not to let even me have any
20 opportunities for causing more trouble!"
21 Correct?

22 A. He's that sort of guy, a good sense
23 of humor, and he was -- that's what he wrote.

24 Q. Then he goes on to write:

25 "Should Syngenta wish for an independent

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2 you see that?

3 A. I'll go over, I will in a minute.

4 Q. Sorry, it's --

5 A. Yes, okay.

6 Q. And he writes:

7 "I have been in touch with Ted about paraquat and
8 the brain, and he suggests that I contact you."

9 Sorry, Dr. Ray writes to Nick.

10 A. Yes, writes to Nick. That's
11 because, you know, he -- he knew that I was no
12 longer -- I'd -- I'd have not quite left the
13 company at that time, but a couple of months later
14 I had. So, you know, Nick was in charge and he
15 just telling him that, you know, I'd been --he'd
16 been in touch with me, we'd just discussed those
17 earlier times when he did.

18 Q. And he says:

19 "Some time ago Ted had planned to give me
20 radiolabelled paraquat for an investigation of
21 bran entry with and without dithiocarbamates."
22 And that's Maneb; right?

23 A. No. No, it's not Maneb, but they
24 were -- similar -- similarly related compounds.

25 Q. Oh, okay.

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2 And it says:

3 "This offer had to be withdrawn ... after the
4 Rochester publications."

5 A. That his interpretation.

6 Q. And:

7 "I wonder if it is still impossible to let me have
8 any label? We have a uniquely sensitive 2-D
9 radioactivity detector here which is 10-20 times
10 more sensitive than a phosphorimager ..."

11 A. The phosphorimager, yes.

12 Q. "... and gives 0.07 mm resolution
13 on tissue selections with a linear response over 4
14 orders of magnitude.

15 Correct?

16 A. Basically what he's doing is he
17 asked me, and I -- I was not allowed to send it to
18 him, or it was not approved to be sent to him,
19 a decision by some -- by the senior management.
20 He's just trying it out and asking whether the
21 things have changed, and now I'm out the way could
22 he possibly get some.

23 Q. And what type of equipment did
24 Syngenta have at that time to measure paraquat in
25 the brain?

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2 A. Well, we -- we measured it with
3 radiolabel. We did two things, we had a -- we had
4 a radiolabeled carbon 14 method that we used to
5 detect radiolabel and associated paraquat in the
6 brain, and we also had a state-of-the-art HPLC
7 mass spec method that was used to detect quite low
8 concentrations of paraquat.

9 I mean, let me be honest, it was our
10 product and we had very efficient analytical
11 techniques for measuring it.

12 Q. Oh, okay.
13 How did that compare with Dr. Ray's equipment?

14 A. Dr. Ray's equipment was slightly
15 different in that he's -- what he's wanting here,
16 if I'm right, is he's wanting -- he's wanting the
17 radioactive paraquat, he's wanting a sample of
18 that. And what he's got is a -- some equipment
19 that engineers have built within the physics
20 department when he was at Leicester University,
21 which is more sensitive than the sort of approach
22 that we would use to detect paraquat.

23 Q. Okay.
24 And in the third paragraph he writes:
25 "In my opinion, measurements of brain levels of

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2 paraquat are essential for the interpretability of
3 the many neurobiological experiments currently
4 being done with paraquat (e.g I have just learned
5 that we have a neuroscience post-doc here who is
6 measuring nigral neuronal numbers after paraquat,
7 but has only just asked for my advice)."

8 Do you see that?

9 A. Which -- no, I'm not following
10 that.

11 Q. The third paragraph.

12 A. Third paragraph. Oh yes, I see
13 (sotto voce reads). Mm, okay, yes.

14 Q. So at least he's pitching to
15 Syngenta that his proposed experiments would be
16 essential for the interpretability of the new
17 studies coming out?

18 A. He would -- he would like to try
19 and understand, I mean because he quite frankly,
20 as a neuroscientist, was as puzzled as I am about
21 why this chemical should produce that effect.

22 Q. And let's go to tab 39, and this
23 is -- it will be exhibit 23.

24 THE EXAMINER: 24 (sic).

25 (Exhibit 25 marked for identification)

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2 MR. TRAVERS: 24 (sic).

3 And when you have a chance can you let me know how
4 much time we have?

5 THE VIDEOGRAPHER: We're at 4.26.

6 **(Discussion off the record)**

7 BY MR. TRAVERS:

8 Q. This email -- this email's from you
9 dated February 14, 2003.

10 A. Yes.

11 Q. And you write, "I think" -- and the
12 subject is: "Research proposal with labeled
13 [paraquat] form David Ray"; correct?

