THE COURT: Everyone be seated, please.

THE COURT: Ready for your next witness.

MR. O'CONNELL: Yes. He's gone to get him, Your Honor.

THE COURT: What is his name?

MR. O'CONNELL: Charles Linch.

THE COURT: Charles Linch.

(Witness sworn by the Court.)

THE COURT: Have a seat right up here, sir.

All right.

MR. CLAYTON: Thank you, Your Honor.

CHARLES LINCH,

called as a witness on behalf of the State of Texas, having been previously duly sworn to testify the truth, the whole truth, and nothing but the truth, testified on his oath as follows:

DIRECT EXAMINATION

BY MR. CLAYTON.

Q Please state your name for the jury.

A Good morning. My name is Charles Linch. L-i-n-c-h.

Q Would you tell the jury what you do for a living, sir?

A The last three months I've been working as a forensic consultant in Dallas. Prior to that I was employed as a trace evidence analyst at the Southwestern Institute of Forensic Sciences in Dallas.

Q Since the time that -- or can you tell the jury a little bit about your training academically and also professionally in regard to your position as far as being a trace evidence analyst?

A I've worked at the Institute of Forensic Sciences in Dallas for the last fifteen years off and on. I've worked in trace evidence for the last seven years. Five and a half years of that was in Dallas and a year and a half of that was for the Harris County crime lab in Houston. I have a bachelor of science from the University of Houston. I have attended the FBI hair and fiber school, the FBI forensic serology school, the FBI DNA analysis school. In addition to working in the crime lab in Dallas I've worked part time at UT Southwestern Medical School in Dallas as a research electron microscopist.

Q Mr. Linch, at the current time you're working as a consultant. Are you also possibly considering taking some other position with the laboratory?

A I've been entertaining various options.

Q Now, Mr. Linch, you've testified in the past in

cases involving the analysis of hair, fiber, and other trace substances; is that correct?

A Yes, sir.

Q And can you tell us whether or not you've ever had occasion to testify in Midland, Texas, before in a case called -- entitled State of Texas versus Brenda Branch?

A No, sir. Brenda Branch was a murder victim here, but I did testify in that case here, and I've testified in other Midland cases, but I don't remember the style of the case.

Q Okay. Brenda Branch was a victim in a case that you testified here then?

A That's right.

Q Also, have you had occasion to testify in a series of cases involving Kenneth MacDuff?

A I testified in Houston and in Seguin, Texas, in matters related to the trial of Kenneth Allen MacDuff.

Q Mr. Linch, obviously you've worked for laboratories that are run essentially by your Dallas County or the State, but have you had occasion as a professional to work or testify having been called by both the Defense and the State?

A Yes, sir. I have.

Q Can you name a case for the jury that you

testified in which you were a defense witness?

A I testified for the defense in a case involving the disappearance and murder of three nine year old boys in West Memphis, Arkansas.

Q Now, Mr. Linch, back in September of 1993 can you tell the jury where you were working at that time?

A I was a trace evidence analyst at the Southwestern Institute of Forensic Sciences in Dallas.

Q And that particular institute, is that a part of the Dallas Medical Examiner's office?

A The Institute of Forensic Sciences is two departments of Dallas County. One department is the Medical Examiner's office and the other department is the Criminal Investigation Laboratory. I've worked both in the Medical Examiner's office and the Criminal Investigation Laboratory part of the Institute.

Q How is it that in your position in Dallas County that Collin County evidence is routed to you or how is it you get involved in a Collin County case?

A Collin County has no crime lab, per se. They have access to personnel trained in fingerprint identification and collection, but there is no forensic microscopy service in Collin County and Collin County sits adjacent to Dallas County so we have a working relationship with Collin County.

Q Mr. Linch, I'm going to at this time ask you a little bit about whether or not you've had occasion in your professional capacity to make comparisons of hair and had occasions then to testify about those analyses in court?

A Yes, sir. I have.

Q On many occasions?

A Many times.

Q Mr. Linch, can you tell the jury exactly what is hair?

A Hair is the thread-like structure of protein that grows from the bodies of most all mammals. It -- during the embryogensis, the epithelium, or the skin, vaginates, forms the hair follicle. From that hair follicle is the subsequent hair growth. Hair begins to grow in the uterus. As we mature we grow and replace different types of hairs. Different types of hairs are subject to different types of hormonal influences. So we have distinctive head hair, distinctive pubic hair, and distinctive body hairs.

Q When we talk about hair as being a characteristic that all human beings have, is it of any value as far as comparison purposes, identification purposes?

A Hair is a very good associative tool in doing a

comparison from a found hair and a known source. It is very good associative evidence.

Q All right. When we talk about a hair comparison, can we talk a little bit what it is, just generally, that a trace analyst specialist would be looking for to make a comparison with regard to the structure of the hair?

A You can think of a single hair as a wooden pencil. The rubber part of the pencil would correspond to the root portion of the hair. The yellow paint of the pencil would correspond to the cuticle of the hair. These are fish-like scales that cover the surface of the hair. The wood portion of the pencil would be like the cortex of the hair. That's where the flattened dead particle cells are found, wood portion of the pencil. The lead of the pencil would correspond to what we call the medulla in hair. Hairs may or may not have medullar structure, but the medulla itself of the hair is an air space, but that's about where the pencil-hair analogy stops.

Within a human hair, when you look at it with a microscope, the light transmits through the hair, the examiner is able to see, more importantly, the pigment pattern and distribution within that hair. It is this alignment of the pigment granules, size of the pigment

granules, and the way they change from root to tip that allows an examiner to say this person could have been a donor of that hair or this person absolutely was not a donor of a particular found hair.

Q All right. When we start talking about hair comparisons -- and I'm speaking generally, of course, right now -- is there any way or has anybody done any work to try to quantify or to try and, I guess, put a number or a -- assign a number, shall we say, to the accuracy of a hair association or comparison?

A There are a couple of reports in the literature that address that problem.

Q Okay. With regard to those, have any of them ever been accepted to such a point that you would feel comfortable trying to put a number on an association saying an association is accurate within one in some number?

A No, sir. That is the limitation of doing a hair comparison. If, sitting on the microscope, you cannot tell the difference between two hairs, you still cannot say absolutely that hair had to have come from that individual and that individual only. The assignment of a probability, one out of 45 hundred, one out of 800, is just not possible to do. In my experience of sitting on the microscope, I have not seen

that many instances where the distinctive hairs from an individual cannot be distinguished by the examiner. You just don't see that many times, that one person's hair is exactly the same as another person's hair microscopically. There are, however, within a person's scalp variation, hairs that are what we term featureless. If you're doing a featureless comparison of hair, if the hairs you're examining, if they are featureless, then that association has a lot less weight than if you're comparing hairs that have substantive microstructural internal detail to compare. The more you have to look at within the structure, the better the comparison. So in the common featureless variety, those associations are less strong than if you have a hair, say, that you haven't seen before.

In seven years of sitting on the microscope looking at hairs and fibers every day, you gain an appreciation for what kind of hairs occur most frequently in the population. So, no, sir, you cannot put a number on what are the chances.

Q Okay. In essence, when you as a professional say, I have made an association between a known hair and a suspected hair or unknown hair, is that association based on your experience and your training and those sorts of things?

A That's right.

Q All right. It's up to the individual examiner to work with that hair and that association as much as he can with different types of microscopes and at some point he will either make an association or he will not based on his training and experience?

A That's right. It is an individual judgment, an individual opinion, but my finding through the years is that experienced examiners don't have that many quarrels when it comes to the microscopic comparison of the fine details within the hair.

Q A little bit more on the general background of hair. I believe you had mentioned earlier that we have the opportunity with the microscope to compare head hair, pubic hair, axillary hair. Are there any -- of those groups of hair are there some that are better or make stronger associations than others?

A The forensic examiners only compare head hair to head hair and pubic hair to pubic hair. The head hairs show more variation and are more distinctive from person to person than are, say, pubic hairs. In general, there's more information to be gained from looking at a head hair comparison than there is a pubic hair comparison. That's not to say that a pubic hair comparison is not a valid association.

Q All right. When you move to axillary hair or chest hair, is that even less distinct than, say, the pubic hair as far as association purposes?

A Forensic examiners do not -- credible forensic examiners do not make a judgment about particular source of a body hair. By that I mean an arm hair, chest hair, armpit hair, leg hair. The reason being is that my arm hairs microscopically probably look very much like your arm hairs. There just isn't that much variation there; however, you can use body hairs to make a racial determination, is this hair from a person of black descent, Caucasian. So that's the usefulness of looking at a body hair, but you wouldn't want to compare that to their body hairs because you would give a wrongful impression of the strength of that match.

Q Okay. Mr. Linch, just as kind of a break, to let the jury know, you began your day today in Dallas, Texas; is that correct?

A That's right.

Q And you caught a flight and arrived here in Midland about what time?

A About 10:35.

Q Okay. So basically you got off the plane. I don't think you even had a chance to check into the hotel yet, have you?

A I've been to the bathroom.

Q Okay. You're coming in pretty much just walking in and starting up this morning without much of a break since you got up, I guess?

A Good morning.

Q Good morning. Okay. Mr. Linch, I guess, moving along a little bit further now. We've talked about hair as far as the general structure, the pencil analogy that you gave us, and make sure that I understand, too. If a hair were structured like a pencil, the outer cover, the yellow paint -- if it was a yellow pencil -- is the cuticle?

A That's right.

Q Inside the cuticle, that particular portion which would correspond to the wooden part of the pencil, is called the cortex?

A That's right.

Q And finally in the very center of a hair we have what would correspond to the lead in the pencil and that is known as the medulla?

A That's right.

Q All right. And we've talked about the different types of body hair and a little bit about the types of associations you can make. Head hair is only compared to head hair as far as making associations, or

matches, if you want to use that word?

A Yes, sir.

Q Pubic hair to pubic hair. We don't mix. We don't try to compare a head hair to a pubic hair and make an association?

A No, sir.

Q Okay. Now, when we start looking at hair -- and I'm being inclusive here of axillary, pubic and head hair -- is an examiner who is experienced and trained in this field able to make distinctions as to the racial origin of those particular hairs in these situations?

A In most cases you can determine the racial origin of a particular found hair.

Q Can you tell the jury essentially what portion of the hair do we look at in order to make that racial association and a little bit about the variances that you look for in order to come to any conclusion about the racial origin of a hair?

A There are a combination of factors that are used to determine which racial group. Hair examiners recognize three racial groups, Caucasian or white, Negroid or black, and Mongoloid. Mongoloids include Asians, Eskimos, and American Indian. Now, with regard to Hispanics, they are termed Mongoloid or Mongoloid, slash, Caucasian, depending upon how much European

influence they've had. So the predominant factor showing Mongoloid characteristics would be from the American Indian. Amerasians would also show predominant Mongoloid hair characteristics.

As far as the process of making that determination, is there a place to draw that I can show the cross section or shapes?

Q I've got a small chalkboard we can wheel in here. Take just a moment.

THE COURT: Okay.

A (By the witness) If I may, I'll attempt to describe what you asked.

Q (By Mr. Clayton) Well, just to occupy time, I'll get him to describe it. Then when we get something in here to draw it up, we can.

THE COURT: I hear him coming. Looking for something kind of permanent. Let's see if this can be done back up here against the door so the jury can see and the rest of us can see.

MR. O'CONNELL: I don't think the folks in the back row can see. The wall comes out.

THE COURT: Let's move it this way as much as possible. I don't know if that's going to do the trick or not.

MR. CLAYTON: We need to let Mr. Linch

get out, I think, first.

THE COURT: All right. I don't know whether that's going to really help much. You all can't see. I still can't see. We'll bring it back over here, I guess. At least the jury can see. I guess that's the most important thing. All right.

MR. CLAYTON: Okay. May I?

THE COURT: Sure.

Q (By Mr. Clayton) Mr. Linch, I believe that you were about to show the jury the shapes of hairs that you examine and how you classify them as far as racial characteristics. Can you show the jury here on our board what it is you're looking for in the way of features?

A (By the witness) Yes, sir. Backing up a little bit, the basic structures of the hair are the cuticle, or yellow paint of the pencil, the cortex, or wooden portion of the pencil, and the medulla, or the lead portion of the pencil which, in reality, in a hair is the hollow space. With regard to assignment of a particular hair to the Caucasian category the hair on cross section, if you were to cut it, is roughly oval shaped. Internal recognition of pigment granules is that the pigment grains are very fine. They can be clumped somewhat, but pigment grains themselves are very

fine and there may or may not be medullation found.

With regard to Negroid racial characteristics, the cross sectional shape is relatively flat and within the hair shaft the pigment granules are fairly large and fairly clumped. Again, it is the variations in the distribution and the pattern recognition of these pigment granules that allows the examiner to associate or exclude a found hair from a particular source.

With regard to the classification of Mongoloid racial origin, that is, persons of Asian, Eskimo, American Indian and very often Hispanic descent, the pigment again is fairly clumped. Sometimes it has kind of an auburn cast to it. Very often the hairs are medullated. Sometimes they aren't medullated. The cross sectional shape is almost perfectly round. That's what allows the hair to be particularly straight. So -- but the significant feature of a hair of Mongoloid racial origin is a thick cuticle, especially in head hairs. The cuticle thickness is fairly large and there is a distinctive gapping at the cuticular layer with the cortex.

Now, in Caucasians this cuticle layer may not be as distinct because often in Caucasians you have the pigment grains actually falling into the cuticle itself. So those are three racial groups which are actually

anthropological terms for racial identity of human hairs.

Q Thank you, sir.

When we talk about making a comparison of hair, is a head hair the best comparable type of hair for associative purposes?

A Yes, it is. Because, as I said before, you see the most variation in the microscopic appearance of head hair from person to person.

Q Okay. Now, when you look at a head hair -- I'll kind of focus on those for a minute -- do -- does the length of the hair or the amount of hair aid or assist you in the associative process?

A Yes, it does. Absolutely. I think there's a lady in the Guiness book with 23 feet of hair. If you find a 23 foot hair strand, your testimony that that hair had origin with her is a lot stronger than if you just had a small piece of a hair fragment.

MR. MCDERMITT: Can we move the chalkboard?

MR. CLAYTON: We may be using it from time to time. Why don't you stick it right here?

Q (By Mr. Clayton) Mr. Linch, as far as the lengths of hair, if it was an ideal, perfect world, what would a hair examiner want with regard to a head hair?

What would he like to have for comparison purposes?

A (By the witness) The examiner would like to have a complete hair, that is, a hair shaft with its root and undisturbed tip. The full-length hair would be the ideal comparison.

Q In your many years of work in forensics, hair comparisons, how often do you find that perfect hair from root end all the way to tip in an undisturbed state for comparison purposes?

A From the collection of a body of a murder victim I've seen it once, and I see it more frequently, but not very frequent, from the collection of hairs from a suspect vehicle. The -- usually if you have an intact hair, it will be a pubic hair because they are less likely to fracture and break during an altercation.

Q In reality what do you usually work with as far as things that are found at a murder scene or a vehicle or what have you?

A In the real word what you end up with in criminal cases are pieces of hairs. You may have a root, but a break further down. You may have an intact tip, but a break at the root.

Q Is there a term y'all use for a piece of hair like that?

A Hair fragment.

Q Fragment. When you have a hair fragment, does that prevent an experienced examiner from making associations based upon a fragment of hair?

A That depends on the examiner's experience. My cutoff for doing an association of a hair to a known source is about a half an inch. And beyond that is -- anything beyond that is better, but if I have a hair piece that is less than a half inch, I won't try to make a claim about an association to a particular individual.

Q If you have a piece or hair fragment that is under one half inch in length, what is the reason, essentially, that you would not want to use that as an association, as a definite association?

A Again, doing the hair comparison you're looking at microscopic changes from the root end to the tip. It's important to know if the hair changes in the same ways. At the root end you start out with a certain density of cortical fusi, little fat inclusions. As you move up the shaft, pigmentation becomes more dense, medullation may start or stop. So you want to look at all these fine microscopic changes from root to tip.

Q When you have a fragment as long as, say, over an inch or even as long as two inches, would you consider that a pretty good fragment for comparison purposes?

A That, in my experience, is suitable for comparison.

Q When you make your comparisons -- and I'm going to move just for a minute to how you make a comparison -- what tools do you use in making these comparisons?

A In the initial stages -- depends on what kind of item you're working with -- but, say, you're working with tapings. Tape that has been laid down on a carpet surface or tapings from a body or head hair combings, the first step is to look at that item under a stereo microscope, or the common dissecting microscope like you may have used in high school. Doing that microscopic examination you're picking very small fibers and hairs from the tape surfaces. From there you mount these on a glass microscope slide using something like a medium of Permount because Permount has about the same refractive index as a hair. You get less light scattering when you put it on microscope.

The comparison microscope itself consists of two compound microscopes. You have one slide on one side, the other slide on the other, say, a found hair and known hairs from a suspect or a victim. The light is transmitted through this material, comes together by way of a bridge, and the bridge brings the two images together so the examiner is able to look at the items on

both sides at the same time. That is absolutely essential in doing a hair comparison. It's not possible to just have the one compound microscope, put one slide up, look, then put the comparison slide up and look. That's just impossible to do. The examiner has to have the simultaneous vision of both items.

Q You mentioned the collection of hair from a crime scene a moment ago. I believe you mentioned taping as being one method that you can use to collect tape -- and incidentally have you been to crime scenes where you assisted in the collection of the hair on occasions?

A Many times. And at the Institute in Dallas I would routinely recover hairs and fibers from the bodies of murder victims who had been dumped, because that is a situation where hair and fiber evidence is the most important.

Q When hair -- and I'm going to stay with hair for just a minute. When hair is collected, either by taping or, I think they've got some vacuum cleaners or something that can be used now as well, I think, but whatever method that you collect it in, is hair a substance that is subject to deterioration in the same way as, maybe, some other substances?

A That is one of the real strengths of using hair

in forensics is that, its durability. It's a very hard, durable protein. It will last longer than a semen sample or blood sample or a fingerprint at a crime scene. It is very durable, very resistant to destruction. I've looked at mummy hair before and it retains all its internal structures that we talked about before.

Q In other words, there's not any special process that needs to be done or anything like that when hair is collected at a crime scene as far as keeping it from breaking down internally or something along those lines, assuming that the comparison is done within a fairly reasonable time?

A The answer to that is yes. Except in the instance where you have a large amount of follicular tissue that you may want to subject to biochemical testing, such as DNA typing.

