1	THE CLERK: Raise your right hand
2	please.
3	
4	(Witness sworn by the clerk.)
5	
6	THE COURT: Do you need this part of
7	it?
8	MR. DOUCETTE: Sorry. I can't see it
9	that well.
10	THE COURT: This is part of it.
11	MR. DOUCETTE: No, sir, I do not.
12	THE COURT: All right.
13	THE BAILIFF: Come this way, ma'am,
14	please, right over this way.
15	
16	NICOLE HAROLD, was called as a witness,
17	and after having been first duly sworn, was examined
18	and testified on her oath as follows:
19	
20	DIRECT EXAMINATION
21	BY MR. DOUCETTE:
22	Q. Could you tell us, the ladies and
23	gentlemen of the jury, your name, please?
24	A. Nicole Harold.
25	Q. Ms. Harold, how are you employed?

1	A. I am a employed as a forensic
2	scientist with the Virginia Division of Forensic
3	Science. It's part of the state crime laboratory
4	system.
5	Q. And you work in a particular location?
6	A. Yes. I work in the Roanoke
7	laboratory.
8	Q. How long have you been there?
9	A. For about five and a half years.
10	Q. Do you have a specialty?
11	A. Yes. I'm a forensic scientist in the
12	forensic biology section.
13	Q. What is your background or before
14	we get to the background, you say you're a forensic
15	scientist, biology.
16	What do you do? You go to work. What
17	do you do each day?
18	A. I examine physical evidence for the
19	presence of body fluids, such as blood and seminal
20	fluid, and I also conduct forensic DNA analysis.
21	Q. How long have you been doing that,
22	overall?
23	A. Overall, for about seven years.
24	Q. You have to go to school before you
25	even begin; is that right?

Yes. Α.

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Where did you go to school? Q.

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I have bachelors' of science in Α. forensic science from the University of Alabama at

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4

Birmingham, and a bachelor of science in biology

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from the College of William and Mary, Williamsburg,

Virginia.

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Do you have any other work experience outside of working for the Division of Forensic

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Science in Roanoke?

10 11

Yes. Prior to coming to the Virginia Α.

12

Division of Forensic Science, I was employed as a

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forensic analyst with the New York City office of

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the chief medical examiner, forensic biology

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laboratory.

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After college and then as a part of ο. your experience and duties as a forensic scientist,

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have you had any specialized training in your field?

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I have completed training Yes. Α. 19

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programs with both the New York City medical

21 22 examiners' office and the Virginia Division of Forensic Science in body fluid identification and

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forensic DNA analysis. In addition, I've attended

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numerous conferences on forensic DNA analysis as

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well as statistics.

Q. And as far as the statistics are
concerned, is the statistics part of the DNA
overall DNA analysis process?
A. Yes.
Q. As a result of your duties and your
training, do you belong to any professional
organizations related to your career field.
A. Yes. I'm a member of the
criminalistics section of the Amercian Academy of
Forensic Science, as well as a member of the
Mid-Atlantic Association of Forensic Science.
Q. Have you ever testified in any courts
throughout the Commonwealth of Virginia as an expert
in expert as a forensic scientist?
A. Yes, I have.
Q. Specifically as far as being a
biologist and your work with DNA?
A. Yes.
Q. About how many times have you
0 testified as an expert?
A. About twenty times.
2
MR. DOUCETTE: Your Honor, we would
offer Ms. Harold as an expert in forensic
biology, specifically DNA.

THE COURT: Any objection? 1 MR. DREWRY: No, Your Honor. 2 THE COURT: She'll be admitted as an 3 expert in her field. 4 5 (Continuing) BY MR. DOUCETTE: 6 Ms. Harold, some of us watch CSI, we 7 hear the initials DNA. 8 But what is DNA? I mean, we -- we 9 know it's out there. What is it? 10 DNA stands for deoxyribonucleic acid. Α. 11 It is the genetic material that is found inside the 12 cells of your body. It controls how you develop and 13 function. You inherit half your DNA from your 14 mother and the other half from your father, and this 1.5 inherent DNA will stay the same throughout your 16 lifetime. 17 I take it those are some pretty basic Q. 18 principles that are -- are involved in the DNA 19 analysis process --20 Yes. Α. 21 -- the fact that you stay with the 0. 22 same DNA the rest of your life --23 Α. Yes. 24 -- beginning to end? 0. 25

1	A. Yes.
2	Q. Do I have DNA?
3	A. Yes.
4	Q. Do I have DNA in my fingers?
5	A. Yes. There's you have DNA in all
6	of your body fluids and tissues.
7	Q. Is the DNA in my fingers any different
8	than the DNA in my hair?
9	A. No. A persons' DNA is the same in all
10	of the body fluid and tissues. This allows me to
11	compare a DNA profile obtained from a known blood
12	sample to DNA found in evidence samples.
13	Q. What sort of things is DNA found in?
14	A. It's found in blood, seminal fluid,
15	vaginal fluid, saliva, skin cells, perspiration.
16	Q. All those sort of things?
17	A. Yes.
18	Q. Does my DNA differ, say, from
19	Mr. Petty's DNA?
20	A. Yes. With the exception of a
21	identical twins, all individuals have unique DNA.
22	Q. Now, the ladies and gentlemen of the
23	jury may not have heard these initials before, but I
24	think we probably need to discuss that.

PS -- PCR, excuse me, what is PCR?

A. PCR stands for polymerase chain
reaction. This is the method that I use to conduct
DNA analysis. PCR makes millions of identical
copies of specific regions of DNA, and these
millions of copies allow me to determine a DNA
profile, for example.

1.3

- Q. And this PCR process, is this used in other fields of science, as well?
- A. Yes. PCR is used in many different fields such as disease diagnosis and medical research.
- Q. There's one other term we need to discuss real briefly, Power Flex.

What is Power Flex?

- A. Power Flex is the name of the commercially-available kit that I use to conduct the DNA testing. Like I said, it's commercially available, and it targets sixteen different regions of the DNA.
- Q. Now, none of us need to go through a bachelor's or master's program today, but we do need to have some idea as it how it is you do the testing that you do.

