

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

FRIENDS FOR ALL CHILDREN, INC., as legal
guardian and next friend of the named 150
infant individuals, et al.,

Plaintiff

-against-

Civil Action No. 76-0544

LOCKHEED AIRCRAFT CORPORATION,

Defendant and Third-Party Plaintiff

-against

THE UNITED STATES OF AMERICA,

Third-Party Defendant

Deposition of:

STANLEY A. MORAIN

Tuesday, November 24, 1981

Washington, D. C.

GASDOR REPORTING COMPANY
General Stenotype Reporting
499 South Capitol Street, SW, Suite 408
Washington, D. C. 20003

(202) 484-0016

Deposition of STANLEY R. MORAIN was taken, pursuant to notice, before Albert J. Gasdor, a Notary Public in and for the District of Columbia, commencing at 10:40 o'clock, a.m., Tuesday, November 24, 1981, in the law offices of Haight, Gardner, Poor & Havens, Suite 1000, 1819 H Street, N. W., Washington, D. C.

APPEARANCES:

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I N D E X

Tuesday, November 24, 1981

Washington, D. C.

DEPONENT:

STANLEY A. MORAIN

4

DIRECT EXAMINATIONE X H I B I T S

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>FOR ID.</u>	<u>TRANSCRIPT REFERENCE</u>
DD-2541-12 through-28	Photos	5	5, 7, 34, 45, 52
DD-2541-29	Map, 1st and 2nd Impact Main Wreckage	5	5
DD-2541-30 through-35	Photos	5	5
DD-2541-36	Photogrammetric Measurements & Soil/vegetation Interpretations related to C-5A Incident, prepared by Dr. Stanley A. Morain, EarthScan International, Inc.	6	6
DD-2541-37	Wreckage Diagram	10	10, 101
DD-2541-38	Map, Burned & Discolored Areas	11	11
DD-2541-39	Tracing from Plaintiff's Ex. 3E	11	11
DD-2541-40	"Group Minutes"	13	13
DD-2541-41	Wreckage Diagram	13	13
DD-2541-42	Report on Meeting of Experts on Mechanization of Rice Production and Processing	17	17
DD-2541-43	Accident Report	19	19
Tarbell 4-EE, Tarbell 4-E, Tarbell 4-I, Tarbell 4-G			14
Tarbell 3-K			15
Bandy 30 and Bandy 35			15

E X H I B I T S (continued)

<u>NUMBER</u>	<u>FOR ID.</u>	<u>TRANSCRIPT REFERENCE</u>
Walker 3-770, 3-320, 3-768, 3-142, 3-140, 3-769, 3-136, 3-137, and 3-734		16
D-1217		40
Walker 3-748		44, 49, 51, 52
D-1216		50
Walker 3-257		53, 54, 55, 57
Walker 3-269		61
Walker 3-736		62
Walker 3-321		64
Walker 3-735		66
Walker 3-335		79, 84, 91
Walker 3-262		84, 87
Walker 3-263		86

REQUEST FOR PRODUCTION OF DOCUMENTS:

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1 Whereupon,

2 STANLEY ALLEN MORAIN

3 was called as a witness and, having been duly sworn by the
4 Notary Public, was examined and testified as follows:

5 DIRECT EXAMINATION

6 BY MR. CONNORS:

7 Q Would you state your full name, please.

8 A Stanley Allen Morain.

9 Q Do you have a degree?

10 A Yes, sir.

11 Q What is that, please?

12 A Ph.D.

13 Q In what area?

14 A Geography.

15 Q Would you state your business address, please.

16 A 2500 Central Avenue, Northeast, Albuquerque, New
17 Mexico, 87131.

18 Q Doctor, have you previously been deposed in this
19 matter on October 26, 1981?

20 A Yes, sir.

21 Q Have you had an opportunity to review the transcript
22 of that deposition?

1 A Yes.

2 Q Is there anything in there that you would like to
3 change?

4 A I have not reviewed it for two weeks. I don't think
5 there is anything in there I would want to change.

6 Q Doctor, the first thing I would like to do is just
7 go over the photographs to get them identified for the record
8 so we have them referenced.

9 I would like to now show you some Xerox copies of photo-
10 graphs marked in the upper right-hand corner Defendant's
11 Exhibit DD-2541-12 through -35, and I will note for the record
12 that in the lower left-hand corner I have in my own handwrit-
13 ing indicated Walker 3 Exhibit sub-number and a Morain figure
14 number which I took from your report. I would like you to look
15 at these Xerox copies and ask you if you can identify those
16 photographs, please.

17 A I recognize the photographs. The notation that you
18 have made regarding Morain we need to clarify. Is that the
19 Morain number I put upon the back of the photograph?

20 These numbers that refer to Morain are not necessarily
21 the figure numbers in the report.

22 Q Those numbers were taken from page 4 of your report;

1 is that correct?

2 Q What do they reflect?

3 A They reflect numbers that I put on the photographs
4 at the time I did the analysis, but when I did the report
5 for matters of organization they may have come out in differ-
6 ent places and have different figure numbers on them.

7 Q If you do note a difference as we go through them,
8 put it on the record, but DD-2541-12 -35 which are before
9 you, constitute the photographs appended to your report?

10 A Yes, there may be a few in this set that were not
11 ultimately included in the report.

12 Q These are photographs you used in connection with
13 the report, though; is that correct?

14 A That is correct.

15 Q I would now like to show you a document entitled
16 Photometric Measurements and Soil-Vegetation Interpretations
17 related to the C5A incident, premarked Defendant's Exhibit
18 2541-36, and ask you if you can identify that, please.

19 A Yes, this is my report.

20 Q Does that constitute your entire report with regard
21 to the C5A accident?

22 A Yes, sir.

1 MR. McMANUS: Excuse me, counsel. I would just
2 like to note in going through these photos and comparing the
3 ones in Doctor Morain's report and the ones you have given us
4 if you would look at DD-2541-18, it is marked also as Walker
5 3767, Morain 7, which is the same as that found on page 16
6 of Doctor Morain's report which you can see that the photos,
7 while they might have some portions that are the same, the one
8 that you have marked as DD-2541-18 is of a smaller angle than
9 the one found on page 16 of Doctor Morain's report.

10 THE DEPONENT: This one appears to have been cropped
11 a little bit differently. It appears this part has been cut
12 off. I make note of that in the footnote on page 15.

13 BY MR. CONNORS:

14 Q For the record, Doctor, I believe in your report it
15 indicated you worked from 5-by-7 photographs?

16 A Yes, sir.

17 Q It is 5-by-7 photographs reflected on the DD
18 exhibit I just showed you; is that correct?

19 A That is correct.

20 Q The photographs you have in your original report
21 which I believe is in front of you and also Xerox copies
22 furnished to us are enlargements or 8-by-10's; is that

1 correct?

2 A Thht is correct.

3 Q Do you know who those 8-by-10's were prepared by?

4 A No, sir.

5 MR. CONNORS: Am I correct, counsel, those 8-by-10's
6 were, in fact, prepared by your office?

7 MR. MCMANUS: I would assume so, yes, taken from
8 negatives we got from the government.

9 MR. CONNORS: Any differences with respect to the
10 cropping would have been taken from the negative.

11 MR. MCMANUS: We had the whole negative developed.

12 MR. CONNORS: They appear to be the same.

13 MR. MCMANUS: I am not quarreling that they are
14 different. There is more shown in the photo attached to Doc-
15 tor Morain's report than the one in the records. I just want
16 that clear for the record.

17 BY MR. CONNORS:

18 Q Did you bring with you any other records today,
19 Doctor?

20 A Yes, I have brought some additional materials which
21 are in the back of my report, which are referred to in the
22 report.

1 I brought an additional copy of plaintiff's Exhibit 3-E
2 onto which these plastic transparencies may be overlaid,
3 and I noticed that one of your color photographs is the same
4 exhibit. I have extra copies of the report.

5 Q May I see the pictures and the overlays?

6 A Yes.

7 Q Did you also bring anything else with you, Doctor?

8 A Yes, I have a revised wreckage diagram that is
9 referred to in my report which has been included in the Xerox
10 copies in a preliminary format. We received these this morn-
11 ing, and these wreckage diagrams should be substituted for
12 the last page of my report.

13 Q Doctor, this wreckage diagram that you brought
14 with you, is this the final version of the wreckage diagram
15 you have prepared?

16 A There are two or three minor additions, enlarge-
17 ments, and there won't be any major changes in the report,
18 but time did not permit us to finish some of the final
19 touch-up.

20 Q Anything in terms of location of the pieces of the
21 airplane?

22 A No, sir.

1 Q What caused the changes from the wreckage diagram as
2 it appears in your report and the diagram you brought with
3 you today?

4 A There were some items missing that we felt were
5 necessary for clarification. For example, the patterns that
6 showed the heavy debis area and the light debris area were
7 inadvertently admitted by the illustrator, and there were and
8 there still are -- as I look through this, there are still a
9 few words misspelled. You will notice in the legend under
10 the item marked "C" with a circle around it, it says "dis-
11 tance with no discernible track," and that is not spelled
12 correctly.

13 Q Let me ask at this time the wreckage diagram be
14 marked Defendant's Exhibit DD-2541-37, which the Doctor has just
15 been referring to.

16 (Said document marked Exhibit
17 DD-2541-37 for identification.)

18 BY MR. CONNORS:

19 Q I would also like to ask that the two transparencies
20 which the Doctor has brought with him be marked as follows:
21 The approximately 9-by-10 transparency entitled "Map of
22 Burned and Discolored Areas prepared from Plaintiff's Exhibit

1 The only thing I find missing, there is a defendant's
2 exhibit which has your original sticker on it and it referred
3 if you recall, to those two colored maps which I thought were
4 in here. I have copies of the maps but I have only one and
5 it is not the one that has your defendant's exhibit number
6 on it.

7 Here they are. I was confident they were in there.

8 Q Doctor, I have just returned to you a group of
9 papers with some handwritten notes on those. Could you
10 identify those for us, please?

11 A Yes, these are the notes I took with regard to the
12 final report. It is not a complete set of notes.

13 Q There are other notes?

14 A Yes, but they have been cut and pasted and I don't
15 have them anymore.

16 Q Those papers are in various little groupings with
17 some stapled together and the whole grouped together with a
18 paper clip. Is there any particular organization to them?

19 A No, there isn't.

20 Q If we marked them as a group, those would consti-
21 tute your notes except those that have been cut?

22 A Yes.

1 3-E. I ask that that be marked as Defendant's Exhibit

2 2541-38.

3 (Said document marked Exhibit

4 DD-2541-38 for identification.)

5 MR. CONNORS: And that the transparency identified at
6 the bottom as "Tracing from Plaintiff's Exhibit 3-E" be marked
7 as Defendant's Exhibit DD-2541-39 for identification.

8 (Said document marked Exhibit

9 DD-2541-39 for identification.)

10 BY MR. CONNORS:

11 Q Doctor, do you have any other copies of those
12 transparencies in transparency form?

13 A No.

14 Q Those are the only copies you have?

15 A Yes.

16 Q Have you brought anything else with you today,
17 Doctor?

18 A I have the exhibits mentioned in the first deposi-
19 tion. I have notes from which this report was prepared.

20 Q May I see those, please.

21 A Here are extra photographs.

22 I have some other photographs that were not used.

1 Q I return your transparencies to you.

2 I would like to ask that the documents the Doctor just
3 identified as his notes be marked as Defendant's Exhibit
4 2541-40.

5 (Said document marked Exhibit

6 DD-2541-40 for identification.)

7 BY MR. CONNORS:

8 Q Let me show you a single document entitled "Wreckage
9 Diagram" with some Xeroxed items and some penciled-in items
10 on that. Can you identify that, please?

11 A Yes, this is my work.

12 Q Are those pencil notations yours?

13 A Yes, sir.

14 Q Does that represent an early draft of the wreckage
15 diagram?

16 A That is correct.

17 MR. CONNORS: Let me ask this be marked for identi-
18 fication as Defendant's Exhibit DD-2541-41.

19 (Said document marked Exhibit

20 DD-2541-41 for identification.)

21 BY MR. CONNORS:

22 Q Doctor, I would like to show you seven 8-by-10

1 color prints and ask you if you can identify those.

2 A Yes.

3 Q What are those?

4 A Those are prints, many of which have been used in
5 the final report, particularly with regard to pages 2 and 3
6 of the report.

7 Q Are they referred to in the report?

8 A I don't believe Tarbell 3-K is. I will have to go
9 back and confirm whether I did or did not use each of those.

10 Q Having reviewed them, can you tell us if they were
11 used in the report?

12 A The thing to do is for me to scan through the rele-
13 vant sections of the report. If I can name numbers --

14 Q For the record, would you indicate on the back of
15 each of these prints there are various writings. If you want
16 to identify the photo as you understood it to be identified,
17 then you can make whatever statement you want to make as to
18 whether it was used or not in preparing your report. I would
19 appreciate that.

