MARY LONG,

having first been duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. PETERSON:

Q State your name for the record, please.

A Mary M. Long.

Q And your profession or occupation.

A I'm a criminalist with the Oklahoma State Bureau of Investigation in Oklahoma City.

Q And how long have you been so employed in that capacity?

A Eight years.

Q And what are your duties that you're assigned to with the Oklahoma State Bureau of Investigation?

A Well, as a criminalist what my duties are is to receive evidence in criminal cases, then do analysis -- excuse me, do analysis on those items, then make reports and testify to what I've done in court. At the OSBI, I am in a specific division called the serology division, and what I deal with is things from the human body, body fluids, semen, saliva, those kinds of things, plus blood.

Q And how long have you been engaged in this profession?

A All of my eight years at the Bureau.

Q And what training, study, or preparation have you had in connection with your duties at the Oklahoma State Bureau?

A Well, my formal education consists of a Bachelor of Arts degree in Chemistry from Southwestern Oklahoma State University and a Bachelor of Science degree from Central State University in Forensic Science.

After I went to work for the OSBI, is actually when I began to learn how to do specific forensic testing in serology. I've attended various courses given by the FBI at their training academy in Quantico, Virginia, which include: basic serology and biochemical methods of blood stain analysis, also microscopy of hairs and fibers.

I've attended seminars there, international seminars, which were given on the analysis of sex crimes evidence and a technique called electrophoresis. I've also had the opportunity to study at the Serological Research Institute which is in Emeryville, California, on the analysis of sex crimes evidence.

I've also attended the OSBI's fifth agents academy, and one of my duties as part of my training in the academy is I pass on my training to police officers in the State of Oklahoma and teach them how to collect evidence and submit it to the laboratory properly.

Q Would you explain to the jury the nature of the work you do, please.

A Well, what I do is I receive items in criminal cases, and I do the examinations on them for the presence of blood or the presence of body fluids such as semen or saliva, and I also examine them for the presence of anything else that might be evidence. Sometimes, we don't know what kind of things might be evidence, maybe little fragments of things or hairs or fibers or anything. Sometimes, we don't know until we're working with trace items.

And my job is to collect all these things, even though I may not analyze them myself, I'm still responsible for collecting them many times. Then after they are collected, they are either given to who does have the expertise to work on them, or I work on them myself.

In the case of water-base body fluids such as semen, saliva, whatever else it might be, or blood, I do that testing myself.

Q So, you examine -- basically, you examine the body fluids is one of your --

A Yes.

Q Okay. Could you explain blood analysis, please. Tell how you --

A Well, that's a pretty broad topic.

Q How do you classify blood, then?

A Well, blood, actually, can be classified in many ways. The species can be determined; and in the case of human blood, there are several different things that we in the forensic field can use to help narrow down possibly who the blood could have come from.

Q Okay. That's fine. From the body fluids, are you able to determine a blood type?

A From certain body fluids, yes, we are.

Q Okay. And how is that done?

A Well, in water-base body fluids in everyone -- well, let me take that back. In water-base body fluids, everyone has them; okay. Everyone has saliva, and females have vaginal fluid; males have seminal fluid. Eighty percent of everyone has their blood type activity in their water-base body fluids just as they have it in their blood.

So, in forensic testing we can do testing on these water-base body fluids to see what the blood type is. These people who have this blood type activity in their water-base body fluids are called secretors. And this type of testing is done routinely on such cases as rape cases and cigarette butts and things like this where sometimes we can tell what the type of the donor of the body fluid is in the ABO system, that's whether the antigens are consistent with the A group, the B group, the O group, or the AB group.

Q And there's also another term used called non-secretor. What does that mean?

A Well, a non-secretor is, oh, about -- around 20 percent of the population who is genetically incapable of producing their blood type activity in their water-base body fluids. These people don't show any blood type activity in the ABO system at all in their saliva or semen or vaginal fluid or whatever water-base body fluid.

Q Did you have an occasion, Ms. Long, to receive evidence in a case that you know as the [redacted] Case?

A Yes.

Q And do you -- from whom did you receive evidence?

A Well, I received evidence from several people; Jerry Peters of the OSBI, Agent Gary Rogers from the OSBI, Dennis Smith from the Ada Police Department. And I believe that's -- I believe those are all of the people I received items from.

Q Okay. Jerry Peters; okay?

A Yes.

Q What evidence did you receive from Jerry Peters, please.

A From Jerry Peters I received the items which come from the medical examiner's office, and those are the body samples taken from the person at the time of autopsy. In this case, it was whole blood, vaginal swabs, oral swabs,

rectal swabs, the comb and pubic combing, the known pubic hair, the known scalp hair, and trace evidence that was collected from the perianal area, and right and left-hand clippings of fingernails, more trace evidence from the body, scrapings from writing on the chest, material from writing on the back of the body, a bottle cap which was removed from the body, clothing items, a washcloth, and paper sacks which were placed over the hands to protect them at the scene. These were all from the body of [redacted].

Q Let me show you what's been marked for identification purposes State's Exhibit 16; ask you to look at that -- you don't necessarily have to pull it out, but just look at it, and do you recognize that?

A Yes, I do. State'e Exhibit No. 16 is a paper sack that has various labeling on it. It also has my case number, my initials, the date that I opened this and worked on it, and then my item number which I gave it for my report. And inside here contains a washcloth.

Q Thank you. Let me show you what's been marked for identification purposes State's Exhibit No. 17. Would you take a look at that.

A State's Exhibit No. 17 is what we commonly refer to as an OSBI evidence envelope. What this is is just a manila envelope that has sort of a preprinted form on the

front, so when people submit evidence to the lab, they can fill this out and help us keep up with the information that we're supposed to. Inside this is numerous items that I listed before. On my report it's Nos. 1 through 14, which is the blood and the swabs and the fingernails and all of the small samples which were taken by the medical examiner. They just put them all in this one.

Q Okay. Let me show you what's been marked for identification purposes State's Exhibits 18 and 19. Do you recognize those?

A Yes. State's Exhibit No. 18 is just a regular letter envelope that's stapled over, and it's labeled [redacted], scalp hair, 82-5138. It also has my initials, my case number, my date, and my item number for my report. And this is the know scalp hair that was pulled from the body of [redacted] that we used for known standard in the OSBI lab. This is No. 7 on my report.

State's Exhibit No. 19, again, is a similar envelope with labeling [redacted], pubic hair, 82-5138. Again, it has my case number, initials, date, and Item No. 6. And again, this is the standard known pubic hair taken from Ms. [redacted].

Q Let me show you what's been marked as State's Exhibit 17-A. Can you identify that?

A Yes. No. 17-A is, I suppose you call this a little

plastic beaker with a lid. It has labeled on it, bottle cap from anal canal, [redacted] Then again, the medical examiner's number, 82-5138. It has my case number, initials, the date, and my Item No. 14 for my report.

Q Those items that were submitted to you from the medical examiner's office, the whole blood of [redacted] [redacted] the vaginal swabs, oral swabs, rectal swabs, everything that you've mentioned that you received from the medical examiner's office, did you examine those for any kind of evidence?

A Yes, I did.

Q And were you able to find anything of value?

A Well, I don't know exactly what you mean by value, but I was able to make some determinations on the items.

Q Okay. The -- for example, were you able to do analysis of the whole blood of [redacted]?

A Yes, I was. The whole blood of [redacted] I did several things on. I determined of course, that it was human blood, Type A. I also did some other things on this blood. I determined the phosphoglucomutase, esterase D, and glyoxalase types which are genetic markers that we use to just help narrow down the percentage of the population who could be the donor of this blood. In this particular case, these weren't used any further. They were -- I found

out what they were in case I needed them, had something to compare them to because this was the known sample of [redacted] but I never had anything to compare those to, so that's why no more of those strange words appear in my report.

Q Okay. Of the vaginal swabs, were you able to retrieve anything of value?

A Yes.

Q And what was that?

A From the vaginal swabs, sperm cells were identified. And when I attempted to do the blood typing or the secretor-status typing on these, no antigen activity was detected at all. No blood-type activity showed up in the ABO system on this. Now, also, I need to correct what I said. I did do the phosphoglucomutase test. Type 21 was detected, and that's the same type as [redacted]

Q And what significance does that have?

A Well, in this instance, it's really not very helpful because Type 21 would mask any type which could be donated from the semen donor, so it's noninformative.

Q Did you look at the oral swabs that were submitted to you?

A Yes.

Q And were there any items of -- there found?

A No sperm cells were identified on the oral ones.

Q And the rectal swabs?

A Again, no sperm cells were found.

Q And to whom did you submit the pubic combings to?

A Pubic combings were submitted to Susan Land of the OSBI lab, and that was on the 3rd of January of 1983.

Q And the known pubic and known scalp hair, to whom did you submit those to?

A Also Susan Land on the same day.

Q Did you submit the trace evidence from the perianal area -- to whom did you submit that to -- or did you retain it?

A Yes, I did, and that also was submitted to Susan Land on the same day.

Q Now, you stated that you received the right fingernails and the left -- the right-hand fingernails and the left-hand fingernails from [redacted]. Did you detect anything there?

A Yes, I did. On the fingernails from the right hand, I had a very small amount of blood present, and I detected antigen A activity which is indicative of Type A blood, which is also consistent with what she herself would produce.

Q Okay. You didn't find anything else? There wasn't any skin or dirt or anything like that?

A I don't believe so.

Q Okay. On the left hand?

A On the left --

Q On the left-hand fingernails.

A Sorry.

Q That's okay.

A On the left-hand ones, I did not find anything that I could work with for evidentiary purposes.

Q There was no blood, no skin --

A No.

Q -- anything of that --

A Nothing that I could test.

Q In -- on the western belt, on the socks, or the white electrical cord and control box, were you able to detect anything?

A Well, chemically, I did not detect any indications of semen or anything like that; but I did remove some hairs, and I also submitted those to Susan Land.

Q From the bags placed on the hands of [redacted] and the washcloth that was removed for her mouth -- or the washcloth that you've looked at, were you able to detect anything of value?

A Oh these -- excuse me, again, hairs were removed and submitted to Susan Land.

Q On what date if you recall?

A That date was the 4th of January of 1983.

Q Do you know what items of evidence were submitted to you by Gary Rogers and Dennis Smith?

A Yes, I do. On the 16th of December of 1982, from Gary Rogers I received a Del Monte catsup bottle, a white bra, a small section of wall, a maroon floral blouse, some scrapings from the -- labeled as being from the west wall in the living room of the crime scene, scrapings labeled from the kitchen table at the crime scene, hair sample labeled from east window sill in the bedroom of the scene, a hair sample from the left hand of [redacted] at the scene, hair sample from under the left arm of [redacted] at the crime scene, hair sample from the floor under [redacted] at the crime scene, a white plastic cup, a pair of jeans and a belt from the kitchen at the crime scene, one pair of dark blue panties, a blouse and a jacket, some bedding items, a pillow, a blanket, bedspread, a fitted sheet, and a flat sheet. Those were all received from Gary Rogers.

Received from Dennis Smith were a partially smoked, hand-rolled cigarette, four cigarette butts that were labeled from the ash tray of the vehicle of [redacted] a hair sample from the vehicle, then known scalp hairs --

Q Let me -- let me -- I know there's a long list there. Could you just say that you received numerous hair, head and hair samples from various and sundry individuals?

A Yes. On that particular day of submittal, I received samples from two different people.

Q Okay. And did you receive something from Agent Jerry Peters on 12/20/82?

A Yes.

Q Okay. What would that have been?

A There was one hair which was removed from inside a drinking glass that had been submitted to him for fingerprints.

Q Okay. And on 1/4/83, did you receive various head and scalp hairs from different individuals --

A Yes.

Q -- from Dennis Smith?

A Yes.

Q And your Item 62, did you receive a hair sample that is labeled under the body at the crime scene?

A Yes, I did.

