

AFTERNOON SESSION

Chairman STOKES. The committee will come to order.

The Chair recognizes the gentleman—

Mr. EDGAR. Mr. Chairman.

Chairman STOKES. The gentleman from Pennsylvania.

Mr. EDGAR. While Mr. Fithian is getting the questions ready, I have two relatively innocent questions I would like to ask our witness.

Chairman STOKES. You may proceed.

Mr. EDGAR. Thank you, Mr. Chairman.

You were describing the processes of the photography and using the computer, and particularly the visual box of the TV. Is it possible to make video tapes of the computer's activity on that video screen similar to what you can do in home TV cassettes?

TESTIMONY OF DR. BOB R. HUNT—Resumed

Dr. HUNT. The answer to that is "yes". But you have to use a different type of video taping system than you would find in a regular off-the-shelf thing you could buy from your local electronic store, for example. The reason for that is that to produce a higher quality display on the TV sets that were used for computer enhancement, we use a different electronic format for the creation of the image on the TV tube than the electronic format which is used in commercial broadcast television standards.

So you would have to have a box, so to speak, which is suited for the electronic standards of our TV display, rather than the electronic standards of commercial broadcast television.

Mr. EDGAR. OK. Just one other question. I wonder if we could have put up on display the pictures that you enhanced, looking at the figure on the corner of the wall in the grassy knoll that looks like a person.

Dr. HUNT. OK. That would be Willis No. 5, I guess. I don't know the exhibit number.

Mr. EDGAR. And also the picture of the bush and the hat.

Dr. HUNT. OK. Zapruder frame 413 that would be. That is one of the retaining wall photos.

Is that the one you are interested in?

Mr. EDGAR. Yes. This was the one I am particularly interested in.

In your description—and we had also a chart up there of the fact that that hat was probably somewhere near the steps, and the bush was closer to Zapruder, I believe, when he took that picture; is that correct?

Dr. HUNT. Yes; that's correct.

Mr. EDGAR. Put that up.

The question is a relatively innocent one. It seems to me that we had some pictures of Zapruder taking the famous film. Did you analyze or look at any of those pictures to see if there is anyone with that kind of a hat standing anywhere near the steps?

Dr. HUNT. First of all, what you perceive as a hat the panel did not conclude was a hat; they concluded there is not an individual with a hat there. But what you see, the perception of a hat with the brim turned down, is actually just a coincidental appearance of

leaves in that bush near the edge of the head, in such a way that it looks like the brim of a hat.

Now with respect to——

Mr. EDGAR. But there is a head under that——

Dr. HUNT. There is definitely a head; and you can tell that, for example, by some of the pink flesh tones on the ears and the back of the neck when you look at them on a computer display.

Now the head there itself, you can see, for example, in the picture which Mrs. Downey just put up, three individuals standing on the steps there. All three of them appear to be fair-haired or with hair cropped short, perhaps balding or beginning to bald, which would be very much the same perception you would receive from looking at this individual's head which is seen in Zapruder 413, namely, that of a balding or fair-haired individual with the hair cropped short.

Mr. EDGAR. I just wanted to make clear on the record that there were some people standing in the proximity of where you suggest someone might have been standing to cause the optical illusion that appears, that the gentleman—person—is in the bushes.

Dr. HUNT. That's correct. In fact, they appear to be standing just about on the steps where that line that I drew on the survey map would indicate, on a distance measurement from the geometry of the imagery that they would have to be.

Mr. EDGAR. Thank you, Mr. Chairman. I yield back my time.

Chairman STOKES. The time of the gentleman has expired.

The gentleman from Indiana, Mr. Fithian.

Mr. FITHIAN. Thank you, Mr. Chairman.

Dr. Hunt, just theoretically, hypothetically, if someone in your profession, someone with your talents, wanted to arrive at a certain thing, a certain kind of object out of computer enhancement of a photo, would it be possible to fake that?

Dr. HUNT. In some cases it probably could be. I would qualify it in the following way:

For example, if I wanted to distort an object to appear to look like some other object, I could do that if the object that I wished to start the distortion operation on had certain characteristics which were probably similar to the object that I wished to arrive at when I did this distortion, whatever it might be. But——

Mr. FITHIAN. Could you, for example, if you set out to do it, take what has been alleged to be a head in the bush and with the right adjustment of height and computer assistance make that into a person?

Dr. HUNT. How would you judge the criterion of making it into a person?

Mr. FITHIAN. Enough so that you could convince the average lawman that that was, in fact, a person in the bush.

Dr. HUNT. Yes, I believe that could be done.

What you would probably go about doing would be to add more color to it, so that more skin tones would be visible, perhaps using the machine in some artistic way, putting in more of a hairline than is immediately visible in the raw imagery, and so on.

Mr. FITHIAN. Dr. Hunt, let's turn to the analysis of the Hughes film that you talked about this morning——

Dr. HUNT. OK.

Mr. FITHIAN [continuing]. Which shows the Texas School Book Depository building. Did the photo panel look for motion in other areas of the picture than this sixth floor open window, southeast window?

Dr. HUNT. Yes. There is an adjacent set of windows also on the sixth floor, where it has been alleged that motion occurs, or there is a visibility of something like a human form in that region.

That area was also analyzed at the same time we analyzed the open window.

Mr. FITHIAN. And what were the results?

Dr. HUNT. The conclusions were negative. We found nothing that we would attribute to real motion of any object that was recognizable by the panel.

Mr. FITHIAN. Referring to the autoradiographic enhancement of the Dillard photo, which is JFK F-156—I don't know that we have to have it back up there, but I wanted to clarify something you said this morning that left me a little uncertain as to what you meant. You said that you were unable to detect any human presence in the window.

Now, as a point of clarification, you were referring, were you not, to the photographic image of the window. You would have no way of saying whether there was an individual further inside the window than that?

Dr. HUNT. That's correct. Our conclusions related strictly to that negative image which we had on hand. Within that negative we could see no human form or shape.

Mr. FITHIAN. The conclusion, therefore, is that if Oswald shot the President from the window, that at the time that photograph was taken, the shot that you were working with, at the time that was taken he had sufficiently removed himself from the window inside, that all the photo-enhancement could not bring him out to light; is that correct?

Dr. HUNT. That would be my supposition; that, in fact, if he is there, he is beyond the line of sight, not just in the shadows but outside of the line of sight visible through the window.

Mr. FITHIAN. I would like to ask the staff to put up JFK F-153. As I understand it, Doctor, this is a picture that was taken a few seconds after the shot; is that correct?

Dr. HUNT. I am not sure until I see the picture. Which one are you referring to?

Mr. FITHIAN. I believe that is the one of the—the TSBD?

Dr. HUNT. Oh, yes, right. Yes; in answer to your question, that was taken a few seconds after the last shot was fired. At least that is Dillard's testimony to the Warren Commission, I believe.

Mr. FITHIAN. Now, directing your attention to that particular exhibit, the photograph in the area of the sixth floor window, the open window, there seems to be a change in the configuration of the boxes. How did the photo panel account for this?

Dr. HUNT. The change in configuration of the boxes with respect to what, with respect to another window view?

Mr. FITHIAN. No, with respect to other photos that you analyzed.

Dr. HUNT. OK. Probably the one most pertinent to that would be the exhibit which is showing next to it at the moment—I am not aware of the exhibit number for it—but that shows the same

window, taken approximately one to two minutes after the first picture which we talked about, the one taken by Dillard on the right, the one by Powell on the left.

You are correct in perceiving that there is something which we could ascribe to a change in the configuration of the boxes.

For example, the picture on the right, we see only two boxes, one at the left of the windowsill and just a corner of the one peeping up at the right of the windowsill. Whereas, in the picture, the enlarged picture, for example, on the left, we see not just the two boxes; you can still see, for example, on the left there is the same small box at the left, there is the same corner peeping up at the right. But now we have two or three other boxes, apparently rising up in between them.

There are two possible explanations, I guess, for that, that the panel considered. One is that we are seeing boxes which are in the room, but because of our perspective, our line of sight, is different, we are seeing different boxes than were visible in the other picture.

The second explanation is that there has been physically a movement of the boxes in the room during the time which elapsed between the taking of those pictures.

Mr. FITHIAN. All right. Now there is no way that we can know which it is?

Dr. HUNT. There are ways of eliminating or narrowing down the possibilities between those two choices. For example, given the geometry at which you are viewing, and given the apparent sunlight on the boxes, you could probably guess how far into the room those boxes do lie.

For example, if you look at the two boxes which appear to have been introduced in the picture on the left, they appear to be in full sunlight, which means they must not lie too far inside the room because this was high noon, in November; the sun angle is simply not that low in Dallas at high noon in November to shine sunlight very deep into the room. So they can certainly not be too far behind the plane of the window; and that would therefore tend to rule out the possibility that we are looking at the box which lies in one position in the room and is simply tended to be viewed in different perspective from two different viewing points.

Mr. FITHIAN. You say it rules that out?

Dr. HUNT. It tends to rule it out, yes. It does not rule it out completely, because we lack what is usually referred to as the analytical information, from the position of the two photographers to precisely plot the positions of those boxes by stereoanalysis techniques.

Mr. FITHIAN. Well, if it generally tends to rule that out, then it seems this committee would be left with only one conclusion, and that is, that a box was actually moved.

Dr. HUNT. That would be my only personal conclusion, that somebody or something moved boxes around in that room during the time of taking of those two pictures.

Mr. FITHIAN. I would like to move to the next film, and perhaps we don't have to have it up there. I think we remember pretty clearly what that is.

But in Aerospace's enhancement of the dark image in what would then have been your enhancement photo which, I believe, shows above that, the image seen at the retaining wall, these bright spots in the area of that image which were made even more significant in the upper portion?

Dr. HUNT. Right, that's it.

Mr. FITHIAN. I didn't quite get how you accounted for those.

Dr. HUNT. Our explanation would be that we are seeing some shadow shining through. There is a large stand of trees which you do not immediately see in that frame, of course, lying to the left of the frame. And there is a wall, a structural wall, back behind this whole region. And at various places the sunlight is shining through the trees, and you are seeing little bits of light speckling on the pattern of the wall behind it.

Another explanation would be just that there are simply three bright spots of paint on the wall back there, for example, which are visible even in the deep shadow that they lie in.

Mr. FITHIAN. Now, while we are referring to this particular section of the photos, there has been a great deal made of this business of somebody seeing a puff of smoke or something they thought was a puff of smoke in the area. As I remember your testimony this morning, you said there was no photographic evidence of that?

Dr. HUNT. That's correct.

Mr. FITHIAN. Is there anything that you could tell me that would clarify whether or not your techniques would tend to increase the prospect of seeing it if it were there? Or is there something in your computer enhancement that would actually tend to filter—for lack of a better term—would tend to filter that smoke out of the picture when you go to blowing it up and putting it on a computer?

Dr. HUNT. The techniques which we applied in the analysis were specifically those which we hoped would enhance details or features of that type. In other words, we were careful to guard against using any kind of technique which would have the prospect of—and your term of “filtering it out” is a technically proper one—which would tend—we avoided techniques which would filter out any such type of artifacts. We were using techniques which would bring those details out.

Mr. FITHIAN. So you set out actually to increase the prospect of seeing any smoke that would appear in the picture?

Dr. HUNT. Well, not just smoke. It is not to say we were concentrating on just smoke, but we used techniques which would bring out details of any kind, whether they be smoke or people standing at walls, whatever. Those techniques tend to be fairly universal in their application for the enhancement for restoration of details.

Mr. FITHIAN. Let me ask the clerk to put up JFK-155.

This is the Willis slide. I don't think that is up there now.

Now, obviously, the human eye doesn't give us the full story; we have discovered that, if we have discovered anything, in the last 2 to 3 weeks. Any viewing of this picture indicates that that is a pretty good quality photograph, given a lot of the other things we have been trying to work with and that you have been trying to work with; and, therefore, my layman's judgment is that if it is

that good a photograph, why couldn't you get more information from it in regard to the dark image on the retaining wall?

Dr. HUNT. First of all, from the distance that you are viewing it—is not accurate.

The human eye has an inability to resolve details, and that inability, of course, is governed by how close you are to an image. You have to, first of all, look at the image close up in the region to the areas or the features that you are trying to deal with; and then, second, if you do that under the magnification—and by magnification I mean the small sampling of individual numbers, such as I described in my earlier testimony—if you do that under magnification which is consistent with the details you are trying to resolve, you find indeed that the blur, the extent to which some of those features are blurred, are almost the magnitude of things you are trying to resolve.

In other words, if I were to put a measure of one inch on the film of some object I were looking at, I would find it had been blurred by almost a distance of my hypothetical one inch. So that from your viewing point it is difficult to conclude whether that is a good or bad image. It is the kind of thing that you can really conclude, or a photoanalyst can conclude, only by looking at it under the proper magnification.

Mr. FITHIAN. Now correct me if I am wrong, but isn't that a blowup of a 35 millimeter slide?

Dr. HUNT. It is—I think it is roughly about a full frame print. By that I mean I don't think it is much of a blowup; it tends to show much of the original frame, with the original slide.

Mr. FITHIAN. And is this the slide that you had difficulty with because of the coating on it?

Dr. HUNT. Yes. When it was received by the contractors who were performing the work for the committee to be scanned and digitized, it was noticed at that time that there was some kind of grayish coating on it.

Mr. FITHIAN. Some what?

Dr. HUNT. Some kind of grayish coating, a gray coating, grayish coating.

Mr. FITHIAN. Was this in the processing of the film?

Dr. HUNT. We are not aware of the source of that coating. We don't know how it got on there.

Mr. FITHIAN. Dr. Hunt, did the photo panel make use of any information that came from prior studies done on the photographic materials? Because there have been a great many.

Dr. HUNT. We made use of two different—I beg your pardon—three different studies which were performed by ITEK Corp. in the year 1967, which were performed for Life magazine at that time, and then another study performed in 1976 for CBS Television.

Mr. FITHIAN. And did you—I am now talking about your technique—did you take what they had developed as basic knowledge and go from that? That is, did you rely upon that data, or how did you—

Dr. HUNT. We tended to operate in an independent mode of the ITEK studies. There are two reasons for that. First of all, technology has advanced considerably from the time of the 1967 studies. More is known about those processes now than was known then. A

second reason was that we were not entirely in agreement with ITEK. That is not to say we faulted the ITEK study. Simply, there were other options to be explored.

Mr. FITHIAN. So you were satisfied, then, that you and your group explored all the options open to you, given the data and the material you had to work with and the state of the art now?

Dr. HUNT. That is correct. We think the sum total of the things we did and the things ITEK did represent a very broad spectrum of the options available to any person taking up this technology and applying it to that information.

Mr. FITHIAN. Are there any cautionary notes that you would give, either ourselves or somebody reading this report 5 or 10 years down the way, any cautions to be observed in the efforts to enhance poor quality photographs?

Dr. HUNT. Yes; I think the cautions that I would give would be what everybody working with this technology already knows. In anything you do in enhancing an image it is important to interpret the results which you achieve, and interpret them strictly in terms of what you see on the film. My favorite cliché in this regard—people who work with me on the panel have heard me use it before—is that a low quality image is very much like a Rorschach ink blot; people will look at it and see a lot of things under different circumstances. My main caution is to be sure you don't fall into traps by drawing more conclusions than are necessarily warranted by the hard evidence on the film itself.

Mr. FITHIAN. I have sometimes looked at some of the pictures and the quality of them. And until somebody pointed out this was a tree, or whatever, I had not seen that. I sort of concluded it is like the ink blot test. You pass this out to 10 people and the person tends to bring out of that very subjective photo or conglomeration what he takes to it. I don't know whether I am making myself clear or not.

Dr. HUNT. I have the same impression. Vision is the most subjective of the five human senses because it conveys the most information, and consequently that subjectively will always be employed.

Mr. FITHIAN. With regard to that one particular one that has been sensational, that is the seeing of the form in the bush and the rifle presumably, and there is tremendous argument back and forth as to what people are seeing when they look at that. As I understood your testimony this morning, you did a pretty tough analysis of it. But I did not hear anything that satisfied me—I don't mean any severe criticism—as to how you dispensed with the idea that long, black, thin 45-degree object was not a rifle.

Can you tell me what kind of tests you did or didn't do on that particular question?

Dr. HUNT. Yes; perhaps it would be better if I went to the display itself.

Mr. FITHIAN. Would you.

Dr. HUNT. It is a very good question. Because of the placement of the figure out in the plaza, the conclusion that this is a rifle in the figure's hands makes it geometrically impossible for it to be lying in front of the bushes. We also did some very precise measurements on what I referred to earlier as the rifle stock, namely this thick linear portion I am pointing to here.

The measurements were analytical in nature. Since this is a color picture we can measure red, green, and blue out of this picture. Those color measurements were then processed by a technique which was originally developed by NASA for the isolation of geographic and vegetation features on the ground from satellites. That technique is one of taking the individual colors which are measured, the red, green, and blue, looking at the numbers measured by them, and dividing the one into the other and making a picture of the results of that division. When we did that we had the relative balance of one color to another in the region of what I refer to as the stock of the rifle. Those color ratios were consistent with the same measurements taken back here in the limousine, which you see in a hole in the bushes as it is passing through.

