MONTANA THIRTEENTH JUDICIAL DISTRICT COURT

YELLOWSTONE COUNTY, BILLINGS, MONTANA

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STATE OF MONTANA,	)	
	)	
	)	
vs.	)	
	)	
	)	Case No. DC 08-526
RICHARD E. COVINGTON,	)	Jury Trial Transcript
	)	
	)	
Defendant.	)	

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TRANSCRIPT OF PROCEEDINGS
Thursday, March 4, 2010

Volume XV of XXII

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HONORABLE G. TODD BAUGH
District Judge Presiding

Yellowstone County Courthouse
217 North 27th, Courtroom 608
Billings, Montana 59101

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MORNING SESSION, THURSDAY, MARCH 4, 2010

(Whereupon, the court reconvened at 8:39 a.m., with all interested parties present, and the following proceedings were had:)

THE COURT: Okay. For the record, continuation of State versus Covington. Mr. Covington is present with counsel, as are all other relevant personnel.

If I'm counting correctly this is the fourth week of trial -- not the third as they said in the *Gazette*, but only the 15th day of trial. And if everybody is ready, we'll bring in the jury.

(Whereupon, the jury entered the courtroom at 8:40 a.m.)

THE COURT: Please be seated. Looks like the jury is all seated, but as a matter of formality I'll ask the clerk to call the roll of the jury.

(Whereupon, the roll was taken by the clerk.)

THE COURT: The record may reflect the jury is all present.

State may call its next witness.

MR. TWITO: Thank you, Your Honor. The State would call Jamie Bray.

JAMIE BRAY,

called as a witness on behalf of the State, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. TWITO:

Q Good morning.

A Good morning.

Q Please state your full name and spell your last name for the record.

A Jamie Bray. Last name is spelled B-r-a-y.

Q Ms. Bray, what is your current profession?

A I'm a forensic scientist in the field of serology.

Q And where do you work as a forensic scientist in the field of serology?

A The Montana Division of Forensic Science, or commonly know as the Montana State Crime Lab.

Q Ms. Bray, how long have you worked for the Montana State Crime Lab?

A In my current position, since February 2006.

Q Could you, for the jury, describe the field of serology and briefly the nature of the work that you do in that field.

A Forensic serology is the identification of biological fluids on items of evidence.

Q How many forensic serologists are employed by the Montana State Crime Lab?

A There are six full-time scientists in the DNA serology section, two of which are full-time serologists.

Q Are you a full-time serologist?

A Yes, I am.

Q Ms. Bray, how did you, -- let's go through your academic background, I guess sort of the road map as to how you became a serologist. Could you describe your education?

A I have a bachelor's degree in biology, with a human biology emphasis from the University of Montana.

Q And what sort of specialized training did you receive before you became a full-fledged serologist?

A I completed an extensive in-house serology training program at the Montana State Crime Lab, which included testing over a hundred unknown stains for either blood or semen. I completed 11 mock cases, which included testing unknown stains for blood or semen. I completed and passed a comprehensive exam over topics related to serology. I participated in a mock trial over one of my mock cases. And I've also attended training from other outside agencies over the topics related to serology.

Q And, Ms. Bray, in your field of serology, do you have mandatory continuing education and training that you must complete?

A It's not necessarily mandatory for us to seek outside training, but it's encouraged to do so every year.

Q And have you done some outside training?

A Yes, I have.

Q And you stated in your work as a serologist since February of 2006, I believe you said, you've previously identified biological fluids as part of your work and working in cases?

A Yes, I have.

Q Could you estimate the number of cases that you've worked on since becoming a full-fledged serologist in 2006?

A Approximately 350.

Q Ms. Bray, could you tell the jury how many times you've testified in a court of law?

A Approximately 12 times.

Q And has that all been in the state of Montana?

A Yes, it has.

Q Have you actually testified as a serologist in this judicial district in Yellowstone County, which is the 13th Judicial District?

A Yes, I have.

Q And have you been -- how many -- have you been qualified as an expert in forensic science specializing in serology in those courts?

A Yes, I have.

MR. TWITO: Your Honor, at this time I'd move to qualify Ms. Bray as an expert in the field of forensic science specializing in serology.

MS. HOOD: I've no problem with that.

THE COURT: And she is qualified and may testify in an opinion form about those matters in her field of expertise.

MR. TWITO: Thank you, Your Honor.

Q (By Mr. Twito) Ms. Bray, before we discuss your involvement in this case specifically, I want to talk a little bit about sort of the protocols in your state -- the Montana State Crime Lab, sort of what you do at the Montana State Crime Lab.

MR. TWITO: Permission to approach the witness, Your Honor.

THE COURT: You may.

Q (By Mr. Twito) Ms. Bray, I'm going to approach you and hand you what's been marked for identification purposes as State's Proposed Exhibit 372. It's a diagram. Do you recognize what's represented in that diagram?

A Yes, I do.

Q And what is it?

A It's an outline of the Montana State Crime Lab.

Q And are you familiar with the outline of the Montana State Crime Lab and all the various laboratories within that building?

A Yes, I am.

Q Where is the Montana State Crime Lab?

A It's in Missoula, Montana.

Q Would this diagram be helpful in explaining sort of

where you conduct your work and where other work in the lab is conducted?

A Yes.

MR. TWITO: Your Honor, at this time, I think for demonstrative purposes, I'd move for the admission of State's 372.

MS. HOOD: No objection.

THE COURT: Received, and it may be published.

(Whereupon State's Exhibit No. 372 was received in evidence.)

MR. TWITO: Thank you, Your Honor.

Q (By Mr. Twito) All right. Ms. Bray, do you utilize all sections of this lab at this building?

A For my analysis, no.

Q Can you point on this diagram where you conduct your analysis in serology?

A From a serological analysis, I conduct it in this area right here, the larger area where the DNA serology label.

Q And the other areas of the lab, are they all sectioned off from your particular area?

A Yes, they are.

Q In fact, can you -- do you have the ability to lock your area off from the other areas of the lab?

A Yes, I do.

Q And why is that important? Why is it important to

have each section have its own section within the building at the Montana State Crime Lab?

A It prevents us from cross-contaminating with any other evidence that might be being examined at the time.

Q But isn't it fair to say that an item of evidence may come to the lab to be received by the lab and go to various departments?

A Yes.

Q Can you briefly describe how the Montana State Crime Lab receives an item for testing?

A An item is submitted from an agency and received at the laboratory where it is entered at the evidence counter right here (indicating). And they inventory it and -- inventory it and then creating a file for us listing the evidence that's been submitted.

Q Now, the Montana State Crime Lab is also a secure facility, is it not?

A Yes, it is.

Q I couldn't just show up at the front door and go into the firearms sections and check out the latest guns, could I?

A No.

Q Okay. Now, how -- where do you store items of evidence that finally make it to your department, your serology department?

A I store it in the serology DNA vault.

Q And you said an item of evidence comes to your evidence department. How does the evidence department know that you have it?

A Through an internal chain of custody.

Q And does your -- do all departments within your lab maintain this internal chain of custody?

A Yes, they do.

Q Okay.

MR. TWITO: All right. You can take that down.

Q (By Mr. Twito) I would like to just generally explain how you perform your work. When you're asked as a serologist to examine an item, what do you do, what tools do you use and how do you go about doing it?

A First, I will place my lab coat on and put a face mask on, I put a fresh pair of latex gloves on. I then clean my work area with a ten percent bleach solution. Once that's done, I put down white butcher paper. I then clean my utensils, such as pens, markers, rulers, any light sources, my camera with 10 percent bleach. I clean my scissors and my tweezers with ten percent bleach and methanol.

I then, depending on the case scenario, if presumptive chemical tests are needed, I will then make up the chemical presumptive test and perform a QC on them to make sure they're working properly. Once that's complete, I change my gloves, put a fresh pair of gloves on, I then go and

retrieve the evidence from the serology DNA evidence vault. I bring it back to my work area, where then I document the packaging seals, any labeling on the packaging.

I then open up the item of evidence, I lay it out on my work area on the white butcher paper. I document staining, the condition of the item in my notes. If pictures -- I then take pictures of the item and then perform any chemical test needed on -- presumptive chemical test needed on that item and collect any stains that need to be forwarded on to DNA analysis.

Q How do you -- let's just -- for example, let's say you are asked to examine an item of clothing. Is that a common item that you would examine?

A Yes.

Q How do you collect a stain? Say you observed the stain on there, how would you just collect it?

A Either by cutting the stain from the item or swabbing the stain using a cotton tip swab.

Q And why are you -- why are you collecting a stain?

A To send it on for DNA analysis.

Q You don't actually complete the DNA analysis, do you, as a serologist?

A No, I do not.

Q Do you ever work more than one item at a time?

A No.

Q Why is that?

A To prevent cross-contamination, Only one item is opened and examined at a time.

MR. TWITO: Your Honor, permission to approach the witness again.

THE COURT: You may.

MR. TWITO: And I'd ask, if need be for this day, continuing permission to approach the witnesses.

THE COURT: You may.

Q (By Mr. Twito) Ms. Bray, I'm handing you a series of four photographs, they are marked as State's Proposed Exhibits 351 through 354. Please take a look at those. Have you had an opportunity to examine those photographs?

A Yes, I have.

Q What are they photographs of?

A They are photographs of the -- some of the -- well, the evidence technician area where we receive main evidence from the evidence technicians, and then the serology working area and my work station.

Q And do they fairly and accurately depict those areas of the Montana State Crime Lab?

A Yes.

MR. TWITO: Your Honor, at this time I move for the admission of State's Exhibits 351 through 354.

MS. HOOD: No objection.

THE COURT: Received. They may be published.

(Whereupon, State's Exhibit Nos. 351, 352, 353, 354 were received in evidence.)

MR. TWITO: Thank you.

Q (By Mr. Twito) Starting with 351, Ms. Bray, what is the jury seeing in this photograph?

A That is the main evidence receiving area.

Q Okay. And that's where all evidence is run into the labs?

A Yes.

Q And then it can go out to various departments?

A Yes.

Q On the right half of the picture there, what is that?

A Those are nitrile or latex gloves.

Q A lot of boxes of those around the lab?

A Yes.

Q Okay. All right. State's 352. Okay. What do we have in State's 352?

A This is the view of the main serology examination area.

Q Is your area that you work in visible in this photograph?

A Yes, it's right -- that's a lot of arrows.

Q You are actually doing a lot better than the witness we had on yesterday.

A Okay. It's actually right here where the arrows are.
Q You also have a laser pointer up there if it would be helpful.
What is this big blue thing back here on the right side of the photograph?
A It's a hood.
Q Okay. What is that used for?
A It's used for when a reference standard is made and the blood is placed on UV-filtered -- UV-treated filter paper. It's placed under the hood to allow it to dry, so it's keeping it away from other contaminants that might possibly be there.
Q Contained in that hood?
A Yes. The hood can actually be closed.
Q You just mentioned something there. What is a reference standard?
A A reference standard is a known standard, typically a buccal swab, which is a cotton-tipped swab that's used to swab the inside of the cheek and it's from a known individual that is sent on for DNA analysis purposes.
Q As part of your job as a serologist, do you enter that chain of those reference standards that are then passed on to your -- the DNA portion of your lab?
A Yes.
MR. TWITO: All right. Could you pull up State's 353. All right. What do we have here -- it's just another

view of your laboratory area?

A Yes. This is another view of the serology examination area.

Q All right. I'm looking at the left side of this picture here, bunch of refrigerators there?

A Those are freezers, and the one right there with the green dot is the serology freezer and refrigerator.

Q There is some cables coming around. Do you lock that?

A Yes. It's padlocked every night and the key is stored in the back of the armed serology DNA vault.

Q All right. And State's 354? What do we have here?

A This is my work station.

Q And this is the station that you described that you work one item at a time, then clean your station each time before you work the next item?

A Yes. Before I start an item, I clean my work station. Once that item has been examined and completed, I then clean the work station again. And then I move on to the next item, and then clean my work station again.

Q Okay.

MR. TWITO: Now, Kimberly, would you put up 372, again.

Q (By Mr. Twito) You did say that you -- an item would come in, everything is received in the evidence section of the

lab, and then it goes out to the various other departments within the Montana State Crime Lab. Do you ever receive or obtain things directly from one of the other sections?

A Yes.

Q Okay. And that -- you maintain a chain of custody that reflects that as well?

A Yes.

Q So I think you talked about this a little bit, but how do you secure the evidence that you still have in your section? You have a locked fridge there. Is there another area within your section itself that you can secure items?

A Yes, the armed serology DNA vault, or I have two locked cabinets to where I only have the possession of the key.

Q Okay. All right. I want to turn to -- you can take that down, Kimberly.

I would like to talk to you specifically about the items in the case of State versus Covington that you were asked to examine as a serologist. Now, in this case you were asked to examine quite a few items, were you not?

A Yes.

Q You also generated several reports in this case?

A Yes, I did.

Q Just -- we'll go through some of the items, but approximately how many items did you look at?

A Approximately 29.
Q And when you examined those items, were you able to identify areas that you believed to be stains that you either cut, removed or swabbed?
A Yes.
Q Had some of the items that you analyzed already been to other departments within the Montana State Crime Lab?
A Yes.
Q What department in particular looked at quite a few of the items prior to you looking at them?
A The trace analysis.
Q Do you recall looking at any duct tape pieces or anything like that?
A No.
Q All right. Ms. Bray, I'd like to turn your attention to your report dated June 13th, 2007. I believe it's titled a Supplemental Serology Report. To your recollection, is that the first report that you generated with regard to this case?
A As far as my analysis, yes.
Q What two items did you examine in that report?
A Item 78, number 103, sweat pants.
Q Okay. Was there another item?
A Yes, item 79, number 104, sweater.
Q You identified it by a number. You gave them each an item number, 78 and 79. Who -- where does that number come

from?

A It's generated -- once the item is received in the laboratory, we give it our own individualized number.

Q Why is -- why do you give it your own number?

A To keep track of the evidence through the internal chain of custody.

Q You also read another number associated with the sweat pants and then with the sweater. You said 103, sweat pants, 104, sweater. Is that the number from the submitting agency?

A Yes, I believe so.

Q Okay. And looking at your report, is the submitting agency there the Billings Police Department?

A Yes.

Q Okay. Let's just briefly tell the jury what you found on your item 78, the sweat pants.

A Indications of blood were detected on the sweat pants. I collected two representative stains, and they were retained in the laboratory. I noted apparent hairs and debris, they were repackaged and retained with the item, and then the debris that came off the item during my analysis was retained with the item.

Q Okay. So you recovered some stains, you collected some stains. Did they then in turn get assigned a number?

A Yes.

Q What number -- since this is item 78, what number would you assign to those stains that you collected?

A It would have the main number of 78, which would identify coming from the sweat pants, and then the two stains would be assigned a point zero, so it would be 78.01 and 78.02.

Q So, for example, just so we can all track, because we're going to have to talk about some numbers here, if you had, in fact, collected ten stains from this item, it would have gone all the way to 7810?

A Yes.

Q You then you said you did collect some hair and debris and you repackaged it. Is that common for you to be doing that as a serologist?

A Yes.

Q Okay. We won't go through the sweater, but you did the same -- well, actually we should. This was your item 79. What did you collect from this?

A I collected swabs -- 79.01 should be swabs of outside of left arm cuff. That was a typographical error by me. 79.02 is swabs of outside of right arm cuff.

Q And you made that correction?

A Yes.

Q And so this is that cotton swab that you described earlier?

A Yes.
Q So you didn't collect any stains from this, you collected swabs?
A That's correct.
Q Let's talk about the swabbing process. How do you know where to swab?
A In the -- it's either a stained region where I identified a stain, or in this case it would be on the arm cuff.
Q Is that fairly common, when you get an item like a sweater, to swab the arm cuffs?
A Not typically. It just depends on the case scenario.
Q Did you observe -- you said you observed indications of blood. Were indications of blood present on the arm cuffs?
A Yes, I did identify stains on the arm cuffs that were positive for indications of blood.
Q All right. I want to turn your attention to another report, and this one is your report dated June 18, 2007.
A Okay.
Q What did you do in this situation? What item were you presented with and what did you do?
A It was item 104, it was a St. Vincent Hospital plastic cup. I didn't perform any serological analyses on this plastic cup. I took a swab of the lid of the cup. I swabbed the areas on the lid, and then I retained that swab in

the laboratory for DNA analysis.

Q And you identified it as a St. Vincent Hospital plastic cup?

A Yes.

Q But the item number you gave it, 104, is just the laboratory number?

A Yes.

Q All right. Ms. Bray, I'm going to hand you what's previously been introduced as State's Exhibit 283. It's a St. Vincent's plastic cup. Does that appear to be the plastic cup that you swabbed the lid of?

A Yes.

Q Can you tell the jury how you know that?

A Based on my notes, and then also my seals are right here (indicating) with my initials and date.

Q Okay. All right. Thank you.

All right. I want to turn your attention to, I believe it's your next report, is it August 7, 2007?

A Yes.

Q In this report, did you note any reference standards?

A Yes, I did.

Q Whose reference standards are noted in your report here?

A Norman Leighton, Patti Hubbert, and Gerald Morris.

Q Okay. And how did you come to obtain Norman

Leighton's reference standard and Patti Hubbert's reference standard?

A I received a blood sample from the toxicology section.

Q So like a blood sample?

A Yes. It was a known blood sample in a small centrifuge tube.

Q And so with regard to Norman Leighton's reference standard and Patti Hubbert's, you actually didn't get it directly from a submitting agency like the police department, you got it from your own toxicology department?

A The submitting agency sent the blood tubes into the crime lab and they were sent to the toxicology department, and then I retrieved the sample from the toxicology department.

Q And, again, those are those reference standards that you talked about earlier?

A This one is one that the blood is transferred to a UV-treated filter paper.

Q Okay. And then you also mentioned Gerald Morris's reference standard as well.

A Yes.

Q Again, collecting these reference standards for later use by your DNA section of your laboratory?

A Yes, for the DNA analyst.

Q Did you also detail in this report the examination of

some other items that were submitted to you by the Billings Police Department and also the Yellowstone County Sheriff's Office?

A Yes.

Q All right. Did you also obtain -- or retain a buccal swab from Richard Covington?

A Yes, I did.

Q And what item number did your lab assign to that?

A 83.

Q And that was submitted to you, I believe, according to your report, by the Yellowstone County -- or excuse me, the Yellowstone County Sheriff's Office; is that correct?

A It was submitted by the Billings Police Department.

Q Okay. My mistake.

One of the items that you tested was a shirt?

A Yes.

Q Okay. And what was your item number, and what was the submitting agency's number, and what sort of tests did you perform on the shirt?

A Our number -- laboratory number was 74, the agency number was number 44, and identified indications of blood on the pink shirt.

Q Okay. And how many stains were you able to collect off the shirt?

A I chose four representative stains.

Q When you say you chose, and as a serologist, do you sometimes have to make a choice as to which stains you collect and which stains you leave on there?

A Yes.

Q And how do you make that determination?

A Based on the case scenario and just the staining that's present. We can always go back and collect more for DNA analysis.

Q What do you mean by case scenario?

A Just the circumstances involved in this case, if there is maybe more than two people bleeding or other people involved.

Q Okay. Are you given some of the facts before you begin your analysis of the case so you have a background?

A Yes.

Q And, again, did you note some hairs and other debris on this item?

A Yes, I did.

Q Did you retain those?

A Yes.

Q Now, with something like this shirt, when you're retaining debris and hairs, is it fairly common then for this item then to go back to trace or back and forth occasionally?

A No.

Q Normally -- does normally it go to trace first?

A Yes.

Q All right. Now, I want to turn your attention to a report dated November 1, 2007. Before we discuss your testing that's reflected in this report, I'd like to ask you what fluorescing is.

A Fluorescing is where a stain either can be seen by the naked eye or not, and it's examined underneath an alternate light source which is similar to a black light and this stain illuminates.

Q What does it look like under the black light? It just gets bright?

A Yes. It essentially fluoresces, it gets bright.

Q Sticks out among all the other things around it?

A Yes.

Q Is there a fluorescing process in your work?

A We use an alternate light source.

Q Always the alternate light source?

A Yes.

Q Okay. What type -- in your line of work as a serologist, what type of fluids typically fluoresce?

A Semen, seminal fluid, saliva, sweat, urine, alcohol, deodorant, those are some examples.

Q Do some of those items fluoresce differently?

A Yes.

Q When you would examine an item, could you see several

areas that would fluoresce, that they would fluoresce at, I guess, different levels or brightness, or how would you describe that?

A Yes. Sometimes a stain would fluoresce a lot brighter than another stain in a different area of an item.

Q Let's assume you're testing an item and you got several fluorescing stains. How do you determine which one's a stain of interest and which one is not that you are going to collect?

A It just depends, again, on the case scenario. And then if it sometimes fluoresces brighter, that might be one that we go ahead and collect and send on for DNA analysis.

Q Okay. And you had testified earlier that there are basically two ways that you can take this fluorescing stain or stain, and one process was cutting and the other was swabbing. Can you explain the cutting process and then the swabbing process.

A Cutting process, I wash my scissors with ten percent bleach and with methanol. I also do that with my tweezers. And this is done with each individual stain before and after. No stain is ever collected with using the same scissors, they are cleaned before and after. I then excise the stain. I don't cut around where the edge of the stain is, I go about a centimeter out. I cut around the stain, I use my forceps, place that stain in a labeled glycine envelope with the case

number, the item number I gave it, my initials and date. That glycine envelope is then placed in a coin envelope, which has the case number, my item number that I gave it with a description of the item, initials and date, and then that is sealed with evidence tape, my initials and date.

Q And then a swabbing process?

A The swabbing process, I use either one or two swabs. I wet the swabs with deionized water, and then I try to wick up the stain using the swab kind of in a twirling motion to try to pick up as much stain as I can. And then those -- the swab or the swabs are then placed in a glycine envelope with the case number, my individualized item number that I gave it, initials and date. I place that in a coin envelope with the case number, the item number, the description, my initials and date, and then seal it with evidence tape, initials and date.

Q Why do you go to such great lengths? Why is that important?

A Just to make sure everything is lined up as far as the numbers and the descriptions and so they know -- so I know, too, what's there.

Q Do you prefer one method over the other?

A It really just depends on the circumstances.

Q Might be some particular stain that you see on an item that you can't cut out so you would have to swab?

A Yes.

Q Okay. I want to turn your attention to your November 1st report and some of the items that you tested there. Do you recall testing an item you identify in your lab as item 76?

A Yes.

Q Can you describe what that item was that you looked at?

A It was the agency number, number 52, and it was a pillow.

Q Was there a case over the pillow?

A Yes.

Q Do you recall the color?

A It was green.

Q And can you tell, had this pillow been to trace analysis prior to you examining it in your serology lab?

A Yes.