Q And from whom did you receive that?

A That was received from Dennis Smith of the Ada Police Department, and that was on the 4th of January of 1983.

Q Did you receive cigarette butts and threads and drinking straws and various things like that that were submitted to you?

A Yes, I did.

Q On 12/16/82, did you receive from Dennis Smith the known pubic and head hairs of a number of individuals?

A Yes.

Q And just approximately, if you could just glance, could you tell me approximately how many?

A I believe about 16.

Q Okay. Did you also receive saliva samples from those people?

A From some of them, I did.

Q Okay. Did you receive from Dennis Smith a saliva sample from Ronald Keith Williamson and Dennis Fritz?

A Yes, I did.

Q And how many sets of samples did you receive from them?

A Did you say saliva and blood?

Q Well, saliva -- yes, ma'am, saliva and blood.

A I believe from each of these two I received at different times two saliva samples, but only one sample of blood from each.

Q Okay. And we'll direct your attention to the blood analysis. When did you receive the blood of Ron Williamson?

A Let me check. I think I'm missing one page of the report. From Ron Williamson, I received whole blood on 10/26 of '87 from Gary Rogers of the OSBI.

Q And did you receive a saliva sample?

A Yes, I did. And that -- the first one was received on March 29th of 1983. And then, the second one -- I may have to refer to something that's in my folder.

Q That's all right.

A I do not have the information. Do you have -- okay. This is a copy of my report which was issued on 10/12 of 1987, and I received the saliva sample from Mr. Williamson on the 24th of September of 1987.

Q Okay. So, you have two saliva samples from Ronald Keith Williamson and one -- for lack of a better term -- vial of blood; is that correct?

A That's correct.

Q And did you perform -- let me ask you this: Did you perform any tests to determine whether or not there was saliva on either one of those samples?

A Yes, I did. On the one that I received in -- I believe it was September, I did do a test which is called amylase diffusion test to make sure that there was activity there indicative of saliva. And then, I did the secretor test and determined that no antigen activity was present.

Q And when you say no antigen activity was present, what does that indicate to you?

A Well, when no antigen activity is present, the conclusion that I can draw is that the person is a

non-secretor.

Q Okay. Did you have an occasion to receive saliva samples and blood samples from person labeled as Dennis Fritz?

A Yes.

Q And when did you receive the saliva samples and blood samples from Dennis Fritz?

A The first one was received on March 29th of 1983. And again, the second one was received on the 8th of September of 1987.

Q Okay. And did you also receive on that date whole blood?

A Yes, I did.

Q And from whom did you receive that?

A Received it also from Mr. Fritz.

Q Okay. Did you perform on the second one that you received anything -- any kind of tests to determine whether or not there was saliva present on the paper?

A Yes, I did.

Q And would you -- what were your results?

A Again, amylase activity was present which is indicative that saliva is there.

Q Okay. On the first samples that were submitted to you -- strike that. Was -- on the whole blood of Dennis Fritz, what was his grouping?

A Dennis Fritz is Group O.

Q Okay. And Ronald Keith Williamson, what was his group?

A Again, that may be the page that I don't have; I'm sorry.

Q That's quite all right.

A Again, Group O.

Q Okay. Now, for my own information, I've wondered about this, so I'm going to ask it. From blood itself, Ms. Long, from blood itself, if you took my blood, just my blood, not my body fluids.

A Uh-huh.

Q Just my blood. Could you determine just from the blood whether I was a secretor or non-secretor?

A Yes.

Q Okay.

A Yes, I can, and the way that I can do that is with a test called the Lewis test. The Lewis test tests for the presence of an antigen or a chemical substance on the surface of the red blood cells. And this chemical substance that's on the surface of the blood cell is genetically linked to a person's ability to produce blood group substances in their water-base body fluids.

If a person is A positive B negative in the Lewis system, they don't have the genetic capability to be a

secretor. If they are A negative B positive in the Lewis system, then they do have the genetic capability to be a secretor.

Q Okay. When you ran the -- whether the -- on the item that you -- that was marked Dennis Fritz, were you able to determine whether or not he was a secretor or a non-secretor, or whether -- was there any antigen activity?

A His Lewis type indicates him to be a non-secretor.

Q On the first samples that you received from Dennis Fritz and Ron Williamson, were the exact same results reached on those as they were on the second samples?

A On the very first ones that I analyzed back in 1983, no antigen activity was detected.

Q Okay. And on the samples that you received later from Ron Williamson and Dennis Fritz, were the same results then as were then -- back then?

A Again, no antigen activity was detected.

Q And having no antigen activity detected, what is that indicative of?

A Non-secretor.

Q These hair samples that you received from Dennis Smith and Gary Rogers, to whom did you submit those hair samples to?

A All of these hair samples were submitted to Susan Land of the OSBI.

Q Ms. Long, on the vial of blood that you had from the medical examiner's office that was labeled [redacted], could you tell from her blood, or did you attempt to tell from her blood whether she was a secretor or non-secretor?

A No, that test was not run because in 1982, we had not routinely started incorporating Lewis testing, so at that point in time it wasn't available to us.

Q Let me show you what's been marked for identification purposes, and I'll set it here beside you, State's Exhibit No. 2, and ask you to look at that.

A (Witness complies with request.)

Q Have you looked through those?

A Yes.

Q Do you recognize those items?

A Yes.

Q And --

A State's Exhibit No. 2 is a box which contains bedding items that I tested, removed hairs from, and made cut-outs on to test for the presence of semen. There's a bedspread, and then there's also a sheet.

Q From the sheet -- from the fitted sheet that is in the box, did you make any attempt to remove or analyze any substance from the fitted sheet?

A Yes, I did.

Q And what did you find on that fitted sheet dealing with body fluids?

A On the fitted sheet semen was identified by identifying sperm cells under the microscope; and also, human blood of Group A was also identified.

Q Okay. From the piece that you took out of the fitted sheet, there was sperm identified; is that correct?

A That's correct.

Q Okay. Did you run tests on that particular item?

A Yes, I did.

Q For the determination of whether the -- for blood type on that -- out of that semen; is that correct?

A Yes, I ran secretor test on the semen stain.

Q And on the semen sample that you removed from the fitted sheet, was there any antigen activity detected?

A No.

Q From those items of evidence, the sheets and the blanket and the bedspread, did you remove or collect any other items of evidence?

A Yes, I did. Hairs were collected.

Q And to whom did you submit those hairs?

A The hairs were collected and then submitted to Susan Land on the 17th of January of 1983.

Q Let me show you what's been marked for identification purposes State's Exhibit No. 4. Do you

recognize that envelope?

A State's Exhibit No. 4 is a manila envelope which is labeled panties found in bedroom S.E. corner floor, and it has GLR, the date, and the time. It also has my case number, my initials, the date, and what's left of my number. It's not on there where it can be seen. Inside here is a pair of navy blue panties, and this is No. 30 on my report.

Q Okay. And did you run or attempt to find any items of trace evidence on those panties?

A Yes, there were hairs that were collected, and subsequently submitted to Susan Land.

Q Okay. And do you recall on what date?

A The 4th of January of '83.

Q Was there anything else done after the removal of hairs?

A Yes. Again, these were analyzed for the presence of semen. Sperm was identified, so that means semen was present.

Q Okay. And from that body fluid were you able to determine a blood type?

A No, no antigen activity was detected.

Q And that would be indicative of a non-secretor?

A It could be.

(Whereupon, State's Exhibit Nos. 29, 30, and 31 were marked for identification.)

Q (By Mr. Peterson) Let me show you what's been marked for identification purposes State's Exhibit No. 29. Do you recognize that item?

A Well, State's Exhibit No. 29, the outside container came about after I handled these items; however, the contents are one -- six paper bindles which contain hair samples that were removed from the bedding items, and each one of these paper bindles has my case number my initials, the date, 4th of January, 1983, and No. 32, and it's labeled as hairs from bedding.

Q And those are the items that you submitted to Susan Land?

A That's correct. But she originated this little outside container.

Q Let me show you what's been marked for identification purpose State's Exhibit 31. Do you recognize that?

A Yes. State's Exhibit No. 31 is a paper bindle which has, again, my case number, my initials, the date, and my Item No. 17; and it's also labeled hairs from washcloth.

Q And what did you do with that item?

A These were submitted to Susan Land. State's Exhibit No. 30 is a little plastic Petri dish. Again, it has my case number, my initials, the date, and Item No. 30,

which is the panties, and it's labeled as hair from panties.

THE COURT: We'll take a recess at this time. Remember the instructions I've given you previously. It will be about ten minutes, so the bailiff will tell you when to come back in. You may step down.

(Following a short recess, proceedings continued as follows:)

THE COURT: You may proceed.

MR. PETERSON: Yield the witness.

THE COURT: Counsel approach the bench.

(Whereupon, the following bench conference was had:)

THE COURT: Just to make a record that you advised me that she had additional testimony by exhibit; is that --

MR. PETERSON: No, she's testified to everything that she got and gave to Mary Long -- I mean, excuse me, Susand Land.

THE COURT: Okay. It's another witness.

MR. PETERSON: Yes, sir, she's outside.

THE COURT: All right.

MR. PETERSON: She does not have --

THE COURT: You're finished with all your questions of this witness on direct?

MR. PETERSON: At this time, yes.

THE COURT: All right.

(Whereupon, the proceedings following the bench conference:)

CROSS EXAMINATION

BY MR. SAUNDERS:

Q Ms. Long, I'll have a series of questions that may expose my ignorance; so if I do that -- if I ask you a question -- me being a layman -- that doesn't make any sense at all, would you just tell me it doesn't make any sense, and I'll try to restate the question.

A Okay.

Q All right. Let's talk to start with about the samples taken from the body of the victim; all right? Can you -- whatever record you need to start addressing that issue. Did that consist of three swabs, one of which was not useful and not significant?

A I don't know what you mean.

Q Okay. The evidence taken from the body of the victim, was that presented to you by way of three swabs?

A Oh, you mean, like different body areas, vaginal, oral, and rectal?

Q Yes.

A Yes, yes.

Q Okay. And one of those was not significant -- the oral swab was not significant. You found no semen on that swab; is that correct?

A No, no semen was found on the oral or the rectal.

Q All right. So, those two we can rule out as

having any significance to your testimony?

A Nothing that could be blood typed or anything like that, no.

Q All right. Let's talk about the other swab, the one coming from the vaginal tract. Did you do a quantitative analysis on that sample?

A Quantitative analysis for what?

Q Yes, to determine the amount of substance on the swab?

A No.

Q Would that be significant? Let me restate the question. Could that be significant?

A There are studies that have been done that have shown that it could be.

Q All right. Let's say, for example, that there was insufficient quantity on the swab itself, and you ran the test to determine whether or not it was -- the donor was a secretor or a non-secretor. What would the results of that test be if there was insufficient quantity?

A Okay. First of all, I don't run the test to see if the person is a secretor or non-secretor. I run the test to see if any antigens that are foreign to the person the swab is taken from show up.

Q All right.

A Okay. Kind of need to clear that little point up.

Now --

Q Now, if you did that test --

A Yes.

Q -- to render that result, and you had insufficient quantity, what result would be rendered?

A If there's an insufficient quantity to detect antigen activity, then, of course, no antigen activity would be detected.

Q And you would come to the conclusion that that donor could have been a non-secretor?

A Then I could come to the conclusion if I knew for sure that there was insufficient amount, just a non-informative situation.

Q All right. But in that situation where you don't know whether there is enough there --

MR. PETERSON: Could we approach the bench a moment, Your Honor.

(Whereupon, the following bench conference was had:)

MR. PETERSON: He's assuming facts not in evidence, and he's doing all kinds of hypotheticals with facts not in evidence.

MR. SAUNDERS: You bet.

MR. PETERSON: He assuming facts not in evidence, Your Honor. I object.

MR. SAUNDERS: Hypotheticals are certainly valid.

