

1 THE COURT: All right. Go ahead. Let's call call him.

2 Back within the hearing of the jury:

3 THE COURT: This witness is going to be pretty long; isn't  
4 he?

5 MR. CASTO: Shouldn't be too long, your Honor, on direct.

6 THE COURT: All right, I'll let you go ahead and start. Go  
7 ahead.

8 SGT. FRED S. ZAIN was thereupon called as a witness on  
9 behalf of the State and having been first duly sworn, testified  
10 as follows:

11 DIRECT EXAMINATION

12 BY MR. CASTO:

13 Q Could you state your name, please?

14 A Fred Salem Zain.

15 Q Mr. Zain, I see you have a state police uniform on. Are  
16 you a member of the state police?

17 A Yes. I have been a member of the Department of Public  
18 Safety for approximately a little over 10 1/2 years, stationed at  
19 the Criminal Identification Bureau in South Charleston, West  
20 Virginia where I'm in charge of the particular identification  
21 unit which receives and examines physical evidence for the  
22 presence of blood, body fluids, and hair type evidence.

23 Q In your duties down there as head of this bureau, this  
24 identification bureau, do you have occasion to become involved in

1 the investigation of sexual assaults?

2 A Yes, sir, on occasion.

3 Q And could you tell us just a little bit, just educate  
4 this jury, if you would, about how, number one, you can identify  
5 seminal fluid and sperm and exactly what that is.

6 THE COURT: And go ahead too, for us relatively  
7 unsophisticated people who might not be so knowledgeable of  
8 technical terms and things like seminal fluids or saliva or  
9 whatever term you might encounter there in your explanation, and  
10 explain to us, me and the jury, what something is from time to  
11 time. We are not as familiar with some of these scientific terms  
12 or even parts of body fluids as you might be in your experience.  
13 Go ahead, sir.

14 THE WITNESS: Okay, your Honor.

15 More specifically, of course spermatozoa are simply the male  
16 reproduction cells which are secreted by the male. Secondly,  
17 seminal fluid is also a body fluid that is secreted by a male  
18 individual which in essence is the transfer fluid for the sperm  
19 cell itself. In other words, without the seminal fluid and sperm  
20 cell, then conception or, of an embryo then wouldn't develop.

21 As far as identification of spermatozoa or the cells  
22 themselves, that is simply done with a microscope. You look  
23 through a microscope, some slides or extracts from swabs, say, in  
24 a sex crime evidence kit, and you can visually see the cells,

1 just like if you would scrape cells off of your finger, whatever,  
2 put them on a glass slide, look at them by the microscope, and  
3 you would be able to see those cells also.

4 Secondly, seminal fluid is identified by a chemical means.  
5 The specific test for seminal fluid that we use is named P30.  
6 P30 is simply a name which was derived by forensic experts as  
7 well as clinical experts at Johns Hopkins medical hospital in  
8 that when the test was developed, to simply state, that "P" was  
9 from the prostatic acid phosphatase; and prostatic acid  
10 phosphatase is a constituent or substance that is found in large  
11 quantities in the male seminal fluid.

12 The 30 is what was designated as the 30th/thousandth of a  
13 size, in other words molecular size of seminal fluid itself.

14 The bottom line is the particular test that we use is  
15 specific for seminal fluid. It will not react with any other  
16 substance in the human body and give a positive result.  
17 Therefore, when we test certain items for the presence of seminal  
18 fluid itself and the test is positive, we know it can't be  
19 anything other than seminal fluid. Therefore, the secretion  
20 material or seminal fluid which we have identified then  
21 definitely would have to have come from a male individual.

22 You can also from seminal fluid and not from a sperm cell  
23 identify blood characteristics, blood characteristics from this  
24 standpoint. I'm sure that once upon a time you may have had your

1 ABO blood typed, either by Red Cross or donated blood or maybe  
2 when you were in school. The ABO blood type can be identified  
3 from your body fluids, such as seminal fluid -- you can get your  
4 ABO blood type -- vaginal fluid, saliva, and other body fluids  
5 such as perspiration and even urine. They are, the ABO blood  
6 type is identifiable if you are classified as a particular type  
7 of individual, which I could go into later on.

8       You can also identify other blood characteristics from your  
9 body fluids which are just other ways of sort of giving an  
10 internal picture of, say, what you are made of by blood typings.  
11 Blood characteristics are an internal picture, just like if I  
12 were to say you had brown hair and blue eyes and long arms and  
13 short fingers and whatever. Those are physical characteristics.  
14 So if we are talking about genetic markers or blood  
15 characteristics or blood types, they all mean the same thing,  
16 they are just giving a picture of an individual they may have  
17 come from.

18       Q   (BY MR. CASTO) All this that you have just talked to us  
19 about here, Sgt. Zain, have you received any type of special  
20 training in this area of dealing with these body fluids?

21       A   As long as I have been in the Department I have worked  
22 in this specific capacity in the specific area of the testing and  
23 identification of blood characteristics and the identification of  
24 certain body fluids. My prior employment was with the Department

1 of Natural Resources where I worked for three years as a  
2 chemist. My educational background is that I have a Bachelor of  
3 Science degree in biology with a minor in chemistry. I also have  
4 an Associate degree in applied sciences from Marshall Community  
5 College, and I have a master's degree in biological sciences from  
6 Marshall University.