Q Follicular tissue, for the jury, is that an amount of tissue -- when you say tissue, I guess you mean, maybe, like -- I guess for my use I would say skin that is attached to the root ends of hair?

A Yeah. If a hair is ripped out of your head, there will be tissue attendant on the hair root, and the amount of tissue that you get in a force-removed hair is dependent on which growth phase the hair is in.

Q Okay. Assuming a person has a hair that does come out with a root end on it and has some tissue attached to it, follicular tissue, have you had occasion or have you been trained in some form or fashion with regard to DNA testing of that type of tissue?

A I have attended the FBI DNA school.

Q Okay. Does the possibility of getting a result, just based on what you've learned, in follicular -- some amount of follicular tissue, does it simply come down to, a lot of times, to how much tissue they have to work with?

A Absolutely. The other factor is the amount of degradation. DNA will degrade as it's exposed to an environment, and the current typing studies done on hair are of the D2 alpha or D1S80 typing, and that's looking at a specific protein-producing locus, it -- and the numbers you get from that are like one out of 800 or one out of 8. It's very different DNA technology than, say, RFLP technology where you have a large quantity-quality sample. The future of hair comparison most probably will be mitochondrial DNA. Within the mitochondria it has own circular or bacterial-like DNA that -- that folks at the FBI and Armed Forces Institute of Technology in Washington are looking at this method. It's had some initial drawbacks, but ultimately that may

be where the future of hair comparison lies.

Q With regard to any follicular tissue then, if you don't have enough tissue to work with under our present technology that's in use here, if you don't have a sufficient amount attached to that hair, then you end up being really unable to do anything definite as far as results go with that tissue.

A Using present methods of DNA typing you are required to have a fairly substantial amount of root tissue.

Q Now, when we talk about hair at a crime scene, be it a vehicle, be it a field, be it in a home, wherever, why is hair important as being something that we could possibly associate with the person that did a crime? How is -- how is it that that comes into play so often?

A Hair is probably the most frequently left form of evidence when there is a struggle. In instances of crime where there is a struggle you most often do not have fingerprints and you do not have DNA material, semen or blood, unless there is a bleeding injury or there has been a rape complete with ejaculation and the sample is recovered. So that is very often what a dump body site case comes down to, is a hair and fiber comparison.

I think you asked about hairs particularly, if something is jerked out of somebody's head in a struggle, but the other thing is the fibers. A dumped body, you're thinking in terms of, well, was this person transported in the trunk of a car, can I recover any fibers that are consistent with trunk origin or can I maybe associate fibers from that body with another crime scene, a second crime scene. And so it is very often, in the instance of a found body, that hair and fiber evidence is about the only physical evidence that's there.

Q When we speak of fiber, that's something that is -- could come from clothing, it could come from carpet in a vehicle, could come from carpet in a house. It could come from just any type of cloth or fibrous-type substance. Would that be a fair statement?

A That's right. Synthetic textile fibers include the carpeting of this room, our clothing. Some of us are wearing animal hairs in the form of wool. So anything, any fiber that is non-human, is what we refer to in fiber comparison.

Q Now, you made mention of something just then, animal hairs. Is it easy to tell animal hair from human hair under the microscope?

A That is probably the easiest thing to do.

There is a dramatic difference between animal hair and human hair. Animal hairs have very large medullas in general, maybe occupying a third or more of the entire hair shaft, and prominent cuticles, and a very coarse type pigment pattern that the experienced examiner recognizes right away. The root ends are different. Cats have different type roots than dogs.

Q Now, I'm going to move just a little bit further now into not only the basic structure of hair, which you covered with us, I'm going to talk a little bit about when you're getting samples of hair and you're making these comparisons, what are the points of comparison that you actually look for? If you can describe some of those for the jury, then maybe we'll put the board back up and draw them in.

A The starting place is the three basic structures. If you're wanting to determine if a found hair could have association with a known hair sample, you start out by looking -- well, it's really not the starting place for an experienced examiner. An experienced examiner, when they have two hairs under the microscope that could be of the same origin, it's almost like a lizard brain reaction. You know it's a match, and then you have to go back to higher thinking and figure out why it is.

I've talked to fingerprint examiners. They -- they express this same phenomena. They see two prints that are the same, yeah, this is it. Then they have to go back, look at the particular points. Same thing with the experienced hair examiner. Once they see something that is identical on the microscope with all microstructural details the same, then they go back, say, the cuticle is same, pigment description and pattern is the same, density is the same. Yeah, the medulla is the same.

Then you start looking for what I described as special features. Are there special characteristics that make this comparison stronger than some other comparisons you may encounter.

Q All right. When you talk about special characteristics or special features within a hair sample, what are some that would be very important to any experienced hair examiner?

A One that comes to mind is if you have an individual who is of a particular race, upon observation and looking at their known hairs, and microscopics don't fit what you generally associate with that particular race, that would be a special feature. Any residues that may be attached to the hair, that's a special feature. The presence or absence of forced removal,

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breaking fracture, particularly medullar structures that you may not have seen before and other inclusions that you just don't typically encounter in case work. There's, like, a range of stuff that you see every day, and once in a while something will come along that you haven't seen before or have seen infrequently.

Q Okay. You mentioned residues on hair. When you talk about that, are you talking about something that a person has done to treat their hair to make it comb easier or color it or something along those lines?

A Usually what you see in forensic cases as far as a residue on hair is dried blood, dried semen, or clear residues that correspond to hair conditioners.

Q Okay.

A Or sometimes there's insect activity, crabs, pubic lice.

Q You also mentioned that the presence or absence of trauma as seen in the hair could be considered a special feature or characteristic. How is it that you can tell whether or not a head hair has received some trauma or force to it?

A If you crush a hair there will be breakage. There will be a splintering of the cortical elements. Cortical elements will be frayed. That is very different from where a hair is cut. You can distinguish

a clean cut very easily under the microscope. In the same line of thought, you can look at the tip of hair and make a rough estimate about how long it's been since a person has had a haircut. A very clean cut on the tip means two to three week history of maybe having had a hair cut, and with time that hair tip will round off a little bit and so it's -- crush a hair, you know, it splinters like any other fibrous structure would.

Q If we could, Mr. Linch, we're going to go ahead and set our board back up again. We're going to go -- I want to ask you if you can show the jury a little bit of a hair shaft and some of those special features we talked about, illustrate those. We'll talk about them a little more, also show them how we can see the cutting of a hair or the shattering from trauma.

THE COURT: Mr. Clayton, why don't -- why don't we hold that off until right after lunch. Let's go ahead and take a lunch break. I'll ask you all to be back at ten minutes after one. I'll remind you not to converse among yourselves or anyone else on any subject connected with the trial or to form or express an opinion thereon until the cause is finally submitted to you.

(Recess.)

THE COURT: All right.

MR. MCDERMITT: Your Honor, just a moment.

THE COURT: Okay.

(Jury returned to the courtroom.)

THE COURT: Everyone be seated, please. Mr. Clayton, you may continue.

Q (By Mr. Clayton) For the record you are one and the same Charles Linch who was testifying earlier in this cause; is that correct?

A (By the witness) Yes, sir.

Q Mr. Linch, kind of in wrapping up our discussion about general properties and characteristics of hair and their comparison points, I do want to ask you whether or not you are able as a trace evidence analyst, if you're able to make microscopic photographs of some of the things that you're able to observe in that comparison microscope?

A Yes, sir. The examiner can take pictures of what they're seeing through the microscope side by side.

Q And in doing so, of course, we can take those photographs, we can blow them up, I guess, in size; is that correct?

A That's right.

Q Then they can be used for display to a jury or to someone wanting to learn about that comparison?

A Yes, sir.

Q When you make one of these microscopic photographs, is there anything that we need to caution the jury as far as limitations of what you can see in one of these photographs?

A Yes, sir. There are.

May I step down again? I draw better than I talk.

Q Yes, sir. All right.

A When the examiner is doing a hair or fiber comparison with the comparison microscope what they see basically is one hair on one side of the screen and another hair on the other side. The examiner, as they're doing a comparison, is constantly focusing up and down and back and forth. That means that -- say, this is a hair. They're constantly focusing from this plane through the middle and all different stages in between. They're also running back and forth looking at the entire length of the hair. Like, if you start at the root end on a found hair and a known standard, you then traverse up each hair looking for the microscopic changes. There's a big limitation in looking at a photomicrograph. You can never look at a photomicrograph and say, these hairs match.

The reason is that the photograph only

represents a thin slice of the hair this way and a thin slice of the hair this way and so you don't appreciate what the examiner appreciates in focusing at all different levels. You haven't seen the entire hair back and forth. The only value of a photomicrograph of a hair fiber is to give you a very general idea of what the examiner has seen.

Q Now, as I'm kind of -- apologize for jumping back and forth a little bit between hair and fiber, but when you use your comparison microscope to look at fibers, would the same limitations apply to a fiber photograph made with the comparison microscope?

A Absolutely.

Q All right. Now, Mr. Linch, I had just a couple of other questions I did want to ask you. I know -- I think you pointed it out earlier. I just want to clarify it a little bit if I could for the jury. First of all, just in your experience as long as you've been looking at hair under the microscope and making these comparisons, have you come to a point where you can almost look across a room and tell us whether or not there are folks whose hair has recognizable differences just looking across a room?

A Very often you can look at somebody with the naked eye and tell whether or not they would have same

or different features under the microscope. I don't see anybody in this courtroom today who has similar appearing hair. The qualification would be to that if some of us with gray -- sometimes gray hairs are indistinguishable from individual to individual, but still sometimes you can make a distinction with the gray hairs. But again, a gray hair has no pigmentation in it. That's why it looks gray, and the follicle has decided to use its energy some place besides producing melamine pigment. But again, the identifying individualizing feature of hair in a forensic hair comparison is the pigment distribution, its size and how it arranges within the hair, but I would expect of those here today that within their distinguishable set of hairs from their head that I could tell the difference.

Q In fact, as part of your ongoing training or practice at the Southwestern Institute of Forensic Sciences did y'all have programs where y'all were given ten or twelve or however many hair samples and asked to match them to known samples, just kind of in a pile?

A We would do a matching test. Yes, sir.

Q Okay. So you've had extensive practice both from training and then the experience as well?

A I completed a one year apprenticeship at the Institute prior to becoming a case working examiner, and

after I became a case working examiner we would do a test where we'd take ten known samples from ten individuals, say, ten individuals who were blond, or ten individuals who were Hispanic. The other examiner would withdraw a single hair and we would attempt to match it back to which package it came from, and we've always been able to do that.

Q Okay. Now, in the last seven years, what percentage of your time or -- I guess I'll preface this question by asking you to define what exactly is a trace evidence analyst.

A Trace evidence can be broken up into a chemistry section and a forensic microscopy section. I was in the forensic microscopy section, and in that we identified and compared hairs, fibers, glass, paint, and gunshot residues. That was -- that is what's covered by the forensic microscopy section of trace evidence. In the chemical section you look at things like arson evidence and hand wipings from suspected shooters.

Q Over the last seven years or -- can you tell the jury how much of your time has been devoted to looking at, under the microscope, hair and fiber submitted from crime scenes?

A 85 to 90 percent of my time was spent on the microscope looking at hair and fibers.

Q Mr. Linch, I'm going to move now from some of the general characteristics of hair and the examination tools that you use and just some of this background to whether or not you had occasion to assist the Plano Police Department in its investigation of the killer of Ashley Estell back in September of 1993.

A Yes, sir. I did.

Q Can you tell the jury how it was you first became involved in the case?

A The evidence started coming in from Plano Police Department, and subsequently from the Collin County Medical Examiner's office, for identification and examination. The first time that happened was September 6.

Q All right. Is that when you received from Mr. Dan Rhodes a package containing fiber collected from the autopsy of Ashley Estell? Let me check my dates here for a minute. Well, let me do it this way.

MR. CLAYTON: May I approach, Your Honor?

THE COURT: You may.

Q (By Mr. Clayton) I'm going to hand you what's been marked for identification as State's Exhibit No. 12. I'll ask you to take a look at this paper bag. Tell me if your initials are on it and when it was received by you.

A (By the witness) State's No. 12 was received by me on September 6, 1993, and in my handwriting on the outside of the package, panties, head hair standard, head hair combings, and fiber from the victim's perianal area. On the outside is marked number four and number seven through nine that are unique Institute of Forensic Sciences laboratory numbers.

Q Did you have occasion to open up State's 12 at the laboratory and examine the contents of State's 12, which would be and have been previously marked as State's 13, State's 14 and 15?

A Yes, sir. I did.

Q Can you tell the jury at this point in time what those particular exhibits are?

A State's 13 are head hair combings of Ashley Estell. State's 14 are the known pulled hairs from the head of Ashley Estell. State's 15 is the fiber removed from the perianal area of Ashley Estell.

Q Okay.

MR. CLAYTON: Your Honor, at this time the State would offer into evidence State's Exhibit 12, 13, 14, and 15.

MR. MCDERMITT: Your Honor, we have no objection.

THE COURT: 12, 13, 14, 15 are admitted.

Q (By Mr. Clayton) In addition, on the 13th day of September, 1993, did you have occasion to pick up at the Plano Police Department some hair from Ben Armstrong, and I will steer you toward State's Exhibit 77 marked for identification, ask you if recognize it as a package picked up at the Plano Police Department by you?

A (By the witness) Yes, sir. State's 77 corresponds to my unique item number 87.

Q All right. Does State's 77 contain your initials showing that you picked this up and have, in fact, examined the contents?

A My initials are on here and it indicates that I received this at Plano Police Department on September 13, 1993.

Q All right. After you received State's 77, was that logged in at the Southwestern Institute of Forensic Sciences for your examination?

A Yes, sir. It was.

Q Does it bear the same number from the Southwestern Institute of Forensic Sciences that has been applied to this case?

A Yes, sir.

MR. CLAYTON: Your Honor, at this time we'd offer into evidence State's 77 and its contents,

the flyer wrapped around the hair, State's 78.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: They are admitted.

Q (By Mr. Clayton) Mr. Linch, I'm going hand to you what I marked for identification previously as State's Exhibit No. 49. I will ask you to take a look at State's Exhibit 49 and its contents, State's No. 50, and I'll ask if you recognize these exhibits?

A (By the witness) State's 49 is Plano Police Department number 21 and 20 and the Forensic Sciences number 61T, as in Tom, 61U, and I received this September 11, 1993, and these are tapings from the vehicle of Michael Blair.

Q You've had a chance to examine the contents of those tapings; is that correct, sir?

A That's right.

MR. CLAYTON: Your Honor, we would offer into evidence State's Exhibit 49 and 50.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: They are admitted.

Q (By Mr. Clayton) Also going to show you what's been marked for identification as State's Exhibit 62, 63, 64. I'll ask you if you can identify these three exhibits.

A (By the witness) State's 62, 63, and 64 are

hairs that were taken from Michael Blair. State's 62 is a sample of his head hair. State's 63 is a sample of his pubic hair. State's 64 is a sample of hairs from his chest and axillary hairs or hairs from his armpit. They were collected by me on September 10.

Q The Michael Blair who is the source of the chest, axillary, pubic, and head hairs contained in State's 62, 63, 64, those were gathered personally by you at the Plano Police Department from suspect Michael Blair; is that correct?

A That's correct.

Q Is Michael Blair in the courtroom today the same one you gathered these hairs from?

A Mr. Blair is standing at the Defense table.

MR. CLAYTON: Let the record reflect the witness has identified the Defendant in this cause, Michael Blair.

THE COURT: Record will so reflect.

Q (By Mr. Clayton) With regard to State's 62, 63, 64, are these the standards you used for comparison purposes in this case?

A (By the witness) They are the envelopes in which all of the hairs were collected and subsequently I took hairs from the envelopes and placed them on glass microscope slides.

Q You've brought those to court as well with you today?

A Yes, sir.

MR. CLAYTON: Your Honor, we'll offer into evidence State's 62, 63, 64.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: They're admitted.

Q (By Mr. Clayton) Now, you had occasion, did you not, to assist in the search of Defendant Michael Blair's vehicle back on the 10th of September, 1993; is that correct?

A (By the witness) That's correct.

Q During the course of that search did you have occasion to take with you a stuffed bunny rabbit for examination and comparison to the fiber contained in the evidence from the Medical Examiner's office?

A Yes, sir. I did.

Q All right. I'm going to show you what's been admitted previously into evidence as State's Exhibit 51 and 52. I'll ask you if 51 bears the contents of the rabbit that you found boxed up and then later examined?

A State's 51 is the sack that the rabbit was placed in. Yes, sir.

Q Bears the time and, I believe, your initials and the date; is that correct? In the corner?

A Yes, sir. My initials are present on the sack, the time, 1:30 p.m., and the date, September 10, 1993.

Q With regard to State's 52, does it also bear your initials and date and time?

A State's 52 is the rabbit I recovered from Mr. Blair's car with my initials and the date, September 10, 1993 at 1:30.

MR. CLAYTON: For the record, if they have not already been previously admitted, Your Honor, we would offer 51 and 52.

THE COURT: I believe they have been admitted.

Q (By Mr. Clayton) Mr. Linch, also as part of your search, did you have occasion to take from Mr. Blair's vehicle a plaid blanket for examination at some point, or at least did you find it and initial it as a blanket that you wished to inspect further?

A (By the witness) You mean included in the initial recovery of items from the car?

Q Yes, sir.

A No, sir. I recovered a blanket with deer patterns on it at that time.

Q Okay. Day or two later was a plaid blanket submitted to you that you had initialed previously, I believe?

A Yes, sir. It was.

Q Okay. Let's see. Mr. Linch, I'm going to show you what's been previously marked for identification -- let me find the sticker -- State's Exhibit No. 69, white butcher paper. Does it bear, as you see it here on the floor, your initials, date, 9-11-93, and the time that you received it?

A Yes, sir. That was State's what?

Q Be State's No. 49 -- or, excuse me. I'm sorry.

A State's 69 contains -- is butcher paper containing a plaid blanket with my initials, date, September 11, 1993, and the time, 10:38 in the morning.

Q All right. Its contents marked as State's Exhibit No. 70, does that appear to be a plaid blanket that you had occasion to examine at the laboratory?

A Yes, sir. It is.

Q All right.

MR. CLAYTON: We offer State's 69 and 70, Your Honor. They have not been previously admitted.

MR. MCDERMITT: No objection Your Honor.

THE COURT: Okay. They're admitted.

