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O/R-III (E)

PRESIDENT'S COMMISSION

ON CIA ACTIVITIES

1 OF 2

STAFF INTERVIEW

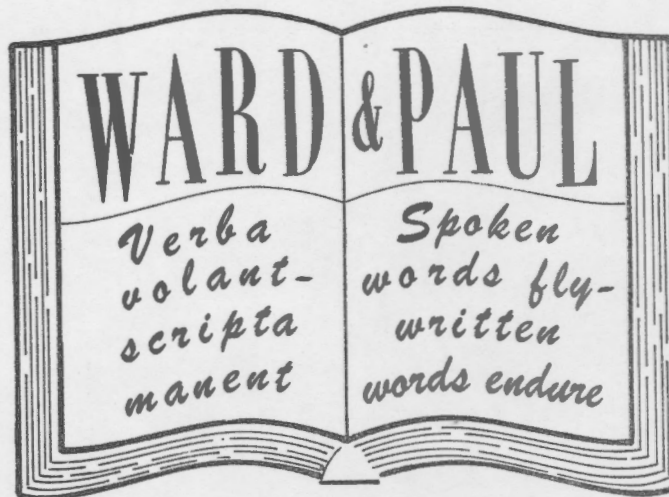
Washington, D. C.

Friday, April 18, 1975

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By KBL/NARA, Date 11/18/93



WASHINGTON, D.C.

410 First Street, S.E., 20003

Phone

(202) 544-6000

FAIRFAX, VIRGINIA

4055 Chain Bridge Rd., 22030

Phone

(703) 273-2400

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Phone (Area 202) 544-6000

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## STAFF INTERVIEWS

## PRESIDENT'S COMMISSION

## ON CIA ACTIVITIES

- - -

Washington, D. C.

Friday, April 18, 1975

The Staff met, pursuant to notice at 9:00 o'clock a.m.,  
in Room 14 N, National Archives, 85h and Pennsylvania Avenue,  
N. W., Washington, D. C.

## PRESENT:

DAVID BELIN, Executive Director,

ROBERT B. OLSEN; Senator Counsel

MARION JOHNSON; National Archives

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P R O C E E D I N G S

Whereupon,

ROBERT R. MC MEEKIN,

having been duly sworn by the Nortary Public, was examined  
and testified as follows:

EXAMINATION BY COUNSEL OF THE COMMISSION

BY MR. BELIN:

Q Would you state your name, please.

A Robert R. McMeekin.

Q Is it Dr. McMeekin?

A Right.

Q We are here watching slides made from the Zapruder film, and this one is numbered 312. The fatal bullet aftermath is shown on 313. And we are trying to measure the movement of the President's head as to whether it is going forward or backward. And at the fram 12 on the screen you have taken a measurement from the back of the President's head where his coat meets his head to a point which is on the structure which separates the passenger's from the driver. Do you want to measure that now and see what you get?

A I get 14 and a half inches now.

Q Now, on the top of this slide as it is showing on the screen you can see the presiding fram 311.

MR. OLSEN: I don't thing you have got it quite to the back of the head, the left-hand side.



1 COLONEL MCMEEKIN: This looks like 14 and three-  
2 eights.

3 MR. BELIN: I am going to go back to fframe 311,  
4 which will show 310 on top, and then back to 310, what shows  
5 309. Do you want to measure 310 at the bottom there and see  
6 how that is?

7 COLONEL MCMEEKIN: This appears to be 14 and three-  
8 eights.

9 BY MR. BELIN:

10 Q Now, we are going forward to 311, 312, and now 313.  
11 Do you want to try and make the same measurement there on 313?  
12 Or is it too fuzzy to do it on 313?

13 A This is awfully fuzzy.

14 Q At 313 we can see fully a splash of orange, so that  
15 you can see that the President has been hit, is that correct,  
16 you see part of the President's head being blown off there  
17 on 313.

18 A Yes, that is what it appears to be.

19 Q On 314, can you take a measurement at 314 right after  
20 he has been hit?

21 A Fourteen and a quarter.

22 Q This is 315, now.

23 A Fourteen and a half.

24 Q This is 316.

25 A Fourteen and seven-eights, it looks like.





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MR. OLSEN: That is before he is hit?

MR. BELIN: No, this is after he is hit.

MR. OLSEN: No, that is the subsequent frame.

MR. BELIN: I see. This isn't really 317, but it is 308.

The next frame is too fuzzy to measure, is that correct?

MR. OLSEN: Can you go back to 315?

The missing frame is shown up at the top. You can make that measurement on that missing frame.

MR. BELIN: That is correct.

We are showing 321 right now. At 321 it appears he is staring on the backward movement. Can you measure 321 on a backward measurement? I think it is more than 13 inches.

COLONEL MC MEEKIN: Yes, the ruler is 15 inches, it is more.

BY MR. BELIN:

Q Here is an 18 inch ruler. This is 321, now.

A. The head seems to be tipped back. I am going to try to measure it from the same point there, the lower part of the back of his head. And it looks like approximately 16 and a quarter.

Q So definitely at 321 he has started on the backward movement, is that correct?

A. It appears that he has.

Q Bob, what was that missing frame that they had the

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1 replacement on out of order?

2 MR. OLSEN: I think it was 317.

3 MR. BELIN: Here is 317, we have 317 at the very top,  
4 because of the taking of the Zapruder film where they had more  
5 than one frame on each 31 millimeter slide.

6 COLONEL MC MEEKIN: That appears to be 15 and a half.

7 BY MR. OLSEN: He has started backward at frame 317 --

8 MR. OLSEN: No, he has already started backward  
9 according to the measurements that Colonel McMeekin has given  
10 by fram 315.

11 MR. BELIN: Let's double check that. That is 317.  
12 Here is 316. Do you want to double check 316?

13 COLONEL MC MEEKIN: At the top or bottom?

14 BY MR. BELIN: The bottom. That is 316.

15 A. That appears to be about 14 and seven-eighths.

16 Q. That is 315 now. Do you want to measure that one?  
17 You can use your 15 inch ruler if you want to.

18 A. That appears to be 14 and three-eighths.

19 Q. This is 314. Do you want to measure that?

20 A. This is 14 and about an eighth.

21 Q. This is 313. Do the best you can as far as measur-  
22 ing that, if you would.

23 A. About 14 and a quarter. That is as close as I can  
24 come. It is awfully blurred.

25 Q. And then you get 312 on the top of that?



1 A. Fourteen and a quarter.

2 Q. Doctor, we have just been doing approximate film  
3 measurement here, and if you had to do an accurate reading,  
4 you would really have to have a film reader with some kind of  
5 a scale on it, is that correct?

6 A. That is correct, yes.

7 Q. Do you have facilities there to do that at your  
8 office?

9 A. We do not, no.

10 Q. I think Mr. Olivier is here and he has indicated that  
11 he has facilities at his office, and perhaps we can subsequently  
12 have that done.

13 Bob, do you have any questions before we adjourn to see  
14 those other films?

15 MR. OLSEN: I would like to ask Dr. McMeekin if  
16 on the basis of those approximate measurements that you have  
17 made you can tell whether the President's head moved at the  
18 time of the head shot being visible on fram 213 and what  
19 movements and in which direction it occurred thereafter?

20 COLONEL MC MEEKIN: Can we be off the record just a  
21 minute?

22 MR. BELIN: Sure.

23 (Off the record discussion.)

24 MR. BELIN: Back on the record.

25





BY MR. BELIN:

Q Just repeat what you said off the record, that you weren't paying too much attention and you were doing approximate measurements.

A That is right.

Q And you really can't remember which way it went other than what the record will show, is that a fair statement?

A Right.

MR. OLSEN: Would that be attributable to the fact that we kept going backward and forward and asking you to take measurements both ways?

COLONEL MCMEEKIN: Yes.

MR. BELIN: I think we had better get a film reader to check, and we will have testimony here from Dr. Olivier here just in a moment.

Anything else you want to ask, Bob?

MR. OLSEN: No.

MR. BELIN: Any other points you want to make, Colonel McMeekin?

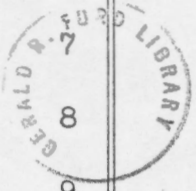
COLONEL MC MEEKIN: No.



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P R O C E E D I N G S

Whereupon,

ALFRED G. OLIVIER, VMD,  
having first been sworn by the Notary Republic, was examined  
and testified as follows:

EXAMINATION BY COUNSEL OF THE COMMISSION

BY MR. BELIN:

Q Dr. Olivier, will you give your name, please?

A Dr. Alfred G. Olivier.

Q Doctor, you have watched th4se slides from the  
Zapruder film, have you not?

A Yes, I have.

Q And these are 35 millimeter slides made from the  
original or a copy of the original eight millimeter Zapruder  
film. And on these slides you can see the frame of the  
Zapruder film plus part of the previous film, is that correct?

A Right.

Q At your offices do you have film readers that might  
either on the basis of an eight millimeter film or a 35 milli-  
meter slide, determine what movement if any there was in the  
President's head?

A I am pretty sure we had a head for an eight milli-  
meter. We normally use 16, but I think we can. I can check  
on it and let you know.

Q Just for what you saw today, does there appear to be



1 any movement of the President's head at the frame 313  
2 immediately after he was hit as compared with frame 312?

3 A. There appears to be, but unless you have measured it  
4 precisely, I think you are in the realm of guessing on it.  
5 In other words, our accuracy here isn't that great. But I do  
6 think it moves forward a little bit, and then in subsequent  
7 films moves back in the other direction again.

Q. And the backward movement eventually is a lot more  
than the forward movement, is that correct?

10 A. Yes, it becomes very pronounced, and you don't  
11 need a film reader to see that.

12 MR. BELIN: Bob, do you have any questions?

13 MR. OLSEN: Yes. I would like to ask Dr. Olivier  
14 if he can tell from the viewing of the film and these individual  
15 slides of the film what direction the movement was, both  
16 forward and backward. Was it straightforward, straight-  
17 backward?

18 MR. OLIVIER: Even with a film reader you are going  
19 to have trouble with sideways movement, because the perspec-  
20 tive -- you can see that there appears to be some forward  
21 movement and definitely some backward movement, and along with  
22 a backward movement appears to be a movement to the left, to  
23 the President's left. Whether the forward movement had any  
24 left component I don't think even a film reader will tell.

25 MR. OLSEN: Were you able to see anything with

1 reference to whether there was a turning of the head in any  
2 direction at the time of the shot and immediately afterward?  
3 Would you like to have a review of several of these slides to  
4 answer that question?