7 I am, I have given lectures at WVU Medical Center, West  
8 Virginia State College, West Liberty College in reference to  
9 forensic science and human genetics. I have also given  
10 specialized seminars and public speakings at medical and bar  
11 association meetings, Prosecuting Attorney's Association  
12 meetings, as well as in-house training at the West Virginia State  
13 Police Academy for members of our department and members of other  
14 police agencies in the state.

15 My background as far as associations and memberships is that  
16 I'm a member of the Southern Association of Forensic Scientists,  
17 a member of the Canadian Society of Forensic Scientists, a member  
18 of the American Academy of Forensic Scientists, a member of the  
19 International Association of Electrophoresis.

20 THE COURT: Electro ---

21 THE WITNESS: Phoresis.

22 THE COURT: Go ahead, sir.

23 THE WITNESS: A member of the International Society of  
24 Hemogenetics, and a member of the American Blood Banking

1 Association.

2       These associations and societies which I belong to are  
3 specifically set forth for scientists, not just forensic  
4 scientists but scientists in general. There are particular  
5 qualifications that are necessary and mandatory when you are  
6 recommended for membership, and you are admitted from peer groups  
7 in the scientific arena.

8       I have also been in charge of the training of other  
9 individuals in the serology section or in the section which I  
10 spoke of where I work for their specific training in these  
11 methodologies, techniques, types of testing. We do have two  
12 papers submitted for publication in reference to the type of work  
13 that we do: Number one, a population study using blood  
14 characteristics in the state of West Virginia; and secondly, a  
15 methodology used in testing and identifying certain blood  
16 characteristics. There are a variety of other things, but in  
17 general that would basically cover it.

18       Q     (BY MR. CASTO) Sgt. Zain, I believe you have testified  
19 around the state in a number of judicial circuits around the  
20 state; is that right?

21       A     Yes, sir, I have testified in approximately 46 counties  
22 in the state of West Virginia out of 55 of which I have testified  
23 in Kanawha County many times.

24       Q     Okay. You have been qualified as an expert in your area

1 dealing with secretions, body fluids, and blood?

2 A Yes, sir, that's correct.

3 THE COURT: Do you want to submit his qualifications now?

4 MR. CASTO: Yes.

5 THE COURT: I do declare -- and Mr. Zain has testified in my  
6 court on a number of occasions -- I do declare that Mr. Zain by  
7 his education, his experience, and his training is qualified to  
8 express testimony upon the subject matter spoken of, and in  
9 addition to that Mr. Zain will be qualified to give opinions to  
10 questions that you or Mr. Jacobs or anyone might ask him  
11 concerning this subject, and the jury would be allowed to listen  
12 to Mr. Zain's opinions; and you, the jury, may take the opinions  
13 into evidence of this case to assist you in your work at hand.

14 So you may proceed, Mr. Casto, to make inquiry of Mr. Zain.

15 MR. CASTO: Thank you, your Honor.

16 Q (BY MR. CASTO) Sgt. Zain, I would like to direct your  
17 attention to a particular investigation that your department  
18 performed, or became involved in, dealing with the Kanawha County  
19 Sheriff's Department and a sexual assault case where the victim's  
20 name was [REDACTED]

21 A Yes, sir.

22 Q Do you have some reports there in front of you that your  
23 section has put forward in this case?

24 A Yes, sir, I do.

1 Q I believe you have basically three separate reports; is  
2 that right?

3 A Yes, sir.

4 Q Okay. I would like to draw your attention to the first  
5 report, and I believe it's dated February 1985. Do you have that  
6 there before you?

7 A Yes, I do. And it's, in '85 there was an '84 submission  
8 which would probably be the, I believe, let's see -- I have on  
9 December 18th, 1984 we received various items from Deputy Johnson  
10 with the Kanawha County Sheriff's Department.

11 Q Okay. That would be Deputy Steve Johnson?

12 A Yes, sir.

13 Q And those items were turned over personally to you all  
14 at the lab?

15 A They were received at the bureau by personal delivery,  
16 yes, sir.

17 Q Okay. And your bureau or your lab took about testing  
18 these items; is that right?

19 A That's correct.

20 Q Could you just describe the tests that were run by your  
21 section down there?

22 A Yes, sir. Of the items submitted is what we call a sex  
23 crime evidence kit which I referred to earlier. A sex crime  
24 evidence kit is simply a compilation of materials that are



1 collected from a, an individual that's been examined by a  
2 physician of possible rape. The items in a sex crime evidence  
3 kit would consist, say, for example, of a blood sample of the  
4 individual that's being examined; it would also included hair  
5 samples, hair samples not only to be used as known or standard  
6 hair samples such as the pubic hair samples and head hair samples  
7 but also pubic, what is called pubic hair combings; and that is  
8 simply that a physician or a nurse would take a comb and go  
9 across the genital area of the victim, and any loose hairs that  
10 may be present that possibly could have been derived from the  
11 assailant or suspect would be deposited because they would be  
12 loose hair samples. Also, there would be a saliva sample and  
13 there would be vaginal swabs which the physician would have  
14 taken, and also vaginal smear slides or just slides which are  
15 made from the vaginal swabs.