Can you give us a thumbnail scenario of what you do when you're looking for a -- any sort

of DNA on exhibits?

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- A. The whole process we go through?
- Q. Well, no. Without -- so that they will -- so that all of us lay people can understand it.
 - A. Okay.
 - O. Yes, ma'am.
- A. The first thing I do is I act -- I examine the piece of evidence and I collect a sample, whether it's a blood stain or if it's skin cells that I'm recovering from an item. I will then take that sample and extract the DNA from it. I --
 - Q. How do you extract DNA from it?
- A. Using a series of chemicals as well as heat, I'm able to break open the cells and release the DNA.
- Q. Okay. Once you've got that extracted, then what do you do?
- A. I then quantitate the samples to determine how much DNA that I have in each one of them. And after I determine how much DNA is present in a sample, I will then contact the PCR, or preliminary chain reaction.
 - Q. That's where you multiply it or --
 - A. Right. It basically makes millions of

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copies of specifics regions of the DNA, sort of like Xeroxing the regions of the DNA.

- Once you do that PCR, what do you do Ο. then?
- After I end up these multiple copies Α. of these specific regions, I then run what is called an electrophoretic gel, which is just -- is sort of like gellish side between two glass plates, and I load my samples into the top of those, into the top of that gel, and apply an electrical current. DNA is negatively charged, so it will migrate toward the positive side and will separate based on its So I'm able to determine the size of each size. individual DNA band.
- Once you've got those separated like that, then what do you do?
- I then go through a computer program Α. that assists me in analyzing what DNA types are present for each sample. And at the end of this, I have a DNA profile for that sample.
 - You say DNA types. Ο. What do you mean by that?
- Like I said before, I'm testing sixteen different regions of the DNA. And each one of these regions you have two types, one type from

your mother one type from your father. And these 1 are represented by numerical values. So each region 2 of the DNA, you have two numbers. 3 Okay. You -- you look at, you go Q. through the program. Do you stop there? When I say 5 program, the computer program. You stop the 6 computer program? 7 Well, when I'm finished with computer Α. 8 analysis, I will have a complete DNA profile for the 9 samples. 10 Well, do you stop there? Do you stop Q. 11 with just the DNA profiling? 12 Oh, well, I then would compare these 13 DNA profiles from evidence to DNA profiles obtained 14 from the case. 15 You mentioned something before about 16 statistics, that you had had training in statistics. 17

Where is -- where do the statistics

come in as far as this analysis is concerned?

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After the comparison of DNA profiles Α. from evidence to the DNA profiles from known standards, if I determine that a profile is consistent with a known standard, I will then calculate statistics on that evidence profile to determine how rare or how common it is in the

i	
1	general population.
2	Q. And I take it at that point you're
3	pretty much done?
4	A. Well, I then have to write up my
5	report, but, yes, that's the end of the analysis.
6	Q. Okay. I want to direct your attention
7	to a number of exhibits. I'm going to hand these to
8	you all at one time.
9	I want to show you what's previously
10	been introduced into evidence as Commonwealth 139.
11	There is also some related items to that. I want to
12	show you previously been introduced into evidence as
13	Commonwealth Exhibit 200. And I want to show you
14	what's previously been introduced into evidence as
15	Commonwealth's Exhibit Number 201.
16	Take a look at that and see if you
17	recognize having seen those items before.
18	A. (Witness perusing documents.)
19	Yes. I recognize each one these as
20	
21	
22	has previously been introduced as Commonwealth
23	Exhibit 400

MR. PETTY: Your Honor, it's on the

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witness stand, I believe. 1 MR. DOUCETTE: Oh, okay. 2 3 BY MR. DOUCETTE: (Continuing) 4 Q. -- and ask you if you recognize 5 Commonwealth's Exhibit Number 400? 6 Yes. Α. 7 And you -- you've done something there 8 to help you identify it. 9 Yes. I attached a tag, which has the Α. 10 R -- or forensic laboratory number on it as well as 11 12 my initials. Q. Okay. I want to show you what's been 13 previously introduced as Commonwealth's Exhibit 14 Number 403 and ask you if you are able to recognize 15 that? 16 Yes. Α. 17 Okay. 18 0. I -- again, it has my initials on it 19 as well as the laboratory number. 20 Okay. And let me just put this back 21 Q. here for right now. 22 I want to show you what's previously 23 been introduced as Commonwealth's Exhibit Number 33, 24

34 and 5401 and ask you to take a look at those.

(Witness complies.) Α. 1 Yes. These are the items that I had 2 examined, and all have my initials on them. 3 All right. Let's start first of all Ο. 4 with the last three I showed you, 34 -- excuse me --5 33, 34 and 5401. 6 What are those items? 7 These are the known standards from 8 David Hardy, Kevin Brown and Leon Winston. 9 Okay. Which one is Leon Winston, 10 Ο. number-wise? 11 Number 33. Α. 12 Okay. Which one is Kevin Brown's? Q. 13 34. 14 Α. Okay. And which one is David Hardy's? Ο. 15 5401. Α. 16 When you say these are the known 17 0. standards, what do you mean by that? 18 These are the samples that were 19 Α. collected and submitted as buccal swabs from 20 Kevin Brown, Leon Winston and David Hardy. Buccal 21 swabs are just cotton swabs that are rubbed inside 22 the cheek of an individual. We use these to 23 determine the known DNA profile from a person. 24 I'm going to step back here so we're 25 Q.

sure that everybody hears us.

I want to direct your attention, first of all, to Number 139. And that should be in front of you there. Yes.