Q Well, Ms. Bray, I'm going to hand you what's marked for identification purposes and previously introduced as State's Exhibit 181. It's been encased in plastic, and Detective Richardson spoke of it. Sort of a large item. Do you have some room there to hold that up. I also have the accompanying paper sacks if that can help you in your --

A Should I lift that up?

Q If you want.

MR. TWITO: May the witness get down from the stand

for just a moment, Your Honor?

THE COURT: She may.

Q (By Mr. Twito) Ms. Bray, you're holding State's Exhibit 181. Do you recognize that?

A Yes, I do.

Q Okay. Is that your item 76?

A Yes.

Q Okay. Do you -- can you identify any markings that you made during your analysis of that item?

A It would be right in here (indicating).

Q Might be hard to see through the plastic.

A Yeah. I believe there is some of my markings right there.

Q Okay. All right. Thank you.

We'll make this easier, we'll get some photographs going, how about that? Thank you.

Ms. Bray, when you examined this item, did you take your own photographs?

A I did.

Q Ms. Bray, I'm handing you what have been marked for identification purposes as State's Proposed Exhibit 354A and 354B. Ms. Bray, do you recognize what's represented in those images?

A Yes, I do.

Q And what are they photographs of?

A Of item number 76, the pillowcase or the pillow.
Q And are both sides of that pillow, item 76, in each photograph?
A Yes.
Q Okay. And are they photographs that you took?
A Yes.
Q And they accurately represent the pillowcase and pillow, your item 76, when you conducted your serological examination?
A Yes.
MR. TWITO: Your Honor, at this time I move for the admission of State's Exhibit 354-A and 354-B.
MS. HOOD: These are 354?
MR. TWITO: Yeah, 354-A and 354-B.
MS. HOOD: And 354 was a photograph of the crime lab?
MR. TWITO: Yes. I just had to label them A and B.
MS. HOOD: Okay. I'm sorry, I have no objection.
THE COURT: Received. May be published.
(Whereupon, State's Exhibit Nos. 354-A and 354-B were received in evidence.)
Q (By Mr. Twito) Can you please put up 354-A. Okay. It's difficult to see under the light, but what do we have here, Ms. Bray?
A This is the burned side of the pillowcase.
Q Where did you take this photo?

A This is at my work station.
Q Okay. Again, so that's that white butcher paper that you talked about that you laid down before you examine an item?
A Yes. Before I laid down the white butcher paper, I washed my area with 10 percent bleach.
Q Okay. And then 354-B. Okay. What do we have here?
A This is the non-burned side of the pillowcase.
Q How did you determine burned side in 354-A to non-burned side in 354-B?
A Just based on the discolorations I saw, there was more brown on the burned side, I just determined that burned, and then the other side, non-burned side, for note-taking purposes.
Q Okay. I see a, sort of a large, I guess, a stain with a lot of big black circle around it.
MR. TWITO: Kimberly, can you zoom in on that. Okay.
Q (By Mr. Twito) Are those your markings?
A Yes.
Q Can you tell the jury why you're putting that marking around that stain like that?
A It's to circle the stain so I know to test it for indications of blood.
Q Okay. Now, looking at State's 354B. Did you recover any stains from this side of the pillow?

A Yes, I did.

MR. TWITO: Kimberly, can you zoom in. Thank you, Kimberly.

Q (By Mr. Twito) We zoomed in on the upper right half of the pillow in the photograph. What can the jury see in this photograph?

A You can see my circled areas where I tested for indications of blood. There is also a dotted circle area with a KM positive sign, that stands for Kastle-Meyer, that's the presumptive chemical test I use for indications of blood. The dotted line indicated -- I also examined this item using the alternate light source, and this dotted line indicated to me that this stain tested positive for blood and also fluoresced underneath the alternate light source.

Q So is there something else there besides blood?

A There could be.

Q Did this stain fluoresce differently than some of the other stains that you looked at?

A Yes.

Q From this item, how many separate stains did you remove and repackage for later DNA testing?

A Three.

Q Are you familiar with your stain number 76.01?

A Yes.

Q Can we see it here?

A Yes, it's the dotted line.
Q It's this one right here? (Indicating.)
A Yes.
Q Okay. And now I focus in on -- this is stain 76.01?
A Yes, that's correct.
Q And that's seen in State's 354-B and what you call the non-burn side of the pillow?
A Yes.
Q You can put it down.
Visually, you said the stain sort of -- Did it look like blood as you examined it visually?
A It had red brown stains, so I tested for indications of blood.
Q At the time that you tested it, was it wet or was it dry?
A It was dry.
Q Was there any difference to you, when conducting your test, whether it's moist or dry?
A No.
Q How did you go about obtaining that particular stain from this pillowcase?
A I removed it with scissors and tweezers. I cut out the stain.
Q All right. And I believe you said you retained three stains from this item?

A Yes.
Q And where did you get the other stains from this item?
A The other two stains were from the burned side of the pillowcase.
Q Can you put 354A up?
A Okay.
Q The other two you got were on the burn side?
A Yes.
Q And can you tell, looking at the photograph there on your monitor, Jamie, where approximately those stains would be?
A Is it possible to zoom in just a little bit --
Q You bet.
A -- to the right side.
Q On the right side? Yes.
A Oh, yep, this will work. (Indicating) this stain right here, it's a little difficult to see, would be 76.02.
Q Okay.
A Then if you could zoom out again.
Q Go up higher?
A Yes.
Q Do we see it there?
A Actually, we need to go to the left just a little bit.

Q All right.
A I believe this stain right here would be 76.03.
Q Okay. Can you take it down. Thank you, my Ms. Bray.
Again, all three of those stains, were they -- they all cut?
A Yes.
Q They were cuttings, all right.
You also -- you also, in this report, indicated that you worked on a towel. It was, I believe, your item 80?
A Yes.
Q Could you describe the item that you tested and what sort of tests you did on it and what, if anything, you collected from it?
A It was a blue towel, and I tested the stains for indications of blood. And then I collected swabs, two swabs from the non-stained area on the non-tagged side of the blue towel, and then I collected swabs of the non-stained area on the tagged side of the towel.
Q Did you also note some hair and debris with the item?
A Yes. An apparent hair was noted, repackaged and retained with the item, and debris was noted and retained on it -- with the item.
Q Okay. Now, according to your chain of custody, had this towel already been to the trace evidence division of the crime lab prior to your analysis that you just described for

the jury?

A Yes.

Q You also tested another pillow, your item 73.

A Yes, I did.

Q What tests did you conduct on that, and what, if anything, did you get from that item?

A I noted areas of fluorescence on the pillow. I then tested the pillow for indications of blood. Apparent hairs were noted, repackaged and retained with the item, debris was noted and retained with the item, and I collected three red brown stains from the item.

Q You also tested your item 75, and I believe it was marked by the submitting agency as a shirt. But what was this item and what tests did you do on it?

A This item was a pillowcase. I noted areas of fluorescence on the pillowcase. I tested the areas red-brown areas for indications of blood. I collected three red-brown stains that also displayed fluorescence, and those were retained in the laboratory. Debris was noted and retained on -- with the item.

Q Okay. And just so we're clear with numbers, I don't want to have to go through this, but the defense may want to go through some of these other items. In this report you also tested your item 77, and that was a sheet, a bed sheet?

A Yes.

Q You-all -- did you also test your item 156, a red shirt?

A Yes.

Q Did -- what tests, at all, did you do on the red shirt?

A I noted areas of red-brown staining, however no serological tests were performed on the shirt due to the condition of the shirt.

Q And why did you make that decision?

A The shirt, when it was received, there was a lot of -- part of the shirt was received missing, it appeared that it had been burned, there was quite a bit of red-brown staining, and I consulted with my technical leader, Phil Kinsey, and we decided no serological testing could be done on this shirt.

Q And you were also given some -- your item 157, some black and gray gloves?

A Yes.

Q And did you obtain stains from both the right and left gloves?

A Yes, I swabbed the stains.

Q I want to talk to you now about your report dated November 26, 2007. I believe in this report you secured another reference standard.

A Yes.

Q And what item number did you assign to it and who was the reference standard for?

A I assigned the number 164.01, James Gammage reference standard.

Q And that would be for later use by your DNA section?

A Yes.

MR. TWITO: If I may just have a moment, Your Honor.

THE COURT: You may.

Q (By Mr. Twito) All right. Ms. Bray, I want to talk to you -- I want to go back a little bit and talk to you about some of the dates that you actually -- not the dates of your reports, but the dates that you actually worked some of the items.

A Okay.

Q All right. With regard to that item that you -- just prior to identifying the reference standard, it was your item number 157, some black and gray gloves. Could you please, if you need to refresh your memory with your notes, tell the jury the date and time that you would have worked those gloves?

A The left glove was worked on October 4, 2007, at 1:00 p.m.

Q Okay.

A The right glove was worked on October 5th of 2007.

Q Okay. And your item 83, which you previously testified was the Rick Covington reference standard, when was

that item worked and repackaged by you?

A Mr. Covington's reference standard was worked on July 18th of 2007.

Q Then finally, turning back to your report dated November 1st, when was your item 76, that green pillowcase and pillow, worked by you at your work station?

A October 7 -- excuse me, October 2nd of 2007.

Q Now, Ms. Bray, I want to talk to you a little bit about the sweater that you worked, one of the first items that you worked. It was in your first report. It's your item 79. I believe you testified that you got a swab from the left arm cuff which was identified by you as 7901, after it was corrected by you, and then a swab 7902, the right arm cuff. Was there any -- was there some of the hairs that you retained and then provided to trace, was one of those hairs later determined to be one of your hairs?

A Yes.

Q Is -- we talked about a lot of the precautions that you take in your department. Do you wear a hair net, or at the time did you wear a hair net or anything to secure your hair?

A At the time I was under impression that this item had already been to trace analysis from an outside agency. But, yes, when I do examine an item, if trace is an issue in the case, it typically goes to trace first. When I examine it,

I'll pull back my hair and, if need be, I will wear a hair net. I'll document if apparent hairs are there and then I'll go ahead and repackage them.

Q In your opinion, did that hair being found somewhere on that sweater at some point by trace that was later identified by the lab as your hair, would that have affected any of your serological testing of even that item or any of the other items that you took and secured?

A I just noted it and collected it and sent it on.

Q To your knowledge, it didn't affect the integrity of any of the further testing processes within the DNA serology department?

A Not to my knowledge.

Q Okay. Thank you, Ms. Bray.

THE COURT: Cross-exam?

CROSS-EXAMINATION

BY MS. HOOD:

Q Good morning, Ms. Bray.

A Good morning.

Q Let's talk a little bit about this trace evidence. Throughout your report and your testimony, you've talked about looking at items and that you recover trace evidence from them, correct?

A Yes.

Q A number of these items had already been to the trace

area of the lab, correct?
A Yes.
Q So what you're recovering are things that you visually noted?
A Yes.
Q But had not been noted in trace?
A Not to my knowledge.
Q Okay. And the -- despite all of the precautions that you took, you left some trace evidence?
A Yes, I did.
Q Okay. And that's easy. I mean, it's trace evidence, right?
A Yes.
Q Easy to scatter around?
A I -- at the time I didn't know if I had shed a hair or not. I wanted to be sure that I collected, though.
Q Sure. You wouldn't know what kind of trace evidence you left behind, would you?
A No, I'm not a trace analyst.
Q Sure. In terms of the fluorescing of these items, you did that on a number of items, didn't you?
A Yes, I did.
Q When you look at those items, you can't determine visually by the fluorescing of stains what stain they are?
A Do you mean the biological?

Q Right.
A No, I cannot.
Q You just know there's a stain there?
A Something is causing something to fluoresce.
Q Right. The items that you specifically looked at -- well, let me ask you one other thing about these stains. You have no idea when they got on the item that you're looking at, do you?
A No, I do not.
Q You have no way of timing them?
A No.
Q The items that you looked at, if I understand you correctly, you know, sometimes I get -- you have them all numbered, which is easy to follow, but the number that was 73.01 and from thereon was a pillowcase, correct, or a pillow with a pillowcase?
A Let me turn to the page real quick. Yes, 73 was a green pillow -- or was labeled as green pillow.
Q Do you have an indication from where that was recovered?
A Said on the evidence tag from the submitting agency, "West side of female on floor."
Q And 74 was a shirt, correct?
A (No response.)
Q The pink shirt?

A Yes, it was.
Q And from where was that recovered according to your information?
A "Laying by male vic. head on bed."
Q 76 was the pillow that you showed the jury, correct?
A That's correct.
Q And from where was that recovered?
A On the evidence tag on the bed it was marked green pillow on bed.
Q And 77 was the sheet that we presume came from the bed, right? Or I guess we probably know it came from the bed.
A And it was labeled, "One sheet under male vic. on bed."
Q 79, this -- I can't think of the word. It was a top, right, because you looked at the cuffs of it?
A It was a sweater.
Q A sweater. And that had come from Patti Hubbert, correct?
A Yes.
Q And the sweat pants that you looked at were from Norm Leighton, correct?
A Which item number are you looking at?
Q Oh, I'm sorry, 82.
A Yes.
Q And you talked about looking at a pair of gloves.

There was an additional glove that was your item 149, correct?
A Yes, that's correct.
Q From where?
A It just said there was -- it was unmarked. It had markings by the crime lab on the --
Q No indication of from where?
A Not as far as what I documented, no.
Q Okay. Thank you.
When you're looking at an item, any one of these items, you're making your best judgment as to which stains to test, correct?
A Yes.
Q So you talked about the green pillow and showed it to the jury. There was, I don't know what, four or five stains that you didn't test?
A For --
Q Or somewhere in that range.
A Could you rephrase that?
Q When you are examining, for example, the green pillow that you showed it to the jury through the pictures, and there were a number of stains that you did not test, correct?
A There's -- the stains I tested for indications of blood, and I looked at it under the alternate light source, but I only collected three stains to send on to DNA.
Q So there were stains that were not sent on?

A That's correct.

Q And all of the tests that you do are only presumptive for blood or -- right?

A We do presumptive tests for blood and/or semen.

Q All right. And not for presumptive for sweat or other bodily fluids, right?

A No.

Q Thank you.

MS. HOOD: I have no further questions.

MR. TWITO: Just briefly, Your Honor.

REDIRECT EXAMINATION

BY MR. TWITO:

Q Ms. Bray, with regard to your item 76, the green pillowcase and pillow, when you put the alternate light source on those, all the stains that you looked at, and you looked at all those stains that you could determine, correct?

A Yes.

Q Did any of the other stains on that pillow fluoresce like stain 7601?

A No.

Q Did any of the other stains fluoresce?

A Yes.

MR. TWITO: Thank you, Your Honor. I have nothing further.

MS. HOOD: May I ask one more question?

THE COURT: You may.

RECROSS-EXAMINATION

BY MS. HOOD:

Q They fluoresced; they just didn't fluoresce exactly the same?

A That's correct.

Q So you don't know what it was?

A No, I do not.

Q And you don't know what the ones that you didn't test are, at least at this point in time?

A That's correct.

THE COURT: Thank you, ma'am. You can step down. Witness can be excused.

MR. TWITO: Thank you, Your Honor.

THE COURT: We're close to the time that we're going to be stopping for the morning recess. Is this a good time to do that?

MR. TWITO: Judge, for the State it would be. The next witness is Phil Kinsey, the DNA laboratory analyst that Ms. Bray referred to, and probably be a good time to recess now.

THE COURT: Ladies and gentlemen, I will admonish you in the usual fashion: It is your duty not to converse among yourselves or with anyone else on any subject connected with this trial or to form or express an opinion thereon, until

this case is finally submitted to you.

Court's in recess for about 20 minutes. Court's in recess.

(Whereupon, the jury exited the courtroom at 9:47 a.m., and a recess was had until 10:07 a.m.)

THE COURT: Okay. Looks like everybody is present. This is the continuation in State versus Covington. Mr. Covington is present with counsel, as are all other relevant personnel except Mr. Souza.

MR. TWITO: I believe he is in the restroom.

THE COURT: We'll pause briefly to allow him to return.

MR. TWITO: I wouldn't have any objection to holding him in contempt, that's fine with me.

(Laughter.)

THE COURT: You-all may sit down.

MS. HOOD: But we sit all day.

THE COURT: Or you can stand up, that's fine with me.

I should put on the record, since I've been so hard with the *Gazette*, that they actually can count, they just didn't count the week that we took selecting a jury as being part of the trial.

MR. TWITO: That's the hardest part.

(Laughter.)

MS. HOOD: And there was one day of testimony.

MR. TWITO: That's true.

He's here, Judge.

THE COURT: Okay. And as I remarked, now everybody is present and -- except for the jury, and you may bring in the jury.

(Whereupon the jury entered the courtroom at 10:09 a.m.)

THE COURT: Please be seated. Record may reflect the jury is all present. Okay. You may call your next witness.

MR. TWITO: Thank you, Judge Baugh. State would call Phil Kinsey to the stand.

PHILIP THOMAS KINSEY,

called as a witness on behalf of the State, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. TWITO:

Q Good morning.

A Good morning.

Q Could you please state your full name and spell your last name for the record.

A Philip Thomas Kinsey. Philip is with one L, Kinsey is spelled K-i-n-s-e-y.

Q Mr. Kinsey, what is your current profession?

A I'm a forensic scientist in the DNA section of the Montana State Crime Lab.

Q And how long have you been a forensic scientist in the DNA section with the Montana State Crime Lab?

A For about four and a half years now.

Q Do you have a particular title within that department?

A Yes. I'm the supervisor of the forensic biology section and the DNA technical leader of that section.

Q Do you also supervise the serologists that work under that section?

A I do.

Q Approximately, how many people do you supervise in your position?

A Six.

Q Do you have any other laboratory experience prior to coming to the Montana State Crime Lab serology DNA section?

A Yes. I worked at the Oregon State Police Crime Lab for eight years before moving to the Montana lab.

Q And did you work there as a forensic scientist specializing in DNA?

A Yes, yes, I did.

Q Let's go through your educational background as to how you became a forensic scientist specializing in DNA. Could you detail your education.

A Yes. I received my bachelors of science and doctoral degrees in biology from the University of California at

Irvine. I spent four or five years as a post-doctoral research fellow at the University of Oregon in Eugene, and from there was hired on at the Oregon State Police Crime Lab.

Q Did you receive -- in addition to your education, did you receive any specialized training?

A Yes. We as DNA analysts are required to receive continuing education. So before I was able -- I was qualified to actually perform DNA testing in Oregon, I had to go through about a six-month training program that highlighted all the aspects of the testing that I'd be performing. And then since then gone to specialty training classes on various instrumentations that we have in the laboratory and new techniques that are coming, available in the industry or the forensic community.

Q And forensic community is ever changing, is it not?

A Yes.

Q And you keep current to the best of your ability with those changes?

A Yes.

Q Mr. Kinsey, have you ever testified as an expert witness in a court of law as a forensic specialist specializing in DNA analysis?

A Yes, I have.

Q And have you been recognized as an expert by those courts at those times?

A Yes.
Q Approximately how many times in the state of Montana has that been done?
A 14 times.
MR. TWITO: Your Honor, at this time I move to qualify Mr. Kinsey as an expert in forensic science specializing in DNA analysis.
MS. HOOD: No objection.
THE COURT: He is so qualified and may so testify.
Q (By Mr. Twito) We've heard a lot about these three little letters. What is DNA?
A DNA is the genetic material that's contained in the cells of our body. We have 23 pairs of chromosomes, we get one set of each of those chromosomes from mom and the other pair from our dad's.
Q Everyone's got it?
A Yes.
Q Is -- where is it found within the human body?
A In just about every cell. The only one that I can think of where it's not found are red blood cells which are specialized just for transporting oxygen in the blood. Where we get DNA from blood itself is from the white blood cells, or the immune system cells that are present there.
Q Is it found in the nucleus of those cells?
A Yes, the nucleus is a -- sort of a little

sub-compartment of a cell that is primarily there to hold the DNA.

Q And would that be considered nuclear DNA then?

A That's the DNA -- yes, nuclear DNA.

Q Is there such a thing as mitochondrial DNA?

A Yes. Mitochondrial DNA comes from little subcellular organelles known as mitochondria. They have a different DNA is basically made up of the same type of molecule, but it's organized a little bit differently. And the mitochondria, the DNA's found instead of in long, long strands, it's in a small circular pattern. And there are large numbers of copies of mitochondrial DNA per cell, where there's only the two copies of DNA of nuclear DNA in each cell.

Q You talked about DNA, it's what makes us, it comes from -- 23 chromosomes of mom and 23 chromosomes of dad?

A Yes.

Q Let's talk about some other terms that you use in the specialty of DNA. What is a locus?

A A locus, you can think of it is as a location or just a specific region on a piece of DNA.

Q What is an allele?

A An allele is a different form of a gene. So along the chromosome, or this very long piece of DNA, there might be a thousand different genes. And some of those genes will be exactly the same from person to person and some will be

slightly different from person to person. Where you get differences, you would say, if there was a difference between -- in the same gene from one person to another, you would say those were different alleles of the same gene, different variations.

Q Okay. When we would have two alleles as you've described them as a particular location, a locus, what would that be called?

A That would be part of a genotype, or the beginning of a DNA profile, which could consist of -- it just depends on how much information you are able to get out of the sample. It could be from one location or it could be from many locations.

Q Okay. And one of the terms that I've come across is a DNA marker, and that term is used in your field, is it not?

A Yes.

Q What is a DNA marker?

A What we're referring to there is the locus, or the location, the -- just a region on the DNA.

Q In terms of this, you can use them almost interchangeably?

A Yes.

Q All right. I'm going to ask some questions about the lab that you work in. Does your lab, your DNA section at the Montana State Crime Lab, have established methods for

analyzing DNA evidence?

A Yes, we do.

Q And are those methods accepted within the scientific community in your profession?

A Yes, they are.

Q Are there any times that you ever deviate from your methods or from your protocols?

A There may be times when it's -- it would be necessary to deviate from them. The protocols are primarily written for the types of samples that we get 90 percent of the time. Some samples might require a little bit extra reagent to be added to the tube to help the process along, but those times when we do deviate are really pretty rare.

Q Are your methods that you utilize in your lab reviewed by outside agencies or outside people that specialize in DNA?

A Yes, there are a couple of different ways. The DNA section itself, to be able to participate in a national DNA database, to be able to receive federal funding, we have to follow DNA quality assurance standards that are put forth by the FBI lab director. It's an audit, or, let's see, it's a multiple-page document that just details out standards that should be followed to run a well-organized DNA laboratory. Our laboratory is audited to those standards on an annual basis. We can do it ourselves one year, but then it has to be

performed by somebody from outside our laboratory every other year. The results of those audits go back to the FBI director for his approval, that allows us to continue receiving federal funds and to participate in the national database.

In addition to that, our laboratory as a whole is accredited by the American Society of Crime Lab Directors. It's commonly referred to as ASCLD. They will review not only our protocols and procedures, but also those procedures for the entire laboratory and the other sections in our laboratory. It's more of an overall accreditation process. Our lab is audited every five years under that program by an outside agency, and then every year we'll still review our procedures and protocols to make sure that they are up to date and that we're following those procedures.