16 As I referred to earlier, we would look at the vaginal  
17 slides to see if we could see any sperm cells present  
18 microscopically. Secondly, we would test the vaginal swabs to  
19 see if there's any presence of seminal fluid. If there was  
20 seminal fluid identified on the swabs, then we would continue on  
21 with blood typing to obtain blood character, blood typing  
22 characteristics from the vaginal swab. Any other items that may  
23 have been submitted -- for example, I believe in this case in  
24 this case there was a pair of bluejeans and a turtleneck blouse

1 and a white pair of panties. These items would have been  
2 examined also for the presence of seminal fluid, which I have  
3 explained earlier how we do that. And if any seminal fluid was  
4 identified, then blood characteristics would try to be obtained  
5 from each of the other items of, say, clothing, say, for example,  
6 a pair of panties.

7 Q Did you in this case identify any seminal fluid on the  
8 swabs or slides?

9 A According to the report we issued and the results of the  
10 exam are simply that seminal fluid and spermatozoa were  
11 identified on a pair of jeans, also that seminal fluid was  
12 identified on the panties and the vaginal swabs. We did obtain  
13 some blood characteristics from those items as well as the known  
14 blood sample of Ms. [REDACTED] was also typed for blood  
15 characteristics at that time. The blood typings which were  
16 identified from the seminal fluid on the jeans and the vaginal  
17 swabs were what we call the ABO blood type which was "O."  
18 Another blood characteristic which we identified was called a PGM  
19 1+, and there were two additional blood characteristics which  
20 were checked for the possibility of determining what the race of  
21 the possible suspect may have been at the time and which is  
22 called PEP A Type 1 and CA II Type 1. There again, these names  
23 and abbreviations may not mean anything to you. What I could do  
24 is make it a little bit clearer. They are just other blood

1 characteristics which give us information on what the individual  
2 or who the individual may be that deposited the semen.

3 The characteristics of the, from seminal fluid identified on  
4 the panties were simply, there again, an ABO Type O, a PGM Type  
5 1, a PEP A Type 1, and a CA II Type 1. There were also stains of  
6 human blood identified on the panties and the vaginal swabs which  
7 contained the ABO Type O, PGM Type 1+, and PEP Type 1. In other  
8 words, all of the blood typings and all of these abbreviations  
9 and numbers I have given you were pretty much the same blood  
10 characteristics on all the items which were examined and which  
11 were either seminal fluid or blood identified on them.

12 Q So, in other words, what you are telling us, you typed  
13 the known blood of the victim, [REDACTED] --

14 A (Interposing) Yes, sir.

15 Q (Continuing) -- and got the results that you told us?  
16 You also typed the seminal fluid, and the blood typings that you  
17 could get from the seminal fluid were the same?

18 A That's correct. Even though the, even though we know  
19 that the seminal fluid could not have been made by the victim, or  
20 the female, the blood characteristics which were identified from  
21 the secretions of seminal fluid and vaginal fluid were the same  
22 blood characteristics as Ms. Woods'.

23 Q Just a couple questions about this report here,  
24 Sergeant. I notice on Page 2 of this report you mentioned, under

1 the ABO factor there are two notations here: "O" and in  
2 parenthesis "H." Could you explain just what that is, please?

3 A Yes, sir. For the benefit -- the "O," ABO blood Type  
4 "O," when you report it as coming from blood -- say, if I would  
5 cut myself, and I would type my blood and it would be a Type "O,"  
6 it would simply be an "O" by itself. Because the ABO blood type  
7 was identified from body fluids other than blood, then an "H" is  
8 put in parentheses beside it which designates that it came from a  
9 secretion and not from your whole blood.

10 Q Okay. And you also mentioned here the PGM which is the  
11 next, the next factor down here. A couple of times you said --  
12 "1+." I noticed here on your sheet it says "1+1+." Is there any  
13 difference there?

14 A No, sir. In 1984 we were reporting it out as a 1+1+.  
15 There are a variety of ways of reporting the same thing as far as  
16 nomenclature is concerned. As of now we report it as a PGM 1+.  
17 It's no difference. They are exactly the same thing.

18 On one of the items I did state that on the panties we  
19 identified a PGM 1, and I didn't say a PGM 1+. There are two  
20 separate tests which are used to obtain a PGM blood type. The  
21 PGM 1 was identified, but the subtyping of the PGM 1 was  
22 unobtainable; therefore, it is classified as just a 1.

23 Your Honor, if I could show the jury, I could show them  
24 better on the board than I could tell them.

1 THE COURT: You may indeed, sir. When you are down there  
2 without a microphone, just use your classroom voice and speak up  
3 so that all of us would be able to appreciate your remarks.

4 THE WITNESS: While I'm here, I'll just go ahead and show  
5 you what I was talking about with the "O" and the "H," and that  
6 way you can visually see it.

7 When you report an ABO type in blood, you report it out as  
8 just an "O." If you report it out as an ABO type from a  
9 secretion, you report it out like this. This is what Mr. Casto  
10 was referring to. That's what's on my, on the report that I  
11 spoke of. This "H" just designates that the ABO blood Type O  
12 came from a body fluid other than blood.

13 As far as the other blood type of a PGM blood type, I  
14 referred to it as a 1 and then I also referred to it as a PGM  
15 1+. The PGM 1+ is a subtyping of a PGM 1. A PGM 1 has three  
16 subtypings. You have a PGM 1 equals a 1+, a 1-, or the  
17 combination of a 1+1-. During the identification of the PGM  
18 blood type from, say, the secretions also on the pair of panties,  
19 a PGM 1+1 -- a PGM 1 was identified, but no subtyping of that  
20 PGM 1 was identified. On the other items, a PGM 1+ was  
21 identified from the secretions on the other items and the vaginal  
22 swab.

