A Yes, sir.

Q And perhaps in the near future we will be able to read latent prints and identify them that we are not able to do today?

A It's a possibility.

MR. RUCKER: Thank you, sir. No further questions. Thank you.

MS. EASTMAN: I have nothing further for this witness.

THE COURT: May the witness be excused?

MS. EASTMAN: He certainly may.

(Witness stood down.)

THE COURT: Who is your next witness?

MS. WALKER: Carol Palmer.

THE COURT: Carol Palmer.

(Witness was sworn.)

Thereupon,

CAROL PALMER

Called for examination by counsel for the Commonwealth, having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. WALKER:

Q Would you please state your name.

A My name is Carol Palmer.

Q And by whom are you employed?

A I'm employed by the Virginia Division of Forensic Science Northern Laboratory in Fairfax, Virginia.

This is part of a crime laboratory system for the State of Virginia.

Q And what is your position in the lab?

A I'm a forensic scientist senior in the forensic biology section of our laboratory.

Q And could you explain what a forensic scientist is?

A A forensic scientist is an individual who applies scientific matters -- scientific issues to matters of law.

Q And do you have a particular field within the biology field?

A Yes. In the forensic biology section, I routinely analyze items of evidence submitted from criminal investigations for the presence of blood and other body fluids, such as seminal fluid, and I conduct DNA testing on those items.

Q How long have you been employed at the lab?

A For over ten years.

Q And can you tell us a little bit about your academic background?

A I have a Master of Science degree in forensic science from Virginia Commonwealth University in Richmond.

I have a bachelor's degree in both chemistry and criminology from the University of Pennsylvania as well as several bachelor level credits in molecular biology from George Mason University.

Q Do you have any special training in serology and in DNA examination?

A Yes. Throughout my career at the Division of Forensic Science, I have had training in the fields of serology and DNA testing.

Q How often do you analyze evidence for the presence of blood or other body fluids?

A As a daily task that I can do in the lab.

Q And once you determine that there is a presence of some type of fluid such as blood or

some other fluid, who do you do then?

A After I have examined an item of evidence and determined, if possible, what biological material is present, such as blood, and if needed, I can then conduct a form of DNA testing.

Q And could you explain a little bit of what that means to be a DNA examiner?

A Basically in the laboratory, I will examine the item of evidence, determine what stain exists and then conduct DNA testing using PCR, which stands for Polymerase Chain Reaction.

Q Now, do you extract DNA from both crime scene evidence and known samples?

A Yes.

Q And approximately how many samples have you examined in the DNA process?

A I have been doing this for over six years, so it would be in the thousands.

Q Are you a member of any social organizations related to forensic science?

A Yes. I'm a member of the Mid-Atlantic Association of Forensic Scientists.

Q And have you previously testified in

courts before as an expert in serology and DNA examination?

A Yes, I have.

Q In what courts?

A I have testified in all of the jurisdictions up here, Arlington, Alexandria, Fairfax, Prince William as well as some in the Richmond and the Tidewater area as well as in Montgomery County, Maryland.

MS. WALKER: I would move her in as an expert.

THE COURT: Any voir dire?

MS. WOLFE: No, Your Honor.

THE COURT: Ladies and gentlemen of the jury, you will receive Ms. Palmer as an expert in forensic science.

BY MS. WALKER:

Q Now, could you explain what DNA is?

A DNA stands for deoxyribonucleic acid. And basically DNA can be thought of as like a blueprint for your body just as you have a blueprint to build a house that tells you where the walls and windows should go.

DNA tells your body what color your eyes should be, what color your hair should be or how tall you are.

And the DNA that you have in your body, you get half from your mother and half from your father.

Therefore, when someone says you have your father's eyes and your mother's nose, that's because your DNA comes from your parents.

Q And where is it located in the body?

A The DNA that I test for is found throughout your body in cells which have what we call a nucleus, which is just kind of a control center of the cells that are throughout your body.

Q Would that include blood cells?

A Yes. It is everywhere. It would be in your blood, your skin, your saliva, the seminal fluid, all of those contain these cells which would have the DNA that I test.

Q And your sweat glands as well?

A Yes.

Q And do the cells differ at all from cell to cell?

A Meaning the DNA within the cells?
Q Yes.
A Your DNA is going to be the same throughout all of the cells.
Q And does DNA differ from person to person?
A With the exception of identical twins, everyone's DNA is different.
If you will look around, you will see that all of us look different. Our DNA is different. If you look at identical twins, they are identical. So, therefore, their DNA is the same.
Q And when you are doing the DNA examination, what are you looking for?
A When we're conducting the DNA testing in forensics, what we are trying to do is possibly differentiate between two individuals.
Q And what is your final goal in doing that?
A What we do is I would conduct DNA testing on evidentiary samples, such as a stained blood swab from a sidewalk, and compare it to the DNA

profiles that I establish for individuals possibly involved.

And what we're trying to do is see if this person can be eliminated from being a contributor of the DNA profile that was obtained from that stained swab.

Q So you do not come to a conclusion that such and such a person is that person, is the person who committed it. Is that correct?

A No. We look at it from an elimination factor, whether they can or can not be eliminated.

Q Now, did you do some DNA analysis in this particular case?

A Yes, I did.

Q And you mentioned before PCR. What sort of testing did you use for this particular case?

A The method of DNA testing that I used is referred to, as I said before, PCR, which I have explained stands for Polymerase Chain Reaction.

And what this method does is if you would take a piece of DNA, if you think of it like a long link chain, and one of those areas is a link of DNA, an area of DNA, what PCR will do to that area

is just make copies of it just like you would take a piece of paper and put it on a copy machine and make copies of that document.

This is what PCR does to DNA. I can take the DNA and, using the PCR method, copy the amount of DNA present.

Q And would you explain what the PowerPlex system is?

A I have some overheads.

Q Would you step down?

(Witness stood in the well of the court.)

MS. WALKER: First of all, is everybody going to see the screen?

(Jurors indicated yes.)

MS. WALKER: All right. Is it possible to dim them a little bit?

BY MS. WALKER:

Q Okay. If you could explain the PowerPlex system to us.

A PowerPlex system just a name given to the different areas of the DNA that I looked at. There is actually eight areas that are within the PowerPlex system.

One of those areas is referred to as the TPOX, and locus is just defining that that is the locus in area on the DNA.