Q Mr. Kinsey, why is all this important for your -- in your procedure profession?

A Well -- I, that's a good question. It's -- so people can have -- can rely on the results from our laboratory. There are a set of standards that show that we have policies and procedures in place that, if followed, we should -- we can say that we are running a well-run lab, and we're following procedures that have been reviewed by people outside of our laboratory so you can have an additional level of, I guess, trust in the results.

Q And I think you might have mentioned this, but you as

a supervisor, you as in your lab, conduct internal audits yourselves within your own lab?

A Yes.

Q All right. Let's talk a little bit about the DNA examination process so the jury has sort of an understanding of what you do.

A Okay.

Q How do we -- we heard from Jamie Bray, a serologist that works for you at the lab. How do you get from an object that may or may not have DNA, such as a stain as Ms. Bray talked about, or a swab, to a result that may have some evidentiary value?

A It's a multiple-step process. And I'll just list the steps first and then we'll kind of go through a little bit of the background for them. The first step is to try and extract DNA from the cellular material that's found on the evidence. The next step would be to try and determine how much DNA we were able to extract from that evidence, because that plays a role in how we set up our subsequent experiment. After we determine how much DNA is present in our extracts, we will then amplify the DNA at a small number of markers, DNA markers or DNA loci. In our laboratory, we use 16 of those.

Once we amplify the DNA so we're able to detect the information at those different markers or regions, we will then run those amplified samples over an instrument, it's

called a capillary electrophoresis instrument. And what it does is separate out DNA fragments of different sizes, and so it sort of develops for us a DNA pattern that then we're able to look at and compare from one piece of evidence to another or from one piece of evidence to the DNA profile we receive from a reference sample from somebody who is involved in the case.

Q Let's talk about that and we'll go back through the process a little bit.

A Okay.

Q I think I have some items here that will assist in that. But you said you needed a reference standard to have something to compare what results that you may get to a known standard of reference; is that correct?

A Yes.

Q There is not much evidentiary value if you don't have a known to compare what you may get from that item to the known standard; is that fair to say?

A Yes. The only place where there might be a little bit of amendment to that statement would be if there is no known reference sample, we can put a DNA profile that we think might come from a suspect into the DNA database, but then the DNA data basis really sort of serves as a reference standard. We're comparing profiles from evidence to some known sample.

Q And we'll talk about that database in just a few

moments here.

Mr. Kinsey, I'm going to hand you what has been marked for identification purposes as State's Proposed Exhibits 355 through 358. It is a series of four photographs. Do you recognize what's represented in those photographs?

A I do.

Q What are those photographs of?

A State's Exhibit 355 is a picture of the DNA extraction room in our laboratory.

Q Okay. State's 356.

A That's a picture of the DNA amplification setup room in our laboratory.

Q State' Proposed Exhibit 357.

A We refer to that room as the post PCR room, or post amplification room, I'm sorry.

Q And then the State's 358.

A This is a picture of the capillary electrophoresis instrument I mentioned a minute ago.

Q And do those photographs fairly and accurately depict those sections of your DNA lab at the Montana State Crime Lab?

A They do.

MR. TWITO: Your Honor, I'd move for the admission of State's Proposed Exhibits 355 through 358.

MS. HOOD: No objection.

THE COURT: They are received, and they may be

published.

MR. TWITO: Thank you, Your Honor.

(Whereupon, State's Exhibit Nos. 355, 356, 357, and 358 were received in evidence.)

Q (By Mr. Twito) Mr. Kinsey, it should appear there on your screen at the witness stand.

A Um-hum.

Q Now, tell the jury what they can now see in this photograph?

A So this is our DNA extraction room from our laboratory. Pictured on the left are two laminar flow hoods where the majority of the DNA extraction procedures are carried out. There's a picture of what we call a dead air space hood directly on the wall facing us (indicating), yes.

Q Mr. Kinsey, you have a touch screen at your disposal if you wish to use, or there's also a laser pointer if you're more comfortable with that.

A How do I select --

Q Just touch the screen.

A I'll just use the laser point.

Q Okay.

A Okay. So these are the laminar flow hoods on the left, and then the dead air space hood there. There are pictured, it's kind of hard to see, off to the right on that benchtop are incubators. So these are little, they're called

thermo mixers, so they keep a temperature and then they shake at the same time. So when we put a little sample of DNA to be extracted, one of the steps in that procedure is to incubate for a couple hours at a slightly elevated temperature. And that's a better picture of them there.

Q And just let me know if you want to zoom in on anything.

A Okay.

Q State's Exhibit 356. What do we see in this photograph?

A This is the room in which we set up our DNA amplification reactions. There's a refrigerator that holds the testing reagents, there are two dead air space hoods off to the left there. That's the only thing setting up these amplification reactions are the only things that occur in this room.

Q So this room is separate from any other room in the lab?

A Yes.

Q And the same with the extraction room that we just observed in State's 355?

A Yes.

Q Why is it important to keep those rooms separate?

A Well, in the DNA section, the tests that we use are

extremely sensitive, and we're acutely aware of the potential and the potential ramifications of a contamination event in the laboratory. The design of laboratories are set up, at least for the design of the way the evidence flows through the laboratory, to be in one direction. We don't want to take DNA from -- the next room we'll be going to is the amplification room where billions of copies of DNA are amplified and present in that room. We don't want to take any possible DNA from that room out to the rest of the laboratory where we might contaminate evidence. So this is just one of the mechanisms that we use to make sure -- or to minimize the possibility of a contamination event.

Q And State's 357?

A And so this is the amplification room/PCR room. What's shown, and we'll see in the next picture is the capillary electrophoresis instrument there. There is a couple of computers on the benchtop. Once we set up the amplification reactions in that room we just looked at, those samples go directly to one of these four instruments known as thermocyclers. And I can -- I'll probably be explaining this reaction a little bit in more detail later. After about three or four hours in these instruments, we've made billions of copies of the different regions of DNA that we are looking at in the laboratory. And if you could zoom -- pan back out then. Once that has occurred, then these samples will be

prepared to run over this instrument.

Q From this process that you just described -- actually, I guess, State's 358, just so Mr. Kinsey can identify it, is this just a close-up of that instrument that you just described?

A Yes.

Q All right. From this process, you are sometimes able to obtain what's considered a DNA profile --

A Correct.

Q -- is that right?

A Correct.

Q Tell the jury what a DNA -- how you would define a DNA profile.

A So the DNA profile is going to be some information about different regions of DNA that will enable us to distinguish DNA from one person from the DNA from -- as compared to DNA from another person. In the forensic laboratory, I mentioned we look at 16 different DNA markers. I also told you a little bit earlier we receive half our DNA from mom and half our DNA from dad. What we're looking at are essentially we're measuring the length of these little DNA at these DNA regions between two set points in determining how large those fragments are, just in how many DNA units large they are.

So the DNA profile information that we get will have,

will list, okay, there is a certain notation for every genetic marker. At marker number 1, we might have measurements of 15 and an 18, where we would have gotten the 15 possibly from mom and the 18 information from the dad. We might also get two copies of the same sized piece of DNA from mom and dad, so we would only see one signal. At DNA marker 2, the information might say just two copies of 11.

Q Okay.

A And as you go on from locus to locus, all of that information combined will generate a DNA profile.

Q And we mentioned a little bit earlier about reference standards. In your profession, can you get reference standards from a person's known blood sample?

A Yes.

Q And could you also get that from a person's known buccal swab?

A Yes.

Q Those are common areas where you would get a person's known standard?

A Yes.

Q In this case, Mr. Kinsey, did you have reference standards for Norm Leighton and Patti Hubbert?

A Yes, we did.

Q And those were standards that you obtained from your serology department and that were collected from Jamie Bray?

A Yes.
Q And from those known reference standards, did you develop profiles for each, Norm Leighton and Patti Hubbert?
A DNA profiles were developed. I didn't actually do the DNA bench work in this case. That was done by a DNA technician, Lori Hutchinson, at our laboratory.
Q But at your lab?
A But at my lab. And then I reviewed her results and then made the interpretations myself.
Q And Lori is no longer with the Montana State Crime Lab?
A That's correct.
Q Now, in this particular case, were you aware that other laboratories that specialized in DNA testing had processed certain items of evidence?
A Yes.
Q Are you familiar with the lab's DNA Securities and the lab DNA Labs International?
A I am.
Q And those labs, like yours, would have to have reference standards or knowns before they could make any comparative analyses to their evidentiary samples that they may have?
A That's correct.
Q Mr. Kinsey, I'm going to hand you what I have not

marked, but one is a report from DNA Securities and another is a report from DNA Labs International, and I just want you to look at those. I am not going to offer them or seek to have them admitted. Do you recognize those reports from those two labs?

A Yes, I do.

Q Okay. And are there -- do there appear to be profiles from known standards on -- for Norm Leighton and Patti Hubbert on DNA Security's paperwork that you have before you?

A Yes.

Q Okay. And do you have the profile that you developed in your lab for Norm Leighton and Patti Hubbert handy up there on the stand?

A Yes, I do.

Q I want you to take a moment, can you compare the profile from the knowns that's for Patti Hubbert and Norm Leighton in DNA Security's report that you have before you and compare it to the profile that you developed?

A Yes, I can.

Q Please do so.

And do you necessarily have in those profiles, does each lab have their DNA markers or their loci at the same location on the tables?

A No. Every lab sort of organizes their data tables a

little bit differently, so it'll take me a second to hunt and peck and make my comparisons.

Q But does the report of DNA Security appear to have the same markers that you utilize in your lab, though they're out of order?

A Yes.

Q Okay. Go ahead and compare.

A I should say there are, in 2006, 2007, when the case work was done in our laboratory, we used a slightly -- a different amplification kit, so there are, of the 16 markers that we're looking at here, there are two that are different between these two kits.

Q Okay.

A Our laboratory now uses the same kits as these other two labs, but there will just be two that are different so bear with me one second.

Q You bet.

A So the DNA profiles that we developed in our laboratory match those developed from the DNA Security lab report for Patti Hubbert and Norm Leighton.

Q Okay.

A And now I'll look at -- from DNA Labs International, what profiles did you want me to compare.

Q The knowns that appear on that report for Norm Leighton and Patti Hubbert?

A Oh, both for Norman and Patti.
Q Yes.
A Since I have compared the results in the DNA Labs International and the DNA Security reports are organized similarly, so I'll just compare those results.
Q Okay.
A And then I'll be comfortable with that if you are. And those are the same as well.
Q Okay. So I guess here's my question. While you don't know what those two labs used as their reference standards for either Norm Leighton or Patti Hubbert, it appears that the reference standards they used, they were able to develop the exact same profile as you did from your known standards of Norm and Patti?
A That's correct.
Q Thank you, Mr. Kinsey. I'll take those from you.
Let's go back to your analysis. Did you also have a reference standard in a profile developed for Gerald Morris?
A Yes, we did.
Q Okay. Did you also have a reference standard and a profile developed for Jim Gammage, James Gammage?
A Yes, we did -- can I refer to my report to refresh my --
Q Certainly.
A -- memory?

Yes, okay. Yes.

Q All right. Did you also receive and develop -- receive a reference standard and develop a profile for Alvin Zanders?

A Yes.

Q Did you also have a reference standard and develop a profile for Richard Covington?

A Yes.

Q Did you also utilize a profile developed by DNA Security for John Harris?

A Yes.

Q And the same for Paul Case?

A Yes.

Q Did you also utilize a profile developed by DNA Security for Marsha Whitewolf and also one for Doris Covington?

A Yes.

Q All right. Mr. Kinsey, I want to get case specific now, okay?

A Okay.

Q In this case you were asked to test a large number of items that were processed by your serology department, were you not?

A Yes.

Q Did you prepare a report on February 15, 2008, that

indicated most of your findings?

A Yes.

Q And so I want to refer to that report during this part of the examination.

A Okay.

Q I would like to start with what has been identified by Ms. Bray as your item 76.01, which was a stain removed from the non-burned side of your item 76.

A Okay.

Q Do you remember testing that item?

A Yes.

MR. TWITO: And for the record, Your Honor, it came from State's Exhibit 181.

Q (By Mr. Twito) what were you able to develop from your testing from this particular stain?

A The DNA profile developed from this stain was a mixture of at least three people. Do you want me to continue on?

Q What's a mixture?

A Well, a mixture is going to be any time the DNA from more than one person is found in the same location. So in this case, it looked like the DNA from three different people were found from this one particular stained region.

Q Now, that mixture, is that really a mixture profile?

A Yes, a mixed DNA profile. So there will be, we

talked briefly about alleles, different versions of the same region in a gene or a genetic location. In order for me to make the statement that I think there's at least three people could be contributors to that mixed DNA profile, I would need to see indications of five different alleles and at least one of those markers.

Q And from that mixture profile that you developed off of the stain, did you compare that to any of your profiles from your known reference standards?

A Yes, I did. And we compared those -- we compared the following -- that profile to the following reference standards for Patti Hubbert, Richard Covington, Norman Leighton, James Gammage and Gerald Morris.

Q And what were your results?

A "Patti Hubbert," and I'll just read from the report, "and Richard Covington cannot be excluded as possible contributors to this mixed DNA profile. Norman Leighton's possible contribution to this mixture is inconclusive. Gerald Morris and James Gammage are excluded as possible contributors to that mixed DNA profile."

Q You said some words I think we probably need some explanation.

A Okay.

Q Before I do, I want to present you with something. Mr. Kinsey, I'm handing you what's been marked for

identification as State's Proposed Exhibit 359. Do you recognize what's represented in that exhibit?

A I do.

Q And what is in that proposed exhibit?

A This is a table of DNA profiles from item 76.01, and then from Patti Hubbert, Norman Leighton, and Richard Covington.

Q And does it show those DNA markers or those loci that you have discussed previously?

A Yes.

Q Does it appear to be an accurate table that you would create or keep in your line of work?

A Yes.

MR. TWITO: Your Honor, I'd move for the admission of Exhibit 359.

MS. HOOD: No objection.

THE COURT: Received. May be published.

(Whereupon, State's Exhibit No. 359 was received in evidence.)

Q (By Mr. Twito) All right. Okay. I'd like to take some time with this, maybe now that we have a picture, and sort of explain some of the things that we have talked about. What do we have in the far left column here? Could you please tell the jury what that is.

A That is a list of the genetic loci or locations that

we -- that are tested in the forensic DNA laboratory. The names denote which -- the location. So primarily we go by which chromosome they're found on, so most of them are listed as D followed by a number and then S. So that first locus is D3S, 1358, that's a region on the third chromosome.

Q What's the loci right below that, THO1?

A That designates an actual region of the DNA work. It's adjacent to the THO1 gene. I can't remember exactly what protein is generated by that gene, but it's just a genetic marker that was previously identified in medical genetics.

Q Okay. Just going down, I see one that doesn't -- I see one, as I look farther down the column, it doesn't have any numbers, it's five from the bottom.

MR. TWITO: Can you highlight that, Kimberly.

Q (By Mr. Twito) What do we see here?

A That's the amelogenin marker. Amelogenin is the gene for tooth enamel, and it's found on the sex chromosomes, and we can determine whether the DNA donor -- or the DNA that we're testing comes from a male or a female. So if it comes from a female, there will be what's represented as a single X, but essentially two copies of the X chromosome. If you're a male or there's male DNA present, we'll have detectible X and Y chromosomes.

Q Okay. When we talked about stain 76.01, you said it was a mixture. Can you tell the jury where you see the

mixture on this chart?

A Yes. And I'll start by showing you what's -- what aren't mixtures.

Q Okay.

A What aren't mixtures are the profiles developed from the three reference standards that we have, Patti Hubbert, Norman Leighton, Richard Covington. We see either two different numbers present or one number present, which is in -- the way our laboratory reports it is two copies of that one allele.

Q So that could be, pointing to the column --

A The 11 --

Q -- it could be 11 11 --

A Yes, could be 11.

Q -- but you just you report it --

A As 11.

Q You would report that as 11 if the pair really was the same number?

A Yes.

Q Gotcha. Please continue.

A And so what you see is either -- and the reason we report it as a single number is that's the way the data looks off of that capillary electrophoresis instrument. It looks like a single DNA signal, and so that's how we write it in our reports. So from a single person, a single source DNA sample,

we'll see either one or two of these DNA alleles at each genetic locus.

Now, what we mean when we talk about a mixture is there is an indication that there are many more alleles present at various genetic markers. I mentioned a little bit earlier that enabled -- in order for me to say that the DNA profile looks like it's a mixture of three people, I need to see five different alleles at lease one of those loci. And we see here at the VWA marker indications of five different alleles present.

Q Was that the only marker that you had five alleles present?

A Yes.

Q All right. Okay.

MR. TWITO: Kimberly, I just want to break this down. Would you go up to Patti Hubbert at the first location there, just that box there.

Q (By Mr. Twito) So that is Patti Hubbert's allele pair or genotype for that location on the DNA?

A Correct.

Q Okay. All right. So let's talk about some of these things that you said. You said from this, the conclusion is that Patti Hubbert and Richard Covington cannot be excluded as possible contributors to this profile. What do you mean by that?

A That's going to be one of three possible conclusions that we'll draw from a mixed DNA sample such as this. We can -- if the DNA information from one of the reference samples is not present in the evidentiary profile, and we'll explain later, it needs to occur a few more times than just once, but if that information is missing, then we can say that person is excluded as a possible contributor to that DNA profile. For instance, we said that Gerald Morris and James Gammage are excluded as possible contributors to that possible profile. We can say that a DNA profile cannot be excluded as a possible contributor.

And so, for instance, if we look at Patty Hubbert's genotype at the D3 locus right there, 16 and 18, we see an indication of a 16 and an 18 present in the evidentiary standard. So that would say -- or we would say Patti, at that region, cannot be excluded as a possible contributor. And when I say can't be excluded as a possible contributor, I'm not saying for sure that she is there, I'm just saying that she could be there.

The third possible conclusion is maybe not a conclusion, we would call it inconclusive. I can't tell you that a person is not there and I can't tell you that a person could be there. And so in this particular example, that was the conclusion made for Norman Leighton's profile.

There was some -- we see some indication, for

instance, at the D3 locus where there's a 15 and a 16 present. When -- could I ask that when we blow up that we blow up all the way across the table for a particular locus?

Q You bet.

A Thank you. Great.

So at this particular locus, there is -- Norman has a 15 and a 16, and from the evidence there is a 15 and a 16 there as well. So at that one marker, at that point Norman can't be excluded as a possible contributor.

Now, if we could zoom back out to the whole table, and I'll just kind of scroll down quickly and we'll talk about Norman. He could be present at the THO1 marker. However, at the D21 marker, Norman has a 30 and a 31.2, and we don't see any indication of a 31.2 from the evidence.

Okay. So we'll go on. There is a -- Norman has a 15 and a 21 at the D18 locus. There's a 15 but no 21, so we're starting to see that his profile is being kind of less and less represented in the evidence.

We'll go down one more to Penta E, Norman has a 17 and a 20. Although there is a 17 there, there's no 20. And we can continue on, but I think the point is made at this juncture that it looks like at some of these locations he maybe could be there, could be a possible contributor, but at more -- it's more prevalent that his DNA is not there.

So it kind of goes on here, 11-13. There's an 11-13

there. The D5 locus. 11-12. There's no 11 there. So this is kind of one of those in between type results where I can't tell you he's there, I can't tell you he's not.

Q Just briefly, while we have the chart up, I'd like to turn to your attention to your report dated January 29, 2010. It's a supplemental DNA report.

A Okay. I've got it.

Q Did you also have an opportunity to compare Alvin Zanders to this mixture profile?

A I did.

Q What was the results of that?

A He is excluded as a possible contributor to that profile.

Q All right. Now, from the conclusion that Patti Hubbert and Richard Covington cannot be excluded as possible contributors to this mixture profile, What, if anything, can you generate from that conclusion?

A Um, well, what we -- so that's a conclusion there, that's just more of a qualitative statement. And the next step in the interpretations is to try to provide a weight to that statement, how is it -- is it likely that it's -- that the mixed profile, it would be -- let me see. Let me pause for a second.

When we look at the mixed DNA profile, we want to know, could a large number of people be possible contributors

to that mixed profile or could a small number of people be possible contributors. And so we try to assess that by looking at population statistics and databases. We use laws of genetic inheritance to try and tease out how rare it would be to find a person who would have a DNA profile that could be part of that mixture.

And we did that in this particular case, and the -- what we come up with -- so it's a number of -- an estimated number of people who would have a DNA profile that could not be excluded as possible contributors to this mixture. And that number is 1 in 88,000 Caucasians, or one in 286,000 African Americans, or one in about 152,000 Southwest Hispanics.

Q Why three different statistics or different races?

A Those are the three standard race statistics that are reported around the country. Some laboratories would just report the most common statistics, which would be 1 in 88,000, but most laboratories report those three. Those are the three largest racial populations in the country, so that's why those are reported.

Q In looking at Mr. Covington's allele pairs from his known -- his profile, are -- and then comparing it to the mixture, are all his numbers present?

A Yes.

Q All right. In this case, you also tested other

stains. You tested, I think it's your item number 78.2 --

A Yes.

Q -- which was a stain that Jamie Bray had obtained from some sweat pants. What did you determine the results of -- or what were you able to get from this stain, if anything?

A It was also a mixed DNA profile from at least three people. In this case, Patti Hubbert and Norman Leighton couldn't be excluded as possible contributors to that mixture. Richard Covington's possible contribution is inconclusive. Gerald Morris and James Gammage are excluded as possible contributors.

Q So the same sort of loaded words there, cannot be excluded as possible contributors, inconclusive, which you described, and excluded?

A Yes.

Q So using this allele chart, just so we have a reference point, what does it take for you to just say, Jim Gammage, you are excluded from this?

A Well, it would be a direct comparison of the DNA -- of the profile information, but it would -- if I can explain a little bit more of the -- kind of the organization of the chart.

Q Absolutely.

A It's separated into three, kind of horizontal groups

of genetic locations. The genetic loci that are present at the upper end of each of those three segments (indicating) represent markers that, when we amplify the DNA, they're very short DNA fragments that are amplified from 100 bases to maybe a couple hundred bases. The DNA loci that are at the bottom end of each of these groups are loci in which the fragments that are amplified are maybe 400 bases long, so much longer.

When we amplify DNA, it's much more efficient to amplify the shorter fragments. It's done more efficiently, and so the DNA signal you see is usually a little bit higher from those small DNA, those smaller loci, what I'll call smaller loci, then they are from the larger loci. And so, for instance, we were talking about Mr. Gammage's profile is excluded as a possible contributor here. If I were to see if Mr. Gammage had a 14 and a 19 for his DNA profile, I'd look over here and say there is no indication of that DNA at one of these small genetic markers, where I would expect kind of the most robust results. And I looked down the chart, and if I saw a number of places from these smaller loci where his DNA was not present over in the mixed example, I would say that person is excluded.