20 A The photographs marked Tarbell 4-EE, Tarbell 4-E,
21 Tarbell 4-I, and Tarbell 4-G are referenced in the report.

1 BY MR. CONNORS:

2 Q There are three other photographs identified as
3 Tarbell 3-K, Bandy 30 and Bandy 35. Were any of those refer-
4 enced in the report?

5 A In just scanning through the report, I don't see a
6 reference to them, unless I have missed something in my
7 scanning.

8 Q Were they used in connection with the report?

9 A This one was not.

10 Q Tarbell 3-K was not used in connection with your
11 report; is that correct?

12 A I don't recall using those.

13 Q The other two are Bandy 30 and Bandy 35; is that
14 correct?

15 A That is correct.

16 Q Doctor, let me show you nine 8-by-10 black and
17 white prints which you brought with you today. Would you
18 tell us if any of those photographs are referenced in your
19 report?

20 A No, they are not.

21 Q The ones you are referring to, for purposes of the
22 record, are marked on the back as follows, and I am only

1 going to read the Walker number: Walker 3-770; 3-320, 3-768,
2 3-142, 3-140, 3-769, 3-136, 3-137, 3-734; is that correct?

3 A Yes.

4 Q You say those are not referenced in your report;
5 is that correct?

6 A If I used them, they are referenced on page 4 of
7 my report. None of these are referenced on page 4 of my
8 report.

9 Q Do you recall using any of those photographs in
10 preparation of your report?

11 MR. McMANUS: In reviewing them or considering whether
12 they should be used, or what?

13 MR. CONNORS: I am concerned with whether he
14 identified these in any way as significant but may not have
15 later incorporated them later by specific reference in the
16 report.

17 THE DEPONENT: I reviewed them but I did not use
18 them.

19 BY MR. CONNORS:

20 Q In handing over the items you brought with you, you
21 also included a document entitled "Report on the Meeting of
22 Experts on the Mechanization of Rice Production and Processins;"

1 is that correct?

2 A Thht is correct.

3 Q What is that report?

4 A That is one that was in the mix the last time I was
5 here.

6 Q This is an item which you researched in connection
7 with this accident?

8 A I pulled it from the library. I did not use it in
9 any way.

10 Q Did you read it?

11 A I thumbed through the original document which is
12 pretty thick and I extracted a few pages that I thought might
13 be useful somewhere along the line, but it turned out not to
14 be; but, yes, I reviewed that material.

15 Q I will ask that the report be marked as Defendant's
16 Exhibit DD-2541-42 for identification.

17 (Said document marked Exhibit

18 DD-2541-42 for identification.)

19 BY MR. CONNORS:

20 Q Doctor, at your prior deposition, we went over the
21 materials which you had been reviewing, particularly photo-
22 graphs and also any other factual information you may have

1 been given. Since that deposition, have you received any
2 other materials that in any way relate to this litigation?

3 A No other materials besides those photographs we
4 have reviewed this morning.

5 Q In your deposition you indicated you selected some
6 photographs and they were being duplicated and were to be sent
7 to you.

8 A Yes.

9 Q Are these the photographs that were sent to you?

10 A Yes.

11 Q Were there any sent to you that were not selected?

12 A No, but I did not use all the ones that were sent
13 to me.

14 Q Did you select any that were not sent to you?

15 A Not that I recall.

16 Q Have you received any written materials?

17 A No, I have not.

18 Q Have you ever had any occasion to review any of the
19 official reports of Air Force investigations of this accident?

20 A No, sir.

21 Q Have you ever reviewed the reports of any other
22 experts, either for plaintiff or defendant?

1 A I have seen a Xerox copy of a report that I believe
2 is called an accident report.

3 Q Is that the one prepared by Mr. Turner?

4 A Frankly, I don't know.

5 Q Doctor, let me show you a multi-page document and
6 ask you if that is the report that you reviewed?

7 A Yes, this is the report I reviewed.

8 Q Would you look at the last page of that report.
9 It appears to be a wreckage diagram.

10 A Yes, sir.

11 Q Is that the wreckage diagram prepared by you?

12 A Yes, sir.

13 Q Is that the same one that appears in your report?

14 A It is the same that appears on the last page of
15 the copy that was delivered to you and which is now supposed
16 to be replaced by the version I brought this morning.

17 Q Did you ever see this report in draft form?

18 A No, sir.

19 MR. CONNORS: I will ask the report entitled "Acci-
20 dent Report" the Doctor has just been referring to be marked
21 as Defendant's Exhibit DD-2541-43 for identification.

22 (Said document marked Exhibit

DD-2541-43 for identification.)

1 BY MR. CONNORS:

2 Q Doctor, at your first deposition you indicated you
3 had not actually had the time to make the calculations you
4 intended to do in connection with your report; is that correct?

5 A That is correct.

6 Q Can you tell us approximately when you received the
7 photographs that we have been referring to?

8 A It was approximately a week after my first deposi-
9 tion.

10 Q Prior to receiving the photographs, did you do any
11 preparatory work with regard to your investigation on your
12 report?

13 A None beyond the materials that were presented at my
14 first deposition.

15 Q After receiving the photographs, were you able to
16 start immediately on the work or was your own schedule in any
17 way interfering with that?

18 A I did start immediately. It was not continuous be-
19 cause of other pressing matters.

20 Q Would you describe for us the procedures or sequence
21 you used in preparing the materials sent you and in preparing
22 the report?

1 A The basic procedure was to look at the photographs,
2 pick the items that were measurable and for which I had
3 known dimensions and to then, by a series of proportional
4 measurements, extrapolate known measurements to the desired
5 measurements I was asked to prepare.

6 Q I note you used 5-by-7 photographs.

7 A That is correct.

8 Q I note you have brought with you a stack of 5-by-7
9 photographs. Are those the ones you received for this
10 analysis?

11 A The ones I received for preparation of the report
12 were 8-by-10's. These are the ones I actually made the
13 measurements from.

14 Q You made the measurements from the 5-by-7's?

15 A That is correct.

16 Q Where did the others come from?

17 A From the law firm of Lewis, Wilson, Lewis & Jones.

18 Q Did they come at the same time as the 5-by-7's?

19 A No.

20 Q Approximately when did you receive those?

21 A Approximately, as best I can recall, two or three
22 days before I made the annotations in the report. They were

1 sent for illustrative purposes more than anything else.

2 Q Had you identified those to the Lewis firm as the
3 ones you would need enlargements of?

4 A Yes. I did not expect to get enlargements. I
5 expected to get 5-by-7's, but I used them.

6 Q All the measurements were taken off the 5-by-7's?

7 A That is correct.

8 Q In your report, you list some equipment you stated
9 you used in connection with the measurements; is that correct?

10 A That is correct.

11 Q Speaking of page 5, the first paragraph of that page?

12 A That is correct.

13 Q Did you use any other equipment in connection with
14 the evaluation of those photographs?

15 A No, sir, I did not.

16 Q Did you always work directly from the photographs
17 or did you do any work from negatives?

18 A No work from the negatives.

19 Q Did you conduct any evaluations or measurements,
20 interpretations of any kind which have not been referred to
21 in your report?

22 A No.

1 Q Everything you did is embodied in your report;
2 is that correct?

3 A That is correct.

4 Q Did you do any calculations which are not reflected
5 in your report?

6 A Yes, I did a few calculations on the heights of the
7 trees that I believe are reflected on that photograph, but I
8 did not use those calculations because they did not lead to
9 anything fruitful.

10 Q You are referring to Walker 348?

11 A Yes, that is one of the prints that is listed but
12 not actually used.

13 Q Did you do any calculations on the volume of material
14 displaced during the slide of the aircraft?

15 A No, sir.

16 Q Did you furnish any more detailed measurements to
17 plaintiff's counsel or plaintiff's experts than the calcula-
18 tions which appear in your report?

19 A No, sir.

1 Q Since your deposition, have you had occasion to
2 return to Washington for discussions regarding this litigation?

3 A Yes.

4 Q On what dates?

5 A Do you have a calendar?

6 I remember it was a Monday and Tuesday.

7 It was Monday, the 9th. I was here on Tuesday,
8 the 10th, and if I recall, I left on Wednesday, the 11th.

9 You are referring to November 9th through 11th?

10 A That is correct.

11 Q Are those the only meetings you are referring to
12 that you have not previously testified to?

13 A Was I deposed on Monday, the 26th?

14 Q That is right.

15 A Yes, I was here on one other occasion.

16 Q When was that?

17 A It was on October 31st through November 2nd. I
18 remember because I missed Halloween.

19 Q With regard to the dates of October 31st and through
20 November 2nd, did you have occasion to meet with either
21 counsel for plaintiffs or any of plaintiffs' experts during
22 that period?

1 A I met with Doctor Michael Cohen.

2 Q At that time did he furnish you with any factual
3 information regarding the accident?

4 A No. The purpose for that trip was, in fact, to
5 make measurements from these photographs, from the 5-by-7's
6 described in this report.

7 Q You made the measurements in the presence of
8 Doctor Cohen?

9 A I was in Washington. He was not present when I
10 made them.

11 Q Where were you physically located?

12 A I was physically located at the law firm of Lewis,
13 Wilson, Lewis & Jones.

14 Q Was anyone else present?

15 A From time to time other employees were in and out
16 during that weekend. I was working in a conference room.

17 A Was there any particular reason for making the
18 calculations at the Lewis firm?

19 A I can only surmise.

20 Q Were you asked to do it there?

21 A It was a matter of convenience because of the turn
22 around time in getting the photographs and an attempt to cut

1 the time down as much as possible.

2 Q During that stay, did you have occasion to talk
3 with any of plaintiffs' experts?

4 A Casually.

5 Q Was there any information exchanged regarding the
6 accident?

7 A No, sir. The only time I talked with them was at
8 lunch time.

9 Q Do you recall who you were talking to?

10 A I recall talking with a gentleman from Great
11 Britain or Scotland.

12 Q Doctor Mason?

13 A It might have been. I remember hearing that name.
14 I would not swear that that name and that person were one
15 and the same.

16 Q Anyone else?

17 A No, sir.

18 MR. McMANUS: So it is clear, I was there and
19 other counsel.

20 THE DEPONENT: It was a weekend and I don't
21 recognize all of their employees anyway.

1 BY MR. CONNORS:

2 Q Did you complete your measurements at that time?

3 A I would say between 75 and 95 per cent of my
4 calculations were finished.

5 Q Did you furnish any information regarding your
6 measurements at that time?

7 A To Doctor Cohen.

8 Q Do you have a copy of what you furnished to him
9 at that time?

10 A I do not.

11 MR. CONNORS: I call for the production of the
12 materials furnished by Doctor Morain to Doctor Cohen during
13 the period October 31st through November 2nd.

14 BY MR. CONNORS:

15 Q Doctor, between November 2nd and the next time you
16 were in Washington, November 9th through November 11th, did
17 you have occasion to do any work with regard to preparation
18 of your report of the evaluation of this accident?

19 A The only work I recall during that time frame was
20 checking calculations.

21 Q Did you have the photographs with you at that time?

22 A No, I didn't. I was merely checking over the work

1 I had done in anticipation of receiving a set that could be
2 included in the report.

3 Q You had previously indicated in response to a
4 previous question that the photographs were sent to you. Were
5 you sent any photographs prior to October 31st?

6 A No.

7 Q You got the photographs when you got to the Lewis
8 firm?

9 A Yes.

10 Q You got access to them?

11 A For purpose of clarification, I have no photographs
12 in my possession except when I received the 8-by-10s, which
13 I had requested for use as illustrations in the report.

14 Q All you did during the week between November 2nd
15 and November 9th was to check your calculations, the mathe-
16 matics of them?

17 A Yes, that is correct.

18 Q During the period you were in Washington November
19 9th through November 11th, did you have occasion to meet or
20 consult with anyone on behalf of plaintiffs?

21 A Again, I was in discussions with Doctor Cohen.

22 Q Anyone else?

1 A Occasionally with other counsel.

2 Q Did you have occasion to consult with any of
3 plaintiffs' other experts?

4 A No. As I recall, I was the only person in town
5 at that time.

6 Q What was the purpose of your coming to Washington
7 during the period November 9th through 11th of 1981?

8 A To discuss the body of the report that I have
9 submitted.

10 Q Had you submitted any draft prior to that?

11 A No. At that point, this was a draft and it was
12 suggested that I should write a summary for it, which is what
13 I was working on since the 11th.

14 Q You had a draft report and you were writing a summary
15 report?

16 A Yes. The report up through page 46 was essentially
17 completed by November 11th.

18 The material that I have added in the meantime
19 since then has been on pages 47 through, I guess it would be,
20 53, if the final wreckage diagram were paginated, and also
21 at that time I put together the preliminary version of this
22 wreckage diagram.

1 Q Had you completed your measurements prior to coming
2 to Washington on November 9th?

3 A For all intents and purposes, yes.

4 Q Were any additional measurements made during the
5 period November 9th through November 11th of 1981?

6 A The only additional measurements are not really
7 measurements but clarification, you might say, under item --
8 I am referring to the revised wreckage diagram now -- under
9 item C, which describes the distance with no discernible
10 track as being 960 feet, I have since subdivided that into
11 two categories and the final version of this diagram I would
12 like to show what the breakout of that 960 feet is.