- A. Yes.
- Q. What is 139?
- A. 139 I describe as a stocking cap.
- Q. Now, what did you do as far as 139 is concerned to determine whether or not it contained any DNA? And then what did you do if that -- you, in fact, found any DNA on number 139?
- A. Item 139 I examined with which -- with what we call an alternant light source. This is a -- it is basically a light shining at a specific wavelength that will -- when it hits the suspected body fluid will produce a glow. So I was able to identify one area that was glowing, and I swabbed that area with a cotton-tipped swab, and then I took that swab and cut it for DNA.
 - Q. You went through PCR process --
 - A. Yes.
 - Q. -- computer program?
 - A. Uh-huh.
- Q. All right. And you were able to develop what you call a DNA profile; is that

- A. That's correct.
 - Q. And once you have a DNA profile, did you -- what did you do as far as trying to match that up to any of the known samples that were provided to you?
 - A. I then compared it to all of the known sam -- the known samples that were provided to me.
 - Q. Okay. And what did you come up with?
 - A. The DNA profile from the stocking cap was consistent with the DNA profile of David Ralph Hardy and different from the DNA profile of Leon Winston and Kevin Brown.
 - Q. There were some other known standards that were also submitted to you, as well?
- A. Yes. The DNA profile from the samples was also different from the DNA profile of Rhonda Robinson and Anthony Robinson.
- Q. I noticed you said it's consistent with David Hardy's, but you didn't say it was David Hardy's.
 - A. That's correct.
 - Q. What do you mean by that?
 - A. Simply that I can compare his DNA

profile from this evidence to the DNA profile of 1 Hardy and at the sixteen regions of the DNA that ${\tt I}$ 2 3 test, they are identical. Now, is this where the statistics come 4 Q. 5 in? 6 Α. Yes. 7 Tell us about how the statistics come in as far as Item Number 139 is concerned. 8 9 Okay. The probability of randomly selecting an unrelated individual with the DNA 10 profile I obtained from item 139 is one in greater 11 than six billion, which is approximately the world 12 population in the Caucasian, black and Hispanic 13 14 population. 15 It's greater than six billion; is that Q. 16 right? 17 Α. That's correct. 1.8 Q. One in six billion. 19 Would you stop there? 20 Α. Yes. 21 Q. Why? 22 The population of the world is six Α. 23 So numbers greater than that, when you get billion. into the septillion, the octillion, sort of lose 24

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their distinction.

1 So if it's consistent with 2 David Hardy's to that degree, at least one in 3 greater than six billion? 4 Α. Yeah. I would say --5 0. And I -- I know I'm not being exact in 6 my terminology. Please correct me. 7 Α. Go ahead. 8 Oh, I was going to say it's -- the chance of a random match, someone unrelated, is 9 10 greater than one in six billion? 11 Α. Right. I would expect to see this DNA profile from this piece of evidence one time in 12 13 greater than the population of world. 14 Let's talk about Item Number 200. 15 Do you have that in front of you? 16 Α. Yes. 17 0. Okay. What is Item Number 200? 18 Α. Item Number 200 is two gloves. 19 Do they appear to be a pair of gloves? Ο. 20 Α. They were different. One was --No. they're slightly different in color, and also I 21 think -- and they are also slightly different in 22 23 size. 24 Does one appear to be a left-handed Ο.

glove and one appear to be right-handed?

- A. Yes. One is right-handed, and one is left.
 - Q. All right. Let's talk about the left handed glove first.

What did you do as far as examining the left-handed glove, Item 200, to see whether or not there was any DNA; and if so, what did you do with that?

- A. For the left glove, I just took two cotton swabs and I swabbed around on inside of the glove to collect any skin cells that may have been present.
- Q. And did you come up with anything at that point?
- A. Yes. I was able to determine a DNA profile from that sample, as well.
- Q. So I take it when you took that sample and you went through the PCR process, everything you described before; is that right --
 - A. Yes.

- Q. -- computer program, all that sort of stuff and you got a DNA profile.
 - A. Yes.
- Q. And, again, now we deal with the statistics; is that right?

- 1 2

- A. Well, first I compared it to the people that I had the standards from.
 - Q. Okay. Let's do that first.
- A. The DNA profile obtained from the sample from the left glove is consistent with a mixture, which means there's DNA from more than one person present. Leon Jermain Winston,

 Kevin Eugene Brown and David Ralph Hardy cannot be eliminated as possible co-contributors of this genetic material. And Rhonda Robinson and Anthony Robinson are each eliminated as a possible contributor to this genetic material.
- Q. Okay. Now, at this point this is where the statistics come in?
 - A. Yes.
- Q. And tell us about that. What were the results there?
- A. The DNA profile I obtained from the sample from the glove is one point eight billion times more likely if it originated from Leon Winston to Kevin Brown and David Hardy than if it originated from three unknown individuals in a Caucasian population. It's one point one billion times more likely it originated from these three individuals than if it originated from three unknown individuals

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than the black population, two point nine billion times more likely to have originated from these same three individuals than if it originated from three unknown individuals in the Hispanic population.

- So the lowest number of those three Ο. was one point one billion?
- Α. One point one billion, yes, that's correct.
- That number obviously isn't as high as the six billion -- greater than six billion in the -- in Item Number 139.

Is there any reason for that?

The DNA profile that came from the Α. glove, it was -- there were very low levels of the DNA present on the gloves, so the sample was not that high of a quality sample so in order to calculate statistics, I have to have the -- to do a complete DNA profile of these three individuals at each region that I was testing, and I only had their complete profile at five of the sixteen regions.

They're eliminated in -- they're included in all of the other regions, but because of the quality of the sample, sometimes their DNA type would be too weak for me to call as a -- as a DNA type in that sample. So that's why the statistics

1 are somewhat lower. 2 But still, again, lowest one is one Q. 3 point one billion? 4 Α. Yes. 5 Let's talk about the right glove. Q. 6 Did you find any DNA on the right 7 glove? 8 I examined the right glove in the Α. same manner as I examined the left glove; and, 9 again, I obtained a DNA profile from this sample, as 10 11 well. 12 Okay. And once again going through Ο. the whole process of PCR --13 14 Α. Yes. 15 Q. -- come to DNA profile? 16 Α. Yes. 17 And compared the DNA profile between what you recovered off of the right glove to your 18 19 knowns? 20 Α. That's correct. 21 And what did you come up with there? 22 The DNA profile from the sample of the Α. right glove is also consistent with the mixture. 23 Leon Jermain Winston, Kevin Eugene Brown and 24

David Ralph Hardy could not be eliminated as

possible co-contributors to the genetic material, with the exception of the D eighteen, S fifty-one locus, which is a region of the DNA that I was testing.