Q Okay. All right. Let's talk about some of the other items that you looked at and may or may not have gotten DNA profiles from. Did you examine some swabs of some gloves that -- a left glove and a right glove, I think it's your item

157.2 and 157.3 as previously identified by Ms. Bray.

A Yes, I did.

Q And could you exclude Rick Covington as a possible contributor on either of those swabs?

A No, I could not.

Q All right. I'd like to turn your attention to your lab number 104.1, it was previously identified by Ms. Bray, I believe it's identified as a swab from the lid of a cup.

A Yes.

Q What were you able to develop from this, if anything?

A A partial DNA profile was developed from this item that was consistent with coming from Gerald Morris. And then I provide a statistic as far as the estimated rarity of that DNA profile, how often I might be expected to see this DNA profile again.

Q Okay. Mr. Kinsey, you just said something that I don't think you have said before. Partial profile.

A Yes. What I mean by a partial profile is that there some in the evidentiary profile from 104.1, the swab of the lid of the cup, there was a lack of information that was obtained from two loci, the Penta E and the Penta D loci. You'll notice that these are two of the larger genetic markers or loci, and it was a fairly low level sample, and this is the type of result that is sort of exemplified by amplification being more robust at the smaller loci and less robust at the

larger loci. So we had data for 14 of the 16 markers on this cup.

Q And so that would be considered a partial profile?

A Yes.

Q And even from a partial -- can you develop statistics from all partial profiles that you may or may not get?

A If the DNA signal is above a certain threshold that we have set in our laboratory that indicates that it's a robust signal, we are confident what we're seeing is good DNA profile information, yes, we can provide a statistic for very few loci if that becomes important.

Q And what statistics did you develop from the swab of the lid of the cup?

A And so this is -- it's a slightly different statistic that's reported, this is called a random match probability, and it tries to address how -- what the frequency would be for me to expect to find this DNA profile again in the general population. And so it will say one in so many number of people would be expected to have this DNA profile. Those numbers are one in -- and if you don't mind, I'll just cite the Caucasian statistics.

Q Certainly.

A It's one in 16 quintillion 560 quadrillion Caucasians, which is 16 million million people.

Q All right. You also tested some other swabs, and

they were identified by Ms. Bray, I believe she had a swab prepared, 79.02, which was correctly identified as the swab of an outside of a right arm cuff, also your item 80 and some swabs, 80.1 and 80.2, which were swabs from a blue towel. Did you obtain a profile from those three items?

A I did. That profile matched the profile from Patti Hubbert's reference standard.

Q And you also tested some other items, your item -- they're all stains, and they're identified as your item numbers 73.01, 73.02, 73.03, 74.01, 74.02, and 76.02. All stains?

A Yes.

Q What were the -- what results did you achieve from those?

A The DNA profile developed from all of those items indicated mixtures of at least two people. Patti Hubbert is -- her possible -- let's see -- cannot be excluded as a major contributor to those profiles. Norm Leighton's possible contribution to item 73.2 was inconclusive. Norman Leighton is excluded as a possible contributor to the remaining profiles. Richard Covington, Gerald Morris, and James Gammage are all excluded as possible contributors to those profiles as well.

Q Just for point of reference, the ones you excluded Norm Leighton as a possible contributor included 74.01 and

74.02, which were described as -- with regard to 74.01, a stain from the outside front rear bottom of a shirt, and 74.02, a stain from the outside front near right armpit.

A That's correct.

Q Now, did you also test some other stains from item 74? I believe it's 74.03 --

A 03.

Q -- and 74.04.

A Yes, yes.

Q What were the results of the testing of those two stains?

A The DNA profiles developed from those stains are either mixed, full or partial profiles from at least two individuals. Patti Hubbert and Norman Leighton cannot be excluded as possible contributors to those profiles. Richard Covington, Gerald Morris, and James Gammage are excluded as possible contributors.

Q On 74.03 and 74.04?

A Oh, I'm sorry, I'm reading under the wrong paragraph. If you can give me a minute.

Q It is on page 3 of your report.

A Okay. Say the numbers again.

Q 74.03, 74.04.

A Sorry. Yes.

Q Okay.

A The DNA profile developed from those items matched Norman Leighton.

Q Okay. So you got -- you tested at least -- well, you did, you tested four stains from your lab item 74, which was a shirt.

A Yes.

Q And on two of the stains, you excluded Norman Leighton, but on the other two you have matching profiles?

A Yes.

Q All right. Again, on page 3 of your report -- and your report is lengthy, I completely understand -- I'm looking at what's described as item 77.01, You describe as a stain from the bottom left of the sheet.

A Yes, I see it.

Q Do you see that?

A Yes.

Q What, if anything, did you obtain from your testing of this stain?

A That was also a mixture of at least two individuals. Norman Leighton cannot be excluded as a major contributor to that profile. Patti Hubbert, Richard Covington, Gerald Morris, and James Gammage are excluded as potential contributors.

Q All right. I want to turn your attention to page 4 of your report, and it's your item number 79.1, and what has

been corrected by Ms. Bray in her testimony, it's a swab on the outside of the left arm cuff.

A Yes.

Q What results, if any, were you able to develop from this swab -- or these swabs?

A The DNA profile was also a mixture of at least two people. Patti Hubbert cannot be excluded as a contributor to that profile. There was a partial minor contributor profile from a male who was also -- that was also developed. Norman Leighton, Richard Covington, Gerald Morris, and James Gammage were excluded as possible contributors to that mixed profile. That minor male profile that we developed was entered into the Montana state DNA index and was uploaded to the national DNA index as well.

Q All right. I want to talk about a few of the things that you said there. What do you mean by a partial minor contributor profile?

A So we briefly talked about partial profiles. So if there is any information missing from a particular genetic locus, we'll identify that DNA profile as partial information. We don't have a full complete DNA profile. The minor refers to the relative level of the DNA signal from one person to another. So in very complicated mixtures like we have here for 76.1, I'm not able to distinguish who may have contributed more DNA to that stain from one person versus another. But in

some mixtures, and most frequently with two person mixtures, there are times when you can develop a major contributor, the person who left the most DNA there, and also a minor contributor who left a little bit of DNA there. And you can actually pull -- deduce and tease apart the two different DNA profiles, One's a major profile, one's called a minor profile. It was this minor DNA, minor partial DNA profile that we entered into the database.

Q Of all the testing of the items that you've done, was this the only one where you actually got a profile such as this that you could upload into your database?

A With the exception of 79.4, the hair root, yes.

Q Okay. We'll talk about the hair root in just a moment.

I want to talk to you about this database, you mentioned it earlier, you just mentioned it again. What is the database called?

A The actual database itself is known as NDIS, for National DNA Index System. It's part of a broader sweep of database known as CODIS, that might be more popularly known as CODIS, the Combined DNA Index System.

Q Okay. Previous to your testimony, the jury heard testimony by an individual by the name of Mark Rioux had been entered into CODIS in January of 2006, I believe.

A Okay.

Q If he was entered into that system, if his profile fit this minor male profile that you obtained from this swab, would that have alerted you?

A Yes, it would have.

Q And to this day, that hasn't happened?

A That's correct.

Q Okay. Now, is this just something, Mr. Kinsey, that you stick the profile out there, hit it against the system and then pull it back?

A No. The profile information, the different alleles represented on that table there are entered into the computer, and it looks very similar to that table present there. And then that profile is maintained in the database forever, until there's some reason to take it out. We can take it out, but most profiles are just left in the database and are compared continually to new DNA profiles that get entered, new reference, new convicted offender reference samples that get entered in.

Q Is that what sort of consists of a lot of the known profiles are convicted offenders that have been uploaded into the database?

A Yes. There are about 8 million DNA profiles present in the national DNA database now. All but maybe a few hundred thousand of them are actually DNA profiles from convicted offenders.

Q And those known DNA profiles are constantly being uploaded in the system?

A Every time a new person's sample is taken and processed, that data is entered into the system and it stays in the system and continually is compared to all new profiles that get entered.

Q So your profile that you entered in 2008, approximately, it's continually being checked against the profiles that are being entered into that system?

A Yes.

Q So even if someone was uploaded as late as a month ago and -- it's being checked against the system?

A We would have found about it if it would have matched, yes.

Q Did you also compare this profile, this male profile to Alvin Zanders?

A I did. I think that was in the last report from January; is that correct?

Q That is correct. I believe it's your report --

A 79.1. Yes, I did, and he is excluded as a possible contributor of that profile.

Q And you excluded the defendant?

A Yes.

Q And you excluded also -- you also excluded Paul Case and John Harris. And how did you go about doing that?

A I received the DNA profile information for those two individuals from a report generated by, I believe it was DNA Labs International. And so compared the DNA profile, much like that table there, to the -- that partial male profile, and they were also excluded as contributing that DNA profile.

Q And Gerald Morris and James Gammage were also excluded?

A Yes.

Q All right. Now, I would like to talk to you about 7904, a root of bleached hair.

A Okay.

Q What did your results reveal to you initially upon initial testing?

A We developed a partial DNA profile consistent with a female. There was an indication of the possible presence of a mixture of at least two individuals, it's -- and in the report, or of the presence of a triallelic variant. That is a very rare event, where instead of a person having two alleles at a genetic marker, sometimes they have three. They just have to do with some genetic rearrangement that has occurred in their DNA in the past. Doesn't mean that there is necessarily some disease or anything, but just --

Q They don't have a foot growing out of their head?

A No, it's just in the process of copying DNA, when cells divide sometimes little changes are made, and that's how

we generate the difference between us, why we all look a little bit different is some of these changes that occur in DNA replication. And so that's what I mean by triallelic variant, there was -- we couldn't tell if there was a mixture or just one of these very rare events.

Q Could you later determine whose hair it was?

A Yes.

Q And whose hair was it?

A Jamie Bray's.

Q From --

A The serologist from our crime lab.

Q Now, the fact that her -- the root of her hair got into your testing, that's not going to change any other results of any of the other items that you tested is it?

A No.

Q It would have no effect on any of your results?

A No.

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

THE COURT: You may.

Q (By Mr. Twito) Mr. Kinsey, in your line of work, are you familiar with the term degradation?

A Yes, I am.

Q Does degradation play a role in your ability to analyze items of evidentiary value?

A Yes, it does.

Q Could you please explain what you mean by degradation and how it could affect your ability to process DNA?

A It'll most likely have an effect on our ability to develop a full DNA profile. If there is -- so degradation is if the DNA is being damaged, we will be -- it may occur that we're less likely to get a full DNA profile. So I think we introduced this concept with the swab from the cup lid, where we got partial DNA information, in that there was not any information from the Penta E and Penta D loci. That result for that particular item was due to just low levels of DNA. And remember how it's easier to amplify smaller DNA fragments than larger.

DNA degradation would have sort of a similar effect. You're more likely to have a degradation event occur on a big piece of DNA than you are on a smaller piece of DNA. It's like target shooting, it's easier to hit a big target than it is a littler target, and so there are various circumstances that could cause degradation of DNA.

Q Would be -- would an example of something that could cause degradation of DNA would be like a cleaning agent like bleach?

A Yes, that would degrade DNA. Yes, it would.

Q And Ms. Bray testified she uses sort of a bleach solution to clean her station. Is that why she uses a bleach solution?

A Yes.

Q What about heat? How would heat degrade, potentially, DNA?

A Heat would damage DNA. DNA is a very stable molecule, so it's going to take quite a bit of heat to damage it. In the amplification step of our developing a DNA profile that we talked -- I mentioned previously, where I take the DNA, or the DNA is taken and put into a Thermocycler to make billions of copies of these different DNA markers, that's actually -- the temperature is taken up to near boiling temperature, DNA is still fine and still is stable at boiling temperatures.

Q And that's about 212 degrees Fahrenheit?

A 212, yes. We don't take it up quite that high, but, nevertheless, pretty close. But if you get situations where bodies are burned, so in the World Trade Center disaster, there was a lot of burned samples, and those samples were really difficult to get full DNA profiles from, and so new technologies were actually developed that helped in the identification of victims for the World Trade Center primarily to deal with degradation from the heat.

Q So heat can factor into the degradation of DNA certainly?

A Yes.

Q So items that have been exposed to high levels of

heat, higher than 212 degrees, certainly could affect your results?

A Yes.

Q Are there any other degradation factors out there? We talked about heat, we talked about bleach, we talked about cleaning agents. Anything else?

A The main one we contend with in the laboratory has to do with microbial growth on the evidence, so there's lots of bacteria and fungus around. And if evidence is not -- not stored properly, if it's not dried out before it's packaged up and sent for analysis, you might detect fungal growth on the evidence. The bacteria and fungus, fungi do a good job of degrading DNA. In fact, part of the bacterial life is -- well, it's kind of the like the bacterial immune system, they have specific enzymes that are designed to cut DNA and degrade it. It's the way they prevent themselves from being infected with viruses, bacterial viruses. And so bacterial growth, fungal growth can have a dramatic impact on degradation and our results.

Q Okay. Mr. Kinsey, just one last thing, I want to clear something up. On the statistics that you gave to the jury on the two things, the swab of the cup and the stain from 76.01 --

A Yes.

Q -- why the statistical difference from 1 in 16 and a

half quintillion in the swab of the cup to 1 in 88,000 in the mixture? What -- can you explain that a little bit?

A I hope I can, yes. The -- with the statistical analyses that we use are most easily adapted for single source profiles, like we would find with a reference standard or a single source profile from a piece of evidence. And so it's very easy to say how many people would have a 17, 18 at that location, or a 9, 9.3 at that location, or a 12, 15 at that location. Those numbers are very easily tracked and well documented.

And there is very few options. A person has to have a 15 and a 16 there, a 9 and a 9.3 there (indicating). And so the frequency of finding that information becomes quickly rarer and rarer, so we get these huge numbers of one in some huge number, so a very rare event.

But what happens when we look at a mixed DNA profile, we're not trying to tell you how often we'd have to test samples to find that same mixed DNA profile, that really doesn't make sense. What we're trying to say is how many people could have a profile that would fit with that pattern. And so what we have to consider are the following different genetic pairings.

So we talked about having just two copies of one number, so let's go back up to this genetic marker here. We have to consider people that have two copies of the 15, people

that have two copies of the 16, two copies of the 17, two copies of the 18. We have to consider people that have a 15, 16; a 15, 17; a 15, 18; a 16, 17; and a 16, 18; all the parameters -- or all the possibilities. And so because we're combined -- and then we combine those frequencies, and because there are so many possibilities, just by virtue of having a mixed DNA profile, those statistics become a lot more conservative and a lot more common, and that's the result we have here (indicating).

Q Okay.

MR. TWITO: I have nothing further, Mr. Kinsey. Thank you.

THE WITNESS: Thank you.

THE COURT: Cross-exam?

CROSS-EXAMINATION

BY MS. HOOD:

Q Good morning.

A Good morning.

Q In terms of the DNA samples that you were dealing with in this particular case, was degradation a big issue for you?

A Well, we certainly developed partial DNA profiles, and those would come from either degradation or low-level samples. So I don't have, off the top of my head, which ones were from low-level samples or which ones could have been from

degradation, but the results are the same.

Q Okay. So sometimes the samples, as you say, are simply low-level samples?

A Yes.

Q Okay. The -- could we look at 359, please. There is something I don't understand here.

THE COURT: Do you like your pictures with or without light?

MS. HOOD: (Laughter) without, I guess.

Q (By Ms. Hood) I notice that on the evidentiary sample you have put parenthesis around some of the alleles.

A Yes.

Q Why?

A At that time what these parentheses represented were DNA signals, and the signals that we get kind of look like an EKG printout, they're just little peaks along the line. Those peaks have to come up to a certain level for us to essentially report them. All of these peaks represented in this sample passed that threshold, but -- and I think I talked about trying to develop major contributors and minor contributor profiles from a mixed sample, and those parentheses were there to indicate that a particular allele was present at a lower level than the other alleles in that -- at that locus.

So for the D3 locus, that 17 peak was less than 70 percent of the next smallest peak height. So just to

represent that there was some disparity in the peak heights, it was intended originally to try and help the DNA analyst de-convolute, or develop, or try to distinguish major contributors from minor contributors. With complicated mixtures such as this, it doesn't really help that much, but that's what those parentheses represent.

Q Okay. So they were alleles that met a certain threshold but not -- were not full?

A They weren't as high as the other ones.

Q Right.

A Yeah.

Q And is there a variance -- there is a variance, isn't there, among labs in terms of how high it has to be to be looked at?

A Yes. They're all in the -- about the same ballpark, but there will be differences, yes.

Q And these are not attributable to stutters?

A No, no.

Q Okay. So I guess one of the things that we might be able to say is there's a certain amount of subjectivity in the work you do?

A I think the subjectivity would come in in the interpretation part where -- or the qualitative statement, someone's excluded, included or inconclusive. There's a little subjectivity there, but it is that results or that

statement has to be reviewed by other analysts in our laboratory, and so -- and so agreed to by independent scientists.

Q Sure.

A Yep.

Q But I guess what I'm getting at is that you don't look at this and always draw bright lines. You don't say, oh, that one's excluded, oop, that one's included, that's inconclusive. I mean you got to kind of look at what you said were these -- I can't think of the word.

A Alleles?

Q No, not -- I knew that one.

A Oh, I'm sorry.

Q No. You said that some of the -- on the evidentiary side that in some areas they were smaller.

A Oh, the alleles in parentheses, is that what you're asking about?

Q Right, Right.

A Yes, the size of the peaks, the level that they come up to, that's very objective, there's hard numbers and that's hard data. And it's the interpretation that would -- that could be a little bit more subjective. We try to write protocols that limit the subjectivity as much as possible, but there's always going to be a little bit of that present.

Q Sure. And when you look at the evidentiary sample

here, you talked about the D3 one at the very top.

A Yes.

Q And I think you said that this was a mixture of at least two people based on what you saw there.

A If that was the only genetic marker I was looking at, that would be the conclusion, yes.

Q Okay. In other words, you don't have to see it a certain number of times as you go down and say, well, I need to see this same thing reappearing several times before I can say it's a mixture. It's enough to do it at one site.

A Well, if you're just going to make the statement about that one site, you would say, yes, that looks like a mixture of two people. Then the next step would be, oh, we'll go to the next genetic marker and see, does that same statement hold? And then to the next genetic marker, and does that same statement hold? If I looked at one possible marker, if I looked at the D3 marker and saw three peaks there, that state would cause me to say, well, that looks like a mixture of at least two people, possibly two peaks from one person and one peak from another person, but then I would look to the next locus and the next locus to see if that actually bore out.

Q Okay. And on this one you actually found it at several locus, right?

A Yes.

Q All right. Let's see if we are -- I think we're done with that. Thank you.

MS. HOOD: Can we have the lights, please, Judge.

Q (By Ms. Hood) I want to talk to you about some of the evidence that you actually tested. The gloves that were spoken about that 157 was their number.

A Yes.

Q Did you have indication in your file that those were gloves that were recovered from Richard Covington's home?

A I had an indication that they were from Richard Covington, not off the top of my head that they were from his home.

Q Okay. When we're looking at item number 73, which was a pillowcase that I think Jamie Bray testified was near the body of Patti Hubbert, you excluded Rick Covington on all of the stains on that pillowcase, correct, that you tested?

A I would think so, but if I could refer to the report.

Q 73.

A Item 73.1, .2 and .3.

Q Right.

A 73.1 and .2, yes, Richard is excluded. And 73.3. 73.3, yes, he is excluded.

Q Okay. And in terms of the -- these three stains, they all contained mixtures, correct?

A Yes.

Q And for example on 73.03, you couldn't exclude Patti Hubbert, but there is somebody else out there, right?

A I'm -- I couldn't exclude Patti Hubbert.

Q You excluded Norm Leighton?

A But I excluded Norman Leighton, Richard Covington, Gerald Morris, and James Gammage, so there was DNA from someone other than those people present.

Q And in terms of one of the other stains, the 73.01, same thing applied, there was something from someone else?

A Yes.

Q The shirt, which was the 74 number -- Are you with me?

A Oh, yes. I'm sorry, yes, I see it.

Q I don't want -- I want to make sure you have it in front of you.

A Thank you.

Q The 74.01 and .02, you excluded Richard Covington on those?

A That's correct.

Q And, in fact, on the other two stains you matched them to Norm Leighton, correct?

A 73 --

Q 03 and 04. 74.03 and 74.04.

A 74.03 and 74.04, the DNA profile matched that as Norm Leighton, yes.

Q You know I put it in order, it's so much easier.
A (Laughter).
Q But, again, on this particular item, you had the DNA profile of someone other than those you tested in this case, correct? Because, just like you did in 73.03, and I'll -- 7401 and 02.
A I'm getting confused with the numbers.
Q I'm sorry.
A I apologize.
Q I'm still on 74.
A Okay. 74. Now, we just spoke about 74.3 an 74.4.
Q Norm Leighton.
A Yes.
Q 01 and 02.
A Different stains from the same item, okay.
Q Right.
A Yes, he's excluded.
Q Right.
A Yes.
Q But it's a mixed profile, and you have Patti Hubbert not excluded, but you've got somebody else in there, don't you?
A There's -- yes, there's DNA from somebody else there.
Q The -- you've already talked about the 79.01, which is the one that you were able to develop a partial minor

profile that you ran through the system, so there's an unknown person there, too, isn't there?

A Yes.

Q And in terms of all of the information, other than those gloves we talked about that belonged to Richard Covington. Other than not excluding him for one stain at 76.01, he was excluded from everything else, wasn't he?

A He was -- his presence was inconclusive at 79.1, I think -- no, not 79.1. The cuff from the sweat pants, and let me try and find that. I think it's item 78.2. Other than that, he was excluded.

Q He was inconclusive at 78.02?

A Yes.

Q Okay.

A And so other than 76.1 and 78.02, the conclusion for Richard Covington's profile, for all the evidence, he's excluded from contributing to those profiles.

Q There was somebody else around in these DNA -- in a lot of these DNA profiles, right?

A The --

Q Or the results that you got.

A The results --

Q The ones we went through, and then if you look over on 82.03, the sweat pants?

A Yes.

Q More than two people -- two or more people?

A Mixtures of at least two people, and so this was -- this is a result, so when there's, for instance, the mixed profile on 76.1, that's a clear mixed profile where there's lots of DNA information at lots of loci, from at least two people. In that one, it looks like information from three. Many of these samples, they're primarily single-source samples, but there might be a little bit extra information and -- but it's not really enough information to identify a particular person with --

Q But it --

A -- but it is from somebody else.

Q Yeah.

A From somebody not mentioned.

Q There is enough information for you to say that there's the DNA of someone else?

A In some of these samples. In some of them, the additional information might be -- you mentioned the word stutter. This is a -- this is a well-characterized artifact that occurs from copying DNA in a test tube. And so what happens is -- we talked about having an allele 15 at the D3 locus. At a small percentage of the time -- or what happens is a little bit of a slip when that enzyme copies across a region, and the result is what's called a stutter band. It's as if that enzyme kind of stuttered as it was doing its job.