13 Q Doctor, was the draft report you had referred to
14 prepared at your offices?

15 A That is correct.

16 Q When did you provide that to plaintiffs' counsel,
17 approximately?

18 A Approximately on the 9th.

19 Q You brought it with you?

20 A That is right.

21 Q When was the summary added?

22 A I began writing the summary on the 11th. That was

1 a week day, if I recall. Yes, that was a week day. I then
2 took a long weekend and got back to it on the 17th, if I
3 recall correctly.

4 Q Where were you at that time?

5 A I was in Albuquerque.

6 Q After finalizing the report, did you send it on to
7 the Lewis firm?

8 A No, I did not.

9 Q When did you forward it to them or deliver it to
10 them?

11 A I delivered it to them yesterday. I brought it
12 with me.

13 Q Other than the summary, have there been any changes
14 in your draft since November 9, 1981?

15 A Nothing of substance. I have tried to clean up
16 some of the grammar. I have a problem with grammar. You will
17 notice that in the report in places.

18 Q Did you furnish a copy to plaintiffs' counsel at the
19 time you arrived on the 9th?

20 A Of the draft version, yes.

21 MR. CONNORS: I will call for the production of that
22 document.

1 BY MR. CONNORS:

2 Q At that time, did you provide any other measure-
3 ments or calculations to anyone on behalf of plaintiffs?

4 A No.

5 Q Have you had anybody else working with you in
6 connection with the preparation of this report?

7 A Only in the typing.

8 Q Has anyone else done any research for you?

9 A No, sir.

10 Q Have you attempted to do any calculations to
11 determine the time frame that any photographs depicting
12 the accident scene were taken?

13 A No.

14 Q Doctor, I am probably going to be working through
15 your report at this time. You might want to have a copy
16 of it in front of you for reference.

17 On page 1 of your report, you state that the
18 report addresses three questions. Doctor, who framed those
19 three questions?

20 A Doctor Cohen.

21 Q Did he frame any other questions to address?

22 A No. Those were the three items that he requested

1 some clarification on.

2 Q Did he give that to you verbally or in written
3 form?

4 A Verbally.

5 Q At the time that you came to Washington for what
6 I believe was the third time, November 9th through 11th,
7 were you furnished at that time with any additional facts or
8 materials regarding the accident?

9 A I have never been provided anything except these
10 photographs. As I stated earlier, I did see one copy of an
11 accident report.

12 Q Since your initial review of the large volume of
13 photographs you referred to in your first deposition, have
14 you been shown any new or additional photographs?

15 A I saw some new photographs yesterday which are
16 referred to as T-r-a-y-n-o-r -- I don't remember how many
17 there are, but they are referred to as the Traynor photo-
18 graphs. I understand there are some slides also, but I have
19 not seen those.

20 Q Having reviewed those Traynor photos, do they
21 cause you in any way to change or alter any of the measurements
22 or conclusions you reached in your report?

1 A I have not studied them carefully, but my initial
2 reaction is that they would not cause me to change then.

3 Q Were the photos you were shown color or black and
4 white?

5 A Both.

6 Q Eight-by-10s?

7 A Correct.

8 Q Turn to page 1 of your report, Doctor, the report
9 we have identified as DD-2541-26. The second paragraph on
10 that page refers to an anaylsis of low altitude aerial
11 oblique photographs taken after the accident and it says,
12 in parens, 24 to 48 hours. Is that correct?

13 A That is correct.

14 Q On what do you base the statement that the photo-
15 graphs were taken during that time frame?

16 A There is a sequence of photographs that show
17 helicopters, numerous people on the ground.

18 There is also -- and I don't remember the numbers
19 on the photographs that show various stages at what appear
20 to be a dismantling of the T-tail. In discussion with
21 Doctor Cohen, it was suggested to me that the local inhabi-
22 tants were at that point pilfering whatever was salvageable,

1 and it is based on that surmise on my part that the photo-
2 graphs were taken sometime afterwards but not too long after-
3 wards. So those numbers are my numbers just based on
4 experience, you might say.

5 Q But you have no real factual information to pinpoint
6 when the photos were taken?

7 A No, sir, I have no idea when any of these photo-
8 graphs were taken.

9 MR. CONNORS: Why don't we take a brief recess at
10 this point.

11 [Whereupon, a brief recess was taken.]

12 BY MR. CONNORS:

13 Q During the break, Doctor Morain asked me to
14 amplify his last answer. Please do.

15 A With regard to the time on the photographs, I did
16 notice that some of the color photographs appear to have been
17 taken late in the afternoon. The sun was very low and the
18 prints are very dark. There is a lot of sun glint off the
19 standing water and there is also smoke in the background,
20 which I presume to be from the wing area. I can only surmise
21 those photographs were taken the afternoon of the accident.

22 Q Aside from the presence of smoke clearly coming

1 from the wings, you cannot pinpoint a date for any of these
2 photos, can you?

3 A No, I cannot.

4 Q You state also on page 1 that the first question
5 involved the measurement of the length and depths of tracks
6 produced by the aircraft's landing gear; is that correct?

7 A That is correct.

8 Q Looking at just the west side of the river for a
9 moment, is it correct that the photographs indicate that just
10 after the dike, which borders the Saigon River, that two
11 track marks appear parallel to each other; is that correct?

12 A That is correct.

13 Q Are they track marks from the aircraft's landing
14 gear?

15 A I assume so. I don't know. They appear to be tire
16 tracks.

17 Q In your opinion, they are tire tracks?

18 A Yes, sir.

19 Q Are there more than the two parallel track marks in
20 terms of marks on the ground?

21 A On the east side of the river?

22 Q On the west side of the river.

1 A Yes, there are numerous smaller, for want of a better
2 term, I will use the word gouge. It looks as though something
3 has gouged in a skipping fashion and left some marks.

4 Q Is it your opinion that the two parallel marks
5 are the tire marks; is that correct?

6 A That is my assumption, yes.

7 Q Do you have an opinion at what point the tires or
8 landing gear would have broken off or separated from the air-
9 craft on the west side of the river?

10 A No, I have no opinion about that.

11 Q The last sentence on page 1, which carries over
12 to page 4, which is the next textual portion, refers to
13 measurement of the length and depth of what appears to be
14 skid marks made by the troop compartment after it separated
15 from the main frame; is that correct?

16 A That is correct.

17 Q Do you have an opinion as to the location of the
18 point at which the troop compartment separated from the main
19 frame of the airplane?

20 A No, I have no opinion on that.

21 Q How could you make any measurements then?

22 A The troop compartment is obviously separated from

1 the main frame so at some point it had to break away from
2 it.

3 Q So you worked backward from the final resting place
4 of the troop compartment; is that correct?

5 A That is correct.

6 Q Did you make any attempt to determine at which
7 point the main sections of the aircraft started to separate?

8 A Judging from the debris on the ground, the aircraft
9 appears to have lost its structural integrity sometime after
10 the initial impact on the west bank of the river at the end
11 of those tire tracks, and from that point to the point of
12 the final resting place on the troop compartment, all I can
13 say is the evidence on the photographs indicates a lot of
14 debris, so I presume it is in that area that the aircraft lost
15 its integrity.

16 Q Would it be your opinion that the aircraft was
17 substantially intact, and by that I mean the major portions
18 of it together, at the time of the impact on the west side
19 of the river through Point C on your revised wreckage diagram?

20 A Yes, I would assume that. There are, as the diagram
21 indicates, several sets of tires found on the east side of the
22 river, so obviously the plane was not totally intact.

1 Q There is no doubt that there was evidence of
2 separating on the east side?

3 A There is some evidence of that.

4 Q The empennage, flight deck and wing section separated
5 and there is no doubt about that and I understand it is your
6 testimony that it would have been substantially intact at Point
7 C on your revised wreckage diagram; is that correct?

8 A No, it would be substantially intact at Point B
9 and Point C -- actually Point C is not a point at all. It
10 refers to that distance between the end of the tracks at B
11 and the beginning of the tracks at D and E so there is a
12 distance of some 960 feet -- that is what C refers to over
13 that distance. I don't know what the configuration of the
14 aircraft was at that point.

15 Q At page 2 of your report, you have included a copy
16 of Plaintiffs' Exhibit 3-H; is that correct?

17 A Yes, sir.

18 Q What did you use that exhibit for?

19 A The primary purpose was to show the heading of the
20 aircraft and for me to make an estimate of the coordinates,
21 the latitude and longitude.

22 Q Anything else?

1 A No, sir.

2 Q On page 3 of your report and also Figure 3 is
3 Defendant's Exhibit D-1217, what was that exhibit used for?

4 A Primarily to arrive at the length of Compartment E,
5 which is also referred to as the troop compartment, using
6 the dimensions given in the diagram.

7 Q How did you make the measurements of the troop
8 compartment?

9 A By proportional measurements. There is a line
10 item at the very bottom that states there is 1,454 inches
11 and I can estimate the length of the troop compartment on the
12 basis of the length of the aircraft.

13 Q What length did you arrive at?

14 A Sixty-five feet.

15 Q Did you take any other information off the Exhibit
16 D-1217?

17 A Yes, I did.

18 Q What else?

19 A The cross section given in the upper right-hand
20 corner for Section E gives the distance or the length of 232
21 inches, which I used in later illustrations.

22 A Those were the primary ones.

1 Q Did you do anything with the tire?

2 A I am trying to think if it was this illustration
3 or another one.

4 The tire dimensions I got off of a different
5 illustration, so those were the primary uses of Figure 2.

6 Q On page 4 you refer to the soil-water relations
7 along the ground track of the aircraft. What do you mean
8 by ground-oil sections?

9 A In my earlier deposition, I was asked to look into
10 an explanation for the water that filled some of the tracks,
11 did not fill some of the tracks particularly on the east
12 side. So, in my report I have devoted a section to my
13 research into that question.

14 Q The third question listed on page 4 refers to
15 assessment of vegetational conditions with specific regard
16 to patterns and discoloration; is that correct?

17 A That is correct.

18 Q In that connection, did you do anything more than
19 simply measure or define the areas of various discoloration?

20 A No. I prepared the two plastic transparencies,
21 the overlays and related that to general observations in the
22 area; but I have not engaged in any additional research beyond

1 that.

2 Q I am now on page 5, looking at Section 1, photo-
3 grammetric measurements.

4 You refer throughout your report to field boundaries;
5 is that correct?

6 A Yes.

7 Q Would you explain to us, please, the importance of
8 a field boundary sort of analysis?

9 A The main use of the field boundaries, which in this
10 environment almost exclusively tend to be dikes around paddies,
11 was primarily to extrapolate back to the lengths of the tracks
12 and also to get some estimate on the height of those dikes
13 or boundaries.

14 Q Why do you have to use the boundaries?

15 A Because the line of reasoning that I followed carries
16 over on to two or three photographs, beginning with a tire
17 dimension on the one photograph, from that tire estimating
18 the length of the field border and then on a subsequent border,
19 knowing that length, I can relate it to tire tracks that are
20 observable on that subsequent photograph.

21 Q So it is in terms of putting together the mosaic?

22 A I would not use the word mosaic. It has a different

1 connotation.

2 Q Would it be fair to say it is a method for linking
3 together different pictures?

4 A That is correct.

5 Q Does it relate in any way to the problem of adjusting
6 or correcting calculations based on the fact that a track may
7 be going away from you or towards you at a given point in
8 any given picture?

9 A That of course is a real problem. I avoided that
10 problem by selecting photographs that always showed the
11 phenomena in roughly the same distance from the camera lens.
12 With big photographs it is very difficult to measure items
13 that are orthogonal.

14 Q In fact, you attempted to measure the field boundary
15 which was, in fact, also orthogonal in some of the pictures?

16 A But the relationship on the photographs I used is
17 not orthogonal in that photograph. It is parallel to.

18 Q I am looking at the first paragraph under Section I
19 Roman I-A, referring to the use of the tire to measure the
20 "field boundary running roughly orthogonal to the aircraft's
21 flight path."

22 A By aircraft, I mean the C5A. It is not orthogonal

1 to the aircraft that took the picture.

2 Q Perhaps I am misunderstanding you. I think what
3 I am misunderstanding is the importance of the field boundary
4 to your measurements. Can you perhaps explain that so I can
5 appreciate why you go through this exercise which you appear
6 to do in a number of reports?

7 A If I can direct your attention to Figure 3, page 6

8 A Just for the record, so we have everything straight,
9 that would be Walker 3-748; is that correct?

10 A That is correct.

11 Q We have identified that as Defendant's Exhibit
12 DD-2341-12; is that correct?

13 A That is correct.

14 In this particular photograph, both the tire and the
15 field boundary or the dike are at roughly the same distance
16 from the camera lense, and runs parallel more or less to the
17 bottom of the photograph, but the flight track of the C5A
18 was across that dike, so in my description on page 5 where I
19 say orthogonal to the aircraft's flight path, I am referring
20 to the flight path of the C5A, not to the aircraft that took
21 the photograph from which the photograph was taken.

22 Q So you used the dimension from the tire to measure

1 what?