5 DR. OLIVIER: Yes.

6 MR. OLSEN: We are now on frame 313.

7 Would you run about the next six frames, David?

8 MR. BELIN: Before I do that, at fram 313, when you  
9 see splashes of orange, that is after the President has been  
10 hit, is that correct, Dr. Olivier?

11 DR. OLIVIER: Yes.

12 MR. OLSEN: And at the top of frame 313 we see frame  
13 312, which was before that impact, right?

14 DR. OLIVIER: Correct.

15 MR. OLSEN: David, would you run the next six frames?

16 MR. BELIN: 314.

17 315.

18 316.

19 DR. OLIVIER: What happened right here, it looks  
20 like he was turning to his left. And when we come to this one

21 --

22 MR. OLSEN: That one is out of place.

23 MR. BELIN: 317 is out of place, but if you take a  
24 look at 318 you will see the real 317 on top..

25 MR. OLSEN: Here we are. 317 on top and 318 below.





1 DR. OLIVIER: It appears he has turned to the left from  
2 the time he was hit.

3 MR. BELIN: 319.

4 320.

5 MR. OLSEN: Does it still appear to you as though the  
6 head turned to the left during the seven frames after the head  
7 shot?

8 DR. OLIVIER: It appears that way.

9 MR. OLSEN: Do you have any doubt about it?

10 MR. BELIN: If I can interject here, you have the  
11 car moving away from the camera. So there might be some  
12 aspect of that, too.

13 (Off the record discussion)

14 MR. BELIN: Back on the record.

15 Doctor, we are now at 313. Mr. Olsen, do you want  
16 to ask your last question now?

17 MR. OLSEN: Do you notice anything on frame 313 with  
18 reference to the direction of the material that appears to be  
19 flying out of the President's head?

20 DR. OLIVIER: There is an upward component,  
21 apparently a piece of bone or something that is oscilating  
22 upward. And then it appears that there is some going forward  
23 and to the side. But again you have to realize that you are  
24 looking straight at it, and to say that something is coming  
25 toward you is very difficult, but I believe it is, I believe it



1 is, I believe it is coming.

2 But the biggest amount of, say, blood, spray, and brain  
3 tissue appears to be going in a forward direction, forward and  
4 right.

5 MR. OLSEN: Off the President's head?

6 DR. OLIVIER: Out of the President's head, yes.

7 MR. OLSEN: I don't have anything else.

8 MR. BELIN: I am going to go to 314. YOU might see a  
9 little bit of that still. This is 314. And you can still see  
10 a line going forward at what I want to say is about a 60 or 70  
11 degree angle.

12 DR. OLIVIER: I would say it is coming just like this.  
13 I have a certain bias of knowing where the hole was located  
14 and various things.

15 MR. BELIN: But I am talking about this line here and  
16 here. Does that appear to be going forward?

17 DR. OLIVIER: Yes, slightly forward and upward. It  
18 looks like a good sized piece of bone.

19 MR. BELIN: I am going now back from 314 to 313.  
20 You can see there the bone hasn't had as extensive a tracer as  
21 it does now.

22 I am going to 314.

23 Is that correct?

24 DR. OLIVIER: Yes. What I think you see right here  
25 is the actual piece of bone caught at this point.



1 MR. OLSEN: When you say this point right here, we  
2 have got to get this on the record. What you mean, Dr. Olivier,  
3 is that there appears to be a light interrupted line running  
4 from approximately the President's head upward and forward, is  
5 that correct?

6 DR. OLIVIER: And it appears against the background  
7 of the green grass and is in contrast against it.

8 MR. BELIN: And it is a point that is located almost  
9 directly overhead to the front of Mrs. Connelly's head?

10 DR. OLIVIER: Right.

11 MR. OLSEN: And at the end of that line, the upward  
12 and most forward position of that line, is that the point that  
13 you referred to as being approximately a piece of bone?

14 DR. OLIVIER: That is what I suspect is a piece of  
15 bone, the forward point.

16 MR. BELIN: I am now going from 314 back to frame 313.  
17 Here you can see the bone tracers, but instead of it being over  
18 Mrs. Connelly's head it is about half as high as it is on 314,  
19 and it appears that it is over toward the front of Mrs.  
20 Kennedy's head, who is more forward in this particular picture  
21 than the President, is that correct?

22 DR. OLIVIER: Right.

23 MR. BELIN: So between 313 and 314 -- I am now turn-  
24 ing to 314 -- the bone continues to go forward. So now it is  
25 at a point higher on the frame and over Mrs. Connelly's head,



1 is that correct?

2 DR. OLIVIER: Correct.

3 BY MR. BELIN:

4 Q At frame 315 it doesn't appear anymore, is that  
5 correct?

6 A I am not sure.

7 Q Is there still a little tiny trace of it here over  
8 Mrs. Connelly's head?

9 Yes, it appears to be a little bit over Mrs.  
10 Connelly's head on 315.

11 On 316 you can even see a little bit of a trace of  
12 it.

13 A I think it is dropping there.

14 Q Is that correct?

15 A Yes, it is. I can point it out agin, what I think  
16 is the bone dropping.

17 Q And what do you see on 316?

18 A It is almost directly over the partition in the car,  
19 the back of it, still at considerable height.

20 Q Is it as clear as in the previous frames?

21 A No, it isn't.

22 MR. BELIN: Mr. Olsen, are there any other questions  
23 that you have?

24 MR. OLSEN: Not at this point.

25 MR. BELIN: Doctor, are there any other comments you

1 have from seeing the film on this particular point as to which  
2 direction the tissue seems to be going?

3 DR. OLIVIER: No, not at this particular point --  
4 yes, I do have a comment. If you intended to derive from the  
5 way the tissue is flying the direction of the bullet impact,  
6 you could get some errors, because when that bullet entered the  
7 head the nose of the bullet erupted on the skull and expanded  
8 within the head and expended a tremendous amount of energy.  
9 This caused what is known as a temporary cavity. This cavity  
10 expands in all directions. Apparently the cavity was nearer  
11 the right side of the head so that it buried in that area, and  
12 say, took the path of least resistance. If the bullet path had  
13 been near the top of the head it could have burst through the  
14 top. So while the motion of pieces of skull and brains like  
15 that are in the direction in which the cavity opened, they do  
16 not necessarily indicate a bullet flying in that same direction.

17 MR. BELIN: All right. What about the motion of the  
18 President's head where it first might have gone a little bit  
19 forward, but perhaps did not, and then went substantially  
20 backward, what does that indicate with regard to the direction  
21 of the bullet?

22 DR. OLIVIER: That first movement forward, if it is  
23 later substantiated by more accurate measurements, could quite  
24 possibly be the momentum imparted to the head by the bullet.  
25 The backward movement could have two components. One, it could



1 be the jet of the rain of material flying out of the skull in  
2 that direction -- and I say this based on some experiments done  
3 in California where they shot melons, and the jet went out the  
4 front of the melon, and the melon rolled back toward the gun.  
5 It is something that you don't normally expect, you would  
6 always expect them to roll away.

7 The other component of that backward motion -- and I think  
8 as you go on to later slides you will see that it is a neuro-  
9 muscular reaction, it is a very violent reaction of the body,  
10 and his whole body is moving, and a bullet cannot move the  
11 whole body, contrary to what you see on television and in the  
12 movies, where a man is hit by a bullet and flies backwards,  
13 this does not happen.

14 MR. BELIN: Mr. Olsen, do you have any other  
15 questions?

16 MR. OLSEN: Nothing.

17 MR. BELIN: Let's continue this interrogation.

18 And probably, Mr. Olsen, I am going to turn the rest of it over  
19 to you. I probably overstepped myself. These really are your  
20 witnesses that you brought down here. But I am reliving my  
21 experiences with the Warren Commission. So if you will pardon  
22 any interruption of questions.

23 MR. OLSEN: Shall we go ahead and turn the projector  
24 off, or we can come back to these.

25 (Off the record discussion)

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17

Room 410,

3:00 p.m.

MR. OLSEN: Let the record show that we are resuming the testimony of Dr. Olivier.

TESTIMONY OF DR. OLIVIER CONTINUED

BY MR. OLSEN:

Q. You have now had an opportunity, have you not, today to view the Zapruder motion picture film?

A. Yes.

Q. And the Nix filme?

A. Yes.

Q. And the Muchmore film?

A. Yes.

Q. And the individual slides of the Zapruder film covering the entire period during which the shots were fired and for a portion thereafter?

A. Right.

Q. And you have also had an opportunity, have you not, to view here at the National Archives the photographs taken of the President's body at the time of the autopsy?

A. Yes.

Q. And the x-rays that were taken also at the time of the autopsy?

A. Right.

Q. And the Commission's Exhibit 399, being the nearly

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1 whole bullet that, according to the testimony presented to  
2 the Warren Commission, was found at the stretcher of Governor  
3 Connolly at Parkland Hospital in Dallas?

4 A That is right.

5 Q And you have also had an opportunity, have you not,  
6 to view the bullet fragments and lead particles that were found  
in the Presidential car after the assassination?

8 A Yes.

9 Q And also the fragments that were recovered from  
10 Governor Connolly's wrist?

11 Q On the basis of your viewing of the motion picture  
12 films and the slides, do you have an opinion with respect to  
13 the question of the direction of the bullets that struck the  
14 President?

15 A Yes -- I had an opinion before, having viewed them  
16 before. And looking at them differently before, I wasn't so  
17 closely watching the head movements as this time. And watching  
18 the head movement carefully, all I saw this time hasn't changed  
19 that opinion.

20 Q Let me go back a little bit in order that we cover  
21 a few things about your background. Would you tell us what your  
22 educational background is?

23 A I am a Veterinarian, Doctor of Veterinary Medicine.

24 Q And you graduated from the School of Veterinarian  
25 Medicine where?

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19



1 A The University of Pennsylvania in 1953.

2 Q How old are you, Dr. Olivier?

3 A Fifty-three.

4 Q And have you been engaged in the practice of  
5 Veterinary Medicine since you graduated?

6 A No. When I graduated I went to work for the Depart-  
7 ment of Agriculture doing disease eradication work for three  
8 and a half years. And then I went to work for the Department  
9 of the Army at Edgewood Arsenal.