The result will be if the single-source sample was just a 15, you might get a little tiny blip at the position 14. It stuttered a little bit and didn't copy one of the repeats.

And so some of these samples, where I say there are indications of a possible mixture, are -- the information is just at a stutter position, and so we're not quite sure or we're not confident enough to say, yes, it is a stutter, we don't have to worry about it. We just kind of throw it in and say we're going to be conservative and not try to, you know, do too much subjectivity analysis on the profile. We'll just give you the information, and the information is if a single-source profile had a couple of stutter peaks that got called, got identified, our reporting is going to be on the conservative side, we'll say it looks like it has indications of two people, and so that's what some of these are.

Q Okay.

A Others will have, I'm sorry.

Q Some of these?

A Yes.

Q Not all of them?

A That's correct.

Q You are saying to this jury, are you not, that on some of the items there was the DNA of someone who you didn't test?

A Yes.

Q In determining who to run -- who the reference samples are that you're going to use, do you determine that?
A No.
Q Somebody else does, right?
A Yes.
Q And in terms of what constitutes these stains, do you make the determination if they are blood or semen or whatever they are?
A That's what Jamie Bray does in our lab, the serology section.
Q Okay. The stain at 76.01, do you have in your file in front of you what that stain was?
A The extent -- the extent of what I have would be the description, 76.1, which is stain from non-burned side of pillowcase.
Q Okay. So all we know from you is that it's just a stain, not what it is or what the quantity of it is?
A That would be in Jamie Bray's report.
Q Let's talk a little bit about how we leave DNA around. Okay. Certainly blood, if you are testing something that's blood, there's going to be DNA in it, correct?
A Yes.
Q And certainly semen, correct?
A Yes.
Q But when you're testing it, you don't know how it got

there necessarily?
A No.
Q Okay. Or when it got there?
A No.
Q Okay. So you can't age DNA?
A No.
Q And the stain that you're talking that you've gotten some DNA from may have been a direct transfer, a primary transfer, correct?
A Yes.
Q And that would be -- would you agree that the person's whose DNA touched it -- or not touched it, but had direct contact?
A An example would be if I cut my finger and dripped blood onto that table, that would be an example of direct transfer.
Q Okay. There is secondary transfer also, correct?
A Yes.
Q And that -- so your drop of blood goes, you go -- the blood comes from you to right next to you.
A Um-hum.
Q And then what happens?
A That would be if I brushed my -- an example would be if I brushed my coat jacket across that blood stain, well, that would be direct transfer of the blood to my jacket, but

indirect transfer of my blood to that jacket.

Q Okay.

A Or secondary transfer.

Q And then if I came up and rubbed shoulders and arms with you and it transferred to me, it could, couldn't it?

A If it was -- under certain circumstances, if it was wet, it could transfer and that would be tertiary transfer.

Q And if we're talking about simply cells transferring, they don't necessarily have to be wet, do they?

A I'm not sure -- I'm not sure what you -- I guess what I'm thinking about is what's wet? You can transfer cells by handling an item. So if your steering wheel -- it would not be unexpected to find your DNA profile on your steering wheel, because you have held on to it and turned the wheel several times, so there would be expectation of transfer of skin cells in that sort of an example.

Q So if I got in your car and I drive it, I might transfer your skin cells to me?

A That's a possibility. But there's been some studies that indicate that it's -- well, verifying it, it makes sort of common sense that it's much easier to transfer a wet stain than it is a dry stain. It also depends on what you're transferring it from, the porosity, you know, how rough the texture is of what you're transferring it from, what you're transferring it to. There's lots of variables that are

included.

Q Right.

A Yes.

Q And they're talking about where it's easier to transfer, they're not saying it's not possible to transfer?

A Oh no, no, they're not saying that.

Q The -- you mentioned mitochondrial DNA.

A Yes.

Q And that's the DNA you get from your mother?

A Yes, it's inherited from your mother.

Q And so it has -- would you agree with me that it sort of has less evidentiary impact or -- I don't know. You know, it comes from your mother, so my brother has the same mitochondrial DNA?

A That's correct.

Q And my daughter does?

A Yes.

Q And my grandchildren do?

A From her, yes.

Q You mentioned -- you talked about some statistics here and, you know, there were some of us that chose our profession because we weren't going to deal with statistics.

A I thought I was one of those. (Laughter).

Q So did I.

I presume you have some training now in statistics?

A Yes, I do. I did actually take statistics in college, and have training, yes.

Q Okay. The -- as to that St. Vincent's cup that was the Gerald Morris match, you gave a huge number -- I thought you were talking about the national debt, but you gave a really huge number, right?

A Yes.

Q By that, you are not indicating that somehow that's unique, correct?

A No. I'm trying to provide some sort of insight as to how rare it is. I'm not saying it's the only one that is there.

Q Right.

A Yes.

Q There is no way in the DNA field to say that the DNA that you get, somebody's sample is unique to them, correct?

A Our laboratory doesn't try to assess the samples that way. There are laboratories who will make statements that say essentially that it's a statistical argument, they have to identify their statistical threshold that they use to make that sort of a statement. The FBI laboratory is one of those labs that will say that. And I believe the threshold was that their statistic has to be -- that huge number we were talking about has to be bigger than 1,000 times bigger than the population of the United States. Now, that's from memory and

so don't --

Q Sure.

A -- don't quote me on that, but they have a statistical threshold. If that profile surpasses that threshold, they'll make a statement that essentially says that blood came from that person.

Q Right. But to really say something is unique you would have to test everybody, wouldn't you?

A Yes.

Q It's sort of like -- there was a long time in which it was felt that the -- that snowflakes unique, right?

A I guess I thought they still were.

Q You know, they aren't. They found two alike, I thought you knew that.

A No, I'm sorry.

Q Okay. Well, we'll go off snowflakes.

A I'll believe you.

Q This one in 88,000 that you gave -- well, I want to use an example here, because I just find this stuff hard to conceive, and I told you I would do this. So the chances of you and I having the same birth date by month and by day would be about one in 365, right, because there are 365 days in the year?

A Yes.

Q Right. Okay. So the chances of you and I having the

same birth date by month, day and year would be much, much higher, right?

A Yes.

Q Because you'd have to -- it would be to the power of how many years we overlapped, right?

A That would be included in the estimate, yes.

Q It would be in -- well, the power of at least, what, 60, 70 or a hundred, or something like that?

A Sure.

Q I'm going to live to a hundred.

A Me, too.

Q Okay. So, see. But I mean that's a gigantic number.

A Yes.

Q I can't do the math.

A Okay.

Q But you would agree it's a gigantic number, right?

A Yes.

Q Okay. Let's assume, because it's true, I have -- my husband and I have five couples that we're very close to, so there are 12 people. Two of the people of this group have the same birthday by year and day, which is, frankly, the same as my mother's too. So I didn't have to go through 365 people to get to two people who would have the same birthday, right?

A That's correct.

Q Okay. And one of these people has the same birth

month, year -- month date and year as me. So I didn't have to go through whatever this huge has -- huge number we are talking about to get to somebody who was the same as me, right?

A Yes.

Q And that's all consistent with the statistics that you're giving, right?

A (No response.)

Q And by that I mean, when you say 1 in 88,000, the very next person you test might have the same?

A Yes.

Q Okay. So it doesn't mean that you have to sort of go through 88,000 people to get to the one that matches, it could be the very next one. See what I'm saying?

A Yes. Yes.

Q Do you agree with me?

A Yes.

Q Okay. And in terms of even when it's a huge number like the one with the Gerald Morris, you cannot say that the very next DNA test you do won't match it?

A That's correct.

MS. HOOD: Could I have just a moment, please, Your Honor?

THE COURT: You may.

MS. HOOD: I have no further questions. Thank you.

THE WITNESS: Thank you.

MR. TWITO: Judge, just very briefly, Your Honor.

THE COURT: Very briefly.

REDIRECT EXAMINATION

BY MR. TWITO:

Q I really don't want to get into to try explain statistics. I don't understand them. The only thing I know is I keep buying lottery tickets and I still don't win.

Ms. Hood asked you a little bit about some subjective interpretation that's done, and you minimized that. But the statistics that you create from these profiles, that's not subjective, that's objective.

A That's correct.

Q Now, Ms. Hood correctly pointed out that other than the stain on 76.01 and the gloves that -- and then there was an inconclusive, Rick Covington was excluded from essentially every item that you were able to develop a profile?

A Yes.

Q But on every item stain that you looked at, every stain, every swab every hair root, Jim Gammage was excluded from everything, wasn't he?

A Yes.

Q The same for Gerald Morris?

A With the exception of the cup, yes.

Q Well, the cup -- all right. That's just fine. So

that was the only thing, the cup, Gerald Morris. He was run against everything else and excluded from everything else, right?

A Yes.

Q Okay. Well, Ms. Hood asked you a little bit about transfer, and I think you summed it up best, if it's liquid, it's easier to transfer?

A Yes.

Q Well, you gave an example of grabbing on to a steering wheel and holding it a few times that you might find someone's cells and you were able to develop a profile?

A Yes.

Q Then you also coupled that, under questioning from Ms. Hood, you cannot age DNA?

A That's correct.

Q Okay. This Court -- or excuse me, this jury heard testimony that James Gammage had been in the apartment of the two victims five or six times, yet you still found him on nothing?

A That's correct.

Q And this jury's heard testimony that Gerald Morris lived right next door to that murdered couple, yet on everything you tested you found nothing?

A That's correct.

MR. TWITO: I have nothing further.

THE COURT: You always get the last word.

MS. HOOD: Oh, I know. I'll try to make it good.

THE COURT: It's recross. State goes first, defendant goes second.

RECROSS-EXAMINATION

BY MS. HOOD:

Q And I could have walked into that apartment once and left my DNA?

A I -- by either spitting or --

Q I could have left my DNA?

A That's correct.

Q Okay. And when you -- every stain on every item was not tested, correct?

A That's correct.

MS. HOOD: Thank you. I have no further questions.

THE COURT: Thank you, sir. Witness can step down. Witness can be excused.

THE WITNESS: Thank you.

MR. TWITO: Thank you, Your Honor.

THE COURT: And, ladies and gentlemen, we'll take our noon recess at this point.

I will admonish you in the usual fashion: It is your duty not to converse among yourselves or with anyone else on any subject connected with this trial or to form or express an opinion thereon until this case is finally submitted to you.

We'll be in recess until about 1:30. Court's in recess.

(Whereupon, the jury exited the courtroom at 12:01 p.m., and a recess was had until 1:34 p.m.)

THE COURT: It looks like two of you are ready and two of you aren't. Who has the next witness?

MR. WALD: Sorry, Judge.

MR. SOUZA: Sorry, Judge.

THE COURT: You-all ready?

Okay. For the record, this is the continuation in State versus Covington. Mr. Covington is present with counsel, and all other relevant personnel are present except for the jury, and you may bring the jury in.

(Whereupon, the jury entered the courtroom at 1:34 p.m.)

THE COURT: Please be seated. Record may reflect the jury is all present.

State may call its next witness.

MR. SOUZA: The State calls Detective Keith Buxbaum.

KEITH RICHARD BUXBAUM,

called as a witness on behalf of the State, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. SOUZA:

Q Could you please state your name and spell it for the

record.
A It's Keith Richard Buxbaum, it's K-e-i-t-h, B-u-x-b-a-u-m.
Q Where do you work?
A Billings Police Department.
Q And what do you work at the Billings Police Department?
A I'm currently assigned to the detective division.
Q How long have you been with the police department?
A 28 years.
Q How long as a detective?
A Be 13 years in June.
Q And as a detective, what types of cases do you typically investigate?
A Mainly felony cases.
Q And have you had training apart from the Montana Law Enforcement Academy?
A Yes.
Q Can you briefly describe that for the jury.
A I went to an intermediate academy a couple years after I was hired on, and then later -- every year you have to go through so many classes just to keep up on so many hours of continuing education.
Q Have you had training in crime scene investigation over the years?

A Yes.

Q Detective Buxbaum, what was your role in this particular case?

A Well, I was called down to the fires at about 6:20 that morning, on September 22nd of '06. And then after I showed up, I was assigned to assist basically Detective Richardson who was the primary officer.

Q Have you assisted Detective Richardson throughout the course of this investigation over the last several years?

A 3 and a half years, yes.

Q Were you involved in the process of collecting evidence at the crime scene?

A I was.

Q Who were the main detectives involved in that process?

A Basically it was Detective Shawn Finnegan and myself. We're the ones that were kind of digging through things, and Detective Richardson was behind us, and then he would tell us which items he wanted to take as evidence.

Q Were -- as far as the bedroom goes, was it just you three that primarily worked in there all day?

A Yes. I mean we started with the outside and kind of worked our way in, so we did the kitchen area first, and that took a couple hours, and then we started working our way into the bedroom.

Q Were there investigators and detectives tromping in and out of the bedroom all day?

A No.

Q With regard to BPD items 52 and, I believe, 32, there were some pillows in the bedroom, were those items bagged up in the bedroom?

A Well, I would pick them up and Detective Finnegan was taking all the pictures, and I would hold the items up. He would take a picture sometimes just of the front, sometimes he would turn it around and get a picture of the front and the back of the item.

I think the pillow, we actually took a picture of the front and back. Detective Richardson would open a bag, take that item and put it into the bag. Would go into the kitchen area that was now cleared out, and that's where they would seal them up and take them out to the crime scene van.

Q What about the bodies, Detective Buxbaum?

A From what I recall, they were taken out later that day. Norm was taken out first and Patti was taken out second.

Q What was done with the bodies before they were taken out?

A Well, once the coroner got there, he did some things, whatever he was doing, and then he took pictures. And then he brought in a cart, and on that cart was a yellow bag, and inside the yellow bag he placed the -- it was a heavy white

plastic bag.

And then the bodies were picked up and placed inside that white bag, that was kind of sealed over, and then the yellow bag was sealed and then the bodies were removed.

Q Did that all occur inside the apartment?

A Yes.

Q With regard to the blue towel that was recovered from Patti Hubbert's mouth, was that ever touched or manipulated prior to her body being bagged up?

A No. We tried to just pick her up as easy as we could and put her into the white plastic bag.

Q Detective Buxbaum, were you at the autopsy in this particular case?

A I was.

MR. SOUZA: May I approach, Your Honor?

THE COURT: You may.

Q (By Mr. Souza) Detective Buxbaum, we had some testimony earlier about some shoes. I just want to hand you a couple of photographs. Handing you Proposed Exhibits 422 and 423. Can you identify those, please?

A The one is a picture of the shoes worn by Patti Hubbert, and then the second one is just a close-up of those shoes with a measuring device in here by the blood stains.

Q And those photographers fairly and accurately depict the shoes that Patti Hubbert was wearing?

A Yes.

MR. SOUZA: At this time the State would move admission of 422 and 423.

MR. WALD: No objection, Your Honor.

THE COURT: Received. May be published.

(Whereupon, State's Exhibit Nos. 422 and 423 were received in evidence.)

Q (By Mr. Souza) And looking at 422, it appears to be some blood on the left shoe; is that correct?

A Yes.

MR. SOUZA: And then, Kimberly, if you could please go to 423.

Q (By Mr. Souza) Is that also a photograph of the left shoe of Ms. Hubbert?

A Yes.

Q Detective Buxbaum, were you the first detective to speak with Marsha Whitewolf?

A Yes, I was.

Q When did you first take a statement from Marsha?

A On the morning of September 22nd.

Q And what time was that statement taken?

A I believe it started at 8:28 and ended at 8:41.

Q Where was the statement at the same time?

A On third floor of City Hall police department.

Q So this statement was taken approximately two and a

half hours after the fire was reported; is that right?
A Yes.
Q At that time, did you ask her how long Gerald had been gone?
A I did.
Q And what did she say?
A She stated three and a half days, four days today, I think.
Q Did you also take a statement from Ms. Whitewolf on the 24th of September?
A I did.
Q At that time, did that issue come up again?
A Yes.
Q With regard to timing, was she a little more vague at that point?
A It was Tuesday, Wednesday or Thursday.
Q And what did she say was the last time -- when you say Tuesday, Wednesday, Thursday, was that referencing before the fire?
A Right.
Q And at that time, Detective Buxbaum, did she say where he was going?
A She said the last time she saw Gerald he was going to move furniture with Rick Covington.
Q Did she also make some statements about what she had

observed him to be wearing?

A I think she said he was wearing black jeans, and he took a -- like a Dallas Cowboy coat or jersey of some sort with him.

Q Over the course of the Billings Police Department investigation, was there a pair of gloves and a jacket that belonged to Mr. Covington that was recovered?

A Yes.

Q And what was the date those items were recovered?

A April 10, 2007.

Q And what was done with Mr. Covington's jacket and gloves?

A They were sent to the Montana State Crime Lab in Missoula for analysis on September 28th, 2007.

Q 9-28-07?

A Correct.

Q Earlier in the investigation, were you contacted by Mr. James Gammage about a letter he'd found?

A Yes.

Q What date was that?

A I believe it was October 19th, 2006.

Q So this was well after Gerald's body was found?

A Yes.

Q And once you got that call from Mr. Gammage, what did you do?

A He called, he was down in those apartments actually cleaning up inside No. 3. And Detective Richardson and I drove down there, went in Apartment No. 3, and basically it was all gutted out. The walls had been, I don't know John if it was sheetrock or plaster, but it was all down to the bear studs, and there was piles of debris on the floor that they were sweeping up.

Q And at that time, did you collect this letter that was -- had Gerald Morris's name on it?

A We did. It was on a pile of debris on the floor, and he picked it up and gave it to us.

Q Was the letter clean?

A Fairly clean.

Q Correct me if I'm wrong on the date, but I want to go forward now to October 31, 2006.

A Okay.

Q Were you involved in sorting through and swabbing some particular evidence?

A Yes.

Q And who did you do that with?

A Detective Richardson and I did it.

Q And what is it that you did that day?

A Mostly it was any pieces of wire coat hangers, the pieces of wire hangers, and then the actual -- couple coat hangers themselves that had been tagged in evidence from

various areas, different crime scenes, I guess, and we took those items and just took a swab off each one.

Q What were you swabbing them for?

A For DNA purposes.

Q So you would swab the particular item, and then what would be done with the swabs? Where would they go?

A They were tagged into evidence.

Q And then they were sent in later for DNA testing?

A That's correct.

Q That same day, did you and Detective Richardson also work on some particular hairs?

A I believe we did that on the next day, it was November 1st.

Q And what did you do at that time?

A There was a couple items that had just some hair on them. We took the hair off those items, tagged it separate, and those were also sent off.

Q When you are talking about tagging the swabs separate and tagging the hair separate, what do you mean?

A Put it in another envelope, and then that envelope went inside another bag and we created another evidence tag for that particular item.

Q So to summarize, say, you grabbed item 100, you took a swab from item 100, you would then create a new evidence tag number for that particular swab and tag that into evidence?

A Correct.

MR. SOUZA: If I may approach, Your Honor?

THE COURT: You may.

Q (By Mr. Souza) I'm handing you what's been marked as State's Proposed Exhibit 421. Have you seen that, Detective Buxbaum.

A I have.

Q Okay. And what exactly is that?

A It's just a list of the item numbers that we opened up that day. There is a couple on here that we didn't actually open that day, we had it done earlier, but most of these we did that day.

Q And does that item contain the original BPD tag numbers and then the new BPD tag numbers for the swabs that were taken?

A It does.

Q Now, had you compared that exhibit to all of the Billings Police Department original evidence tags?

A I did.

Q And those are somewhat cumbersome; is that correct?

A There is, I think, eight or 900 evidence tags.

Q And the information contained on that document is just a summary of the swabbings that you took; is that right?

A Correct.

Q And comparing those to the original evidence tags, is

that an accurate summary?

A Yes.

MR. SOUZA: At this time the State would move the introduction of 421.

MR. WALD: No objection, Your Honor.

THE COURT: Received. May be published.

(Whereupon, State's Exhibit No. 421 was received in evidence.)

MR. SOUZA: And, Judge, if I could have the lights, please.

Okay. Kimberly, could you focus in on the wire coat hanger as an example.

Q (By Mr. Souza) All right. It says a coat hanger, and correct me if I'm wrong, but the second column, this is where the item was originally located; is that right?

A Correct.

Q Okay. So it was located in apartment number 3 in the bedroom by Ms. Hubbert's feet?

A That's correct.

Q Now, what is 23?

A Twenty-three is the wire coat hanger.

Q And then what is item 198?

A That's the swab taken from 23.

MR. SOUZA: Okay. Kimberly, if you could please focus on 203 and 204.

Q (By Mr. Souza) Okay. So correct me if I'm wrong, but we have metal wire collected at the morgue from Ms. Hubbert's ankles?

A Correct.

Q And then it looks like there is two separate swabs for the same item?

A That's correct.

Q Why is that?

A We took one swab on the end of the two cuts, and then we took another swab in the middle of that piece of wire.

Q When you refer to the cuts, is that the area where Dr. Bennett was cutting the bindings?

A Correct.

Q Thank you.

Now, you said that you also did some -- the same thing with some hairs that were recovered on November 1, 2006?

A Correct.

MR. SOUZA: If I may approach, Your Honor?

THE COURT: Yes.

Q (By Mr. Souza) Now, handing you what's been marked as State's Proposed Exhibit 424. Can you identify that exhibit, Detective Buxbaum.

A It's the hair samples.

Q And is that a --

THE COURT: That's not a hair sample he's got.

THE WITNESS: Well -- (indicating).

(By Mr. Souza) Is that a document that summarizes hair samples recovered from other pieces of BPD evidence?

A It does.

Q Have you had the opportunity to compare that to the individual Billings Police Department evidence tags?

A I did.

Q And is that an accurate summary?

A Yes.

MR. SOUZA: At this time the State would move introduction of 424.

MR. WALD: No objection, Your Honor.

THE COURT: May be received, and may be published.

(Whereupon, State's Exhibit No. 424 was received in evidence.)

MR. SOUZA: Okay. Kimberly, could you please just focus in on the first one.

Q (By Mr. Souza) Okay. So we have some hair, and does -- correct me if I'm wrong, but it was originally -- this hair was mixed in with some cord, duct tape and wire from Mr. Leighton's left wrist and thigh, and that was originally recovered at the morgue?

A Yes.

Q And the original BPD item was 114?

A That's correct.

Q And then you separated out the hair and tagged that as 207?

A That's correct.

Q Okay. Thank you.

MR. SOUZA: Kimberly, could you focus in on the last one.

Q (By Mr. Souza) This melted plastic container referred to as 216, Was that the Ace melted plastic container?

A It was.

MR. SOUZA: Can you take that down. Thank you.

Q (By Mr. Souza) With regard to all of these hairs and swabs, where were they sent?

A To DNA Securities in North Carolina.