2 A The length of this phenomena labled as Dike B

3 Q Where did you derive dimensions of the tire?

4 A From my Figure 4, which is Defendant's Exhibit
5 1216, given on page 7 of my report.

6 Q Were you measuring the diameter of the wheel rim
7 or the actual tire?

8 A The tire itself as shown in Figure 3. It was
9 3.75 feet.

10 Q Do you have any knowledge of the condition of that
11 particular tire in the photograph, DD-2541-12, also identified
12 as Walker 3-748?

13 A I have no prior knowledge of the condition of that
14 tire. It looks like it is in fairly good shape.

15 Q You have assumed then that it is the same dimension
16 as an intact tire or piece of equipment would be on a normal
17 C5A; is that correct?

18 A Yes.

19 Q If, in fact, it had been damaged or deflated, would
20 that change your calculation?

21 A By a small amount, perhaps.

22 Q How large was the tire in the picture that you

1 used for scaling purposes? I am talking about the 5-by-7
2 picture that you used?

3 A Point 4 centimeters.

4 Q In terms of an inch, how long is that?

5 A There are 2.54 centimeters per inch. I am not
6 accustomed to going back and forth between metrics and
7 English. It can be calculated but I don't know offhand what
8 it is.

9 Q When you use a very small item for scaling purposes,
10 such as the tire which you said measured point 4 centimeters,
11 does that affect the accuracy of other dimensions as they
12 are calculated as opposed to using large or refined items?

13 A For photogrammetric purposes, this is a well-defined
14 item.

15 Q I am talking about the size. Is the accuracy of
16 measurements derived from a relatively small item, in this
17 case a 5-by-7 photograph which measures only 1.4 centimeters,
18 can that affect other calculations?

19 A The accuracy of any measurement, whether made from
20 a long item versus a short item, rests with the person making
21 the measurement. All I can say is that people who are experi-
22 enced in making such measurements maintain an internal

1 consistency which another interpreter might find small
2 variations with, but the end result will be close. The
3 results will not be orders of magnitude difference.

4 Q In fact, any error in calculating, for instance, the
5 4 centimeters would be multiplied by the number of times that
6 distance went into the overall distance; is that correct?

7 A Yes, of course.

8 Q Of course, a small error on a small item, in fact,
9 would multiply out to, say, 20 or 30 times that distance;
10 isn't that correct?

11 A Not necessarily.

12 Q Let me rephrase that question.

13 An item which is only 4 centimeters in diameter
14 and taking your basic scale in measuring, isn't that likely
15 to result in -- I will strike the question.

16 Let the record reflect I should be referring to .4
17 centimeters.

18 Also, on page 5 you refer to what you term a cosine
19 correction.

20 A Yes.

21 Q What is the purpose of the cosine correction?

22 A That refers to the idea that Dike 3 on Figure 3

1 runs at a slight angle across the page. It does not exactly
2 parallel with the bottom of the photograph. Therefore, a
3 slight correction could be applied by taking the cosine of
4 that small angle if one were to superimpose a line parallel
5 to the bottom of the photograph intersecting the dike at the
6 tire. Then you could apply a cosine correction to that small
7 angle, but the cosine of an angle of less than 10 is .99 or
8 .95.

9 Q And you have measured that angle out to be less
10 than 10?

11 A I have not actually measured it. I estimate it is
12 less than 10.

13 Q So you did not measure the angle?

14 A I did not.

15 Q The scale is going to vary on any line that is not
16 perpendicular to the frame of the photo, isn't it, the bottom
17 edge of that?

18 A Ask that again.

19 Q Is the scale as you move away from the bottom of the
20 photograph going to change?

21 A If you move perpendicularly from the bottom --

22 Q From the bottom edge you referred to, and you moved

1 away from the camera, would, in fact, the scale change?

2 A There is a constant variation in the scale from
3 the bottom to the top of that photograph, that is correct.

4 Q Did you apply any cosine correction to any other
5 measurements based on this photo?

6 A Not based on this photo?

7 Q Did you measure any other dikes in the photo besides
8 Dike B?

9 A No.

10 Q What was the purpose of obtaining a photo measure-
11 ment on Dike B?

12 A So I could use that distance for additional calcu-
13 lations illustrated in Figure 5.

14 Q Could I see the photograph you actually worked
15 from?

16 A Sure.

17 Q Could you show me the actual photograph you used to
18 calculate the length of Dike B?

19 What is that photograph?

20 A Morain No. 14, yes.

21 Q That is Walker 7-348.

22 In the copy I am looking at and in the small 5-by-7

1 photograph you have just indicated was the one you actually
2 used to make the measurement, the edge of the dike, that is
3 the corner where it joins the next dike is not visible?

4 A That is correct.

5 Q How did you get a measurement on the length of that
6 dike if you can't, in fact, see it?

7 A By extrapolating the field boundaries to the left
8 of the photograph as described in the report.

9 Q So you did not have an actual visible photograph
10 from which you could measure the distance and you have to
11 extrapolate based on the angles of the dikes converging?

12 A That is correct.

13 Q Did you take any other measurements off of D-1216,
14 which is Figure 12 in your report?

15 A Yes, I did.

16 Q What other measurements did you take?

17 A As indicated on that exhibit in my notation in the
18 center of the three diagrams, the center diagram indicates
19 No. 34.5 feet, which is calculated to be the height from the
20 tip -- strike that -- from the aft tip of the fuselage to
21 the aft tip of the tail, the upper extremity of the tail.

22 Q In a vertical direction?

1 A In a vertical direction?

2 A In a vertical direction. I don't know what the

3 word for that is.

4 Q Did you later use that in other calculations?

5 A Yes, I used this later in the report.

6 Q Doctor, did you do any measurements on Walker 3-748

7 to determine more than just the length of that dike? Did you

8 attempt to determine the width or height of the dike that

9 appears in that picture?

10 A I attempted to calculate the height of the dike.

11 Q Did you arrive at a number?

12 A Yes, approximately 20 inches.

13 Q Where did you measure that?

14 A I measured it at the point of the tire, the dike
15 immediately behind the tire.

16 Q Did you again use the diameter of the tire for
17 that purpose?

18 A No, I used what in this photograph would be described
19 as the height of the tire, 17 inches.

20 Q How did you arrive at the 17 inches as the height?

21 A That was given to me in some specifications that were

22 Xeroxed out of some place. I don't know where they came from,

1 to be honest with you -- published specifications for the
2 C5A.

3 MR. CONNORS: Does counsel know what document we
4 are referring to?

5 MR. McMANUS: I think the specifications you gave
6 us in the large boxes with the computer printouts.

7 BY MR. CONNORS:

8 Q So you are using 17 inches for purpose of measuring
9 the height?

10 A Yes, sir.

11 Q What was the length you obtained for Dike B?

12 A By extrapolation of the field borders to the left of
13 the photograph, I came up with, I think, 147 feet. But on my
14 Figure 5, on page 8, which is Walker 257, it is apparent that
15 the border is a little bit longer than that.

16 Q In fact, you cannot extrapolate from the convergence
17 of the two dikes as they appear in Walker 3-748, DD-2541-12,
18 because, in fact, Dike B extends passed the conversion point.

19 A Yes, and I made the correction on Figure 5.

20 Q How did you make that correction to determine the
21 excess footage?

22 A By proportional measurement, 147 is to that length

1 as the apparent length --

2 Q You did not attempt to rescale the picture from
3 any known items in the Walker picture?

4 A No, there was nothing in the picture for me to
5 rescale from.

6 Q In that size picture, Walker 3-257, the tire would
7 have been too small to scale from?

8 A Yes, you can't even see it.

9 Q Could it have been blown up for scaling purposes?

10 A I think if you had blown it up, you would have had
11 such a blurry rendition you would not have known what to
12 measure.

13 Q After obtaining the boundary margin, that is the
14 full length of Dike D, how does that relate, then, to the
15 measurement of the track marks which you attempted to calculate?

16 A What I did was by proportional measurement on page
17 9, and in this case I did apply a cosine function to 20 degrees.
18 I estimate the length of that field boundary along the flight
19 track of the C5A, more or less along the flight path, to be
20 639 feet. And on that same figure, Figure 5, the tire tracks
21 in question appear as a dark line at the very left edge of
22 the photograph.

1 Q We are talking about Walker 3-257; is that correct?

2 A That is correct.

3 Q Where is the 20-degree angle that you applied the
4 cosine correction to?

5 A If you draw a line horizontal to the photograph
6 intersecting with the left-hand side of the field boundary
7 that is labeled 639 feet, then the actual heading of the field
8 boundary with regard to that horizontal line is approximately
9 20 degrees and the cosine for 20 degrees is .94.

10 Q The boundary which you determined from the tire
11 size, first through scaling from the tire and then extrapolating
12 and correcting the extrapolation, is the 164 feet which runs
13 vertically from the bottom of Walker 3-257; is that correct?

14 A Yes, sir.

15 Q From that measurement you then determined the length
16 of the boundary which you have indicated as 639 feet; is that
17 correct?

18 A That is correct.

19 Q What we have been referring to as Dike B, and the
20 164 foot, in fact runs perpendicular away from the bottom of
21 the picture; is that correct?

22 A That is more or less correct.

1 Q We have already discussed that the scale changes
2 when you do that; is that correct?

3 A Yes, but the scale changes that you keep referring
4 to occur across the entire photograph and become very large
5 at the top of the photograph. Near the bottom and toward
6 the middle, the amount of scale variation is relatively small.

7 Q Did you apply any correction at all to the distance
8 of Dike B as it appears in Walker 3-257?

9 A No, I did not.

10 Q How did you then calculate the distance of 639 feet
11 from the original boundary of 164 feet?

12 A By proportional measurement, on the assumption that
13 the short distance shown to you in Figure 5 between 147 feet
14 and 164 is sufficiently small that the scale variation across
15 that distance is, for our purpose, negligible.

16 Q The fact is that the scale is not just varying at
17 that very end of the line but, in fact, varies over the entire
18 length of Dike B as it appears in this picture; isn't that
19 correct?

20 A Say that again.

21 Q Dike B in picture Walker 3-257 runs perpendicular
22 to the picture. Therefore, the scale varies not in just the

1 last portion of that line but, in fact, through its entire
2 length?

3 A Precisely, and that is why I did not measure the
4 entire length off that photograph..

5 Q You are agreeing with me, in fact, that, in fact,
6 in the perpendicular plane it varies.

7 MR. McMANUS: He said that several times.

8 BY MR. CONNORS:

9 Q When you calculate what is running almost parallel
10 with the bottom boundary, doesn't that make a difference?

11 MR. McMANUS: He told you what the difference is.

12 In that area of the photograph he explained that the difference
13 in scale is negligible and that allows him to make the
14 measurement that he made of the horizontal or nearly horizontal
15 dike.

16 MR. CONNORS: Thank you, Mr. McManus.

17 BY MR. CONNORS:

18 Q Doctor, can you answer the question?

19 A I concur with Mr. McManus. As I have stated, this
20 sort distance occurs at a place where the scale variation is
21 relatively small, sufficiently small that I can use that along
22 with the cosine correction to estimate the length of 639 feet

1 by proportionl measurement. At this point it does not really
2 matter -- if I have already measured the distance at 147 feet
3 from another photograph, that does not suffer this problem,
4 then all I am doing with the figure 5 is allowing myself the
5 ability to extend backward toward the east --

6 Q And south?

7 A I have corrected for the southing, as it is
8 called, by taking a cosine correction.

9 Q What is that variation on this photograph?

10 A I don't know.

11 Q Did you attempt to calculate it?

12 A No, sir.

13 Q You indicated you used the 639 foot boundary and
14 you then worked back to the length of the track mark; is that
15 correct?

16 A That is correct.

17 Q Does the track mark appear in its entirety in the
18 picture we have been referring to as Walker 3-257?

19 A It does not appear to be entire and I say that
20 because it stops abruptly at the left margin of the print so
21 I can only assume there is some distance beyond that not shown.

22 Q Did you attempt to determine what that distance

1 would be?

2 A I did not have to because it shows in its entirety

3 in Figure 6.

4 Q Which figure did you use to measure the length of
5 the track mark?

6 A I used Figure 6.

7 Q In Figure 6, the lines have again changed in their
8 angles as it were to the bottom of the picture; is that correct?

9 A Again, we are working on the center part of the photo-
10 graph and the features of primary interest all fall more or
11 less along that same distance from the camera lense, and
12 having applied the cosine correction, I can then make another
13 estimate on the length of the tire track.

14 Q Am I correct, you show different distances where the
15 boundary between Figure 5, which is Walker 3-257, and Figure
16 6, which is Walker 3-269?

17 A Yes. On page 9 the center of the page I give the
18 numbers applying the cosine correction.

19 Q How does the length of a boundary change from one
20 photograph to the next? You have a distance in Figure 5 of
21 639 feet for one boundary and I believe for that same boundary
22 you have 615 feet in Figure 6; is that correct?