23 Q In other words, you know, just on the panties you just  
24 couldn't break it down any further?

1 A That's correct.

2 Q Is that unusual?

3 A No, sir, not really. Because every type of biological  
4 fluid is really different, and the concentrations, say, of  
5 seminal fluid and vaginal fluid and bacteria and everything else  
6 mixed in together, sometimes you can identify it and sometimes  
7 you can't.

8 Q Sergeant, I also noticed in this report that you took a  
9 look at the pubic hair combings and known pubic hair that you had  
10 mentioned earlier. Do you have any results, or did you reach any  
11 results after looking at those hair samples?

12 A The examination of the hair samples stated as the pubic  
13 hair combings which I referred to earlier that were contained in  
14 a sex crime kit were reported out as having similarities and  
15 differences which were characteristic with the known hair of  
16 Ms. [REDACTED] It was also requested to some degree that more known  
17 may be submitted to get a more exact comparison. But at the  
18 conclusion from the examination it was simply that the character,  
19 the microscopic characteristics were consistent with Ms. Woods.

20 Q Could you tell us just a little bit about how you look  
21 at this hair in detail?

22 A Very simply it is that you look -- hair samples are  
23 usually in an envelope that is contained in a sex crime kit. The  
24 hairs are removed, they are looked at visually, measured,

1 sometimes either before they are mounted or afterwards. By  
2 "mounted" they are simply placed on a microscope slide. There is  
3 a certain substance that's placed on top of them. Another piece  
4 of glass is, a more type of a microscope slide is then placed on  
5 top of the hair. The substance which was placed on the  
6 microscope slide simply allows a scientist to look through a  
7 microscope and visually see inside the hair. Without doing that  
8 you wouldn't be able to see anything except the external  
9 characteristics of a hair specimen. This was done with the pubic  
10 hair combings and the known pubic hairs.

11 Q You don't test them out chemically or anything like  
12 that? You just look at them basically?

13 A They are reviewed microscopically, although I have on  
14 occasion over the years been able to obtain blood typings from  
15 hair specimens.

16 Q You did not in this case?

17 A No, sir, that's correct.

18 Q Based on your, what you have done to this point, the  
19 test that you had run on the blood, the seminal fluid that you  
20 got from the swabs and the panties and the pants -- in other  
21 words, after you tested everything in this report, this February  
22 5th, 1985 report, what type of conclusion could you reach about  
23 the blood and the seminal fluid that you had found?

24 A Okay, you are referring to February 5th, 1985.

1 Q That's the -- I'm sorry, that's the date of the, that  
2 the report was reported out. S-84-508 is the one I'm talking  
3 about.

4 A Okay. There again, the conclusion was simply that the,  
5 on the hair specimens, they were similar; and that on the blood  
6 characteristics which were identified from the secretions on the  
7 pair of bluejeans, the vaginal swabs and panties and also blood  
8 stains which were identified on the vaginal swabs were consistent  
9 with the blood characteristics of Ms. [REDACTED] The combination  
10 which all of these blood characteristics would occur would be  
11 approximately 3.4 percent of the general population of West  
12 Virginia.

13 Q I'm going to come back to that, to percentage here in a  
14 moment.

15 At the conclusion of this report, S-84-508, which we just  
16 dealt with, at that point you had no known blood from any type of  
17 suspect; is that right?

18 A That's correct.

19 Q Did there come a time that you received some known blood  
20 from a suspect in this case?

21 A There was a submission of a whole blood specimen, a  
22 saliva sample, and also some pubic hair samples from a William  
23 Harris which were submitted by the Kanawha County Sheriff's  
24 Department, specifically submitted by Detective Balcom. They



1 were submitted to the laboratory, placed in an evidence locker on  
2 September 10th, 1985, and they were submitted in reference to  
3 comparison with the evidence which I have been speaking about.

4 Q Okay. And did there come a time also in the last few  
5 days, last week or so, that you received some more blood of a  
6 suspect in this case?

7 A Yes, sir, that's correct. On July 13th, 1987  
8 Cpl. Johnson brought down to the laboratory a known blood  
9 specimen of William Harris, and it was requested that blood  
10 typing be performed on the blood sample.

11 Q And did you and the people in your lab perform tests on  
12 these two samples of blood that you received?

13 A Yes, sir.

14 Q And were you or someone in your lab able to breakdown  
15 the blood and receive their, get some blood typings, not only of  
16 the ABO group but of certain other groups?

17 A Yes, sir, we were.

18 Q And could you tell us -- perhaps the easiest one to use  
19 would be your latest report which I believe you said was July  
20 13th was reported out?

21 A July 13th is when Cpl. Johnson brought the blood sample  
22 down to the bureau for typing. And it was reported out July  
23 14th. On my report I have got "returned" on that date, but I  
24 retained it, thinking I might be here. So the reports are

1 consistent with each other on the blood samples.

2 Q Okay. Could you just go down and tell us what type of  
3 factors that you reached here when you tested this blood?

4 A Yes, sir. The known blood specimen which was submitted  
5 of William Harris contained the following blood types: The ABO  
6 blood type was Type O; the PGM blood type was Type 1+; and what  
7 is called a Lewis blood type was an a-b+. Now, to eliminate the  
8 Lewis from throwing y'all off, a Lewis simply tells whether an  
9 individual -- whether blood typings can be identified from an  
10 individual's body fluids or not. Earlier when I spoke of that  
11 your ABO blood type can be identified from seminal fluid, vaginal  
12 fluid, saliva, perspiration, whatever, it can be identified if  
13 you are called or classified as a secreter individual. If you  
14 are a secreter individual, this can be done. If you are  
15 classified as a nonsecreter individual, you cannot identify an  
16 ABO blood type from your body fluids. Not because they are not  
17 there; it's just that they are not there in the amounts that can  
18 be identified. In other words, if there's not enough there to  
19 find it, you can't find it. And if -- and that would be a  
20 nonsecreter individual.