Q That's a DNA lab; is that correct?

A Correct.

Q During your investigation of this case, were you contacted by Alice Ammen, a trace analyst from the Montana State Crime Lab?

A Yes.

Q What was that with regard to?

A She had left a message for Detective Richardson, and it was in regards to a -- she had got some trace tape fibers from Mr. Gammage's vehicle, and she also had called an wondered if we could go out and actually go out and get plucked fibers, and if we could cut a little piece of the seat

off for her.

Q Did you and Detective Richardson do that?

A Yes, we did.

Q What, was Mr. Gammage cooperative?

A He signed a consent to search so we could search his vehicle, and we did take cuts of the seats and plucked fibers.

Q Were those items tagged into evidence?

A They were.

Q Do you remember the numbers?

A I think they were like 497 to 501.

Q 497 to 501?

A Yes.

Q And were those later sent to the Montana State Crime Lab?

A They were. And the reason there was four of them is because we took from the front seat and the back seat and the passenger's seat.

MR. SOUZA: Thank you. I have nothing further at this time.

MR. WALD: Moment, Your Honor.

THE COURT: Yes.

MR. WALD: No questions, Your Honor.

THE COURT: Thank you, sir. You can step down, witness can be excused. You may call your next witness.

MR. TWITO: The State would call Kathryn Moyse.

KATHRYN MOYSE,

called as a witness on behalf of the State, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. TWITO:

Q Could you please state your full name and spell your last name for purposes of the record.

A Sure. It's Kathryn Moyse, M-o-y-s-e.

Q Ms. Moyse, what is your current profession?

A I'm a forensic DNA analyst at Scales Biological Laboratory in Jackson, Mississippi.

Q How long have you worked there?

A I have been there two years.

Q And have you worked anywhere in your profession, in any other laboratories prior to working at Scales?

A Yes. Prior to that I worked at DNA Security, Incorporated, which was in Burlington, North Carolina, for about two and a half years. Prior to that, in my master's program, I also did part-time work in a laboratory at King's College London where I did my masters.

Q And what did you get your masters in?

A I have a masters in science, in forensic science.

Q And did you -- where did you go to under grad?

A I completed an undergraduate degree, a biology major at Memorial University of Newfoundland in St. John's,

Newfoundland, Canada.

Q When we talked earlier, you were excited that Canada beat the United States in the Olympics.

A I am, yes.

Q Well, can you describe some of the training that you go through before you can work at laboratory like Scales?

A Sure. Scales Laboratory and DNA Security are both ASCLD accredited laboratories. ASCLD stands for the American Society for Crime Laboratory Directors. This is an accreditation body that is basically considered the gold standard in forensic DNA testing.

They, in conjunction with the FBI, have set forth guidelines that their accredited laboratories have to follow. Those guidelines, among other things, entail what kind of training and education an analyst must have.

To be an analyst, you are required to have an undergraduate degree in either chemistry or biology, with a concentration in certain areas, so you have to complete certain courses.

Also, once you have that education experience, you need at least six months of supervised, on-the-job forensic casework experience as well. So when I first started at DNA Security, I had to be fully supervised for my first six months.

After that six months, I was required to take an exam

and to show and demonstrate that I had done testing on a wide variety of forensic samples, and that I had met all the requirements set forth by ASCLD in order to be considered a fully qualified analyst.

So the training I received on the job, as well as my education background qualified me to do the kind of work that I do today.

Q And what date did you become a full-scale analyst with DNA Security?

A It was in February of 2006.

Q Ms. Moyse, have you ever testified as an expert witness in -- as an expert in forensic science specializing in DNA analysis?

A Yes, I have. I believe this is my tenth time.

Q What jurisdictions have you testified in as an expert in that area?

A I've testified here in Montana twice, also in several counties in North Carolina, and several counties in the state of Mississippi as well.

Q And on each of those times, did the Court recognize you as an expert in your field in DNA analysis?

A Yes, that's correct.

MR. TWITO: Your Honor, at this time I'd move to qualify Ms. Moyse as an expert in forensic science specializing in DNA analysis.

MS. HOOD: I don't object to that.

THE COURT: And you may -- she is recognized, as you say, and you may question her as an expert in her area.

Q (By Mr. Twito) Ms. Moyse, we all heard from Phil Kinsey, the director of our state crime lab, and he gave us a little background on DNA and some of the terminology that we use, so I'll briefly go through that with you and then we'll get to your results.

A Sure.

Q Do you use the word "locus"? How do you use the word "locus" in your profession?

A The word "locus" is another word for location. What we are essentially doing in DNA testing is looking at locations along the DNA molecule. DNA is a big long chemical structure that we inherit. We get half of our DNA from our mom and half of our DNA from our dad. Their DNA combines to form a new individual.

The whole premise of DNA testing is, whether it be items that we're looking at is a blood sample from a known person, something we call a reference because we know it came from an individual, or if it's an item of evidence and we're not really sure if there's DNA or how much DNA or whose DNA it is.

We are always looking at the same set of locations, so we are comparing apples to apples. At DNA Security at the

time that we were doing this testing, we looked at a total of 16 locations, or loci, locus. Sixteen different locations along the genetic code along our DNA. And so the same 16 locations are looked at for every item of evidence or every individual's reference sample so we can compare side by side if there is a match or not, or if they are consistent or not.

And so that's the whole premise for the DNA testing, it's on these loci, or the plural for locus. That just means location that we're looking at on the DNA molecules.

Q Ms. Moyse, the way that the Montana State Crime Lab was set up, through the testimony that we heard earlier today, was that their serology department had a serologist looking at items, perhaps remove a stain from an item or swab an item.

Can you tell us what was the set up at DNA Security and whether or not you participated in the obtaining of swabs or staining of certain items that are sent to you?

A Sure. That's usually the first step in any type of forensic DNA examination. The majority of the time we're getting in items of evidence such as clothing or objects from a crime scene. And the whole objective is to, A, first identify if there is any biological fluids on there.

Biological fluids are blood, saliva, semen, these are all the fluids in which it's possible to obtain a DNA profile from. Our DNA is found in our cells, every cell in our body, with the exception of red blood cells, has DNA in it. And so

saliva has our cells in there, our blood has cells, semen, vaginal secretions, whatever the case may be.

So initially we need to ascertain whether or not there are some of these biological fluids present or not. So typically we'll look at an item and then determine whether or not there may be some biological fluids on there from which we may be able to get a DNA profile.

So in this case, and many others, I would examine items, look for maybe blood or semen or whatever the case called me to look for. And if those stains were, in fact, present, I may cut them out, or sometimes swab them, whatever was more appropriate for collecting that sample, and then take it forth to the next step in order to try and obtain the DNA profile from that item.

That's typically referred to as a serology test or presumptive test is usually what I use. It's a presumptive test to see if blood or semen or saliva or whatever the case may be is in fact present on an item.

Q Thank you.

Ms. Moyse, your work, either in the presumptive testing or result analysis, if you have an evidentiary DNA sample and compare it to a known sample, is that all peer reviewed?

A Yes. All of the techniques that we use are widely accepted peer-reviewed techniques. And above and beyond that,

there are techniques that have to be validated by the laboratory, again, under the ASCLD accreditation guidelines, you have to extensively validate every technique that you use before you use it on any kind of a real case.

So every technique, every test procedure that is done throughout this type of a case is done using procedures that have been studied, and you have written up a validation study of that particular procedure so they are accepted and peer reviewed and generally used widely in the scientific community.

Q And that was all in place back when you worked with DNA Security?

A Yes, it was.

Q All right. I want to talk to you about the specific items that you were asked to test in this case.

A Sure.

Q You talked about before you can make any comparisons to profiles that you may obtain from a stain or a swab, you have to have some reference samples.

A That's correct.

Q Were you provided reference samples in this case from the Billings Police Department?

A Yes, we were.

Q Were you provided reference standards from a Gerald Morris?

A Yes, we were. We were given a blood sample from Gerald Morris.

Q Okay. And how about a reference standard for Marsha Whitewolf?

A Yes, we were given buccal swabs from Marsha Whitewolf. Buccal swabs is another word for mouth swab. They rub the inside of your cheek with a cotton tip applicator to obtain the skin cells from the inside of your mouth, and that's typically used for a reference sample from an individual. It's called a buccal swab.

Q Okay. And were you given a reference standard for a Doris Covington?

A Yes.

Q And was that a buccal swab as well?

A Yes, it was. Again, that was a buccal swab.

Q And how about Richard Covington?

A Yes, that was also a buccal swab.

Q Were you given a reference standard for Paul Case?

A Yes, a buccal swab.

Q Were you given a reference standard for John Harris?

A Yes. Again, that was a buccal swab.

Q Okay. And how about a reference standard for Norman Leighton?

A Yes, that was a blood sample.

Q And how about a reference standard for Patti Hubbert?

A Yes. And, again, that was a blood sample as well.

Q Okay. And when you received those samples from the Billings Police Department, those samples, either the buccal swabs or the blood, those packaging didn't appear damaged or tampered with in any way?

A That's correct. On our submission forms, our evidence technician at the time did note that all the samples were received with no signs of damage or tampering.

Q Okay. And from those reference standards that we just discussed, were you able to develop profiles?

A Yes.

Q All right. Ms. Moyse, I'm handing you what I have marked as Proposed State's Exhibits 415 and 416. Can you please take a look at those starting with State's Exhibit 415. Do you recognize what that is?

A Yes. These are two pages from two of our reports that we sent out after completion of these testings were done at our laboratory. They have a variety of items on them, I guess we could go through them individually or -- but it's basically a table of our DNA results.

And it has what we call alleles on here. When you see them, I'll explain them. When we are looking at those 16 genetic locations, or loci that I had mentioned before, at those 16 genetic locations we are looking for genetic markers known as alleles.

There are many possibilities of alleles at each of these genetic markers, and that's what makes someone's individual profile so unique.

When we look at all 16 of them, when we get a complete profile, usually the likelihood of obtaining that same profile in the general world population is less than 1 in 999 trillion. So that will tell you that these profiles are unique, because there's nowhere near that many people on the earth, or there never will be, but that's what we are looking at here on these two pages of the report.

Q And these allele tables, would they assist in explaining your testimony as to those results and those reference standards?

A Yes, they will.

MR. TWITO: Your Honor, at this time I'd move for admission for demonstrative purposes State's Exhibits 415 and 416.

MS. HOOD: No objection.

THE COURT: Received. And they may be published.

(Whereupon, State's Exhibit Nos. 415 and 416 were received in evidence.)

Q (By Mr. Twito) Okay. We're looking at 415 here, if I'm not mistaken. And your name appears at the bottom of that?

A Yes, it does.

Q And these results typically come with your reports that you generate?

A That's right. This is basically just a visual presentation of DNA profiles. Each column represents a different specimen that we tested in the laboratory, and the numbers going down the columns are a number representation of those genetic markers that we have seen at those 16 genetic locations.

The first column on the left, if you can see --

Q We'll bold it up there.

A There you go.

Q Okay.

A -- that very first column on the left that says "System" on the top, that's the 16 genetic systems, the 16 different genetic loci that we look at when we do these tests. So all those long name -- or letter and number titles that they're given are listed on that left-hand column.

The next --

Q Let me -- I'm sorry to interrupt. Do most, a lot of labs have the same markers or utilize the same markers?

A Yes. These 16 markers in particular are part of a commercially wide kit known as Identifiler. This is widely used by many different laboratories. It's a commercially made kit by a company called Applied Biosystems, and it's widely used, a lot of laboratories do use it and therefore will end

up with these exact same 16 locations.

There are some other kits available that have slightly variable locations on them. They may have some similar to this and then a couple extra or a few less, but this particular one is known as Identifiler, and it's used widely throughout the community.

Q Let's start with, it says spec A and work down.

MR. TWITO: Kimberly, can you just sort of highlight that first two columns there.

THE WITNESS: Okay.

Q (By Mr. Twito) Okay.

A That's specimen A, as you see underneath it, it has a number 16807. Every item that comes into the laboratory at DNA Security is given its very own specimen number, and that's what that particular specimen number is.

When I refer to the next -- a previous page on my report, it tells me that 16807 corresponds to the blood sample that was from Gerald Morris.

Q Okay.

A And when we go down through that column, you will see some NR and some INC's. That particular reference blood sample did not give us a full profile from that particular individual. There were some missing genetic information there.

This can happen if it's not an ideal blood sample, if

a victim was found maybe several days later after death and the autopsy was not performed right away. Decomposition usually will affect the quality of the DNA that you can get from a blood sample, so that was most likely what happened here.

The blood that was obtained was not pristine and therefore we did not get a full DNA profile for this particular individual, but we did get a partial profile.

Q Sufficient enough to identify it as Gerald Morris?

A Yes.

Q Okay. Let's go to specimen B. Who is in -- who is specimen B?

A This is the buccal swab from Marsha Whitewolf. And this example you will see that we did get an allele call for all 16 of those genetic loci that we tested, so this is a full profile from Marsha Whitewolf.

Q Okay. And then specimen C?

A This is from D. Covington. Again, we did get a full profile from the buccal swab taken from D. Covington.

Q Okay. Okay. That's from Doris Covington?

A Um-hum.

Q And then specimen D?

A Specimen D, again, our specimen number is 16810, and that corresponds to the buccal swab taken from Rick or Richard Covington. Again, here we did get a full complete DNA profile

from him, so this is his individual DNA profile.

Q Now, I want to keep that up there for just a second. Interesting -- you said something that was very interesting to me. You produced a statistic for these profiles even though they are known profiles.

A That's correct.

Q Why do you do that? Why did you do that at DNA Security?

A Really, a DNA profile, it's strength is in its number really. What we are trying to do when we calculate a statistic is to tell you how common or uncommon this particular DNA profile is in the general world population. Because if you then match it to an item, it tells you how strong that match is.

So, for example, on all of these samples in which we got a complete profile from Marsha Whitewolf, D. Covington, Rick Covington, and Paul Case, the likelihood of getting this DNA profile from a randomly selected person in the general world population is less than 1 in 999 trillion.

So the chances of this matching someone else are less than 1 in 999 trillion. And that statistic is what gives this DNA profile its value, that tells you how rare it is, and that's why we always provide a statistic with any profile that we can when we do this type of testing.

Q Okay. And then specimen E, if you would just -- so

we can see who we have here. And who is specimen E?

A This is also a buccal swab taken from Paul Case.

Q All right. Now, I want to turn your attention to State's 416, and I want to -- you have 416 up there?

A Yes, I do.

Q And who do we have in specimen A in 416?

A Specimen A, our lab number 16816, corresponds to the blood sample taken from Patti Hubbert. And, again, this was a full profile that we obtained.

Q And then specimen B?

A That was taken from Mr. Leighton, that was our sample number 16819. Again, it was a blood sample and it was a full profile.

Q And then finally on this chart, specimen C.

A Specimen C is from John Harris, and it was a buccal swab from him, full profile.

Q And so we've just gone through all the reference standards that you had in order to do that side of the comparison analysis.

A That's correct. And I should mention, at DNA Security, we actually had two completely separate areas of the laboratory in which we did reference samples such as these, samples from known individuals, and evidence items were tested in a completely separate area, you know, that eliminated any chance of reference items coming in contact with evidence

items. So all of these reference items were done in that reference area in the laboratory.

Q Okay. Now, on this chart that we -- that we still have up there --

MR. TWITO: Kimberly, if you can pull it back up to D and E.

Q (By Mr. Twito) -- I want to talk a little bit about results now; okay. We have your reference standards out there. Are there two specimens here that are represented in this allele table that are actually from evidentiary items?

A Yes. The last two items in this table, items D and E, our sample is number 16813 and 16818, those were two DNA profiles that were from items of evidence that we tested.

Q Okay. And are they -- what does your report indicate that your item 16813 was that you received from the Billings Police Department?

A It was a swab taken from a telephone cord, Billings Police Department, item number 152.

Q Okay. And what results, if anything, did you get from your comparison of that profile that we see in specimen D to -- in your comparison to your known reference standards?

A Okay. Well, again, whenever we get an item of evidence and get a profile from it, then we do -- look at the reference samples that we receive in a case to see if there is a match to anybody.

In this particular item, the swab taken from the telephone cord produced a full profile which matched the reference sample taken from Mr. Leighton, which we saw earlier in that same table. It was sample number 16819.

Q So we see it here on -- we've just taken part of State's 416, just the other column, and just sort of put them together; is that correct?

A That's correct. Specimen B there represents the full profile obtained from Mr. Leighton. And as you look down that column, those are the allele calls, or genetic markers that I mentioned. As you look down, you can see there's an exact match to the two evidence items, specimen D and E.

So you see he had a 10-15 -- the evidence items had a 10-15. He had a 30, 31.2, the evidence items had a 30, 31.2. And those numbers are known as alleles, and that's what we inherit from our parents. They match the entire way down this profile from the evidence items to that reference sample of Mr. Leighton, and that indicates that these are consistent with each other. The DNA on those items had to have come from Mr. Leighton.

Q Okay. Then let's -- what did you identify in your report as specimen E?

A Specimen E was a swab taken from a bottom of a walker, the Billings Police Department number 131. That too gave us the exact same DNA profile from that other item of

evidence from the telephone cord, and, again, was a match to Mr. Leighton.

Q Okay.

MR. TWITO: Thank you, Kimberly.

Q (By Mr. Twito) Okay. I want to turn your attention now -- well, first of all, you issued quite a few reports in this case, did you not?

A Yes, we did. I think it was around 13 or 14 reports.

Q I'd like to direct your attention to certain reports and ask you questions from the results of those reports, or lack of results from those reports.

A Sure.

Q I turn your attention to a report date December 19, 2006, page 1 of two, five items appear on that report starting with specimen A, hair 3, and then specimen B, hair 4. Do you have that report in front of you?

A Yes, I do.

Q Okay. I want to talk to you about some of your results there. What -- and it goes A through E; is that correct?

A That's correct.

Q I'd like to talk to you about your specimen C.

A Okay.

Q What was the item that you identified in your specimen C?

A This was a swab that I collected from the inside neck area of a T-shirt, Billings Police Department item number 142.

Q Okay. And so you actually did the swabbing there?

A Yes, I did.

Q Okay. Inside neck. What do you mean when you swab the inside of the neck of the shirt?

A When we're looking to find who wore an item of clothing, we swab the inside of that clothing looking for epithelial cells. Epithelial cells is just another word for skin cells. We all know that we are constantly shedding our skin cells, and a great place for that is on the inside of our clothing.

So we typically will swab the inside neck area, or underarm area, or on the shoulder seams, areas that have really good contact with the wear. So that's what I was trying to achieve in this particular sample. It was a T-shirt, I wanted to see if I could get skin cells from whoever was wearing that T-shirt, so I swabbed the neck area for that particular item.

Q Okay. Now, this particular item, this wasn't like a burned T-shirt or just coated in blood and you were swabbing the neck because it was bloody. It was just swabbing the neck to see who possibly could have worn this shirt.

A That's right.

Q Okay.

A I believe there is one small stain that we'll probably discuss later, but there was no major blood on that shirt, and we were looking to see who the wearer of that T-shirt was.

Q Okay. And what was the results of your tests on your specimen C, the inside neck of the T-shirt swab?

A I did obtain a full profile from that swabbing that I took from the neck area. And when compared to our reference samples, it was consistent with the DNA profile taken from Ms. Whitewolf which was our sample number 16808.

Q And then your specimen D in this particular report, what is that item described as?

A That was a swab that I took from the inside shoulder area of the T-shirt, Again, trying to achieve the same thing, trying to collect skin cells from whoever may have worn that T-shirt.

Q Okay. And, again, from item number 142 from the Billings Police Department?

A Yes, it was the same item number.

Q Okay. And what were the results of that?

A Again, I was able to obtain a full profile which matched the profile from the neck area which was consistent with that of Marsha Whitewolf.

Q And then you also you -- what about your specimen E in this report, what was that?

A Specimen E was a swab, in this case it was not a swab that I had collected, it was a swab that was received by us, taken from tag number 23, and it was Billings Police Department item number 198.

Q But it didn't have -- in the submission form, it didn't have any other identification on it?

A No, that was the way it was described to us. Swab from tag No. 23. That's all we had.

Q Ms. Moyse, you haven't seen this, but this was just introduced by the previous witness. It's a list of some swabbings that the Billings Police Department did. Do you see item numbers that match on this 421 that match your specimen E?

A Yes, I do.

Q Okay. And that is the third one down.

MR. TWITO: Kimberly, if you could zoom in on that.

THE WITNESS: That's correct. The third one down has items number 23 and 198, and those correspond with the swab that we received.

Q (By Mr. Twito) All right. Thank you.

And what were the results, I should ask, of that testing of that swab?

A This particular swab yielded a mixture profile. A mixture profile means that there is more than one person's DNA mixed together. We can tell that, because, as you may

remember on the table we had up there earlier, we get one of our genetic markers from our mom and one of our genetic markers from our dad.

So we should at all times have a maximum of two genetic markers. Sometimes we can only have one if mom and dad gave us the same genetic marker, there is the possibility of that, but no more than two. If we see more than two, we know that most likely there's another individual in that profile as well.

And that was the case for this particular item, it indicated a mixture profile. None of the reference samples that we had were included in that mixture. All references obtained were actually excluded as contributors to that mixture.

Q So even Patti Hubbert was excluded?

A Yes.

Q Norm Leighton was excluded?

A Yes.

Q Rick Covington was excluded?

A Yes.

Q Gerald Morris was, excluded?

A Yes.

Q And so on and so forth?

A Yes, that's correct, all references.

Q I want to turn your attention to another section of a

report dated December 19th, 2006, it's page 1 of two. It starts with an A swab, B swab, C swab, D hair.

A Yes, I have it.

Q Okay. You have -- with regard to specimen A, what do we have here?

A This, again, was a swab, not that I took, but a swab that was received from Billings Police Department, described as swab from tag number 174 cup, also item number 210.

MR. TWITO: Kimberly, if you would put up 421 again.

Q (By Mr. Twito) Looking again at the diagram that's previously been introduced, do you see those numbers from your report anywhere on this page?

A Yes, I do. Third from the bottom, they have the item numbers that correspond to this swab.

Q All right. And let's see -- okay. And did you get any results from your analysis on specimen A?

A Actually no. We were not able to obtain any DNA profile from this particular item. We called it just no results.

Q And then with regard to your specimen B and specimen C, can you identify what those are that you tested?

A Sure. Specimen B was, again, a swab received, described as swab from tag number 192 ends, and specimen C was swab from tag number 192 middle, items 211 and 212.

Q All right.

MR. TWITO: And, again, Kimberly if you would put up 421.

Q (By Mr. Twito) Do you see where those -- your numbers reflected in your report are on the diagram?

A Yes, the two bottom.

Q Okay. So you put ends and middle as it was described to you. It's possible they were trying to describe where they swabbed the item?

A I'm assuming.

Q What were your results of testing these two swabs?