At this locus, it's -- the profile is consistent with Leon Jermain Winston,

Kevin Eugene Brown and David Ralph Hardy and another individual; however, due to limited information of this region of the DNA, no conclusion can be regard -- be made regarding this DNA type.

- Q. Now, I've got your report in front of me. It doesn't have any numbers, doesn't have any stats?
 - A. Yes, that's correct.
- Q. It doesn't it have the -- the randomness, if you will.

Why is that?

- A. Because the conclusions were basic -were the same for the right glove and the left
 glove, I calculated statistics for the sample from
 the left glove because it was the more complete
 profile.
- Q. This was a $\operatorname{\mathsf{--}}$ not as complete as found on the left glove; is that correct?
 - A. That's correct.

- 1 You have Item Number 201 in front of Q. 2 you. 3 Α. Yes. 4 Okay. And what's 201? Q. 5 201 is a bandanna. Α. 6 Once again, did you examine 201 to see Q. whether or not there was any DNA on that? 7 8 Yes. Again, I asked examined it with the alternate light source to see if there were any 9 visible areas of staining; however, I did not 10 11 observe any. 12 But on item 201, there is -- it's a bandanna, but it's tied in a knot. It's right here, 13 but you can't really see it. And what I did was I 14 assumed that the person who had tied that would 15 have, you know, tied that knot fairly strongly and 16 possibly left some the DNA from their hand on the 17 knot. So what I did was I took a cotton-tipped swab 18 and I swabbed that area of the knot. 19 20 Did you come up with anything? Ο. 21 Yes. I was able to obtain a DNA Α.
 - profile from the sample.

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Okay. And once again went through Q. whole process, the PCR process, the DNA profile, compared to your knowns.

And what did you come up with?

A. The DNA profile from the sample from the bandanna is also consistent with the mixture. Leon Jermain Winston and another individual cannot be eliminated as possible co-contributors to this genetic material. Kevin Brown, Rhonda Robinson, Anthony McKinley Robinson and David Hardy are each eliminated as a possible contributor.

And the portion of the DNA profile that was not consistent with Leon Winston was unsuitable to search through the Virginia DNA data bank.

- Q. So as far as 201 is concerned, you've got a mixture?
 - A. Yes.

- Q. Leon Winston cannot be eliminated as a contributor?
 - A. That's correct.
 - Q. And somebody else is a contributor?
 - A. Yes.
- Q. We have -- were you provided a known sample to compare that matched up with this individual that is mixed in with Leon or this other --
 - A. No. There was none of the known

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standards that were provided to me were consistent with unknown DNA types.

Before I asked that last question, Ο. though, you finished up with saying that it was unsuitable for a Virginia DNA data bank search.

What do you mean by that?

Α. In many situations when we have unknown DNA profile, what we will do is we'll search it through the Virginia DNA data bank to see if it -- if this unknown profile will hit on the individuals in the data bank.

However, this profile, the foreign part or the part not consistent with Leon Winston, there was not enough genetic material there. not have enough DNA types for this sample for it to be suitable for a data bank search.

- You have Item Number 400 in front of Q. you; is that right?
 - Yes. That's a pistol. Α.
- Did you examine Item 400 to see Q. whether or not there was any DNA on that?
- Α. Yes. I examined and I tested several orange staining on the gun, on the pistol, to determine if they were blood; however, there was no blood detected on it. I then swabbed, using

cotton-tipped swabs, the textured portion of the 1 grip, and I cut those down for use for DNA. 2 3 You were able to find something on the Ο. textured portion of the grip; is that right? 4 5 Α. Yes. 6 0. Skin cells? 7 That's what I would assume it would Α. 8 be, from skin cells, but I couldn't -- I can't identify that specifically. 9 10 Okay. But you were able to get Q. 11 something? 12 Yes. I was able to obtain a DNA Α. profile from the sample. 13 14 Okay. Again, same thing, you went 0. through the PCR process, got the DNA profile and 15 compared it to your knowns? 16 17 Α. Yes. 18 What did you find out on Item Number Ο. 19 400, that pistol? 20 The DNA profile obtained from the Α. 21 sample from the pistol is consistent with the DNA 22 profile of Leon Winston and different from the DNA profile of Kevin Brown, Rhonda Robinson, 23 Anthony Robinson and David Ralph Hardy; therefore 24

Leon Winston cannot be eliminated as a possible

contributor of this genetic material.

- Q. I noticed you didn't say anything about a mixture on this one.
- A. That's correct. There was not a mixture on this sample.
 - Q. Just from one source?
 - A. Yes. It was a single-source sample.
- Q. All right. Did you -- having looked at that, did you come up with any statistics as far as that one is concerned?
- A. Yes. The probability of randomly selecting an unrelated individual with a DNA profile matching the DNA profile obtained from this sample from the pistol is one in greater than six billion, again, which is approximately the world population, in the Caucasian, black and Hispanic populations.
- Q. So once again, as before, with the 139 greater than -- greater than six billion.
- A. Yes. Again, I would expect to see this DNA profile one time in the great -- greater population in the world.
- Q. Item 403, the jacket that I've put back over here on the table, did you have occasion it take a look at that?
 - A. Yes.

- 1 Q. And were you able to find any DNA on 2 that?
- 3 Α. Again, I examined it for blood; however, I did not detect any blood on it. I then 4 5 examined it with the alternate light source to find б areas of possible body fluid staining. weren't any, really, areas of specific body fluid 7 staining. So what I did was, in order to determine 8 the possible -- determine -- obtain the DNA profile 9 1.0 of the person who had been wearing it, I took swabs and I swabbed the neckline and the cuffs of the 12 sweatshirt, which I would assume would be the areas that would be in the most contact with a person's skin.
 - Okay. Were you able to find anything Q. from there?
 - Yes. I was able to obtain a DNA Α. profile from the sample.
 - 0. Okay. For the last time, you go through the whole PCR process, cut the DNA profile and compared it to known samples; is that right?
 - Α. Yes.