Q (By Mr. Clayton) Also, Mr. Linch, I just want to cover this real quickly before we start in with the comparison directly of the photographs. During the course of this investigation did you have occasion to

look at many, many hairs and fibers submitted to you from such sources as the Estells' home, other stuffed animals that Ashley Estell had in her home, carpet from her home, carpet from her family's vehicles, carpet from vehicles that had been requested by various Plano officers, did you have occasion to compare many of those fibers to the fiber from Ashley's autopsy in the course of all this?

A (By the witness) Yes, sir. I did.

Q All right. From all of those other sources that I have just mentioned, did you ever make an association microscopically -- and I understand there are instrumental things that we have an FBI technician to talk about -- but microscopically were you ever able to make any association with the white fiber found at Ashley's autopsy other than the one from the rabbit that we've been discussing here in court?

A It was my opinion that the fiber from the perianal area of Ashley Estell was from a source other than her own environment.

Q Okay. Now, were you also submitted hair samples from known associates of Michael Blair for your analysis and comparison as possible sources for head hairs found in Michael Blair's vehicle?

A Yes, sir.

Q Did any of those other sources, including Kenny Lancaster, Kedra Arnold, Scott Lancaster, Brett Lancaster, Sandra Stirewalt, Paula Lancaster, or Terry Freeman, were any of these people the source of the hairs that you later associated with Ashley Estell that came from Jack Carter Park or Mr. Blair's vehicle?

A None of the hairs from the mentioned persons looked like the hairs from the Jack Carter Park. With regard to Mr. Blair's vehicle, I was not attempting to make that determination. Certainly there were a large number of hairs from Mr. Blair's vehicle that were microscopically the same as Mr. Blair's known hairs.

Q Okay. But with regard to this list of people that I have named, none of their hair matched the hair of Ashley Estell, I guess, is what I'm trying to get at.

A No, sir. They were all different from Ashley.

Q All right. Insofar as the fiber that you examined from the autopsy performed by Dr. Rohr, the white fiber found on Ashley's buttocks, did you have occasion to compare a sleep diaper from the Estell home as any possible source of that white fiber?

A Yes, sir. I did.

Q And did you come to an opinion as to whether or not that sleep diaper could have been the source of that white fiber found on Ashley Estell's body?

A The sleep diaper was not the source of the fiber from Ashley.

Q All right. Mr. Linch, have you had an occasion to prepare a series of photographs that we can look at and you can point out some of the associations made with some of the evidence that has been admitted here before the Court?

A Yes, sir. I have.

Q Okay. Mr. Linch, I'll show you what we'll now be marking for identification State's Exhibit No. 82. I'll ask you if you've had occasion to prepare and recognize State's Exhibit No. 82 as comparison microscope photographs of the head hair found in the front passenger side of the suspect vehicle, that would be Mr. Blair's vehicle?

A State's 82 is an exhibit I prepared demonstrating the microscopic appearance of the comparison of a head hair fragment from the passenger side floor of Mr. Blair's vehicle compared to the head hair of Ashley Estell.

Q That head hair that is the subject of the photographs in State's 82, is it the one that came from the floor tapings contained in State's Exhibits -- would be 49 and 50 that were submitted to the laboratory?

A Yes, sir. They are.

Q All right.

MR. CLAYTON: Your Honor, I'm going to offer at this time State's 82 for demonstrative purposes for the jury.

MR. MCDERMITT: No objection for that purpose, Your Honor.

THE COURT: All right. Admitted for demonstrative purposes.

Q (By Mr. Clayton) Yes, sir. If you would, come on and step around and we'll move this tripod up a little bit.

Okay. Mr. Linch, if you would step on around. First of all, can you tell us what photograph -- or how these photographs are laid out, I guess, would be the place to start as far as the ones down the center of the exhibit.

A (By the witness) The right side of State's 82 is a photograph of Ashley Estell. In the center of State's 82 are four photomicrographs that represent, on the right side, the appearance of Ashley's head hair on the right side. On the left side is the hair fragment that was recovered from the passenger side floor of Mr. Blair's vehicle.

Q Can you point out for the jury some of the points of comparison that convince you that the fragment

of hair found on the passenger side of Mr. Blair's vehicle make it a match with the known head hair sample from Dr. Rohr's office of Ashley Estell's?

MR. MCDERMITT: Your Honor, I'm going to object to the use of the word match. I don't believe that's the definition. I don't believe that's what Mr. Linch is testifying to.

THE COURT: Well, why don't you rephrase?

MR. CLAYTON: Sure.

Q (By Mr. Clayton) Mr. Linch, would you characterize this as a strong, very strong, association for several reasons?

MR. MCDERMITT: Well, now I object to him as leading, Your Honor.

THE COURT: Sustained.

Q (By Mr. Clayton) Would you characterize this as a strong association?

MR. MCDERMITT: Again, objection. Leading.

THE COURT: Objection sustained.

Q (By Mr. Clayton) Would you characterize this as stronger association than most for several reasons?

MR. MCDERMITT: Objection. Leading.

MR. MIEARS: Objection. Leading.

MR. CLAYTON: Well, what's the problem?

THE COURT: I'll sustain the objection.

Q (By Mr. Clayton) All right. Is this an association?

A (By the witness) The microscopic appearance of Ashley Estell's head hairs, the internal structures, are the same in all microscopic characteristics as the head hair fragment found in the passenger front floor of Mr. Blair's vehicle. Specifically, points of comparison?

Q Well, first I'm going to ask you this. Are there some points of comparison that make this a particularly strong association in your mind as a trace evidence analyst?

MR. MCDERMITT: Objection. Leading, Your Honor.

MR. CLAYTON: I'm asking him to point them out, Judge.

THE COURT: In that particular instance overruled.

A (By the witness) In addition to cuticle, general cortex, and medulla of Ashley's hair being in agreement, or the same microscopically, as the hair fragment from the floor board, Ashley's hair has what is termed bilateral pigment distribution. There are very fine grained pigment particles that are centered on the sides mostly. This pigment pattern is in agreement with

pigment pattern in the hair from the floor board.

Additionally, most of Ashley's head hairs are medullated with fragmentary medullation. You can see the little whirls. To me the whirls within this medullary structure are a significant comparison factor. Additionally, you can see the small cortical fusi up in this area of the shaft, and the hair from the Mr. Blair's vehicle have very similar cortical fusi.

Now, the interesting thing about Ashley's hair, when you look at her standard, is that she has microovoid bodies. These are very small air inclusions that are smaller than a true ovoid body. Ovoid bodies are mostly found in cattle hair and they're much larger, but Ashley, throughout her standard or known head hairs, has these microstructures. Sometimes you see them in human hair where they're randomly distributed through the hair shaft. In this instance Ashley's sit just right below the cuticle.

Another significant point of comparison for me is that these microovoid bodies are sitting right under the cuticle and you don't find them any place else in Ashley's hair. The comparison hair fragment from Mr. Blair's vehicle is a hair that is the same in pigment distribution, medullary structure, especially the fine structure of the medulla, and in particular these little

ovoid bodies that are sitting only right under the cuticle. So the hair from the passenger front floor board has the same microscopic characteristics as known head hairs of Ashley Estell.

Q Just one follow-up question. Did Ashley's hair in the known standard have in its racial characteristic features, did it have anything that was -- particularly stood out in your mind to make it a particularly interesting, I guess you might say, standard?

A Well, again, the presence of this microstructure sitting below the cuticle --

Q Uh-huh.

A -- and the fine -- the higher magnification, you can appreciate the medullary detail better. Those are the two significant comparison characteristics.

Q What was the length, if you recall, of the hair that is portrayed here as the suspect hair from Michael Blair's vehicle that you have associated with Ashley Estell?

A It was a piece of a head hair that was a little less than two inches.

Q Okay. All right. Thank you, sir.

Mr. Linch, as part of your examination of the plaid blanket, which has been previously introduced into evidence as State's Exhibit No. 69 and 70, did you have

occasion to take that to the laboratory and look for any head hairs on it?

A Yes, sir. I did.

Q And did you or were you able to find at least two head hairs that you were able to associate with Ashley Estell?

A Of the many, many hairs that were recovered from the plaid blanket there were two that had suitable comparison to the head hair of Ashley Estell.

Q I'm going to ask you to take a look at what I marked for identification as State's Exhibit No. 83. I'll ask you if you have had an occasion to review and prepare the photographs and the associations from the microscope that are portrayed here?

A Yes, sir. I have.

Q All right.

MR. CLAYTON: Your Honor, for the purposes of demonstrative purposes we would offer State's Exhibit 83.

MR. MCDERMITT: No objection for demonstrative purposes, Your Honor.

THE COURT: Admitted for that purpose.

Q (By Mr. Clayton) All right. Mr. Linch, were you able to make an association between the two hairs you just mentioned from the plaid blanket, State's

Exhibit No. 70, with Ashley Estell?

A (By the witness) The two hairs represented on State's 83 had the same fine microscopic characteristics as the known head hair of Ashley Estell.

Q All right. If you wouldn't mind, would you step around and show the jury some of the points of comparison in these two hairs that convince you that these are Ashley Estell's hairs?

MR. MCDERMITT: Objection, Your Honor. It's a misstatement. Convincing Mr. Linch that these are the hairs of Ashley Estell. I'll object to the leading question in that form.

THE COURT: Sustained.

Q (By Mr. Clayton) Well, are there -- do these two photographs of the hairs that were found on the plaid blanket in the back of Mr. Blair's car, do you find these to be associations that can be made with Ashley Estell?

A (By the witness) Ashley Estell cannot be excluded as the donor of the Caucasian hairs recovered from the blanket in Mr. Blair's car.

Q Are there any features that stood out in your mind as -- that you can see here in these photographs, recognizing the limitation of these photographs?

A These two hairs were wrapped around each other

upon my recovery from the blanket and they both had root end with a small amount of tissue indicating that they'd been forcibly removed, and as you can see on the right side of State's 83, these hairs from the blanket have what I call bilateral pigment distribution. Pigment is concentrated on either of the two sides. There is no medulla. These hairs have no medulla. In comparing these to the known head hairs of Ashley Estell, which also had no medulla, I found that they were microscopically the same.

Q Mr. Linch, you mentioned in your earlier testimony that the hairs that were recovered from the plaid blanket exhibited some signs of trauma. And is that something that can be shown in several different ways, be it by twisting or some other evidence to the hair itself?

A I -- my testimony was such that the hairs from the plaid blanket, the two that were twisted around each other, had been forcibly removed. I don't know about trauma to the hair shaft itself. I didn't see that.

Q With regard to the hair that was removed from the front passenger seat that we talked about in the previous poster, did it show signs of trauma to the hair?

A Yes, sir. That hair had been crushed on each

end.

Q As such can you see that crushing under a microscope as well?

A Yes, sir.

Q I'm going to show you what I marked for identification as State's Exhibit 84. I'll ask you if State's 84 in the photograph shows the evidence of the trauma that you had mentioned?

A State's 84 is four microphotographs that were taken by me. They are a series of photomicrographs of the hair fragment from the passenger floor of Mr. Blair's vehicle.

Q All right.

MR. CLAYTON: We'd offer --

Q (By Mr. Clayton ) First of all, there are three other photographs here. Can you tell me what those portray in State's 84?

A (By the witness) All four are photographs, on State's 84, are pictures of the same hair piece from Mr. Blair's front floorboard. They are all photographs of the one piece, just at different places in the hair.

Q All right.

MR. CLAYTON: We'd offer 84 for demonstrative purposes, Your Honor.

MR. MCDERMITT: No objection, Your Honor.

For that purpose, Your Honor.

THE COURT: Admitted for that purpose.

Q (By Mr. Clayton) I hate to keep doing this to you, but could you just step around and show us a little about some of these terms we've been talking about. First of all, at the top this is, first of all, again, the hair from the front passenger side; is that correct?

A (By the witness) That's right. All of these photographs represent that hair, that single hair.

Q A moment ago -- well, let's start with the top photo. Essentially this gives us some of the characteristics that you found to be special characteristics for Ashley's hair; is that correct?

A That's right.

Q All right. And the second photograph, can you tell us what you portrayed here along with the suspect hair fragment from Mr. Blair's vehicle?

A Do you want me to talk about the first or go to the second one?

Q Okay. We'll just let you move from the first one then as it applies to the second.

A The first photograph represents bilateral pigment distribution, fine grain pigmentation of the found hair in Mr. Blair's car. It also represents the fragmented medulla, and fine structure swirling on that

medulla on higher power becomes more apparent. The second photograph from the top is a lower power photomicrograph of the same hair. In this photograph you can start to see the clear residue that is on the hair, and also in number two there's a carpet fiber, consistent with origin from Mr. Blair's vehicle. The hair came from the floor of his carpeting. There's a darker hair with Mongoloid racial characteristics. Underneath all these is another hair that is featureless.

Q This one with the Mongoloid hair features, you've had a chance to look at Michael Blair's hair as well; is that correct?

A Yes, sir. I have.

Q This particular hair did come from Michael Blair's vehicle. Is it one that you've been able to make an association with or at least certainly can't exclude Mr. Blair?

A Mr. Blair cannot be excluded as being the source of this hair from his car.

Q Now, you mentioned some clear residue that shows up in this photograph. I assume here, the third paragraph from the top, shows that more clearly. Would the clear residue that is clinging to the hair from the passenger side of Michael Blair's vehicle that you've

associated with Ashley Estell, is that residue from some kind of hair treatment product, in your opinion?

A The third photograph down on State's 84 --

Q Be 84.

A 84 represents a synthetic liquid material adherent to the hair shaft. This is microscopically consistent with hair conditioner, some sort of hair treatment. The -- it is inconsistent with a dried biological product.

Q Cream rinse, then, be a possible source of this residue?

A That's a possible source.

Q All right. Finally, down here in the bottom photograph, we were talking about trauma a few moments ago. Do we see the trauma displayed to the hair fragment from the front passenger side of Blair's vehicle you've associated with Ashley Estell, do we see that trauma you were talking about?

A Yes. The fourth photograph on the bottom of State's 84 represents one end of this hair piece from the floor of Mr. Blair's vehicle. You can see that the hair has been crushed or particle filament or frayed ends. The other end of this hair has a similar appearance indicating that this hair piece has been subjected to some sort of blunt force.

Q All right. Thank you, sir.

Mr. Linch, you had occasion to examine a clump of hair, did you not, that has been admitted into evidence that -- labeled its location as originally being Jack Carter Park. Did you have a chance to look at that particular hair?

A That's right. There were a strand of hairs that became my unique item number 87.

Q All right. From that particular item 87 were you able to associate at least two hairs in that clump with that of Michael Blair, the Defendant in this case?

A There were two hairs from the strand of hairs that had Mongoloid racial characteristics and they further had internal microscopic structures that were the same as the known head hair of Michael Blair.

Q Additionally, within this clump containing the two hairs you associated with Michael Blair, did you find hairs that you were able to associate with Ashley Estell, the victim in this case?

A The strand itself contained head hairs that had the same microscopic characteristics as the head hair of Ashley Estell.

Q Was this one or two associations or was it a number of hairs that you were able to associate from that clump?

A I compared fifteen to twenty hairs within the strand and they were all the same as Ashley Estell's head hair.

Q All right. Now, this is the first time we've talked about Michael Blair's hair. We've already previously admitted a head hair standard from Michael Blair taken by yourself. I'm going to show you what's been marked now for identification as State's Exhibit No. 85. I'm going to ask you if you'll take a look at State's Exhibit No. 85 and tell me whether or not this is a series of photographs prepared by you with the use of the microscope for comparison of the two hairs associated with Michael Blair from Jack Carter Park that were admixed with some twenty-odd hairs from Ashley Estell's association at Jack Carter Park?

A This exhibit contains four comparison photomicrographs of known hairs from Michael Blair compared to the microscopic appearance of two separate hairs found within that larger strand. The two top photographs are the same hair compared at different magnifications, different places in the hair, and the two lower photomicrographs are pictures of the same hair compared at different magnifications and at different places in the hair.

Q All right. With regard to the far left-hand

side of the poster at the bottom -- let me see if I can turn this a little bit for you. At the bottom is that a photograph that you prepared of Jack Carter Park for this poster?

A That --

Q Not that you took, but that you used for its association.

A That photograph was provided to me by the Plano Police Department.

Q All right. Above this photo labeled Jack Carter Park -- I believe we have the same photo in evidence -- is there also a photograph made by you of the hair clump that you examined?

A Yes, sir. The photograph above that is a representation of the item as it was submitted to the laboratory, that is, the whole hair clump.

Q All right. Okay. We have four photographs down the center. On the right-hand side are the strands that were -- well, first, higher power and lower power photograph of one of the strands. Then at the bottom we have two that appear darker. Why do we see part of the head hair standards from Michael Blair appear darker in color, as well as the suspect strands you've associated with Michael Blair from Jack Carter Park? Why do we see that difference?

A If I can correct one thing, the top photograph is the lower power, the lower is the higher power. Within everybody's head hair you have variations. The continuing theme within an individual's hair is how is the pigmentation distributed. That's the individualizing characteristic of head hair. Mr. Blair's hair ranges from fairly heavily pigmented to the ultimate extreme of being opaque. There are a couple of hairs in his head hair standard that are completely opaque, that is, the pigmentation is so dense that you cannot see through the hair.

Q Would that be the two that are portrayed down here at the bottom, the opaque examples?

A The two photographs, but that's one hair.

Q Two photographs of the same hair?

A That's right.

Q Okay. Within the racial group that is classified as Mongoloid hair, is opaque hair something that you find very often?

A I've never seen a Caucasian or Mongoloid hair that was opaque like that.

Q That's in seven years or more of looking at hair under a microscope about 85 to 90 percent of your day?

A That's right.

Q As such, Michael Blair then has some very strong special characteristics in his hair because of some of his hair standard having these opaque features; is that correct?

A I haven't seen a hair like that before. Not a human hair.

Q All right.

MR. CLAYTON: For demonstrative purposes, Your Honor, I just want to make sure the record is clear, Exhibit 85 was offered.

MR. MCDERMITT: We have no objection.

THE COURT: Admitted for that purpose.

Q (By Mr. Clayton) All right. With regard to the hair clump that we've been talking about from Jack Carter Park, Mr. Linch, did you also have occasion to prepare some comparison microscope photographs that show the association in the hair found at Jack Carter Park with the known head hair standard and combings of Ashley Estell?

A (By the witness) I compared the hair strand found at Jack Carter Park to the known head hairs of Ashley Estell.

Q All right.

A And this exhibit contains four photomicrographs that roughly demonstrate those comparisons.

Q All right.

MR. CLAYTON: We would offer into evidence for demonstrative purposes State's 86.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: Admitted.

Q (By Mr. Clayton) With regard to State's Exhibit No. 86, as you said, this is simply roughly showing the comparison. We have a lot of hairs portrayed here. Would it be fair to say that the strongest characteristic that you can see in both is the fragmented medulla and the bilateral pigmentation that we see in most of these?

A (By the witness) Obviously you have to consider each hair individually in doing the comparison, but the notable thing about this comparison was that within the range of Ashley's hairs, that range from featureless to the fragmented medullated with the little bodies sitting below the cuticle, I was able to associate all ranges of her variation with hairs in that strand.

Q As you testified earlier, and correct me if I'm wrong, did you say that the more hairs you have at a crime scene for comparison to the standard the stronger the association you can make? Is that a fair statement?

A Absolutely.

Q And you had a good range then of variation in

Ashley's standard and combings present at the Jack Carter hair?

A The complete range of Ashley's variation in her head hair is represented in that strand from Jack Carter Park.

Q Okay. I want -- just in that same idea of the variation in the standards, I want to kind of reverse myself and talk about Mr. Blair's hair for just a minute. You pulled two hairs that you associated with Michael Blair mixed up in this clump from Jack Carter Park along with these that you've associated with Ashley Estell. Those two hairs that you associated from Jack Carter Park with Michael Blair, did they meet this range of variation in Mr. Blair's hair as well to make these particularly good associations?

A The comparison of the two hairs from that strand with Mongoloid racial characteristics represented two extremes of Mr. Blair's known head hair, one being the opaque hair that I haven't seen before and the other being the heavily pigmented type hair.

Q I'm going to ask you if you would, Mr. Linch, to kind of change your focus for just a minute again to hair. I mean, to fiber. With regard to fiber, you can make these same types of visual observations under the comparison microscope; is that correct?

A The initial steps of the fiber comparison are identical to the steps of a hair comparison; however, the final steps of a fiber comparison are very different from the steps of a hair comparison.

Q With regard to the fiber that has been introduced into evidence as State's Exhibit No. 15 from the autopsy performed by Dr. Rohr, did you have a chance to make microscopic comparisons of that fiber from Ashley Estell's buttocks with fiber taken from the stuffed rabbit that has been introduced into evidence as State's Exhibit No. 52?

A Yes, sir. I did.

Q Based upon your microscopic comparison -- and I believe you said you used two different microscopes in that comparison or I may be mistaken there.

A No. I use two microscopes when there is a needed recovery from a piece of tape or clothing article sometimes, but in this instance I just used the comparison microscope.

The fiber from Ashley's body was affixed on a microscope slide with masking tape from Dr. Rohr, and I removed that fiber from his slide and directly mounted it on a microscope slide. I then did the comparison microscopically.

Q Based upon your examination did you come to an

opinion as to whether or not the fiber from the rabbit we've just been discussing, State's Exhibit No. 52, matched in fine microscopic characteristics the fiber from Dr. Rohr's office that was found in the perianal region of Ashley Estell?

A I couldn't tell the difference microscopically between the fiber from Ashley's perianal region and the fibers that comprise that white rabbit from Mr. Blair's vehicle.

Q Now, as you alluded, there are further tests that can be done with fiber to strengthen the association that you made at least visually; is that correct?

A That's right.

Q Did you make preparation then to send this particular fiber that was taken from Ashley Estell and the fiber taken from -- the fiber samples from the stuffed rabbit to the FBI laboratory in Washington, D.C.?

A Those fibers were sent to the FBI laboratory for chemical identification.

Q All right. John Naylor picked those up from you and sent those on to the FBI, if I'm not mistaken?

A That's correct.

Q Okay. And as far as what their findings are,

that's something that is not within your area of testimony today because you did not perform those tests yourself?

A That's right.

Q Okay. As far as the microscopic work that you did, did you also have occasion to -- I think I asked this -- look at stuffed animals, toys, and things in Ashley Estell's environment as potential sources for the fiber found on her body?

A Yes, sir. I did.

Q In your opinion microscopically you were able to see distinctions, eliminate them as possible sources?

A Yes, sir. I was.

Q I'm going to show you what I'm marking for identification as State's Exhibit 87. I'll just ask you if State's Exhibit 87 represents the fiber or a comparison of fiber from the rabbit, State's Exhibit 52, the white rabbit found in Michael Blair's vehicle with fibers that belonged to Ashley Estell's dolls at her home, and some of them are portrayed here in the photograph that's been previously introduced into evidence?

A Yes, sir. They do.

MR. CLAYTON: We'll offer States 87 for demonstratives purposes.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: Admitted for that purpose.

Q (By Mr. Clayton) If you could step around once again, and I want to go over with the jury real quickly some of the things you look for when you're comparing fibers. If you can, show how Ashley's dolls just simply did not match those from the suspect doll in Blair's vehicle.

A (By the witness) In the center of State's 87 there are two photomicrographs. Again, these are comparison photographs taken through the microscope. One side is one sample. On the other side is the other sample. On the left side of the photograph are representations of the fibers that make up this rabbit with glasses that came from Mr. Blair's vehicle. On the right side is a photograph of fibers taken from one of Ashley's rabbits that I found on the shelf in her bedroom.

Now, the closest agreement between -- I did a fiber sampling from all these stuffed animals. I think there were about fifteen all together, and from what was described to me as her sleep bunny, a bunny that she used to sleep with, kind of a floppy thing, the closest agreement was found from the sleep bunny; however, in looking at subtle microscopic differences I was able to

exclude her sleep bunny, primarily through the existence in the sleep bunny of these linear inclusions. No matter how far you go out on these fibers on the microscope, you won't find these linear-type inclusions. The closest stuffed animal that Ashley had, State's 87, represents fibers from that rabbit; however, shown in the bottom photograph is the difference in the change. The typical fibers from the rabbit from Mr. Blair's car are what we call ribbon acrylics or modacrylics. Modacrylics are used often in wig manufacture, but these type fibers, again, do not possess this linear inclusion.

Additionally, there are specific splits in the fiber. This is a function of manufacturing. All fibers are manufactured a little bit differently. The key thing about this rabbit is that he is mostly this fiber. There are some occasional thinner what we term trash acrylic fibers. There are also in this makeup -- I don't usually look at trash acrylic fibers. This is a fiber seldom encountered in forensic work. The fibers comprising the closet bunny of Ashley was made up not primarily of this, but primarily of this fiber here. The dots that you see in both fibers are delustered titanium dioxide. It's used in paints or fibers to cut down on shine or glare. Obviously the fibers from the

bunny are heavily delustered. The fibers from her bunny and this particular type fiber are heavily delustered, all these little grains of titanium dioxide. In this fiber that is the predominant fiber of this sleep bunny there is a very clear difference in the distribution of titanium dioxide particles. That is a significant comparison characteristic used to exclude Ashley's own bunny.

Q Mr. Linch, with regard to the bunny that belonged to Ashley, that came from her room -- we can call it Ashley's sleep bunny -- even though you were able to make microscopic distinctions in it from the rabbit that came from Michael Blair's vehicle and that you have associated as being microscopically, at least, the same in fine microscopic characteristics as the fiber found in Ashley's body, did you go ahead and send that rabbit doll, Ashley's sleep rabbit, to the FBI for examination chemically, along with the fiber from Ashley's body and the fiber from the suspect doll?

A Yes, sir. I did.

Q All right. Do you have those in the box there before you that contains your microscopic slides?

A Yes, sir. I do.

Q Okay. And those were sent, as you stated earlier, through Mr. Naylor to the FBI for their

analysis; is that correct?

A That's right.

MR. CLAYTON: May I approach, Your Honor?

THE COURT: You may.

Q (By Mr. Clayton) If I might, Mr. Linch, I'd like to see the three slides that you pulled, as well as the bag they came from. Thank you.

Mr. Linch, I'm going to hand you a bag that you just opened here in open court that I've labeled as State's Exhibit No. 88. I'm going to hand you the contents of that bag that you just pulled out here in open court. They've been labeled as State's 89, 90, 91. I'll ask you if you can identify each of the three cardboard boxes with the microscope slides in them as being the -- being associated with this case?

A (By the witness) State's 88 is the packaging that the slides were provided in. State's 91 contains the microscope slides of the single white fiber from the perianal region of Ashley Estell. In that same package are known fibers from the rabbit obtained from Mr. Blair's vehicle. State's 90 contains one microscope slide. These are white fibers that I plucked from a white bear. That would be Mr. Blair's white bear that was in his car. And State's 89 are two glass microscope slides. One is from -- or is a fiber sampling from one

of Ashley's dolls. It was a bear with an inscription on it, I Love You, and the second glass microscope slide is a fiber sampling from her sleep bunny. It was identified on her shelf as being from Eden Toys.

Q Mr. Linch, you mentioned a moment ago a term, trash fibers, trash acrylic fibers. What does that mean?

A There are fibers that occur so commonly in the environment that an experienced forensic microscopist really doesn't pay much attention to them. I've probably got some white cotton fibers in my head hair from putting on a T-shirt this morning. To me they don't mean anything. To me the white cotton in my T-shirt looks like the white cotton in your T-shirts, just like the white cotton in everybody's T-shirt. There are within the acrylic family very thin, very, very common, white acrylic fibers. When I see them in case work, whether collected from a body or suspect environment, I just don't pay any attention to them. They're really not worth reporting because their value is nothing. The polyester group of synthetic fibers is approaching that worthless examination state because they're so common in the environment. I don't know of many head hair combings from victims that I have examined that I haven't found a red polyester fiber in

there some place. These are trash fibers. They have no forensic significance.

Q In regard to the fiber found and compared by you that came from the buttocks or perianal region of Ashley Estell's body was -- I believe you mentioned that fiber is not one you see very commonly in the environment. Have you ever seen that particular fiber, the one found on Ashley Estell's body, alone as that one was in the perianal region?

A I've never seen that type of ribbon fiber by itself before.

Q Have you seen that type of ribbon fiber before in association with other fibers?

A Yes, sir. It is.

Q When you usually see that particular type of fiber, what kind of association or where do you generally see it? What kind of situations?

A That type of fiber is such a fragile, thin fiber that once it's released from its parent body, possibly the rabbit in this instance, it easily becomes wound up with other fibers. The times before that I've seen this type of class fiber, it's in association with lint material. It's wrapped up with other acrylics and other polyesters, like lint material from maybe the corner of somebody's house, but they are a very fragile

type fiber. Once they're released from the structure they came from, they usually get wound up with some other types of fibers.

Q Okay. When a fiber moves from its parent source, as you say -- here we'd be talking as a parent source, Mr. Blair's bunny rabbit in his vehicle -- that would be the parent source to make the association with the fiber found on Ashley's body; is that correct?

A That's right.

Q Okay. All right. Now, what -- is there a theory of exchange? When you talk about fiber coming from a source, a parent source, to some other location, what is that called?

A This is called the Locord exchange principle. In 1923 Edmond Locord was the first microscopist to start looking at fiber-type evidence. He postulated that whenever two objects come in contact, then there's always a transfer of material. It may be too small to be found. It may be lost subsequently, but that's known as the Locord exchange principle.

Q When we talk about exchanges of property from the parent material to some other location, is there what we call primary transfers and secondary transfers? Kind of how does that work or play into -- I guess, how is that significant, then, as it relates to the parent

body here, the rabbit from Mr. Blair's vehicle, and the fiber you associated with it being on Ashley's body?

A If one of my head hairs is later found on the floor here, that would be a primary transfer. If I had tracked in some airplane carpet into this carpeting, that would be a secondary transfer. Primary transfer would be that carpet to me and then me bringing it in here. This can go on and on and on, tertiary, quaternary. I haven't -- I don't have pets in my environment. I find animal hair on my clothing from time to time.

Q With regard to the fiber found on Ashley's body being in the perianal region and due to the extremely fragile nature of this single fiber that you rarely or have never seen by itself without association with other fibers, do you have an opinion as to whether or not this was a very primary type of transfer from the parent source, the rabbit, to Ashley's body?

A My opinion would be that that would be a very secondary type transfer, with the primary being to a finger and then the finger coming in contact with Ashley's body.

Q What is the reason for that opinion?

A Well, the -- if you grab the rabbit, you will invariably receive one of its fibers on your finger.

And then if that hand comes in contact with the body, I would expect an immediate transfer from that finger. Earlier when I was handling the rabbit, one fiber came loose and I placed it here and it's no longer to be found, but that would be my opinion about theory of transfer in this case.

Q Be a fairly recent or rather recent transfer for that fiber to still be alone without association with other fibers, particularly due to the unique and difficult place for that fiber to have reached?

A Yes. And the cleanliness of that fiber is a factor.

Q That fiber had not picked up other debris or other fibers or anything --

A There was just a very scant amount of material. It was microscopically consistent with fecal material. As you travel further along on the fiber under the microscope, it's very clean.

Q Hasn't been spattered with mud or out in the rain or anything like that that you could tell?

A I don't know about rain, but there's no mud there.

Q Okay.

Q The last area I need to cover you with you I suppose -- oh, yeah. Back when we talked about the hair

that was recovered from Jack Carter Park and that you associated between fifteen and twenty of those hairs with Ashley Estell -- do you recall that?

A Yes, I do.

Q That particular hair that you associated with Ashley Estell from Jack Carter Park, did you have an opinion as to whether or not that hair had been cut or broken or traumatized in some way?

A The hairs that were consistent with origin from Ashley Estell, the strands had been cut.

Q When we talk about cut hair, can hair be cut by other means other than a knife or scissors or something along those lines?

A Yes, sir.

Q And appear the same microscopically pretty much as if they'd been cut by scissors?

A Yes, sir.

Q All right. When a kiddo wears a bow in their hair or one of those little hair band things to hold a ponytail in place, if that is pulled or dragged or smacked up against something, can that also fracture hair or cut, leaving the impression the hair has been cut in your opinion?

A Tangential forces applied to the scalp can damage the hair in a way that microscopically it appears

to have been cut. I've seen an instance where a close range gun shot of the head produced or released hairs that appeared to have been cut.

Q The last thing I'll cover with you has to do with some plant matter. Did you have occasion in association with this case to look at microscopically some plant matter that was recovered from County Road 113 by Ben Armstrong?

A Yes, sir. I did.

Q Mr. Linch, I'm going to show you what's been marked for identification previously as State's Exhibit 79. I'll ask you if recognize it as some plant matter that you had occasion to look at microscopically in association with this case?

A State's 79 is my unique item number 184. It came into the crime laboratory on October 7, 1993, and this is labeled as being plant material taken from where near where Ashley's body was found.

Q Did you have occasion to --

MR. CLAYTON: First, let me offer into evidence, Your Honor, State's Exhibit 79.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: State's 79 is admitted.

Q (By Mr. Clayton) Mr. Linch, whenever State's Exhibit No. 52, Mr. Blair's rabbit from his vehicle, was

collected and sent to the laboratory, did you detect clinging to the ear of the rabbit a -- an amount of what appeared to be plant material?

A (By the witness) There was dried plant material, I believe, on the left ear on the inside.

Q All right. Did you have occasion to collect that plant material from the rabbit's ear for some sort of inspection microscopically?

A Yes, sir. I did.

Q Where is that -- or do you have that material with you today or did you photograph the material for microscopic comparison?

A It was photographed with a light microscope. It was also photographed with a scanning electron microscope.

Q And after you had made your photographs, were you able to compare those photographs with photographs made from the plant material contained in State's Exhibit 79?

A Yes, sir. I did.

Q Were you able to make an association based on those photographs of the plant materials microscopically with the plant material that you recovered and photographed from the ear of State's Exhibit No. 52?

A In forensic botany in order to try to determine

if a leaf found on an item like the rabbit is consistent at the present time with leaves in a crime scene like at Ashley's body site, you really need the entire leaf. You need the borders of the leaf to know if it's smooth or jagged, and it helps to have a fresh leaf, and in this instance the fragment of leaf material from the rabbit's ear was incomplete. It was fractured and very dry and there was no remaining border, and a lot of the substrate material between the veins was gone.

So the best you can do in that instance is to look at the hairs on the leaf. Hairs are specific for genus of type plants. We're homo sapiens. Our genus is homo. So you're limited to assigning whether or not plant material in this instance could be from the same genus type plant, and in that instance the plant material from the rabbit's ear, the hairs on that leaf appeared by scanning electron microscopy to be the same as plant material at the crime scene.

Q Now, granted, and being perfectly candid with the jury, the plant material around the crime scene is a very common type of plant material we'd see, or vegetation, we'd see in the eastern part of the State of Texas.

A It's a common Texas weed. I've seen it in Central Texas, as well as North Texas.

Q So -- and being perfectly candid, although there's an association between the plant material on the bunny rabbit's ear and the scene where Ashley was found, it's simply that, just an association as far as the genus goes?

A Can't exclude it.

Q Can't exclude it. Okay. Mr. Linch, with -- sort of in closing, I'd like to ask you if, finally, in your opinion the hairs that you examined that you have associated with Ashley Estell from Jack Carter Park, from the front passenger side of Michael Blair's vehicle, from the plaid blanket in Michael Blair's vehicle, do you feel that those particular hairs were either Ashley's or someone with hair just exactly like hers?

MR. MCDERMITT: Objection, Your Honor. That's a misstatement. The -- Mr. Linch is not going to be able to say exactly like that. He's testified as to that, and we object to it on that basis because it's leading the witness.

THE COURT: I'll sustain it as to leading.

Q (By Mr. Clayton) How would you characterize the associations you made with Ashley Estell?

A (By the witness) If I can rank them, in the strand of hairs from Jack Carter Park there is a strong

microscopic indication it came from Ashley because of the number of hairs that are the same and the fact that so much variations represented there that is the same in her variation from her scalp. Second to that, the fragment from the passenger floor is a strong association to Ashley Estell. It has come from somebody who has the exact same microscopic characteristics, including the medullary swirling and the microstructure sitting right under the cuticle and the fact that it shows evidence of trauma. It has come from someone who had, most likely had, head trauma and the -- the latter or less conclusive association would be the two hairs from the plaid blanket. Now, they are in exact microscopic agreement with Ashley Estell's head hair, but there is less detail in there to evaluate and so -- and the length is also a consideration factor. These hairs were -- I think, the longest one was about four inches. So in order for them to have origin from Ashley they would need to be from her bangs area, but certainly I cannot exclude Ashley as being the source of those two hairs.

Q Now, with regard to the hair associations made with Michael Blair, those were two hairs that you associated with Michael Blair's head hair standard from Jack Carter Park admixed with the hairs that you

characterized as strong associations with Ashley Estell; is that correct?

A That's right.

Q All right. Now, the two associations you made with Michael Blair's hairs at Jack Carter Park, how would you rank those or characterize those in associations?

A The opaque head hair from the strand of hairs from Jack Carter Park has strong microscopic indications that they had origin with Mr. Blair. They are -- it is a hair type that I haven't seen in Mongoloids or Caucasians before, and the fine detail agreement under the cuticle before the hair goes completely black is microscopically exact. The second hair from that hair strand is also a strong association to Mr. Blair. It -- microscopically I could see no difference between the pigment pattern in that hair and the hairs from Mr. Blair's head.

Q In wrapping up, Mr. Linch, I'm going to show you what I'll mark for identification at this time as State's Exhibit No. 92. I'm going to ask you to take a look at State's Exhibit 92, ask you if this essentially, then, summarizes the associations that you've made and testified about here today with regard to State of Texas versus Michael Blair?

A Yes, sir. It does.

Q Okay. Within State's Exhibit 92 we have photographs, known photographs, of Ashley Estell, suspect vehicle, location where the body was found, and some of the vegetation growing, Michael Blair's rabbit from his car, picture of Jack Carter Park previously in evidence, and a known photograph of Michael Blair; is that correct?

A That's correct.

MR. CLAYTON: Your Honor, we'd offer into evidence for all purposes and a summary for the jury State's Exhibit No. 92 at this time.

MR. MCDERMITT: May I take the witness on voir dire, Your Honor?

THE COURT: You may.

VOIR DIRE EXAMINATION

BY MR. MCDERMITT:

Q Mr. Linch, are you saying by this evidence, by this chart here, that definitively three head hairs from her match this car or came from this car necessarily?

A My testimony is such that three head hairs from the car had the same microscopic characteristics as Ashley Estell. I'm not here to tell you that they came from her to the exclusion of all other people in the world.

Q Okay. So when you say -- when I have an arrow pointing here that goes to the vehicle, then I have one here by the plant material, are you saying that -- you're not saying, then, any plant material could only have come from this location?

A No, sir.

Q You're not saying that this fiber that was found on the perianal area could only come from this doll?

A No, sir.

Q Okay. And you're not saying that any hairs that may or may not have been found at Jack Carter Park or of a ponytail or tennis ball size or mass of hair is not hers definitively?

A To -- not to the exclusion of all other persons, no, sir.

Q The same as regards any hair combings here. So are you telling me that those are more guidelines as to your testimony?

A That's a summary of the associations. Yes, sir.

MR. MCDERMITT: Pass the witness, Your Honor

MR. CLAYTON: We offer the exhibit, Your Honor.

MR. MCDERMITT: We don't object to it then, Your Honor.

THE COURT: Admitted.

DIRECT EXAMINATION (Cont.)

BY MR. CLAYTON:

Q Mr. Linch, I just had one other question about the Jack Carter Park hair and also about Mr. Blair's vehicle. Did you have occasion to examine the Jack Carter Park hair in the clump fairly closely, and in addition to hair associations made with Michael Blair and Ashley Estell, did you find some little C-shaped bodies in that particular clump?

A Yes, sir. There were a number of human hair fragments that looked like the letter C. They were darkly pigmented.

Q Being so short, you couldn't make an association because they were under half an inch in length and you could not make an association?

A I can tell you they didn't come from Ashley.

Q Okay. Could you exclude Michael Blair as the source of those C-shaped bodies?

A No, sir. They were too short and they had darker clump pigmentation.

Q And I'm just being perfectly candid. We're not trying to say you made an association or match with

Mr. Blair with this -- these C-shaped bodies contained in the clump. We're just saying you could not exclude him as a source for those little C-shaped hairs in the clump?

A That's right. I could not really identify whether those were head hairs, facial hair shavings, or from what body site origin they had. So I don't know.

Q Did you ever seen those C-shaped bodies in association with other samples that appear in the summary of this case?

A There were a number of very short, heavily pigmented hair fragments in the plaid blanket from Mr. Blair's vehicle.

Q Once again, those things are too short to make an association or a match as we did with the longer hairs; however, you could not exclude Michael Blair due to some of the characteristics that were visible as Mr. Blair being a source for those C-shaped bodies on that plaid blanket.

A No. Could not exclude Mr. Blair, or the other hairs from the blanket. There was a lot of extraneous materials on that blanket that may or may not have had origin with Mr. Blair.

Q Those C-shaped bodies were present on the blanket in his car?

A Yes, sir.

Q And they were present in the clump at Jack Carter Park?

A That's right.

Q Also admixed in the clump of hair from Jack Carter Park did you see some little pieces of tan or light tan pieces of straw or grass or things of that nature admixed in it?

A Strands from the park?

Q Yes, sir. In that little clump.

A There was some grass in there. Yes, sir.

MR. CLAYTON: Your Honor, at this time we'll pass the witness.

THE COURT: All right. We'll stand in recess then until 3:15.

Ladies and gentlemen, let me remind you not to converse among yourselves or with anyone else on any subject connected with the trial or to form or express an opinion thereon until the cause is finally submitted to you.

(Recess. Jury returned to the courtroom.)

THE COURT: Everyone be seated, please Mr. McDermitt.

MR. MCDERMITT: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. MCDERMITT:

Q Mr. Linch, early on you talked about that the value of hair comparison is associative evidence; is that correct?

A That's right.

Q All right. Is it fair for me to interpret that as an exclusion type evidence?

A If given proper standards and under proper conditions you can absolutely exclude somebody as being a contributor of a hair.

Q Okay. For example, if you had a -- a known hair sample that was Causcasian and then you saw two different hair samples that were Mongoloid or Negroid, then you could exclude them from matching the Caucasian; correct?

A Well, that's at the simplest level. Yes, sir.

Q But starting at the simplest level?

A Right.

Q That would be an initial determination that you would make?

A You could do that possibly with the naked eye. Yes, sir.

Q Okay. And so then we could get -- then you could go on further in your examination as regards

different features and special features and such as that; correct?

A That's right.

Q And is it, then, that you use those determinations or observations by you to further exclude?

A At the level of the initial eye exclusion you're looking for curliness, thickness, color. At the microscopic level you're looking for primarily pigment distribution and color, after you've done a racial determination. It's all of those factors added together.

Q Right. Okay. But basically trace analysis, is it fair to say it's done for the purpose of -- albeit findings may be similar -- it's also done for the purpose of excluding other possibilities?

A That's right.

Q Okay. Because there is no such thing or is there such thing as a -- a situation where you can say this hair came from this person?

A You can't do that. No, sir.

Q It's -- like you can with a fingerprint?

A I'm not a fingerprint expert, but I understand a fingerprint from that person is that person. Right.

Q So what we're talking about when you're saying

could have been a donor or such as that, you're saying -- you're saying it's still in that classification, that it's not excluded?

A That's right.

Q Okay. Now, you talked about a lot of what you do and the associations that you make between different types of hair and fiber evidence are based on your individual judgment and experience; is that correct?

A Yes, sir.

Q Okay. You talked about the -- and I'm not sure I can phrase it correctly -- the lizard brain approach?

A Yes, sir.

Q Okay. Where you -- you know they're the same so --

A Something -- yes, sir. Something intuitively tells you it's the same. You then go to a higher thinking and look at the structures that make that true.

Q Like you talked about fingerprint experts, they look at them and they -- they have a feeling or something that there's a match. Then, therefore, they go and look for different points?

A It's not a feeling. It's a complex system of the senses and the coordination with what you're looking for. It's a search image situation.

Q Now, in the scientific trace analyst area, can

you tell me what a double blind test is?

A That's where the examiner is unsure what is being tested and that's where the person doing the testing isn't sure of the conditions. Should be a third person involved.

Q Okay. But it would -- is it fair to say then that you don't necessarily have a known sample?

A That's right.

Q Okay.

A That's right.

Q And with -- a lot of what you talked about here today, you have a known sample so you're looking for things as compared to that known sample?

A Right.

Q Well, when we talk about these double blind tests -- why would they do double blind tests? I believe you mentioned that they did some of that with you.

A The testing that we did is a quality control measure. It does not qualify as double blind. A person being tested knew that the one hair he had would fit that category of twenty in doing the comparison.

Q So in a double blind you wouldn't even know --

A Any of those twenty were the source; right.

Q -- if any of those twenty were the source?

A Right.

Q Well, is there some advantage to doing double blind as opposed to using a known sample when you're talking about this intuition, intuitive thought process?

A No. I don't think so. If something is microscopically the same, it's microscopically the same regardless of surrounding circumstances or test conditions.

Q Okay. Well, would the double blind then eliminate the subjective aspect of it?

A No.

Q Okay. So the double blind, you're still going to be using the subjective aspects as regards these examinations?

A That's right. You're comparing microscopic appearance of one thing to another. If they're the same, they're the same. If they're different, they're different.

Q Okay. Okay. And you talked, about as concerns comparison, head hair is -- is the best hair to have available for comparisons?

A In general. Some individuals have a head full of featureless hairs and another person out there may have a few featureless hairs. So if you're dealing with a person with relatively featureless hairs, then that's

a less optimal situation than if that same person had pubic hairs that had significant microscopic features, but generally speaking, head hair shows more variation and more distinguishing characteristics than pubic hair.

Q Okay. All right. But even using that, then even to that extent pubic and axillary hair can still be used for purposes of this exclusion?

A Pubic hairs -- I mean, axillary hairs and pubic hairs can be -- pubic hairs can be used for exclusion. Axillary hairs can be used for racial grouping. Now, if you can exclude on the basis of race, then you've done that job with the axillary hair, but as far as a microscopic comparison, this to this, beyond the racial aspect of that hair, then no.

Q Okay. So you can exclude on the basis of this racial characteristic, Negroid, Mongoloid, and Caucasian, with the axillary hairs. Is -- is it as simple to do as with the pubic and head hairs, at least to that level?

A Generally speaking, there are some armpit hairs from some people that are very difficult to distinguish from the pubic hairs. A criteria for assignment of a particular hair to the category of pubic hair is what we call buckling. As you go along the hair shaft there's a buckling. Chest hairs and axillary hairs have very

minor, if any -- usually none -- of the buckling. And also with the axillary hair you can see a bleached-out tip where it's been exposed to deodorants and things like that

Q Okay.

A So the general hypothetical -- could you rephrase?

Q Okay. My point was or my question was, you can still use axillary hair, at least for the benefit of racial determination.

A Yes, sir.

Q Okay. And that to use it any further than that is difficult. Or it can be done, but it's difficult to make that as a general statement.

A I think it would be irresponsible to sit up here and say, yeah, I matched an armpit hair or you -- I included an armpit hair.

Q So like you talked about, looked across the room and talked about head hairs and from looking at all the individuals you could tell, based on your experience and such, that these may not match. You sure couldn't do that as regards axillary hairs?

A That's right.

Q And I would assume pubic hair fits somewhere in the category in between?

A Pubic hair is a lot stronger than axillary hair.

Q Okay. But it's -- okay. You say Hispanics or Mexican-Americans come within this Mongoloid, it's been your experience?

A Depending on how much European influence they have. The Hispanics are, by history, Spaniard and American Indian. Now, the predominant influence of American Indian would give them predominant Mongoloid characteristics.

Q At the first level of, say, interaction between the -- the American Indian and someone from European culture, are they going to be predominantly then a Mongoloid show? Is that going to be that way or is there a rule of thumb or some generalization as regards that?

A Genetically they would be, with any -- with some American Indian influence, they would be predominantly American Indian, but with regard to myself there is some very, very remote American Indian influence and the only microscopic indication of that in my head hair is a thick cuticle, but the pigment distribution in my hair appears Caucasian.

Q Okay. So for you to examine your own hair prior to the microscopic examination, would you be able

to -- would yours be classified as Caucasian?

A With the naked eye?

Q The naked eye.

A I couldn't tell. I'd have to look at it microscopically.

Q All right. And then you say Amerasians would be predominantly Mongoloid?

A Depending on --

Q As a rule.

A Depending on the recency of the mixture.

Q Okay. One generation?

A Right. Right.

Q What about as we separate from that, then do they become more Caucasian? Say you're a third generation American.

A That's difficult to know, difficult to say. I rarely have that kind of family tree history.

Q Okay. Your cutoff as far as the -- your ability to make a -- I guess I should say an educated, qualified evaluation is a half inch?

A That's right.

Q As concerns hair?

A Yes, sir. Depending on -- may I add?

Q Please.

A Depending on the type of hair. If it's the

featureless, blond type hair that I described earlier, then I may not bother with that if it's four inches long, but if there are sufficient microscopic features in that half inch, then yes. I do compare that.

Q Well, can we say then it's an absolute cut off below half an inch as regards --

A In all cases.

Q -- as regards anybody?

A In all instances. Yes.

Q And as small as one and a half to two inches is satisfactory for your comparisons?

A If they have sufficient detail to evaluate.

Q Now, you testified that it's been your experience that the best -- or that the hair and fiber from the body site in a dump case and from the body -- I'm trying to remember how you phrased it -- that the hair and fiber from the body site was the most important as far as samples or as far as your evaluation; is that correct?

A I recall saying that in dump body cases that hair and fiber evidence is often the only evidence that you have. I don't remember talking about a specific area of the body that something was recovered from.

Q Well, would you agree with me that hair and fiber samples found on the body at a dump site are

obviously something of primary concern to you as far as for evaluation purposes?

A They are an indicator of recent contact.

Q Okay. And then the more recent contact the better your information or the more valuable may be your evaluation; is that correct?

A With one caution. Okay? On the body that is an indication of recent contact. Now, that also includes, if that person had been on a blanket and on that blanket were hairs that were not from the suspect, then that is recent contact with that blanket and that hair, but that does not mean that you're associating that person. I talked about looking at mummy hair earlier. If we've got a mummy hair on a blanket, body goes to the blanket, you're looking for a mummy in 1994.

Q All right. Okay. You also talked about the DNA testing, follicle tissue and then mitochondrial?

A Yes, sir.

Q DNA -- did I pronounce that correctly?

A Yes, sir.

Q Can you explain that again to me, please, sir?

A The -- within all cells of the body there are small inclusions called the mitochondria. They produce adenosine triphosphate. That's an energy chemical for the cell. So these little bodies within the cell are

producing ATP. So that powers the cell, drives the cell. Within the mitochondria itself are -- is circular DNA. A theory is that in part of the evolutionary process eukaryotic cells, or cells like we have, out on their own took up bacteria, ate these bacteria, incorporating them, and they became the mitochondria. So they're both benefitting each other. The mitochondria is producing energy for the cell and the mitochondria has a nice place to live.

The DNA in the mitochondria is circular. It looks more like a bacterial DNA than it does regular nuclear human DNA. Then another interesting thing about mitochondrial DNA is that you get all your mitochondria from your mother. As the spermatozoa meets the egg and fertilization occurs all the mitochondria that are incorporated there come from the egg. The sperm itself has maybe one or two in the tail piece, but the tail piece breaks off. The sperm just injects its DNA, nuclear DNA. So as the call or fertilized zygote begins to divide, the mitochondria themselves are dividing.

So all of us have our mother's mitochondrial DNA, and you can trace back in a number of evolutionary studies have been done, but it is -- the AFIT and the FBI are looking at the sequence called the D loop in the mitochondria that is a hypervariable sequence. They

are actually sequencing this strand and so the sequence of nucleotides in my D loop of my mitochondria would be identical to my mother, would be identical to my brothers and sisters, but it is possible to get around the problem in forensics where you don't have fresh root tissue and actually extract mitochondria from the hair shaft. The hair shaft is made up of cells that have been pushed up and die. That's like extracting the fly encased in amber. So if you can extract this mitochondrial DNA and you can, in fact, amplify it up to where -- a point where you have enough sequence, you get the sequence of yourself, your mother and your brothers and sisters and you go on back to your grandmother. That is -- that is the hope for individualization of hair in forensics.

Q Okay. We're not -- is it fair to say we're not at that stage yet?

A It's been done on some remains from Viet Nam, but that's a big controversy. AFIT got one result. Lab in California was unhappy with that. It's turning out there's not as much variance as they originally thought.

Q Okay. On these matters that you evaluated as regards this particular case, could conceivably that have been done with any of these?

A The data base is not in place to do that on

forensic case work. That would -- question would be better posed to somebody familiar with what the current status is of the FBI.

Q Well, you talked about, when you made the points of comparison -- and please correct me if I misstate anything -- that we start with basically racial background, then we go to the basic features, then we talk about special features. Is that -- is that fair for a layman to put them in that order?

A Yes, sir.

Q Okay. And these special features you talked about, residue, the absence of tips and roots, or the -- or the presence thereof. Okay? Residue, you talked about blood, semen, some hair rinses, some insect activity, such as that. When you talk about hair rinses and such as that, is that common, uncommon for you to be able for you to see it in your work?

A Hair rinse in particular?

Q Or I guess I should say --

A You don't see it that often.

Q Well, is it -- are residues on hair, whatever kind, common or uncommon?

A Depends on the situation. If somebody is shot in the head, you expect to see blood on the hairs. If there's a sexual assault where there's been drainage

into the pubic area, you expect to see dried seminal material on the pubic area. So it's situational dependent.

Q Okay. Can you explain for me how the -- the presence or the absence of -- of these, of either tips or roots, may provide a special feature?

A With regard to the traumatized or crushed hair, it tells you that that hair did not naturally fall out. Especially where you've got a less than two inch piece that's crushed on both ends. With regard to a tip very fresh cut, if that came from a live person, you could make a judgment, recent hair cut. How recent is debatable. The -- a hair clippers will leave a different appearance than scissors, than a razor.

Q Now, Mr. Clayton had asked you about different ways that cuts may appear or that it may appear to be cut when it was not, and you had mentioned a gunshot example that you had seen. Can you tell from examining that this -- what appears to be a cut hair, how it was done?

A In this instance, no, sir.

Q Well --

A In some --

Q In general.

A Yeah. In some instances, yeah.

Q So you're able to tell, like, a razor cut as opposed to scissors or something like that?

A Yes, sir.

Q Now, you also talked about the limitations of the documentary evidence. Or demonstrative evidence. Excuse me. You talked about a thin slice. For the jury's sake, and for mine, if we took -- I believe it was the -- the one that you testified to as regards being found in the front floorboard. Wasn't that one of the shorter ones you examined?

A Uh-huh.

Q Okay. If we did that same thing with that whole fiber that you examined, how big would it be? As to what you showed on the charts.

A Yeah. There are two problems with that in going from one end all the way to the other end and putting them all together. It would be a montage. I don't know. You know, considerable length along the wall, but the secondary problem is it's demonstrating the layers this way that the examiner is able to see.