To explain the PowerPlex, I'm just going to take you through the TPOX so you can get an idea of exactly how all these eight areas work and what I look at them for.

So TPOX would be one of those links in the chain, which I would use PCR to make copies of. And then I would test for what DNA types or alleles exist at that specific area.

And for TPOX, there are these alleles, 6, 7, 8, 9, 10, 11, 12 and 13. Now, knowing that you get half of your mother -- half of your DNA from your mother and the other half from your father, there are 36 possible combinations that exist.

So what that means is that everyone in this room would then be in -- you probably can't see it because it's very small print -- it would be one of those 36 different types.

So, for example, here is an 8,13. And if I was an 8,13, I would get the 8 from my mother or the 13 from my father or vice-versa, the 13 from my

mom, an 8 from my dad.

But the bottom line is that if I were to test anyone's blood sample in here, you would one of these 36 types.

Now, that TPOX is one of the eight areas that exist, and here then are the complete PowerPlex systems listing all eight. And what we have is a CSF139. There is the TPOX that we talked about. The THO1. The vWA. And then these four down here, D16S539, D7S820, D13S317 and D5S818.

So once again, these are just areas, the individual areas that then I make copies of and test for the possible variations or alleles that exist for evidentiary materials as well as on blood samples submitted to me.

Q Now, when you're going through this analysis, do you have a particular protocol that you follow?

A Oh, yes.

Q And did you follow that protocol when you did the testing in this particular case?

A Yes, I did.

Q I guess I will have you sit down for a

second, if I may, and I will take this down.

(Witness resumed the stand.)

BY MS. WALKER:

Q I show you now what is marked as Commonwealth's Exhibit No. 19 and ask if you could identify this item.

A Yes. I recognize this item by the unique laboratory number that was assigned to it as well as my initials on it.

And this was submitted to me as a blood sample from Mr. Dicks.

Q The victim in this case.

And when you received the sample, what was the condition of it?

A It was in a sealed condition.

Q I show you what is marked as Commonwealth's No. 27 and ask if you can identify this item.

A Once again, I recognize it by the unique laboratory number assigned to it as well as my initials right here.

And this was submitted to me as a blood sample from Mr. Lovitt.

Q And what was the condition of the package when you received that?

A This also was sealed.

Q I show you what is Commonwealth's Exhibit No. 25 and ask if you can identify that.

A Yes. Once again, I recognize it by the unique laboratory number, my initials here.

And this was submitted to me as a blood sample from Mr. Grant.

Q I show you what is marked as Commonwealth's Exhibit No. 9 and ask if you can identify this item.

A Once again, by the unique laboratory number, my initials right here, and I recognize this item as scissors that were submitted to me.

Q And what was the condition of that package when you received it?

A This package was also sealed.

Q Now, what was the purpose of all of these items coming into your possession?

A The purpose of my examination was to determine if there was any biological material present on the scissors and compare it to the DNA

profiles of the known standards that were submitted to me, the known blood samples.

Q Now, when you received the scissors and they came to you, was there any discussion about what those scissors were going to be examined for?

A Yes. There was a request to have DNA testing as well as latent fingerprint examinations conducted on that item.

Q And when there is going to be testing of more than one type -- in this case there was going to be DNA and also print examination -- does that item generally go to the lab?

A Yes.

Q And if in fact the item had been submitted to the Arlington Police Department, for instance for fingerprint analysis, what would that have done to your examination?

A That would not have been preferable because we need to collect the samples for DNA testing prior to any type of fingerprint examination.

Q And so was fingerprint examination done before or after you had it?

A After. I had received the scissors first, removed the areas that were going to be tested for DNA and then forwarded the scissors to our latent examiner section.

Q Now, did you in fact extract any DNA from the scissors?

A Yes, I did.

Q And could you explain where that was?

A I actually obtained human DNA from two different areas on the scissors.

One I designated Area A, which was the lower blade portion near the tip of the scissors. In this area I found the presence of blood and then obtained DNA results from that area.

I also tested another area of the scissors, which I designated as Area B, which also had blood on it. And it was almost like in the midsection of the scissors, just right below the loops of where you stick your fingers in, there, and then on the blade portion.

Q If I show you a photograph of the scissors, could you point out the two areas?

A Yes.

Q I show you what is marked as Commonwealth's Exhibit No. 12 -- and may I hide Your Honor. And if maybe you -- can everybody see this?

If you could point out the two areas of the scissors that you are talking about.

A When I examined these, this area -- I had taken them from both blades -- were considered Stained Area A. And then Stained Area B was this area right here.

So it would be from both of these on both sides there.

MR. RUCKER: I missed that, Your Honor. I wonder if she could do that again.

BY MS. WALKER:

Q Please say that again.

A Stained Area A was further down near the tip of the blade. And then Stained Area B was up here right below in the midsection of the scissors.

Q I show you what is marked as Commonwealth's Exhibit No. 20 and ask if you can identify this item.

A Once again, I recognize it by the unique

laboratory number and my initials on this item.

This item was submitted to me as the, excuse me, fingernail clippings and hair from, excuse me, from Mr. Dicks.

Q And what was the condition of that package when you received that?

A This package was also sealed.

Q And did you in fact look at the fingernail clippings for the presence of blood?

A Yes, I did.

Q And did you find any?

A Yes. I had the indication of blood on the fingernail clippings.

Q I show you what is marked as -- this has been taken out of the package -- but 18-B, and ask if you could identify this item.

A I recognize this outer packaging as well as the contents. On the packaging, I recognize the unique laboratory number and my initials.

And this was submitted to me as a jacket coming from Mr. Lovitt.

Q And did you examine that for the presence of blood, for body fluids?

A Yes, I did.
Q And were you able to find any?
A Yes. I did find blood on one area on the front of the jacket.
Q And did you make an extraction?
A Yes. And I attempted to obtain DNA results from this jacket.
Q Now, when you made that extraction from the jacket, how did you do that?
Did you have to make any cuttings or --
A Yes. Whenever we have an item of evidence that has a stain on it, usually if it is on clothing, what we need to do is cut the stain out and then extract the DNA from that piece of material that I have removed.
Q And just a second, and I will find those.
A Sorry. I recognize this. This is a package that I made, and it has a unique laboratory number assigned to it as well as my initials.
And this the part of the stain that I cut out, and this is what I didn't take for the DNA testing. So there is still some sample that remains.