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- And what did you come up with there? Q.
- The DNA profile at the Power Flex Α. sixteen loci, with the exception of the FGA locus,

obtained from this sample is consistent with the DNA 1 2 3 4 5 6

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profile of Leon Winston and different from the DNA profiles of Kevin Brown, Rhonda Robinson, Anthony Robinson, David Ralph Hardy and Warren Darrel Hairston; therefore, Leon Winston cannot be eliminated as a possible contributor of this genetic material.

Again, the DNA type of the FGA locus was consistent with a mixture of Leon Winston and another individual; but, again, because I only had this one DNA type, it was unsuitable for a data bank search, and I couldn't make any conclusions regarding it.

- Okay. So -- and when you say it was 0. unsuitable -- sometimes we here the term cold hit. Is that what you mean by a data bank search?
- Α. I have -- if I have a complete Yes. DNA profile and I search it through the data bank, it is possible that it will hit on an individual in the data bank, and that would be a cold hit.
- As far as when you're -- you come to Ο. the -- you looked at this, it's consistent with Leon Winston, did you then check with the statistics to see what the statistical probability on this

	1 particular DNA was?
	A. Yes. The probability, again, of
	randomly selecting an unrelated individual with the
	DNA profile matching this DNA profile obtained from
	the sample from the sweatshirt. Is one greater than
•	six billion in the Caucasian, black and Hispanic
•	populations.
8	Q. So as far as 139 is concerned, it's
9	consistent with David Hardy?
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12	consistent with Leon Winston, Kevin Brown and
13	David Hardy?
14	A. Yes.
15	Q. As far as
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17	MR. DREWRY: Judge, objection. It's
18	been asked and answered.
19	THE COURT: Overruled.
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21	BY MR. DOUCETTE: (Continuing)
22	Q. As far as 201 is concerned, that's
23	concerned, that's

consistent with -- I forget now. That's consistent

with Leon Winston and somebody else that we don't

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know?

1 Α. Yes. 2 Q. That's a mixture. 3 As far as item 400, the pistol, is concerned, it is not a mixture, and that's 4 consistent with Leon Winston? 5 6 Yes, that's correct. 7 0. And 403 is consistent with 8 Leon Winston, the jacket? 9 Α. The major profile from that Yes. sample is consistent with Leon Winston. 10 11 The statistics that you talk about, Q. where does statistics come from? 12 13 The -- for each region of the DNA, for 14 each DNA type, a frequency is determined on how common that is seen in the general population. 15 then take these frequencies for all of the DNA types 16 that I have in a specific sample and I multiply them 17 together using formulas, and it determines the 18 overall frequency of that DNA profile. 19 20 The statistics are based on actual 0. 21 testing? 22 Α. Yes. 23 And as far as the formulas that you discussed, are these formulas recognized in your 24

profession as being the way to do this?

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	A. Yes. These are the same formulas that
	are used by all the labs in the country.
	3 The country.
4	MR. DOUCETTE: Ms. Harold, thank you
	very much. Those are all the questions I
6	
7	have. Counsel for the defense may have some.
8	
9	THE COURT: Mr. Drewry.
10	CROSS - FYAMINA DI COL
11	CROSS-EXAMINATION BY MR. DREWRY:
12	
13	I sale to say that
14	every cell in our body that has a nucleus has DNA in it?
15	
16	A. Yes, that's correct.
17	Q. So you're looking for anything that
18	has a cell; correct?
19	A. Yes.
20	
21	(Discussion was held off the record.)
22	MR. DREWRY: Judge, may I approach the
23	bench?
24	THE COURT: Yeah. You need something?
25	MR. DREWRY: I need yes, sir.

THE COURT: Tell me what. I might be able to help you.

BY MR. DREWRY: (Continuing)

Q. Ms. Harold, Mr. Doucette has already asked you about -- where's the green hat -- oh -- has already asked you about Item 139, the green stocking hat; is that correct?

A. Yes.

Q. And that indicated that the only person's DNA on that was David Hardy's; is that correct?

A. (Witness perusing report.)

Yes. With the exception of one of the regions of the DNA that I tested, it was consistent with David Hardy and another individual.

Q. And, I believe, you also tested an item known to you as one thirty-six, the New York baseball cap; is that correct?

A. Yes, that's correct.

Q. Does this appear to be the same hat that you tested? It's identified as Defendant's Exhibit C.

A. It appears to be, and the -- really, the only thing I'm basing that on is the word that's

1 | 2 |

written on it, because I have that word in my notes, Corleone name or --

- Q. Okay.
- A. -- whatever it says.
- Q. So you tested item one thirty-six that was collected by Bobby Moore and submitted to the lab; is that correct?
 - A. Yes, I did.
- $\ensuremath{\mathbb{Q}}.$ And what was the results of your DNA test at that time?
- A. The DNA profile obtained from a sample from this baseball cap is consistent with a mixture. Leon Winston, Kevin Brown, Rhonda Robinson and Anthony McKinley Robinson and David Ralph Hardy are each eliminated as a possible contributor to this genetic material.

Subsequently, I searched the major DNA profile from the sample from the baseball cap against the Virginia DNA data bank; however, no DNA profiles consistent with this major DNA profile were found in the Virginia DNA data bank at this time.

- Q. Now, the sixteen areas that you're talking about, individually they're called locus; is that correct?
 - A. Yes.

The way the frequencies are determined

for our database that we use for our statistics is

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25

Hispanic?

individuals were tested and based -- classified according to their race. So we had -- so a -- a certain number of people who are classified as Caucasian, and they're DNA profiles were determined and frequencies were determined based on these DNA profiles.

- Q. All right. So if someone identified themselves as being Caucasian, or white, that's the way the statistics would compile?
- A. That person would be included in the Caucasian database.
- Q. Okay. But if they were a mixed race, combination of African-Americans and Caucasians, they would not be included in your database?
 - A. I don't believe so, no.
- Q. Now, in looking at Item 200, you did the left and the right glove; is that correct?
 - A. Yes.
- Q. And then in order to come up -- you look -- you're looking at sixteen areas of this DNA?
 - A. That's correct.
- Q. All right. One of those areas -- and excuse me for the pronunciation -- is called the amylit -- where the sex gene is.
 - A. It's called amelogenin, yes.