10 Q And you have been at Edgewood Arsenal since when?

11 A February 1957.

12 Q And what have you been doing at Edgewood Arsenal  
13 in these 18 years that you have been there?

14 A Except for the first two or three months I came there  
15 as a Veterinarian to be in charge of the experimental analysis,  
16 and I got into the research, let's say, within three months  
17 after I got there, and ever since I have been in what they  
18 call wound ballistics research, the study of wounds and what  
19 causes them, and the development of weapons, and the develop-  
20 ment of protection against enemy seapons, armor, and such.

21 Q And what position do you now hold?

22 A I am acting Chief, Biophysics Division, Biomedical  
23 Laboratory.

24 Q And what previous positions have you held at --

25 A Previous to that, I was Chief of the Wound Ballistics

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1 Branch, which is part of the Biophysics Division.

2 Q And how long were you the Chief of the Wound  
3 BALLISTICS Branch?

4 A Since 1965.

5 Q From 1965 until when?

6 A Until '69, when the Chief of the Division died, Dr.  
7 Carl Hergot. And then I became acting Chief, and I have been  
8 ever since.

9 Q You mean you have been acting Chief from 1969 to  
10 1975?

11 A Yes -- with the exception of 11 months they brought  
12 in Dr. Kirby as Chief, and he almost wrecked the place, he  
13 didn't know the first thing about it, he lasted 11 months and  
14 left, and I went back to being acting Chief.

15 Q Would you describe for us just very briefly what  
16 kinds of work you have been engaged in in ballistic studies  
17 during the years that you have been with the Arsenal?

18 A For example, you remember, the Army originally had  
19 the M-14 rifle, and then along came what they call the AR-15, w  
20 which was adopted by the Army as the M-16. We did the original  
21 work comparing what is now the M-16 and the M-14, and comparing  
22 the wounding power of the bullets with the standard rifle of  
23 the Russian Army, the AK-47. And as a result of our work, we  
24 adopted the M-16.

25 Q Have you been engaged moreorless for 18 years now in



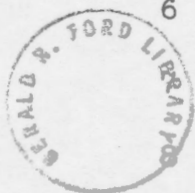
1 the study of wounds administered by bullets being fired?

2 A That is just one aspect of it. The US uses weapons  
3 -- and this isn't secret information, this is common knowledge  
4 -- multim fragmentation weapons, small fragements, developed as  
5 a result of our work. Now. other countries are adopting it.  
6 In fact, there is a great hassle today. The Internaitonal  
Red Cross says most American weapons are cruel and inhuman, and  
some countries agree and some disagree. There probably will be  
studies into it, are any weapons in violation of the rules of  
warfare. And we are involved in this, too.

11 Q Can you describe for us very briefly the kinds of  
12 studies that you have been engaged in over these 18 years?  
13 Describe for us briefly, if you will, what kinds of studies  
14 you have made of the reactions of animal bodies or human bodies  
15 to high velocity bullets being fired into the various portions  
16 of those bodies?

17 A Animals are used for -- goats are the experimental  
18 animal of choice, and also there is less public empathy with  
19 a goat than there is with other types of experimental animals.  
20 And you need something fairly large approaching a human. Goats  
21 have been used for years.

22 And in the course of those studies one thing we had noted  
23 -- people say a gun has great knockdown power. So we tried to  
24 see which weapons had the best knockdown power. So in  
25 examining goats that were shot with various weapons we found



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1 out that no small arm as we know it, shoulder fired weapon, has  
2 knockdown power. As many foats fell toward the weapon as  
3 fell away, or fell straight down. And we looked into it a  
4 little further as to what is happening. Well, when they are  
5 hit in the central nervous system, the head, the spinal cord,  
6 it apparently sends impulses down the system, non-regulated  
7 impulses. And what happens is, an animal -- and it doesn't  
8 matter whether they are anesthetized or unanesthetized -- an  
9 animal shot in the head, the legs fly up, the bullet passes  
10 through, and all of a sudden you see this reaction of the front  
11 legs coming up and the hind legs swinging out. Naturally in a  
12 timeframe it takes place in fractions of a second, so fast that  
13 you wouldn't see it with the naked eye, you would merely see  
14 the animal fall, but on a high speed motion picture you can see  
15 the process.

16 . We have also done an awful lot of work using 20 percent  
17 geletin by weight, it is 80 percent water, and 20 percent  
18 geletin. This has the advantage of being transparent, you can  
19 backlight it and take pictures with a camera. And you can see  
20 what that bullet is doing within the geletin. And it reacts  
21 the same as it would in muscle in living tissue. You can see  
22 a formation of what they call a temporary cavity when the  
23 bullet expands energy in this geletin, a temporary cavity forms,  
24 its walls are formed radically very rapidly, and they can do  
25 tremendous damage. You can have a large bone like a femur and

1 high velocity bullet pass through centimeters from it and  
2 fracture a bone without touching it.

3 Q Simply because of the force that is exerted against  
4 the bone?

5 A Right. Some people say this is shock wave. It isn't.  
6 A shock wave in gelatin travels rapidly, it travels at the  
7 speed of sound in gelatin, which is much faster than the speed  
8 of sound in air. The shock wave is passed through long before,  
9 and that does not do the damage, it is the actual throwing  
10 aside of the material itself, it is just hurled to each side  
11 by the passing bullet. And after the bullet passes that  
12 material continues. And in the body this can tear blood vessels,  
13 or at the very least it can contuse them so that you will get  
14 a thrombus being formed.

15 Q So that it is not necessary, then, in order to have  
16 a bullet break a bone, that there be any direct contact between  
17 the bullet and the bone?

18 A No. But if you are familiar with this, you can tell  
19 the bone that is fractured by being hit directly or by a  
20 temporary cavity, there is a difference in the appearance of  
21 the bone.

22 Q And what is that difference of appearance?

23 A Well, you have to reconstruct it. But when you take  
24 the pieces and put them together in the bone that was hit, you  
25 will find the missing material that was pushed aside ahead of





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the bullet. And the one that was broken by the temporary cavity will moreorless be convuluted, it will be moreorless a simple fracture, at least if it is convoluted in many pieces. And if you reconstruct the bone there will be no missing material, and you can tell that way.

Q Let's get back if we can to the question I was about to put to you a few minutes ago. You observed on the motion picture films and on the slides the action of the President's head and body on the occasion of the fatal head shot, which appears at the frame 313 of the Zapruder film, do you not?

A Yes.

Q What is your opinion, based upon the expertise that you have acquired in these 18 years at the Edgewood Arsenal in wound ballistics, with respect to the question of the direction from which the bullet came that struck the President in the head?

A Well, the President in 313, the head appears to have moved slightly forward from the previous frame. Now, I say appears, because unless you measured this precisely you don't know. But it appears to have moved slightly.

And this would not be inconsistent with the momentum of the bullet being transferred to the head. Whereas I said a bullet cannot knock a person down or move a body in any violent way, it could conceivably move the head a little bit. We fired at human skulls filled with gelatin sitting on the table, and

1 they would roll off the table. And this apparent side movement  
2 of the head is in the correct direction if the bullet came from  
3 the book depository.

4 Q That is, from the rear of the President?

5 A From the rear of the President.

6 Q Now, then, what can you tell us with respect to the  
7 subsequent action of the President's head and body after that  
8 initial apparent slight movement forward?

9 A There could be two reasons for it. One reason, there  
10 is a jet of blood and brain material from the head, some bone  
11 seemed to fly up in the air, but the bulk of it appears to  
12 fly forward and maybe slightly to the right. This give an  
13 indication that that is possibly in the direction that the  
14 bullet exited from the skull.

15 Q Now, was there any movement of the President's head  
16 and body associated with that?

17 A That material going in that direction would have a  
18 tendency as a result of this jet effect to push the head in the  
19 other direction. This was demonstrated by Louis Alvarez in  
20 California several years ago by shooting melons. When you  
21 could get a jet of huneydew melon going out the front, the  
22 melon would roll toward the gun, showing that there is some  
23 movement from this jet effect.

24 Q That also a moderate movement?

25 A That would be moderate, yes. Now, most of the

1 movement you see of the President moving backwards and his  
2 body moving sideward I believe is a neuromuscular reaction.

3 another factor that could be involved is acceleration of  
4 the car. I have no idea of when the car started to accelerate.  
5 But at any rate, it is typical of animals or humans struck on  
6 the head to have a violent muscular reaction to it. And this  
7 is what it appears to me. Certainly the bullet didn't knock  
8 him backwards and sideways. This was, I think a neuromuscular  
9 reaction.

10 Q Let me ask you this, Doctor Olivier. Approximately  
11 how many test firings have you been associated with and an  
12 observer to at the Arsenal where the firing has been done into  
13 a live animal?

14 A In the thousands -- some done by myself, or as the  
15 years went by, and I went up to a supervisory position, then  
16 under my supervision.

17 Q And in approximately how many, can you tell us,  
18 instances has there been a firing into the head of such an  
19 animal?

20 A Not nearly as many. The goat head is not a good  
21 model for the human. The brain is a pea brain compared to the  
22 large brain in the human. But we did do some studies deliber-  
23 ately to see this neuromuscular reaction firing into goat heads.

24 Q On those occasions when there has been such a firing  
25 into the goat's head, did you observe a vigorous, violent action  
of the head from the impact of the bullet itself?



1 of the head from the impact of the bullet itself?

2 A. In the particular movies I was thinking of that we  
3 made to show the neuromuscular reaction, unfortunately the head  
4 was restrained, so you could not see the movement of the head.  
5 You could see the violent movement of the legs. But no, you  
6 couldn't see the movement of the head. It couldn't move, it  
7 was restrained.

8 Q. Have there been any instances in which you have done  
9 firings into the head?

10 A. We have done firings into human skulls filled with  
11 gelatin and coated with gelatin, and we have even put goat  
12 skin on it to simulate the human scalp.

13 Q. Have you been able to observe the nature of the move-  
14 ment of the skulls?

15 A. The skulls that we shot invariably rolled away from  
16 the gun. And this was a reason for this, that you didn't get  
17 inay jet effect, because the gelatin that we used was 20  
18 percent gelatin, this was our simulant for tissue. We also  
19 used it as a simulant for the brain.

20 There is one bad thing about that. If you want to see  
21 this movement, the gelatin is too elastic, it recovers, in  
22 other words, any gelatin that expands out comes back like a  
23 rubber band. So it didn't fly loose from the skull to get a  
24 jet effect.

25 Q. You mean such as brain tissue might?





1 A Right.

2 Now, if I was going to do it today I would do it a  
3 different way, I would probably use 50 percent gelatin mix,  
4 something that would be more like the brain.