Q Correct.

A So there's really no way visually possible to demonstrate that to somebody with photographs.

Q Okay. With -- well, if that -- for example, say we -- say I came to you one time and showed you a

photograph such as that. Okay? That you've used. Could you or would you, on the basis of that alone, make any comments regarding comparison?

A I might attempt to make a racial ID, but I wouldn't go any further than that.

Q All right. Why would you limit it to the racial ID?

A We didn't specify what magnification. You mean magnification like these?

Q Yes, sir. For example.

A With regard to Mongoloid, the very pronounced difference between the cuticle and the rest of the hair and the thickness of the cuticle would put it into the Mongoloid group. Very fine pigment grains would put that into the Caucasian group, and a specific clumping appearance would put it into the origin from a black person group.

Q Okay. You talked about, as I say, looking out in the room and seeing -- not seeing anyone that might have similar hair. How large a group would you have to have before you thought you might see someone that might have similar hair? Couple hundred?

A Depends on the population.

Q Okay. Say --

A You know, if we were in a courtroom in Los

Angeles, that population segment would be very different than what we have here. So it depends.

Q Okay.

A If everybody in here was blond, it is still possible to see differences microscopically, but I wouldn't know until I looked at them.

Q All right. Okay. So if you had a couple hundred people out at a soccer field or such, it would depend, once again, on the makeup and all of that; is that correct?

A That's right.

Q Okay. As regards the evidence that started coming in on this case, you said you started receiving some on the 6th of September; is that correct?

A That was the initial submission. Yes, sir.

Q And from -- I believe that's from Dan Rhodes, at least initially, and that was -- or at least a portion of that that you received was as regards from the autopsy from the Medical Examiner's office; is that correct?

A The initial submission from Dan Rhodes was items from autopsy and apparently items from some location.

Q Somewhere at the scene?

A Right.

Q Okay. You -- you know, of course, you examined all these items?

A Yes, I did.

Q Okay. I notice on the -- at least one sock you found synthetic textile fibers. Do you recall what those were?

A On each sock there were clear trilobal-type fibers. By trilobal that implies origin from a carpet or a rug. And there were animal hairs on the socks, also.

Q Okay. But as far as the -- as far as the fibers, is it because of those fibers that you asked Mr. Ben Armstrong to look in certain kinds of cars and such as that?

A It was not those fibers, the clear trilobals or borderline trash category, but it was a trilobal delustered tan, carpet-type fiber from one sock that was being compared to various types of vehicles.

Q Did you receive fibers from the carpet of Mr. Blair's vehicle?

A Yes, sir. I did.

Q And did you compare those with this fiber you're talking about?

A Yes, I did.

Q And since Mr. Clayton asked you about -- didn't

ask you about them, I assume --

A The carpeting itself was not a source of that fiber. There were, however, a lot of extraneous fibers in his car not of origin from the carpeting in the car.

Q Okay. Also noticed that on the 7th you received some fibers from the T-shirt and another sock. I believe it's on that same page on your report dated the 13th.

A Yes, sir. I received the T-shirt, and I examined it for hairs and fibers, and I received a sock and examined that for hairs and fibers.

Q All right. And can you recall what those fibers were? Once again, are they this trash category which you discussed?

A There were some animal hairs and some of what I characterize as trash fibers, but the -- there were hairs and fibers recovered that were not necessarily associated to anything.

Q And they weren't -- they weren't associated with anything, at least as far as what you evaluated. Is that what you're telling me?

A That's right.

Q As far as the other evidence you evaluated?

A That's right. Yes.

Q Were you able to identify any of them to the

extent, like, being a carpet hair; therefore, it could be a tan carpet or anything like that?

A Yeah. The one that I described before was the tan delustered carpet fiber, and the others are fibers that you find on socks. You know, various colored cottons, various colored polyesters.

Q Mr. Linch, you talked about seeing a number of different hairs and fibers on the -- on the plaid blanket?

A Yes, sir.

Q Did that also -- is that consistent with, also, on this other blanket that you talked about, the deer blanket?

A There were a lot of hairs and fibers on the deer blanket, also.

Q Okay. Now, you had samples from those individuals that Mr. Clayton mentioned; is that correct?

A Right.

Q Okay. Were all of those samples -- or were all of those that you found on the plaid blanket and deer blanket, other parts of the car, were they -- were you able to match those with each one of those individuals, or match in the sense that they were microscopically similar to them?

A There were, again, a large number of hairs from

the blanket.

Q I understand.

A They were compared mostly to Ashley Estell's head hair and they were compared against stuff from the blankets. There were some certain instances where I could not exclude associates of Mr. Blair as being the sources of those hairs, but those were, in general, featureless-type associations that are -- have less value than a hair with suitable comparison characteristics.

Q Well, it would not be uncommon, for example, in my -- for you to find hair similar to mine in my car?

A Absolutely not.

Q Now, you're aware that Mr. Blair was a carpet cleaner?

A Yes, sir.

Q Okay. That was done commercially?

A Yes, sir.

Q Okay. Would you expect to find hair in his car or wherever there had been, the equipment, transferred that would not be associated necessarily with Mr. Blair? I believe you called -- would that be something like a secondary?

A Secondary, tertiary. Yes, sir.

Q So that wouldn't be uncommon?

A No.

Q As comparing -- when you're comparing fibers as opposed to the hairs, is there a -- I would assume that some fibers, modacrylics, I -- I think is what you called some of them -- were there more similarities in those type fibers? I mean, in the sense of hair and fibers -- you have natural fibers. Then you have man-made fiber. Okay? When we're looking at man-made fibers, at least from the standpoint of the naked eye and then the comparison microscope, we need to go further as far as being able to distinguish fibers. Is it a fair statement to say that a lot of white fibers -- which are, in essence, clear; is that correct?

A That's right. Colorless.

Q Looking at six stuffed animals that are all white, there are certain tests and things, you can go further, narrow those down to other ones?

A They may look exactly the same under the microscope with polarized light microscopically, yet when you do the chemical identification, you may find out they are different polymer types. Two clear trilobal fibers may look perfectly the same under the microscope, but when you do the chemical identification you find out that in manufacture different chemicals were used to produce that specific fiber.

Q Okay. Is it your understanding that a lot of companies that manufacture fibers, that they are used in a variety of the -- or may be used in a variety of different products?

A There are a variety of different mixtures. You know, like a nylon 6 is a different chemical mixture than, say, a nylon 5, nylon 4.

Q Would they necessarily, like nylon 5, be used in different products themselves? I mean, it wouldn't all be necessarily confined only to one product?

A That's right. The fiber maker sells his bulk product to somebody who puts it into some kind of form. That person sells it to another person. So the distribution -- some may end up as car carpet, some may end up as a home carpet.

Is that what you're asking?

Q Yes.

A Okay.

Q Okay. Now as regards, for example, fibers from a stuffed animal, might those fibers be used in other products other than stuffed animals?

A This -- the other -- I don't know. Candidate for that type fiber might be a very furry, soft rug-type item.

Q Maybe a bathroom-type, some of those rugs?

A That's possible.

Q Seat cover or something like that?

A That's possible.

Q Okay. And you also talked about that this is a -- tell me again. A ribbon you mentioned?

A Ribbon acrylic.

Q Ribbon acrylic. All right. It's also been used in -- or you've seen ribbon acrylics used in wigs, such as that?

A Not the ribbon type, but the chemical, the chemical modacrylics. The chemical composition of the general family of modacrylics is used in wig manufacture, but not this specific fiber shape.

Q I understand. I understand, but some modacrylics, then, as far as my notes --

A Ribbon can be a modacrylic.

Q Okay.

A And a circular or triangular fiber can be modacrylic, but you don't find -- you know, this would be a pretty funny looking wig, but you can take the chemical compounds that make up modacrylics and have the fiber thicker and in a different cross section of shape and have something, and add dyes to it, add color to it. You would have a potential wig fiber.

Q Okay. You discussed that, as regards the fiber

in the perianal area, in your opinion that was probably a secondary transfer; is that correct?

A If, indeed, it occurred from this rabbit. Yes, sir.

Q Well, it was a secondary transfer from somewhere? Could it have been a primary transfer from something else?

A My opinion is that it's a secondary transfer. Yes, sir.

Q Okay. You had described that fiber as having some fecal material?

A That's right.

Q What you perceived to be?

A Yes, sir. In one of the narrow ends, and that was illustrated in one of the photographs that was shown to the jury.

Q Okay. And my understanding is you didn't find any fecal material or anything on the rabbit or anything else?

A No, sir.

Q Is that -- is that something, then, that further tells you that in your opinion it was a secondary transfer?

A No. No. A lot of people defecate at the time of death, but the primary reason for me thinking that

it's secondary is that primary you get more than one and so primary would be this rabbit contacting the body and secondary would be something intermediate contacting and then a certain fiber loss and then contact with the body.

Q Did you find secondary transfer -- did you find other fibers similar to that in the rabbit in his car?

A I found fibers on the rabbit that were like fibers from other dolls in the car. I didn't find any carpet fibers on the rabbit that matched his car.

Q Did you find any of those fibers on the carpet?

A These?

Q Uh-huh.

A No, sir.

Q When we are talking about the hair recovered from Jack Carter Park, the -- they don't call it a rubberband any more. Whatever little girls put in their hair, boys. Whatever they tie up their ponytails with. Could that in and of itself be used to cut off the ponytail? Is that something you would be able to notice on the ends of those hairs? Mr. Clayton was talking about how those things may be cut or appear to be cut.

A I don't understand the question.

Q Okay. Well, these ties, I guess, that -- that they use for ponytails.

A Right.

Q Okay. Is that -- can you tell from what you examined whether or not it was something like that that was used to separate this hair?

A No. I don't know. You know, you grab hair, cut it or if you use that type of thing to collect it and cut.

Q Something like that?

A No. I don't know.

Q You couldn't tell -- could you tell how those were cut?

A No, not the Jack Carter Park hair.

Q You couldn't tell how those were cut at all. So you can't say that they weren't cut with a razor or not. Did they appear to be cut?

A I think I can rule out a razor. Could have been a knife. Could have been having been clasped in something and then jerked with a tangential force.

Q Like clasped in one of those ribbon clasps?

A Yeah.

Q Okay. Is -- going from there, then, to the plant matter, you talked about hairs on this leaf. That's one thing you looked for that was similar?

A Yes, sir. The -- the plant hairs, not --

Q I understand.

A -- human or animal hairs, but plant material has its own hairs. Yes, sir.

Q Okay. Could you determine the genus of that that was on the rabbit?

A No. Did not.

Q So can you tell us even the genus -- can you tell us the genus of what was in the exhibit showed you?

A No. Given the limited amount of material on the rabbit ear, it would have been fruitless to go out and do a taxonomic study of what's present at the different sites.

Q Did you ever go to the other sites or did you ever evaluate any plant matter or anything else from any other sites?

A Yes, sir. I did.

Q Okay. Can you exclude those as being from that plant matter?

A The plant material from the stuffed animal collection site and the plant material I collected in Dawson, Texas, between Corsicana and Waco, had similar appearing hairs.

Q So even that far away there was similar appearing hair?

A Yes.

Q So would you say then three or four miles away

it wouldn't be unusual for you to find plants or plants matter that had similar appearance?

A Absolutely not.

Q Mr. Linch, as regards these exhibits. Okay? That were proposed for demonstratives purposes like 84 -- 84, which was the -- the four photos of the crushed hair, 85, 86, 87, which were all comparisons of head hair with Ms. Estell, and some of the ones you found or some of the ones that were submitted to you, and then Mr. Blair's hair as a known, and then fibers found there, do those, any of those exhibits at all, tell you who the unknown hair belonged to?

A With absolute certainty of all persons, no, sir. They do not.

Q And that's true of all, basically true, of all hair examinations; is that correct?

A That's right. Even with the 23 foot strand of hair.

Q Well, if, for example as a hypothetical, it was determined that the hair at the Jack Carter Park was part of a ponytail that had been cut off and then that it was determined that that ponytail was not from Ashley Estell, that wouldn't change your testimony at all, would it?

A If the strand that I testified to that was

consistent with origin from Ashley Estell was not from Ashley Estell, that wouldn't change my testimony?

Q No. No. I'm not talking about the known strands. I'm talking about the strand from Jack Carter Park.

A Right.

Q If it was shown in my hypothetical that they did not come from her?

A Okay. You have the true donor?

Q Okay. No. You don't have the true donor. To say we know, by virtue of some reason, that it didn't come from her. Okay? Does that change your evaluation?

A No, it doesn't.

Q Does that change --

A No, it doesn't.

Q It doesn't change your testimony as regards your comparisons or anything else, does it?

A No, it doesn't. Microscopically the same is microscopically the same.

Q Okay. As concerns this fiber that you found on the sock, and you referenced it as what you believed to be a carpet fiber?

A That's correct.

Q Okay. Did you give any -- any other instructions as to what particular cars to look for or

types or anything else?

A That's really not possible to do. It happens on TV, but it doesn't happen in the real world.

Q Well, I mean, I would assume a lot of the manufacturers use a lot of the same companies to make their cars or the carpets?

A They do. But even that manufacturer may not -- the ultimate source may be a slight chemical variant and so -- and polymer is of different composition.

Q Okay. So as far as you could go that way was to request one that was tan, what you believed to be a tan carpet fiber?

A Well, yeah. That's not even accurate. You know, say, that you picked up the little red fibers from this carpet on your shoe. It would be a misunderstanding to think that you had been on a red carpet. This carpet is blue, but there is a red component in it. So, you know, to make a judgment on a color of something on the basis of one fiber is often a mistake.

Q Okay. But it's a place to start?

A Starting place.

Q Well, what is it you told Mr. Armstrong then to look for?

A In terms of suspect or in terms of vehicle?

Q Well, in going by the vehicle. Since I think we're talking about a tan fiber or what I believe you said was a tan fiber.

A Right. It could be possibly a tan carpeted vehicle.

Q Now, there were some other items found, other hairs found, during the -- or that were submitted to you from the Medical Examiner's office; is that correct?

A That's right.

Q All right. My understanding one was a pubic hair that was found on the body transport sheet?

A I -- it's a hair with secondary sexual characteristics, and my ultimate determination is that that is more consistent with an axillary or armpit type hair.

Q Were you able to determine the race of that hair?

A It appears to be of Mongoloid racial origin.

Q On the body transport sheet?

A Yes, sir.

Q Okay. The -- there was also a fiber or a hair found on the -- I guess it was a small hair found in the -- on the panties?

A Inside the panties. Inside, just below the waistband of the panties.

Q Were you able to determine what kind of fiber that -- or hair that was?

A It was dark and heavily pigmented and had a cuticle consistent with Mongoloid racial origin.

Q All right. And did you say whether that was axillary?

A It's either a body hair or a very thin head hair, but it's too short to completely evaluate. It's not thick enough to be axillary or pubic or chest.

MR. MCDERMITT: May I have a moment, Your Honor?

THE COURT: You may.

Q (By Mr. McDermitt) Do you classify pigment according to race, Mr. Linch?

A (By the witness) You mean the chemical composition of pigment?

Q Right. I mean when you're looking at the pigment makeup in a hair, is that further an indication of race?

A Not the chemical composition, but the way that it is distributed in the hair. Clump pigmentation with conditions of proper appearing surround matrix around that clump is an indication that gives you the racial determination. Then again, it's a combination of things. It's the cross sectional shape of the hair plus

the pigment distribution. You know, I've seen instances where pigment clumping in Caucasian hair was more clumped than I'd seen in persons of black heritage. So in general the pigment clumping and pigment color -- pigment distribution is the key indicator of racial origin.

Q Okay. So would you use terms like Caucasian pigmenting?

A You could.

Q Well, Doctor, from looking at your -- excuse me. Mr. Linch, from looking at some notes that you prepared, I guess, on the seven drawings and such as that, where it says, as regards the panties, it says very thin hair cutting. Then thick cut Caucasian pigment, frayed medulla, or fragmented.

A I recall that.

Q Okay. Is that a different hair than the one I had asked you about as regards the panties?

A No. That's the same panties' hair.

Q So that it has a Caucasian pigment but has some Mongoloid characteristics, also. Is that what you're telling me?

A I'm telling you that the pigmentation is Caucasian, slash, Mongoloid, and the cuticle on that hair is more Mongoloid on its mixed features, but my

overall determination from that is that it may be of a Mongoloid origin.

Q Okay. Did you reference -- ever reference any of that Mongoloid determination or phrasing in your report?

A About this hair?

Q Uh-huh.

A I don't recall if I reported that hair or not.

Q Do you have your reports with you?

A No, sir. I do not. I don't believe I reported that hair. I think that all discussion about that hair was verbal to the investigators.

Q Doctor -- excuse me. Mr. Linch, I want to show you what's marked Defendant's Exhibit -- well, I'll let you view that as Defendant's Exhibit 7. Is that a copy of your notes?

A Yes, sir. It is.

Q Okay. And is this what I had mentioned to you earlier.

A The -- these notes that I made on September 6, 1993, says Labor Day, has a little diagram of the hair piece from the panties. It says very thin hair cutting, brown. Before it says brown Caucasian pigment. The first two words are thick CUT. C-U-T, CUT, stands for cuticle.

Q I understand.

A So these are notes of my observations about that fragment.

Q Okay.

A So the way I prioritize things, thick cuticle is predominant in assigning the predominant racial origin.

Q Okay.

MR. MCDERMITT: Offer Defense 7.

MR. CLAYTON: No objection, Your Honor.

THE COURT: It's admitted.

MR. MCDERMITT: Thank you very much. Pass the witness, Your Honor.

REDIRECT EXAMINATION

BY MR. CLAYTON:

Q Mr. Linch, just couple of follow ups. Mr. McDermitt just introduced, I believe, as Defense 6 -- excuse me -- 7, Defense 7, a page, some just raw notes, I assume, that you put together as you were examining this quarter-inch or so hair fragment found in the panties of Ashley Estell. Is that essentially what that is is just some raw notes?

A May I see it again?

Q Sure.

A It is notes, and I just read the bottom part.

Raw notes. Yes, sir.

Q Okay. Was there a reason that you did not make a report as in one of these nice, typed out, printed ones that they send us after you have analyzed things for purposes?

A If I reported all hairs and fibers that I examined and looked at on this case, the typist would still be typing. I did not consider this hair to be, or hair piece, to be of value for comparison.

Q And for that reason would part of it be the fact it's under a quarter of an inch in length?

A That's right.

Q Are there some other reasons as to its -- first of all, it's not a head hair apparently; is that correct?