21 Approximately 72 percent of any population would be  
22 classified as secreter individuals. 16 percent would be  
23 classified as nonsecreter individuals. You might look at it this  
24 way: That 7 out of 10 people, you would be able to identify

1 their ABO blood type from their body fluids, and 3 out of 10  
2 people you wouldn't.

3 Q That's the Lewis factor?

4 A That's the Lewis secreter factor, yes, sir.

5 Q Were you able to identify any of the other factors?

6 A Other blood typings were identified; but as far as being  
7 able to compare them to the previous blood typings, there was no  
8 relevancy in the blood typings.

9 Q Okay.

10 A They were all the same as had been previously  
11 identified; but seeing as how I was trying to confine it to the  
12 secretion type evidence, I felt it would be a more exact  
13 comparison.

14 Q Okay. If you could step back down.

15 MR. CASTO: Your Honor, if I could have him step back down  
16 to the board here, please.

17 Q (BY MR. CASTO) What I would like for you to do here,  
18 Sgt. Zain, is right over here make a little chart here. On this  
19 side will be the secretions that you received from, on the  
20 vaginal swabs, that you typed on the vaginal swabs and the jeans  
21 where you identified the seminal fluid. And over on this side  
22 would the known blood of William Harris.

23 If you could just go through the characteristics that you  
24 identified in both of them and just put them side by side there

1 so that we all know what we are talking about here.

2 Q The victim's is the third column there?

3 A That's correct.

4 Q Sgt. Zain, that middle column there -- maybe we are  
5 getting the cart before the horse here -- is the known blood of  
6 William Harris? Just tell us what "known blood" is.

7 A That would be the blood sample which I received on July  
8 13th of this year and what typings were done on it. It was ABO  
9 Type O, a PGM Type 1+, and the Lewis just determines whether the  
10 person is a secreter or not, which he is.

11 Q By "known blood," though, you mean blood that somebody  
12 knows where it came from; is that what you are saying?

13 A Yes, sir, it's submitted as being the known blood  
14 specimen of Mr. Harris.

15 Q In other words, if you draw blood out of my arm right  
16 now, you label that "known blood of Tom Casto"?

17 A Yes, sir.

18 Q Okay. That's all I need for you over there. Thank  
19 you.

20 THE COURT: Some of the jurors, I see, have a little visual  
21 problem. I wear glasses myself. And if it will help --  
22 Mr. Casto, I think No. -- Juror No. 4, we can have that pulled a  
23 little closer to your jury box, if it will help you.

24 JUROR MICHAEL WYLLIE: I can't see that.

1 THE COURT: No. 4 can't see that at all.

2 And I appreciate that, that many of us have visual  
3 problems. Jurors, I'm going to instruct the officers of this  
4 court not to erase these figures that the witness has put up  
5 there. You'll be able to go over and squint a little closer to  
6 it when you want to. The fact of the matter is you can go right  
7 now if you want to, and it will give all of you jurors a chance  
8 to stretch your legs maybe, if you want to go over there and look  
9 at it closer. Now, if you do that, though, don't be commenting  
10 to each other on what you see. Just look at it.

11 Go ahead, No. 4, if you want to go over there.

12 Anybody else who can't see can go over there, too.

13 I might save that for your later examination, ladies and  
14 gentlemen. The correct time is one minute after 4:00. I don't  
15 know whether we'll be able to finish with Mr. Zain or not. I had  
16 hoped to today, if we can.

17 MR. CASTO: I'm just about through.

18 THE COURT: I didn't mean to imply that you ought to rush,  
19 but I just want all sides to be attentive to it.

20 Go ahead.

21 Q (BY MR. CASTO) Sgt. Zain, these characteristics that you  
22 have identified that you have testified to and written up here,  
23 these three characteristics that you identified from the  
24 secretions, three characteristics you identified from the known

1 blood of William Harris, and three characteristics that you  
2 identified from the known blood of the victim, is there any way  
3 for you to break that down and to tell us -- if you look at the  
4 general population of, say, the State of West Virginia -- what  
5 type of, what number of people, or maybe you can break it down  
6 into a percentage, what percentage of people possess those three  
7 characteristics?

8 THE COURT: And if you do that, do it only upon the figures  
9 and data and information and education that you have as to  
10 reliable scientific pictures and percentages, Mr. Zain. I'm sure  
11 that Mr. Casto intended to include that in his question to you,  
12 but I want to make sure that -- not that I'm trying to imply that  
13 you would in anywise be reckless or just make guesswork, but I  
14 want you to thoroughly explain to the jury too how these patterns  
15 of our society in the United States or West Virginia melds  
16 together, and these scientific figures that you forensic students  
17 and commentators have at hand when you work on these projects.  
18 And you may make a thorough kind of a classroom type presentation  
19 if you wish for my benefit as well as the jury's benefit and the  
20 benefit of these lawyers too.