1 A That is correct.

2 Q Why is that difference?

3 A That is an error.

4 Q Should it be recalculated?

5 It is an error then?

6 MR. McMANUS: He is checking.

7 BY MR. CONNORS:

8 Q One of them has to be incorrect; is that right?

9 A Yes. What we need to do is figure out what that
10 does to the tire track.

11 Q Are you able to do that at this time?

12 A If you will give me a couple of minutes.

13 Q During a short break, Doctor, we asked you to take
14 a look at that calculation. Have you been able to sort that
15 out yet?

16 A Yes. In my previous comment that the calculation
17 was incorrect is not true.

18 You will notice on page 9 about a third of the way
19 down, I say for confirmation of the above measurement the
20 photograph marked Morain 16 can be used.

21 What I have done is try to confirm the measurement
22 of 639 feet by looking at yet one more photograph and by
proportional measurements I come up with a number of 615 feet
which is within 25 feet of the previously given number on

1 Figure 5, which indicates to me that the length of that
2 boundary is on the order of 615 to 640 feet.

3 I listed on Figure 6 as 615 feet because that is
4 what I actually calculated on that photograph. Since I am
5 making the measurement of the tire mark from the same photo-
6 graph, I used that measurement to arrive at the tire mark of
7 the 107 feet.

8 Q But, in fact, that differed from the measurement
9 of the same length in another photograph by some percentage?

10 A That is correct.

11 Q Do you know what the percentage of error would be
12 in this sort of calculation?

13 A There is no standard. I can tell you what the
14 difference is between 639 and 615.

15 It is within 96 percent. So, I guess that means
16 a 4 percent error.

17 Q Assuming that either one of these is correct?

18 A I am confident that the length of that boundary
19 is 600-plus feet.

20 Q But you are not sure how much plus; is that right?

21 A Let's put it this way. It is between 600 feet and
22 650 feet. It certainly isn't 700 feet and it is not 200 feet

1 so I am not off by an order of magnitude. I am off by a
2 small percentage.

3 Q How does that 600-some feet relate to the tire
4 marks that you were measuring?

5 A Again, as given, the length -- its the calculation
6 given there. I come up with around 107 feet and I think for
7 the remainder of the report I refer to it as 110 feet.

8 Q How did you determine from Walker 3-269, which I
9 believe is Figure 6, the beginning and end points of the track
10 marks which you were going to measure?

11 A By visual inspection.

12 Q What we are looking at is a dark streak in the
13 center, left of Walker 3-269; is that correct?

14 A That is correct.

15 Q To the further left, there is a smaller streak
16 which you have also measured off on Figure 6; is that correct?

17 A Figure 6, correct.

18 Q Did you attempt to determine the height or width
19 of any of the dikes which appear in any of these photos?

20 A No.

21 Q Section B of this portion of your report at page 11
22 refers to the depth of tire tracks; is that correct?

1 A Yes.

2 Q The tire tracks you are referring to are the marks
3 which you just measured as being somewhere between 107 and
4 110 feet long?

5 A Yes.

6 Q Did you attempt to determine the depth and width of
7 those tire tracks, as you call them?

8 A That seems like a redundant question. Yes, it is
9 in the report.

10 Q What did you determine to be the depth and width of
11 the marks which you measured?

12 A I didn't determine the width of the tire tracks.
13 I measured the depth of the tracks as indicated by the
14 proportional measurements on page 11, using Walker 736 and
15 given in my report as Figure 7.

16 Q What scaling device did you use to determine the
17 depth of the marks that you were measuring?

18 A That is based on an estimated height of dikes in
19 that area of 20 inches.

20 Q That estimate is based on the original measurement
21 based on the tire; is that correct?

22 A That is correct.

1 Q Looking at page 11 of your report, there is a
2 reference to a tire in the right foreground. Do you see that?
3 It is at the top of page 11.

4 A Yes, that is the same one shown in Figure 3.

5 Q What did you assume to be the height of the dikes
6 throughout the area on the east side of the river?

7 A Based on that original calculation shown in Figure
8 3, the tire shown in Figure 3, I estimate the average height
9 to be about 15 to 20 inches.

10 Q Fifteen to 20 inches is a fairly wide margin for
11 that length; isn't it?

12 A Yes.

13 Q What percentage would that be?

14 A About 25 percent?

15 A So the estimates based on that could vary by 25
16 percent; is that correct?

17 A I also say in the textual part of the report at
18 page 11, in some places depending upon minor variations and
19 relief, they may be only 12 inches.

20 Q In fact, the calculation is based on an assumption
21 of 20 inches and it could vary as much as 40 percent?

22 A Yes.

1 Q Would you turn again to page 11. About midway in
2 the large paragraph there, it states, "The tire markes in the
3 field in which the two military persons are standing appear
4 to be scrapes and appear to have depth of no more than 6 to
5 8 inches."

6 Which picture are you referring to?

7 A Figure 8, page 13.

8 Q That is Walker 3-321?

9 A Yes.

10 Q Looking at Walker 3-321, there is apparently an
11 American standing to the far left-hand side and then two
12 Vietnamese children.

13 A That is correct.

14 Q Are the marks you are referring to immedietly in
15 the center of the picture and to the right of the little
16 Vietnamese child?

17 A The ones I am referring to are in the immediet
18 foreground and in the center, almost the exact center of the
19 photograph.

20 Q I am showing you now Walker 3-321 and pointing to
21 the very bottom of the picture and that is what you are
22 referring to?

1 A Yes, that plus this area back in here.

2 Q In fact, you are referring to two areas, the one in
3 the immediate foreground and also the marks in the center to
4 the right of the little girl; is that correct?

5 A Yes.

6 Q You are saying that the marks to the right of the
7 little girl are somewhere between six and eight inches deep?

8 A Yes.

9 Q Where, in this picture, would be the deeper marks
10 which we previously talked about?

11 A They would be beyond the group of three or four
12 people who appear to be Vietnamese in the center distance.
13 The main tracks are in front of them.

14 Q The picture in the foreground, the marks you are
15 indicating there, would you say also are six to eight inches
16 deep?

17 A Yes.

18 Q Is that, in fact, an indentation made in a dike?

19 A In the immediate foreground, yes, it looks as though
20 something has scraped across that dike.

21 Q Is there any track mark or indentation between the
22 area where the dike was disturbed and the area to the right of

1 the little girl?

2 A No.

3 Q So that area was not touched by any portion of the
4 aircraft; is that correct?

5 A It certainly does not appear to be.

6 Might I amplify --

7 Q Certainly.

8 A On Figure 9, the areas we have just been referring to
9 can be seen again in the foreground.

10 The area that is in the center of the photograph
11 on Figure 8 shows up on Figure 9 in the bottom center for
12 purposes of orientation.

13 Q Figure 9 is also Walker 735?

14 A That is correct.

15 Q For the record, there appears to be some ground
16 disturbance immediately in the center foreground of the
17 picture, two other lines of disturbance a little bit higher
18 and to the right and crossing over a dike and in the center
19 of the picture two parallel disturbances that appear to be
20 deeper; is that correct?

21 A That is correct.

22 Q The ones past the dike, would they be the ones that

1 you measured the length of the track marks in the prior
2 figures?

3 A That is correct.

4 Q Based on the dike, those figures would be approxi-
5 mately 107 feet long?

6 A Yes.

7 For further reference on Figure 6 where I show a
8 distance of 144 feet, that distance encompasses these
9 additional marks in the foreground of Figure 9.

10 Q Again, you picked your starting and end points
11 based on the contrast in the Figure 6, is that correct,
12 contrast in the photos shown in Figure 6?

13 A That is correct.

14 Q Doctor, throughout your report you refer to the
15 presence or absence of water and attempt to relate that to
16 the depth of penetration of the groups; is that correct?

17 A That is correct.

18 Q In terms of the marks on the east side of the
19 river, what is the significance of the absence of water in the
20 track marks?

21 A The significance is that the tracks are not deep
22 enough to have penetrated to the perched water table.

1 Q Which would be what?

2 A It varies, but at this time of the year it can be
3 anywhere from the surface to a couple of feet down. It
4 depends upon local topography and how much rain fall had
5 been received in the days or weeks just prior to the time
6 the photograph was taken.

7 Q I understand from your report that at this time
8 of year in Vietnam the dry season would have been completed
9 and they would now be entering into the rainy season; is that
10 correct?

11 A Yes. The climatic charts indicate that April is
12 the beginning of the heaviest part -- it is hard to speak
13 of rainy seasons and dry seasons because there is a fair bit
14 of moisture at most times of the year but there is a pronounced
15 increase in rain fall beginning in about April.

16 Q So there would have already been rain by this time?

17 A It is never very dry there.

18 Q Would the appearance of water also relate to whether
19 or not or what stage of cultivation the individual fields
20 were in?

21 A Yes, in some instances.

22 Q In other words, in a rice paddy area the water is

1 moved in and out of the individual quadrants so that the rice
2 grows at various stages?

3 A This is a common misconception that people unaccus-
4 tomed to rice culture have about this part of the world.
5 There are places in the world where the technique is to
6 actually flood the field. That is a form of water management
7 that allows people to get water where it would not normally
8 be. In the Mekong Delta the problem is getting rid of excess
9 water. It is a problem of drainage more than irrigation.
10 Some fields flood earlier than others through natural rain
11 fall and the rise of this perched water table.

12 Q In fact, an area like this under cultivation, the
13 amount of water in there is something the farmers would be
14 able to control?

15 A Yes, they are trying to control the water in there.

16 Q You described this area as the Mekong Delta; is
17 that correct?

18 A For soil pedologic reasons and in speaking in terms
19 of world-wide distributions of soil, the Mekong Delta is a
20 unit that is homogeneous and easily mapable.

21 Q Could this area also be described as an estuary?

22 A Not in geomorphic terms.

1 Q Is there any tidal fall in this area?

2 A First of all, we have a confusion of terms. An
3 estuary is an estuary. The Chesapeake Bay is a brown river
4 delta. The estuary continues to build up by alluvial material
5 brought down by the highlands.

6 Q Is there, in fact, a tidal fall of the Saigon River
7 in this area?

8 A I don't know for sure. I have been told that there
9 is a tidal fluctuation. I would expect there to be a tidal
10 fluctuation. There is no reason to suspect that the Mekong
11 Delta would be the only place in the world on the coast that
12 did not experience a tidal fluctuation of some kind.

13 Q Do you know what the tidal fall would be in this
14 area?

15 A I have no idea.

16 Q Would that have any effect on the water in this
17 area?

18 A Again, I have been told that when the tide comes up,
19 there is a sort of natural damming effect on fresh water
20 coming down the river so that during high tides, water that
21 would normally drain more freely into the ocean gets somewhat
22 blocked, and then you would obviously have a flooding effect

1 upon the terrain. When the tide goes down, there is a
2 flushing effect, so to speak.

3 Q So the flushing of the tidal waters would, in fact,
4 have some relationship or could affect the appearance of water
5 in this area; is that correct?

6 A In this area, I don't know. It depends on how far
7 up the river one feels the effects or one observes the effects
8 of that tidal fluctuation. At this particular point, the
9 site at which the accident took place, I have no knowledge
10 about whether or not the tidal fluctuation is felt that far
11 up river.

12 Q Did you make any attempt to determine that infor-
13 mation?

14 A No, I did not.

15 Q I would now like to turn our attention to the west
16 side of the Saigon River. I believe your discussion there
17 begins at page 15 of your report; is that correct?

18 A That is correct.

19 Q You mention here, beginning that there were two
20 procedures used for calculation of the various measurements;
21 is that correct?

22 A That is correct.

1 Q Could you describe briefly for us the two procedures
2 and particularly the differences between the two?

3 A The first procedure arrives at a length of the track
4 based on observations and measurements of the people shown in
5 Figure 10 and culminates in the diagram I have shown on page
6 20, given as Figure 13. That analysis on page 15 is all leading
7 up to describing who and what I measured.

8 The diagram on page 20 gives you the summation of
9 all of those measurements but again it is all done by pro-
10 portional measurements, from objects and phenomenon visible
11 in Figure 10.

12 The second procedure, I turn to the Army Topographic
13 Comman Map, which shows the location of some canals and walk-
14 ways along which people have ingressed and egressed from the
15 area, and I tried to tie the measurements into the Army
16 Topographic Map and the features shown on that.

17 Q What specific Army Topographic Map did you use?

18 A It is the same map on which -- it is exactly that
19 map but my version is a Xerox copy.

20 Q By that map, you are referring to what was previously
21 identified as Plaintiffs' Exhibit 3-H?

22 A Yes. I have that somewhere in the report. It is

1 Figure 14 on page 23.

2 Q You are saying from the map, which appears as page
3 22, Figure 14, you are able to determine the canal sizes; is
4 that correct?

5 A No. What I calculated on Figure 14 was the distance
6 from the west bank of the Saigon River to the north-south
7 trending canal walkway -- you can see the heavy dark line
8 going across there that I superimposed on that dark area.

1 Q Doctor, there is a word, d-o-n-g, at that point;

2 is that correct?