A I can't exclude the possibility that it may be a very, very thin head hair. Our head hairs vary in size as well as pigment distribution. I can't say it's not.

Q Okay. With regard to a hair found on the body transport sheet, do you recall Mr. McDermitt asking you that question?

A Yes, sir. I do.

Q Now, did you make a comparison of a hair found on the body transport sheet that you felt was possibly

either an axillary or maybe even a pubic hair that came off that sheet?

A Yes, sir.

Q I believe you said you that you felt its predominant racial characteristic was Mongoloid; is that correct?

A That's right.

Q As far as making an association with that hair, were there things about it that would prevent you from making an association that would cause it to be fit to be generated into an official report that you would carry into court and try to make an association with?

A Could you rephrase?

Q Okay. I guess what I'm asking is what, if anything, would prevent that particular hair to have been one of sufficient quality for an association to be made or not made?

A It, in my opinion, is a body hair, and comparison of body hairs is of extremely limited value. Again, the best you can do is attempt racial determination.

Q Okay. And in your opinion that body hair, as you, I believe, pretty well concluded, it's a body hair, had Mongoloid features primarily?

A That's right.

Q Although it did have some Caucasian features in its pigmentation?

A No. We've gotten the hairs mixed up.

Q I'm sorry.

A The axillary hair had Mongoloid type pigmentation with shallow cuticle.

Q Okay.

A The head hair, quarter-inch head hair, fragment had dense Causcasian type pigment with Mongoloid type cuticle.

Q Okay.

A So we've got a mixture in both instances.

Q In your capacity as an experienced hair examiner, you wouldn't feel comfortable coming into court and trying to tell a jury that that was something that would associate any individual for purposes of going to court and trying to say an association with the defendant?

A Absolutely not.

Q However, you could -- you could use those hairs, the transport sheet hair and that found in Ashley's panties, possibly as something of sufficient quality to exclude certain individuals, and I'm assuming that's true. I'm not sure.

A No. It goes both ways.

Q Goes both ways. Okay.
A You can exclude with regard to race.
Q Okay.
A But not doing the microscopic comparison.
Q Did you do a microscopic comparison of these for not only race, but just to see if you saw any other features as well?
A I compared these hairs to known hairs of Mr. Blair.
Q Okay. And although they're not necessarily an association that Defense asked you about, these hairs, have you prepared a demonstrative exhibit to show the jury what features we can see in the known head hair standard of Michael Blair?
A Yes, sir. I have.
Q Did you prepare that exhibit shortly after discussing with us that transport sheet hair and the hair from Ashley's panties in the last week or ten days?
A Yes, sir. I did.
Q I'm going to show you what's been marked for identification as State's Exhibit 93. I'll ask you if 93 is, in fact, a comparison microscope series of blow-up photographs of the known pubic hair of Michael Blair and the pubic hair in the panties of Ashley Estell as they appear on the microscope?

A No, sir. State's 93 is totally unrelated. Dallas Police Department sexual assault case.

Q I'm sorry. My mistake. I have been known to make them. Let's try that again. I do carry off pencils, too. Okay.

Let me show you what we'll mark as State's Exhibit 94, and once again, I'll ask you to take a look at State's Exhibit 94. Tell me if I've got the right exhibit this time with regard to comparison microscope photographs of the hair from the body transport sheet and comparison with a head hair standard from Michael Blair, as well as axillary hair from the body transport sheet and Michael Blair's pubic hairs compared in another photograph. Finally, we have on the other side, I believe, we have hair fragment from panties compared to a known head hair from Michael Blair, as well in this series of photographs?

A State's 94 is, indeed, related to this matter. It contains five photomicrographs of comparison photomicroscopy of Michael Blair's hair compared to hair fragments, a hair fragment recovered from the panties of Ashley Estell and compared to what I determined to be an axillary hair from the body transport sheet.

Q All right.

MR. CLAYTON: Your Honor, just for

demonstratives purposes, we'd offer State's Exhibit No. 94.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: All right. It's admitted for that purpose.

Q (By Mr. Clayton) Mr. Linch, I recognize, and I want the jury to be sure that you understand that you have not claimed that these are associations with Michael Blair at all, have you? Any of the photographs here?

A (By the witness) Those are a claim of non-inclusion. They are not a claim of strong inclusion.

Q In other words, you can't determine quarter-inch hair from Ashley's panties or the body hair that was found on the transport sheet?

A That's right.

Q If you would, step around, maybe, and point just for the jury just to show them how you got your racial classifications that you were able to give us an opinion on with regard to, first, to the body transport sheet and hair.

A On the right side of the photographs on the right side of State's 94 at the top is a photograph of Michael Blair's head hair. Below that is a photograph

of pubic hair. Below that is a photograph of the -- the Michael Blair pubic hair.

In each of these three photographs the known hairs have been compared to the single axillary-type hair from the body transport sheet. Again, remembering the limitation of viewing a photomicrograph, the pigment distribution is roughly the same, the color is roughly the same. The cuticle in both instances is very well demarcated at the junction of the cortex and cuticle.

On the left side of State's 94 there are two photographs. On the right side of these two photographs the top one has the known head hair of Michael Blair.

Q Would you stand around on the other side?

A Below that -- changed my orientation. Left side of State's 94 there are two photographs on the right side of the top photograph is the known head hair of Michael Blair. Below that is the known head hair of Michael Blair. On the left side of each of these photographs is a microscope picture of the thin hair fragment from Ashley Estell's panties. This hair is being compared to one of Michael Blair's thinner head hairs.

You have to look carefully. I know you can't see it from where you are, but the cuticle in Michael Blair's thin head hairs is the same size as the cuticle

in the hair fragment from Ashley's panties. The bottom photograph shows a greater difference in the pigment distribution. If -- you know, in Michael Blair's head hair we go from clumped, classic Mongoloid pigmentation, as you go along this turns into classically Caucasian pigmentation. If I only had this piece of hair to look at, I would call this a Caucasian. And that's compared to the region of the hair from the panties that has Caucasian appearing pigmentation, but again, the more important racial determination factor for this piece of a hair is the cuticle thickness.

Q Thank you, sir.

Mr. Linch, I do want to be very, very sure that we're not trying to tell this jury that you've made an association with Michael Blair based on that transport sheet or on that piece of hair from the panties. You did see similarity. You can't exclude him as a source. You're not saying that's the kind of match like you made from the car with Ashley's hair or from Jack Carter Park with Michael Blair's hair?

A He, indeed, cannot be excluded as being the source of those hairs. It would be irresponsible for a hair examiner to make that type of comparison.

Q I'm going to shift your attention just for a -- a minute back -- you don't have a copy of your report,

but I believe I have one here. I will show you.

MR. CLAYTON: May I approach, Your Honor?

THE COURT: You may.

Q (By Mr. Clayton) I want to show you a copy of a report dated September 27, 1993, which was returned to regular -- or Ken Presley of the Plano Police Department. I'll ask you to take a look at this report, and I will mark it at this time as State's Exhibit No. 95 for identification.

A (By the witness) This is a true and accurate copy of my report of September 27. I just have a quarrel with some of the editorializing on page three.

Q I understand. I've marked up my copy a little bit, but the main thing I want to call your attention to -- and I'm not going to be offering it for evidence. I just want to identify it -- that you referred to it as part of your review of some of the evidence in this case. With regard to State's Exhibit No. 95 do you see and recall preparing a section beginning with item 105 entitled Items from Joshua Foster?

A Yes, sir.

Q All right. If you would, I'm going to ask you about several of those items that were submitted under the heading Joshua Foster. I guess the best thing to do is, if you would, just go item by item beginning with

item number 105. Beginning in the report, first of all, tell me what is item 105?

A Item 105 is fibers taken from a blanket found in the vehicle of Joshua Foster.

Q And with regard to that blanket can you tell the jury if you did any type of particular examinations for hair and/or fibers that you could association -- or associate with either Ashley Estell or the fiber that was taken from the buttocks or anal region of her body during her autopsy?

A I compared those fibers with the fiber found on Ashley's body, and they were very different.

Q All right. And those -- well, what's number item 106 then?

A Number 106 is fibers from the seat of the vehicle.

Q That would be again Mr. Joshua Crowley Foster, whatever his name is this week, from the vehicle he was driving at that time?

A That's right.

Q Did you have an occasion to compare those items with the fiber that was recovered from the anal area of Ashley Estell during her autopsy that's been previously introduced into evidence?

A Yes, I did.

Q Were you able to see any type of a match microscopically to that particular fiber found on Ashley Estell?

A That was not the source of the fiber on her body.

Q What's the next item there?

A 107 is fibers from carpet vehicle. This is a sampling of the actual carpet in the truck.

Q All right. Was it the source of the fiber on Ashley Estell that we've been talking about?

A These were nylon, yellow, clear type trilobal fibers. They were different.

Q All right. Do we have any other items from Josh Crowley?

A Two gray socks, two gray, slash, red socks, small white towel fibers, and hairs from the seat recovered with a vacuum cleaner, fibers and hairs from the floor of the vehicle recovered with vacuum cleaner. Fiber from the hood of the vehicle and a fiber from a cap recovered from the driver's side of the vehicle.

Q Any of those particular items that you just read off, any of them associate back to the fiber on Ashley's body or any of the hairs that were picked up by the vacuum cleaner anywhere? Did any of them come back and match Ashley Estell?

A No, sir. They were all different. The -- the white cat hair from the hood of the vehicle, but you bring me two white cats, they'd look about the same.

Q If I could tell you that Patrick Foster, Josh Foster, whatever his name is this week, is an individual of Causcasian background, would that make any difference as far as any of the hairs that you found in the floorboard of his vehicle as being associated with Ashley Estell?

Let me back up and rephrase that. I think I got my locations mixed up here. If I tell you that Joshua Crowley Foster is a Causcasian, would that change your racial associations from the fragment found in Ashley's panties or on the body transport sheet as having primarily Mongoloid racial characteristics?

A No. It wouldn't, but, of course, you know, how much Caucasian?

Q Okay. All right. Thank you, sir.

MR. CLAYTON: I think I'll pass the witness at this time.

THE COURT: All right.

RECROSS-EXAMINATION

BY MR. MCDERMITT:

Q Mr. Linch, did you ever review or was ever submitted to you known head, pubic, or axillary hairs of

a Josh Foster or Josh Crowley?

A No, sir. They were not.

Q Do you know how many vehicles' fibers were taken from -- as concerns Mr. Crowley?

A The total count of fibers taken?

Q No. The total count of vehicles.

A Vehicles. I think there was just one truck.

Q So if there were other vehicles --

A I wouldn't know about them.

Q You don't know about that?

A No, sir.

MR. MCDERMITT: That's all I have at this time, Your Honor.

THE COURT: Anything further.

MR. CLAYTON: Just one other item.

REDIRECT EXAMINATION

BY MR. CLAYTON:

Q Mr. Linch, with regard to the comparisons that you have been made under the microscope, did you have occasion to bring the slides that have been associated with Ashley Estell and Michael Blair at Jack Carter Park and Blair's vehicle, as well as the fiber? Have you brought all of those to court today?

A No, I didn't, but they were brought by the Plano Police Department.

Q Okay. They're here in court in a red box before you; is that correct?

A Yes, sir.

Q And within that red box I'm assuming that you also have hairs and fibers from a number of other sources that have appeared in your reports prepared periodically through this investigation?

A That's right.

Q Now, we've introduced into evidence all the packaging and items that they ultimately reached you with. Would it be possible, if we take a few minutes -- I might even ask the Judge to take ten -- for you to pull those particular slides that you associated with Michael Blair's vehicle and the three hairs from Ashley Estell's head hairs, as well as the fiber from the anal region of Ashley Estell that associates back with the rabbit doll, and, finally, the Jack Carter hairs, too, that belong in your association with Michael Blair, and the others that are associated with Michael Blair? I'm not going to ask you to do that in front of the jury.

MR. CLAYTON: I'm going to ask to admit all of those in evidence at this time since you used them for your opinions here in court.

MR. MCDERMITT: We have no objection to that, Your Honor.

MR. CLAYTON: If the Court approves, I'd like to number those and simply admit those for record purposes outside the jury's presence.

With that I have no further questions, Your Honor.

MR. MCDERMITT: I have no further questions, Your Honor.

THE COURT: Is this witness excused now?

MR. CLAYTON: I'd like him reserved, Your Honor, but if he feels he needs to leave town or something in the meantime we can bring him back.

MR. MCDERMITT: That's agreeable, Your Honor.

THE COURT: Okay. Well, with that then, ladies and gentlemen, we'll take -- we'll recess until tomorrow at nine o'clock. And let me remind you, it is your duty not to converse among yourselves or with anyone else connected with the trial or to form or express an opinion thereon until the cause is finally submitted to you.

(Jury excused until September 16, 1994.)

THE COURT: Now, off the record.

(Discussion off the record.

MR. CLAYTON: For the record, the parties have received and reviewed State's Exhibit 96A and 96B. The contents of each of those two exhibits are the microscopic slides whereupon hair has been mounted for examination by Mr. Charles Linch, the hair examiner who has testified in this cause during the day of September 15, 1993.

THE COURT: '94.

MR. CLAYTON: '94. And made associations with regard to this case. Being as to the fact that these slides are fragile, we have committed them in bulk following Mr. Linch's testimony about his findings regarding the hair that is contained therein.

MR. MCDERMITT: No objection.

THE COURT: All right. They're admitted.

(Proceedings recessed until 9-16-94.)

NO. CRB 21,1152

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| | ) | MIDLAND COUNTY, TEXAS |
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| :L NAWEE BLAIR | ) | 238TH JUDICIAL DISTRICT |

Statement of Facts

Volume XXIV of XL
24 40

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For the Defendant

On the 16th day of September, 1994, the above entitled and numbered cause came on to be heard said Honorable Court, Nathan E. White, Jr., Judge presiding, sitting in and for the 238th Judicial District Court, and the following proceedings were had:

# I N D E X

ALPHABETICAL INDEX

INDEX (Cont.)

ALPHABETICAL INDEX (Cont.)

(September 16, 1994.)

MR. CLAYTON: Your Honor, before we start, just as a housekeeping matter, Mr. Linch left behind a few other slides that related to this Josh Crowley examination. I didn't know if the Defense wanted to go ahead and mark those as part of Mr. Linch -- if they want to use them as part of their case. I'm going to go ahead and mark those as 96C.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: It'd be State's C.

MR. MIEARS: And also, Your Honor, since we're on the subject of Mr. Crowley, could we maybe get from the Court today some sort of ruling on our petition to secure his appearance? Also, another thing, I didn't know if the Court had had an opportunity to review the Internal Affairs file or not.

THE COURT: I do have it. I've not -- I've really not reviewed it. Do you all have -- we'll take time here somehow today to take up this matter of securing out-of-state witness. Do you have the videotape?

MR. MIEARS: Off the record.

(Discussion off the record.)

MR. CLAYTON: Judge, just a correction,

too, for the record. State's 96A, B, C, although we've gone ahead, formally admitted them outside the jury's presence are admitted for all purposes at this time.

THE COURT: I show them admitted. Okay.

MR. MCDERMITT: B --

THE COURT: A and B were the slides in those two cases.

(Jury returned to the courtroom.)

THE COURT: Everyone be seated, please.

Good morning ladies, and gentlemen. For planning purposes we plan to recess this afternoon approximately four o'clock. That may mean we have a little bit shorter lunch or breaks. I don't know. It's just we'll see where we are, but plan to break about four o'clock this afternoon.

Okay. Mr. Clayton, call your next witness.

MR. CLAYTON: Your Honor, the State would call Robert Fram.

THE COURT: Last name is --

MR. CLAYTON: F-r-a-m.

(Witness sworn by the Court.)

THE COURT: All right. Just have a seat

right over here, sir.

All right.

MR. CLAYTON: Thank you, Your Honor.

ROBERT B. FRAM,

called as a witness on behalf of the State of Texas, having been previously duly sworn to testify the truth, the whole truth, and nothing but the truth, testified on his oath as follows:

DIRECT EXAMINATION

BY MR. CLAYTON:

Q Would you please state your name for the jury?

A Yes. It's Robert B. Fram. That's F-r-a-m.

Q Would you tell the jury what you do for a living, sir?

A I'm a special agent with the Federal Bureau of Investigation.

Q Can you tell the jury a little bit about, first of all, how long you've been with the FBI? Also can you tell them a little bit about your education in preparation for your position? --

A Yes. I've been with the FBI approximately fourteen years. I have a bachelor's degree in anthropology from City University in New York City. I have a master's degree in physical anthropology from Pennsylvania State University. In the FBI I've done a

variety of jobs. Was finally transferred into the FBI laboratory in Washington, D.C., where I went through approximately one year training program under the direct supervision of my unit chief and other qualified hair and fiber examiners. I looked at about -- thousands of samples of hairs and fibers, read available literature, discussed cases with the qualified examiners in the unit, and took a series of courses taught by the FBI, as well as some outside organizations. Finally went through a series of oral board certifications.

Q Mr. Fram, I'm going to call your attention at this point to a case that came out of Collin County, Texas, specifically the Plano Police Department, and also the assistance of one, Charles Linch, at the Institute of Forensic Sciences in Dallas, Texas. Do you recall having contact with those individuals regarding a case called State of Texas versus Michael Blair?

A Yes, I do.

Q Did you have occasion to receive from Charles Linch of the Institute of Forensic Sciences certain slides of some fibers for further testing and analyses examination by the FBI?

A Yes, I did.

MR. CLAYTON: May I approach, Your Honor?

THE COURT: You may.

Q (By Mr. Clayton) Mr. Fram, I'm going to hand you what's been marked for identification as State's Exhibit No. 88. I'm going to ask you to look in and examine the contents of State's 88. Specifically, I want to look at State's Exhibit Nos. 89, 90, 91. I'll ask you if you recognize these exhibits as being the material sent to you by Charles Linch of the Institute of Forensic Sciences in Dallas, Texas, with regard to the State of Texas versus Michael Blair?

A (By the witness) Yes. I do recognize them.

Q Can you tell the jury how it is that you recognize these exhibits?

A Each of these cardboard slide holders have my laboratory numbers, my symbols, and my initials on them.

Q That laboratory number for the FBI purposes, can you read that into the record for us?

A Yes. It's 30924030.

Q That particular number follows anything that was submitted to the laboratory with regard to State of Texas versus Michael Blair?

A That's correct.

Q Contained in each of these small boxes, State's 89, 90, 91, are there slides containing fibers for examination?

A Yes, there are.

Q You've initialed those as well?