- Q. Okay. So that's where you tell whether or not the contributor is a male or a female?
 - A. Yes, that's correct.
- Q. So if you throw that out, you've got fifteen points; is that correct?
- A. Yes. There are fifteen other regions other than amelogenin, yes.
- Q. All right. And in order to come up with your statistics for the gloves, the Item 200 that's in front of you, you only used five of the points; is that correct?
- A. Yes. I used five of the remaining fifteen regions.
- Q. Okay. So you came up with your statistics using one-third of the fifteen available?
 - A. Yes.
- Q. Bear with me just a minute because I'm $\operatorname{\mathsf{--}}$ do you have your statistics or your report there?
 - A. Yes, I do.
- Q. All right. Let's go to the Item 200, the sample from the right glove and the sample from the left glove.

You came up with a profile at THO one,

1 O one; right? 2 Where exactly are you in my report? Α. 3 Page six of your August 26th, 2002 Q. 4 report. 5 Α. Okay. 6 You've got the known on the top and your sample of unknown at the bottom; correct? 7 I'm not sure I understand. Α. 9 Q. Turn over to page six where your chart 10 is. 11 Α. Okay. 12 All right. You got your chart there? Q. 13 Α. Yes. 14 Go to THO one. Q. That's one of the loci that you're testing; right? 15 16 Yes, that's right. Α. 17 And the known band at -- you got five Ο. known samples, one from Rhonda Robinson, one from 18 Leon Robinson -- I mean Anthony Robinson, one from 19 Leon Winston, Kevin Brown and David Hardy; is that 20 21 correct? 22 Α. Yes, that's correct. 23 All right. And in that situation, you found that Rhonda Robinson had a band that measured 24

out or was given an amount -- value of seven, comma,

eight; is that correct? 1 2 Yes, that's correct. Α. 3 And in your samples from the glove, Q. the left glove and the right glove, you came up with 4 the band that's seven, comma, eight; is that 5 6 correct? Yes. I detected two types in those Α. samples, a seven and an eight. 8 9 All right. And in your report, there Q. are some on the -- on this chart, there's some that 10 are in bold, and then there's -- or not bold, but --11 but there's some in parentheses and some not in 12 parentheses; is that correct? 13 14 Yes, that's correct. Α. 15 Okay, all right. And it says these Q. alleles generally travel in pairs. 16 17 Well, let me back up. 18 Do these alleles generally travel in 19 pairs? 20 Α.

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- What do you mean travel in pairs?
- Well, if I have a one allele from my 0. father and one from my mother, if I give you some of my genes, you're going to find those -- that pair there; right?
 - Yes. If you received a different Α.

allele from your mother and a different allele from you father, I would see two. However, it -- it's also possible that you got the same allele from your mother and the same allele from your father. So in that case I would only see one.

- Q. Go over to the loci -- or the locus rather, marked D seven, S eight twenty.
 - A. Okay.
- Q. And there you found in the right glove an eleven eleven and in the left glove an eight eleven; is that correct?
 - A. Yes, that's correct.
- Q. Now, Leon Winston has a nine ten at that location; is that correct?
 - A. Yes, that's correct.
- Q. So none of his alleles are in that sample of the right or the left glove?
 - A. That's correct.
- Q. You didn't include that locus in your calculations, did you?
- A. No, because, like I said before, in order to calculate statistics, I only chose the loci that had the three individuals I was including in -- their complete profiles in.
 - Q. So if you take -- if you take it where

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you know that they are, but you're not including where they're obviously not; right?

> Α. Yes.

- Okay. When you did this, you used a Q. likelihood calculation?
- Yes. It's -- the statistical calculation I used for the sample was -- it's called a likelihood ratio.
- That's assuming that you do not know Q. any of the contributors to the unknown gloves -- or to the gloves; correct?
- Yes. What it does is it takes two Α. different hypothesis and makes -- it's -- the number provided is a ratio of this hypothesis. The first one is that -- is these three individuals, and then the second hypothesis is that it is three unknown individuals.
- And in order to come up with Q. statistics of likelihood of someone having this particular band at this particular locus, multiply that by the likelihood of another locus at another band -- or another band at another locus, correct, and then multiply it out?
 - Α. Yes.
 - Okay. That's my knowledge from basic Q.

statistics in college.

1.4

Did you anybody associated with the Lynchburg Police Department or the Lynchburg Commonwealth's attorney's office tell you that these gloves, Item 200, belonged to David Hardy?

- A. No.
- Q. All right. If they had told you that they belonged to David Hardy, then that would upset your thesis of unlikely -- using a likelihood situation; correct?
- A. It would, yes. It would have changed the two hypothesis that I would have been calculating my statistics at.
- Q. Because at that point you'd be operating with one known individual versus three unknown individuals?
 - A. Yes.
- Q. Did anybody with the Lynchburg Police Department or anybody with the Lynchburg Commonwealth attorney's office tell you that they knew for a fact that Kevin Brown got those gloves from David Hardy?
 - A. No.
- Q. All right. So that would change your hypothesis even more; correct?

Α. Yes.

2 3

So you would then be dealing with two Q. known individuals versus three unknowns or an unknown and a sample; correct?

4 5

Α. Right.

6

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And the proper calculation at that Ο. point would be used -- would be to use a mixture calculation that would take all of the elements that I've just given you into account?

9

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It would have changed my hypothesis. Α. So I would have then been calculating based on the theory that it was Leon Jermain Winston, Kevin Eugene Brown and David Ralph Hardy.

13 14

would -- let's see. I'm trying to think.

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The statement would be it's so many times for likely originated from Leon Winston, Kevin Brown and David Ralph Hardy than if it had originated from Kevin Brown, David Hardy and an unknown individual.