THE COURT: Have you asked her whether she tested quantity?

MR. SAUNDERS: Yes, I did. Yes, I did.

THE COURT: She said no?

MR. SAUNDERS: She said no.

THE COURT: Okay. Overruled.

(Following the bench conference, proceedings continued as follows:)

Q (By Mr. Saunders) Let me gather my thoughts here a second. Let me restate that last question. If there was insufficient quantity, then your results would be no antigen activity, and you would say as a result of Mr. Peterson's question that the donor could be a non-secretor; is that correct?

A Okay. If there was insufficient quantity, then there wouldn't be any information about the donor at all because it would be sub-detectable.

Q Well, would your test render that result? Would you be -- would you be able to determine by your testing procedure whether there was sufficient quantity there or not?

A In 1982, quanitation of acid phosphatase, especially in our laboratory was not done.

Q All right.

A Which is really the indicator -- that's how

presence of semen is done.

Q So, if I understand your answer, the answer is that you would not be able to determine by your testing procedures whether there was sufficient quantity there to get a valid test result; is that your testimony -- by your procedure in 1982?

A In 1982, the only thing I had available to me was to observe the sperm cells on the slide. From that I cannot determine how much water-base material is there; therefore, I cannot determine how much could be there for antigen activity detection.

Q And that could be important; could it not?

A It could make a bearing on what the results are.

Q All right. And that test was not done?

A No.

Q Was there a Lewis test -- I think you indicated on your direct testimony that Lewis test on [redacted] was not performed because that was not customarily done back in 1982?

A That's correct, not at the OSBI laboratory, it wasn't.

Q Would you expect a sample taken from the body of a victim -- it's been there for some time, over 24 hours -- to reflect some antigen activity if the victim was a secretor?

A Yes.

Q Did you notice any antigen activity whatsoever in this sample taken from the victim?

A No.

Q And you -- so, in order for that test to be valid, you would have to assume that the victim was a non-secretor? You have to make that assumption; do you not?

A Basically, yes.

Q So, when you're talking about the donor being a non-secretor, you are making several assumptions, and see if -- and correct me if I'm wrong. One assumption is that there was sufficient quantity in order to render valid test results?

A That's a possibility. They're not really assumptions; they're possibilities, yes.

Q Well, I mean, you've got to have enough there to work with, or you're not going to get a very good result?

A That's correct.

Q And that the other assumption you're making is that [redacted] was, in fact, a non-secretor?

A That's a possibility.

Q Well, when you say that's a possibility, I mean, you would expect to find some antigen activities if [redacted] had been a secretor?

A That's correct.

Q And you didn't find any?

A That's correct.

Q So, you're assuming that she's a non-secretor even though you do not have tests to indicate that?

A That's correct. That's the conclusion that I would with common sense come to.

Q So, your test results, again, rely on certain variables that you have not controlled; is that --

A That's correct.

Q Is that being done now as a routine matter by the OSBI?

A No. At this point acid phosphatase quantitation is not done because we still have a few other things that we can do in our testing procedure. It may be done, but it's not routine.

Q All right. But the Lewis test, that test to determine whether or not [redacted] was a secretor or a non-secretor was not -- is now currently being done as a routine matter?

A Yes.

Q And it was not done in 1982?

A That's correct.

Q Why did you make the change, or why did the OSBI make the change?

A Well, the technology came along; and as it came along, we adopted it, but at that point in time it was something that still wasn't -- we weren't ready to go into yet.

Q Well, you are more comfortable with the results running -- having these tests available -- these additional testing procedures available to you at this time; are you not?

A Yes, because we can use the Lewis test and then use a back-up test of actually testing a water-base body fluid which is customarily saliva, and have one back up the other.

Q Is there anything in your testing that would help a jury or any trier of fact determine whether or not there was multiple or single donor?

A There's no way for me to tell that at all.

Q I've heard there are two different types of evidence. That being class characteristic evidence and identification evidence. Is that a valid -- is my terminology bad?

A No, that -- that could be a correct statement.

Q Okay. For an example of an identification -- a piece of identification evidence would be fingerprints, so we're understanding each other?

A Yes, that's correct.

Q Am I thinking correctly?

A Yes.

Q And how would you define class characteristic evidence?

A I would define class characteristic evidence as the kind of evidence that shows consistencies, that can show what piece of the whole pie the possibilities could be. It narrows things down, but still is within a piece of the whole.

Q All right. If I understand what you're saying, see if this is incorrect? Class characteristic evidence is that evidence designed to place individuals into a certain classification?

A Right. And in serology evidence, this falls within, say, a percentage of the population who could be the donor.

Q So, your type of evidence is class characteristic evidence and not identification evidence; is that correct?

A That's correct.

Q Is there any way you can determine when you've got a sample coming to you, the time at which that sample was created? Well, let me see if I can restate that. You had some other samples other than the swabs come to you. Can you tell when those occurred by your testing procedures?

A Not really.

Q Let's change the hypothetical back to the original line of questioning about the swab. If [redacted] was, in fact, a secretor, that would be indicative of the fact that you had insufficient quantity in order to render a test -- a valid test result? Do you follow my logic and my reasoning?

A Well, yes, I follow your reasoning, but I don't agree because that just means insufficient amount of material from her because we already know that it's a mixed fluid on the swab, and it would just have to be the material from her to detect her antigen activity. So, there may just be insufficient material from her, not necessarily from anyone else.

Q If the sample was taken more than 24 hours after the time of death, you would expect sufficient sample or some sample from her to have mixed with the sample; would you not?

A Yes.

Q All right. Ms. Long, are you a commissioned law officer?

A Yes, I am.

Q So, you're a policeman or a police person?

A Well --

Q You can carry a gun?

A I can.

Q Okay. Now, you tested several people on this characteristic; did you not? Do you have the records in front of you on how many tests you did from knowns?

A Which characteristic -- blood or from the saliva?

Q Saliva.

A Yes, I have a list.

Q Can you tell the jury how many folks you tested and -- to determine?

A Okay. I had 19 different saliva samples to test; 19 different people.

Q Okay. How many were determined to be non-secretors?

A Two.

Q Only two?

A Yes, because I had the blood from -- no, wait, I take that back -- one, and that was Mr. Fritz because I had both the blood and the saliva to back each other up on his. On these other ones, there was no antigen activity detected on 11 of them.

Q Which would mean that they could be a non-secretor if I understand your testimony?

A That's right. That's right.

Q Would be consistent with being a non-secretor?

A That's right.

Q So, 11 out of 19 could have been a non-secretor?

A They could have if the samples were --

Q Properly done?

A -- good samples, yes.

Q And that's one of the assumptions you always make, is that there's sufficient quantity and the samples were properly taken on any type of testing; isn't that correct?

A Yes.

Q I mean, you always have to make that assumption?

A Yes.

Q Your opinion that making those assumption we've talked about that the donor was a non-secretor?

A If there's no antigen activity detected, then the conclusion I come to is that they're probably a non-secretor.

Q And of that 19, 11 of those, based on your testing results, could have been the donor?

A Could have been the donor?

Q Yes, could have been the donor or the assailant, the perpetrator?

A That's possible.

Q Okay. Eleven out of 19 could have been the perpetrator?

A With no antigen activity to give, if these are proper samples, that's a possibility.

Q That's the type of testimony you can give on class characteristic evidence; is it not?

A That's correct.

MR. SAUNDERS: No further question. May I approach the bench.

(Whereupon, the following bench conference was had:)

MR. SAUNDERS: I move that her testimony be striken from the record and the jury advised to totally disregard it for the reasons of the evidence I've just brought out on cross examination. She has to make a lot of assumptions.

THE COURT: Overruled.

(Following the bench conference, proceedings continued as follows:)

REDIRECT EXAMINATION

BY MR. PETERSON:

Q Ms. Long, you used the term acid phosphatase. What does that mean?

A Acid phosphatase is an enzime that is present in semen in the high quantity. It's produced by the prostate gland, and it's something that in the laboratory we can test. And it's -- because it's in a real high quantity in seminal fluid, we use that as a screening or presumptive test for semen in a qualitative way, and then we test to see the amount and gives us an idea of how much semen could be there.

Q Okay. And you ran the acid phosphatate test on the swabs that were taken from the vaginal area?

A No.

Q You did not?

A No.

Q Okay. If the victim was a non-secretor, and the donor was a non-secretor, and their body fluids were mixed on the swab, what would you expect to find?

A No antigen activity.

Q Thank you.

MR. PETERSON: No further questions. Just a moment.

Q (By Mr. Peterson) Would the sperm and the items that you received from the sheet that you did the tests on, would the same results be as a result of the semen that you detected on the sheets? Did I make myself -- did I lose you?

A No.

Q Okay. The semen that you determined that were on the sheets; okay. You detected no antigen activity.

A That's correct.

Q And semen are indicative of male or female?

A Well, it did not originate in the female; it came from a male.

Q Came from a male. And the semen that you detected on the sheets, there was no antigen activity detected there either? Is that correct?

A That's correct.

Q So, from two different sources, the vaginal swab and the sheets, there was no antigen activity detected from the body fluids; is that correct?

A That's correct.

MR. PETERSON: Yield the witness.

RECROSS EXAMINATION

BY MR. SAUNDERS:

Q Please the Court. Well, if I understand your previous testimony, you would not have done a quantitative analysis on the semen from the fitted sheet or the semen on the panties as well?

A That's correct.

Q So, again, you would have to make the basic assumption that there was sufficient quantity, sufficient amount to render a valid test result?

A That's correct.

Q And the assumption would be the same? I mean, that assumption would be the same for -- no matter where you got the sample?

A Right. Once the sperm cells are observed then, then I would assume that there is enough there for further testing.

Q And that is the assumption that's basic and underlying to your opinion here on all of this; isn't it?

A That's correct.

Q Okay.

THE COURT: You may step down. Call your next witness.

SUSAN LAND,

having first been duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows, to-wit:

(Whereupon, the following bench conference was had:)

MR. PETERSON: This witness I can just go so far with until Mel Hett gets here. I'll stretch her out.

THE COURT: Did you say you're not going to call Terry Holland?

MR. PETERSON: I don't think so.

THE COURT: You mean either you are or you're not?

MR. PETERSON: I don't think so.

THE COURT: John Christian?

MR. PETERSON: I don't think so.

THE COURT: Which leaves you with two witnesses, Susan Land and Mel Hett?

MR. PETERSON: That's correct.

THE COURT: Let's proceed.

(Following the bench conference, proceedings continued as follows:)

DIRECT EXAMINATION

BY MR. PETERSON:

Q State your name for the record, please.

A Susan P. Land. That's L-a-n-d.

Q And your profession or occupation?

A I'm a criminalist with the Oklahoma State Bureau of Investigation.

Q And what are your duties with the Oklahoma State Bureau of Investigation?

A I analyze evidence that is submitted in criminal cases, process crime scenes, testify in court as to the results of analysis.

Q Did you have an occasion in 1982 to receive some evidence from Mary Long concerning the [redacted]?

A I believe it was 1983 when I received it.

Q Yes, 1983.

A Yes, sir.

Q Did you have an occasion to receive some?

A Yes, sir.

Q Do you have a set of records before you?

A I have a copy of the report that Mary Long issued and the report that Mel Hett issued.

Q Okay. On 1/3/83, did you have an occasion to receive from Mary Long pubic and combings of [redacted]?

A Yes, sir.

Q Did you have an occasion on 1/4/83 to receive

from Mary Long hairs removed from certain items of evidence from a western belt, a pair of socks, or a white electrical cord?

A Yes, sir.

Q Did you have an occasion to receive from Mary Long on 1/4/83 hairs from bags placed on [redacted] hands at the crime scene and hair from washcloth removed from her mouth and from her bra?

A I believe so, yes.

Q And from a maroon floral blouse?

A Yes, sir.

Q And one white plastic cup?

A Yes, sir.