A Specimen B, again, yielded a mixture but it was only a partial mixture. In my opinion at the time, there was not enough genetic material present within that profile to make any kind of conclusive comparisons.

In a DNA profile, when there's not enough there, if we don't get a full profile, if there is obviously things missing in that profile, we get no results for some of those 16 genetic locations that we look at, we have to make kind of a call as an analyst as to whether the quality of that profile is high enough to make comparisons to known reference samples.

In that particular case, I did not feel it was. There was not enough genetic information in there. Item C, the swab from tag number 192, in the middle, yielded a partial profile. It was not a mixture, it was just a single-person profile, but, again, only a partial profile.

Meaning at some of those 16 genetic locations we look at, we did not obtain a result. But generally it wasn't too bad of a profile. Unfortunately, it did not match any of the reference samples that we had tested in this case.

Q So the swabs from the metal coat hangers in garbage truck didn't match anybody involved that you had for reference samples?

A That's correct.

Q Okay. And then, finally, with regard to this report, your specimen D, what is that described as?

A Specimen D was a hair from container tag number 126, item number 215.

Q Now, is that 126 on your report, do you believe now to be a typographical error?

A That's right. I've been informed that it was wrong on the submission form, it should actually be tag number 216.

Q Okay. And that came from item 215; is that correct?

A Yes.

MR. TWITO: If you could put up 424, please.

Q (By Mr. Twito) Do those -- now, I guess with that corrected number, does that now correspond to the numbers you had in your report?

A Yes, on the bottom there, um-hum.

Q Okay. All right. And what result did you get with regard to this specimen?

A This specimen D, the hair from the container, tag number 216, we were not able to get any result from that. Hairs are a difficult thing. You need to have a pretty significant root tag attached to the hair in order to obtain a DNA profile, because that's actually where we're getting the DNA from, would just be from the skin that's attached to the root end of the hair.

If there's not enough of that skin attached, we won't be able to get a profile, and that was the case with this particular hair, we did not get a profile.

Q Ms. Moyse, can heat degrade the ability to get a profile?

A Yes. There's several factors that do something, what we call degradation, to the DNA molecule. The DNA molecule is really, really long and really, really complex, and certain things such as high heat exposure to UV light, moisture and bacterial and mold, they can all degrade the DNA.

And that means literally the DNA molecule is being eaten away. So some of these factors can degrade the DNA molecule which prevents us from obtaining a profile at all or maybe just a partial profile.

Q Ms. Moyse, if I told you that that hair was recovered within a big bunch of fire debris, does that surprise you that you didn't get results?

A No. I mean, hairs are tricky to begin with, like I

said, due to the root tag. But things that have been exposed to a fire, regardless of how good an item may have been, fire is definitely going to come into play in the degradation of the DNA.

Q Thank you.

Now I would like to turn your attention to one of your reports dated December 20, 2006. It starts with specimen, specimen A at hair 1?

A Yes, I have it.

Q And I believe there are five specimens in this report. Could you identify each of those as to what they are?

A Sure. Items A, B, C, and D are described as hairs 1, 2, 3, and 4, and they were all taken from tag number 114, item number 207. And then that final sample, specimen E, was a clump of hair, also from tag number 114, item number 207.

Q And what were the results of your testing with regard to your specimens A through E on this report?

A With these particular hairs and with the clump of hair, we were able to obtain profiles for all of them, full profiles. This full profile from the hairs was then compared to our reference samples and was found to be consistent with the reference samples on Mr. Leighton in this particular item.

Q Okay.

MR. TWITO: Kimberly, if you would put up 424.

Q (By Mr. Twito) And do the numbers from your report

correspond to one of the horizontal columns here?

A Yes, the top row.

Q Okay. All right. I would like to turn your attention to another report dated December 20, 2006. There were three specimens, A through C, hairs 1, 2, and 3.

A Yes, I have it.

Q And what -- how are those items identified in your report?

A Those are three hairs from duct tape tag number 217, item number 223. We actually had a typographical error there as well on that item number. We had it written as 127, it should actually be 217.

Q And what results, if any, did you get for your specimen A?

A The hair 1, specimen A, we obtained a partial profile. Again, there was no match to any of our reference samples. This was a case, again, where we just were not able to obtain a result at all 16 of those genetic locations.

I think we got them at about nine out of the 16 genetic locations, and those nine that we did obtain were compared, and there was no match to any of the reference samples in this particular case.

Q Okay. And then your specimen B?

A Specimen B, another hair was another partial profile, again, that indicated a mixture. So we have that situation

where it looks like there's more than one person in there, but we did not get a full mixture profile. There is still some genetic information missing.

What we did have was compared to the reference samples, again, no complete match but this is another scenario where the quality of the profile was not really sufficient to make any real conclusive comparisons. And then, finally, the third hair, specimen C, no results were obtained from that hair whatsoever.

MR. TWITO: And just so we can keep corresponding those numbers, Kimberly, could you pull up 424 one more time.

Q (By Mr. Twito) And do those numbers that you identified in your report, do they appear in this exhibit as well?

A Yes, in that middle row.

Q Okay. All right. Now, I would like to turn your attention to a report dated January 3, 2007. It begins with specimen A and identifies a cutting.

A Yes, I have it.

Q With regard to your specimen A, how is it identified?

A This is a cutting that I took from a T-shirt which was item number 142.

Q Is that the same T-shirt that we talked about earlier that you did the swab from the shoulder and from the neck area?

A Yes, it's the same T-shirt.

Q All right. And why did you take a cutting this time rather than just swab?

A This particular time I was trying to obtain a blood sample that I had examined on the sleeve of the T-shirt. I did a presumptive test on the stained area that I saw, and it was positive for hemoglobin using a test that we call the phenolphthalein test.

It's a presumptive test that we use to determine whether a particular sample may be blood or not. In this case it was positive, so I then took a cutting from that stained area and tried to obtain a DNA profile from that stain.

Q Okay. And what did you find out?

A I did get a full profile from that blood stain, and that matched or was consistent with the reference sample from Marsha Whitewolf.

Q Okay. So this blood on the shirt, was there just a lot of it in this area where you did this cutting?

A I don't believe -- I don't have a picture in my notes. I don't believe it was an extensive amount of blood.

Q Okay. And it was on a sleeve area?

A It was a sleeve area.

Q Do you recall the color of the shirt?

A I don't. I don't have the exact color written down and I don't remember exactly what it was.

Q Okay. I'd like to turn your attention to swab -- or your specimen D and specimen E in that report.

A Okay. Specimen D and E, again, were swabs that I took from the left shoe which was item number 99 that we received.

Q Okay. And what is item 99 described as?

A Item number 99, I'll have to go to my submission form. It was just described as the left shoe from Hubbert.

Q Okay. And did you photograph this item during your testimony?

A Yes, I did. When I took that shoe out, I observed several areas that seemed to be obvious blood. I took a picture of that and then circled the areas on the photograph where I sampled blood stains from that shoe. I took eight separate samples from that particular shoe.

Q Okay.

MR. TWITO: And can you pull up State's 423.

Q (By Mr. Twito) Does this State's 423 appear to match the shoe that you observed in that area of blood stains?

A Yes, it does.

Q All right. And how many swabs did you take of that -- from that left shoe?

A I took eight different swabbings from eight -- I tried to take eight kind of separated areas of blood on that shoe.

Q Were you also -- were you only sent a left shoe, or were you also sent a right shoe?

A We were also sent the right shoe.

Q Did you do any swabbing of the right shoe?

A No. I made a note in my notes that there was no apparent blood on that particular right shoe, and so no samples were taken.

Q All right. What were the results of the swabbings that you took from the left shoe?

A Again, I took eight separate swabbings, and all eight of those yielded a full profile. This profile was then compared to those reference samples and was found to be consistent with the reference samples from Ms. Hubbert.

Q All right. I would like to turn your attention now to actually a report dated January 3, 2007. It begins with specimen A, a swab, and through specimen E. They're all swabs?

A Yes.

Q Do you have that report in front of you?

A Yes, I do.

Q What is your specimen A identified as?

A This, again, is a continuation of the swabs that I took from the left shoe. Specimen A is swab 3 from the left shoe, item number 99.

Q And the results of all those swabs were that it was

from Hubbert?

A That's correct. All eight of those swabs taken from the shoe, again, gave full profiles which were consistent with that of Hubbert.

Q Okay. I'm sorry, the report I'm referencing is "and another swabs." I believe your first line, might be several reports down, but it's going to be your specimen A, I believe, is identified by your lab number at 17126.

A Okay. Yes, I have that one.

Q Okay. That's the report I'd like to refer to at this time.

A Okay.

Q What -- with regard to specimen A of that report, how is that identified?

A This was a swab that we received. It was described as swab from tag number 48, item number 199.

Q And what were the results of that?

A This was a profile, again, that yielded a mixture of more than one individual. However, when we did compare this mixture to all the reference samples, it was found that Hubbert sample could not be excluded as a contributor to this profile.

When we have a mixture, we have to be careful of the wording that we use. Usually in the forensic community when you have just a single source sample on -- from a reference

item, and then you have a single source sample from an other evidence item and they match, we usually use the word match or it's consistent with.

However, when you have a mixture profile, there's obviously more than one person in there. We have to use the words "can be excluded" or "cannot be excluded" from that mixture.

Since there's all kinds of genetic markers in there from more than one individual, you're basically looking at your reference items to see if all those reference alleles from that individual can be found in that mixture.

So in this particular case when we compared Ms. Hubbert's reference profile to that mixture, all of her genetic markers were present within that mixture. There are other markers there as well, but all of hers are in there.

With the other reference samples in the case, no one else's full genetic profile was contained in that mixture, but hers were.

Q And it was identified as a swab. It wasn't a swab that you had done?

A No, it was a swab that we received.

MR. TWITO: And so, Kimberly, if you'd pull up State's 421.

Q (By Mr. Twito) And those numbers appear on this diagram that correspond with your report?

A Yes, it's the fourth one down. BPD item number 48 and swab number 199.

Q All right. And with regard to your analysis of specimens B, C, and D, can you identify what those are and discuss the results that you found.

A Sure. These were three more swabs that we received. B is a swab from tag number 89, and C is a swab from tag number 91 ends, and D is a swab from tag number 91 middle. These three evidence items yielded full single-source or single-person DNA profiles, and those were consistent with the reference profile from Ms. Hubbert as well.

Q Okay.

MR. TWITO: And, Kimberly, again, if you would pull up 421.

Q (By Mr. Twito) And your laboratory numbers correspond to the numbers on the diagram?

A Yes. We have swab from 89 and item number 200, and then 91, and 91 middle and ends, which is items number 201 and 202.

Q Okay. And then in regard to your specimen E, how is that identified and what results did you get?

A This was a swab, again, that we received from tag number 93 ends, item number 203. This gave a partial mixture again. We've encountered that several times before. It's a mixture. There's several people probably in there, but there

are areas that we didn't receive any -- or we didn't obtain any genetic information at all, so it's a partial mixture.

In this particular one we didn't feel comfortable comparing it to the reference samples provided, and so we just kind of left it at that. We didn't make any conclusive comparisons in this particular scenario.

Q Okay. So there's all those people -- did you make -- are they all excluded then, those reference samples?

A Well, I have noted that they all are excluded, but we had to be cautious. Again, we always try to err on the side of caution and use conservative approaches when we're approaching these partial mixtures.

At the time that I submitted this report, we did not compare it to any of the reference samples, we just said it's a partial mixture, not enough DNA there to really make a comparison. But what is there does exclude all of the reference samples.

Q All right. Turn your attention to one last report dated January 4, 2007. It begins with specimen A swab, goes all the way through specimen E, all of them are swabs. Do you have that report in front of you?

A Yes, I believe I do.

Q I believe it'd probably be easier if I just said it starts with 17131.

A Yes, okay. I have that one.

Q I guess, starting with specimen A, could you identify what that was and what your results were?

A Sure. Specimen A was a swab we received from tag number 93 middle. Again, a partial profile was obtained, however there were -- let me have a look, it was all but one of the 16 genetic locations we were able to obtain a result for.

So 15 out of 16, we still had to call it a partial. However at the 15 out of the 16 that we did obtain, the profile was consistent with that from Ms. Hubbert.

Q Okay. And that's that from tag number 93, item 204?

A That's correct.

Q All right. And let's before -- let's go through your specimen B. What is that identified as and what were the results?

A Specimen B was also a swab we received from tag number 114, item number 205. This also gave us a mixture containing DNA from more than one individual. And this scenario, when we compared our reference samples to this mixture, the reference -- the alleles, the reference sample from Mr. Leighton could not be excluded as a contributor to this mixture profile.

So his profile is found within that mixture profile obtained from that item, so he cannot be excluded as a contributor to that mixture profile.

Q Okay. And then with regard to exhibits -- or excuse me, specimen C, that again is the same, tag number 114, item 206, but it's just a different area?

A That's right. This is described from tag number 114 in the middle, and we obtained a full profile, single-person profile from this item which was consistent with that from Mr. Leighton.

Q Okay. And with regard to your specimens D and E, could you please identify those and discuss your results?

A Sure. Both of these swabs were taken from tag number 134, D was taken from the ends, and E was taken from the middle, items 208 and 209 respectively. These also each gave mixture profiles.

These were full mixture profiles in this particular case with the exception of one genetic location. And all of the reference samples, all seven reference samples in this particular case were excluded as contributors to these mixtures.

Q Okay.

MR. TWITO: And, Kimberly, could you put up 421.

Q (By Mr. Twito) And correct me if I'm wrong, Ms. Moyse, but these came from tags -- these five specimens came from tag 93, tag 114 and tag 134; is that correct?

A That's correct, yes.

Q And do those numbers correspond to the numbers on

this chart?

A Yes, they do.

Q And just with regard to this mixture that you got on specimens D and E, you base -- did you exclude everyone of the known profiles?

A Yes, we did.

MR. TWITO: If I may have a moment, Your Honor.

THE COURT: You may.

Q (By Mr. Twito) Ms. Moyse, did you find -- other than Ms. Whitewolf on the T-shirt, did you -- were you able to compare profiles with anyone other than Marsha Whitewolf, Patti Hubbert and Norman Leighton?

A No. Out of all the evidence samples that we did look at, which was quite a few, we did have that -- those matches to Ms. Whitewolf on the T-shirt, Ms. Hubbert was on several items, and then Mr. Leighton.

No other reference samples in this case proved to be consistent with those evidence samples that we tested.

Q If I told you that the T-shirt that you tested and did the cuttings on came from Ms. Marsha Whitewolf's apartment, actually from the floor of her closet, would you be surprised that you found what appeared to be a profile consistent with her DNA from those areas that you tested?

A No. Since we swabbed the inside of that shirt, it wouldn't surprise me that the owner, if it was found in her

own apartment, since she obviously had it on, her DNA was on the inside and her blood was also on that, that would not surprise me.

Q Okay. Thank you.

MR. TWITO: I have nothing further.

THE COURT: Cross-exam?

CROSS-EXAMINATION

BY MS. HOOD:

Q Good afternoon.

A Good afternoon.

Q You ran -- you dealt with, what, 29 items, did you say?

A I'm not sure exactly, but I know there was --

Q Somewhere --

A -- a good many.

Q Okay.

A That sounds about right.

Q And sometimes had multiple swabs from this evidence?

A That's correct.

Q And none of this evidence matched the reference sample of Richard Covington, correct?

A That's correct.

Q And in at least more than once, you had a mixture in which you excluded everyone that you had reference samples for?

A Yes, that's also correct.
Q And you had reference samples, of course, for Norm and Patti?
A Yes.
Q And Doris Covington, Marsha Whitewolf, Gerald Morris, Paul Case and John Harris, correct?
A Yes, that's correct.
Q And no others?
A Did you mention Leighton? I'm sorry.
Q Norm and Patti.
A Oh, I'm sorry. Yes.
Q Thank you.
MS. HOOD: I have no other questions.
MR. TWITO: Nothing further, Your Honor.
THE COURT: Thank you, ma'am. You can step down. Witness can be excluded -- or excused.
Okay. Let's take our afternoon recess here.
Ladies and gentlemen, I will admonish you in the usual fashion: It is your duty not to converse among yourselves or with anyone else on any subject connected with this trial or to form or express an opinion thereon, until this case is finally submitted to you.
We'll be in recess for about 20 minutes. Court's in recess.
(Whereupon, the jury exited the courtroom at

3:00 p.m., and a recess was had until 3:20 p.m.)

THE COURT: Everybody ready?

MR. WALD: Yes, sir.

THE COURT: Okay. For the record, we are in the continuation of the trial State versus Covington. Mr. Covington is present with counsel, and all other relevant personnel are present except for the jury, and you may call in the jury.

(Whereupon, the jury entered the courtroom at 3:21 p.m.)

THE COURT: Please be seated. The record may reflect the jury is all present. State may call its next witness.

MR. SOUZA: State calls Dr. Edwin Berry.

EDWIN X. BERRY,

called as a witness on behalf of the State, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. SOUZA:

Q Could you please state your name and spell it for the record, sir.

A Edwin X. Berry.

Q And what is your occupation?

A I'm an atmospheric physicist.

Q Could you describe for the jury your educational background.

A I have a bachelor's degree in engineering from Cal tech, I have a masters degree in physics from Dartmouth college, I have a Ph.D. atmospheric physics from the University of Nevada at Reno. That's education.

Q And what about teaching experience?

A I have worked -- well, in university teaching, I have worked as part of the National Science Foundations program manager in Washington, D.C., where I managed a good part of the weather research projects in the United States.

And more recently, like in the last 20 years, I went into private business, which is more of my preference, and have done consulting and other major projects all related to atmospheric physics.

Q Where do you currently live at?

A I'm sorry?

Q Where do you live now, sir?

A I live in Kalispell.

Q And you said you're an atmospheric physicist. Does that also cover meteorology, climatology?

A Yes, it does. I'm a member of the American Meteorological Society as well as the American Physical Society. As a part of the American Meteorological Society, I am a certified consulting meteorologist, which it takes a special kind of testing and application beyond even getting a Ph.D. degree.

Q And can you describe that? How do you become a certified consulting meteorologist?

A There are several criteria that the American Meteorological Society has set up, you can read them on the Web page, but it has to do a lot with professional experience, as well as your educational background, as well as taking a pretty comprehensive test.

Q And how long have you been certified in that, sir?

A I was certified, I believe, somewhere about 1972, my recollection.

Q Where is the National Weather Service based out of?

A Well, the main department of the National Weather Service is in Washington, D.C. That's the NOAA, essentially, National Oceanographic and Atmospheric Administration.

Q And what is the purpose of the National Weather Service?

A Well, the primary purpose of the National Weather Service is to collect and maintain weather data. And originally it was just with simple thermometers, and it got more elaborate and wind speed and then direction, and of course now they even have satellite data in the last 25 or so years. So it's a very comprehensive data collection organization.

Q How is the data collected?

A Virtually by all means, by ground stations, data from

ships, data from airplanes, data from satellites. In the case of our local weather station, which is out near the airport, it is an automated weather station.

And those types of weather stations have been developed -- oh, they were starting to be good about 30 years ago, certainly 20 years ago they're automated weather stations. They have some help and watched over by weather service personnel.

Like the one out here, there is some maintenance people that are on staff, and they do watch it and be sure that it's doing the right data collection and calibration.

Q Okay. So our National Weather Service station is located at the airport?

A Yes, it is.

Q And then data that's collected, that is then transferred to Washington, D.C.; is that right?

A In the case of the data that's collected, they send it to the National Center For Data, it's NCDC, which is in Virginia -- or North Carolina. So the data itself does not go to Washington, D.C., it goes to a data center.

And they have subsidiary data centers, maybe about five or six around the United States. Like, for example, the regional one for here is in Reno, Nevada, and so the data that we have here and collected here, we can get it either from the main center or from the data center in Reno.

Q And as a certified consulting meteorologist, are you able to interpret that data?

A Yes.

Q Have you testified in the past as an expert in meteorology climatology?

A Yes, I have.

Q Atmospheric physics?

A Yes.

Q Can you approximate the number of times?

A Maybe a dozen times.

MR. SOUZA: At this time, Your Honor, the State would move to qualify Dr. Berry as an expert in climatology, meteorology, and atmospheric physics.

MR. WALD: I have no objection to that, Your Honor.

THE COURT: And he may be so recognized and testify in that manner.

MR. SOUZA: Thank you, Your Honor.

Q (By Mr. Souza) And whereabouts up near the airport is the Billings National Weather Service located?

A The data station is sort of in the middle of the whole airplane. It's not on top of the runway, but it's between a runway and a taxiway, but it's not surrounded by any buildings, and it's in a good exposed location.

Now, that's the data center. But you've also asked maybe where the weather service is, and their personnel is in

a building kind of in the southwest Billings. So the people are there, but they're in charge of the data station at the airport.

Q And that data station is one of the newer automated stations?

A Yes, it is.

Q Now, when records from the National Weather Service are requested, are those certified?

A That's an optional thing. In the case of the data that you have gotten from them, it is certified.

Q Okay.

MR. SOUZA: May I approach the witness, Your Honor?

THE COURT: You may.

Q (By Mr. Souza) I'm going to hand you what's been marked as State's Exhibit 329.

A Okay.

Q Have you seen that before, sir?

A Yes, I have.

Q And can you please identify that exhibit.

A This is data obtained from Asheville, North Carolina, for the National Climatic Data Center. And the data is from the Billings Logan International Airport. It consists of pages of hourly data, which many parameters are measured and there are certain summaries that go through with this.

Q And does that cover September 15, 2006, through

October 4, 2006?

A Yes, it does.

Q And you said that is certified?

A Yes, certification is right -- collect -- is right with it here.

MR. SOUZA: At this time, Your Honor, the State would move admission of Exhibit 329.

MR. WALD: No objection.

THE COURT: Received. It may be published.

(Whereupon, State's Exhibit No. 329 was received in evidence.

MR. SOUZA: Kimberly, if you could please put up on the screen, just for purposes of example, this data, September 19th.

Q (By Mr. Souza) Now, can you see that okay up there on your screen?

A Well, I can see it, but I think it's all pretty hard to read it.

Q Sure. Okay. We'll ask you some questions about that.

MR. SOUZA: Okay. First, Kimberly, can you focus in on dry bulb temperature.

Q (By Mr. Souza) What is dry bulb temperature?

A Dry bulb temperature, although there's sophisticated electronic ways to measure it, basically think of it as a

mercury thermometer with the mercury bulb at the end, and the temperature of that bulb is what drives the mercury up the thing and gives you a certain temperature.

The measurement, when that bulb is dry, is called the dry bulb. Okay. If we had one in this room, it would be measuring what's known as the air temperature in this room.

Q Now, I'm going about half way down, it says 68, does that basically equate to 68 degrees Farenheit?

A Yes, it is.

Q Okay. So dry bulb temperature, is that basically what we think of as our daily temperatures?

A Yes.