Q And if I could hold up the jacket, could you show us from what area?

A Sure. It is on the front left side.

These holes there. Those I made.

Q Can everybody see?

And finally I show you what is marked as Commonwealth's Exhibit No. 28 and ask if you can identify this package.

A Yes, by the unique laboratory number assigned to it, my initials.

And these were submitted to me as stained and controlled swabs.

Q And was that sealed when you received that package as well?

A Yes, it was.

Q Now, I would like to refer back to the jacket again.

When you were examining that and you determined that there was blood on the jacket, were you able to determine which side of the jacket that blood came from?

A Yes. I determined that it was from the outside of the jacket. Outside origins is how we

refer to it as.

Q And could you describe to the jury what the bloodstains looked like?

A Yes. They were -- if I may refer to my notes for a second.

They were three small somewhat circular stained areas.

Q And about what size, would you say?

A About the size of a nickel, each of them.

Q The round part of the nickel?

A Yes.

Q The diameter of the nickel?

A Yes.

Q And were they all in the same area?

A Yes. As you can see from my cuttings, they were all on that left front side grouped together.

Q Now, did you make a chart that summarized your findings of your analysis that you made of all of these items?

A Yes, I have.

Q And I show you what has been marked as Commonwealth's Exhibit 30 and ask if you can

identify this.

A That seems to be a copy of the chart that is in my certificate of analysis just made a lot bigger and put on cardboard.

MS. WALKER: I would move this in as Commonwealth's Exhibit 30.

THE COURT: Any objection?

MS. WOLFE: No.

THE COURT: 30 is admitted without objection.

(Thereupon, Commonwealth Exhibit 30 was admitted into evidence.)

BY MS. WALKER:

Q And by using the chart, could you come down and explain what your findings were?

(Witness stood in the well of the court.)

BY MS. WALKER:

Q Okay. Can you-all tell us, first of all, if everybody can see it and does it need to be closer?

Is that okay?

All right. If you may explain.

A What this is is a table of the summary of

typing results, the DNA typing results that I obtained for this particular case.

And as you can see up here at the top, these are the eight areas that I showed you on the overhead, the CSF, TPOX, CFOR and et cetera.

And this column then is the description of the item as it was submitted to me. And then in each of these columns are the results that I obtained as of areas for those specific samples.

So if you go to this first sample, which was submitted to me as a blood sample from Clayton Dicks, I tested his sample and established that in the CSF1PO his type would be an 8,13. He is an 8,9 here; a 7,7; an 11,14; a 12,13; an 8,11; a 20,14; and an 8,12.

This is his DNA profile. So if I were to test anything from his body, this is what I would obtain. In this particular instance, I tested his blood sample, and this is what his DNA profile is.

I then did that also for the blood samples from Mr. Lovitt and Mr. Grant and established a profile for each of those individuals.

Now, the first thing that I do whenever I conduct this type of testing is look at these profiles and see if I can tell these people apart, and I can see right here that I can tell them apart.

All three of them are a different type at this one area as well as being different in other areas. Each are the same here. They are all three different here. They are all three different here and so forth, but there are differences that exist.

But the bottom line is I only need one of those eight for them to be different so that I can tell them apart. But I have many instances where I can easily tell them apart.

Now, that I have their DNA profiles and I know that I can tell these three individuals apart, I then would compare it to any type of -- any DNA profiles that I obtain from evidence in the case.

So for this particular one on the scissors, which we already talked about Stained Area A, which was near the tip. And then Stained Area B, which was in the midsection of the scissors. Remember, I found blood on both of those

areas.

Stained Area A, and the profile is an 8,13; an 8,9; 7,7; 11,14; 12,13; 8,11; 10,14 and 8,12.

Now, what I do is I compare these DNA profiles to this profile to see if these people can be eliminated as the human DNA that I obtained from Stained Area A.

In comparing this profile to these three individuals, we can see that Mr. Grant is eliminated because he is an 11,12, and I'm picking up an 8,13. He is eliminated. Mr. Dicks is an 8,13, so he can't be eliminated.

So what I do is I look at the rest of the profile and determine can Mr. Dicks be eliminated.

But here you can see that the whole way across is the exact same DNA profile. So the conclusion for that sample is that Clayton Dicks cannot be eliminated as the contributor of the DNA on the end of the scissors, whereas Mr. Lovitt and Mr. Grant are eliminated.

Stained Area B, which was in the midsection, I then go back and do the same

comparison.

Now, I want to draw your attention to vWA. I have three results here. And what this means to me in the laboratory, knowing that you have half of your DNA from your mother and the other half from your father, the most that you can have is two alleles or two variations.

Well, here I have three. So I know that I have more than one person's DNA. So this is what we call a mixture.

This is the only area where I'm detecting this mixture. And actually the parentheses here also indicates that it is in a lesser amount. It is not as much -- there is a lesser amount of it compared to the 11 and 14. And this is something that we see often in mixtures, DNA being -- one being more present than the other.

So, my conclusion in comparing to these three people, I have the 8,13, and this profile is very similar. It is exactly the same except for the 17. So Clayton Dicks cannot be eliminated because this main profile that we are coming to is consistent with him.

Q But you do have a 17 here. So could this come from Mr. Lovitt or Mr. Grant?

A Well, the whole bottom line is I can't draw a conclusion. Even though they have 17, I do not have a 16 or a 15 here.

But more importantly is this is the only area, only one area that I'm even detecting the mixture. And it's kind of like putting a puzzle together. If you don't have all the pieces, you don't even know what you're looking at.

So I only have this one little bit of information that tells me I do have a mixture. There is DNA from more than one person here, but it's not enough for me to base any conclusions as to eliminating an individual or not.

So for that particular sample, I could say that Mr. Dicks cannot be eliminated. But as for Mr. Lovitt and Mr. Grant, I can make no conclusion to whether they are eliminated or included. There is no conclusion made in reference to those two people to that stain.

So the fingernail clippings from Mr. Dicks, comparing this profile back to these

people, this profile is consistent with Mr. Dicks. And that's not unusual to pick up his own DNA profile in his own fingernail clippings.

So I have no information of DNA being present from another individual on his fingernail clippings.

And on the jacket, the stained area on the left side that I found blood, here I have "-INC-," which indicates an inconclusive result, meaning I was not able to get a conclusive -- a reportable result out, so it is inconclusive.