Q Did you have an occasion on 12/23/83 to receive from Mary Long a hair removed from a Del Monte catsup bottle?

A What was the date on that?

Q Twelve -- excuse me, 1/3/83?

A Okay. Yes, sir.

Q And on 1/4/83, did you have an occasion to receive from Mary Long a hair removed from one pair of blue panties?

A Yes, sir.

Q And did you have an occasion on 1/17/83 to receive hairs submitted to you from Mary Long from bed

clothing items?

A Yes, sir.

Q Did you have an occasion on 1/31/83 to receive a hair from Mary Long that was identified as hair sample from under body at crime scene?

A Yes, sir.

Q From your records, Ms. Land -- let's see, to whom did you submit it -- it would be your Item 17. The hair that you received that was on the washcloth, who did you submit that to?

A I submitted those to Mel Hett.

Q Did you place that hair on a slide?

A Yes, sir.

Q And when did you submit that to Mr. Hett?

A September 19, 1983.

Q Your Item 27, a hair identified to you as a hair from under the -- from the floor under [redacted] that you received from Mary Long, did you -- what did you do with that hair?

A I mounted that on a microscope slide.

Q And to whom did you submit that?

A Mel Hett.

Q On what date?

A September 19th, 1933.

Q You received two hairs from the torn panties

from Mary Long. From -- what did you do with those hairs?

A I mounted those on microscope slide.

Q Okay. And whom did you submit those to?

A Mel Hett.

Q From the bedding, you received a number of hairs from Mary Long. What did you do with those hairs?

A Which one?

Q Item No. 32.

A Thirty-two, okay. I mounted some of those hairs on microscope slides.

Q Okay. And to whom did you submit those to?

A Mel Hett.

Q On 9/19/83?

A Correct.

Q Your Item 62. On 9/19/83, did you receive a hair from under [redacted], identified to you as a hair from under [redacted]?

A No, that's when I submitted it to Mel Hett.

Q And did you receive that item of evidence from Mary Long?

A Yes, sir.

Q And did you submit that to Mel Hett?

A Yes, sir.

Q And when did you do that?

A On 9/19/33.

Q Did you receive any other items of evidence independently from -- then, from Mary Long?

A I received other hair samples from Mary Long.

Q Okay. And what would those be?

A Do you want me to go through the whole --

Q No, I know there's a whole list there. There was a number of hair samples.

A Yes.

Q Did you mount some of those on slides and some you did not?

A Yes, sir.

Q And all those items that -- of hair samples, to whom did you submit those to?

A Mel Hett.

Q Did you receive some items of evidence that were labeled known scalp hairs of Williamson and known scalp hairs of Fritz and known scalp hairs of -- pubic hairs of Fritz and known scalp -- excuse me, pubic hairs Williamson?

A Yes, I did.

Q And when did you receive those?

A Those were submitted -- some of them were submitted on March 17th, 1983, and one item was submitted on March 23rd, 1983.

Q And from whom did you receive those?

A Those were submitted by Dennis Smith from Ada PD

-- okay, he submitted all those.

Q Okay. And you mentioned you received one on the 23rd of March, and the others were received on March the 17th; is that correct?

A That's correct.

Q Let me show you what's been marked -- just a second, excuse me. Let me show you what's been marked for identification purposes State's Exhibit No. 7. Do you recognize that envelope?

A Yes, I do.

Q And do you know what it contained?

A It contained hairs and saliva samples.

Q Okay. And to whom did you submit that item to?

A Which -- the whole thing.

Q The envelope.

A The hairs were submitted to Mel Hett, and I believe the saliva samples were submitted to Mary Long.

Q And that -- could you tell the date when it was submitted to Mr. Hett, please.

A It was submitted to him on September 19th, 1983.

Q Okay. Let me show you three envelopes, State's Exhibit 18, 19, and 6. Would you look at those, please.

A (Witness complies with request.)

Q Can you identify those?

A Yes.

Q And how do you identify them?

A My initials and the date.

Q Okay. And those exhibits, what did you do with those?

A I mounted these hairs on microscope slides.

Q Okay. And then --

A And submitted them to Mel Hett.

Q Okay. Let me show you what's been marked for identification purposes State's Exhibit 29, 30, and 31, and ask you to look at those and see if you can identify them.

A Yes, I can.

Q And how do you do that, please?

A My initials, the date, and the lab number.

Q Okay. Are there inside -- excuse me. Inside State's Exhibit 29, would you pull those out, please.

A (Witness complies with request.)

Q Do you recognize those?

A Yes, sir.

Q And how do you recognize them?

A My initials and the date.

Q Okay. And what did you do with State's Exhibit 29 and 30 and 31?

A I mounted some hairs on a microscope slide and submitted those to Mel Hett.

Q Okay. Do you recall the date you did this?

A The date that I mounted them?

Q No, the date that you submitted them.

A The date that I submitted them was September 19th, 1983.

Q Okay. Ms. Land, would you give for the benefit of the jury your experience and background, your training.

A I have a Bachelor of Science in Chemistry from Missouri Western State College in Saint Joseph, Missouri. I have a Master of Science in Forensic Science from the George Washington University in Washington, D.C.

Q During your training and experience, have you had an occasion to mount samples, whether hair or fiber or whatever?

A Oh, yes, sir.

Q And is that part of your job to do that sort of thing?

A Yes, sir.

Q And this is probably going to sound like a silly question, but approximately how many items of hair have you mounted since the time that you began this profession -- for examination purposes?

A Thousands.

Q Okay. For the benefit of the jury, could you verbally without -- could you verbally tell how that is done -- that you mount exhibits like that.

A Okay. Basically, I take a glass slide that's about two or three inches long and maybe an inch wide, and place hairs on this microscope slide. We use what is called permount; it's a mounting medium that will hold those hairs on that slide. Then we take a very thin glass cover slip and place that on top of the permount and the hairs, so that it will stay on the slide.

Q Is that a fairly routine thing that you do?

A Yes, sir.

(Whereupon, the following bench conference was had:)

MR. PETERSON: I can't go any further. I'm as far as I can go without those slides.

THE COURT: Is he not here?

MR. PETERSON: He's here. It's going to take him some time to separate what he did from what she did out. Could we break for lunch and give us an opportunity to sort those things out?

THE COURT: All right.

(Following the bench conference, proceedings continued as follows:)

THE COURT: We're going to recess for lunch at this time. Remember the instructions I've given you about talking about the case or letting anyone talk to you about the case. And by that clock we'll start at 20 minutes till 1:00; that's just a little over an hour. So, be back at

that time.

(Following noon recess, proceedings continued as follows:)

THE COURT: Ms. Land, will you retake the witness stand.

Q (By Mr. Peterson) Ms. Land, I notice that you brought some items with you. What are those, please?

A These are the hair slides that I mounted and gave to Mel Hett.

Q Okay.

(Whereupon, State's Exhibits Nos. 32 and 33 were marked for identification.)

Q (By Mr. Peterson) Let me show you what's been marked for identification purposes State's Exhibits 32 and 33, and ask you to look at those and see if you can identify them.

A Yes, I can.

Q And those are the items that you've previously testified about that you mounted, the hairs that were submitted to you by Mary Long, and you mounted those, and then you, in turn, submitted those to Mr. Hett; is that correct?

A Yes.

Q Did that contain the hairs from the washcloth, your Item 17?

A Yes, it does.

Q Does that contain the hairs from under the -- hair from under -- on the floor under Ms. [redacted], your Item 27?

A Yes, sir.

Q Would that contain the hairs from the torn blue panties, your Item 30?

A Yes, it does.

Q And would that contain the hairs from the bedding submitted to you by Mary Long, your Item 32?

A Yes, it does.

Q And would that contain the hair, a scalp hair, that was under Ms. [redacted], your Item 62?

A Yes, it does.

Q Does it contain other hairs that were mounted by you?

A Yes, it does.

Q Okay. Does it contain known scalp hairs of Ron Williamson and Dennis Fritz and known pubic hairs of Dennis Fritz; did you mount those?

A This just contains the knowns from Fritz.

Q Okay.

MR. PETERSON: Do you want to look at these, Greg? Move for admission of 32 and 33.

(Whereupon, the following bench conference was had:)

MR. SAUNDERS: I object.

THE COURT: Okay. What is the objection?

MR. SAUNDERS: There's no showing of how they were taken care of inhouse custody. They were in -- how they were preserved; things that are very important in determining the integrity of this evidence.

MR. PETERSON: They're here, Judge, they're not -- we're not talking about contraband. They were mounted.

THE COURT: Is that the only objection?

MR. SAUNDERS: Yes, sir.

THE COURT: Overruled, 32 and 33 are received.

(Following the bench conference, proceedings continued as follows:)

MR. PETERSON: Yield the witness.

MR. SAUNDERS: I have no questions of this witness.

THE COURT: You may step down. Call your next witness.

MEL HETT,

having first been duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. PETERSON:

Q State your name, please.

A Melvin R. Hett.

Q And your profession or occupation?

A I'm employed as a criminalist by the Oklahoma State Bureau of Investigation. I work in the Northwest Regional Laboratory, Enid, Oklahoma.

Q Describe briefly the nature of your work.

A The nature of the criminalist's job and also what would be my work is to receive and analyze physical evidence for the purpose of examining the evidence, making reports, and oftentimes testifying in court.

Q How long have you been engaged in this work you've described?

A Thirteen years.

Q Please state what special studies or training you have undertaken to qualify you as a specialist in your work.

A I graduated in 1973 from Southwestern College in Winfield, Kansas, with a Bachelor of Science degree in Chemistry and Biology. The year following my graduation, I attended the University of Oklahoma in Norman for a period of one year in the graduate department in biology.

After that year I went to work for the Oklahoma City Police Department for three years from 1974 until 1977 as a forensic chemist, which is basically the same job duties as a criminalist. It's just another name for it. During my three years with Oklahoma City Police Department working in the laboratory at OSBI, I had some basic training at

OSBI originally on handling physical evidence, examinations of all types, starting first of all in drug analysis, then moving on the next year into what is currently most of my duties in the way of blood and body fluids and hair and fiber analysis, which I've spent most of my time since that date.

The training consists of working with another examiner for a period of time working duplicate samples, working test samples until I was proficient enough to work examinations on my own.

Other training I've had, I've attended four seminars with the Federal Bureau of Investigation. Two of these were on blood and body fluids, basic course and an advanced course with the FBI. Attended a two-week hair and fiber course with the FBI that was sponsored by them. Also, attended the International Symposium on Hair Comparisons approximately three years ago.

I've had several other short courses, such as one-day courses either sponsored by the Southwestern Association of Forensic Scientists of which I'm a member on either hair or fiber comparison. And the rest of the training has actually been in working with samples, making comparisons, and currently trying to improve myself in those areas.

Q How much time do you devote to the duties which you've described?

A Outside of additional supervisory duties where I'm assigned in Enid, the comparison of hairs and fibers compromises approximately 90 percent of my job duties.

Q What technical equipment is available for you to conduct these examinations?

A On hairs and fibers at the Northwest Regional Lab in Enid, the basic tools for hair and fiber comparisons are microscopes, as it would be in any laboratory. The tools that are available are stereo microscopes which are low-power microscopes which would only magnify to approximately 30 times.

The main tool for hair comparisons is a comparison biological microscope. What that basically consists of are two microscope stands that are side by side with an optical bridge in between the microscopes. In this way one can look at samples on two different microscope slides at the same time during a comparison of either hairs or fibers.

Other tools which are available, and these would be mostly in the way of fiber comparisons, would be a polarizing microscope. However, this is -- and as well as most examiners do not use a polarizing microscope very often in hair comparisons, but it would be available.

Q Did you prepare some illustrations to assist you in explaining to the jury what hair comparison is?

A Yes, I brought four charts along that I can use for that purpose.

Q Would it assist you in using these charts to explain to the jury exactly what hair comparison is?