14 A. Yes, correct.

15 Q. And you write:
16 "I think somebody is going to do this at some
17 stage, be it Debbie in NY or David at Nottingham.
18 We have already looked in the C57BL mouse at brain
19 levels and like in the rat they are very low, so
20 all David will confirm is a low level enters the
21 brain."

22 Correct?

23 A. That's his interpretation, yes,
24 that's what I would think.

25 Q. Okay.

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2 But then you go on to write:

3 "The risk is that he detects some localised in the
4 substantia nigra. If that is the case then (a) we
5 need to know about it and (b) by supporting David
6 we will get this information hopefully prior to
7 publication."

8 Correct?

9 A. Correct.

10 Q. And the last sentence:

11 "Regarding David Ray's proposal I think we should
12 work with him on this, LLS blocked it last time so
13 he should or will have the ultimate say."
14 That is Lewis Smith.

15 So you are advocating for the study to be
16 completed -- or for Syngenta to give that
17 radiolabeled PQ to Dr. Ray; correct?

18 A. Yes.

19 Q. Then -- now I'd like to go to
20 tab 40 and this will be exhibit 25 .

21 THE COURT REPORTER: Exhibit 26,
22 actually.

23 BY MR. TRAVERS:

24 Q. 26. It's tab 40.

25 (Exhibit 26 marked for identification)

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2 MR. TRAVERS: These are the minutes
3 from paraquat in Parkinson's disease HATT meeting
4 dated Mat 14, 2003; correct?

5 A. My last meeting yes.

6 Q. Oh, your last meeting?

7 A. I believe.

8 Q. And on page 3 of that meeting there
9 is -- and it's paragraph 4 -- there is
10 a discussion of David Ray proposal for use of
11 radiolabeled paraquat and proposed L-Valine study;
12 correct?

13 A. Yes, yes, that's correct.

14 Q. And at this meeting, after
15 discussion with Lewis Smith, it was decided that
16 Syngenta could not supply him with radiolabeled
17 paraquat but could still perhaps get involved in
18 other ways:

19 "We have ... given him details of an HPLC method
20 for the deduction of PQ (not a particularly
21 sensitive method)."

22 Correct?

23 A. Yes, I didn't write that, that
24 was -- this is not me here. But no, that was
25 a record of a meeting, yes?

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2 Q. Yes.

3 A. That's -- I mean that was Nick,
4 I presume.

5 Q. So the recommendation was you'd
6 tell him how to do it in a less sensitive manner?

7 A. That's one inference, that's one
8 inference.

9 Q. All right.
10 Then at -- then the meeting minutes go on to
11 state:
12 "David Ray is currently working with a post doc
13 from Charles Marsden's group at Nottingham who is
14 looking at neurochemical and behavioural effects
15 of PQ in rats. They have already seen effects
16 with 5 and 10mg/kg PQ but not with 3mg/kg although
17 the detail of these effects is not currently
18 known."

19 Do you see that?

20 A. Yes, I -- yes, I never -- I've
21 never found out what -- what they did do there.

22 Q. Oh, okay.
23 And who is Charles Marsden?

24 A. He's -- he's an eminent professor
25 of neuroscience, I think, at Nottingham

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2 questions related to your work in 2007, your
3 consultancy work?

4 A. I was -- oh, the consultancy work.
5 Yes, of course I do.

6 Q. Would you describe that work as
7 completed or preliminary?

8 A. It -- it was -- it was a position
9 that I had interpreted personally at that time by
10 reading the literature. So I was giving new --
11 I was giving what I understood to be going on to
12 help them in their discussions.

13 Q. Do you still hold that view today?

14 A. Mm, yes.

15 MR. HONG: What were you going to
16 say counsel?

17 MR. TRAVERS: I was going to object
18 to the asking for an expert opinion outside the
19 scope of these topics.

20 BY MR. HONG:

21 Q. So doctor, I want to ask you a few
22 questions related to surfactants.
23 Do you recall counsel asking you questions about
24 that?

25 A. Yes.

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2 explanation for this observation may be found."

3 And then you went on to write:

4 "What is now beyond doubt is that paraquat can
5 enter dopaminergic neurons in the substantia nigra
6 of C57BL6 mice in sufficient concentration to
7 cause cell damage."

8 Correct?

9 A. I said that because that's what has
10 been reported in the literature by the scientists,
11 and there -- it had happened in two laboratories,
12 and therefore I assumed that that was what they'd
13 found, okay?

14 Q. And --

15 A. And I presumed that that was the
16 current position at that time.

17 Q. And -- and you wrote it was beyond
18 doubt based on your review of the literature.

19 A. Well, you use words at times, you
20 know, to say these things, you know. But, I mean
21 --

22 MS. BAILES: That question was in
23 reply to --

24 MR. HONG: Go ahead and finish.

25 BY MR. TRAVERS: