

Mr. DULLES. That is right.

"At this time Hosty made the statement that Lee Oswald had killed the President, and that Oswald was a Communist."

Now, at this time, that is walking toward point "C" you have just marked on exhibit—

Mr. BRIAN. No, sir; we stopped here for a pause just for a short time, it would be hard to say how long but it wasn't because—it wasn't long because it don't take long to make a statement.

Representative FORD. That is point "B."

Mr. BRIAN. Yes, sir.

Mr. DULLES. Near point "B" is where this conversation took place.

Mr. BRIAN. Yes, sir.

Mr. DULLES. And you did not hear the content of any further conversations?

Mr. BRIAN. No, sir; other than that he said he knew he was a Communist and knew he was working in the Book Depository.

Mr. DULLES. Did further conversations take place between Lieutenant Revill and Agent Hosty after that?

Mr. BRIAN. Yes, sir; they walked on talking.

Mr. DULLES. But you did not hear what they said at that time?

Mr. BRIAN. I was behind them and Lieutenant Revill got in a hurry when that happened and they got on and I was behind them, and it is pretty hard to hear what people are saying in front of you when they have got their back turned to you and you are behind them.

Mr. DULLES. You have indicated that in paragraph 3 of Exhibit 7. You say, "While we were in the basement Hosty also said several things to Lieutenant Revill that I could not hear," because of the excitement and commotion, that is what you had reference to?

Mr. BRIAN. Yes, sir; they were conversing as they walked on and I couldn't hear them and I didn't hear what they said, I was behind them. I didn't pay a whole lot of attention to the whole thing because like I say I didn't think it would matter any. It was just—and things were happening pretty fast, and along about that time.

Mr. DULLES. That is all I have, Mr. Chairman.

Mr. RANKIN. Mr. Chairman, I would like to offer the diagram, Exhibit 839, if I may.

The CHAIRMAN. Yes, all right; it may be admitted under that number. Thank you very much.

(At this point Representative Ford left the hearing room.)

(Commission Exhibit No. 839 was marked for identification and received in evidence.)

Mr. DULLES. That is the original before the notary public put his endorsement on it.

Mr. BRIAN. Yes, sir; that went forward.

The CHAIRMAN. Thank you.

Mr. RANKIN. Mr. Chief Justice, Mr. Specter is going to examine these people about the velocity and so forth and I want to speak on—speak to him just a minute about the matter we talked about.

The CHAIRMAN. We will take a break now.

(Recess.)

TESTIMONY OF ROBERT A. FRAZIER

The CHAIRMAN. Mr. Specter, you may proceed.

You have been sworn and you are still under oath, as you understand?

Mr. FRAZIER. Yes.

Mr. SPECTER. Will you state your name again for the record, please?

Mr. FRAZIER. Robert A. Frazier.

Mr. SPECTER. Mr. Frazier, you have appeared heretofore to testify about certain tests which you have conducted, but at this phase of the record, will you state briefly your occupation and your specialty, please?

Mr. FRAZIER. I am a special agent assigned to the FBI laboratory, the firearms identification unit in Washington, D.C., where I make examinations of bullets,

cartridges, gunpowder tests, bullet holes, examinations of clothing, and other similar types of examinations.

Mr. SPECTER. In the course of your duties have you had an occasion to examine the clothing which was purportedly worn by President John Kennedy on November 22, 1963?

Mr. FRAZIER. Yes, sir; I have.

Mr. SPECTER. And do you have that clothing with you at the present time, sir?

Mr. FRAZIER. I have certain parts of it. I have the coat, shirt, tie, and the bandages and support belt which he allegedly was wearing that day.

Mr. SPECTER. Would you refer at this time to the coat, if you please, which, may the record show, has heretofore been marked as Commission Exhibit 393.

And by referring to that coat will you describe what, if anything, you observed on the rear side of the coat?

Mr. FRAZIER. There was located on the rear of the coat 5 $\frac{3}{4}$ inches below the top of the collar, a hole, further located as 1 $\frac{3}{4}$ inches to the right of the midline or the seam down the center of the coat; all of these being as you look at the back of the coat.

Mr. SPECTER. What characteristics did you note, if any, on the nature of that hole?

Mr. FRAZIER. I noticed that the hole penetrated both the outer and lining areas of the coat, that it was roughly circular in shape. When I first examined it it was approximately one-fourth of an inch in diameter, and the cloth fibers around the margins of the hole were pushed inward at the time I first examined it in the laboratory.

Mr. SPECTER. Did any tests conducted on the coat disclose any metallic substance on that area of that hole?

Mr. FRAZIER. Yes, sir. I had a spectrographer run an analysis of a portion of the hole which accounts for its being slightly enlarged at the present time. He took a sample of cloth and made an analysis of it. I don't know actually whether I am expected to give the results of his analysis or not.

Mr. SPECTER. Yes; would you please, or let me ask you first of all, were those tests run by the Federal Bureau of Investigation in the regular course of its testing procedures?

Mr. FRAZIER. Yes, sir; they were.

Mr. SPECTER. And have those results been made available to you through the regular recordkeeping procedures of the FBI?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Would you then please tell us what those tests disclose?

Mr. FRAZIER. Traces of copper were found around the margins of the hole in the back of the coat, and as a control, a very small section under the collar was taken, and no copper being found there, it was concluded that the copper was foreign to the coat itself.

Mr. SPECTER. Have you now described all of the characteristics of that hole, which you consider to be important for the Commission's consideration?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Assuming that those clothes, that jacket, specifically, at this juncture, was worn by President Kennedy, and was in the same condition when that hole was made as it is now, and at the time when you made your examination, do you have a professional opinion as to what caused that hole in the back of the jacket?

Mr. FRAZIER. Yes, sir; I would say that it was an entrance hole for a bullet.

Mr. SPECTER. And what is the reason for that conclusion, please?

Mr. FRAZIER. It has all the physical appearance characteristics which are considered when examining holes, such as its shape, its size, and in particular the fact that the fibers around the margins of the hole were all pushed inward where the cloth was torn by the object which passed through, and the fibers were unraveled as they were pushed inward, which is characteristic of a entrance-type bullet hole.

Mr. SPECTER. Is the presence of the metallic substance relevant in your conclusion that it was a bullet hole?

Mr. FRAZIER. Not necessarily. It is a factor which corroborates that opinion

but even without it, it would still have been my opinion that it was a bullet entrance hole.

Mr. SPECTER. Can you tell the size of the bullet from the hole in the jacket?

Mr. FRAZIER. The hole in the jacket is approximately a quarter of an inch in diameter.

Mr. SPECTER. Would that hole be consistent with a hole which would be caused by a 6.5 millimeter bullet?

Mr. FRAZIER. Yes, sir; the actual bullet which makes a hole cannot be determined because the cloth in one instance may stretch more than it does in another instance causing either a larger or smaller hole even for the same caliber, but it is consistent for a bullet of 6.5 millimeters in diameter to make a hole of approximately this size.

Mr. SPECTER. Were there any holes indicative of being bullet holes found on the front part of the President's jacket?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Did you have further occasion to examine the President's shirt?

Mr. FRAZIER. I did.

Mr. SPECTER. May the record show that the shirt has heretofore been identified as Commission Exhibit 394?

The CHAIRMAN. Yes; it may be.

Mr. SPECTER. What, if anything, did you observe then on the back side of the shirt, Mr. Frazier?

Mr. FRAZIER. I found on the back of the shirt a hole, $5\frac{3}{4}$ inches below the top of the collar, and as you look at the back of the shirt $1\frac{1}{8}$ inch to the right of the midline of the shirt, which is this hole I am indicating.

Mr. SPECTER. May the record show the witness is examining the shirt, as he has the coat, to indicate the hole to the Commission.

The CHAIRMAN. The record may show that.

Mr. FRAZIER. In connection with this hole, I made the same examination as I did on the coat, Exhibit 393. I found the same situation to prevail, that is the hole was approximately circular in shape, about one-fourth inch in diameter, and again the physical shape of it is characteristic of a bullet hole, that is the edges are frayed, and there are slight radial tears in the cloth, which is characteristic of a bullet having passed through the cloth, and further, the fibers around the margin of the hole were—had been pressed inward, and assuming that, when I first examined the shirt it was in the same condition as it was at the time the hole was made, it is my opinion that this hole, in addition, was caused by a bullet entering the shirt from the back at that point.

Mr. SPECTER. Is that hole consistent with having been caused by a 6.5 millimeter bullet?

Mr. FRAZIER. Yes; it is.

Mr. SPECTER. With respect to the front side of the shirt, what, if any, hole did you find there?

Mr. FRAZIER. Only one hole.

Mr. DULLES. May I ask one question there?

Mr. FRAZIER. Yes; certainly.

Mr. DULLES. Is the hole in the shirt and the hole in the coat you have just described in a position that indicates that the same instrument, whatever it was, or the same bullet, made the two?

Mr. FRAZIER. Yes; they are. They are both—the coat hole is $5\frac{3}{8}$ inches below the top of the collar. The shirt hole is $5\frac{3}{4}$ inches, which could be accounted for by a portion of the collar sticking up above the coat about a half inch.

Mr. DULLES. I see.

Mr. FRAZIER. And they are both located approximately the same distance to the right of the midline of both garments.

Now, on the front of the shirt, I found what amounts to one hole. Actually, it is a hole through both the button line of the shirt and the buttonhole line which overlap down the front of the shirt when it is buttoned.

Mr. SPECTER. Proceed.

Mr. FRAZIER. This hole is located immediately below the button being centered seven-eighths of an inch below the button on the shirt, and similarly seven-eighths of an inch below the buttonhole on the opposite side.

The CHAIRMAN. You are speaking of the collar button itself, aren't you?

Mr. FRAZIER. The collar button.

The CHAIRMAN. Yes.

Mr. FRAZIER. In each instance for these holes, the one through the button line and the one through the buttonhole line, the hole amounts to a ragged slit approximately one-half inch in height. It is oriented vertically, and the fibers of the cloth are protruding outward, that is, have been pushed from the inside out. I could not actually determine from the characteristics of the hole whether or not it was caused by a bullet. However, I can say that it was caused by a projectile of some type which exited from the shirt at that point and that is again assuming that when I first examined the shirt it was—it had not been altered from the condition it was in at the time the hole was made.

Mr. SPECTER. What characteristics differ between the hole in the rear of the shirt and the holes in the front of the shirt which lead you to conclude that the hole in the rear of the shirt was caused by a bullet but which are absent as to the holes in the front of the shirt?

Mr. FRAZIER. The hole in the front of the shirt does not have the round characteristic shape caused by a round bullet entering cloth. It is an irregular slit. It could have been caused by a round bullet, however, since the cloth could have torn in a long slitlike way as the bullet passed through it. But that is not specifically characteristic of a bullethole to the extent that you could say it was to the exclusion of being a piece of bone or some other type of projectile.

Mr. SPECTER. Have you now described all of the characteristics of the front of the shirt holes which you consider to be important?

Mr. FRAZIER. Yes, sir.

Mr. DULLES. Could I ask one question there. If the bullet, after entering, hit something that made it tumble or change, would that account for this change in the appearance of the exit through the shirt?

Mr. FRAZIER. I think not. In my opinion it would not have been necessary, if I may put it that way, for the bullet to have turned sideways or partially sideways in order to make an elongated hole.

Mr. DULLES. I see.

Mr. FRAZIER. I think the effect in the front of the shirt is due more to the strength of the material being more in the horizontal rather than the vertical direction which caused the cloth to tear vertically rather than due to a change in the shape or size of the bullet or projectile.

Mr. DULLES. Or possibly the velocity of the bullet at that place, would that have anything to do with it?

Mr. FRAZIER. I think the hole would not have been affected unless it was a very large change in velocity.

The CHAIRMAN. Mr. Frazier, I notice that the front of the shirt immediately around the hole you have just been describing and in fact on much of the front of the shirt is bloodsoaked. Would that, with the other evidences you have seen there indicate to you as an expert that this was the exit of the bullet that had entered in the back of the coat as you have described it?

Mr. FRAZIER. The presence of the blood would have in my opinion no value for determining which was entrance or exit, because I have seen entrance wounds which bleed extensively and exit wounds which bleed not at all and vice versa. It depends entirely on the type of bullet which strikes, whether or not it mutilates itself in the body, and probably more importantly it depends on the position of the person who is shot after the shooting occurs as to where the blood will be located on the garments.

The CHAIRMAN. May I put it this way, probably a little better. Do the evidences that you see on this shirt indicate to you that this hole in the front of the shirt that you have just described was made by the bullet which entered in the rear.

Mr. FRAZIER. I can say that this hole in the collar area could have been made by this bullet but I cannot say that the bullet which entered the back actually came out here or at some other place because I am not aware of the autopsy information as to the path of the bullet through the body.

The CHAIRMAN. I see.

Mr. FRAZIER. But if the path of the bullet was such that it came through the body at the right angle, then one bullet could have caused both holes.

The CHAIRMAN. Could have caused both holes.

Mr. FRAZIER. Yes.

The CHAIRMAN. That is sufficient.

Mr. DULLES. Is it correct that the blood on the shirt might well have been occasioned by the second wound rather than exclusively by the first wound?

Mr. FRAZIER. Yes; it could have come from any other wound on the body as well as this one.

Mr. SPECTER. When you refer to any other wound, Mr. Frazier, are you referring to the head wound which is widely known to have been inflicted on the President at the time of the assassination?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Did you have occasion to examine the President's tie or the tie purportedly worn by the President on November 22, 1963?

Mr. FRAZIER. Yes; I did.

Mr. SPECTER. May the record show at this juncture that that tie has heretofore been marked as Commission Exhibit 395?

The CHAIRMAN. Yes; it may show that.

Mr. SPECTER. What did you note, if anything, with respect to the tie, Mr. Frazier?

Mr. FRAZIER. When the tie was examined by me in the laboratory I noted that the neck portion had been cut from one side of the knot. However, the knot remained in apparently its original condition. The only damage to the tie other than the fact that it had been cut, was a crease or nick in the left side of the tie when you consider the tie as being worn on a body. As you view the front of the tie it would be on the right side. This nick would be located in a corresponding area to the area in the shirt collar just below the button.

Mr. SPECTER. As you now indicate on your own tie, you are indicating on the portion of the tie to your right?

Mr. FRAZIER. If it was on my tie it would be on the left side of the tie.

Mr. SPECTER. Your left side.

Mr. FRAZIER. The left side of my tie. There is a nick on the left side of the tie if you consider it as left and right according to the person wearing the tie.

Mr. SPECTER. Does the nick in the tie provide any indication of the direction of the missile?

Mr. FRAZIER. The nick is elongated horizontally, indicating a possible horizontal direction but it does not indicate that the projectile which caused it was exiting or entering at that point. The fibers were not disturbed in a characteristic manner which would permit any conclusion in that connection.

Mr. SPECTER. Is the nick consistent with an exiting path?

Mr. FRAZIER. Oh, yes.

Mr. SPECTER. Is there any indication from the nature of the nick as to the nature of the projectile itself?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Is the nick consistent with a 6.5 millimeter bullet having caused the nick?

Mr. FRAZIER. Yes. Any projectile could have caused the nick. In this connection there was no metallic residue found on the tie, and for that matter there was no metallic residue found on the shirt at the holes in the front. However, there was in the back.

Mr. SPECTER. Did any of the other—

Mr. DULLES. Excuse me, on the back of the coat?

Mr. FRAZIER. The shirt.

Mr. DULLES. Back of the coat and on the shirt?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Did any of the other items of President Kennedy's clothing which you have heretofore referred to contain any indications at all of any bullet holes or any other type of holes?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Mr. Frazier, did you have occasion to examine the clothing which

has heretofore been identified in prior Commission proceedings as that worn by Governor Connally on November 22, 1963?

Mr. FRAZIER. Yes; I did.

Mr. SPECTER. I now hand you what purports to be the Governor's coat, and may the record show that has been heretofore marked as Commission Exhibit No. 683?

(At this point the Chairman left the hearing room.)

Mr. DULLES [presiding]. The record may so show.

Mr. SPECTER. Have you had opportunity heretofore to examine that coat?

Mr. FRAZIER. Yes; I have.

Mr. SPECTER. What did your examination reveal with respect to the back side of the coat?

Mr. FRAZIER. There was found on the coat by me when I first examined it, near the right sleeve $1\frac{1}{4}$ inches from the seam where the sleeve attaches to the coat, and $7\frac{1}{4}$ inches to the right of the midline when you view the back of the coat, a hole which is elongated in a horizontal direction to the length of approximately five-eighths of an inch, and which had an approximate one-quarter inch height.

Mr. SPECTER. Were you able to determine from your examination of the Governor's clothing whether or not they had been cleaned and pressed prior to the time you saw them?

Mr. FRAZIER. Yes; they had.

Mr. SPECTER. Is that different from or the same as the condition of the President's clothing which you have just described this morning?

Mr. FRAZIER. It is different in that the President's clothing had not been cleaned. It had only been dried. The blood was dried. However, the Governor's garments had been cleaned and pressed.

Mr. SPECTER. Had the President's clothing been pressed then?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Will you proceed to describe any other characteristics—

Mr. DULLES. Had been dried artificially or let nature take its course?

Mr. FRAZIER. It appeared to be air dried.

Mr. DULLES. Air dried, artificially?

Mr. FRAZIER. I couldn't say whether any outside heat had been applied but it did not appear that any heat had been applied to the blood.

Mr. SPECTER. Proceed.

Mr. FRAZIER. On the hole on the back of the coat although it had the general appearance and could have been a bullet hole, possibly because of the cleaning and pressing of the garment. I cannot state that it actually is a bullet hole nor the direction of the path of the bullet, if it were a bullet hole.

Mr. SPECTER. Is the nature of the opening consistent with being a bullet hole?

Mr. FRAZIER. Yes, sir; it is.

Mr. SPECTER. And is it consistent with a bullet hole caused by a missile traveling from the back to the front of the wearer of the garment?

Mr. FRAZIER. I could not determine that.

Mr. SPECTER. You couldn't determine that it was, but could it have been?

Mr. FRAZIER. It could have been, yes; either way.

Mr. SPECTER. All right. Will you now turn to the front side of the coat and state what, if any, damage you observed on the body of the garment?

Mr. FRAZIER. When considered from the wearer's standpoint, on the right chest area of the coat there is a hole through the lining and the outer layer of the coat which is located $6\frac{1}{2}$ inches from the right side seam line and also $6\frac{1}{2}$ inches from the armpit which places this hole approximately 5 inches to the right of the front right edge of the coat.

This hole was approximately circular in shape, three-eighths of an inch in diameter, and again possibly because of the cleaning and pressing of the garment, I could not determine whether it actually was a bullet hole or whether or not it entered or exited if it were a bullet hole.

Mr. SPECTER. Was the hole consistent with being an exit bullet hole? That is to say, could it have been caused by an exiting bullet?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Did you find any damage on the right sleeve of the jacket?

Mr. FRAZIER. Yes, sir; on more or less the top portion of the right sleeve very near the end of the sleeve there is a very rough hole which penetrates both the outside layer, the lining and the inside layer of the sleeve.

Mr. SPECTER. Were you able to observe sufficient characteristics to formulate any conclusion as to the cause of that tear?

Mr. FRAZIER. This also did not indicate direction from the condition of the fibers, possibly due to the cleaning and pressing of the garment.

However, it could have been a bullet which struck the garment at an angle to the surface which caused a slight elongation. The hole was approximately five-eighths of an inch in length, and three-eighths of an inch in width. The elongation could also have been the result of a mutilated bullet having struck the garment or it could have been caused by a fold in the garment at the time the object or bullet struck.