A Yes, it would.

(Whereupon, State's Exhibits Nos. 34, 35, 36, and 37 were marked for identification.)

Q (By Mr. Peterson) Let me show you what's been marked as State's Exhibits 34, 35, 36, and 37. Are you familiar with those?

A Yes, I am.

Q And were these either done by you or prepared at your instructions?

A They were prepared for this case. They have been used in other education, however.

MR. PETERSON: I'd ask that he be allowed to step down and demonstrate to the jury the use of -- in hair comparison, using these charts.

THE COURT: Have you seen them?

MR. SAUNDERS: I have not seen them. Could I ask one or two voir dire questions before that, just one or two.

THE COURT: Well, approach the bench.

(Whereupon, the following bench conference was had:)

MR. SAUNDERS: I'd like to ask him if he prepared

them specifically for this case, or if these have been prepared -- have these been used for other types of cases.

MR. PETERSON: He already testified to that.

THE COURT: I think he's answered those. They were prepared for this case, but they have been used for other purposes.

MR. SAUNDERS: Okay. I have no objection.

(Following the bench conference, proceedings continued as follows:)

THE COURT: You may proceed.

Q (By Mr. Peterson) Mr. Hett, will you step down or however you want to do it and use those charts to explain to the jury, so that they have some idea as to what you have just been talking about, please. Whatever is convenient or comfortable for you and the jury.

A I'd like to get it so the jury can -- can the jury see these? Ladies and gentlemen of the jury, first might mention that in doing any kind of hair examination, there are several things which are in common to any hair that is looked at, any opinion that is given in a hair comparison.

Might explain, first of all, that a hair of any type, whether it be animal or human is much the same as an ordinary lead pencil in the way that its morphology or shape is.

MR. SAUNDERS: Excuse me, Mr. Hett. May I approach the bench, please.

(Whereupon, the following bench conference was had:)

MR. SAUNDERS: He can use them, but I don't think he ought to be able to lecture. I think he ought to respond to the questions Mr. Peterson asks --

THE COURT: Sustained.

MR. SAUNDERS: -- and use those in that manner. Thank you.

(Following the bench conference, proceedings continued as follows:)

Q (By Mr. Peterson) Okay. You were talking something about a lead pencil. Could you explain to the jury what you mean in showing this in relationship to a lead pencil, please.

A Yes, sir. First of all, we see several hairs on the chart here, several depictions or drawings of hairs. The hair is basically like an ordinary lead pencil. It has three layers which would correspond to the paint in a pencil, that would correspond to the cuticle or scale layer covering the hair.

The wooden portion of a pencil would correspond to the cortex and approximately the same size in human hair in relation to the other structures, which is where the pigment and other -- some other structures are found, which

I'll get into in a little bit.

The center portion termed the medulla is in the same relationship as the lead would be in a pencil. The ordinary pencil would also have two different ends on it; one would be the eraser end and a pointed end. The eraser type end on a pencil would correspond to the root of the hair where it is attached to either the scalp or part of the body. The tip of the pencil can have many of the same treatments; it can either be sharp, or it can be blunt cut, or several other treatments.

But as far as what we're talking about in the different morphology or the different structures of the hair, it's probably the closest thing that I could think of that it would be like; the cuticle, the cortex, and medulla.

Q And how many different classifications are there of hair as far as Mongoloid, Caucasian, that type of thing?

A Generally, there's considered to be three classifications. These would be racial characteristics or racial classifications. The first is Caucasian which would be white individuals; what we consider white; this particular structure that would classify it in that particular group.

The second one is Negroid or black, and the third is Mongoloid, which could cover American Indian and some other oriental groups. Could be classified in those three broad

areas. There are, however, interlapping occasionally between areas where it is often difficult to tell other than there are racial mixtures which may occur.

The Caucasian, as I mentioned before, has several characteristics that we classified into that group. First of all is the cross section, generally, a flattened circle. It would be more of an oval shape. The cuticle is generally thin. It can be up to medium and even some Caucasian individuals have very thick cuticles.

The pigment, generally, has particular distribution in size, fine to medium size; it's fine to medium size, and generally an even distribution of the pigment.

Negroid hair, however, is extremely flat which would give it a kinky or curly type texture as you would see it, basically due to the flat cross-sectional shape. Other characteristics, it -- on this chart it particular mentions a medium to thick cuticle, however, it can be extremely thin in Negroid individuals.

The pigment is generally medium to coarse in size and has some very obvious clumping or aggregations of pigment in very localized areas and very characteristic of Negroid hairs in general.

The third type, Mongoloid, as I mentioned, American Indian groups and also other oriental groups. Generally, a very round cross section as compared to Caucasian and

Negroid. The cuticle in most cases will be very thick in comparison to the other two groups.

The pigment is generally coarse, and there is generally quite a lot of pigmentation which would give the hair its particular color. Pigment is what gives hair its color.

So, these would be the three racial groups and also the characteristics which would classify them into those particular racial groups.

Q You mentioned something about the different characteristics inside the cortex; I believe that's what you referred to. Is there anything that distinguishes between Caucasian, Negroid, and Mongoloid in the cortex -- if I've got my terminology correct.

A Yes, the cortex as I -- using the pencil again -- would be the wood part of the pencil which is generally in this area. (Indicating.) As I mentioned previously, the pigment seem to be the main thing that we'll differentiate between different racial groups. Caucasian is generally very -- for the most part very even distribution, very general and even. Negroid will generally have clumping or aggregates of pigment grains, very localized; can be seen very easily under a microscope. A Mongoloid will generally be larger pigment grains than Caucasian, generally more dense pigment as far as the cortex goes. Those would be

the main differentiations between these three broad racial groups.

Q To use your terminology, is there anything distinguishing about the lead of the pencil?

A Between racial groups?

Q Yes, sir.

A Occasionally, yes, but this is not always very clear-cut between racial groups. The medulla or the center portion of the pencil which corresponds to the lead, it can in Caucasians run into any number of widths, and the same way with Mongoloid. On the -- as a general rule, though, Mongoloid is for the most part wider, or it takes up a larger space than Caucasian would. However, there are several Caucasian individuals that can have very wide medulla, so it's not a real hard and fast rule as far as racial characteristics. Those are usually based on shape and the way that the cuticle or the pigment is presented in the cortex and also on cuticle thickness. Those are the three main characteristics that are used.

Q What happens when you have a person who is the product of a mixed marriage, say, American Indian and Caucasian? Is the -- do those characteristics in the hair mingle, so to speak?

A Yes, they can. This is common, especially for Oklahoma, a lot of racial mixtures that we see in hair

comparison in Oklahoma. And in talking with individuals from other areas of the State this seems to run a very high incidence here in Oklahoma -- seems to be a melting pot. But because you have someone that is Caucasian and someone that is Mongoloid, for example, you wouldn't be able to predict what their hair would look like. It's very difficult to do, so you can't actually just predict something like that.

But generally, what you will see in a classical mixture will be somewhat in between these characteristics. It will probably be hair -- scalp hair, especially, that's more round than oval, somewhere in between. However, I have seen perfectly round Caucasian hair that one might think has some racial mixture to it. So, there are -- it's kind of a hybrid between the two if you were looking for a classical, racial mixture.

Q Is there anything else of significance that would assist the jury in understanding your testimony in that c hart?

A On this particular chart -- only, actually, one thing.

Q And what would that be?

A The particular diagrams that would depict a hair beside each one of the racial groups. For example, we'll start with Mongoloid hair. Because of its shape being

perfectly round, Mongoloid hair will generally be very straight, and generally it will be, for the most part, more coarse than other hairs, such as Negroid or Caucasian. Also, on this it's generally rather stiff. It can be very large diameter; however, it is not always large diameter. This is one thing in racial groups that there has to be some allowances made for.

Generally, there is very little fluctuation in the diameter. It generally runs very consistent in its size. Negroid hair, on the other hand, because of its flat shape, would tend to be very curly or coiled. This happens very often, and this is basically because of the shape.

Caucasian hair -- some Caucasian hairs can be very straight; others can be very curly. A lot of this is a function of how oval the hairs are. The more oval or flat the hair is, generally the more curly it will be, excluding anything such as artificial treatment like permanent or waving or things like this. You can take a very straight hair and introduce a curl to it, but it will generally be of the particular shape that it originally was.

So, this is -- there'a a lot of variations, and this is one of the points I'm trying to make. So, that should be all on that particular chart.

Q What does State's Exhibit 35 exhibit to you, sir?

A Okay. State's Exhibit 35 is part of two other

State's Exhibits, No. 34 and 37. These would all go together. What these depict are various characteristics that are observed microscopically or under microscopes in a hair comparison. Generally, it's considered that approximately 25 characteristics are used in a hair comparison. And the purpose of these three State's Exhibits are to demonstrate some of the differences that are seen within different individuals.

Q Okay. You have different classifications, scale size, cuticle function -- what are those -- what do those mean to you, sir? For example, just start at the top.

A Starting on the top, the cuticle, as I mentioned before, would correspond to the paint on a pencil. This would be the outside layer. Actually, what it is are several overlapping scales which can often be seen in a microscopic view of a hair. So, when we're talking about scales, we're actually talking about the cuticle area of a hair.

In this top row, we're talking about scale protrusion. These are just three depictions of what can be see. There are a great number of variations within this. For example, there is what we term slight protrusion where the scales would lay very flat on the surface. They would not stick up very much at all.

A medium protrusion would be where the scales would

protrude above the surface of the hair and actually be seen sticking above it, or you can have great protrusion. Now, it's not limited -- you understand this -- on these three categories. There are several variations, and this can also vary. On one individual it can vary from the root of the hair to the tip of the hair. There can be variation there, also. Just because someone would say that there is a medium scale protrusion on a hair does not mean that the entire sample may be that way. There is variation on a single individual. So, this is what we're talking about in scale protrusion.

Scale size; it can be, for example, small, medium, and large. The scales, as far as the distance between them, will vary between hairs. This is a difficult characteristic to observe, but it is present on hairs.

Cuticle thickness seems to be a very important factor, especially in determining what racial origin a hair may have come from. As we mentioned before, on a thick cuticle -- very thick cuticles generally belong to Mongoloid or Indian-type groups. Medium to thin can belong to either Mongoloid or -- excuse me, Negroid or Caucasian individuals generally in most respects. Even within a Caucasian group there is variation between the cuticle thickness, and this can also vary from the root to the distal part or the tip of the hair. There can be variations there that can be

introduced from either weathering or chemical treatment, any number of things, so it's not only what is present in the hair, but the environmental factors play a great deal to these characteristics.

Within certain individuals the cuticle fluctuation actually is the -- does the cuticle thickness vary any or if any. Some individuals have no cuticle fluctuation which would mean it would be the same thickness from the root of the hair completely out to the tip of the hair. Other individuals, there are slight variations where there -- it seems to kind of pulsate where it will be thin in one area, thick in another.

There can be great variations where it becomes extremely thin all the way to extremely thick, all the way -- within one hair. And this can vary between individuals; it can also vary within one sample.

Cuticle color, oftentimes, it can be either a clear, kind of a milky color, or it can be yellow. There can be other colors that are introduced from dying or bleaching where color would be either stripped or added into the hair, so it's not just these three classifications. You understand, these are examples of what is often seen. Some -- just some very clear-cut basic examples.

Now, moving on to the -- away from the cuticle area into the cortex, we're talking about pigment which is a

very important characteristic within hair comparison, also individualizing hair samples. Pigment distribution can range anywhere from very heavy which would -- in other words, that would be dense if there's a lot of pigment within that hair, which, again, gives rise to color. The more pigment, the darker hair would be. The less pigment, the lighter hair would be until it's either blond, or if a hair is gray, has no pigment in it. So, it can range anywhere from a light distribution through average to heavy.

And this can even -- will even be differences from the root to the tip of the hair depending on sun bleaching and other artificial, chemical reactions such as bleaching, sun bleaching, or other chemicals. Pigment distribution in some individuals can either range toward the cuticle where there is more pigment to the outside of the hair than it would be the inside. Generally, most hairs are a general pigment distribution where it is fairly even, but there can be variations within that. I believe that's all on that one.

Under the category pigment gapping, this would be on State's Exhibit 34. There can be a range of characteristics from a shallow gap. Now, what's actually meant by gapping is an absence of pigment where there is just no pigment in that particular area. This can either run from a deep gapping which would go further inside the hair to a medium gapping to shallow or even no gapping at all. No gapping

whatsoever. This can happen. These can either be very long gaps, medium gaps, or very narrow gaps; or as I mentioned before, no gap at all. These will vary between individuals.

As far as the -- excuse me, as far as -- another characteristic which is present in the cuticle is a term called cortical fusi. What these cortical fusi are are small air gaps which are included in a hair as it grows. These in this particular depiction under absent, there are no cortical fusi whatsoever which we're able to see. It can be a sparse density, or it can be very numerous where there's a lot of these. And hairs, generally -- in human hairs, there will generally be more cortical fusi at the root area, and these will tend to disappear further out in the hair.

These can either range part way out in the hair, completely through the hair, or not be present at all. And it can be various sizes from small to medium to large. One thing that is not depicted on here is that there can be different distributions of these cortical fusi either toward the center portion of the hair or out toward the cuticle, the outside of the hair. There can also be mixtures of cortical fusi, so it's not limited to just these categories.

The medulla, that would be the lead of the pencil, can

either be absent where it is not actually seen in the hair whatsoever, can range anywhere from there to what we term fragmented which would be an occasional medulla in the center of the hair, discontinuous which is occasional gaps, or completely continuous which would be like a pencil where the lead would run completely through it. There can be these variations. Can be different sizes such as very thin medulla, be like a very small line running through a hair as you would look at it under a microscope. Can be either medium size or large.

Now, as I mentioned again, these are not the only categories that are present. There can be mixtures of these in an individual. There can also be variations of the thickness of the medulla within a single hair. These are all characteristics that must be accounted for in hair comparisons.

These cells at the bottom are various medulla structures. Occasionally one can see the type of structure that is in the medulla. That can either be a bulb-shape cell, other shapes, or they can be very amorphous which means nothing more than they have no particular shape. These are all variations that can be seen.

The last chart, State's Exhibit 37, depicts several other types of characteristics that are seen in a hair comparison. Pigment distribution, as mentioned before again,

generally in Caucasians there's a general or an even distribution for the most part, but there can be other characteristics seen. There can be clumping. There can be streaking and variations within that, so it's not only Negroid individuals that would have the clumping. This can happen, especially in the way of streaking, so it can be either a general distribution, there can be some clumping. Even in Negroid individuals there are different amounts of clumping, and also, occasionally, some clumping within Mongoloid individuals. So, these are just some depictions of different ways that hairs would look, different microscopic characteristics, clumping, streaking. There can be slight clumping, average, or very dense clumping where most of the pigment would be in definite aggregates or definite little pockets within the hair.

There can be a great number of variations within that in the way of shapes, the length of the streaks and clumping, the size of them, also, small, medium, large, any number of variations and mixture of that even within one hair.

You make your pigment -- again, a pigment would give color to the hair. That's what we see generally in a natural hair. It can either be fine pigment; it can be coarse or mixed. There can be any number of variations within this category, also. Pigment shape can vary from

round to oblong to various shapes that are oftentimes very difficult to describe.

One last category here, the pigment in the cuticle, occasionally, this will happen in individuals where when the hair is growing, pigment grains become included in the cuticle. And this can be either from none whatsoever to occasional grains to a large number of pigment grains within the cuticle of a hair.

As I mentioned before, there is -- I mentioned approximately 25 characteristics. That is an estimation of the characteristics that are observed under a microscope, and that a microscopic comparison is based on, so 25 is not an exact number. There may be more -- there may be several categories that can be used. As a general rule, it is considered approximately 25 characteristics in hair comparisons.

Q Would it be correct to state even in one head of hair there could be various colors in one set of head of hairs?

A Yes, sir, there can be various colors, also various specific types of hair on one individual. One of the most classic examples of this would be someone that had salt and pepper hair, where they have both gray hairs and pigmented hairs. Those would be some very obvious differences that can be seen with the naked eye.

Q In your course of work did you have an occasion to receive from -- my mind's gone blank -- Susan Land certain exhibits?

A Yes, I did.

Q And relative to the [redacted]?

A Yes, sir, I did.

Q Let me show you what's been marked as 32 and 33 and introduced into evidence. Would you look at those, please.

A (Witness complies with request.)

Q Did you receive those on 9/19/83?

A Most of the samples I did, either the actual slides and the slide holders. There are a few slides in here that I prepared myself from other samples.

Q Okay.

A But the majority of these samples, yes, I did receive these from Susan Land on September 19th, 1983.

Q And there are some hairs in there that you mounted yourself; is that correct?

A That's correct.

Q Okay. And did you conduct an examination of certain known and unknown hairs?

A Yes, I did quite a large number of examinations.

Q Okay. Did you receive a very large number of known hairs from various people that were submitted to you

by law enforcement?

A Yes, sir, I did. There were several individuals that were submitted as known hair samples for comparison.

Q Did you receive known hairs from persons named Ron Williamson and Dennis Fritz, both scalp and pubic hairs?

A Yes, I did.

Q And are they in those State's Exhibits that you have there in front of you, State's Exhibits 32 and 33?

A Not both of them, no, sir. I have scalp and pubic samples from Dennis Fritz; however, not from the other individual you mentioned.

Q Okay. Did you conduct examinations of unknown hairs? Did you receive some unknown hairs, also?

A Yes, I did.

Q Did you make a comparison between the unknown -- the unknown hairs with all of those known hairs that you received from the various people? Did you compare the two, the known with the unknown?

A All of the unknowns with all the knowns?

Q Yes, sir.

A No, sir, I did not. There were some samples that I did not make comparison of.

Q Okay.

A There were other samples that I did.

Q Okay.

A But not in each and every case.

Q Did you have an occasion to compare the known scalp and pubic hairs of Dennis Fritz and Ron Williamson to the unknown hairs that you received?

A Yes, I did.

Q What tests and examinations did you perform on those exhibits?

A First of all, on State's Exhibit 33, this is a slide holder which contains 14 microscope slides. All of the microscope slides within State's Exhibit 33 are known scalp hair and pubic hair samples from [redacted]. These were used to, first of all, compare to unknown or question hairs that were submitted to me in this case.

The second slide holder, State's Exhibit No. 33, contains 15 microscope slides. The majority of these are questioned or unknown samples that were furnished to me for comparison. These would be, as I mentioned before, unknown samples.

The remainder are known scalp and pubic hair samples from Dennis Fritz. These were also used in the comparison.

Q Did you perform comparison tests between the known and -- the known of Dennis Fritz, Ron Williamson, and [redacted] in relationship to the unknowns?

A Yes, I did.

Q Could you explain to the jury or tell what your

test or examination consisted of, please.

A The examinations that I performed were between certain known scalp and pubic hair samples. Among these knowns were from Dennis Fritz, Ron Williamson, and [redacted]. These were compared to certain unknown or questioned samples within the case that were furnished to me.

The samples were compared by placing them under a stereo microscope which is a low-power microscope, to get some gross characteristics that could be seen. Many of these characteristics I have not actually covered on the charts that I spoke of earlier.

After a certain amount of comparison there, they were then placed under a comparison microscope. This would be the two miscroscopes stands that are connected by an optical bridge. First of all, the known hair samples are observed microscopically under a microscope to determine what the microscopic characteristics of the known sample consists of using many of the same characteristics that I explained to you on the charts, such as the cuticle, differences in the cuticle, differences between hairs in the same sample, that -- the cortex, the various structures that I had talked about before, the pigment, the distribution of the pigment, amount of streaking, cortical fusi, ovoid bodies, which is another term that I did not discuss on the chart -- that

was not present on the chart. But the characteristics are observed under the microscope to determine what the range of each particular known sample is.

With this in mind, these are compared, then, to the unknown samples to determine whether or not the questioned or unknown sample is consistent microscopically with a particular known sample. This is done on a comparison microscope at this point.

Once this is determined an opinion can be formed about the comparison. There's generally three major ways -- three major opinions that can be formed at this point.

Q Okay. Is there some way for you to determine whether a hair is a pubic hair, head hair, chest hair, moustache hair, facial hair -- is there any way for you to determine that by looking at them through a microscope?

A Yes, there is. This is a very common request, and it's very commonly done with hair examiners. The best way I can explain this is to go through kind of a way of doing this. When I encounter a hair of any type, one of the first things I do is to look at the hair, determine whether or not it's even human.

There are several hairs that we run into in criminal cases and all other types of examinations where the question is is it actually human or some other animal. If it's determined that it is human which comes from a

microscopic comparison and also a visual comparison, there are certain categories that it can be placed in. In particular cases, if a hair is nonhuman, it may be of no importance to the case whatsoever because there are no known samples to compare it to. It just happens to be there.

If it is human, it is then looked at to determine what body origin it may have come from, whether it be several broad categories, scalp hair, pubic hair, facial hair, other body hairs, such as facial hairs, eyebrow hairs, for example. Many of these hairs are difficult to work with, difficult to examine. Say, for example, a single arm hair has, for the most part, very little value in a comparison. However, scalp hairs because of the sufficient variation between individuals can be examined and can be compared, but it is a microscopic examination that would determine what is a scalp hair, what is a pubic hair. Those are the main two categories that are worked with in criminalistics, and occasionally, other body areas, such as facial hair or just general body hairs.

Q You received a hair from Susan Land identified as hair from washcloth; did you not?

A Yes, sir.

Q And what kind of hair did you determine that to be?

A Well, sir, there were several hairs submitted from the washcloth. I believe there were scalp hairs, also pubic hairs, and there were some hairs that were not of evidentiary value, be either because of their length or possible body origin. But I did receive both -- I believe there was one pubic hair. I believe there were some other scalp hairs, also, so there were several.

Q Okay. Did you make a comparison of that one to narrow it down -- that one pubic hair found on the washcloth, did you compare it to an individual by the name of Dennis Fritz that you had the known sample from? Did you make that comparison?

A Yes, I did. Dennis Fritz and also other known samples.

Q Right.

A Other than Dennis Fritz.

Q And what did your test -- your comparison reveal?

A There was one pubic hair in particular that I examined. This particular pubic hair that I compared after comparing this to the known pubic hair sample from Dennis Fritz, it's my opinion that the questioned pubic hair from the washcloth and known pubic hairs from Dennis Fritz are consistent microscopically and could have the same source.

Q Did you find two scalp hairs from the washcloth, also?

A Yes, sir, I did.

Q And did you make a comparison of those scalp hairs to the Defendant, Dennis Fritz, and the Defendant, Ron Williamson?

A Yes, sir, I did.

Q And what did your test reveal?

A After comparing these two particular scalp hairs from the washcloth to both Williamson and Fritz, and there were other comparisons that had been performed to individuals other than these two, I might add; it's my opinion that the two scalp hairs from the washcloth and scalp hairs from Ronald Williamson are consistent microscopically and could have the same source.

Q Did you compare a pubic hair -- a hair found from under the -- from the floor under Ms. [redacted]?

A There were several pubic hairs that I made comparisons on.

Q Your Item 27.

A Yes, sir, there was one particular that I did make comparisons on.

Q And did you compare that hair with all -- with a number of other individuals that were sent to you?

A Yes, I did.

Q And after your comparison, did you -- did your test -- what did your test results reveal?

A There were two pubic hairs that I made an examination of. The first one, it's my opinion that it is consistent with [redacted]. There was a second pubic hair that I made a comparison of. I compared this to [redacted], compared it to Williamson, also compared it to Fritz. There were other individuals I also made comparisons with that were not consistent. This particular opinion on one of these pubic hairs is that the questioned pubic hair from the floor which would be No. 27 and known pubic hairs from Dennis Fritz are consistent microscopically and could have the same source.

Q Did you receive two hairs from torn panties and other hairs?

A Yes, sir, there were others. There were two in particular that have reference to this case.

Q Okay. Did you also receive one other hair from that -- those torn blue panties?

A Yes, sir, there were a total of three pubic hairs that I examined.

Q Okay. Were you able to compare the hairs to Ms. [redacted], the Defendant Williamson, and Defendant Fritz, and the others? Did you make those comparisons?

A Yes, I did.

Q And what did your tests reveal?

A Of the three pubic hairs from the torn blue

panties, one of the pubic hairs is consistent microscopically with [redacted] and could have the same source. Two of the pubic hairs, these are two different pubic hairs for a total of three. Two of these pubic hairs were not consistent with [redacted], were also not consistent with Ronald Williamson, and there were other comparisons. However, these two pubic hairs were consistent microscopically with Dennis Fritz and could have the same source.

Q Did you compare hairs that you received from the bedding?

A Yes, I did. There were -- well, quite a large number of pubic hairs and also some scalp hairs or head hairs.

Q Dealing with the public hairs, if you'll go to that area first.

A Yes, sir.

Q Approximately how many pubic hairs did you receive?

A I examined approximately 31 pubic hairs from the bedding.

Q Okay. And along with the Defendant Fritz and the Defendant Williamson, you also had the victim, Ms. [redacted]; is that correct?

A That's correct.

Q And numerous other people's hairs; is that correct?

A Yes, I did.

Q Did you make a comparison test and examination of the pubic hairs that were recovered from the bedding?

A Yes, I did.

Q And what did your tests reveal?

A Of the -- I believe there were 31 pubic hairs that I made an examination and report on. Twenty-one of the pubic hairs from the bedding were consistent with [redacted] and could have the same source. There were two pubic hairs from the bedding that were not consistent with [redacted]. They were consistent with Ronald Williamson; these were two pubic hairs, and could have the same source.

There was seven pubic hairs that I made a comparison of from the bedding that were not consistent with [redacted] that were, however, consistent with Dennis Fritz and could have the same source. There was one last pubic hair that I made a comparison of that was not consistent with [redacted]. It was not -- also not consistent with Ronald Williamson. This was a pubic hair that there were both some consistent and some inconsistent characteristics; therefore, I reached no conclusion on whether or not that could have come from Dennis Fritz, so

it was basically no conclusion on this particular pubic hair.

Q Turning your attention to the scalp hairs. You received various scalp hairs from different items, such as the catsup bottle, the belt, socks, et cetera, and various other things you received hairs. You received a large number of hairs, scalp hairs, from different objects that were -- that they were removed from; did you not?

A Yes, sir, that's correct.

Q Direct your attention to two scalp hairs from the washcloth. Did you make a microscopic comparison of those hairs with Ron Williamson, Dennis Fritz, [redacted], and numerous other people that their hair was submitted to you?

A Yes, sir, I did perform several comparisons, both with [redacted], Williamson, Fritz, and there were other individuals that I made comparisons.

Q And what did your tests reveal?

A My opinion is that the two scalp hairs from the washcloth and known scalp hairs from Williamson are consistent microscopically and could have the same source.

Q Direct your attention to the -- and we're still dealing with scalp hairs -- to the bedding again, please. Did you have an occasion to make comparisons of scalp hairs that were submitted to you from the bedding?

A Yes, sir, I made several comparisons of that.

Q Okay. Did you compare those hairs to [redacted], Dennis Fritz, Ron Williamson, and numerous other people?

A Yes, sir, I did.

Q Okay. Were you able to -- what did your test results reveal?

A There were several scalp hairs that I did make comparisons on with varied results. Thirty-three of the scalp hairs that I found -- that were supplied to me in the bedding, I compared to [redacted]. They were -- of these 33, consistent with [redacted] and could have the same source. There was one scalp hair from the bedding, I made a comparison to [redacted]. It was not consistent with her; however, it was consistent with Dennis Fritz and could have the same source.

There were also included in this approximately 18 dark scalp hairs that were not consistent with Carter, Fritz, Williamson, or any other individual that I have been supplied with so far.

Q Turn your attention to the scalp hair found underneath [redacted]. Did you make a microscopic comparison of those hairs --

A Yes.

Q -- to the known hairs of Dennis Fritz, Ron

Williamson, [redacted], and numerous other people?

A Yes, sir, I did.

Q And what did your test results reveal?

A I reported comparisons on three scalp hairs from Item 62 which is from underneath [redacted]. Two of the scalp hairs after comparison, it's my opinion that they are consistent microscopically with [redacted] and could have the same source. There was a third scalp hair that was not consistent with [redacted]. It was, however, consistent with Dennis Fritz and could have the same source.

Q Now, Mr. Hett, when -- for the jury's benefit and my benefit, when you are making an examination of hairs, it is not done as rapidly as you've talked about; is it?

A Just to --

Q You don't just look and there it is, and you move on to the next slide; do you?

A No, sir. When I'm making a microscopic examination, what I'm talking about is a detailed microscopic examination, it often takes -- or it can even take up to several hours on one hair in some situations. Most other situations, it would not take that long, but it does take a great deal of time to examine the range within a known hair sample. For example, to determine what that range is, and then to make comparisons to however

many samples that are present within a case as unknowns, so it is a very lengthy comparison. It's not just looking at a hair and saying, yes, that matches that, doesn't it. It's a detailed microscopic examination.

Q If you know, how many characteristics did you compare, if you know off the top of your head?

A I don't generally count every characteristic or go through a check list. Most examiners do not use a check list to say that I looked at this, this, this, this, and this; but approximately 25 characteristics were used. Actually, everything that's present in the hair is used as a characteristic, so this would be in the neighborhood of 25.

Q Must all of the characteristics be identical before you consider the hair as the same?

A I wouldn't say identical. Each individual hair is identical only to itself. It's my understanding of identical. What is actually done is the characteristics are compared from a questioned sample to a known sample. If they are either indistinguishable or there are no unaccountable differences between a questioned sample and a known sample, is then considered to be microscopically consistent. If there is a characteristic in a questioned sample that just cannot be accounted for because of any reason -- let me give you an example. An accountable reason could be something such as length of the hair. This

can be accounted for, especially if an individual leaves a six-inch hair somewhere and goes and gets a haircut. Because it's not six inches long anymore, this could be accounted for, so this is an accountable characteristic. So, I'm talking about if there are no characteristics that are unaccountable or basically if -- another way of saying this is indistinguishable, the hair is included, and it is microscopically consistent with a known sample.

Q Are there varied results that you can get from a hair examination?

A Yes, sir. There's generally three main results can be considered, but there's actually five or more ways of reporting hair examinations. One is that hairs are consistent microscropically and could have the same source. This means that they match if you want it in one word.

A second conclusion can be that the hairs are not consistent microscopically; therefore, in the examiner's opinion they would probably not have the same source.

A third way of reporting hairs is that there are some consistent characteristics, yet there are some unaccountable differences. They just cannot be accounted for, but there's still enough to match most of the characteristics into a hair. In this kind of a case there would be no conclusion as to whether it could or could not have had the same source.

Then, there are several other ways of reporting, such

as a hair that does not have sufficient identifying characteristics. An occasion such as this would be a hair that is very short; it's too short to actually make a comparison. It may be too damaged to make a comparison; therefore, you may be able to just say that it's a -- probably a Caucasian scalp hair or probably from some other body area. It just does not have enough characteristics to base a comparison on.

Q Okay. In your analysis of the known and unknown hairs of the Defendant -- pubic hairs of Dennis Fritz; okay? You're with me?

A Yes, sir.

Q The pubic hair. How many as a total pubic hairs were microscopically consistent with that of Dennis Fritz? Do you have a count offhand?

A There were 11 pubic hairs that I reported that were consistent with Dennis Fritz.

Q And Ron Williamson -- pubic hairs?

A Ron Williamson, there were two pubic hairs.

Q Direct your attention to scalp hairs. How many scalp hairs were microscopically consistent with that of Dennis Fritz?

A There were a total of two scalp hairs consistent with Dennis Fritz.

Q And the Defendant, Ronald Williamson?

A There were also two scalp hairs consistent with Ronald Williamson.

Q Okay. Does the fact that you have pubic hairs which are different than scalp hairs -- you follow me so far?

A Yes, sir, scalp hairs are different than pubic.

Q And you find both of those sources at a crime scene, is there any significance attached to that?

A I believe there is. A single hair match, say, for example, a single scalp hair match in a case would have a particular significance. There is, say, one scalp hair that matches a particular source. This has a particular significance that if that was the only evidence present in a case, the significance would be fairly low in my way of thinking.

THE COURT: Let me stop him. Counsel approach the bench.

MR. SAUNDERS: Yes, sir, please.

(Whereupon, the following bench conference was had:)

MR. SAUNDERS: He keeps using the word matches, and I don't think he is capable of saying that first of all.

THE COURT: Don't give an opinion as to what he feels.

MR. SAUNDERS: Twice he's given --

THE COURT: Wait. Is he going to give an opinion

as to the weight of the evidence. He cannot do that.

MR. PETERSON: I understand.

(Following the bench conference, proceedings continued as follows:)

MR. PETERSON: Yield the witness.

MR. SAUNDERS: Thank you. Please the Court, if I may cross?

THE COURT: Yes.

CROSS EXAMINATION

BY MR. SAUNDERS:

Q Mr. Hett, if I should ask you a question because of my ignorance doesn't make any sense to you, will you tell me that question doesn't make any sense and let me restate the question.

A Yes, sir.

Q All right, sir. And again, I may use some words that are -- are not words of art, are not proper words, and I want to use the proper words, so when I use a word improperly, you tell me. All right, sir?

A Yes, sir, if I don't understand the question, I will.

Q Well, just tell me if that's not a proper usage or that's not a proper concept or something because I don't want to mislead you, and I don't want -- I want us to communicate and understand each other. Is that a fair deal?

A Yes, sir.

Q Before I get started, you had an occasion to take some hair samples to McCron Laboratories in Chicago, Illinois; did you not, sir?

A Yes, sir, I did.

Q When was that done?

A That was done in, I believe, March. I don't recall the exact date.

Q Do you have any --

A It was on -- excuse me, that was in February, the 25th of February, 1988.

Q How did you get them up there?

A I personally took them to McCron Research Institute.

Q All right. Are those the samples that you personally took up there that you've got in possession right here?

A Yes, sir, these and other samples.

Q Did you take all of the samples that you had said were microscopically consistent and could have come from the same source as Dennis Fritz, you took them to McCron Laboratories?

A Yes, sir, I did.

Q Who did you deliver those to?

A This was to a Dick Bisbing.

Q All right, sir. And you turned those over to Dick Bisbing; is that correct?

A Yes, sir.

Q Then you gathered up the samples later and brought them back to OSBI laboratories; is that correct?

A Yes, sir, they were returned to me.

Q How much time were these samples in Mr. Bisbing's possession?

A His actual possession before he turned them back to me, approximately five to six hours.

Q Five to six hours, and then you took them back to -- you took them back with you?

A That's when he said he was through and gave them back to me.

Q All right, sir. And those are the same samples that we're talking about here. Just for the record, those are the same samples that you've got there before you are the ones you took up there and gave to Dick Bisbing -- among others?

A Yes, sir, among others. I took a -- I took every slide I had up there, but these are the ones that he did look at, yes, sir.

Q All right, sir. Now, you've rendered some opinion about the hair of -- the known hair of Richard -- excuse me, of Dennis Fritz; have you not, sir?

A Yes, sir.

Q Is there anything of an unusual nature about the known hair samples of Dennis Fritz?

A Unusual as far as --

Q Yes, characteristics.

A Not what I consider to be extremely rare characteristics or extremely unusual.

Q That's what I mean. I was talking about rare characteristics. That's a pretty common color, pretty common size, most all characteristics are pretty commonly found; is that correct?

A Well, I have seen most of these characteristics before, yes.

Q All right, sir. So, there would be nothing that would in and of itself -- I'm not talking about a comparison, but in and of itself there was nothing to distinguish the hair of Dennis Fritz as opposed to any other type of hair?

A I wouldn't say nothing.

Q Well, I'm not talking about characteristics. Certainly he's got a combination of characteristics everyone doesn't; is that what you're saying?

A Yes, sir, everyone has particular combinations of characteristics that would be different from --

Q Some combinations are extremely rare; is that

also a fair statement?

A They can be, yes, sir.

Q But that's not the case with Mr. Fritz?

A There was -- would be nothing that I would say was extremely rare.

Q All right, sir. You are a law enforcement officer; are you not, sir, you're commissioned?

A Yes, sir, I am.

Q And on occasions carry a gun?

A On occasion.

Q Isn't hair examination a subjective science -- now, let me define subjective for you. You rely upon the person's ability to observe and qualify observations. That would be my definition of subjective. Isn't it a -- using that definition, isn't it an objective science?

A I'd say it would be an objective looking --

Q I mean --

A -- with subjective -- it is somewhat subjective. It depends on the person's observation of particular characteristics that are there.

Q Is the science such that equally qualified individuals could disagree as to an opinion about a given sample?

A That can happen, yes, sir.

Q And both of them be equally qualified?

A Yes, sir.

Q Both of them be highly qualified?

A Yes, sir, that can happen.

Q So, it's -- we're just talking about an opinion where individuals may differ. I'm talking about qualified individuals may differ, and that's the nature of the science we're talking about; isn't it?

A Yes, sir, especially with the word may differ.

Q Okay.

A They may also agree.

Q Sure. Sure. Let me ask you this about the science. Except on rare occasions, except on rare occasions, can hair comparisons ever be used for positive identification -- except on rare occasions?

A Except on rare occasions, meaning -- positive identification to me would mean a science such as fingerprints --

Q Yes, sir.

Q -- where that is considered to be a positive, personal identification. Hairs, generally, considering one scalp hair cannot be positively identified as coming from one individual and eliminating all other individuals on the face of the earth unless, of course, a comparison was done, and they were all eliminated.

Q All right, sir. So, you do agree that it is not

a positive identification science?

A It is not a means of personal, positive identification.

Q So, your opinion is not -- and you're not telling these jurors that the evidence hair absolutely came from Dennis Fritz, the ones that you have said were microscopically consistent and could have come from the same source?

A No, sir, I'm not positively identifying Dennis Fritz by a hair comparison.

Q All right. You used a couple of words back here that I find unusual, and you tell me if I've got a right to find them unusual. Couple of times you used the word matched. That's really not a word of science or a word of art in your science; is it? You don't ever say these hairs match. You say they are microscopically consistent and could have come from the same source; isn't that the preferred and accepted opinion?

A That's correct. Generally, the word match would be more of a slang word that might be used.

Q So, that's not a word of science, and that's not one of the acceptable opinions generally accepted in the science of hair comparisons?

A I have heard hair examiners use that term. Some may even prefer to use it, such as a positive match.

Q Okay. That's what I'm talking about, a positive match.

A And people can --

MR. PETERSON: Your Honor -- counsel, let the witness answer.

MR. SAUNDERS: I'm sorry.

Q (By Mr. Saunders) Go ahead, sir.

A I have heard it used. I've even heard it reported where a questioned hair and a known hair microscopically match. This has even been suggested for some terminology in hair comparisons. There are different ways of saying the same thing.

Q Well, would that be that rare occasion when you had an unusual characteristic such that you could feel more comfortable using the word match as opposed to could have come from the same source?

A That they match? I tend not to use the word match. I tend to use consistent microscopically.

Q That's the reason I -- we talked about this before, and that's the reason I wrote those down. I thought that was unusual usage for you because we've talked about this before.

A Yes, sir.

Q How long did you have custody of all these hairs you're talking about -- how long did you have them up there

at the OSBI?

A I've had them since -- majority of these since September of 1983.

Q When did you render an opinion concerning -- your first opinion concerning these samples?

A I believe the first report was in December of 1985.

Q So, that would be like two years after you had gotten all of the samples?

A Approximately two years, yes, sir.

Q It didn't take you that much time to examine all those samples; did it?

A There was a length of time between when I received them and when I reported them. I had -- this was not the only case I was working on if that might help you.

Q Well, I do appreciate that and understand that. Let me ask you this: How were these samples preserved up there when they're in your custody? Where are they?

A Where are they?

Q Yes, sir.

A They are generally in a secure laboratory area during the entire length of time I would have them. Either that, or if I'm not currently looking at them, they would be locked into an evidence storage area.

Q Would you take them out and put them back in on

occasion when you wanted to work on this or had the opportunity to work on this?

A Yes, sir.

Q Are there other hair samples in the same location?

A These were always placed within the same box, so there would be no hair samples from other cases --

Q All right. What I'm --

A -- being out at the same time.

Q Do you have a locker there where you keep the evidence for security?

A Yes, either lockers -- it is a secured laboratory, the laboratory area.

Q And there's other hair evidence placed in that same locker at times?

A Possibly there could be, yes.

Q We're talking about the effect of time in our prior discussion about this, about the effect of time, whether time would have any effect on the quality of the evidence. And I think you indicated to me that it could under certain circumstances have some effect, just depending on some variables. Would that be a fair statement?

A Yes, sir, and also depending on what type of evidence we're talking about. Time would be a lot more

important for some types of physical evidence than others.

Q Well, we're talking about hair now; is that what you were talking about?

A Yes, sir, I just wanted to make sure we were clear on it, yes, sir.

Q Okay. As far as hair is concerned, time would -- could have some effect, depending on some variables. For instance, -- have you answer that question: Could time have an effect, depending on some variable -- would you agree with that?

A It can in some cases.

Q A good example of that would be someone like me who's going gray by the hour; all right? If you take a sample from me now and then a sample from me, say, six months from now, the likelihood of you getting more gray hair, assuming that I'm graying like I say I am, is greater; is it not, sir -- on that second sample?

A On the second sample that you would have more gray hair?

Q Yes.

A In numbers, yes, probably so.

Q All right, sir.

A If you were progressively getting gray by the hour.

Q So, hair color would be one of those variables

that time would have some effect on?

A It can in some cases.

Q In some cases. That's what I'm talking about.

A Yes, sir, in other cases it would probably have no effect.

MR. SAUNDERS: Thank you, Mr. Hett.

REDIRECT EXAMINATION

BY MR. PETERSON:

Q Mr. Hett, in your experience as a hair examiner have you in your experience or have you ever heard of anyone in your profession having the experience of having an unknown hair or hairs that were microscopically consistent to two or more different individuals?

MR. SAUNDERS: Objection. May we approach the bench.

(Whereupon, the following bench conference was had:)

MR. SAUNDERS: This was just the type of testimony that the Court discussed with us at the motion in limine. Unless he compares every single solitary hair, he can't say that. Unless he knows every other examiner --

MR. PETERSON: He can talk about within his experience.

THE COURT: He can't give an opinion about the weight of the evidence.

MR. PETERSON: Oh, no, no. I'm not asking him

to do that. He's talking -- I'm asking him the question of an unknown hair, in his experience, ever being matched to two or more different individuals. That's not asking for an opinion.

THE COURT: I think that's going outside his science.

MR. PETERSON: He's a hair comparison expert.

THE COURT: No, he's an expert in the science. What does the science say about that.

MR. PETERSON: No, I'm asking him in his experience as --

THE COURT: Well, what does his science say about that. Is -- can he go outside the science of his field.

MR. PETERSON: Well, I agree.

THE COURT: So, if the science has an established normal amount -- an established norm, he'll have to prove that there is a community scientific norm for that.

MR. PETERSON: You mean, he cannot talk about his own experience?

THE COURT: No, he cannot individually be an expert. I mean, if he's the only one that shares that opinion, he can't do it.

(Following the bench conference, proceedings continued as

follows:)

MR. PETERSON: Have nothing further.

MR. SAUNDERS: Just a couple other questions, Judge.

RECROSS EXAMINATION

BY MR. SAUNDERS:

Q You were directed to certain individuals, were you not, sir, when you were doing your comparison?

MR. PETERSON: Could we approach the bench.

(Whereupon, the following bench conference was had:)

MR. PETERSON: Your Honor, that's outside of the scope of anything I even got to ask him. I never even got my question.

THE COURT: Well, I don't know what the question was.

MR. PETERSON: My question --

THE COURT: No, his question.

MR. PETERSON: He's going to ask him was he directed toward any certain individual.

THE COURT: Recross -- first of all, you sat down.

MR. SAUNDERS: May I reopen cross for just a couple of questions.

THE COURT: All right, but --

MR. SAUNDERS: Okay.

(Following the bench conference, proceedings continued as follows:)

Q (By Mr. Saunders) Sir, were you directed by anybody to particular individuals when you were doing your comparisons?

A Sir, I was advised who were suspects in the case. I was also advised that every hair sample that was submitted was a suspect in the case; otherwise, they would not have been submitted. I also asked some -- about some of the facts in the case what officers knew about the case. This is very important in working a criminalistics case is not to work a case blind. You know, not just to say here's the evidence, figure it out. I like to have information on the case, you know, let's find out what happened, photographs if you can, everything about the case in order to reconstruct what happened if I can. I was advised there were main suspects in the case. There were also other samples that I needed to examine closely.

Q Were you advised that Dennis Fritz was one of the main suspects in the case?

A Yes, I was.

Q And you acted accordingly with that information?

A I examined his hair.

Q Yes, that's what I mean. What emphasis do you place on mental attitude of the examiner when he examines

-- what emphasis do you place on that? I'm talking about -- when I say mental attitude, his objectivity. What emphasis -- what role does that play in the competent examiner reaching a valid conclusion?

A I would say that even performing any examination, an examiner -- there is no examiner that can examine hairs one hundred percent of the time. In other words, you have to know when to lay it down and move away from it and come back to it at a later date. That is one thing that I think any competent hair examiner needs to realize. There are times when you can do hair comparison; there are times when you need to leave it alone and come back to it when there are other things that can be done. So, I think the attitude there plays a very important part in a hair comparison. And being able to realize when your mind is free to just become totally engrossed in a comparison. It isn't something that you can just look at, do something else, look at, and come back again. It needs concentration.

Q It ties in with this idea of subjectivity we talked about earlier about it being somewhat of a subjective science because the examiner is really the important portion of the science; he's the one that makes the evaluation. There's not some system that evaluates; it's the examiner himself, his expertise, and his logical observations. That's what we're talking about; isn't it?

A Yes, sir, it's a combination of all those things.

Q Okay.

MR. SAUNDERS: Thank you very much.

THE WITNESS: Yes, sir.

THE COURT: You may step down. Call your next witness.

(Whereupon, the following bench conference was had;)

MR. SAUNDERS: Your Honor, I think this is his last witness that I was advised. Could the jury be given a break, and my client go to the restroom because I'm going to put him on as soon as -- if the Court allows us a break.

THE COURT: We're going to take a break in just a little bit.

MR. PETERSON: I move for admission of State's Exhibits -- I guess it's 7, 6 -- excuse me, 6, 7 -- was that 4?

MS. SHEW: No.

MR. PETERSON: Five?

MS. SHEW: It was just 6 and 7 that a ruling has been reserved.

MR. PETERSON: Oh, 6 and 7 have been ruled -- reserved ruling. It was the bindles with hair.

THE COURT: I've got the numbers.

MR. PETERSON: Oh, I'm sorry. Let's see, what else -- I think 16, 17, 17-A, 18, and 19.