Here what the "***" means, I got no result whatsoever. So basically for this entire profile, I have no information as to whether it is even human DNA. I can just say for that specific sample that there is blood present, and I isolated DNA, but I cannot tell you if it is human DNA for that sample.

And submitted were some stained swabs from the cash register, which has this DNA profile. And comparing this back to these three individuals, Mr. Dicks is eliminated because it's an 8,13, and what I'm obtaining is an 11,12.

Mr. Lovitt is eliminated because he has a 10, and I'm not picking up a 10 here. But Mr. Grant is an 11,12, so he can't be eliminated. So let's look at the rest of the profile to see if he can be eliminated.

And as you can see, the whole way across it is exactly like Mr. Grant's; so, therefore, he cannot be eliminated as the contributor of the stained swabs from the cash register.

(Witness resumed the stand.)

BY MS. WALKER:

Q People who are related, do they tend to share some of the same genes?

A Yes.

Q So you might see some similarities in their profiles?

A Yes. There is -- when you are related, obviously there are some similarities.

But again, most likely I would be able to tell the difference. And if you submitted a known blood sample from related individuals, then you would be able to answer that question.

Q But for instance, you made the note that

at one of the alleles Mr. Lovitt and Mr. Grant were both 8,12. And if I were to tell you that they were cousins, that would not seem odd to you then?

A No.

Q Now, let me ask you two other things. One is about the jacket. You were able to tell that it was blood.

Is there a reason that you were not able to tell more such as you could, for instance, with the scissors?

A For this particular sample, there are two factors which I think possibly influence my ability not to get the DNA results, one being a low level of DNA present in the stain as well as possible effects of the actual jacket in preventing me from getting a result.

It is a term that we refer to as inhibition where there is something in the jacket that is preventing the DNA testing procedure to work as it normally should. So it blocks me from obtaining the results.

So those two factors in combination, I believe, is the reason I had the inconclusives.

Q But it was able to tell you that it was blood?

A Yes. I still am able to say that there is blood present on the jacket.

Q And that it was external rather than internal?

A Yes.

Q And the size and shape of it?

A Yes.

Q Now, on the Stained Area B where it is inconclusive and you are not able to include or exclude, let me ask you this: If -- and let me turn this around, or maybe you have a copy of it.

A I have a copy.

Q Okay. If in those parentheses instead of a 17 that allele had been a 2, for instance, that would have eliminated Mr. Lovitt, would it not?

A Yes.

Q And if it had been a 1, it would have eliminated him?

A Yes.

Q So there are many numbers that would have eliminated him, and he does have a 17. Is that

correct?

A Yes, he does.

Q So you were not able to eliminate him in doing this process totally?

A I was not able to draw a conclusion, therefore, not able to eliminate him either.

Q But there would have been some -- in some instances you would have been -- if it had been a 2, for instance.

A If the results were different, then they would have had a different conclusion, possibly.

Q Now, this is one other thing. The Stained Area A which came back where you were not able to exclude the victim as being a contributor, that you were able to determine was blood. Is that correct?

A Yes.

Q In the mixture that you have in Stained Area B, does that necessarily mean it is a mixture of bloods?

A I cannot say that because there can be DNA from perspiration or other body fluid that we do not have a test specific for.

So, no, I cannot say it is exclusively from a mixture of bloods.

Q When you have mixtures, is it any more common or not to be a mixture of fluids as well?

A I guess it is depending on the type of case that it is. But oftentimes when you have mixtures which are mixtures of body fluids, they are different body fluids.

Q Now, did you also do a statistical analysis on the blood of Stained Area A --

A Yes, I did.

Q -- in regards to the profile that this predicts?

A Yes.

Q And could you explain what that means?

A The purpose of giving a statistic in my report is just to give you an idea as to how often this profile would be seen in the population.

And so therefore on Stained Area A, which was on the scissors, the probability that that stained area would be seen again in the population is approximately 1 in greater than 5.5 billion, which is the world population in the Caucasian,

black and Hispanic population.

Q Do you-all curtail the numbers that you use? Do you go into the trillions?

A Oftentimes the statistical number is greater than 5.5 billion, but what we do is we cut it off at the population of the world by saying that it's greater than one in the world's population.

The number could be actually higher, but we just report out in the world.

Q Was it higher in this case?

A Yes, it was.

MS. WALKER: I have no further questions.

CROSS-EXAMINATION

BY MR. RUCKER:

Q Ms. Palmer, let me start off by asking you some questions about the blue jacket.

You testified that you can't even tell whether or not the drops of blood on that are human?

A That is correct.

Q Then that must mean it could be animal blood?

A That is a possibility.

Q It could be chicken blood, steak blood. You just don't know what kind of blood it is, do you?

A I do not.

MR. RUCKER: I'm going to need the blackboard eventually, so could you bring it to this area for me?

BY MR. RUCKER:

Q Now, I don't claim to be an artist, but I'm going to try to draw a diagram of the scissors.

If you would please bear with me, Ms. Palmer, is that a fair representation of the scissors?

A It looks like a pair of scissors.

Q And let's say this is the hinge of the scissors.

Now, can everyone see?

When you were talking about Stained Area A on the scissors, are you referring to an area in here as A? This area?

A Yes. It is the lower portion.

I wouldn't call it that high on the

blade --

Q Here?

A Yes.

Q And that area then is A?

A Right.

Q Now, when you swab that area, what do you actually do?

A What I actually do is take a sterile swab and add sterile water to it and recover the stained material that I see present in that area.

Q Do you swab both sides of the thing entirely of that area?

A For this particular item I had swabbed both blades, inner and outer edges.

Q Now, you say there may be also body fluid, perspiration, saliva, that you can't see with the naked eye.

So would you swab this area in here also just to be sure?

A Based on the examinations that were being conducted, both latents and DNA testing, we consulted with each other so that I just didn't randomly swab over anything and possibly destroy

any possible latents that existed.

So we were careful in selecting specific areas to be tested. So I did not swab the entire length of the scissors.

Q So you would say from here to roughly here -- we will call this Area C -- no swabbing was done?

A Actually the hinge area was included in Stained Area B.

Q A little bit below the hinge area.

But there is an area between here and the hinge that was not swabbed at all?

A Yes, I'm sure -- yeah, that small little area was not.

Q And then you have Area B. Could we call that this area between the hinge and the handle?

A It started right below the loop of the handle, so a little bit higher on the handle.

Q Here?

A Right below where your circles are.

Q Here?

A Up a little bit. Up. Up. Right there.

Q So it's from here --

A To below the hinge.
Q Just below the hinge?
A No, to the other side of the hinge, sir.
Q I beg your pardon?
A To the other side of the hinge.
Q And that would be Area B?
A Yes.
Q Now, was that done on both --
A Yes.
Q -- sides?
A Yes.
Q So this is Area B, both sides?
A Yes.
Q Nothing done roughly in this area?
A I did not swab that area.
Q And then roughly this is A?
A Yes.
Q Is that fair?
A Uh-huh.
Q Now, in Area A you found nothing but what you concluded was DNA from Mr. Dicks. Is that correct?
A I was unable to eliminate Mr. Dicks as

the contributor of the DNA I detected in that area.

MR. RUCKER: Sorry about that. I need to set the easel back up, if I could get some assistance.

BY MR. RUCKER:

Q Are you able to see that from your position?

A Yes. I have a copy here also.

Q Now, you testified that you followed the protocol.

What does that mean in layman's terms? I'm not --

A Right. Just like you have a recipe for telling you how to cook a -- make a cake, we have recipes which tell us how to conduct the DNA testing.

It is called a protocol then. It is a recipe.

Q And that's what you followed. Is that correct?

A Yes.

Q Is that in a book or a pamphlet that you have to follow?

A It is in a book form.

Q Now, you testified that we get DNA from our mother and father. Therefore, when you run these tests, you get two alleles.

Allele meaning these are the numbers. These represent alleles, do they not, these 11 and 12s?

A Yes, those are alleles.

Q Now, how do you -- once you extract -- well, once you have the sample fluid, whether it is blood or whatever it may be, what process do you go about to break it down into these various eight categories?

A That's a pretty loaded question which would take a long time to answer, but I would be more than happy to give you an abbreviated version.

Q Well, give me the abbreviated.

A Okay. The bottom line is once I take a stain that I determine is going to have DNA testing done on it, the DNA is removed from the stained area, copies are made of the DNA, and then the types then are determined through the testing of that.

Q Now, that's PCR. The copies are made through polymerase chain reaction?

A Polymerase chain reaction, yes.

Q What was the first word again?

A Polymerase.

Q Polymerase chain reaction. That's the technique you use to amplify or duplicate the DNA that you have. Is that correct?

A Yes.

Q Now, you say that we get DNA from our mother and our father; and, therefore, we have in testing two alleles, meaning this would be mother and father or father and mother, vice versa. Is that correct?

A Yes.

Q Now, in all of human beings, isn't it true that probably 97 percent of our DNA is identical to every other human being?

A Obviously when you look at each other, we all see that we have a head that is somewhere in the middle of our shoulders. So a lot of our DNA is very similar.

But there is that small percentage that

is different, and that's what we are able to use to differentiate between people. So, yes.

Q So roughly only 3 percent or less of the DNA is what we can use for identification purposes?

A That's correct.

Q Now, you had a known sample from Mr. Dicks in all eight categories of this PowerPlex system.

Now, you have here at THO1 a 7,7.

Now, if we get DNA from our mother and from our father, how could you have a 7,7 at that location?

A Very simply, both your mother and father both gave you a 7. So, therefore, you would have a 7 from your mother and a 7 from your father.

Q So you put it down because it's a known sample as a 7,7. Is that correct?

A Yes.

Q But how many alleles did you actually see?

A You only, with our testing, only see one allele.

Q So actually what you saw was just one 7.

But because you knew it was from Mr. Dicks, you put a 7,7?

A The way we write these results, the method or the manner that we do it, yes, you would then write a 7,7 knowing that both parts came -- you have more than -- you have a result that is a part of two, one from your mother and one from your father.

So a 7,7 would be written.

Q Now, you received blood samples from Mr. Dicks, Mr. Grant and Mr. Lovitt.

A Yes.

Q Did you receive any other blood samples or swabs from the police department?

A For known blood samples do you mean?

Q Known or unknown, did they send you any other swabs of blood for DNA analysis?

A No.

Q So you never received any swabs from blood that was obtained from the floor of Champion's pool hall?

A No, I did not.

Q I would like to direct your attention now

to the location vWA, and more particular in that area to Stained Area B of the scissors.

Can you see that from where you are?

A Uh-huh.

Q In that you have three alleles or three variations; correct?

A Yes.

Q Now, that immediately indicates to you that you have a mixture?

A Yes.

Q Now, you can't tell whether it is a mixture of blood and perspiration, blood and saliva, saliva and perspiration, semen and perspiration.

You can't tell what that combination is?

A Well, I do know that there is blood present in there. So I would assume that then blood was providing some of that DNA. But as to the other fluids that you had mention½<I do not know if they are present.

Q It could be blood and blood?

A It could be blood and blood, yes.

Q Now, the 11,14 matches with Mr. Dicks --

A Yes.

Q -- correct?

Now, the 17 does not match with Mr. Dicks at that location.

A That is correct.

Q But it does match or at least has a similar characteristic with Mr. Lovitt and Mr. Grant.

A They both have 17s, correct.

Q Now, this 17, isn't it possible that what you have here is a 17,17, and it is being masked just like this 7,7 was being masked?

A That is a possibility.

Q So if this were a 17,17, would that exclude without any doubt Mr. Lovitt as being the donor?

A For that particular profile, because I only have the information at the one low side, there are other factors that could be happening, so I still would, even if -- even if we could determine it was a 17,17, which would have to be another type of testing that I do not do in the laboratory, I just still feel that no conclusions

would be appropriate.

Q Well, he is not a 17,17; correct?

A That is correct.

Q Well, let me ask you this: Suppose -- suppose that the donor of that material, the 17, was an 11,17. Is that possible?

A You're asking me -- yes, that is a possibility that they would be an 11,17.

Q Because this 11 would mask the 11 of the other allele of the other variation of the second person?

A That is also a possibility.

Q And it could also be a 14,17 at that location.

A Yes. That also could be another possibility.

Q And for the same reason that the 14 of the other individual is being masked by the 14 of Mr. Dicks?

A That's a possibility.

Q So for the purposes of this questioning, you could have a 17,17 here, an 11,17 here, and an 11,14 here.

It could be any one of those?

A Yes.