3 A That is correct.

4 Q Is the dotted line the one that cuts through the
5 end of that word?

6 A Yes.

7 Q You are identifying that dotted line as what?

8 A It is a canal walkway.

9 Q Doctor, do you know the date of the topographic
10 map that you are using?

11 A It is recent. I don't recall the exact date on it.
12 I think it is more recent than the photographs.

13 Q You are saying the map was drawn more recently
14 than the photographs?

15 A I think so but I am not positive. The map is from
16 the Library of Congress.

17 Q Do you know whether the west side of the Saigon
18 River -- strike.

19 You say you measured from the area of the west side of
20 the Saigon River to the area of the pathway across the canal;
21 is that correct?

22 A Yes.

1 Q Do you know whether the west side of the Saigon
2 River as indicated in Figure 14, which is the Army topographic
3 map, reflects the edge of the vegetation, the edge of the dike
4 which we know to bound the river, or what point?

5 A It would reflect the river bank, itself, not the
6 vegetation or the guideline to the west of the river.

7 There is fringing vegetation along that river. Typi-
8 cally, these maps are produced -- the line they would show
9 there would be the mean water mark.

10 Q Do you know how that relates to the position of the
11 dike that bounds the west side of the Saigon?

12 A No, I can't calculate it from this map.

13 Q As I understand it, the two procedures you used,
14 one was based on proportional measurements of human beings
15 in various pictures and the overall was based on the topo-
16 graphic map?

17 A Thht is correct.

18 Q Do you regard one of these as more accurate than
19 the other?

20 A I think the topographic map is more accurate of the
21 two procedures.

22 Q With regard to the first procedure you used based

1 on the height of the Vietnamese personnel in the pictures,
2 you have used an estimated height of 5.33 feet; is that
3 correct?

4 A That is correct.

5 Q On what did you base that?

6 A My personal experience with the average heights of
7 Thai and other people from that part of the world.

8 Q My recollection of your deposition is that you
9 have never been to Vietnam; is that correct?

10 A I have never been to Vietnam.

11 Q Do you have any idea what the average height of
12 Vietnamese individuals would be?

13 A Judging from pictures and photographs I have seen,
14 they are roughly the same heights as Thai people. On the
15 average, they are shorter than -- I want to say Americans.
16 I don't want to get wrapped up in ethnicities if I don't
17 have to.

18 Q In point of fact, you have no specific information
19 from the selection of that height. You simply selected a
20 figure which you probably thought was correct?

21 MR. MCMANUS: Based on his experience and personal
22 knowledge.

1 THE DEPONENT: That is correct.

2 BY MR. CONNORS:

3 Q But no experience with Vietnamese?

4 A Don't say no experience at all. We have a lot of
5 boat people in Albuquerque. I have never actually seen them
6 in Vietnam.

7 Q Are they Vietnamese or Cambodians?

8 A Some of each.

9 Q Do you know which?

10 A I can't tell the difference.

11 Q Turning to Figure 6 on page 10 of your report,
12 there are several lines drawn and also an arrow pointing to
13 a figure in approximately the upper center of the picture.
14 Opposite the arrow it states "Estimate 5.33 feet."

15 Is that correct?

16 A Yes.

17 Q Is that the individual you used for scaling in this
18 picture?

19 A Yes.

20 Q Did you use any other individuals?

21 A No.

22 Q Why did you select that person?

1 A Because that person appeared to be standing almost
2 upright and was located at the dike that I was attempting to
3 measure.

4 Q Is that a man or woman?

5 A I don't know.

6 Q Is that person standing on the ground or in one of
7 the track marks?

8 A I am not sure. The person is standing on the ground,
9 obviously.

10 Q Let me rephrase the question.

11 Is the person standing on undisturbed ground or is the
12 person standing in one of the track marks from the accident?

13 A I am not prepared to say the track mark extends that
14 far. I am not even sure the lines indicated there are, in
15 fact, track marks. In subsequent analyses of these pictures,
16 I am struck by the trend of those lines as being very parallel
17 to the canal, this drainage canal to the left. As I state
18 in the report, I am not even sure those are track marks. I
19 would like to put a question mark after that.

20 Q Is the person standing in vegetation?

21 A Yes, there is some vegetation there.

22 Q And the person is wearing a hat?

1 A Yes.

2 Q How did you determine the reference with respect to
3 the height of individual?

4 A With the equipment I have listed on, I think page 2
5 or page 1, in the introduction of the report, I simply made
6 a measurement from the top of the hat to the bottom of what I
7 could discern as the person and took that to be 5.3 feet. I
8 was not particularly concerned about being able to see the
9 sole of the shoe.

10 Q In point of fact, the measurements are based on
11 the height of an average Vietnamese, but also the points you
12 selected on that individual?

13 A Yes, and as I have stated, that is why I engaged in
14 Procedure No. 2 for verification.

15 Q Is the Army topographic map / hat you used a standard
16 map of projections?

17 A Yes.

18 Q How did you work from that distance which, looking
19 at your drawing, appeared to be an east-west determination
20 on a vertical plane to the measurements which you have made
21 on Figure 11, which is Walker 3-335?

22 A First, I concluded that Figure 15 -- no, I am sorry.

1 I first measured the distance off the topographic map
2 which is given to you as Figure 14. I then transferred my
3 attention to Figure 15 which shows the river bank and the
4 location of this north-south trending canal walkway that I
5 have highlighted. Knowing what that distance is, to then
6 use a combination as I have described it here in the text,
7 to use a combination of other photographs to indicate to me
8 the beginning and end points of the prominent cracks filled
9 with water and make that measurement on Figure 15.

10 Q What I am really looking at is how you work from
11 a measurement taken from a vertical map which presumably was
12 measured relatively accurately but from some source to photo-
13 graphs taken from an aerial oblique position not in the east-
14 west direction from which you took the measurement, but
15 with the pictures running left to right in what I believe
16 would be the north-south direction.

17 A Right.

18 What I have done is to -- for example, on Figure 11,
19 Walker 335, it is possible to see a prominent track which
20 leads up to some point. It actually ends in a little, as I
21 refer to it in the text, a little hook to the left. Do you
22 see where I am referring?

1 Q Yes.

2 A Now, I match that up with these borders, these field
3 borders that are running across here and then I find the same
4 borders on Figure 15, and that, by definition, tells me where
5 those plane tracks are ending.

6 Since, on Figure 15, all of the phenomena that I am
7 measuring fall at that same distance from the camera lens,
8 I am able to convert what is shown on the Army topographic
9 map in vertical format to something I can see in a weak
10 format. As I clearly state in the report, these measurements
11 would not be possible if I were moving all over the print,
12 itself. Since all of the phenomena I am measuring are in
13 this straight line, then I can make some reasonable cal-
14 culations.

15 Q Figure 15 is an overview of the entire slide area,
16 is it not?

17 A Yes, it shows the river bank, the tail section, the
18 troop compartment, the flight deck and some portion, although
19 it is less clear on the very right, the wing and rear.

20 Q Were you able to determine the length of the track
21 marks on that particular photograph?

22 A That is what I am showing.

1 Q What I mean is you were estimating length of track
2 marks from pictures running along the track before. Here you
3 have a complete view of the accident scene. My question is
4 are you able, with your magnifier or whatever, to identify
5 all of the track marks in this picture?

6 A No, I can't see the long track; the first initial
7 long track on the west side of the river is not visible in
8 Figure 15.

9 But I know very closely where it begins and ends because
10 of the evidence shown on the prior photographs, by tracing
11 out boundaries and terminating the measured line on Figure 15
12 with the known terminus of that main track as shown on Figure
13 11.

14 Q The figure 13 which is on page 20 -- are those
15 measurements derived entirely from the topographic map?

16 A No, not all of these measurements. Some of these
17 measurements are derived from the first procedure, and the
18 number given to you, 456, I have rounded it off. If you
19 refer back to page 15 under the capital letter A with length
20 of tracks, I rounded it off to 460 feet.

21 Then, on Figure 15, I have a minimum of 442 feet and a
22 maximum, if you extend the observations in these prior

1 photographs, I come up with a maximum length of 576 feet, as
2 I say, and which is shown on Figure 11; I am not sure that that
3 extended length is in fact tire tracks. They are so parallel
4 to that drainage canal that I am not sure that they are
5 related in any way to that C5A.

6 Q Did you ever explain Figure 13 in your report?

7 A I don't really explain it. It is a sort of summa-
8 tion of a lot of these measurements.

9 Q Derived from both the extrapolations of the height
10 of a Vietnamese individual and also the Army topographic map?

11 A I didn't use the topographic map after that. It is
12 Procedure 2 that uses that.

13 Q That is my question. I thought I asked you before
14 how Figure 13 was derived and I thought you said it was
15 derived from both procedures.

16 A Yes, yes, and what I have done is to measure the
17 distances from the river to the western ends of those field
18 borders as they appear on Figure 15. So, where it says
19 "Morain 290 feet," let me make sure -- that is Figure 15 --
20 Morain No. 2 is Figure 15.

21 Where it says "Morain, 290 feet" and "Morain No. 2, 250
22 feet, those measurements were made from Figure 15.

1 Q Which is the topographic map?

2 A No, which is Walker 262.

3 Q What are these box sections angling off to the
4 right?

5 A They are, as we refer to them, an uncontrolled sketch.
6 It is merely a sketch. It is not a map in the sense of using
7 control points. It tries to recreate the general view shown
8 in Figures 11 and 12 in a planometric form rather than an
9 oblique form.

10 Q My problem is on Figure 13 you have the river, the
11 curved line at the very bottom.

12 A That is right.

13 Q Then you have a box immediately above with Morain 8
14 drawn in which refers to Figure 8 or Picture 8.

15 A Figure 11, Walker 335. It is from Figure 11 that I
16 measure the distance across this field as 118 feet.

17 Q The lefthand edge would be the edge of the drainage
18 canal?

19 A That is correct.

20 Q And the righthand edge would be what?

21 A It is another apparent field boundary.

22 Q So, these little squares are the field boundaries,

1 then?

2 A Yes.

3 In fact, what I have engaged in here, if you go back to
4 my first deposition on this convergence of evidence, I am
5 merely trying to establish measurements within bounds of
6 reasonableness so that I have something to tie back to when
7 I make other measurements and that is what Figure 13 is all
8 about.

9 Q Those box marks are not intended to reflect the
10 track of the airplane?

11 A No way.

12 Q The straight lines or vertical lines would be
13 directly west from the river are also not intended to
14 reflect the track marks of the aircraft; is that correct?

15 A No, those are the calculated lengths of those fields.

16 Q In point of fact, except for the one reference to the
17 main track, there is no reference to the track in the air-
18 craft at all in Figure 13, is there?

19 A To the right it says "Main track completely flooded"
20 and it shows a dashed line going over to that box that con-
21 tains the word "Morain 8." From that point in a vertical
22 direction, the line in there is the line of the track as shown.

1 on Figures 11 and 12.

2 Q And it appears in a flooded state.

3 A That is correct.

4 Q Turning to page 21 of your report, you refer to
5 measurements of the T-tail; is that correct?

6 A That is correct.

7 Q How did you integrate measurements of the T-tail
8 with the topographic map?

9 A Again, that is for confirmation purposes. I did
10 not exactly use that length of 34.5.

11 I am using that to establish what one centimeter is
12 equal to; if one portion is equal to the .40-45, then I come
13 up with 192 feet. As I measure across this line on Figure 15,
14 every centimeter is roughly to 190 feet.

15 Q That again is based on the measurements you have
16 taken from the T-tail to the point where the fuselage ends
17 to the top of the T-tail; is that correct?

18 A Yes, those two tips that are present there.

19 Q Would the fact that they are at an angle and at a
20 horizontal angle on Walker 263 affect the measurements?

21 A Would you state that again, please.

22 Q Would the fact that the aft end of the fuselage is

1 not directly in vertical line with the aft tip of the T-tail
2 affect the measurements from Figure 15 or Walker 3-262 where
3 they appear to be in a straight horizontal line?

4 A Figure 15, Walker 262, the two tips that I am
5 measuring are on almost exactly a horizontal line.

6 Q But they are not on a straight line with the air-
7 craft, are they?

8 A Well, you would have to refer back to Figure 4
9 on page 7. They are not exactly on a straight line, no.

10 Q Would that affect the measurement of the distance?

11 A I don't think that there is enough of a variation
12 at that scale and at that location. I don't think there is
13 enoug variation to alter the scale.

14 Q Do you know what the variation is?

15 A No, I have not calculated it.

16 Q I assume from the statement on page 21 of your report
17 that Figure 15 is only accurate in terms of horizontal dis-
18 tances; is that correct?

19 A Yes, as long as one works within a narrow range of
20 distances from the bottom edge.

21 Q You refer on page 24 of your report to the debris
22 map, (doc C-5A SN 68-218 - 4 April 1975).

1 Is that the wreckage diagram which is attached to the
2 Collateral Report?

3 A This is the original wreckage diagram.

4 In fact, is it possible for me to go off the record a
5 second?

6 Q Sure.

7 MR. McMANUS: Doctor Morain is concerned that at
8 the top of the map he has prepared, 2C is used.

9 We want it to be clear that will ultimately be
10 removed from the wreckage diagram and his diagram should not
11 in any way be confused with the one that has been prepared as
12 part of the Collateral report.