Mr. SPECTER. Did you have occasion to examine the shirt, which was purportedly worn by Governor Connally, and which has heretofore been identified by the Governor in Commission proceedings, as that worn by him on November 22, 1963?

Mr. FRAZIER. Yes; I did.

Mr. SPECTER. May the record show at this point that Mr. Frazier is examining the shirt heretofore identified on the back side with a photograph marked Commission Exhibit 685 and on the front side with a photograph marked Commission Exhibit 686.

Now, referring to that shirt, Mr. Frazier, what, if anything, did you observe on the rear side by way of an imperfection, hole or defect?

Mr. FRAZIER. I found a hole which is very ragged. An L-shaped tear actually is what it amounted to in the back of the shirt near the right sleeve, 2 inches from the seam line where the sleeve attaches to the shirt, and 7½ inches to the right of the midline of the shirt, the right side being as you look at the back of the shirt.

This tear amounted to a five-eighths of an inch long horizontal and approximately one-half inch long vertical break in the cloth, with a very small tear located immediately to its right, as you look at the back of the shirt, which was approximately three-sixteenths of an inch in length.

This hole corresponds in position to the hole in the back of the coat, Governor Connally's coat, identified as Commission No. 683.

Mr. SPECTER. Were there sufficient characteristics observable to formulate a conclusion as to the cause and direction of that hole?

Mr. FRAZIER. No, sir; there were no characteristics on which you could base a conclusion as to what caused it, whether or not it was a bullet and if it had been, what the direction of the projectile was.

Mr. SPECTER. Could it have been caused by a 6.5-mm. bullet coming from the rear of the wearer toward his front?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Referring now to the front side of the Governor's shirt, what, if anything, did you observe with respect to a tear or a hole thereon, as to the body of the shirt?

Mr. FRAZIER. I found in the right chest area of the shirt, considering the shirt when it is being worn, a very irregular tear more or less in the form of an "H," of the letter "H." This tear was approximately 1½ inches in height, with the crossbar tear being approximately 1 inch in width, which caused a very irregularly shaped and enlarged hole in the front of the shirt. The hole is located 5 inches from the right-side seam, and 9 inches below the top of the right sleeve. The 9-inch figure is from the top of the right shoulder where the sleeve adjoins the yoke of the shirt.

Mr. SPECTER. Had that garment been cleaned and pressed, Mr. Frazier, prior to the time you examined it?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Were there sufficient characteristics then remaining on the hole on the front side to enable you to formulate an opinion as to the cause of the hole?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Could it have been caused by a 6.5 millimeter bullet exiting from the chest of the Governor?

Mr. FRAZIER. Yes, it could.

Mr. SPECTER. Now what, if anything—

Mr. DULLES. Could I ask there, would the size and character of this hole indicate the condition of the bullet, I mean as to whether it was tumbling or whether it was a mutilated bullet or anything of that kind?

Mr. FRAZIER. No, sir; it would not.

Mr. DULLES. Even a bullet in full flight, full velocity could have made this kind of a hole in the shirt?

Mr. FRAZIER. It could have, particularly if the shirt had been wrinkled at the time it passed through, and particularly because the material in this shirt tore rather severely at the time the object passed through, indicating a very weak structure of the cotton fiber, so that it would tear out of all proportion to a stronger fabric.

And for that reason, the shape of the hole could be affected by the condition of the material as well as any folds in the material or, as you say, by a mutilated bullet or a passage of a bullet through the cloth at an angle to the surface or the passing of a bullet partially sideways through the cloth.

(Discussion off the record.)

Mr. DULLES. Will you proceed?

Mr. SPECTER. Mr. Frazier, what, if any, defect or hole did you observe on the right sleeve of the Governor's shirt?

Mr. FRAZIER. I found in the cuff of the shirt which is a French cuff, through both the outer and inner layers of the cuff, a hole which is ragged in contour, irregularly shaped, and which had more or less star-shaped tears extending outward from the hole into the material, located $1\frac{1}{2}$ inches up from the end of the sleeve, and $5\frac{1}{2}$ inches from the outside cuff link hole, through both, as I said, through both layers of the cuff, and the hole was in such a condition, possibly due to the washing of the material, that I could not determine what actually caused it or if it had been caused by a bullet, the direction of the path of the bullet with reference to entrance and exit.

Mr. SPECTER. Could those holes have been caused by a bullet passing through the Governor's wrist from the dorsal or upper portion to the volar or palmar side?

Mr. FRAZIER. Yes; they could.

Mr. SPECTER. Did you have occasion to examine the trousers which have been heretofore identified in Commission hearings as those worn by Governor Connally on November 22, 1963?

Mr. FRAZIER. Yes, I did.

Mr. SPECTER. May the record show that Mr. Frazier has taken and is observing the trousers which have been identified in the record, through a picture of the front side, bearing Commission Exhibit No. 687 and a picture of the rear side bearing Commission Exhibit No. 688.

Now, referring to those trousers, what if anything did you observe in the nature of a defect or hole, Mr. Frazier?

Mr. FRAZIER. In the area which would be the left-knee area of the person wearing the trousers, there was a hole which is roughly circular in shape, and approximately one-quarter of an inch in diameter with some possible expansion of the hole due to slight tearing of the cloth at the outer margins of the hole.

Mr. SPECTER. Had the trousers been cleaned and pressed prior to your examination?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Were there sufficient characteristics available for you to formulate any conclusion as to the cause of that hole?

Mr. FRAZIER. No, sir; I can say that it had the general appearance of a bullet hole but I could not determine the direction of the bullet if, in fact, it had been caused by a bullet.

Mr. SPECTER. What are the characteristics which led you to believe that it had the characteristics of a bullet hole?

Mr. FRAZIER. It has the roughly circular shape with slight tearing away from the edges of the material.

Mr. SPECTER. Is there any other hole on the trousers which could be a hole of exit?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Mr. Frazier, did you have occasion to examine an automobile which was the vehicle used customarily by the President of the United States in parades?

Mr. FRAZIER. Yes; I did.

Mr. SPECTER. When did that examination occur?

Mr. FRAZIER. In the early morning hours of November 23, 1963, at the Secret Service garage here in Washington, D.C.

Mr. SPECTER. I now hand you a photograph previously identified for the record as Commission Exhibit No. 344 and ask you if that depicts the car which you examined?

Mr. FRAZIER. Yes, sir; it is.

Mr. SPECTER. I hand you a subsequent exhibit of the Commission, No. 346, showing the interior view of the automobile and ask you if that depicts the automobile which you examined?

Mr. FRAZIER. Yes, sir; however, it wasn't in this condition. It wasn't as clean as it is in Exhibit 346.

Mr. SPECTER. What was the condition with respect to cleanliness?

Mr. FRAZIER. There were blood and particles of flesh scattered all over the hood, the windshield, in the front seat and all over the rear floor rugs, the jump seats, and over the rear seat, and down both sides of the side rails or tops of the doors of the car.

Mr. SPECTER. Is that condition depicted by Commission Exhibits 352 and 353 to the extent that they show the interior of the automobile?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. What was the purpose of the examination which you made of the car at that time and place?

Mr. FRAZIER. I examined the car to determine whether or not there were any bullet fragments present in it, embedded in the upholstery of the back of the front seat, or whether there were any impact areas which indicated that bullets or bullet fragments struck the inside of the car.

Mr. SPECTER. With respect to the fragments first, what did your examination disclose?

Mr. FRAZIER. We found three small lead particles lying on the rug in the rear seat area. These particles were located underneath or in the area which would be underneath the left jump seat.

Mr. SPECTER. Have those particles been identified during the course of your prior testimony?

Mr. FRAZIER. No, sir; they have not?

Mr. SPECTER. Will you produce them at this time then, please? May we assign to this group of particles Commission Exhibit No. 840?

Mr. DULLES. These have not been discussed before, have they?

Mr. SPECTER. They have not.

Mr. DULLES. It shall be admitted as Commission Exhibit No. 840.

(Commission Exhibit No. 840 was marked for identification and received in evidence.)

Mr. SPECTER. I move formally for their admission, then, into evidence at this time.

Mr. DULLES. They shall be admitted.

Mr. SPECTER. Will you describe the three pieces of metal which are contained within this vial, please?

Mr. FRAZIER. The three pieces of metal are lead. They were weighed immediately upon recovery and were found to weigh nine-tenths of a grain, seven-tenths of a grain, and seven-tenths of a grain, respectively. Since that time small

portions have been removed for spectrographic analysis and comparison with other bullets and bullet fragments.

Mr. SPECTER. Has that comparison been made with a whole bullet heretofore identified as Commission Exhibit 399 which in other proceedings has been identified as the bullet from the Connally stretcher?

Mr. FRAZIER. Yes, sir; the comparison was made by comparing Exhibit 399 with a bullet fragment found in the front seat of the Presidential limousine and then comparing that fragment with these fragments from the rear seat of the automobile.

Mr. SPECTER. For identification purposes, has that fragment from the front seat been heretofore identified during your prior testimony?

Mr. FRAZIER. Yes; it has. It bears Commission No. 567.

Mr. SPECTER. Now, what did the comparative examination then disclose as among Commission Exhibits 399, 567, and 840?

Mr. FRAZIER. That examination was performed by a spectrographer, John F. Gallagher, and I do not have the results of his examinations here, although I did ascertain that it was determined that the lead fragments were similar in composition.

Mr. SPECTER. So that they could have come from, so that the fragments designated 840 could have come from the same bullet as fragment designated 567?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Were the tests sufficient to indicate conclusively whether fragments 840 did come from the fragment designated as 567?

Mr. FRAZIER. No, sir.

Mr. SPECTER. Did you personally find any other fragments in the President's car during the course of your examination?

Mr. FRAZIER. No; I did not.

Mr. SPECTER. Now, where, according to information provided to you then, was the fragment designated Commission Exhibit 567 found?

Mr. FRAZIER. That was found by the Secret Service upon their examination of the limousine here in Washington when it first arrived from Dallas, and Commission No. 567 was delivered by Deputy Chief Paul Paterni and by a White House detail chief, Floyd M. Boring, to a liaison agent of the FBI, Orrin Bartlett, who delivered them to me in the laboratory at 11:50 p.m., on November 22, 1963.

Mr. SPECTER. Does that constitute the total chain of possession then from the finder with the Secret Service into your hands, as reflected on the records of the FBI?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Was there another fragment, was there any other fragment found in the front seat of the car?

Mr. FRAZIER. Yes. Alongside the right side of the front seat, Commission Exhibit No. 569, which is the base portion of the jacket of a bullet, was found, and handled in identical manner to the Exhibit 567.

Mr. DULLES. And the front seat is the seat which would be the driver's seat?

Mr. FRAZIER. Yes.

Mr. DULLES. And the Secret Service man on his right, I believe?

Mr. SPECTER. Mr. Kellerman.

Mr. DULLES. That was the seat from which this came?

Mr. FRAZIER. Commission Exhibit 567 was found on the seat right beside the driver, and Exhibit 569 was found on the floor beside the right side of the front seat.

Mr. SPECTER. The right side of the front seat, Mr. Dulles, as the prior testimony shows was occupied by Roy Kellerman and the driver was William Greer.

Mr. DULLES. Right. Thank you.

Mr. SPECTER. Would you state what the chain of possession was from the time of discovery of Exhibit 569 until the time it came into your possession, based on the records of the FBI, please, if you have those records available?

Mr. FRAZIER. Yes, sir. It was delivered by Secret Service Deputy Chief Paul Paterni, and SAC of the White House detail Floyd M. Boring of the Secret

Service again, to Special Agent Orrin Bartlett of the FBI who delivered it to me at 11:50 p.m. on November 22, 1963.

Mr. SPECTER. Are the records which you have just referred to relating to the chain of possession of Exhibits 567 and 569 maintained by you in the normal course of your duties as an examiner of those items?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Mr. Frazier, is it possible for the fragments identified in Commission Exhibit 840 to have come from the whole bullet heretofore identified as Commission Exhibit 399?

Mr. FRAZIER. I would say that based on weight it would be highly improbable that that much weight could have come from the base of that bullet since its present weight is—its weight when I first received it was 158.6 grains.

Mr. SPECTER. Referring now to 399.

Mr. FRAZIER. Exhibit 399, and its original normal weight would be 160 to 161 grains, and those three metal fragments had a total of 2.1 grains as I recall—2.3 grains. So it is possible but not likely since there is only a very small part of the core of the bullet 399 missing.

Mr. SPECTER. Have you now described all of the bullet fragments which you found in the President's automobile?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Was it your job to analyze all of the bullets or bullet fragments which were found in the President's car?

Mr. FRAZIER. Yes; it was, except for the spectrographic analysis of the composition.

Mr. SPECTER. Have you now described all of the bullet fragments which were brought to you by anyone else and identified as having been found in the President's car?

Mr. FRAZIER. Yes, sir; not this morning but at previous times during my testimony I have; yes.

Mr. SPECTER. But then there is on the record now all of the identification of the metallic or bullet fragments found in connection with your examination of the President's car or which were examined by you after having been found by someone else?

Mr. FRAZIER. No, sir. There is one other, it is not a metal particle but it is a residue of metal on the inside of the windshield.