Q And is Mr. Lovitt at that location a 17,17?

A No, he is not.

Q Is he an 11,17 at that location?

A No.

Q Is he a 14,17 at that location?

A No, he is not.

Q Now, there is only one allele or one variation here for the second individual.

Do you have an explanation for why that might occur?

A For this particular sample, what I'm seeing is one DNA profile coming through very strong, and then I have this small one-piece bit of information that I have a mixture.

And oftentimes whenever you have such an imbalance of something being so strong and the other one being so weak, the weak one might not possibly be coming through all the way.

And as we are seeing, you don't see it in another area on the DNA. So also in that vWA

portion, I could possibly be missing a variation or an allele. So that's a possibility also.

So that's why on that sample I draw no conclusion to Mr. Lovitt or Mr. Grant being possible contributors, even though they have a 17 in their profiles.

Q Well, when you are in the process of this PCR, isn't it possible that in the duplication of the DNA, some DNA overwhelms the other, and you just don't get a reading of the other allele?

A That can happen, yes.

Q It's there, but it just gets overwhelmed?

A That's a possibility.

Q Now, is there a term for that?

A Yes, there is.

Q What is it?

A It is referred to as allelic dropout, which just simply means that our variation or our allele is not being seen because it is so weak that it is then missed or dropped out.

Q Now, in occasions when you have done testing with allele dropout, do you have an opinion with respect to whether or not it is the higher

allele that drops out or the lower allele that drops out?

A Based on my experience, I would not say one way or the other. Whenever you are dealing with this type of sample and you have such low amounts of DNA, it fluctuates.

Q Do you recall talking with me several weeks ago --

A I talked to you many times now.

Q -- about allele dropout?

A Yes.

Q Do you recall me asking you about whether or not there would be the higher allele or the lower allele that you would find in dropouts?

A Yes.

Q Do you recall your answer to me?

A I think that the answer would be that sometimes it is the higher one, that you can see that, but --

Q That's fine. That is all I'm asking. Sometimes it can be the higher one.

At this location, the markers that you have here in vWA, is the lowest you have ever seen

around a 6 or a 7 and the highest about a 22? That's the span that we're talking about?

It doesn't go down to 1 and to 50? I mean --

A No. Those are set numbers.

Q These are markers that you look at when you run the tests?

A Yes.

Q And would you say -- is it fair to say that the low end is 6 or 7 and the high end is about 22?

A For the specific vWA, the number is an 11, if that is what you are asking.

Q Is that the lowest number?

A Yes.

Q What is the highest?

A It is a 21.

Q 21.

So if you have an allele dropout in this case and it is the higher allele, then you could have a 17,18 donor, a 17,19 donor?

A Yes.

Q A 17,20 donor?

A Yes.
Q A 17,21 donor?
A That's a possibility.
Q You could also have down the line?
A Yes.
Q But it is your experience that it is the higher one that drops off?
A Sometimes.
Q Well, the DNA is there, is it not? We just can't see it?
A With allelic dropout, we cannot see the DNA, but it also becomes a question of whether it was even copied.

So it depends on what step of the process you are asking.

Since we can't detect it, I think that's a difficult question to pinpoint exactly when, if it's there, but you can't see it.
Q Now, you testified that you did the DNA on the scissors, that testing swabbing first, and then it went to fingerprinting?
A Yes.
Q Is that correct?

A Yes.

Q Do you know, why does it go to DNA first and not to fingerprinting first?

A As I testified before, because if the fingerprint process was done first, there is a possibility that it could damage or prevent me from getting DNA results.

So what we do is remove -- if we know an item needs both testings done, it comes to me first, and I will remove the DNA areas or the areas that are going to have DNA testing conducted on them, and then forward, whether it be a knife, scissors, a gun or anything.

It goes then to latents for them to conduct their exam.

Q For the sake of argument, if this allele was a 17,17, is it your testimony that it could still be Robin Lovitt's DNA?

A First of all, my conclusion would not change because it is only one piece of information that I have, and I don't feel that that is enough in that whole entire profile to draw a conclusion.

So I still would say no conclusion can be

made in reference to Mr. Lovitt.

Q So tell me -- he is not a 17,17 at that location. He is a 16,17, is he not?

A That's correct. I'm taking that into consideration, that that profile can be from an 11,17; a 14,17; a 17,17 person. That is why we are saying no conclusion.

I am taking all those possible considerations in and evaluating them. But it still is only one piece of information across eight different areas where I could get information, and it's just not enough for me to draw a conclusion.

Q Now, we are talking about this location vWA in your PowerPlex system.

Lovitt at that location is a 16,17. Is that correct?

A Yes.

Q And Grant at that location is a 15,17. Is that correct?

A That is correct.

Q Now, we have Mr. Dicks there at 11,14.

We know that is Mr. Dicks; correct?

A I cannot eliminate Mr. Dicks at that

loci.

Q So the possible combinations that we have here at vWA, we have the 11,14 and 17.

This could be an 11,17; correct, at this location?

A I'm not following. I'm sorry. What are you doing?

Q At vWA, finding this series of alleles at that location, we could be looking at -- we know we are looking at an 11,14. But we could be looking at an 11,17 here.

A That is a possibility.

Q And Robin Lovitt is a 16,17; correct?

A That is correct.

Q And we could be looking at a 14,17 here?

A That's a possibility also.

Q And Robin Lovitt is a 16,17; correct?

A Yes.

Q We could be looking at a 17,17 at this location; correct?

A Yes.

Q And Robin Lovitt is a 16,17?

A Yes.

Q We could also be looking at a 17,18.
A I'm not detecting an 18, sir.
Q Well, it could be a 17 is missing here, so there is a possibility for 17,18.
A Okay. That's a possibility.
Q And Robin Lovitt is a 16,17?
A Right. I see what you're saying. Okay. I wasn't following your train of thought.
Q I'm going on up the ladder.
A Okay.
Q It could be a 17,19. If I'm blocking it, I'm sorry. I'm limited in my movement.
It could be a 17,19 --
A Yes.
Q -- at this location?
A Uh-huh.
Q And Robin Lovitt is a 16, 17; correct?
A Yes.
Q It could be a 17,20 at this location?
A Yes.
Q And Robin Lovitt is a 16,17?
A Yes.
Q It could be a 17,21 at this location?