13 MR. CONNORS: That is why I asked the question.

14 THE DEPONENT: I don't even know what these numbers
15 refer to. In my reconstruction of the map, they have no
16 meaning. I don't want people to get confused.

17 BY MR. CONNORS:

18 Q On what do you base your statement that there was
19 not continuous contact of the aircraft with the ground, on
20 page 24 of your report?

21 A The photographs that are contained later in the
22 report show no, to me, no indication or evidence of anything

1 rolling across the ground or being in contact with the ground.

2 Q There are obvious track marks immediately after
3 crossing the Saigon River; is that correct?

4 A Yes, very obvious.

5 Q Are you aware of the dike on the west side of the
6 Saigon River, the large main dike which bounds the river?

7 A I am aware there is one.

8 Q How far after that dike do the track marks first
9 appear?

10 A As I stated in the report and as evidenced on
11 Figure 12, it appears that they are first really evident about
12 an estimated one-third of the way into the paddy field.

13 Q How far would that be?

14 A It is a third of what I estimate, a third of 250
15 feet, so roughly 80 feet.

16 Q Starting at that point, that is, where the track
17 marks begin, in your opinion, for what distance was the air-
18 craft in contact with the ground?

19 A The evidence from the photographs indicates that
20 it was on the ground somewhere between 450 feet and, as I state
21 in the report, a maximum of 500-something feet.

22 Q In your opinion, what happened then?

1 A I am not sure I am competent to answer what happened
2 then. All I know is the tracks appear to be gone.

3 Q Is it your opinion the aircraft was essentially in-
4 tact through the length of the slide marks and by "sub-
5 stantially intact," I mean that the major sections of the
6 aircraft, T-tail, troop compartment, flight deck and wings
7 were still attached?

8 A You are asking for an opinion. I have no way of
9 knowing how much of the aircraft was there at the time those
10 tracks were made.

11 All I can say from the evidence in the photographs is
12 that the tracks are evident, prominent, and I have to leave
13 it to other experts to decide what it was or how much of an
14 object made those tracks.

15 Q On page 24, you refer to the end of the skid mark
16 as being identifiable as a short lefthand hook on Figure 12.
17 Is that based on the presence of water in the track mark at
18 that point?

19 A Yes, it is.

20 Q In fact, there could be a further track mark past
21 that point that was simply too shallow to capture any water;
22 isn't that correct?

1 MR. MCMANUS: I object to the form of the question.

2 You can answer it, if you can.

3 THE DEPONENT: As I have indicated on Walker 335,
4 I would show some dashed lines extending beyond that hook,
5 westward of that hook. But, as I say, those lines are so
6 suspiciously parallel to the drainage canal that I am person-
7 ally highly doubtful that these were made by this aircraft
8 in whatever form it happened to be at that point.

9 In fact, it would suggest if they are not part of
10 continuation of that track, it would mean the aircraft was
11 going along and suddenly -- my intuition tells me that is
12 not likely, so I think these dashed lines are part of the
13 natural drainage system of that field.

14 MR. MCMANUS: You indicated with your hand when
15 you said "and suddenly" and you didn't use any words there.
16 Could you use some words so the reporter can take it down.

17 THE DEPONENT: There is an obvious heading for
18 these main tracks that we all agree are flooded with water.
19 At the point where there is a little bit of a hook to the
20 left, those tracks terminate.

21 There is then evidence for some water-filled
22 depressions to the west of the hook, but those water-filled

1 depressions have a different heading and are parallel to the
2 drainage canal obvious in the picture.

3 What I am saying is that if one were to put -- if the
4 heading of the aircraft were something like 275 degrees at
5 the point of the hook and then suddenly at the point of the
6 hook the heading would have to change to something else,
7 which I can't determine from this photograph.

8 BY MR. CONNORS:

9 Q Doctor, the track marks or gouges that we have
10 been referring to on the west side of the river -- these are
11 the ones that appear in Figure 12 and virtually every one
12 of the photos you have referred to -- are two parallel track
13 marks running from the west side of the Saigon River in a
14 westerly direction; is that correct?

15 A That is correct.

16 Q These are very noticeable defined parallel track
17 marks; is that correct?

18 A That is correct.

19 Q Isn't it also true along these areas the ground is
20 disturbed in other ways besides those two parallel tracks
21 along the flight path of the aircraft?

22 A Yes.

1 Q You have stated that those two track marks termin-
2 ate at a specific point, which is where you say they take a
3 short left hook; is that correct?

4 MR. McMANUS: No, that is not what he said. He
5 said if those other marks which he is highly suspicious of
6 being made by the airplane, they indicate a sharp turn.

7 MR. CONNORS: No.

8 BY MR. CONNORS:

9 Q Page 24, the second full paragraph, says, "The
10 end of the skid mark is identifiable on the photograph as a
11 short (southward) trending hook of water." Do you see that
12 statement, Doctor?

13 A I know it is there but I have not found it yet.

14 Q That is the point that you are stating is the
15 identifiable end of that skid mark; is that correct? And the
16 ski marks are the two parallel tracks we are referring to;
17 is that correct?

18 A Yes.

19 Q You also just agreed with me, in addition to the
20 two parallel skid marks or gouge marks, the earth along the
21 flight path has been disturbed in other ways; is that correct?

22 A You are referring, I presume, in Walker 335 to
this series of water-filled depressions?

1 Q Isn't it in fact the ground is disturbed along the
2 line of the flight path and between and around those two major
3 track marks?

4 A Yes. There is standing water between the two
5 tracks; that is correct.

6 Q So there is general ground disturbance, is there not?

7 A Yes.

8 Q If we use as a point of reference the short left or
9 southward trending hook of water that you say ends those two
10 major parallel track marks, doesn't the ground disturbance
11 continued past that point?

12 A There is evidence for one track to extend slightly
13 into the other field, to the field just to the west of the
14 one we are referring to here, but most of the disturbance,
15 again, seems to be along lines parallel to that major drainage
16 line.

17 Q Doctor, isn't it correct that if you continue the
18 line of the track marks we have been referring to through the
19 place where the troop compartment came to rest that there is
20 general ground disturbance throughout that entire half?

21 A This is more evident in other photographs than
22 this one there is a lot of debris in that area.

1 Q And there is general ground disturbance along the
2 path marked by the track marks we have been referring to, the
3 two parallel track marks at the point at which the troop
4 compartment eventually came to rest.

5 MR. McMANUS: Are you asking that with respect to
6 Walker 335?

7 MR. CONNORS: Any of the pictures.

8 MR. McMANUS: I object to the question.

9 THE DEPONENT: I see a lot of disturbance.

10 BY MR. CONNORS:

11 Q I am trying to distinguish between the general
12 track marks and the terrain, the ground along the flight path.
13 There are clearly smaller gouge marks, pot marks where pieces
14 may have hit, a great deal of disturbance, but I am talking
15 generally about a disturbance of the ground, a continuous
16 disturbance of the ground from the beginning of the track
17 marks, the track marks being one form of the disturbance
18 through the point at which the troop compartment came to rest.

19 MR. McMANUS: Are you saying is there any relation
20 to this picture?

21 MR. CONNORS: Any picture he has reviewed.

22 THE DEPONENT: I don't like the word "disturbance."

1 There is some alteration. The surface has obviously been
2 altered by all of this debris. I think I would like a better
3 clarification of disturbance.

4 BY MR. CONNORS:

5 Q Has there, in fact, been a continuous alteration on
6 the west side of the river where the track marks begin and
7 the point at which the troop compartment came to rest?

8 MR. McMANUS: Are you using the word "tracks"? He
9 does not understand what you mean. He said there is debris
10 there. It alters the landscape when you have debris from
11 your wrecked airplane all over the place.

12 THE DEPONENT: Basically, again he said it. There
13 is a lot of debris there. I don't see any evidence there for
14 continuous, intimate contact with the ground that would lead
15 to anything like a track, but I have seen numerous photo-
16 graphs in these sets that we have discussed that give evidence
17 for some kind of a fuel spill or something like that and a
18 lot of debris, and in that sense I will agree that there is
19 some disturbance along that entire pathway, but not dis-
20 turbance in the sense of an intimate contact with something,
21 for want of a better term I will say with rolling across the
22 surface.

1 BY MR. CONNORS:

2 Q It is your opinion, then, that there are not
3 continuous linear alterations of the surface on the west side
4 of the river from the point of first impact where the track
5 marks begin to the point where the troop compartment first
6 came to rest; is that correct?

7 A It is my firm belief that there are not continuous
8 markings.

9 Q If, in fact, there were continuous markings, would
10 your opinion regarding whether the aircraft was in contact
11 with the ground be incorrect?

12 MR. McMANUS: He said it is his opinion that there
13 was not continuous contact.

14 BY MR. CONNORS:

15 Q Can you answer the question, Doctor?

16 A In fact, on page 24, in the top paragraph, it
17 goes through my reasoning on this.

18 Q Doctor, my question is, if, in fact, there were
19 continuous linear marks along the ground at the point where
20 the track marks begin just west of the Saigon River to the
21 point where the troop compartment came to rest, would your
22 opinion be --

1 MR. MCMANUS: Do you have any such evidence, and I
2 would demand that you tell us about it.

3 MR. CONNORS:

4 Q Can you answer the question?

5 MR. MCMANUS: No, he is not going to answer the
6 question.

7 MR. CONNORS: My question is whether this man has
8 done what he is supposed to do.

9 MR. MCMANUS: Don't answer the question.

10 If you have some basis for that question, fine, we
11 are not going to sit here and listen to you make up stuff.

12 John, be reasonable. If you have some reason to
13 believe there are continuous tracks, I will be glad for you to
14 ask him those sort of questions.

15 BY MR. CONNORS:

16 Q Doctor, is it your opinion that in the photographs
17 you have been shown by plaintiff's counsel that there are no
18 continuous linear track marks at the point where the aircraft
19 touched down after crossing the Saigon River until the point
20 at which the troop compartment came to rest?

21 A None of the photographs I have seen indicate con-
22 tinuous track marks on the west side of the Saigon River.

1 Q Is it on that basis that you made the statement
2 that the aircraft was not in continuous contact with the ground?

3 A Yes.

4 Q Doctor, you referred to seepage water as the water
5 which flooded the tracks on page 26 of your report.

6 A Yes.

7 Q By "seepage water," are you referring to water com-
8 ing up from below?

9 A I am referring to water that is moving laterally
10 and for which I have given a small diagram.

11 Q Is that the one we marked at your prior deposition?

12 A Yes, sir. It is given on page 41, Figure 24. The
13 water generally held above the clay water will move laterally
14 and seep into depressions.

15 Q You are talking about water that is captured in
16 the soil and then seeping into a track mark?

17 A Yes, sir.

18 Q As opposed to water which may have been standing
19 water in a rice paddy and then either evaporated or was
20 drained away?

21 A That is correct.

22 Q What did you use as a scale for the purpose of

1 measuring the depth of the track marks on the west side of
2 the river?

3 A As I indicated, I have no way of knowing how
4 deep -- I am referring now to the very prominent tracks
5 that end in that short hook. I have no way of calculating the
6 depth of those because they are filled with water.

7 I did give my opinion with regard to the depths from
8 the soil level to the top of the standing water.

9 Q Doctor, did you use the length of the troop compart-
10 ment as it appears in the various pictures as one of the
11 means to scale any of the dimensions?

12 A Yes, I did.

13 Q For that purpose, you assumed the length of the
14 troop compartment as it appears in the picture to be 65 feet?

15 A Yes, I think that is consistent throughout the
16 report.

17 Q Doctor, what is the distance between either the
18 west bank of the Saigon River to the dike which bounds the
19 west bank, whatever you used as your benchmark, to the
20 point where the troop compartment came to rest?

21 A As I have indicated in my revised diagram, the
22 revised wreckage diagram, the troop compartment is

1 approximately 1,715 feet from the west bank. My measurements
2 are from the west bank.

3 Q What are you defining as the west bank?

4 A The line shown on the Army topographic map.

5 Q On your diagram which we have marked as Exhibit
6 2541-37, what is the point of reference there for the west
7 side of the Saigon River bank?

8 A It is actually the right-hand line that defines
9 the vegetation.

10 Q You are using the vegetation line in your diagram?

11 A The difference between the bank and the vegetation
12 line is virtually synonomous. There is no distance between
13 them.

14 Q I am just trying to find out what point of reference
15 you used here and it is the vegetation line shown on the
16 wreckage diagram?

17 A Yes.

18 Q What is the distance from the point of first impact
19 after crossing the river with the point at which the troop
20 compartment came to rest?