Mr. SPECTER. Aside from that residue of the windshield which I am going to come to now, have we placed on the record a description of all of the bullets or bullet fragments?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Now—

Mr. DULLES. Just one moment. You mean bullet fragments related to the car or bullet fragments found anywhere?

Mr. SPECTER. Related to the President's automobile.

Mr. FRAZIER. Yes; you have.

Mr. SPECTER. Did you have occasion then to examine the windshield of the Presidential limousine?

Mr. FRAZIER. Yes; I did.

Mr. SPECTER. What did that examination disclose?

Mr. FRAZIER. On the inside surface of the windshield there was a deposit of lead. This deposit was located when you look at the inside surface of the windshield, 13½ inches down from the top, 23 inches from the left-hand side or driver's side of the windshield, and was immediately in front of a small pattern of star-shaped cracks which appeared in the outer layer of the laminated windshield.

Mr. DULLES. What do you mean by the "outer layer of the laminated windshield"?

Mr. FRAZIER. The windshield is composed of two layers with a very thin layer of plastic in between which bonds them together in the form of safety glass. The inside layer of the glass was not broken, but the outside layer immediately on the outside of the lead residue had a very small pattern of cracks and there was a very minute particle of glass missing from the outside surface.

Mr. DULLES. And the outside surface was the surface away from where the occupants were sitting?

Mr. FRAZIER. That is correct; yes.

Mr. DULLES. And the inside surface was the surface nearest the occupants?

Mr. FRAZIER. Yes.

Mr. SPECTER. What do those characteristics indicate as to which side of the windshield was struck?

Mr. FRAZIER. It indicates that it could only have been struck on the inside surface. It could not have been struck on the outside surface because of the manner in which the glass broke and further because of the lead residue on the inside surface. The cracks appear in the outer layer of the glass because the glass is bent outward at the time of impact which stretches the outer layer of the glass to the point where these small radial or wagon spoke-wagon wheel spoke-type cracks appear on the outer surface.

Mr. DULLES. So the pressure must have come from the inside and not from the outside against the glass?

Mr. FRAZIER. Yes, sir; that is correct.

Mr. DULLES. As far as the car is concerned from the back to the front?

Mr. FRAZIER. Yes, sir.

Mr. DULLES. Not from outside against the glass—from the front against the glass.

Mr. FRAZIER. That is right.

Mr. SPECTER. Was a comparison made of the lead residues on the inside of the windshield with any of the bullet fragments recovered about which you have heretofore testified?

Mr. FRAZIER. Yes. They were compared with the bullet fragment found on the front seat, which in turn was compared with Commission 399. The lead was found to be similar in composition. However, that examination in detail was made by a spectrographer, Special Agent John F. Gallagher.

Mr. SPECTER. Was that examination made in the regular course of examining procedures by the FBI?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. And was that information made available to you through the normal conference procedures among FBI examiners?

Mr. FRAZIER. Yes, sir. He submitted his report to me and I prepared the formal report of the entire examination.

Mr. SPECTER. Are his report and your formal report a part of the permanent record of the FBI then?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. I now show you Commission Exhibit No. 350 which has heretofore been identified as a picture of the windshield of the Presidential limousine and I ask you if that is the crack about which you have just testified?

Mr. FRAZIER. Yes; it is. This Exhibit 350 is a photograph which I took on the 23d of November, showing a view from the front toward the rear of the Presidential limousine and showing the crack in the glass and the lead residue on the inside surface.

Mr. SPECTER. Would you produce at this time the lead residue obtained by you from that inside surface, please? May it please the Commission, I would like to mark this as Commission Exhibit 841 and move for its admission into evidence at this time.

Mr. DULLES. It shall be admitted into evidence.

(Commission Exhibit No. 841 was marked for identification and received in evidence.)

Mr. DULLES. May I just ask a question of you, Mr. Specter, and possibly of the witness.

I assume that the windshield we are now discussing is the windshield that was exhibited to the Commission several weeks ago and which members of the Commission examined?

Mr. SPECTER. It was, Mr. Dulles, and we can establish that, of record, through another Commission Exhibit which is 351, which was the number given to the windshield and we have a reproduction here through the photograph.

Mr. DULLES. You don't have the windshield here today, though?

Mr. SPECTER. No, we do not.

Mr. DULLES. It would be the same windshield that the Commission saw.

Mr. SPECTER. We can establish it through the witness, too.

Mr. Frazier, for that purpose can you identify what is depicted in a photograph heretofore identified as Commission Exhibit 351?

Mr. FRAZIER. Yes, sir; this is a photograph of the very small pattern of cracks in the windshield which was on the Presidential limousine at the time I examined it, and which I also later examined in the FBI laboratory.

(Discussion off the record.)

Mr. SPECTER. Mr. Frazier, have you now described all of your findings on the windshield of the Presidential limousine?

Mr. FRAZIER. Yes, sir; that is concerning the glass itself and not the molding around the windshield.

Mr. SPECTER. Will you then move to the molding around the windshield and state what, if anything, you found there?

Mr. FRAZIER. On the strip of chrome which goes across the top of the windshield and again on the passenger side of the windshield or the inside surface, I found a dent in the chrome which had been caused by some projectile which struck the chrome on the inside surface.

Mr. SPECTER. Was there one dent or more than one dent or what?

Mr. FRAZIER. One dent.

Mr. SPECTER. Will you identify what is depicted by a photograph heretofore marked as Commission Exhibit 349?

Mr. FRAZIER. Yes, sir; this is a photograph which I took of this dent at that time, showing the damaged chrome, just to the right of the rearview mirror support at the top of the windshield.

Mr. SPECTER. Did your examination of the President's limousine disclose any other holes or markings which could have conceivably been caused by a bullet striking the automobile or any part of the automobile?

Mr. FRAZIER. No, sir.

Mr. DULLES. I wonder if I could go back just a moment to the indentation in the chrome around the windshield at the top of the windshield, but on the inside, could that have been caused by a fragment of a bullet?

Mr. FRAZIER. Yes, it very easily could have. It would not have been caused, for instance, by a bullet which was traveling at its full velocity from a rifle, but merely from a fragment traveling at fairly high velocity which struck the inside surface of the chrome.

Mr. DULLES. Could that have been caused by any of the fragments that you have identified as having been found on the front seat or near the front seat of the car?

Mr. FRAZIER. Yes; I believe it could have by either, in fact, of the two fragments of rifle bullets found in the front seat.

Mr. DULLES. Thank you.

Mr. SPECTER. Mr. Frazier, assume certain facts to be true for purposes of expressing an opinion on a hypothetical situation, to wit: that President Kennedy was struck by a 6.5 millimeter bullet which passed through his body entering on the rear portion of his neck 14 centimeters to the left of his right acromion process and 14 centimeters below his mastoid process, with a striking velocity of approximately 1,904 feet per second, and exited after passing through a fascia channel in his body, through the lower anterior third of his neck with an exit velocity of approximately 1,772 to 1,779 feet per second; and that bullet had then traveled from the point where it exited from his neck and struck the front windshield in some manner. What effect would that have had on the front windshield and the subsequent flight of the missile?