A Yes.
Q And Robin Lovitt is a 16,17?
A Yes.
Q It could be a 16,17 at that location?
A Yes, it could.
Q That is Robin Lovitt?
A Yes, that is.
Q It could be a 15,17?
A Yes.
Q And that is Warren Grant?
A That's a possibility.
Q Well, it's a good possibility, isn't it?
A Yes, that is his type.
But I mean --
Q But it's a good possibility it's Warren Grant. He is a 15,17.
A Yes.
Q And it could be a 14,17; 13,17; 12,17; or 11,17?
A Yes.
Q And Robin Lovitt is a 16,17; correct?
A Yes.
Q Now, were you sent other items from the

police department to examine other than for DNA?

Did you do any other analysis?

A I had examined other items in the case, yes.

Q What other items had you examined?

A I had analyzed several items of clothing and shoes.

Q Let's to go back just for a moment to the blue jacket.

You can't tell how long that blood has been on that jacket, can you?

A No, I cannot.

THE COURT: Do you need a break?

Mr. Rucker, you need to take a break, please. Let the jury retire.

(Jury left the courtroom.)

THE COURT: Have them knock on the door when they are ready.

MS. EASTMAN: Your Honor, may I be excused for a moment?

(A recess was had.)

THE COURT: Would you bring the jury in, please?

THE DEPUTY: Yes, sir.

BY MR. RUCKER:

Q Ms. Palmer, before I start to ask you about some of the other clothing items that were sent up to you for analysis, when you received this evidence, were you aware that this was a capital murder case?

A I believe that I knew it was a homicide. I mean, knew it was a homicide, but as far as a capital murder case, no. I had no idea other than it was a homicide.

Q But you have become aware while testing this evidence and et cetera of the -- or have you become aware of the basic involvement, if it was a stabbing, six stab wounds, et cetera?

A I knew it was a stabbing. I don't know how many stab wounds, things of that nature. No, I do not know.

Q When you tested the -- swabbed the scissors, and you ran your DNA test, and you came up with this one -- or these three alleles at location vWA, did you consider swabbing the scissors again and retesting to see whether or not

there might be more DNA there for you to test?

A Actually, from that specific stained area, I feel that I thoroughly swabbed it, that there is nothing to go back and obtain from that specific area, Stained Area B.

Q Are you familiar with a DNA test that's called a microchondrium (phonetic)?

A Mitochondrial DNA testing?

Q Yes.

A Yes.

Q What is that?

A That's just another form of DNA testing that can be done.

Q Is that more sensitive than PCR?

A Actually, mitochondrial testing is utilized whenever you are unable to obtain DNA testing results like I have in this case.

If you were unable to get results like this, then mitochondrial testing is another test that could be done.

Q And did you do a mitochondrial test on this after you got these results?

A First of all, I do not do --

Q You can answer that yes or no.
A No.
Q Now, in the early days of DNA analysis and testing for forensic purposes, we were using what was called restriction fragment length polymorphism, RFLP, were we not?
A Yes.
Q Was that in the '80s?
A Yes.
Q And since that time we have dropped the science of DNA testing as developed with the PCR?
A Yes.
Q And that is a much more sophisticated means of testing than RFLP?
A I don't know if I could say more sophisticated. There are benefits to PCR testing. They are both very sophisticated tests.
Q You don't need nearly as much DNA in PCR as you need in the RFLP. Is that correct?
A That is correct.
Q And the science of forensic and particularly in the area of DNA is progressing every year, is it not?

A Yes.

Q And would you expect as an expert in the field that the DNA will become more sophisticated and more sensitive as time goes on?

A I believe there will always be improvements in the field of sciences continually having research.

Q And would you consider the mitochondrial test a more sensitive test than PCR?

A Because I do not conduct mitochondrial DNA myself, I'm limited by what others tell me, so I cannot give a personal experience type answer.

But there are situations when there is an inability to get results with the traditional DNA testing as I have done, and mitochondrial DNA is a possibility. But it is not something that should be replacing the current DNA testing that I do because they are looking at two different types of DNA.

Q I agree. It shouldn't replace it.

But if you are talking about a murder case and you get what you determine are inconclusive results in DNA, wouldn't be it prudent

to go on to the next step and use a more sensitive test in order to determine the DNA?

A For me to answer that, I would have to explain a little bit more about mitochondrial and how it's inherited only from your mother. So it's not like the type of DNA test where I get from both your mother and your father, so there is a lot of other issues about inclusions and conclusions that can be drawn.

Q But it is a more -- it's used very often when in the PCR you don't get conclusive results, is it not?

A When you are unable to obtain any results -- as I do have results in this particular case -- mitochondrial DNA testing is something that can be utilized.

Q Ms. Palmer, I'm going to ask you to look at what is marked as Commonwealth's Exhibit 18-A, and I'm not going to ask you to touch it, but I ask you to look it and ask you if you can identify it.

A I recognize this item by the unique laboratory number and my initials right here. And this was submitted to me as a shirt.

Q And did you perform an analysis on this shirt?

A Yes, I did.

Q What analysis did you perform?

A I looked at this item for the presence of blood.

Q And what conclusions, if any, were you able to reach after your analysis?

A I did not find any blood on that shirt.

Q Now, did you make any other observations about the shirt when you received it?

A Yes. I noted whether there were hairs or fibers present as well as the general condition of the garment.

Q And what was the general condition?

A There were stains noted, and the shirt I had had a smell of body odor.

Q Based on your experience and analysis, would you testify or would you believe that that shirt had not been recently washed?

A I'm sorry. That is -- I can't -- I'm not an expert in telling you when it was washed or not.

Q Well, it was a soiled shirt, was it not?

A Yes, there were stains noted on it.
Q There were stains on it.
A Right.
Q And you can't draw any conclusions about whether it was recently washed or not?
A Sir, I can't tell what recent is. I mean, perhaps those stains were just put on after it was just recently washed.
Q But he had body odor?
A Yes, I did detect the smell of body odor.
Q Stains?
A Yes, I noticed stains.
Q Yet no blood?
A No blood.
Q Did you -- how did you analyze the garment?
A That item, I visually look for the stains, and then I chemically test for any areas that possibly could be blood.
Q And you found no blood?
A That is correct.
Q I'm going to ask you to look at what has been marked as Commonwealth's Exhibit 18-C.

A I recognize this again by the unique laboratory number and my initials here, and they were a pair of black jeans.

Q And what analysis or tests did you run on the black jeans?