Our conclusion is: All you are seeing in this region of so-called rifle stock is nothing but a chance hole in the bushes, and you are really looking at the limousine through the hole in the bushes. The color measurements bear that out.

A second thing we did was to simply look at the bush in the enhanced version. In this version since we have tended to deblur the image, you will see a lot of features running at 45 degrees, the same as for this feature purported to be a rifle barrel. It was the conclusion of the panel that all we are looking at in this case is just twigs of the bush, and what we are seeing is nothing more than a common growth pattern of a bush itself. If each of these is a rifle, you can count seven or eight rifles down there, which we considered to be an absurdity.

Mr. FITHIAN. What you are saying, the paint or the coloration of that alleged form that was the rifle matches precisely that of the side of the limousine?

Dr. HUNT. That is correct.

Mr. FITHIAN. And it is your conclusion then, what, that we are looking at is a little piece of the limousine through a bush?

Dr. HUNT. That is correct. It just happens to be a hole in the bushes at this point of a strange shape, sort of a rectangular 45° shape, which has the same color reflectance value as the back side of the limousine.

Mr. FITHIAN. Thank you.

I just have one concluding question, if you want to return to your material. I take it all your findings and the analysis and the methods in which you arrived there will be a part of the report to this committee?

Dr. HUNT. That is correct.

Mr. FITHIAN. Would it be possible once that is all in, for someone who is interested in this particular phase of it to duplicate the study that you made, and would they come out with the same answer, or is there enough subjectivity that it is kind of what you bring to it is what you take from it?

Dr. HUNT. To answer your first question, yes, it would be entirely possible for someone to duplicate that effort. The reason it would be possible is that all the data which was used in the computer analysis is recorded on magnetic tape and will be made available to the National Archives as a permanent record for the future.

Furthermore, the report which will be written will describe the actual details of the processes which were carried out, so if some-

one wished to take up that issue and use the same techniques they can do it.

To answer your first question, that would be my reply.

The second question, would they come to the same conclusion? I believe they would.

Mr. FITHIAN. Mr. Chairman, I have no further questions.

Chairman STOKES. The time of the gentleman has expired.

The gentleman from Connecticut, Mr. McKinney.

Mr. MCKINNEY. Mr. Chairman, I have no questions. I just want to thank Dr. Hunt.

I think you have been one of the most lucid and clear witnesses we have had, and we have had a great many fantastic expert witnesses.

As a member of this committee, I am deeply concerned over a lot of the questions you have answered today. I want to thank you for the thoroughness and the openness in your comments. None of what you said was prejudiced nor opinionated. To me, your scientific testimony is amongst the best I have listened to as a Congressman in this Congress.

Chairman STOKES. The time of the gentleman has expired.

Is anyone seeking further recognition?

[No response.]

Chairman STOKES. Doctor, at the conclusion of a witness' testimony before our committee he is entitled to a period of 5 minutes in which time he can make any further comment he so desires relative to his testimony. I would extend to you 5 minutes for that purpose at this time if you so desire.

Dr. HUNT. Thank you. The only comments I would have would be to echo those of Sergeant Kirk earlier and Dr. Snow, thanking the committee for its interest, its support, its enthusiasm.

Chairman STOKES. Thank you very much. I am sure all of our committee would concur in the remarks made by the gentleman from Connecticut, Mr. McKinney, regarding your excellent presentation.

The Chair recognizes Professor Blakey.

Mr. BLAKEY. When the Zapruder film of the Kennedy Assassination was made public, critics and people generally were fascinated by the sight of a man with a black umbrella standing just a few feet from the Presidential limousine. It was a sunshiny day so what purpose could anyone have for an umbrella?

The theories about the umbrella man, for the most part, attributed to him some sinister intent. At the very least, he was a signalman for the actual gunmen, although one critic proposed the idea that a firing device concealed in the umbrella was the weapon used to assassinate the President.

It also appeared curious that the umbrella man was one of the few spectators in Dealey Plaza who was not later identified. In fact, his identity has remained a secret to this day.

When it studied all of the photographs taken in Dealey Plaza on November 22, 1963, the committee discovered one, taken by a Life photographer, in which the umbrella man could be seen from the front. It is moments after the President has been shot, and the man is sitting on the curb, his umbrella by this time lying at his