Mr. FRAZIER. It would have shattered the front windshield. It would have caused a very large, relatively large hole, approximately three-eighths to an inch in diameter with radiating cracks extending outward into the glass for several inches, even to the side of the glass.

Mr. DULLES. It would have penetrated the windshield?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Would the missile then have proceeded in a forward direction?

Mr. FRAZIER. Yes, sir; it would.

Mr. SPECTER. Do you have an opinion as to how far it would have gone?

Mr. FRAZIER. Until it struck some other object in the area of approximately a mile.

Mr. SPECTER. Now assume the same sequence with respect to exit velocity from the point of the President's neck at the same rate of 1,772 to 1,798 feet per second, and assume still further that the bullet had, the whole bullet had, struck the metal framing which you have heretofore described and identified. What effect would that have had on the metal framing?

Mr. FRAZIER. It would have torn a hole in the chrome, penetrated the framing both inside and outside of the car. I can only assume, since I haven't tested the metal of that particular car, I would assume that the bullet would completely penetrate both the chrome, the metal supporting the chrome, on the inside, and the body metal on the outside which supports the windshield of the car.

Mr. SPECTER. Now, assume the same set of factors as to the exit velocity from the President's neck. What effect would that bullet have had on any other portion of the automobile which it might have struck in the continuation of its flight?

Mr. FRAZIER. In my opinion it would have penetrated any other metal surface and, of course, any upholstery surface depending on the nature of the material as to how deep it would penetrate or how many successive layers it may have penetrated.

Mr. SPECTER. Was there any evidence in any portion of the car that the automobile was struck by a bullet which exited from the President's neck under the circumstances which I have just asked you to assume?

Mr. FRAZIER. No, sir; there was not.

Mr. SPECTER. And had there been any such evidence would your examination of the automobile have uncovered such an indication or such evidence?

Mr. FRAZIER. Yes, sir; I feel that it would have.

Mr. SPECTER. Was your examination a thorough examination of all aspects of the interior of the automobile?

Mr. FRAZIER. Yes, sir; for our purpose. However, we did not tear out all of the rugs on the floor, for instance. We examined the rugs carefully for holes, for bullet furroughs, for fragments. We examined the nap of the rug, in the actual nap of the rug, for fragments and bullet holes. We pulled the rug back as far as we could turn it back and even tore the glue or adhesive material loose around the cracks at the edges of the rug so we could observe the cracks to see whether they had been enlarged, and we examined all of the upholstery covering, on the back of the front seat, on the doors, and in the rear seat compartment, the jump seats, the actual rear seat, the back of the rear seat, and we examined the front seat in a similar manner, and we found no bullet holes or other bullet impact areas, other than the one on the inside of the windshield and the dent inside the windshield chrome.

Mr. SPECTER. Had any of those portions of the automobile been struck by the bullet exiting from the President's neck, which I have described hypothetically for you, would you have found some evidence of striking?

Mr. FRAZIER. Yes, sir.

Mr. DULLES. When was this examination made?

Mr. FRAZIER. Between 2 and 4:30 a.m. on November 23, 1963.

Mr. DULLES. That was about 10 hours, 12 hours after the assassination?

Mr. FRAZIER. Yes, sir; 14 to 16 hours.

Mr. DULLES. Fourteen to sixteen hours.

Mr. FRAZIER. Yes, sir.

Mr. DULLES. May I ask, do you know in whose custody the automobile was prior to your examination from the time it was shipped on the airplane?

Mr. FRAZIER. When I arrived there were two Secret Service men present but I do not recall their names. They were introduced to me, and they were there during the entire examination but I don't recall their actual names. The car was under guard in the Secret Service garage in Washington, D.C.

Other than that I do not know.

Mr. DULLES. Was this a joint examination by you and by the Secret Service or was the examination made by the FBI?

Mr. FRAZIER. No, sir; by the FBI at the request of the Secret Service who had already examined the interior of the car for personal effects and other items.

Mr. DULLES. Did they certify to you or advise you that the car had been under their custody during this 14- to 16-hour period?

Mr. FRAZIER. I don't recall whether they actually stated that. What they stated was that the car had immediately been flown to Washington and placed in this garage and kept under surveillance the entire time.

Mr. DULLES. Thank you.

Mr. SPECTER. Was a fragment of metal brought to you which was identified as coming from the wrist of Governor Connally?

Mr. FRAZIER. It was identified to me as having come from the arm of Governor Connally.

Mr. SPECTER. Will you produce that fragment at this time, please?

Mr. FRAZIER. This one does not have a Commission number as yet.

Mr. SPECTER. May it please the Commission, I would like to have this fragment marked as Commission Exhibit 842.

(Commission Exhibit No. 842 was marked for identification and received in evidence.)

Mr. SPECTER. Now, referring to a fragment heretofore marked as Q9 for FBI record purposes, and now marked as Commission Exhibit No. 842, will you describe that fragment for us, please?

Mr. FRAZIER. Yes, sir; this is a small fragment of metal which weighed one-half a grain when I first examined it in the laboratory. It is a piece of lead, and could have been a part of a bullet or a core of a bullet.

However, it lacks any physical characteristics which would permit stating whether or not it actually originated from a bullet.

Mr. SPECTER. Are its physical characteristics consistent with having come from Commission Exhibit 399?

Mr. FRAZIER. Yes, sir; it could have.

Mr. SPECTER. Are they consistent with that fragment identified as Commission Exhibit No. 842, as having come from fragment identified as Commission Exhibit 567?

Mr. FRAZIER. Which is 567?

Mr. SPECTER. 567 is the one which was found on the front seat.

Mr. FRAZIER. Yes, sir; it could have.

Mr. SPECTER. Were the characteristics of the fragment identified as Commission Exhibit 842 consistent with having come from the fragment heretofore identified as Commission Exhibit 569?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Would you set forth from the records of the FBI, if you have those before you, the chain of possession of the fragment identified as Commission Exhibit 842, please?

Mr. FRAZIER. Commission Exhibit 842, that is the one from Governor Connally's arm, was delivered to me in the FBI laboratory on November 23, 1963, by Special Agent Vincent E. Drain of the Dallas Office of the FBI, who stated he had secured this item from Capt. Will Fritz of the Dallas Police Department.

I do not know where Captain Fritz obtained it.

Mr. SPECTER. Referring back for just a moment to the coat identified as that worn by Governor Connally, Mr. Frazier, was there any observable angle of elevation or declination from the back side of the Governor's coat to the front side of the Governor's coat?