A Once again, I was looking for the presence of blood on this item.

Q And did you find any blood?

A No, I did not.

Q And did you make any notations about the condition of the jeans?

A Yes, I did.

Q What were they?

A I noted that there were hair fibers present and that they were relatively clean with few stains.

Q Did you ever make any comparisons on the hair fibers with Mr. Dicks or anyone else?

A I am only able to note whether hairs and/or fibers are present, not even if they are hairs or if they are fibers. So none of those exams were conducted.

Q I'll ask you to look at a package,

Commonwealth's Exhibit 18-D.

A Once again, I recognize this by the unique laboratory number and my initials as a pair of shoes.

Q And are these the shoes that were --

A Yes.

Q And what analysis did you do on the shoes?

A Once again, I was looking for the presence of blood.

Q And did you detect any blood on the shoes?

A No, I did not.

Q Did you make any notations about the general condition of the shoes when you examined them?

A Yes, I did.

Q What was that?

A That they were well worn and stained.

Q How many -- in how many homicide cases have you been asked to analyze material, shirts or clothing for blood stains?

A I'm sorry. I have been doing this for

ten years, so I couldn't tell you.

Q A lot?

A Yes.

Q A lot.

And have you analyzed in cases where there have been stabbings such as in this?

A I have worked homicides where there have been stabbings, yes.

Q Well, in the particular case, the evidence has been presented that Mr. Dicks was stabbed six times with a pair of scissors, that there was a considerable amount of blood on his shirt when he was observed being stabbed by two individuals.

Two people saw him being stabbed, and they saw blood on his shirt. And he was stabbed six times.

Now, based on your experience in situations such as that -- there was a scuffle between two men, and one man got stabbed -- based on your experience, would you believe or would you expect to find a blood transfer from the victim to perpetrator under those circumstances?

A In all my years of experience, the one thing I have learned is not to have expectations as to what evidence may exist or not exist.

Q Well, Ms. Palmer, do you remember speaking with me about a month ago?

A Yes, sir.

Q And do you remember me asking you the very same question?

A I think you proposed it as a hypothetical, sir.

Q Hypothetical. And what was your response to the hypothetical?

A You said that if you were wearing that specific shirt and you had stabbed someone, was there a possibility that blood could be there. That's a possibility.

Q No. I asked you if you would expect to find blood on that shirt, did I not?

A Sir, I interpreted it as could it be a possibility, and I would say it's a possibility, not an expectation.

I know I told you that I do not have any expectations, but it is a possibility.

MR. RUCKER: Judge, may we have a side bar?

(Whereupon, a bench conference is held between the Court and counsel out of the hearing of the jury.)

MR. RUCKER: Judge, I'm no fool.

I asked this lady a month ago, Ms. Palmer, would you expect, and I gave her the hypothetical, if stabbed, this shirt being worn by the perpetrator, would you expect there to be a blood transfer from the victim to the perpetrator. The answer unequivocally was yes.

Now, she is hedging her bets on me, and I'm going to have to ask the Court to let me take the stand.

MS. WALKER: You can't do that.

MR. RUCKER: I can now. She has made a statement to me that she has now retracted.

MS. WALKER: Are you sure you phrased it that way?

MR. RUCKER: I phrased it precisely that way.

THE COURT: The only way you could do

that would be to withdraw and make yourself a witness.

MR. RUCKER: I think there is case law to the effect that if something comes up in the middle of the trial that was unexpected and unanticipated that I can testify.

THE COURT: I don't think it would be appropriate, Mr. Rucker, for you to do that.

MR. RUCKER: Well, note my exception.

(Whereupon, the bench conference is concluded, and the proceedings resumed in open court as follows:)

BY MR. RUCKER:

Q My recollection of the question to you was, Ms. Palmer --

MS. WALKER: Your Honor, he is testifying.

THE COURT: Sustained.

BY MR. RUCKER:

Q Ms. Palmer, is it possible on the scenario that I have explained to you earlier about the stabbing and the fight between the two men, would blood be transferred from the victim to the

perpetrator?

A That is a possibility.

Q And based on your experience, isn't that why the Commonwealth sends that clothing to you to see if that has not occurred?

A Yes, I would assume so.

MR. RUCKER: Thank you, Ms. Palmer. I have no further questions.

THE COURT: Anything else?

MS. WALKER: A couple of quick questions.

REDIRECT EXAMINATION

BY MS. WALKER:

Q Does the lab use the mitochondrial system that you were talking about?

A No. We do not offer that type of DNA testing.

Q Is there a reason?

A Because we are able with PCR to, and the type of testing we have, to obtain results. And it is very -- I have yet to have a case that needed have mitochondrial DNA testing because you do get, as in this case, DNA results.

But there are those instances where you

are unable to, and this then can be sent out to a private lab or another lab to have testing done.

But I have yet to have a case like that.

Q When you take samples, do you try to preserve some extra samples?

A If at all possible, yes, we do.

Q Why?

A So that the defense can retest if need be.

Q Did anybody ask that that be done?

A No, they did not.

Q And bottom line on the alleles, in asking you about the alleles in the chart is that the only result you have is that there is a weak 17 at that particular loci; is that correct, along with what matches up with Mr. Dicks?

A Yes.

Q And the defendant does have a 17 allele?

A Yes, he does.

MS. WALKER: Thank you.

MR. RUCKER: One question.

RECROSS-EXAMINATION

BY MR. RUCKER:

Q This mitochondrial test, that's available in the lab here locally, is it not?

A Not from the State of Virginia.

Q Did you say there is no lab in Virginia that does that test?

A In the Division of Forensic Science, no there's not.

Q Are there private labs that do that testing in Virginia?

A I don't know. I know there are private labs in the Washington DC area that conduct mitochondrial. I don't know if the ones in Virginia do.

THE COURT: Anything else?

MS. WALKER: No, Your Honor.

THE COURT: May the witness be excused?

MS. WALKER: Yes.

THE COURT: Do you want to go to lunch? Are you having enough time for lunch, or do you want more?

See you at 2 o'clock. Have a good lunch.

(Jury was excused for lunch and left the courtroom.)

THE COURT: How many more witnesses do you have today?

MS. WALKER: Seven.

THE COURT: Long? Short?

MS. WALKER: Well, some will be longer than others, but we will finish today.

THE COURT: Okay. Recess until 2.