21 THE WITNESS: Okay, your Honor.

22 The -- to go at it very simply is this: That as far as an  
23 ABO blood type, you have an A, a B, an AB, and an O. Percentages  
24 on those nationwide as well as in most general population studies

1 would be approximately 43 percent of a given population are A's,  
2 43 percent of a given population are O's, 11 percent are Type B,  
3 and 3 percent are Type AB.

4 As far as a PGM --

5 Q (BY MR. CASTO) If I could just stop you right here  
6 then.

7 THE COURT: An ABO, I forgot what that is.

8 THE WITNESS: The ABO blood type, your Honor.

9 THE COURT: Is what percentage?

10 THE WITNESS: From an ABO blood type you have a Type A, a  
11 Type O, a Type AB, and a Type B.

12 THE COURT: I see. Okay.

13 THE WITNESS: A Type O would occur in 43 percent of a given  
14 population, and that's what we are referencing on the board  
15 today.

16 Q (BY MR. CASTO) 43 percent this type here?

17 A That's correct.

18 Q And just so everybody knows, when you are in school, I  
19 think you mentioned this earlier, everybody picks their finger  
20 and gets their blood types. This is the blood type that is  
21 commonly used to separate blood, go to the hospital and give  
22 blood, that first ABO blood type; is that correct?

23 A That's correct. That's what the general public would be  
24 more familiar with than any of the other items or blood

1 characteristics which we spoke of.

2 Q And these other blood types, the PGM and the Lewis and  
3 the others that we have mentioned, are merely different types of  
4 groupings; is that correct?

5 A They are specific blood types. They are just not  
6 necessary -- say, when you go have a blood transfusion, they are  
7 are not worried about what your PGM blood type is. It's a blood  
8 characteristic which is derived from a metabolic process in the  
9 body; but not to get into that, it's of no value from the  
10 standpoint of clinical use. Neither is the Lewis. These are  
11 just characteristics of each individual, and everybody has them.  
12 As far as a PGM Type 1+, it would occur in approximately 40  
13 percent of a given population.

14 Q And I believe you mentioned up here, there under PGM  
15 type there are three different PGM factors?

16 A Three subtypings of PGM 1. A 1+ is approximately 40  
17 percent, a 1- is approximately 15 percent, and a 1+1- is  
18 approximately 25 percent, to the best of my recollection. But  
19 that's really not, you know, material from this standpoint. The  
20 1+ PGM would be the same individual and specific blood type as  
21 what we are referring to as an ABO Type O, and a PGM Type 1+  
22 would be in approximately 40 percent of the population. A Lewis  
23 type person that is a secreter would, as I stated earlier, be  
24 approximately 72 percent.



1           Those percentages on those blood types would be the same for  
2 the secretions identified, say, for example on the vaginal swab,  
3 also the known blood types of Mr. Harris, and also the known  
4 blood types of Ms. [REDACTED].

5           Q     Okay, that's right across the board here?

6           A     Yes, sir, that's correct. And when you combine those  
7 percentages, it would be approximately 11.8 percent of a given  
8 population could have those three blood characteristics, the  
9 three blood characteristics being an O, a 1+, and a secreter.

10          Q     Now, that would be a general, a 11 point -- I'm sorry,  
11 what was that?

12          A     It would be approximately 11.8 percent.

13          Q     That would be the general population. Say, put a  
14 hundred people in the room, pick them at random, men, women,  
15 blacks, whites, whatever; is that correct?

16          A     That is correct.

17          Q     Just dealing with, say, males, what does this do to this  
18 11.8 percent?

19          A     Seeing how you have a -- you have taken a random  
20 population to begin with, just everybody in one room. Taking in  
21 conclusion, it would be approximately 5.9 percent or 5.9 percent  
22 of that given population being the combination if they were  
23 males. Or a male population at random would be approximately,  
24 say, 6 people in a hundred would have those, could have those

1 three blood characteristics.

2 Q Sgt. Zain, if you were dealing not only with a male  
3 but -- in this case in dealing with the general population of  
4 West Virginia -- with a black male, what would that do to that  
5 percentage? Do you have any idea?

6 A Well, approximately 96 percent according to the 1980  
7 census of West Virginia was, 96 percent of the population of  
8 West Virginia was Caucasian, and approximately 3 percent Negroid,  
9 and 1 percent Asiatic, whatever. I would not, you know, state  
10 any specific frequencies on what it could or could not be in a --  
11 but it would definitely be, you know, could lower. In other  
12 words, if you say 6 people in a hundred, it could lower it less  
13 than 6 people in a hundred. But because the statistics are not  
14 really statistics, they are more or less biological data, we  
15 would say that approximately 6 people in a hundred, six males in  
16 a hundred males could have the blood characteristics which were  
17 identified.

18 THE COURT: Of that combination.

19 THE WITNESS: That's correct, your Honor.

20 MR. CASTO: If I could have just a second, your Honor.

21 THE COURT: Yes, sir.

22 While he's conferring with his associate, I know there's  
23 going to be -- well, I don't know that, but I suspect there's  
24 going to be some cross-examination. I wonder if the jury would

1 want to take a 2- or 3-minute rest period and let my court  
2 reporter also rest before cross-examination. Then we'll press on  
3 a little, and this probably be the last witness we will take  
4 today. Would you all like to do that?