A That's correct.

MR. CLAYTON: At this time, Your Honor, we would offer into evidence State's Exhibits No. 88, 89, 90, 91.

MR. MCDERMITT: No objection, Your Honor.

THE COURT: All right. They're admitted.

Q (By Mr. Clayton) Now, Mr. Fram, I will call your attention at this point to whether or not you had occasion to discuss with Charles Linch of the Institute of Forensic Sciences in Dallas a little bit of the background and history on this case with regard to the fibers that have been introduced into evidence and a little bit about where they came from and a little bit about their background?

A (By the witness) Yes, I did.

Q And is it to your understanding Mr. Linch had a chance to look at those fibers through a technique using polarized light and a comparison microscope?

A Yes.

Q All right. Now, when you got those fibers at the FBI, did you have occasion to use some other microscopic techniques for examination on those fibers?

A Yes, I did.

Q Tell the jury what type of microscopic

techniques you had occasion to apply to the fibers in State's Exhibit 89, 90, 91 and how that type of microscopic technique differs, if you could, from the one that Charles Linch used, simple polarized light.

A The two techniques I used, one was called a microspectrophotometer. This is a piece of equipment that really compares color of these fibers. Now, these fibers were not dyed. They were white or clear fibers; however, these fibers were very heavily delustered. Delustrants are additives put in the fibers to take away the shine of the fiber. Since they were so dense I decided to try the microspectrophotometer just to see if it would pick up any subtle differences.

What the microspectrophotometer does very simply is passes light through the fibers and has a color meter above it which is reading the way the light is coming through the fiber and just simply compares the effect of the light on these fibers. Basically is just comparing the color. It's very discriminating, so that if I have two blue sweaters that you buy at the store that look like they're the same color, it'll pick up just a slight difference in those colors. If they're made by manufacturers. Manufacturers use different dyes to come to the same color. They can distinguish that.

Through this technique I didn't come up with

any differences, which you really wouldn't expect since it was really clear. I wanted to try it anyway.

The second technique I used was fluorescence microscopy. That simply is just a type of different type of light using light of different wave lengths. Again, just passing through the fiber comparing how that light reacts to the fiber. Again, it did not pick up any differences between those fibers.

Q Now, I just want to make it real clear for the jury that the microscopic techniques that you used were more specific for certain characteristics. They were not an overall examination of the appearance of those fibers under regular polarized light?

A That's right.

Q Yours was more geared toward if you could tell a difference in the color.

A That's right.

Q And also -- well, actually both for the color?

A Color in the way that if they would fluoresce under certain lights.

Q If Mr. Linch told us yesterday that he could see some slight differences in the fiber from the body of Ashley Estell, which I believe you call Q1, and the fiber from Ashley Estell's sleep doll, you could see that they were different. Under polarized light that

finding would not conflict with your findings that had to do with simple color analysis or attempts?

A That's right. It wouldn't necessarily matter. One could show a difference and one wouldn't.

Q So, in essence, the testing that you did really doesn't, with regard to discriminating between the Defendant's rabbit doll, Ashley's sleep rabbit, and the fiber found in Ashley's autopsy, really distinguish them any further than what Mr. Linch had already done?

A That's correct.

Q After you had performed your testing on the questioned fiber and the fiber from the suspect rabbit doll and the Ashley sleep rabbit, did you have occasion to pull in one of your colleagues, a Mr. Rich Buechele, to do a chemical analysis on these fibers to see if he could find some distinctions from a chemical aspect?

A Yes. He did more of an elemental type. In other words, what composed these fibers, and he did two further examinations.

Q All right. As far as any personal knowledge of any of the facts of this case or any of those things, you do not have that kind of background?

A No.

Q Just basically you told -- you were told this came from a suspect, this came from the victim's rabbit,

this fiber came from the autopsy?

A That's correct.

Q All right.

MR. CLAYTON: I'll pass the witness, Your Honor.

MR. MCDERMITT: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. MCDERMITT:

Q Mr. Fram, do you recall what items were sent to you by Mr. Linch?

A There were four glass microscope slides containing fibers from four different stuffed animals as known samples. There was one glass microscope slide containing fibers from the victim and then there were several items from the Defendant's automobile which were also sent for serological examinations.

Q Were there any other fibers submitted to you at the FBI lab from -- fibers off the body, other than the one you already testified to?

A No.

Q So there weren't -- you didn't receive anything as regards any carpeting or suspected pieces of carpeting or anything found on the body?

A On the body, no.

Q Or on the clothes on the body?

A No.
Q When did you do your examinations?
A It would have been in -- sometime in October of 1993.
Q Okay. When did you call in Mr. Buechele?
A Mid October.
Q Thank you very much.
MR. MCDERMITT: I have no further questions
MR. CLAYTON: No further questions of this witness, Your Honor.
THE COURT: All right. Mr. Fram excused?
MR. CLAYTON: Yes, he is, Your Honor.
THE COURT: Call your next witness.
MR. CLAYTON: We call Rich Buechele.
THE COURT: Spell his name, please.
MR. CLAYTON: I'll try. I believe it's B-u-e-c-h-e-l-e.
(Witness sworn by the Court.)
THE COURT: All right. Have a seat right over here, sir.
All right.
RICH BUECEHLE,
called as a witness on behalf of the State of Texas,

having been previously duly sworn to testify the truth, the whole truth, and nothing but the truth, testified on his oath as follows:

DIRECT EXAMINATION

BY MR. CLAYTON:

Q Would you please state your name for the jury?

A My name is Rich Buechele. Last name is spelled B-u-e-c-h-e-l-e.

Q Mr. Buechele, would you tell the jury what you do for a living?

A I'm employed as a special agent for the Federal Bureau of Investigation. My current assignment is as a supervisor in the laboratory division which is located in Washington, D.C. Specifically I'm assigned to the materials analysis unit where my duties include the analysis of paint, tape, cosmetics, adhesives, plastics, and other synthetic materials as submitted to our laboratory from state, federal, and local law enforcement agencies across the country.

Q Mr. Buechele, would you tell the jury how long you've been with the FBI laboratory?

A I've been employed by the FBI approximately fifteen years, eight of those years with the FBI laboratory.

Q Mr. Buechele, I'm going to ask you if you had

occasion to assist one of your colleagues, Mr. Bob Fram, who testified here earlier, on a case out of Collin County, Texas, styled State of Texas versus Michael Blair, with regard to some instrumental analyses of some fibers?

A Yes, sir. I was involved in that investigation.

Q All right. Can you tell the jury exactly what it was that you were asked to do with regard to that case by Mr. Fram?

A Special Agent Fram presented me with glass microscope slides each containing fibers for comparison. His request of me was to use scientific instruments which I am trained on in our unit to compare these fibers to see if and which ones matched in their chemical composition.

Q All right. Were there two specific tests that you employed in trying to make that determination?

A Yes, sir. There were. I used two scientific instruments. One is called for fourier transform infrared spectrophotometry, abbreviated in the scientific industry as FTIR. The second test I used is pyrolysis gas chromatography mass spectrometry, abbreviated in the scientific industry as Py GCMS.

Q All right. In each of those tests what is it

that -- well, let's start first with the FTIR test, the one using the light. What is it that is exactly the goal -- or let me back up and maybe ask this a better way. What is the scientific principle behind the FTIR test? How does it work?

A FTIR uses a thin beam of infrared light. Shining this beam through a sample the chemicals that are present within that sample will absorb certain portions of that infrared light. Which portions of that have light are absorbed is dependent upon what chemicals are present in the sample. When we shine this light through, we collect what we call spectra, which is typical of what chemicals are found in that sample. We do that from one sample to another and see if the spectra are, in fact, identical. In other words, are these two samples composed of the same chemicals. That's the type of examination I did on these fibers.

Q And with regard to the second test, the gas chromatography test that you mentioned, would you tell the jury a little bit about the scientific principle behind that test and what it hopes to achieve?

A The pyro GCMS examination takes samples, whether it's fibers, plastics, paints, and vaporizes them using an intense amount of heat applied in a very short period. Once the sample is vaporized, it travels

through a chromatographic column which separates this sample into its individual chemical components. Once they're separated into their individual chemical components, they enter into the mass spectrometer portion of the instrument which further breaks down each chemical compound into smaller sections which identifies what chemicals are present in that sample.

Again, I ran samples of fibers to compare them to see if, in fact, they were composed of the same chemical composition. These are two independent tests to confirm whether or not fibers match or did not match.

Q And when you say whether or not fibers match or do not match, you're speaking strictly from a chemical analysis standpoint; is that correct?

A That is correct. Are they made out of the same chemicals.

Q You're not trying to tell the jury that these particular tests are ones that can distinguish the structure, physical structure at least, of a fiber. In other words, whether there are, I guess, air spaces between some of the particles in the fiber, how they might look physically. You're strictly talking from a chemical basis?

A That is correct. These type of examinations will not distinguish physical characteristics; however,

they will distinguish differences in chemical composition.

Q That's kind of where your role as a chemist differs from that of a microscopist who is looking at things for differences in appearance and structure?

A That is correct.

Q All right. Now, I'm going to ask you to turn your attention --

MR. Clayton: May I approach, Your Honor?

THE COURT: You may.

Q (By Mr. Clayton) I'm going to ask you to turn your attention to the exhibits that were submitted to you from Mr. Fram by FBI 30924030, and I'll ask you if you had occasion to examine in the two techniques you just described a fiber described as the Q1 fiber, the questioned fiber that came from the autopsy of Ashley Estell, and what is known as the known number one fiber, a fiber from a rabbit doll that belonged to suspect Michael Blair, and finally a fiber that is known as the K3 fiber, which is one that came from the victim's sleep bunny rabbit? Did you have occasion to run those tests?

A (By the witness) Yes, sir. I recognize these because they bear the laboratory markings and other markings that I'm familiar with. I did perform the tests I previously described on these fibers.

Q All right. Now -- and I recognize you identified these for purposes of your testimony as Q1, K1, and K3. I will try to talk about it in those terms as much as I can. Would that be best for you?

A Yes, sir. That would be fine.

Q Q1 was a fiber that you had occasion to run through both the FTIR test checking its chemical composition and also through the gas chromatography test checking its chemical composition there. Did you get readouts and results from both of those tests for the Q1 questioned fiber from Ashley Estell?

A Yes, sir. I did.

Q Now, did you have occasion then to run the same tests on, or testing procedures, on the K1 fiber, the known fiber, from the rabbit doll from suspect Michael Blair's vehicle?

A Again, yes, sir. I did.

Q All right. And finally when you ran -- did you have occasion to run these same two tests on the K3 fiber from the victim's sleep bunny doll?

A Yes, I did.

Q After having performed these two tests on all three of the fibers, what can you tell me about which of the bunny rabbits, the K3 belonging to the victim, or K1 belonging to suspect Michael Blair, which one of those

in your opinion most closely matched in a chemical fashion the questioned fiber, Q1, from Ashley Estell's body?

A The Q1 questioned fiber from the victim's body most closely resembled in chemical composition the K1 fiber recovered from the suspect.

Q Now, the differences, when you say it most resembled, the differences that you saw between the known fiber from the suspect Michael Blair's rabbit doll and that of the K3 fiber, the victim's sleep bunny, the differences, are they great differences or are they pretty subtle?

A They're very subtle differences, sir.

Q I'm not going to try to ask you to give a lengthy chemical distinction in this, but can you tell the jury where these differences kind of showed up and some of your charting that you use as part of the instruments or readout? Is that where you were able to detect the differences?

A Yes, sir. That is correct. Using the FTIR instrumental technique I produced a spectra which showed all the absorbences of the chemicals that were present in that fiber, the Q1, the K1, and the K3 fiber. As a crude approximation, the spectra of the Q1 fiber from the victim, the K1 fiber, and the K3 fiber all overlay

each other like my hands are, approximately. The difference being the Q1 fiber from the victim and the K1 fiber from the suspect showed one additional absorbence of the infrared radiation which appeared as a small shoulder on one of the peaks. The reason for this absorbence I cannot explain; however, it is present in both the Q1 fiber from the victim and the K1 fiber from the stuffed animal from the suspect. That small minute absorbence is not present in the K3 fiber from the victim's residence.

Q Okay. Now, in your opinion as a chemist working with these two particular instruments, is it your opinion that that shoulder, as you described, that appears on the graph that shows the spectra resulting from your test procedures, is that enough in your mind to show a difference in these fibers?

A Again, I can't account for why the shoulder is present in these spectra, but yes. It is a difference that led me to conclude that the Q1 fiber most matches the K1 rabbit as opposed to the K3 rabbit.

Q And again, this is -- this is in a chemical composition context. We're not talking about the appearance, physical appearance, of the fibers under a microscope. We're talking strictly from a chemical analysis standpoint.

A That is correct. Based entirely upon the chemical composition.

Q All right. Mr. Buechele, I apologize. A moment ago I forgot to ask you to give the jury a little bit of your academic background, as well as your training from the FBI. Would you mind recounting that for the jury as far as where you studied?

A In 1979 I received a bachelor of science degree from Clarion University of Pennsylvania. In 1980 I was hired by the FBI laboratory to work in their chemistry toxicology lab as a chemist. I served for approximately one year in that capacity, was transferred to the chemistry research laboratory at Quantico, Virginia, where I worked for approximately two and one half years developing techniques for use in the forensic laboratory.

After this time period I applied for and received an appointment as a special agent. After my training I served in two field offices, Jackson, Mississippi, and New York City. I was then reassigned back to the laboratory to work as a supervisory special agent with the responsibility of examining evidence as submitted. I have held this capacity for five and one half years.

My training included one year of on-the-job

training at the hands of the senior examiners that were present in the unit at that time. This included training from the manufacturers of the scientific instruments that I use in my examination of evidence. It included training at the University of Missouri, the Raleigh campus. I attend trade shows and symposiums as they relate to collection, preservation, analysis of trace evidence.

Q I believe that's all I have, Mr. Buechele.

MR. CLAYTON: I pass the witness, Your Honor.

MR. MCDERMITT: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. MCDERMITT:

Q Mr. Buechele, you talk about differences. Can you -- excuse me. You talk about differences that are unexplained in the absorption rate; is that correct?

A That is correct.

Q Is that common or uncommon in your business, to see such differences?

A It is very common to see differences in absorptions between specimens. Yes, sir.

Q When you performed both the FTIR and then the gas chromatography, did you notice any other differences that you haven't related to us?

A No, sir. I did not.

Q Okay. And you used terms like most closely matched or most closely -- most consistent with. Are those terms of art or are those terms of comparison?

A I'm sorry. I don't believe I understand your question.

Q Okay. I mean, when you say that, are you limiting the comparison factors in that as to identification? I mean, can you say beyond a doubt or can you say with certainty as regards anything as regards these factors?

A I cannot say with one hundred percent certainty that one fiber came from one source to the exclusion of every other source. Again, in my report and in my testimony I'm stating that the Q1 fiber most closely resembled the K1 fiber based upon my chemical analysis of the composition of those fibers.

Q All right. Can you tell us what other sources these fibers may have been used in that you examined?

A No, sir. I cannot.

Q Did you make any effort as far as determining the source of these fibers?

A No, sir. I did not.

Q Okay. So you only examined and then tested, both through the FTIR and gas chromatography, those

samples that were sent you; is that correct?

A That is correct. Yes, sir.

Q Does your analysis and the tests that you run, do they -- would they have -- would they be able to show any characteristics, say, such as feces that were on a fiber?

A Again, that is not a particular type of examination that I would conduct; however, the majority of the fibers that I receive for chemical composition analysis have been cleaned.

Q They have been cleaned before you received them?

A Yes, sir. That is correct.

Q So if there were feces or some other property on a fiber taken at one point in time, then by the time you conducted your examinations it would have been cleaned off; is that correct?

A That is correct. Yes, sir.

Q How are these fibers cleaned?

A There's a variety of methods for cleaning fibers, based upon how dirty or contaminated they appear to be. The most simple method is to place some water and/or methanol on it and swirl it in a little agitated bath.

Q Well, when you use methanol, would that

introduce any other chemicals into the fiber?

A No, sir.

Q Okay. So then how is the methanol eliminated from the -- from your examination?

A By simple evaporation from the sample.

Q Okay. So there'd be no residue or anything else on this fiber. Is that what you're telling me?

A That's correct, sir.

Q So you couldn't tell if it had been cleaned or not?

A Well, if it had not been cleaned, there would have been certain interferences -- assuming, of course, that the fiber was dirty or contaminated in the first place -- there would have been certain chemical interferences that would have precluded the examinations I have done on these fibers that would have been present. Looking through the microscope at these fibers using infrared IR to examine them, the fibers would have showed contamination; therefore, I'm quite confident that they either were not contaminated or dirty or, if they had been, they were cleaned prior to me receiving them from Mr. Fram.

Q Did you conduct any -- any of these tests as regards any other fibers associated with this case?

A Yes. There were other fibers submitted that I

examined using the instrumental techniques I described in this case. Yes, sir.

Q All right. Can you tell me what those fibers were?

A They were fibers from other stuffed animals represented to me as having originated from the victim's home.

Q Okay. And how many of those?

A I believe --

Q Do you recall?

A I believe there were two, sir.

Q So you were submitted basically three fibers from the victim's home; is that correct?

A Yes, sir. That is correct.

Q Thank you very much.

MR. MCDERMITT: Pass the witness, Your Honor.

REDIRECT EXAMINATION

BY MR. CLAYTON:

Q Just for perfect clarity in the record, Mr. Buechele, the other fibers that were submitted to you Mr. McDermitt just mentioned, not only were they different from these rabbit dolls belonging to the suspect and the fiber found on Ashley's body, but they were -- they were very, very different chemically?

A Yes, sir. They were composed of an entirely different chemical composition than the fiber recovered from the victim's body.

Q Okay. Thank you.

MR. MCDERMITT: I have no further questions, Your Honor.

THE COURT: This witness excused?

MR. CLAYTON: Yes, he is, Your Honor.

MR. MCDERMITT: Yes, Your Honor.

THE COURT: Thank you.

Call your next witness.

MR. CLAYTON: Your Honor, the State would call Tom Gramm.

THE COURT: Is that G-r-a-h-a-m or --

MR. O'CONNELL: I believe it's G-r-a-m-m, Your Honor.

THE COURT: No normal spellings.

Morning. Would you raise your right hand?

(Witness sworn by the Court.)

THE COURT: All right.

MR. CLAYTON: Thank you, Your Honor

THOMAS GRAMM,

called as a witness on behalf of the State of Texas, having been previously duly sworn to testify the truth,