21 A For references, let's make sure we are talking about
22 the same thing.

1 Q Your reference diagram says initial impact point.

2 What is the distance that the troop compartment came to
3 rest?

4 A I think we have already agreed the initial impact
5 point to the resting point -- if you take 1700-some feet and
6 subtract 80 feet --

7 Q So you are saying the total distance was less than
8 17 hundred feet?

9 A Yes.

10 Q Was that measured from the foreward or aft end of
11 the troop compartment?

12 A The aft end.

13 Q So we would take the 1,715 feet and subtract ap-
14 proximately 80 feet; is that correct?

15 A Yes.

16 Q Doctor, on page 32 of your report you referred to
17 the skid pathway being depressed. What do you mean by that?

18 A There is a photograph which I do not have in the
19 report -- wait a minute. It is Figure 21. I do have it in
20 the report. On page 34, Walker No. 83, there is the
21 appearance -- I am trying to find words that everybody under-
22 stands, non-technical terms -- vegetation on either side from

1 the direction of the troop compartment. It is undisturbed
2 and it looks as though there is a slight depression all the
3 way along that pathway.

4 Q I am still not following you.

5 Do you mean along the path the track marks leading up to
6 the troop compartment?

7 A There appears to be a slight bowing in the surface.
8 The track seems to be somewhat depressed.

9 Q Do you mean the vegetation between the tracks has
10 been cleaned away?

11 A That would be a reasonable conclusion.

12 Q So what has been cut away is vegetation and perhaps
13 the wood or whatever it was at the very top or the mud or
14 whatever it happened to be?

15 A The evidence is that the vegetation is gone and
16 whatever else may have happened.

17 Q Doctor, there is a reference in your report which
18 I think may not appear until the summary section relating to
19 an elevation in the terrain.

20 Do you know the height above sea level of the rice paddy
21 area on the west side of the river?

22 A I tried to determine that from the Army Topographic

1 Command map that I have. The Xerox copies I have are not in
2 color and the contour lines are in color and they don't re-
3 produce, so I don't know the answer to that question.

4 Q I believe you indicated you thought the rise was
5 somewhere in the neighborhood of two feet; is that correct?

6 A Yes.

7 Q On what are you basing that statement?

8 First off, can we find the reference in your report
9 where it first appears? I don't think I see it in the sec-
10 tions we have been dealing with here. I know it appears
11 later in the summary section. Do you refer to that anywhere
12 in the main portion of your report?

13 A On page 42, that is the section where I talk about
14 topography.

15 Q This is the summary portion?

16 A No, the summary starts on page 47.

17 Q So page 42 --

18 A On page 44.

19 Q On what are you basing the references beginning on
20 page 42 of an elevation in the topography around the troop
21 compartment and leading up towards the troop compartment?

22 A Partly on the transparency I produced from one of

1 the aerial oblique photographs which I delineated and what
2 appears to be an inflection point in the slope and from the
3 general appearance of the forward end of the troop compartment
4 and its relationship to the vegetation at that point.

5 Q What do you mean, the relationship to the vege-
6 tation?

7 A The vegetation -- as you can see on a number of
8 the exhibits, there seems to be a line of higher ground for-
9 ward of the troop compartment or at the foreward end of the
10 troop compartment. I don't know how else to say it except
11 there is evidence there for higher ground. When I look at
12 it on the aerial photograph, I can delineate what appears to
13 be the deflection point for that higher ground.

14 Q You are saying that would be approximately two feet
15 above the height of the area east of that?

16 A I don't know exactly how high it is.

17 Q Over what distance does that rise take place?

18 A The evidence from the transparency seems to indi-
19 cate that it originates rather abruptly there at the foreward
20 end of the troop compartment.

21 In fact, the evidence from the photographs suggests that
22 there is a swampy sort of topographic depression, the western

1 edge of which follows this inflection line that I have drawn
2 on here and the troop compartment appears to have come up
3 against the inflection. It is a long, roundabout way of
4 saying it happened over a very short distance.

5 Q Am I to understand your inflection line is based
6 on the change in vegetation?

7 A Yes.

8 Q Is there any reason to believe the change in vege-
9 tation relates to a change in elevation?

10 A That is usually what happens. Ecologically speaking,
11 the vegetation is geared to moisture and water availability
12 and as is typical around the world, areas that are in topo-
13 graphic depressions tend to be different from the vegetation
14 surrounding it.

15 Q Is it your opinion that the troop compartment,
16 that is, the forward edge of the troop compartment, is butted
17 up into this elevation?

18 A It certainly appears that way.

19 Q Before, there would be material in front of the
20 front end of the troop compartment; is that correct?

21 A Not necessarily. It depends on how far away this
22 object began to plow the vegetation.

1 Q Is it correct, then, to say that if the elevation
2 is supposedly two feet above the area to the east that there
3 should be about two feet of the front edge of the troop
4 compartment covered by this material or butted into it?

5 A I think that depends on the scenario you write for
6 the final moments of the troop compartment and not being an
7 aeronautical engineer, I cannot answer that.

8 Q It appeared to slide across the grade.

9 A It does not necessarily indicate that it was serv-
10 ing as a plow.

11 Q If it were not in contact as serving as a plow, then
12 it would not have made contact with this elevation?

13 MR. McMANUS: That is not necessarily true.

14 THE DEPONENT: I think the conclusion you are draw-
15 ing, what you are asking for would entail my giving you a
16 scenario on what I thought happened to that troop compartment
17 and I don't believe that is within my area of purview. The
18 troop compartment might have come to rest very abruptly.

19 MR. McMANUS: Just respond to his questions.

20 BY MR. CONNORS:

21 A Outside of the change in vegetation, do you have
22 any evidence to support the rise in elevation at the point

1 where the troop compartment came to rest?

2 A No.

3 Q In the middle of page 42 you make the statement,
4 "The terminus of the tracks suggests the C5A was gradually
5 becoming airborne and placing less stress on what would other-
6 wise have been a rather boggy and plastic situation."

7 A That is on page 42?

8 Q Yes, sir.

9 A I was so busy finding it, I forgot your question.

10 Q I just wanted you to find it first.

11 At what location or period in the slide was the C5A
12 supposedly airborne in your opinion?

13 A From the end of the tracks marked "B" on the
14 revised wreckage diagram to the beginning of the tracks
15 marked "D" on that diagram.

16 Q Approximately how grand a distance is that?

17 A I calculate that to be 960 feet.

18 Q Are you saying the troop compartment was airborne
19 for 960 feet?

20 A There are no tracks on the ground. That is what I
21 am saying, that there are no tracks on the ground. I don't
22 know what else was happening.

1 Q You also stated that this change in vegetation
2 was inferred from the change in coloration; is that correct?

3 A Yes.

4 Q What do you use to support that inference?

5 A Not only the color but the type of vegetation as
6 shown on a variety of these ground-based photographs. I
7 happen to be referring to one I picked up at random, Bandy 35,
8 but there is a difference in the vegetation shown here in
9 addition to which the helicopter, itself, is resting at
10 an angle so there is a suggestion of a slope.

11 Q You are relying on that to show the change in
12 elevation?

13 A Yes.

14 Q I would like to turn briefly to some statements you
15 made regarding discoloration.

16 MR. MCMANUS: Two minutes. Be brief.

17 BY MR. CONNORS:

18 Q Without your report relating to discoloration, you
19 refer to the presence or absence of the chlorophyll.

20 A In that section, but not throughout.

21 Q On what do you base your statement that there is
22 an absence of chlorophyll in any given area around the troop

1 compartment or any other part of the airplane?

2 A The absence of green. If vegetation is green it
3 has no chlorophyll in it.

4 Q What, in your opinion, caused the chlorophyll to be
5 absent from those areas?

6 A As I indicated in the report, it may have been
7 caused by a very rapid, intense heat, it may have been caused
8 by physiologic damage caused by a fuel spill, but in my
9 opinion, it is heat simply because the vegetation in a number
10 of these photographs indicates physiologic death, and no
11 chlorophyll.

12 Q It is your opinion, then, that heat removes chloro-
13 phyll from plants?

14 A Well, it certainly causes the plants to die.

15 Q That was not my question. My question is, is it
16 your opinion heat causes chlorophyll to be removed from plants?

17 MR. MCMANUS: Are you asking always?

18 MR. CONNORS: He just stated the absence of chloro-
19 phyll was because of heat. I am trying to get a clearer
20 statement than that.

21 MR. MCMANUS: I don't know how much clearer he can be
22 than that.

1 BY MR. CONNORS:

2 Q Are you able to explain the mechanism by which
3 heat withdraws from plants?

4 A If the leaves are no longer photosynthesizing, they
5 are presumed dead.

6 Q Are you able to explain the mechanism by which
7 chlorophyll withdraws heat from vegetation?

8 A No.

9 Q You are not competent in that area?

10 A No.

11 Q On what are you basing the statement that heat with-
12 drew the chlorophyll from any of the areas shown in these
13 pictures?

14 A There are only a few explanations that are possible
15 and my experience in analyzing photographs for vegetational
16 analysis leads me to conclude that there has been extreme dam-
17 age to some of the vegetation around all of the units, that
18 is to say, the troop compartment, the wing area and the flight
19 deck, to cause me to conclude that the vegetation has been
20 killed.

21 Q But from that statement, how do you arrive at the
22 conclusion that heat in the area of the troop compart --

1 A By process of elimination.

2 Q What have you eliminated?

3 A I have eliminated at least preliminarily in my
4 thinking the idea of a coating by fuel. If fuel had merely
5 coated the vegetation, it seems to me that it would have
6 taken longer, if, in fact, there was any effect at all except
7 to give it a different color, if there is any physiological
8 effect from that, it would take several days for the physio-
9 logical effect to become noticeable either through the
10 wilting of the vegetation or the death of the vegetation,
11 but these photographs appear to have been taken within,
12 let's say, a couple of days and the vegetation is already
13 dead. It is not just coated, it is dead.

14 Q Do you have any training or background at all in
15 the chemistry or physiology of plants?

16 A I am not a plant physiologist.

17 Q On what basis, then, do you eliminate any causes
18 for the discoloration?

19 A Experience.

20 Q What experience do you have in the area of plant
21 biology?

22 A How much experience does it take to recognize dead

1 vegetation?

2 Q I am talking about experience in the chemical make-
3 up and chemical reactions of plants to given phenomenon. What
4 experience do you have in that area?

5 A All I am prepared to say is that all of my back-
6 ground experience is that some of that vegetation is dead.
7 I am not prepared to say what caused that death, but there
8 are lots of photographs there that substantiate that point.

9 Q In point of fact, you cannot state a cause for the
10 discoloration, can you?

11 A No, I cannot.

12 Q Doctor, you also made some statements regarding the
13 nature of the soils in the area, particularly with regard to
14 their resistance to deformation. On what do you base that?

15 A Clay soils with a lot of water in them become plas-
16 tic. In some cases they become even liquid and under such
17 circumstances it does not take much to deform them. It is
18 similar to what we have all grown up with in grade school,
19 making clay models of things. Clay is easily deformed if
20 it has enough moisture in it.

21 Q You are saying the ground in this area would have
22 been easily deformed?

1 A With all that water around, yes.

2 Q Doctor --

3 MR. McMANUS: Is this your last question?

4 MR. CONNORS: Last series.

5 MR. McMANUS: It is the last question.

6 BY MR. CONNORS:

7 Q What knowledge do you have of the type of lenses
8 or cameras that were used in taking these photographs?

9 A I have no knowledge ablut cameras or lenses used.

10 Q Would it make a difference in determining the
11 calculations?

12 A No.

13 Q Are you saying the presence of such a thing as a
14 wide-angle lens would not make a difference?

15 A It depends upon the kind of measurements one makes
16 and the kinds of measurements I make, my opinion is it would
17 not make any difference.

18 MR. McMANUS: Thank you, Doctor.

19 I am coming back with Doctor Turner.

20 If you would give me a few moments to pick up a
21 sandwich --

22 MR. CONNORS: Note I have not completed my questioning.

1 MR. McMANUS: Let the record note this is entering
2 the eighth hour of this gentleman's deposition. We previously
3 advised counsel for second deponents we would not be here this
4 long and counsel previously indicated to me that we would be
5 finished by 1:30. It is 2:15.

6 MR. CONNORS: I would also note we have a 50-page
7 report with a variety of photographs and none of these were
8 available the first time and all we were able to do is
9 general background. Today we have attempted to depose him
10 on this 50-page report.

11 MR. McMANUS: That is not quite correct.

12 [Whereupon, the deposition concluded at 2:15 p.m.]

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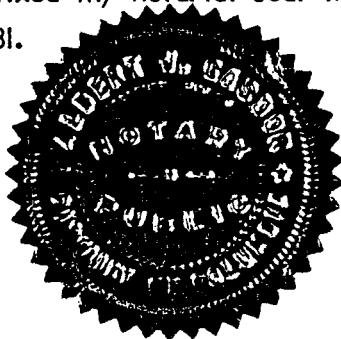
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DISTRICT OF COLUMBIA

I, ALBERT J. GASDOR, a Notary Public in and for the District of Columbia, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness is a true and accurate transcription of the stenographic notes taken by me and thereafter reduced to written form by me and/or under my direction and supervision.

I further certify that I am neither counsel for, related to, nor employed by any of the parties to this action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this litigation.

IN WITNESS WHEREOF, I have hereunto set my hand and
affixed my notarial seal this 25th day of November,
1981.



Albert F. Gossard.

Albert J. Gasdon

Notary Public in and for
the District of Columbia

My Commission expires:
July 31, 1985