5 JUROR RUTH HICKS: I would, please.

6 THE COURT: At least one does, and I make two. Wait just a  
7 second.

8 MR. CASTO: I just have one more question.

9 THE COURT: One more question, and then we'll take a break.

10 Mr. Casto, go ahead, please. The correct Eastern time is 10  
11 after 4:00.

12 Q (BY MR. CASTO) Sgt. Zain, after looking at these blood  
13 characteristics and going through this, can you sit there and  
14 tell us as an expert with all of your experience that the blood  
15 characteristics that you found in the blood of William Harris  
16 then are consistent or inconsistent with what you found in the  
17 seminal fluid on the pants and swabs taken from Mrs. Harris, or  
18 excuse me, from Ms. [REDACTED]?

19 THE COURT: Or another way of asking that, whether it's  
20 consistent or whether it's inconsistent with whether or not it  
21 could have been the assailant, would be another way of putting  
22 it; wouldn't it?

23 MR. CASTO: (Nods head up and down)

24 THE COURT: Do you understand the inquiry, Mr. Zain?

1 THE WITNESS: Yes, sir, your Honor.

2 THE COURT: All right.

3 THE WITNESS: The blood characteristics which were  
4 identified from the seminal fluid secretions on the items  
5 mentioned were consistent with the blood characteristics  
6 identified from Mr. Harris' known blood. There were no  
7 inconsistencies identified.

8 Q (BY MR. CASTO) She could not have deposited that seminal  
9 fluid; is that correct?

10 A That's correct.

11 MR. CASTO: That's all. I know I asked two questions there,  
12 your Honor.

13 THE COURT: So that brings us up to a rest period, ladies  
14 and gentlemen. Take a rest period. Please keep the instructions  
15 I have earlier mentioned, and we'll return whenever you are ready  
16 to return, and we'll kind of stay close by for you. I know it's  
17 late in the day. Take a good rest, and we'll come back when you  
18 can.

19 Thereupon, at 4:10 p.m. a recess was had until 4:23 p.m.,  
20 at which time the following proceedings were had, all parties  
21 being present as heretofore noted, the defendant being present at  
22 all times:

23 THE COURT: Go ahead, Mr. Casto.

24 MR. CASTO: I just omitted a couple of things here, your

1 Honor.

2 THE COURT: You may ask him. Go ahead.

3 MR. CASTO: If I just may approach the witness.

4 THE COURT: You may.

5 Q (BY MR. CASTO) Sergeant, I believe you have some reports  
6 that we referred to earlier; is that correct?

7 A Yes, sir, that's correct.

8 MR. CASTO: Your Honor, if I could mark these. That's what  
9 I forgot to do.

10 THE COURT: Absolutely you may.

11 STATE'S EXHIBIT NOS. 12, 13 & 14

12 Three state police Forensic Section reports were thereupon  
13 marked for identification as above-indicated.

14 Q (BY MR. CASTO) Sgt. Zain, I'm going to hand you just  
15 quickly here State's Exhibit, or what's been marked for purposes  
16 of identification as State's Exhibit 12 and ask you if that's the  
17 examination, or the report of the examination that you have  
18 testified to here previously?

19 A Yes, sir, it is. State's Exhibit 12 is our case number,  
20 S-84-508, and it also contains the submission report form and the  
21 list of items which I spoke about earlier.

22 Q Okay. And I hand you now what's been marked State's  
23 Exhibit 13 and ask you if that's the second report that we have  
24 discussed dealing with the known blood of the defendant?

1           A    Yes, sir, this is the one where our case number is  
2 S-85-378; it's the blood sample which was submitted September  
3 10th, 1985. It's also the report and the submission of that  
4 particular item.

5           Q    Okay. I notice on here some what appears to be  
6 writing. This report is typed. There is also some handwriting  
7 off here to the side. Could you explain that for us?

8           A    Yes, sir, I did that while I was waiting to come in here  
9 to testify. It just simply reiterates some of the information I  
10 placed on the board up there.

11          Q    And State's Exhibit 14, could you identify that, please?

12          A    Yes, sir, it's the report which I issued July 14th, 1987  
13 in reference to the particular blood characteristics which I have  
14 placed on the board up there. I have also included the, some of  
15 the population percentages which I drew in on this paper prior to  
16 coming into the courtroom.

17          Q    Okay. And I believe this last exhibit here, Exhibit 14,  
18 deals with again some more known blood of the defendant. Do you  
19 have that blood with you here today? You mentioned that you  
20 brought it.

21          A    Yes, sir, I do.

22          Q    Could you produce that for me, please.

23          MR. CASTO: If I could mark this, your Honor.

24          THE COURT: Yes, sir.

1 STATE'S EXHIBIT NO. 15

2 The known blood specimen was thereupon marked for  
3 identification as above-indicated.

4 Q (BY MR. CASTO) Sgt. Zain, I am going to hand you here  
5 State's Exhibit 15. Is that the blood we have just discussed?

6 A Yes, sir, it is.

7 Q Is it contained within the box?

8 A Yes, sir, it is. And on the outside is our case number,  
9 S-87-333.

10 Q Okay.

11 MR. CASTO: That's all I have.

12 THE COURT: All right, you may cross-examine, Mr. Jacobs.

13 CROSS-EXAMINATION

14 BY MR. JACOBS:

15 Q Mr. Zain, you are a -- you work at the state police lab  
16 in South Charleston; is that correct?

17 A Yes, sir, that's correct.

18 Q And your duties are basically all performed in a  
19 setting, a laboratory setting; is that correct?

20 A Yes, sir.

21 Q And when you work, do you wear your state police  
22 uniform?

23 A Yes, sir.

24 Q And do you wear your gun when you work?

1 A Sometimes, yes, sir.

2 Q While you are working in the lab there?

3 A Sometimes.

4 Q Okay. There's been a report I refer to by date that is  
5 dated October 30th of 1985 that was prepared. You don't have  
6 those reports in front of you, do you, or do you not?