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Okay. Would it surprise you to know that using a mixture calculation and accepting the two gives, that -- that Leon -- that David Hardy and Kevin Brown had the gloves in the past, using the same five areas that you calculated, that the calculations would then change to one in a hundred

24

and ninety-five among the black population?

- A. I'm not sure what exactly -- what mixture calculation are you talking about?
 - Q. Well, that's a part of the problem.

 The likelihood ratio that you have
- is -- or in order to come up with the statistics that Mr. Doucette had from you or got from you, you plug in your information and you use a computer program; correct?
 - A. Yes, that's correct.
- Q. Okay. It's not like you and I sit down with a piece of paper and calculate it out by hand?
 - A. That's right.
- Q. All right. That same type of program allows for computations of mixtures; is that correct?
- A. Well, for the Virginia Division of Forensic Science, we -- the likelihood ratio is the procedure we use for mixtures. It is the statistical calculation we use for mixtures.
- Q. You never use -- you never use a different type of calculation?
- A. There is another calculation called a combined probability of exclusion, which is another

1 type of mixture calculation that we use.

- Q. And you don't use or are you -- you do use that one?
- A. Yes, but that's a different computer program.
- Q. All right. And you don't have that program with you today?
 - A. No, I do not.
- Q. So if I were to tell you it was one in a hundred and ninety-five for the blacks, one in two hundred and twenty-seven for the Caucasians and one in two hundred and forty-two for the Hispanic population at the five loci that you tested, you wouldn't be able to confirm or deny it today?
 - A. That's correct.
- Q. Go back to your office with the program, you could do that?
 - A. Yes.
- Q. And to go back to the areas that you were looking at the loci, looking -- still sticking with your chart on page six of nine pages from August 26th, there's another loci known as the D seven, S eight twenty; is that correct?
 - A. Yes.
 - Q. And I believe in the right-hand glove,

1 it came up strong for an eleven eleven; is that 2 correct?

- A. Yes. For the D seven region, the only DNA type that I detected was an eleven.
- Q. Okay. So that is either all by yourself, Kevin Brown leaving just his eleven as opposed to his eight and eleven, or it's a fourth individual; correct?
- A. No. Both Kevin Brown and David Hardy have an eleven in their DNA profile, so it could be from either one of them.
- Q. All right. But David Hardy has an eleven fourteen, Kevin Brown has an eight eleven --
 - A. Right.

Q. -- correct?

So you would either have to get just the eleven from Kevin Brown or just the eleven from David in order to come up with that or it may be a fourth person who has an eleven eleven at that locus; correct?

A. To the extent of -- I guess that's a possibility; however, it's not uncommon for me to see just one of the DNA types at a specific region if the sample is of poor quality or if there was low level -- low level of DNA in that sample.

o 4

It's what we call allelic dropout, which is what happens when -- like, say for example, Kevin Brown being an eleven, but I'm am only seeing the eleven, that eighth allele -- or that eight type has just dropped out of the sample.

Q. Okay. But along those lines, Mrs. Harold, you don't know whether or not that eight from Kevin Brown or the fourteen from David Hardy dropped out or not, do you?

A. Just give me one moment.

Going back to my -- to my original data where I have my computer analysis and my visual analysis of this sample, there were several DNA types present at this region that were not at the level where I could report them; however, they were present, and those alleles are consistent -- or some of these alleles that are -- that could have dropped out.

So those alleles are -- those types are there weakly, but they're not on a level that I could call them as actually alleles.

Q. So it's one of two possibilities. It's allele drop out or there's a fourth person in these gloves; correct?

A. Yes.

1 And in doing your calculations, go Q. back to D seven, and using those calculations -- or 2 create those calculations, you did not use that 3 particular situation, is that correct, in coming up 4 5 with your statistics? 6 That's right. I did not use the D Α. 7 seven, S eight twenty locus in my statistical 8 calculation. 9 You also did, I believe -- you also got a -- a -- I believe a Play Station 2 box at some 10 11 point, which was --12 13 MR. BERGER: It is four-o-one. 14 15 BY MR. DREWRY: (Continuing) 16 17 -- which would have been item Ο. 18 four-o-one? 19 Α. Yes, that's correct. 20 Didn't find any of Leon Winston's DNA Q. on that; is that correct? 21 22 Yes, that's correct. The DNA profile Α. from the Play Station 2 box was a mixture. And 23 Leon Winston as well as Kevin Brown, 24 Rhonda Robinson, Anthony Robinson, David Hardy and 25

Warren Hairston were each eliminated as the contributors to this sample.

- Q. Okay. Now, DNA, because it's coming from a nucleic cell is a fairly small piece of material; correct?
 - A. Yes.
- Q. And it doesn't take much for you to find DNA, so it's only a small matter of any substance?
- A. Yeah. I -- it -- in order for me to obtain a DNA profile, I really only need a handful of cells, maybe a hundred cells.
- Q. And those hundred cells are easily transferred from my pen, if I've been sucking on it like that and then wipe it across something, or if I find some fluid gathered up and then dump it on another item; is that correct?
- A. Yes. DNA can be transferred from one item to another.
- Q. And you don't know when the DNA was left on any particular item that you find it on?
 - A. That's correct.
- Q. It's also subject to deterioration on -- either because of the environment, being out in the weather --

3	A. Uh-huh, yes.
2	Q or not being properly collected?
3	
4	
5	Q. Okay. And, then, it's not properly
6	
7	If I collect something properly and
8	then stick it in and don't allow it to properly air
9	
10	that correct?
11	A. Yes. If it's not properly air dried,
12	the sample can deteriorate or mold and bacteria can
13	grow on it.
14	
15	MR. DREWRY: Judge, if I might have
16	just a minute.
17	THE COURT: All right.
18	
19	(Discussion was held off the record.)
20	
21	MR. DREWRY: I don't have any other
22	questions, Judge.
23	THE COURT: Redirect?
24	MR. DOUCETTE: Briefly, Your Honor.
25	If I may approach.