Mr. FRAZIER. Yes, sir; there was, approximately a 35-degree downward angle.

Mr. SPECTER. Measuring from—

Mr. FRAZIER. That is—

Mr. SPECTER. Back to front or front to back?

Mr. FRAZIER. From back towards the front.

Mr. SPECTER. How about the same question as to the Governor's shirt?

Mr. FRAZIER. I would say it was approximately the same angle or slightly less. I think we measured approximately 30 degrees.

Mr. SPECTER. Was that from the front to back or from the back to front of the Governor's shirt?

Mr. FRAZIER. That would be from the back towards the front. Downward from back towards the front.

Mr. SPECTER. Mr. Dulles, those questions complete the ones which we have to ask, sir.

Mr. Frazier, one additional question: Do you have any knowledge through any source whatsoever of any bullets or bullet fragments found anywhere in the vicinity of the assassination other than those which you have already testified to, which were in the car, or the whole bullet from the Connally stretcher or the fragments from Governor Connally's wrist?

Mr. FRAZIER. No, sir; I have never heard of any nor have any been submitted to me.

Mr. SPECTER. During the regular processing of the FBI examination in this case, would all such bullets or bullet fragments be brought to you for examination in accordance with your assignment to this matter generally?

Mr. FRAZIER. Yes; they would.

Mr. SPECTER. Were any metallic fragments brought to you which were purported to have been found in the head of President Kennedy?

Mr. DULLES. Or body?

Mr. SPECTER. Or body of President Kennedy?

Mr. FRAZIER. Yes; they were.

On November 23, 1963, at 1:45 a.m., the two metal fragments in this container were delivered to me in the FBI laboratory by Special Agent James W. Sibert, and Special Agent Francis O'Neill of the Baltimore office of the FBI who stated they had obtained these in the autopsy room at the Naval Hospital near Washington, D.C., where they were present when they were removed from the head of President Kennedy.

Mr. SPECTER. Is there any specification as to the portion of the President's head from which they were removed?

Mr. FRAZIER. No, sir; they told me that there had been numerous particles in the head but only these two had been removed, the others being very small.

Mr. SPECTER. May it please the Commission I would like to have those marked and admitted into evidence as Commission Exhibit No. 843.

Mr. DULLES. It shall be so marked and admitted under those numbers.

(Commission Exhibit No. 843 was marked for identification and received in evidence.)

Mr. SPECTER. In the event we have not already had 842 admitted into evidence, I move, Mr. Dulles, for the admission into evidence of 842 which was the fragment from Governor Connally's arm.

Mr. DULLES. That shall be admitted.

Mr. SPECTER. Moving back to 843 will you describe those fragments indicating their weight and general composition?

Mr. FRAZIER. These fragments consisted of two pieces of lead, one weighed 1.65 grains. The other weighed .15 grain. They were examined spectrographically so their present weight would be somewhat less since a very small amount would be needed for spectrographic analysis.

Mr. SPECTER. Was a comparison made between or among these two fragments with the other metal from the bullets heretofore identified as Commission Exhibits 399, 567, 569, 840, and 842?

Mr. FRAZIER. Yes; they were.

Mr. SPECTER. What did that examination disclose?

Mr. FRAZIER. Possibly my numbers do not agree with those you have. These two particles from the President's head were compared with the lead of Exhibit 842.

Mr. SPECTER. Which is the fragment from the arm of Governor Connally?

Mr. FRAZIER. Yes, sir; they were compared with the lead scraping from the inside of the windshield.

Mr. SPECTER. Which is Exhibit 841.

Mr. FRAZIER. And with the three lead fragments found on the rear floorboard carpet of the limousine.

Mr. SPECTER. Which is Exhibit 840.

Mr. FRAZIER. And they were found to be similar in metallic composition.

Mr. SPECTER. Can you state with any more certainty—

Mr. FRAZIER. Excuse me, one thing. These, as a group, were compared with the bullet fragment, Commission Exhibit 567, which was found on the front seat of the automobile, which also was found to be similar in metallic composition.

Mr. SPECTER. Is it possible to state with any more certainty whether or not any of those fragments came from the same bullet?

Mr. FRAZIER. Not definitely, no; only that they are of similar lead composition.

Mr. SPECTER. Have you now described fully all of the relevant characteristics of the fragments identified as Commission Exhibit 843?

Mr. FRAZIER. Yes, sir.

Mr. SPECTER. Are there any other bullets or bullet fragment or metallic substances of any sort connected with this case in any way which you have examined which you have not already testified to here today or on your prior appearance?

Mr. FRAZIER. No, sir; that is all of them.

Mr. DULLES. Is there anything further?

Mr. SPECTER. No.

Mr. DULLES. Thank you very much, Mr. Frazier.

The Commission will reconvene at 2:30.

(Whereupon, at 1:30 p.m., the President's Commission recessed.)

Afternoon Session

TESTIMONY OF DR. ALFRED G. OLIVIER

The President's Commission reconvened at 3 p.m.

The CHAIRMAN. The Commission will come to order.

Mr. SPECTER, has the doctor been sworn yet?

Mr. SPECTER. No, sir; he has not.

The CHAIRMAN. Doctor, would you raise your right hand and be sworn, please? Do you solemnly swear the testimony you are about to give in the matter before this Commission will be the truth, the whole truth, and nothing but the truth, so help you God?

Dr. OLIVIER. Yes, sir.

The CHAIRMAN. You may be seated.

Mr. SPECTER. State your full name for the record.

Dr. OLIVIER. Dr. Alfred G. Olivier.

Mr. SPECTER. What is your occupation or profession?

Dr. OLIVIER. A supervisory research veterinarian and I work for the Department of the Army at Edgewood Arsenal, Md.

Mr. SPECTER. Would you describe the nature of your duties at that arsenal, please?

Dr. OLIVIER. Investigating the wound ballistics of various bullets and other military missiles.

Mr. SPECTER. Would you describe the general nature of the tests which are carried on at Edgewood Arsenal?

Dr. OLIVIER. For example, with a bullet we run tissue studies getting the retardation of the bullet through the tissues, the penetration, various characteristics of it. We use as good tissue simulant 20 percent gelatin. This has a drag coefficient of muscle tissue and makes an excellent homogenous medium to study the action of the bullet. We also use animal parts and parts of cadavers where necessary to determine the characteristics of these things.

Mr. SPECTER. Would you set forth your educational background briefly, please?

Dr. OLIVIER. Yes; I did 2 years of preveterinary work at the University of New Hampshire and 4 years of veterinary school at the University of Pennsylvania, and I hold a degree doctor of veterinary medicine at the University of Pennsylvania.