5 Q Have you done firings into other portions of animals,  
6 live animals, other than the head?

7 A Oh, yes.

8 Q Have you ever seen any jet effect?

9 A Jet effect, moving the body?

10 Q Yes. because for years we used to document the direc-

11 A No, because for years we used to document the direc-  
12 tion in which an animal fell -- and the number was something  
13 like 2,000 animals and it ended up, as many fell away from the  
14 gun as fell toward the gun, and a goodly number fell straight  
15 down. There was absolutely no -- you can say possibly maybe  
16 a jet effect was pushing some of them toward the gun, or it  
17 could have been a muscular reaction.

18 Q Have you ever seen an instance in which an animal  
19 body, from the impact of the bullet itself, thrust violently in  
20 the direction away from the gunner?

21 A Never.

22 Q Do you have an opinion, then, based upon your work in  
23 this field over the years, as to whether President Kennedy's  
24 body would have moved in the fashion that it did after the  
25 fatal shot in the head, that movement being a consequence of the

1 impact of the bullet?

2 A. As a result of the momentum imparted to the body  
3 by the bullet?

4 Q. Yes.

5 A. No, it wouldn't.

6 Q. Are you saying --

7 A. The President weighs a lot more than a 100 pound goat,  
8 and if a bullet wouldn't move a 100 pound goat it isn't going  
9 to move the President. This just doesn't happen.

10 Q. Is it your testimony, then, that the rather vigorous  
11 backward motion of the President's body could not possibly have  
12 been caused by the bullet itself?

13 A. Yes.

14 Q. And that the only cause that you feel for that kind  
15 of motion would have been the neuromuscular reaction?

16 A. Right. As I said, possibly acceleration of the  
17 vehicle.

18 Q. Do you have also, any other suggestions that you would  
19 like to make to the Commission with respect to the motion of the  
20 President's body.

21 A. No. All I can say is that if the Commission doubts  
22 this and wants us to do some work and set up under US specifi-  
23 cations, we would be glad to do it at Edgewood.

24 Q. Do you have any opinion as to whether or not that  
25 motion of the President's body, as viewed on the Zapruder film,



1 evidences any shot being fired into the President from the  
2 front or right front?

3 A It wouldn't matter whether it was fired from the  
4 front, side or any other way, it would have nothing to do with  
5 that movement of the body. A small arms bullet, anything small  
6 enough to be fired from the shoulder, will not move the body  
7 like that.

8 Q Let me turn next on what has frequently been referred  
9 to as Commission Exhibit Number 399, this being the nearly  
10 whole bullet that is said to have been found on Governor  
11 Connolly's stretcher at Parkland Hospital. You are familiar  
12 now with that exhibit that you have seen?

13 A Yes. I had seen it previously to this time, too.

14 Q Have you seen that particular bullet before?

15 A Yes.

16 Q Did you see that particular bullet in connection with  
17 work that you did for the Warren Commission?

18 A Yes.

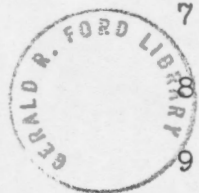
19 Q On that score, by the way, you and the Edgewood  
20 Arsenal and the Wound Ballistics Branch out at the Edgewood  
21 Arsenal did perform tests and testified before the Warren  
22 Commission that studied the assassination of the President?

23 A Yes.

24 Q So this is not a new area of inquiry for you, is it?

25 A No, it isn't.

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1 Q Do you have an opinion as to whether the deformations  
2 that are in evidence on Commission Exhibit 399 are consistent  
3 with that bullet having passed through the President's throat,  
4 through Governor Connelly's chest, through Governor Connelly's  
5 writst, and ending up being lodged in his thigh?

6 A It is consistent with having penetrated a long  
7 distance, because if it hadn't penetrated a long distance, then  
8 if it had stopped abruptly, then it would be much more deformed.  
9 The other fragments of the bullet that were found on the floor  
10 all torn up were consistent with the bullet that didn't pene-  
11 trate a long distance, it had ruptured, expanded its energy and  
12 done tremendous damage somewhere, whereas the bullet recovered  
13 on the stretcher was a bullet that had decelerated more  
14 gradually, not completely gradually, not as if you had fired  
15 it into some cotton waste and recovered it, with absolutely  
16 no harm done, it has some flattening, and it has done some  
17 damage somewhere, but it is consistent with a more gradual slow-  
18 ing down. So undoubtedly it penetrated wuite a bit of material.

19 Q What is your opinion with respect to whether that  
20 bullet could have inflicted the damage that you now know was  
21 inflicted to the President's throat and to Governor Connelly's  
22 chest, and Governor Connelly's writst, and is that right?  
23 What is your opinion as to whether or not that bullet could  
24 have inflicted all that damage and be left in the condition  
25 that you found it that day?



1 A It is consistent with all that, it is not inconsistent  
2 and that is the way I would expect the bullet to look after  
3 doing that. In fact, even the entrance wound on the back of  
4 Governor Conelly is consistent with a bullet that has already  
5 penetrated something, because as the wound is described, it is  
6 rather long, indicating the bullet is either traveling side-  
7 ways or it is an extremely tangential hit. And it appears from  
8 all testimony that the angle of entry was not so that it  
9 skimmed along the body before entering. And this points out  
10 that the bullet was probably flying almost in a sideways direc-  
11 tion when it hit Governor Connelly's back. Something had to  
12 tip that bullet.

13 Q When you say in a sideways position, the testimony,  
14 I believe, that was provided to the Warren Commission was to  
15 the effect that the wound in Governor Connelly's back was a  
16 vertical wound approximately three centimeters in length.  
17 Would this mean in your opinion that the bullet that struck  
18 Governor Conelly was in a vertical position rather than with  
19 the head pointed directly toward him?

20 A Right. And it wasn't approaching the body in a  
21 stationary position, it was probably flipping end over end and  
22 struck in a vertical position.

23 Q And have you familiarized yourself with the nature of  
24 the damage sustained by Governor Conelly to his chest?

25 A Yes.



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1 Q And your testimony would still be that Commission  
2 Exhibit 399 could have inflicted that damage without being  
3 more deformed than it is?

4 A Yes. This is even consistent with the bullet having  
5 lost a little velocity already before it hit the Governor,  
6 because in the course of our work for the Warren Commission  
7 we tried to reproduce the Governor's wound by laying an  
8 anesthetized goat on the side and grazing a bullet on the ribs,  
9 so that in a head-on position it would strike the rib and  
10 graze the bone, but not in the mural cavity, see if we could  
11 get the bullet to strike a bone as it did the Governor. And  
12 I don't remember exactly the distances we used, but it was less  
13 than 90 yards that we know the head shot was, approximately  
14 around 70 yards. And firing offhand with the Oswald rifle,  
15 that 70 yards in trying to graze the rib of a goat is like  
16 shooting at a half inch target. So we hit one out of two  
17 exactly right, and recovered the bullet in a barrel of cotton  
18 waste. And the bullet was flattened a little more than the  
19 Commission exhibit, but still fairly consistent with -- what  
20 it was consistent with as the bullet doing the same thing but  
21 traveling at a slightly higher velocity. So the bullet was  
22 just a little more flattened.

23 Q And you have familiarized yourself, have you not, with  
24 the damage that was sustained by Governor Connelly to his right  
25 wrist?

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1 A Yes.

2 Q And is it nonetheless your opinion that that damage  
3 inflicted to his wrist could have been inflicted by Commission  
4 Exhibit 399?

5 A Yes. Now, I am going back to something I read years  
6 ago, but I believe it entered on the upper surface of the wrist.  
7 The entrance wound was larger than the exit wound, quite a bit  
8 larger. The Exhibit, if you remember, was described as a  
9 small slit right near the crease of the wrist. So what it  
10 means is, this bullet again struck the Governor's wrist in  
11 maybe not quite a vertical position, but sort of sideways,  
12 tipped as it went in, and came out, as you know, by the leg  
13 wound now coming backward --

14 Q You mean the bullet was heading back to the wrist?

15 A When it came out of the wrist it was heading back  
16 into the wrist. And as I said, this thing is going end over  
17 end, and it struck the wrist, approximately the back end like  
18 this.

19 Q When you say like this, you will have to describe it  
20 for the record.

21 A Okay. In an almost vertical position with possibly  
22 the back end preceding the front end slightly. So that in  
23 continuing this motion through the wrist it exited the wrist  
24 completely backwards and lodged in the Governor's leg -- back-  
25 wards, the surgeon seems to believe that because a piece of

1 lead was found next to the femur.

2 At any rate, what I wanted to say was, a bullet striking  
3 that with a high velocity in that manner would have caused a  
4 traumatic amputation, it would have caused tremendous damage,  
5 because we fired at a cadaver -- and this was a bullet heading  
6 straight on -- and those things did much greater damage to the  
7 bone than in the case of the Governor.

8 Q May I interrupt there to ask, is it your opinion,  
9 then, Dr. Olivier, that the nature of the injury sustained by  
10 Governor Connally to his wrist indicates strongly that the  
11 velocity of the bullet had been markedly reduced by the time  
12 it hit his wrist?

13 A Absolutely.

14 Q If he had been hit by a pristine bullet in the wrist,  
15 the damage would have been far greater than it was?

16 A Right. And further than that, if he had been hit by  
17 a bullet at near muzzle velocity that was tumbling, that had  
18 been deflected slightly by something and was tumbling, then that  
19 damage would have been even much greater than he received.

20 Q It might even have amputated the wrist?

21 A Yes.

22 Q I don't think I have any further questions right now,  
23 Dr. Olivier, other than this. If we provided to you a copy of  
24 the Zapruder film, would you be willing to make some measure-  
25 ments to determine the exact degree of motion that the



1 President's head and body sustained, motion that the body  
2 experienced after the fatal head shot?

3 A Sure, I would be glad to, if our equipment is  
4 compatible with that eight millimeter film, and I believe it is.

5 Q We have a 16 millimeter copy of that. Are you  
6 confident that you could make it from a 16 millimeter copy?

7 A I believe so. I have gotten so away from that aspect  
8 of it, since the technicians do that, I am not sure of the  
9 details, but I am pretty sure that we could do it with either.

10 Q And would you be willing to give us a written report  
11 of your findings not only on that, but on the opinions that  
12 you have formed as a result of your viewing of all these  
13 autopsy photographs, x-rays, materials and motion pictures?

14 A Certainly. The only thing I might put in is, in  
15 looking at autopsies, I am not a forensic pathologist, and I  
16 think the information you would get from a pathologist would be  
17 much more meaningful than this.

18 So I am familiar with wounding. And I didn't see anything  
19 in those that was inconsistent with what I feel.

20 Q What is your opinion, Dr. Olivier, with respect to  
21 the reasonableness or unreasonableness of the so-called single  
22 bullet theory, strictly from the standpoint of the wound  
23 ballistics?

24 A I guess the original single bullet theory came out  
25 as a result of our original work for the Commission. And from

1 testimony we gave, they came to this conclusion. I don't see  
2 anything to change that. You can't state with an absolute  
3 certainty, because it is within the realm of possibility that  
4 the bullet that hit the President's neck was a different one,  
5 and that through some freak it skipped out of the car and didn't  
6 touch anything. But that is extremely unlikely. It is as  
7 unlikely as the possibility of the President being hit from the  
8 front and the rear at the same time, and the evidence of another  
9 bullet being destroyed. These are -- I don't like to use the  
10 word fantasies, someone used that, but I can't think of anything  
11 else. It is just not likely.

12 Q. Would you say the odds against that are enormous?

13 A. Yes, I would think so.

14 Q. Do you have any guess or judgment or any figure that  
15 you would like to give us by way of illustrations as to what  
16 you think the odds against that happening would be?

17 A. No. If a person wants to indicate big odds, you say  
18 a million to one shot. I guess I would say a million to one  
19 shot.

20 MR. OLSEN: I am going to ask, Dr. Olivier, that you  
21 begin preparation as promptly as you possibly can of a written  
22 report to us on your findings and conclusions about these  
23 matters that we have discussed today. And we will promptly get  
24 to you a copy of the Zapruder film so that you can make the  
25 measurements we have talked about.

1 A. Okay.

2 Q. Thank you very much for coming. And we appreciate  
3 having you.

4 COLONEL MC MEEKIN: We would like to work with him  
5 on that if it is reasonable.

6 MR. OLSEN: Fine. Let the record show that Colonel  
7 McMeekin is offering to work with Dr. Olivier and the people  
8 from the Edgewood Arsenal.

9 Do you have a suggestion, Colonel McMeekin, as to what the  
10 kind of assistance you would like to be rendering to that score?

11 Co COLONEL MCMEEKIN: I think we would like to help him  
12 with the interpretation of the motion. Our interest is in  
13 kinematics, one of our interests is in kinematics.

14 DR. OLIVIER: Maybe the thing is, when we get the  
15 film up -- you are right close, you could send the film up  
16 with him, I could give you a call and say, could we do the 16  
17 or eight millimeter film, and you come up, and we will read it  
18 right there. I would be glad to do it.

19 MR. OLSEN: Is that all right with you, Colonel?

20 COLONEL MC MEEKIN: That would be fine with me, sure.

21 MR. OLSEN: Thank you very much, Dr. Olivier.

22 (Off the record discussion)



P R O C E E D I N G S

Whereupon,

WERNER U. SPITZ, MD,

having first been sworn by the Notary Public, was examined and testified as follows:

EXAMINATION BY THE COUNSEL OF THE COMMISSION

BY MR. OLSEN: Would you state your full name for the record, Dr. Spitz?

DR. SPITZ: Werner Spitz.

BY MR. OLSEN:

Q Do you have a middle initial?

A Sometimes I use it and sometimes I don't. It is U.

Q And where do you live?

A In Gross Pointe, Michigan.

Q And what is your address there?

A 50 Stonehouse, Gross Pointe Shores?

Q And your zip code?

A 48236.

Q And what is your position, Dr. Spitz?

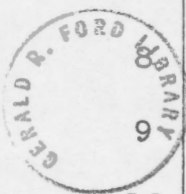
A I am the Medical Examiner for Wayne County, which is essentially the greater Detroit area.

Q And would you give us a brief rundown on your educational and experience background in the field?

A I graduated from Medical School in Jerusalem in 1953. And I did my residency in pathology, and subsequently in forensic







1 forensic Pathology at that University. And also during the  
2 time of my pathology residency I already trained in forensic  
3 pathology, because the department was involved in both of these  
4 specialties?

5 And then in 1957 I became a fulltime staff member on the  
6 staff of the Medical Examiners Office, or the equivalent there-  
7 of, there.

Q In Jeruselem?

8  
9 A It is not in Jeruselem, but it belings to the Univer-  
10 sity of Jeruselem.

11 And in 1959 I came to the US, to Medical Examiners Office  
12 for the State of Maryland in Baltimore. And I was there for  
13 a year and a half.

14 And in August 1971 I left to go to West Berlin, Germany,  
15 and spent two years and three months at the Department of Legal  
16 Medicine of the university of West Berlin. And I came back  
17 at the end of November of 1963.

18 Q Did you rejoin the Medical Examiners Office in  
19 Maryland?

20 A And I rejoined the Medical Examiners Office in  
21 Maryland. And I was Assistant Medical Examiner for the State  
22 of Maryland, and then Deputy Chief Medical Examiner for the  
23 State of Maryland.

24 Q Who was the Chief Medical Examiner for the State of  
25 Maryland during this period of time that you served?

1 A Russell Fisher.

2 And I had teaching appointments at the University of  
3 Maryland and Johns Hopkins University School of Medicine and  
4 the School of Hygene.

5 Q What position did you hold at the University of  
6 Maryland?

7 A The last position I had was that of Associate  
8 Professor.

9 Q And how about at Johns Hopkins, were you an Associate  
10 Professor of Pathology?

11 A No. This was in Forensic Pathology, and at the  
12 University of Maryland it was in Pathology. And in Johns  
13 Hopkins it was in Forensic Pathology at the School of Hygene.

14 And I took my boards in pathology, in atomic pathology  
15 in 1961, and in forensic pathology in 1963, after I came back  
16 from abroad.

17 And I was in charge of the training program in Baltimore  
18 for residents for a number of years.

19 Q Residents in what?

20 A In forensic pathology.

21 And I am author of, I think, about 45 scientific publica-  
22 tions, and editor and author of a textbook on the same subject.  
23 And now I am the Medical Examiner of the metropolitan Detroit  
24 area.

25 Q How long have you held the position of Medical



1 Examiner for Wayne County?

2 A. Nearly three years.

3 And also I am Associate Professor at Wayne State University  
4 School of Medicine.

5 Q. Have you performed a substantial number of autopsies,  
6 Dr. Spitz?

7 A. Yes.

8 Q. Approximately how many autopsies would you say you  
9 have performed?

10 A. I couldn't tell you. But it is in the thousands.

11 Q. Have you performed a substantial number of autopsies  
12 involving bullet wounds in the head?

13 A. I have performed a lot of autopsies on bullet wounds  
14 of the head and the body in general. And I have also done  
15 experiments with bullet wounds -- in the textbooks I mentioned  
16 I wrote the chapter on gunshot wounds and I have published on  
17 them.

18 Q. On the pathological aspect of gunshot wounds?

19 A. Yes.

20 Q. Does this work you have done include gunshot wounds  
21 with high velocity rifles?

22 A. I did high velocity rifles test firings for the sake  
23 of learning their effect, but I have never published.

24 Q. Now, Doctor, it is now about 4:30 in the afternoon  
25 of this day that we have spent at the National Archives here

1 in Washington. You met us here sometime shortly before 10:00  
2 o'clock this morning, did you not?

3 A. Yes.

4 Q And since you have arrived, except for a short period  
5 of time -- and when we took a luncheon break -- you and other  
6 doctors who have been involved as well as Mr. Belin and myself  
7 of the staff of the Commission on the CIA Activities, have been  
8 engaged in watching motion picture films of the Kennedy assassi-  
9 nation, have we not?

10 A. Yes sir.

11 Q The official film, the Muchmore film, and the  
12 Zapruder film, have all been viewed by you, have they not?

13 A. Yes sir.

14 Q And you have also had an opportunity to view indi-  
15 vidual slides in the Zapruder film embracing the entire period  
16 during which the shooting took place, have you not?

17 A. Yes.

18 Q And you have also had an opportunity to examine all  
19 of the x-rays and photographs connected with the autopsy of  
20 the late President?

21 A. Yes.

22 Q And you have also had an opportunity, have you not,  
23 to examine the President's clothing, the bullets and bullet  
24 fragments and particles that were recovered in connection with  
25 the assassination investigation?



1 A Yes.

2 Q And that clothing to include the President's coat,  
3 tie, shirt, and body brace that he wore?

4 A Yes.

5 Q This is a lumbar-sacral brace, is that what you would  
6 call it?

7 A Yes.

8 Q And you have also had an opportunity, have you not,  
9 to view the x-rays of Governor Connelly's chest and wrist and  
10 thigh, have you not?

11 A Yes.

12 Q Have you also reviewed with us the report of Dr.  
13 Connolly's physicians relating to his injuries that he  
14 sustained?

15 A Yes.

16 Q Now, on the basis of all of the materials that you  
17 have had a chance to review today, have you formed an opinion  
18 as to the number of shots that struck President Kennedy?

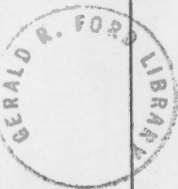
19 A Yes.

20 Q What is your opinion?

21 A I think the President was struck by two missiles.

22 Q Can you tell us about where they struck?

23 A The one struck the back of the head on the right  
24 side, where I saw a bullet wound of entrance in the skin.  
25 That slug penetrated the right side of the brain, exploded that



1 part of the skull, and left a path-way of metal along the  
2 pathway of the slug, with a somewhat larger piece of metal  
3 located on the bone at what I believe is the location in the  
4 bone underlying the bullet wound of entrance which I saw in  
5 the skin. The pathway of the bullet is from back to front, and  
6 possibly slightly upward or horizontal within the head. There  
7 is nothing that I could see on the pictures in the film, the  
8 x-rays, that would indicate any other mechanism for this injury.  
9 The appearance of the brain tends to support this also. And  
10 this is based on what the brain looks like on the photographs  
11 of that organ which I have seen. I do not think that seeing  
12 the actual brain and examining the inside of the brain would  
13 add to this to the extent that it would change my opinion,  
14 because the appearance of the internal organs is usually not  
15 very significant with regard to the direction of fire anyway.  
16 And what I do expect from the appearance of the brain with  
17 regard to this question I have seen on the pictures.

18 The second bullet wound is located on the right side of the  
19 back. The upper back is a typical bullet wound of entrance,  
20 which indicates by its configuration that the missile was  
21 directed upward in the individual whose back is completely  
22 straight. But if the back is bent forward, then this direction  
23 would change, and it would become a downward pathway.

24 Q Did you make a measurement as to where the wound of  
25 entrance was in the upper back with reference to any particular



1 point of reference?

2 A I did not particularly make a measurement, but if I  
3 recall, I think it was somewhere close to five inches below  
4 the tope of the shoulder, and possibly around two inches from  
5 the midline.

6 Q This is just based on a recollection of the photo-  
7 graph?

8 A Yes, this is based on a recollection of the photo-  
9 graph.

10 Q Would you like to have that photograph shown to you  
11 for refreshing your recollection?

12 A Yes, please.

13 MR. OLSEN: The reason I am suggesting that at this  
14 point, Dr. Spitz, is there has been a great deal of speculation  
15 and controversy that has occurred over the years about the  
16 exact location of that wound, and just exactly what the angle  
17 of the pathway of the bullet was from both vertical and  
18 horizonatal standpoints. Can you measure it with reference to  
19 the lowest piece of the neckline?

20 A My ruler shows three centimeters below the lowest  
21 crease of the neck, and about two centimeters from the midline  
22 of the back, and one centimeter on my ruler corresponds to just  
23 about two centimeterters on the ruler that is photographed with  
24 the body.

25 Q Now, you are making your measurement on a photograph,



1 and that photograph then would approximately be half of life-  
2 size?

3 A Approximately.

4 Q What is your judgment, then, as to how far below the  
5 lowest crease of the neckline the wound was in actuality as  
6 shown on that photograph?

7 A I would say it is more close to three inches below  
8 the shoulder.

9 Q When you say three inches below the shoulder are you  
10 speaking with reference to the lowest creaseline of the neck?

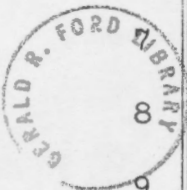
11 A I am saying that the wound -- the entrance wound in  
12 the right side of the back of the President is located at a  
13 point approximately three inches below the level of his  
14 shoulder, and two inches to the right of the midline of the  
15 back.

16 Q And when you say three inches below the level of the  
17 shoulder, again you are speaking about the level of the shoulder  
18 at a point two inches to the right of the midline of the neck?

19 A Yes.

20 And I would like to add that there is no doubt that the  
21 bullet wound of entrance shows that the slug that caused it  
22 traveled -- and I am talking about the picture now -- upward  
23 and to the left -- which means that if the President was  
24 slightly stooped forward, the slug would have traveled down-  
25 ward.





1 Q Dr. Spitz, at that particular place on the human  
2 physique where this wound of entrance is located in the back,  
3 is there not some natural curvature of the body forward?

4 A There is a natural curvature of the body forward also,  
5 and especially if the body is slightly bent forward.

6 Q But there is a natural curvature in that location  
7 anyhow? So that when you refer to the fact that on the photo-  
8 graph the wound of entrance at the skin level reflects the fact  
9 that it goes upward, you are referring to the fact that if there  
10 is a curvature there of the back, that it need not be increas-  
11 ing in elevation with respect to the ground, but just simply  
12 increasing in elevation on the skin, is that correct?

13 A Well, I will make myself clear to the extent -- I  
14 would like to explain to you what I meant by what I said earlier.  
15 Every forensic pathologist, when he examines the body of a  
16 person who died of gunshot wounds, will examine the body try-  
17 ing to establish which are entrance wounds, and if there are  
18 no exit wounds, where am I going to look for the bullet, for  
19 the slug. Looking at this wound in the President's back, my  
20 first thought would be that the slug is to be searched for in  
21 the neck area of the President, the slug or the exit wound.

22 Q Have you had an opportunity to review the photographs  
23 of the President's throat area?

24 A Yes.

25 MR. OLSEN: May we have those again, Mr. Johnson.

1 I am handing you, Dr. Spitz, two large photographs  
2 of the President's head and upper chest area, and ask you if  
3 those -- those are taken at the time of the autopsy -- and ask  
4 you if those reveal a wound in the throat area?

5 DR. SPITZ: Those photographs reveal a wound in the  
6 lower part of the neck -- I say lower part, because they are  
7 under the Adams Apple. The wound is obviously a horizontal cut,  
8 of which the one margin is ragged in the center, and the other  
9 margin shows a light raggedness also. By approximation of the  
10 edges of this wound which was made with a knife, there will  
11 remain a hole where the edges could not be approximated. In  
12 my opinion that represents the exit wound.

13 Q And where would you conclude that the exit wound was  
14 on those photographs?

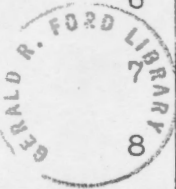
15 A The exit wound was roughly in the middle of the neck,  
16 maybe -- roughly in the middle of the neck.

17 Q That is, in the center of the neck horizontally?

18 A In the center of the lower part of the front of the  
19 neck.

20 Q And do you have a judgment that you could make as to  
21 where the exit wound was with reference to any particular point  
22 on the body that one could mark out and identify?

23 A There is no ruler on this picture. But I would say,  
24 judging by feeling the place on my own body, that this would be  
25 close to an inch or so under the Adams Apple.



1 Q You have also viewed the x-rays of the President's  
2 neck area taken at the time of the autopsy?

3 A Yes.

4 Q Do you have an opinion, Dr. Spitz, that would enable  
5 you to make a judgment of the approximate vertical angle at  
6 which that bullet struck the President with reference to the  
ground level being zero?

7 A I would have to actually measure it in order to give  
8 you an angle. And at that time it would be very approximate.  
9 But I will say that if a person is positioned -- and we all  
10 have done this a little while ago -- if a person is positioned  
11 in a chair slightly stooped forward -- and I put emphasis on  
12 the word slightly -- there is no necessity for any types of  
13 acrobatics, just a slight bending forward of the top half of  
14 the body. If that person is struck by a bullet in the right  
15 upper part of the back that would give a bullet wound such as  
16 the one in the President's back, that slug would travel in a  
17 downward direction and take exit from that particular place  
18 in the neck.

19 Q Can you tell us with reference to the --

20 A Maybe if I estimated an angle roughly -- but in order  
21 to give a more valid opinion I would have to actually measure  
22 it, as I said earlier. But I would venture to say that the  
23 angle would be close to 15 degrees, possibly, 15 degrees  
24 downward. But again, that depends so much on, what do we mean  
25



1 by slight bending forward? An inch more forward would again  
2 increase that angle considerably. An inch less forward of this  
3 bending would increase or would decrease the angle. So that we  
4 are talking about hypotheses when an exact angle is to be  
5 determined.

6 Q Dr. Spitz, in order to calculate the angle with any  
precision, that is, the trajectory of the bullet that inflicted  
7 the wound in the President's upper back and throat, would one  
8 not have to know almost exactly how the President was sitting  
9 at the moment that the bullet struck.  
10

11 A And even then the answer would be tenuous, because I  
12 am not at all convinced that the slug that went through the  
13 President's back and out the neck was not deviated from its  
14 course, and that the line that you are drawing in your mind  
15 from the entrance wound and the upper back of the President to  
16 the exit wound in the neck is a straight line. Because that  
17 missile passed boney structures which appear to be broken on the  
18 right side --

19 Q Which boney structure are you referring to?

20 A I am referring to the right side of the lowest  
21 cervical vertebrae, and the right side of the first thoracic  
22 vertebrae, if which the transverse process appears to be broken.  
23 And if that is indeed so, which it appears to be on those x-rays.  
24 then that slug could have been deviated from its straight line  
25 and perhaps would have existed somewhere else, had it not been





1 deviated.

2 Q Did you detect traces of metal?

3 A There are traces of metal -- or there appears to be  
4 densities which look like metal on the x-rays. And they  
5 definitely look like fractures of these processes.

6 Q In the region --

7 A In the region of the metal and in the region of where  
8 the slug would have gone through.

9 Q And in the immediate region of those transverse  
10 processes of the vertebrae?

11 A Yes.

12 Q With reference to the horizontal angle of the path of  
13 the bullet that entered the President's back and exited, as you  
14 say, from the President's throat, would it be possible to  
15 calculate that angle only if one knew exactly how the President's  
16 body was turned or positioned at the time that the bullet  
17 entered his back?

18 A I am not sure that I understand what your question is.

19 Q Let me put the question a little bit differently.  
20 Assuming that the Presidential car, at the moment that that  
21 bullet hit the President, assuming that the Presidential car  
22 was heading directly north -- in fact, it was not, it was head-  
23 ing generally westward, but assuming for your purposes it was  
24 headed at zero, and one is trying to calculate the exact  
25 horizontal angle from which that bullet was coming, would that



1 be possible only if one knew exactly how the President's body  
2 was turned at the moment of impact of that bullet?

3 A Yes, not only exactly, but with absolute accuracy,  
4 because a smidgeon of a turn to the right or to the left or  
5 forward or backward bending would completely alter any kind  
6 of calculation you would like to make, and lead you on a  
completely wrong pathway.

8 Q Now, in your view of the Zapruder film, or the other  
9 motion picture films, could you tell at what precise point the  
10 President was struck by the bullet that hit him in the back?

11 A No.

12 Q Do you believe that it is possible for anybody to  
13 tell precisely when the President was struck?

14 A No. There are at least ten or 15 frames where the  
15 President's car is behind a sign, a road sign.

16 Q YOU mean where the President's body is being shielded?

17 A Where the President's body is not even seen. You  
18 just surmise where the President may be.

19 Q Is it your opinion that it would therefore be  
20 impossible to determine with any degree of accuracy when the  
21 President was struck, and exactly what position his body was  
22 in when it was struck?

23 A Yes, I think it is impossible, absolutely impossible.  
24 to to this. Any deviation from this -- what I say is impossible  
25 to do this. Any deviation from this -- what I say is

1 impossible -- is sheer speculation.

2 Q Dr. Spitz, is there a uniform time, measured now in  
3 terms of fractions of a second, within which all human beings  
4 react with noticable bodily reactions to a bullet being fired  
5 into them?

6 A No.

7 Q Is there substantial range of differences in the way  
8 human beings react?

9 A Yes, there is.

10 Q And is that difference in reaction dependent in  
11 part upon where the bullet strikes?

12 A Where the bullet strikes, and expecting the bullet  
13 to strike. I could understand that in executions, for instance,  
14 where the individual expects the shot, the reaction time is  
15 entirely different.

16 Q But even in general, any type of shooting, different  
17 individuals react in different ways? Even to the same wound?

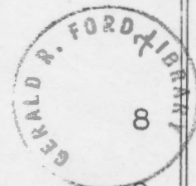
18 A Even to the same wound.

19 Q With the same level of expectation?

20 A This is not only to bullet wounds --

21 Q YOu mean even if two people are struck by the same  
22 kind of bullet in the same place with the same degree of expect-  
23 tation, there still would be differences in the time within  
24 which those people would respond?

25 A Yes, this is my opinion.



1 Q Is there an insignificant or a significant difference  
2 between individuals and the time during which they would  
3 respond?

4 A Well, I think it can be substantially different in  
5 different individuals. Defferent individuals will do different  
6 things after they are shot. And different individuals will  
react differently after they are shot.

8 Q If there is any difference detectable on the Zapruder  
9 film between the time that President Kennedy is apparently  
10 reacting to a shot in the back and the time that Governor  
11 Connelly is apparently reacting to a shot in his back, can one  
12 draw any valid conclusions as to whether or not they have or  
13 have not been struck by the same bullet if that time difference  
14 is as small as a half a second?

15 A No. And besides, not only are you talking about two  
16 different individuals, but you are talking about two wounds in  
17 different locations.

18 Q Might that account for a difference in reaction?

19 A That will account for a difference in reaction.  
20 Neither of those bullet wounds are immediately fatal. And  
21 therefore the reaction of the two individuals will depend on  
22 the individual variability in reaction to wounds.

23 Q Do you have any judgment as to the normal range of  
24 reaction time of individuals?

25 A No. But I would think that it could possibly vary



1 in terms of complet second, not in fractions thereof. I have  
2 never seen anybody that is being shot. And I am basing my  
3 opinion on my judgment, medical judgment and appreciation of  
4 what is possible based on physiological type reasoning. I  
5 thinkanybody who bases his opinion on what he sees in movies --

6 Q You are talking about dramatic movies as distinguished  
7 from real life movies?

8 A I am talking about dramatic movies, and I am talking  
9 about movies of executions. I think these are totally  
10 erroneous, these evaluations, because the dramatic movies, for  
11 a start, are completely wrong, and the other ones involve  
12 people who are braced, who are expecting what is going to happen  
13 to them. And they are reacting differently. And even among  
14 those, if you have a series of people who are executed, you  
15 will notice the difference in reactions among the various  
16 individuals.

17 Q Now, you have also had an opportunity to review the  
18 mostion picture filems relating to the shot that struck the  
19 President in the head?

20 A Yes.

21 Q Do you have any doubt, Dr. Spitz, but that that was  
22 the fatal bullet?

23 A No.

24 Q And you have had an opportunity to see for yourself  
25 on the motion picture films with the kind of reaction the

1 President's body had to that shot, did you not?

2 A. Yes sir.

3 Q. Would you describe that for us just in general terms,  
4 how you understood, observed the film of the President's body  
5 reaction?

6 A. There was a forward and backward and then sideways  
moving -- I think I see a sideways movement toward the left.

7 Q. May I ask this, then. Do you have any opinion, based  
8 upon your observing several times the Zapruder motion picture  
9 film, as to whether that film indicates that the President was  
10 struck by a bullet fired from the front or the right front of  
11 the Presidential car?  
12

13 A. No, the President was struck from the back both times,  
14 the one in the back and the one in the head definitely indicate  
15 that.

16 Q. Is the backward movement that you have observed of  
17 the President's body after the shot was fired and after the body  
18 first moved somewhat to the front, the body moved backward then  
19 rather vigorously, did it not?

20 A. Yes.

21 Q. Does that backward movement of the President's body  
22 indicate in any respect whatever that the shot came from the  
23 right front to the front of the car?

24 A. No. I am not even sure that at that moment the  
25 President did go back, because of the lack of control that he



1 was able to exercise on his body to refrain from going back  
2 upon acceleration of the automobile.

3 Q You don't know for sure whether the automobile was  
4 accelerated at that point?

5 A I don't. But even if it was accelerating, he could  
6 not hold himself at that moment, because he had lost all  
7 nervous control, he had no control to speak of, because half  
8 of his brain was lost.

9 Q Was it also possible that the backward movement of  
10 the body at that point was purely a neuromuscular response?

11 A It was a neuromuscular response activated by the  
12 destruction of the centers.

13 Q You are talking about the nerve centers?

14 A The nerve centers.

15 Q According to the autopsy physicians who performed the  
16 autopsy on President Kennedy, after the chest cavity had been  
17 opened, some color slide photographs were taken of the  
18 interior of the chest. What is your opinion with respect to  
19 whether the availability of those slides and the study of those  
20 slides will contribute anything meaningful from a medical  
21 pathology standpoint to an analysis of the President's wound?

22 A The autopsy surgeon who examined the body of the  
23 President open the chest, examined the organs, described the  
24 bruising of the top of the right lung, described bruising of  
25 the dome of the pleural cavity on that side, but did not describe

1 a hole made by a bullet wound. The description of the observa-  
2 tion of the bruising, to my knowledge of what high powered  
3 missiles do, fits. Also fits is that the slug is seen to go  
4 by that area on the x-ray film. By that I mean that the  
5 damage that the slug did is seen on the x-ray film. So that  
6 there would have been no actual hole in the pleural lining of  
7 the cavity on that side, or the lung cavity at that side.

8 So what would those pictures show me? They would show me  
9 the bruise of the lung.

10 Well, I have got a description of that bruise. I know that  
11 there is a bruise. I don't think those pictures would add  
12 anything.

13 Q I think you previously touch on this, but I am going  
14 to ask you anyway. What is your opinion with respect to whether  
15 a coronal dissection of the President's brain and a microscopic  
16 examination of that brain would add any meaningful information  
17 to you as a forensic pathologist in being able to analyze the  
18 President's wounds?

19 A I would have to add that I would have probably cut  
20 the President's brain if I had had it and looked at it. But  
21 I can tell you right now that I would not have expected to  
22 find anything in there. I would have done it because it is  
23 routine to do that. I would not expect that you would find  
24 anything at all on microscopic examination except for other  
25 bruising and damage which I can see on the picture without doing



1 microscopics. It is not at all my practice to do micropics on  
2 brains of homicide victims when the injuries are such as the  
3 ones in this case, because I consider it a waste of time, unless  
4 I look for gun powder. And forensic pathologists don't usually  
5 have too much time to play around with. Coronal dissection of  
6 the brain would in my opinion not add materially to what I  
7 have by looking at the brain on the picture. The picture shows  
8 the destruction of the right hemisphere, of the right half of  
9 the brain. What else would I want to see? I can already  
10 practically see through the brain on that side, because there  
11 practically isn't any tissue left, because the tissue has been  
12 scattered all over, due to the explosion inside the skull.  
13 So there isn't much brain tissue to cut coronally to begin  
14 with.

15 Q On the right half?

16 A On the right half. The left side is intact. But  
17 does anybody really think that the brain had a brain tumor when  
18 he died when the right side of the brain was destroyed by a  
19 high powered missile?

20 Q Doctor, on the basis of your examination of all of  
21 these autopsy photographs, x-rays, and other materials, do you  
22 have an opinion as to whether there is any evidence whatever  
23 indicating that the President was struck in the head with any  
24 bullet other than the one that you have described as entering  
25 the rear of his head exiting the right front?

1           A.     No. I think the President was struck by a bullet  
2 in the back of the head. And this was a high powered rifle  
3 bullet which caused tremendous destruction and explosion of the  
4 right side of the head, and he was struck by a bullet in the  
5 upper part of the back which cruised adjacent to the pleural  
6 cavity on the right side and exited from the neck after frac-  
7 turing the lower part of the cervical lumbar part of the  
8 thorasic vertebrae on the right side.

9           Q.     Is the photographic and x-ray material that you have  
10 observed today totally inconsistent with any bullet striking  
11 the President from the right front or right side?

12          A.     I think so.

13          Q.     You have also had an opportunity to examine the bullet  
14 fragments which were found in the Presidential car, have you  
15 not?

16          A.     Yes sir.

17          Q.     And what is your opinion with respect to the question  
18 of whether those bullet fragments are consistent with a single  
19 bullet having entered the President's head, the skull in the  
20 rear, and exited the right front?

21          A.     But we know that that bullet that went through the  
22 head was fragmented.

23          Q.     I am asking you if you have an opinion with respect  
24 to whether there is a consistency?

25          A.     Yes, they were totally consisten, there were fragments

1 inside his brain and inside on the bone that was found on  
2 autopsy and x-rays, and there were fragments on the floor of  
3 the car. And that is totally consistent. And I see nothing  
4 odd about that.

5 Q What is your opinion, or do you have an opinion, with  
6 respect to the nearly whole bullet that you examined, Commis-  
7 sion Exhibit 399? Do you have an opinion with respect to  
8 whether or not the appearance of that bullet and the amount of  
9 material missing from that bullet would be consistent or incon-  
10 sistent with that bullet having passed through the necks of  
11 President as you have described it, having entered the right  
12 side of the back of Governor Connolly, shattering several inches  
13 of the fifth rib, exiting from his right chest below the nipple,  
14 and entering the back of his right wrist, and exiting from the  
15 front of the right wrist, and penetrating his thigh and lodging  
16 against the femur in his left thigh, do you have an opinion  
17 with respect to whether the appearance of that bullet today  
18 would be consistent with having traversed the path I have just  
19 described?

20 A Yes.

21 Q What is your opinion?

22 A I have the opinion that that is totally consistent  
23 with the high powered slug that would do this kind of damage and  
24 come out the way it is looking now. And the fragments which  
25 are distributed at the fracture site in the wrist and on the





1 femur are in my opinion sufficient to explain the defect in the  
2 base of the slug which I have examined.

3 Q Based upon your observation of several run-throughs  
4 today of the Zapruder film and the individual slides from that  
5 film, do you have any opinion as to whether that motion picture  
6 evidence would be consistent or inconsistent with the same  
7 bullet having passed through the President's throat, Governor  
8 Connelly's chest, wrist, and the right of his thigh?

9 A No, I have nothing inconsistent with this sequence.

10 Q There is nothing about the Zapruder photograph that  
11 would indicate any consistencies to you?

12 A No, there is nothing about the Zapruder film that  
13 would indicate inconsistency in the path of the same missile  
14 through the President's back, where there was the original entry  
15 wound, out the President's neck, into Governor Connelly's back,  
16 and out of his chest on the right side, and into his wrist, and  
17 into his thigh. And with the addition that the slug does not  
18 necessarily have to be damaged more than the slug that I have  
19 examined.

20 Q According to the autopsy physicians who performed the  
21 autopsy on the President's body at the Bethesda Naval Hospital,  
22 some skin and tissue slides and other slides were made of  
23 samples taken from the area of the bullet path through the brain,  
24 and the points of entry of the bullet of the President's body.  
25 Those tissue slides are not available here at the National



1 Archives to be examined. It appears --

2 A You mean microscopic slides?

3 Q Yes, microscopic slides. They are referred to in the  
4 supplementary report of Commander Humes, I believe. Do you  
5 have any opinion, Dr. Spitz, as to whether having those slides  
6 available to you today for examination would add any meaningful  
7 information that would affect or potentially affect your judgment  
8 concerning the President's wounds?

9 A No. The microscopic slides are prepared of tissues  
10 in gunshot wound cases primarily to detect the presence of  
11 the range of fire to determine whether there is close range  
12 fire or distant fire by the presence of gun powder and other  
13 changes. There is no doubt here that those are not close range  
14 fire shots. By close range fire the implication is up to two  
15 feet or so or even less than that. Nobody seems to think that  
16 the President was shot from a distance of two feet. I question  
17 what the microscopic examination would have given me that I  
18 do not know.

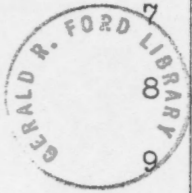
19 Q Do you know why the autopsy physicians would have  
20 made microscopic slides?

21 A Because they are pathologists, and this is the routine  
22 practice of pathologists, to make tissue slides.

23 Q Is it your opinion, then, that in a case of this  
24 nature that this would have been unnecessary?

25 A I don't say they would have been unnecessary, but

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1 they would have been unrevealing. They would have been filed  
2 with the case as a matter of routine. There are certainly  
3 routines which are followed when an autopsy is done. And those  
4 slides would have been filed away and there would have been  
5 no consequences.

6 We do close to a 1,000 homicide autopsies in Detroit a year.  
7 And the vast majority of these are gunshots. A very large  
8 number of these involved high powered rifle shots. And we  
9 treat all those cases in the same way as a matter of routine.  
10 And we know what to expect from individual cases. And my  
11 testimony in this regard, with regard to the sections of the  
12 President, does not differ from what we do in our routine cases  
13 because we know exactly what those sections are going to tell  
14 us. They tell us nothing except that we want to know the range  
15 of fire.

16 Q Is there anything else that you would like to offer  
17 to the Commission in connection with your viewing of those  
18 materials that you have seen today and your assessment and  
19 judgment concerning the President's wounds and what caused  
20 them?

21 A Yes. I would like to say that on the basis of this I  
22 would sum this up as follows: The President was struck two  
23 times in the back, and from no other place but the back. The  
24 first wound, is the wound in the chest, which in my opinion  
25 went through the President's body and came out at the neck

1 area, after possibly being deviated from its course, causing  
2 damage to the vertebrae. And this slug came out the neck.  
3 In my opinion there is no reason absolutely whatsoever to doubt  
4 this, and the findings are perfectly consistent with this.  
5 This same slug went through Mr. Connelly's body into his wrist,  
6 went out of his wrist, after breaking the radius, and continu-  
7 ing to his thigh. That slug need not be more deformed than  
8 it is. And we see this all the time.

9 The second shot was fired into the President's head from  
10 the back approximately four inches above the so-called occipital  
11 protuberance. The slug went forward toward the forward head  
12 on the right side and caused the right side of the skull to  
13 explode, and the brain to be shattered, and very large frag-  
14 ments of it dispersed. You can see them on the film. The  
15 vast majority of what is being seen on the film, that orange  
16 substance around the President's head, is brain tissue.

17 Q You mean that you can see them in the Zapruder film  
18 immediately following the fatal shot?

19 A Yes, that original material is to a larger extent  
20 brain tissue. And it is that brain tissue that is missing and  
21 is not in the photograph that is taken of the brain. That is  
22 the fatal shot which entered the back and came out the front,  
23 and that is that slug which shattered, and the jacket of the  
24 slug is peeled back and the core is partly pressed back into  
25 the slug, and much of the lead is dispersed along the wound



1 track in what is left of the brain, and in the bone.

2 Q Dr. Spitz, as we were looking at the x-rays of the  
3 President's head taken at the time of the autopsy, one of you  
4 doctors pointed out that the track of lead particles or metal  
5 particles in the head appeared on the x-ray to be somewhat at  
6 a higher level than the path of the bullet as you described it  
7 to us. Can you explain that?

8 A That is because the entire skull, especially the right  
9 side of course, but also the left, is displaced. The bone  
10 fragments are overlapping. You can see on the x-ray how frag-  
11 ments are in an unnatural location, as a result of the explo-  
12 sion. If this were all placed back in its original location --  
13 and I have tried to do that in my mind when looking at the x-ray  
14 -- move everything to where I think it belongs -- then that  
15 dispersion of metal fragments which indicates the wound track  
16 comes into perfect alignment with what I believe is the whole  
17 entry into the back of the skull.

18 MR. OLSEN: Thank you very much, Dr. Spitz. We  
19 appreciate your coming from Detroit to be with us.

20 And I would like to ask you if you would be willing to  
21 embody your observations and your conclusions in a written  
22 report to us with the least possible delay. We have a very  
23 tight time schedule on which the Commission on the CIA  
24 Activities is functioning. And we would hope to receive your  
25 observations and your conclusions on this score within a week



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or ten days if we possibly can.



P R O C E E D I N G S

Whereupon,

RICHARD LINDENBERG, MD,

having been first sworn by the Notary Public, was examined and testified as follows:

BY MR. OLSEN:

Q Doctor, would you give us your full name, please?

Q Richard Lindenberg.

Q And what is your position, Dr. Lindenberg?

A I am Director of Neuropathology and Legal Medicine, with the Maryland State Department of Health and Mental Hygiene.

Q Dr. Lindenberg, you have been present throughout the deposition testimony here this afternoon of Dr. Spitz, have you not?

A Yes sir.

Q Have you heard everything that he has testified?

A Yes.

Q Have you viewed all the same materials here at the National Archives today that he has referred to?

A I did.

Q Can you at this time tell us, Dr. Lindenberg, whether there is any particular whatever in which you wish to express an opinion different from that of Dr. Spitz?

A No, I absolutely agree with Dr. Spitz' explanation.

Q Would you be willing to give us, Dr. Lindenberg, a



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1 written report of your observations, findings and conclusions  
2 in the same fashion as I have just asked Dr. Spitz to do?

3 A. I shall.

4 Q. Can you do so within about a week's time?

5 A. I hope so.

6 MR. OLSEN: I thank you very much.



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P R O C E E D I N G S

Testimony of

ROBERT R. McMEEKIN, CONTINUED

BY MR. OLSEN:

Q Colonel McMeekin, you have already been asked a few questions on the record. Let's come back to you. You are the Director of the Aerospace Pathology at the Armed Forces Institute of Pathology here in Washington, D.C., are you not?

A I am the Chief of the Aerospace Pathology Division.

Q And you have been present throughout the entire day as we have been observing these autopsy materials and other items, photographs, x-rays of Governor Connelly, and medical reports of Governor Connelly's operations, and the observation of the bullets and the clothing and these other items, have you not?

A Yes, I have.

Q Would you tell us in your own words, in not more than a minute's time, the extent to which you concur or do not concur with the opinions and observations offered to us during the testimony of Dr. Spitz here -- which you have attended, have you not?

A Yes, I have. And I am in agreement with Dr. Spitz.

Q IS there any particular whatever in which your opinion will be different from that of Dr. Spitz?

A I don't believe so.



1 Q Would you be willing to undertake the measurements  
2 that we have discussed earlier today with Dr. Olivier and  
3 include your findings in a written report to the Commission on  
4 the entire body of evidence that you have viewed today, as well  
5 as those measurement that you will be making on the Zagruder  
6 film?

7 A Yes, I will.

8 Q Can you do so within about a week's time?

9 A I hope so.



P R O C E E D I N G S



Whereupon,

FRED J. HODGES,

Having first been sworn by the Notary Public, was examined and testified as follows:

BY MR. OLSEN:

Q. We turn finally to you, Dr. Hodges. Would you give us your full name, please?

A. Fred Jenner Hodges.

Q. And you are Dr. Hodges, a neuro-radiologist at Johns Hopkins Medical Center?

A. Correct.

Q. What is your position there? Are you the Director of any department?

A. It is not a department, it is a division of the Department of Radiology.

Q. Are there other neuro-radiologists in that Department, or are you it?

A. No, I have an assistant and several fellows in two-year training.

Q. Dr. Hodges, would you be willing to give us a written report of your observations and findings and conclusions with reference to the materials you have examined today.

A. Surely.

Q. And would you set out in that report or attach to it

1 a statement relating to your background, your educational  
2 background, your experience, your qualifications?

3 A Surely.

4 Q And memberships in societies, the specialties, and  
5 certafications, and the like?

6 A Yes.

7 MR. OLSEN: Would you do the same for us, Dr.  
8 Lindenberg?

9 DR. LINDENBERG: Yes.

10 MR. OLSEN: And Dr. McMeekin?

11 COLONEL MC MEEKIN: Yes.

12 MR. OLSEN: YOu have been present here, have you,  
13 Dr. Hodges, during the course of the testimony of Dr. Spitz?

14 MR. HODGES: Yes.

15 MR. OLSEN: Is there any thing that you would like  
16 to add to what we have covered in Dr. Spitz' testimony?

17 DR. HODGES: No.

18 MR. OLSEN: Is there any matter in which you would  
19 like to express an opinion varying from or qualifying the  
20 opinions that Dr. Spitz expressed?

21 DR. HODGES: No.

22 MR. OLSEN: Do I understand from that that your  
23 own findings and conclusions would be in complete harmony with  
24 those that Dr. Spitz expressed?

25 DR. HODGES: Yes, to the extent that I am qualified



1 to draw conclusions.

2 MR. OLSEN: Is there anything anybody else wants to  
3 offer here at the present time?

4 Mr. Hohnson, I want you to know on behalf of the  
5 Commission on CIA Activities we very much appreciate the  
6 splendid assistance you have give us here at the National  
7 Archives.

8 MR. JOHNSON: You are welcome.

9 MR. OLSEN: Thank you very much indeed.

10 (Whereupon, at 5:37 p.m., the Staff interviews were  
11 concluded)





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