MR. SOUZA: Kimberly, if you could back out of that and focus in on the times. Time and date. Perfect.

Q (By Mr. Souza) Now, on the left column, Dr. Berry, it looks like it says 19 all the way down, and then column 2 looks like hours and times. Does the 19, does that refer to September the 19th?

A Yes, September 19th, 2006.

Q Okay. And it says 0056. Is that 12:56 a.m., and then 1:56 a.m., 2:56 a.m.?

A Yes, it is. That's local standard time, right.

Q Okay. And why is the data pulled at 56 minutes after the hour?

A Because the way the automated station works, it

collects the data, and it waits for a meteorologist to check the data and push a button. And when he pushes the button, the data gets sent to North Carolina.

Q Okay. So this is --

A So, typically, their latitude is when they essentially are measuring the hourly data. It can be ten minutes before the hour up until ten minutes after the hour. So if the meteorologist that's watching the data is supposed to do it somewhere in that time, he doesn't have to do it on that minute.

Q Oh, okay.

A He may have to do a few things and verify the data and make sure there is no problems then send it.

Q Okay. So across the top we have several different columns. And do these -- does each row of data correspond with that particular hour?

A Yes, each row of data is a particular hour of the day.

Q Okay.

A Now, I might add to that, you will find some records throughout here where they took observations more than one hour per day, but. . .

Q Okay.

A That's optional, the way we do it.

Q So for the most part, there is an hourly observation

of weather data?

A Yes.

Q Now, you're aware that there was a forensic entomologist that was retained in this case?

A Yes.

Q And his name is Dr. Neal Haskell?

A Yes.

Q Have you compared the official National Weather Service data with the data table 1A that Dr. Haskell relied on in making his conclusions?

A Yes, I have done that.

Q And what was your conclusion with regard to the weather data that Dr. Haskell relied on?

A That he did correctly use the highs and the lows as recorded on this data. And not on this page but another page, I think it shows, for example, the mean between the high and low which is easy to calculate anyway.

So, yes, his table 1A was correct on the high, the low, and the mean.

Q Okay. Now, I think certainly this data is somewhat cumbersome to interpret.

A Could be (laughter).

Q I want to show you what's been marked as State's Proposed Exhibit 347. Is that a document you created, sir?

A Yes.

Q And what is it?

A This document shows the date and it shows the maximum degrees Farenheit temperature that day, the minimum degrees Farenheit, and the mean degrees Farenheit, all taken from this data.

Q And so basically that's just a summary of the temperature data from the previous exhibit?

A Yes.

Q And that is an accurate summary to the best of your knowledge?

A Yes. These are the same numbers here that I found in the data.

Q And what date range does that document cover?

A September 15th through October 4th, 2006.

MR. SOUZA: At this time the State would move introduction of 347.

MR. WALD: No objection.

THE COURT: Received. It may be published.

(Whereupon, State's Exhibit No. 347 was received in evidence.)

MR. SOUZA: And if you could enlarge the actual temperature data.

Q (By Mr. Souza) During the week of September 18th through the 22nd, what was the warmest day?

A The warmest day does show up as the maximum degree

Farenheit, which is on Tuesday, September 19th, 69 degrees Farenheit.

Q Okay. Now, with regard to the -- you're referring just to the week of September 18th through the 22nd?

A Right.

Q All right. Now, the weather data, the bigger packet that you have there, does it also report sky conditions?

A Yes.

MR. SOUZA: Okay. Kimberly, could you please put up September 19th. Can you enlarge that?

Q (By Mr. Souza) All right. There are several abbreviations there. Dr. Berry, can you please explain what these mean.

A Yes. The first designation, when they talk about C-L-R, that means clear. Few, F-E-W, that means a few more. I'll give you a number in just a minute. The SCT means scattered, that means it's cloudier. Broken means it's almost full cover. And not shown on here is OVC, means overcast, and it's total sky cover.

Now, what those mean, I think it's easiest to think of those like you have an inch ruler, and you're measuring from zero to one-quarter inch to half an inch, three-quarters, like that. So as long as it's not clear and it's a little above it, if it's between the zero and the one quarter, in other words one quarter sky cover, it's called few.

When you get beyond that and go from the quarter to the half, it's called scattered; okay. I mean you go from a little above the half, now they go beyond three-quarters, they go to seven-eighths in this case, that's called broken.

When it's beyond the seven-eighths, that means looking up the calculation as to how much clear is there versus the sky; okay. If there's one-eighth or less, that would be called overcast, so that's the one-eighth on out.

Q Now, I see, for example, next to few, okay, so now we're talking about potential coverage up to 25 percent?

A Right.

Q What does the one two zero mean?

A The one two zero, you add two zeros on the end and you get the altitude and feet. It's really the altitude above the ground level as opposed to altitude above sea level we're talking about here.

So when we see these numbers like few, that means at 12,000 feet in this particular case. And there's another case down here where the few is at, it says zero nine zero, that means at 9,000 feet above the ground.

And on top of that, they're scattered at 12,000 feet, so we can get multiple layers and it shows up on this data.

Q So looking at this particular day, fairly nice, few clouds in the morning, as you progress into the afternoon gets a little cloudier?

A Yes.
Q Is that a fair --
A That's what's happening.
Q And further down, looking about the 10th line, 12th line down, it says few, zero seven five, SCT, one two zero. So would that mean we have one-quarter, up to 25 percent cloud coverage at 7500 feet, and then up to 50 percent cloud coverage at 12,000 feet?
A That's what it means.
Q Okay.
MR. SOUZA: Kimberly, now can you go do the same thing on September 20th.
Q (By Mr. Souza) And, again, that's hour by hour?
A Yes.
Q I want to look at Wednesday morning. What was the cloud cover like that day around 8:00, 9:00, 10 o'clock in the morning?
A Coming around 8:00, 9:00, that's about a third of the way down the list, We have, for example, scattered at 3800 feet, broken at -- looks like -- kind of hard to read that --
Q 6000?
A -- 6000 something there. And then we end up having perhaps an hour or so later a few clouds at 2500, scattered at 4800, and broken at 8500, et cetera, So there's several cloud layers in this particular case.

Q And so is this a cloudier day then?

A It's a cloudy day. You would call it a cloudy day, yes.

Q All right. Now, during the week of, again, September 18th through the 22nd, which day had the least amount of cloud cover?

A The -- without going through it, let me just -- because I don't have cloud cover on that particular thing. 18th through the 22nd -- well, the 18th, 19th and 20th, all are principally few.

And then 21st and 22nd, I got rain on the 21st and broken clouds on the 22nd. So if you want me to separate between 18, 19 and 20, I will look at the data on the detail --

Q Sure.

A -- because that's what I would have to look at.

I can pretty much assume that on the 19th, since that was the warmer temperature, high temperature, that that's going to have fewer clouds, it usually works out that way.

So what I'm doing is I'm going through this and getting that particular page for that day that shows the cloud cover as we go through. And the first comparison I can make is between the 18th and the 19th, and there are definitely fewer clouds on the 18th as compared to the 19th.

Now we'll look at the 21st.

Q What about the 20th?

A Oh, the 20th. There are more clouds on the 20th than there are on the 19th. So the answer is that the 19th has fewer clouds as compared or other days of that particular interval.

Q And that also had the warmest temperature?

A And it also has the warmest temperature.

Q And so would it be fair to say during that time period, September 18th through the 22nd, that would be what we call the nicest day that week?

A I think we would all call it the nicest day if we experienced those several days, yes.

Q Now, with regard to cloud cover versus a lack of cloud cover, how does that affect how a human feels temperature?

A Well, we as humans, and actually every object is the same way, we can feel it. In humans, we sense the air temperature and that affects how warm we feel, but we are also affected by radiation.

And so during the sunny part of the day, when there are few or no clouds, we are also warmed by the radiation from the sun. So we can have cool air but a lot of good warm radiation coming in and feel warm.

And, similarly, the extreme would be a cool night by a campfire, the air could be very cold, but the campfire is

giving us warmth by radiation. It's not heating the air that's making us warm, it's the radiation coming directly out of the fire to us, our skin captures the radiation.

Q So if it's 55 degrees and cloudy, and 55 degrees and sunny, although the temperature is the same, a person would feel warmer on a sunny day?

A I think we all realize that we will feel warmer on a sunny day, yes.

Q Okay. Now, the records that were introduced, the actual certified records, those also contain precipitation data; is that right?

A I didn't quite catch that, I am sorry.

Q The certified records from the National Weather Service, did those also contain precipitation data?

A Oh, yes, they do. There is an official certified thing by the National Weather Service that has this insignia, that means that someone double checked the data to make sure there were no mistakes in it.

Q Handing you what's been marked as State's Proposed 348.

A Okay.

Q And are those some charts that you prepared?

A Yes, I prepared these charts.

Q And what are they?

A These are charts of the hourly precipitation that I

took from the data just so it became more visual to see it rather than looking at number by number. So I picked out the precipitation data, it's hours this way for a particular day, and I have included in this set all the days in this whole range that were -- where it rained.

Q So you included all dates between September 15th and October 4th --

A 4th.

Q -- 2006?

A That's correct.

Q And that -- those summary charts were taken from the original certified records?

A Yes.

Q And to the best of your knowledge, they are accurate summaries?

A (No oral response.)

Q Of just the precipitation data.

A Well, these are the numbers that I took directly from the data records.

MR. SOUZA: State would move admission of 348.

MR. WALD: No objection.

THE COURT: Received. May be published.

(Whereupon, State's Exhibit No. 348 was received in evidence.)

MR. SOUZA: Okay. Kimberly, could you just focus in

on the 15th.

Q (By Mr. Souza) And what is on the bottom axis of your chart?

A It's just the hour of the day from 1 to 24.

Q Military time?

A Yes.

Q And what about the left axis?

A The left is in the inches of precipitation for that particular hour.

Q Okay. And so during this period of time --

MR. SOUZA: Let me back that out, Kimberly.

Q (By Mr. Souza) So it looks like rain during the night, early morning on Friday, September 15th, and then started raining again about 6:00 p.m. is that right?

A That's right.

Q And then Saturday, September 16th, rained all day?

A Yep.

MR. SOUZA: Next, Kimberly.

THE WITNESS: I could point out also that I scaled every one of these graphs the same, so the point one eight is at the top, so you can compare graph to graph to graph that way.

Q (By Mr. Souza) Okay. Sunday, September 17th, also rained?

A Yes.

Q What was the rainfall like on Wednesday, September 20th?

A Well, virtually nothing, they -- but the reason it's there is because they reported what they call a trace, meaning, yes, it was a little bit wet, made the surface wet, but it wasn't really enough to add to the measurements which would have been a hundredth of an inch.

And so they are -- or a tenth of an inch. I put in this little trace so it just shows that we, in fact, had this moisture that day.

Q There was trace presip Wednesday morning at 9:00 and 10:00 a.m.?

A That's correct, and also at 3:00 p.m. and 4:00 p.m.

Q And this was the day that we discussed earlier that was somewhat cloudy?

A Yes.

MR. SOUZA: Next, Kimberly.

Q (By Mr. Souza) And we had rain again, looks like Thursday, September 21st, and then Friday pretty much most of the day starting at about noon; is that right?

A That's correct.

Q All right. You can take that down. Thank you.

Did you go to the scene where Gerald Morris's body was found at mile marker 6.7?

A Yes, I did.

Q And who did you do that with? Who did you go with?
A With -- was it Sam? It was your deputy.
Q Okay. Detective Bofto?
A Yes, right.
Q And did you spend some time out there examining the scene?
A Yes.
Q Now, approximately how far is that from the National Weather Service data collection site?
A About ten miles.
Q Now, do you have an opinion as to whether or not there would be different weather out there at mile marker 6.7 as opposed to the airport site?
A Well, I do have an opinion as to the relevancy of the data at the airport compared to the site.
Q And what is that opinion, sir?
A And that is that in all of these weather situations, we had a uniform flow of air, wind was blowing if you go through the wind records. So we have, in other words, a uniform air mass.

A measurement at the airport is going to be the same air mass that we're going to have ten miles away from the airport in virtually any direction and beyond. And the key difference is that the site south of town is a little bit higher in elevation than the measurement where it's taken at

the airport.

Q Do you know approximately the elevation change?

A The elevation change, it's about 170 feet, in that ballpark.

Q Okay. How would that affect things?

A The air is going to behave in what's -- it's called, it's a big word, the normal adiabatic lapse rate. In other words, air goes up, it's going to cool, air goes down, it's going to get warmer.

And in a 200-foot level change in these conditions, it equates to about 0.6 Farenheit, so at 200 feet -- so 170.4, .5 Fahrenheit, it's in that ballpark. In other words, the site being higher will have an air temperature in the ballpark of a half degree cooler than the measurements taken at the airport.

Q Okay. A half a degree cooler?

A A half a degree cooler.

Q Now, how can you say that the weather out there is generally going to be comparable to the weather at the airport?

A Well, it -- the only way we can get a division, in other words, having a total different weather situation, ten miles away, would be to have our frontal situation right between the two sites.

And, yes, if a front comes through, and there are

only some minor things, there is nothing here that says, that I saw, there was any major front. How long does it take a front to go ten miles even if it's going? Usually it's coming sideways to it.

So we're only talking a few minutes that we could have a different regime. And it doesn't affect the data when we're looking at hourly data. In other words, the hourly window of the data, any weather change in this thing is going to change both stations at the same time with locations.

Q Okay. And will you expect the same thing with regard to precipitation at mile marker 6.7, and here in the city, and also with relative cloud cover that you've already discussed?

A Yes. I would expect the same thing, in cloud cover, in wind speed, air temperature, and precipitation. So the measurement at the airport is representative of quite a wide area around the airport.

Q And, finally, so considering all things, cloud cover, precipitation, temperature, in your opinion, September 18th through the 22nd, was the 19th what we would refer to as the nicest day?

A Yes. I am sure if anyone could go back to the 19th and drive around at that time, you would have found it's a nice day anywhere you go within a normal distance.

MR. SOUZA: I have nothing further. Thank you.

THE WITNESS: Thank you.

THE COURT: Cross-exam?

MR. WALD: Thank you, sir.

CROSS-EXAMINATION

BY MR. WALD:

Q Dr. Berry; is that right?

A Yes, sir.

Q Dr. Berry, my name is Matt Wald. Just a couple questions if you don't mind.

First, I understand you're a physicist, but you're speaking to weather like it really behaves like science wants it to behave, right? Does that make sense to you?

A No, science doesn't really want anything. Science is just the whole process of discovering and measuring.

Q How come we watch the evening news and the weather man tells us what's going to happen, and about half the time they're wrong?

A They are trying to make a forecast, and it's pretty hard to make a forecast.

Q Have you ever lived in Billings?

A I'm sorry, sir?

Q Have you ever lived in Billings?

A No, I have not lived in Billings.

Q Spent a lot of time here?

A No, I have not.

Q Have you lived in central or eastern Montana?

A No.
Q Okay. You understand that the weather station here is on the Rims? We call it the Rims where the airport is.
A Well, we call at the Rims, but it still happens to be infield, it's not right on the cliff if that's what you're --
Q No, no, I'm just saying it's not downtown, it's up --
A Yes, yes.
Q Okay. Did you ever live at Blue -- you didn't live at Blue Creek, right, because that would be near Billings, right?
A You say, did I live there?
Q Did you, yeah?
A No, I've not lived here. I live in Kalispell, Montana.
Q Okay. You have not spent a lot of time around Blue Creek, the site that you went --
A No.
Q -- with Sergeant Bofto?
A No.
Q So you've never really experienced that locale of weather for yourself except for that one day?
A Around here, you're right, that's true.
Q Okay. Well, I've always found Montana weather to be kind of temperamental?
A Um-hum.

Q Would you agree with that?
A You say you found it to be simple --
Q Temperamental.
A Temperamental. Are you talking time variation --
Q Well --
A -- not space variation?
Q Well, I don't know. I mean, I've just lived in eastern Montana (laughter). And I'm telling -- I understand you're a physicist, but I have lived here, but there is variations, sir, in temperatures within miles of places within this geographic area. Are you disputing that?
A Well, you could show me some data, and I could probably help explain it. But when you say variation in temperature, you could be -- I have no idea where you're going to get this variation.
Q Okay. Sure. Let me tell you something, I live in the Lodge Grass Creek Valley.
A Okay.
Q I live -- it goes kind of towards the Big Horns. I live about ten miles out of town. We have friends that live another ten miles closer to the mountain at a higher elevation.
A Um-hum.
Q Several times this winter they didn't have any snow and we did.

A All right.

Q Several times, different times you go, there is appreciable difference in temperatures.

MR. SOUZA: I need to object. I think counsel is testifying.

MR. WALD: He asked for an example. (Laughter.)

THE COURT: Yes. But the purpose of the attorney is to ask questions, not testify.

MR. WALD: Trying to make --

THE COURT: You can -- you need to ask him the questions.

MR. WALD: Okay, sir. Sure.

Q (By Mr. Wald) Would you agree or disagree that within ten miles in eastern Montana there can be a variation of at least several degrees between two points ten miles apart, same time?

A If we were at exactly the same elevation with no mountain ranges in between, then I will say it would be very, very unusual to find any major temperature difference; okay. Your case about snowing at a lower elevation than higher, that's easily explained.

It takes a certain temperature to develop snow in a cloud, and sometimes that will not occur at a high elevation. So these things mean nothing as far as this situation is concerned.

Q Well, certainly there's areas that are within ten miles that get appreciable precipitation compared to another place without a mountain range in the way.

A There will be times of the year, mostly in the spring time and early summer, when you have convective clouds causing local rain showers, then you will find rain in one place and not so much in another place.

In the fall, the situation we're talking about here, it's a major weather situation that covers 50 to a hundred miles or more that we're experiencing, and a ten-mile distance within 50 to a hundred is negligible.

Q Doctor, well, I can see you believe your science, but I don't believe your weather (laughter).

MR. WALD: I'm sorry, I'll withdraw that, Your Honor. Sorry.

THE COURT: Thank you.

THE WITNESS: It's okay.

MR. WALD: Nothing further, Your Honor.

THE COURT: Redirect?

REDIRECT EXAMINATION

BY MR. SOUZA:

Q These aren't forecasts you are looking at, this is actual data that was checked; is that right?

A That's right, we're not forecasting. And you can say a lot -- much more definitive about the past when you've

measured the data than you can say about the future.

Q And Mr. Wald was referencing mountains versus the valley where he may live in. How does that differ from this particular situation looking at the rimrocks and then looking at the scene?

A Well, overall the -- I don't assign very much relevance to what he was talking about on the differences in the weather data. There will be times, no doubt, you know -- see, I can say these things without having to have lived here.

There's certain principals that the air will follow and the atmosphere does. You will find times where there will be an inversion in this valley and it could be warmer up there and cooler down here during an inversion.

But typically when the air is mixed, it's going to get warmer as it comes off the hill. So most of the time it will be warmer in the middle of the city than it is up at the airport.

Now, no matter what is in -- around in the city of Billings terrain-wise, we come from the airport elevation called the rim, and it's almost a straight shot elevation-wise, ten miles south until you hit some mountains and go up about 170 feet, and what's underneath that isn't going to have any major effect.

In other words, the air could do few things. But by the time it gets back to there, it's essentially the same

temperature air over here.

So it's easy to draw this direct association with what's out there. If it were situated in a much different location, maybe behind trees, down by a creek in a valley, I might have to say a lot of different things, but we're talking about an open exposure in all cases here.

Q And so when you went out and you looked at the scene, did you consider things like foliage and that sort of thing?

A You say foliage?

Q Yes, um-hum.

A Well, it was mostly a dry grass site at the time I looked at it, so it's a grassy slope. Yeah, I considered that.

Q Okay. Now, people who have lived in Billings know that there are temperature differences between downtown Billings and the Heights.

A Sure.

Q Why is that?

A Well, when the air is mixed, meaning good convection, typically in the afternoon, and not fog in the valley, the -- there's going to be a general change in the air temperature getting warmer as you go down, okay, roughly by this .6 degrees Farenheit for 200 feet.

You can have times, however, when you have the ground cooling off down low and cool air flowing into the valley

developing an inversion during the night. Which an inversion just means it's like a bowl of cool air.

The cool air is heavier, it came down the mountain slopes, it cooled by radiation in the valley, and you can end up in the mornings, at least, it may usually change during the day, and the mornings can be much cooler than what you would find up at the airport.

So, yes, there are differences that can happen just because of terrain.

Q But you didn't note any of those differences between the data collection point and the homicide scene at mile marker 6.7?

A No, that's correct. Even though we crossed the valley, if there were an inversion, it would have no effect whatsoever on the temperature that goes right over the top. In other words, there's a direct line of sight, essentially, from the airport right at a certain level right out to the site.

And whether there's an inversion, or we have good mixing in the valley, the conclusion is still the same, okay. It's the same air mass and we can -- we will always find the weather situation there will be representative of all that kind of a situation.

Q So I think you said, if anything, it might be a touch cooler?

A That's correct.

Q Can you ever imagine a situation where it would be warmer out there?

A If it were -- yeah, I can imagine a situation. It would take -- it would be a temporary situation, such as scattered clouds, and we could have an opening of nice sunshine ten miles south. We could have scattered clouds over the airport. It won't remain that way very long.

In other words, this is part of a fluctuation. These scattered clouds will blow over there eventually, but you will find if you look at short-term intervals, yes, you can find some fluctuations just because of the solar radiation difference.

Neglecting the solar radiation, just as far as air mass, I cannot see any time, any situation that would cause a major temperature difference between the airport and the site, other than about the half of degree that I mentioned.

Q And that would, generally speaking, always be cooler not warmer?

A It will always be cooler, because it's at a higher elevation.

Q Thank you.

MR. SOUZA: That's all I have.

THE WITNESS: Okay.

MR. WALD: I'd like to continue the argument, but I

won't do it today.

THE COURT: Thank you, Doctor. You can step down.

THE WITNESS: Okay.

THE COURT: This witness can be excused.

THE WITNESS: Thank you.

MR. SOUZA: We have no more witnesses today.

THE COURT: Okay. We'll take our evening recess at this point.

Ladies and gentlemen, I will admonish you in the usual fashion that it is your duty not to converse among yourselves or among yourselves -- damn, I will admonish you in the usual fashion: It is your duty not to converse among yourselves or with anyone else on any subject connected with this trial or to form or express an opinion thereon, until this case is finally submitted to you.

We'll be in recess until 8:30 tomorrow morning.

(Whereupon, the jury exited the courtroom at 4:11 p.m., and court recessed for the day at 4:11 p.m.)

REPORTER'S CERTIFICATE

I, Kim Marchwick, one of the duly-appointed, qualified, and certified acting Official Court Reporters in and for the Thirteenth Judicial District of the State of Montana, do hereby certify that the foregoing 237 pages were reduced to typewritten form using Computer Aided Transcription and constitute a full, true, and correct transcription of my stenographic notes transcribed to the best of my ability.

Signed this January 30, 2007.

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