1	REDIRECT EXAMINATION
2	i de la companya de
3	Q. Ms. Harold, you have your report?
4	· I
5	Q. I'm sorry. You have lots of them.
6	
7	of 2002, a nine-page report?
8	A. Yes.
9	Q. I want you to go to page five of that
10	particular report.
11	A. Okay.
12	Q. And I'm referring to I'm going to
13	refer to two items, Number 33 and Item Number 400.
14	A. Uh-huh.
15	Q. What was item Number 33?
16	A. 33 was the buccal swabs from
17	Leon Winston.
18	Q. Item Number 400?
19	A. 400 is the sample from the grip of the
20	pistol.
21	Q. This pistol right here?
22	A. Yes.
23	Q. What is the value let's start the
24	FGA locus.
25	

-	MR. DREWREY: Judge, I object, asked
2	
3	
4	THE COURT: All right. Overruled.
5	
6	BY MR. DOUCETTE: (Continuing)
7	
8	
9	A. Leon Winston is twenty-two twenty-two
10	
11	Q. Okay. Let's go down to FGA on item
12	
13	What is the numeric value on from
14	
15	A. The value is twenty-two twenty-two
16	FGA.
17	Q. Let's go to the next locus, T-POX,
18	T-P-O-X.
19	What is the value at thirty-three,
20	Leon Winston?
21	A. I was not able to determine a DNA
22	profile for Leon Winston at this sample.
23	Q. 400, what was the value for T-POX on
24	400?
25	A. Again, I did not have a DNA profile
ĺ	1-1-11

```
for this particular region.
  1
  2
                     In both of these you have I-N-C in
                Ο.
  3
      your report.
                     What does that mean?
  5
                     It means inconclusive.
  6
                    Let's go to the next locus, D eight s
               Q.
  7
      one one seven nine.
  8
                    What is the value for Number 33,
  9
      Leon Winston?
 10
               Α.
                    Fourteen fourteen.
 11
                    Going down to 400, what's the value at
12
     that same locus?
13
               Α.
                    A fourteen fourteen.
14
                    Going to the next locus, V, capital,
               Ο.
15
     W-A.
16
                    What's the value for Leon Winston.
17
              Α.
                    Sixteen sixteen.
18
                    Going down to 400 at the same locus,
              Q.
19
     VWA, what's the value?
20
              Α.
                   Sixteen sixteen.
21
                   The -- you're going to have to
              0.
22
     pronounce it for me, the next locus.
23
              Α.
                   Amelogenin.
24
                   All right. What is the value there
25
    for Number 33, Leon Winston?
```

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1
                Α.
                     An XY.
   2
                     What is the value for 400?
                Q.
   3
                Α.
                     XY.
   4
                     Next one, Penta E, what's the value
                Q.
      for Penta E, Leon Winston?
   5
   6
                Α.
                     Twelve fifteen.
  7
                     What's the value for 400, this pistol?
                Q.
  8
               Α.
                     Twelve fifteen.
  9
                     The next one, D one eight, S five one,
               Q.
      what is the value for Leon Winston?
 10
 11
               Α.
                    Fifteen fifteen.
 12
                    What is the value for the pistol?
               0.
 13
               Α.
                    A fifteen fifteen.
 14
                    D twenty-one, S eleven, the next
               Q.
     locus, what is the value for Leon Winston?
 15
16
                    Thirty-two point two, thirty-two point
               Α.
17
     two.
18
              0.
                    What's the value in Number 400, this
19
     pistol?
20
                   A thirty-two point two, thirty-two
              Α.
21
     point two.
22
                   Let's go to the next page, the next
              Q.
     locus, DH zero one, what is the value for
23
24
    Leon Winston?
25
             A. Seven seven.
```

-	Q. What is the value for this pistol?
2	A. Seven seven.
3	Q. The next locus D three, S one three
4	
5	
6	Q. What is the value for this pistol?
7	
8	Q. Penta D, the next locus?
9	A. Again, I had an inconclusive results
10	
11	
12	
13	A. Yes.
14	Q. All right. And as far as those two
15	same locus those two same loci for this pistol?
16	A. These were both also inclusive.
17	Q. The next locus, D one six, S five
18	three nine, what is the value for the defendant,
19	Leon Winston?
20	A. A nine nine.
21	Q. And what the value for this pistol?
22	A. A nine nine.
23	Q. The next locus, D seven, S eight two
24	zero, what is value for Leon Winston?
25	A. A nine ten.

	Q. And what is the value for this pistol?
	A. A nine ten.
	Q. D one three, S three one seven, the
4	next locus, what is the value for Leon Winston?
5	A. An eleven twelve.
6	Q. And what is value for the pistol?
7	A. An eleven twelve.
8	Q. And the last locus, D five, S eight
9	one eight, what is the value for Leon Winston?
10	A. Eleven twelve.
11	Q. And for this pistol?
12	A. An eleven twelve.
13	
14	MR. DOUCETTE: Thank you, ma'am.
15	Those are all the questions I have.
16	THE COURT: Mr. Drewry.
17	
18	RECROSS-EXAMINATION
19	BY MR. DREWRY:
20	Q. Ms. Harold, you don't know what type
21	of cell body cell was left on that pistol, do
22	you? It could have come from a hand, it could have
23	come from blood, it could have come from sweat;
24	correct?
25	A. I didn't detect any blood on it, on
	1 OH

1 the pistol. 2 It could have come from sloughed-off skin cells, could have come from sweat, it could 3 have come from saliva? 4 5 Α. That's true, yes. I can't identify a specific body fluid that these cells came from. 6 7 And it was a fairly small amount? 0. 8 Actually, it was probably -- it wasn't Α. a small amount of DNA. There was actually quite a 9 10 bit of DNA in the sample. 11 Q. All right. But a hundred cells, a thousand cells, it was in one part of the gun; 12 13 correct? 14 Α. Yes. 15 Okay. And you don't know when it was Q. 16 left there --17 Α. That's correct. 18 -- or how it got there? Q. 19 Α. Yes. 20 21 MR. DREWRY: I don't have any other 22 questions, Judge. 23 THE COURT: All right. Do you want 24 this lady to return tomorrow?