7 A No, sir.

8 Q Okay. I'll just give you all of the reports.

9 The report is dated October, at the top October 30th, 1985.  
10 Do you see that report?

11 A Yes, sir.

12 Q Who was that report prepared by?

13 A The report was specifically prepared by at that time  
14 Cpl. Midkiff.

15 Q When you say "at that time," has that changed? Has her  
16 name changed? Is it still Gail Midkiff?

17 A Her name is still Sabrina Gail Midkiff.

18 Q So you didn't do the analysis and the blood work that is  
19 the result of this, that is -- these are the results that are  
20 published here; is that correct?

21 A The results which I specifically performed firsthand  
22 were the ones reported July 14th, 1987. These results were  
23 reviewed by me and also the final report was reviewed before it  
24 was issued by me.



1 Q Now, again referring to the report dated October 30th,  
2 1985, and that is the blood specimen of William O. Harris and the  
3 saliva specimen of William O. Harris and the known pubic hair  
4 specimen of William O. Harris, I would like to ask you this  
5 question: There appears to be no system run for the CA and the  
6 PEP A; is that correct?

7 A It appears that there was no report of those blood  
8 typings reported, that is correct.

9 Q The report now -- I'm referring you to the report dated  
10 February 5th of 1985, and that is the known blood specimen and  
11 the known saliva specimen and the pubic hair specimen of [REDACTED]  
12 [REDACTED].

13 A Yes, sir.

14 Q And there were a PEP report, a PEP A and a CA run on  
15 her, it looks like, from the reports I'm looking at.

16 A Yes, sir, that's correct.

17 Q It's my understanding that these two tests refer to  
18 secreters also; is that correct?

19 A As far as the PEP A Type and the CA II Type? No, sir.

20 Q Okay. Could you explain to me what those systems, what  
21 they mean?

22 A The PEP A or more commonly known as the Peptidase A  
23 blood type and the CA II or more commonly known as the Carbonic  
24 Anhydrase II are blood typings which are given at the discretion

1 of the analyst as far as the analysis of secretion stains, can  
2 differentiate between Caucasian and Negroid populations,  
3 sometimes. It all depends on what the typings are. For example,  
4 hemoglobin and other blood typing, one other blood typing system  
5 in particular, can show blood characteristics which are found in,  
6 for example, Negroid and Mediterranean populations but do not  
7 occur and are not found in Caucasian populations.

8 Q I'm referring once again to your report of February 5th,  
9 1985, and on the second page there's a report which states --  
10 it's broken down into three areas. And number one,  
11 the "Secretions identified on the jeans and vaginal swabs contain  
12 the following genetic markers." It is not true that those, that  
13 there was identified in those jeans and the vaginal swabs a  
14 systems PEP A and CA II; is that correct?

15 A Those particular blood characteristics were identified,  
16 yes, sir.

17 Q And the next was the "Secretions that were identified on  
18 the panties contained the following genetic markers," and also  
19 that system denotes PEP A and CA II; is that correct?

20 A That's right.

21 Q And also the stains of human blood identified on the  
22 panties and vaginal swabs contain the system PEP A; is that  
23 correct?

24 A Yes, sir, that's correct.

1 Q I was listening to your testimony on the pubic hairs.

2 A Uh-huh.

3 Q And it was my understanding that you said that the pubic  
4 hairs, that the analysis of the pubic hairs, the characteristics  
5 were consistent with Ms. [REDACTED]. Is that your testimony?

6 A I testified that in summary from what is in the report  
7 where it is stated that the microscopic characteristics which  
8 were identified from the pubic hair combings exhibited  
9 similarities and differences as compared to the known pubic hair  
10 specimen of Ms. [REDACTED]. In other words, there were similar and  
11 dissimilar characteristics. As far as the conclusion, it could  
12 be concluded that they probably did not derive from anyone else

13 Q Now, as I read the conclusion made by Gail Midkiff, her  
14 conclusion was that there could be no conclusion made due to  
15 insufficiency in quantity. Now is that correct?

16 A What she has stated is exactly what you said. I did  
17 state that there was a request for more known hairs also.

18 Q And that was from [REDACTED]; is that correct?

19 A That's correct.

20 Q And so your conclusion and her conclusion are different  
21 on this point?

22 A Not really. There are similarities and  
23 dissimilarities. It doesn't prove whether they came from one  
24 individual or another.

1 Q But you don't deny the fact that she says that no  
2 conclusion can be made from the information?

3 A In her opinion.

4 Q Thank you. She also made another conclusion on the  
5 February 5th, 1985 report which dealt with Cheryl Woods' genetic  
6 markers, that these markers occur in approximately 3.4 percent of  
7 the population. That's all of the genetic markers that are  
8 referred to on the report dated which I stated.

9 A Yes, sir, that's in combination of all of the blood  
10 characteristics that would have been identified from the blood  
11 stains on the vaginal swab and as compared with the blood  
12 characteristics from the known blood specimen, in comparison of  
13 blood stain to blood stain, not secretion to blood stain.

14 Q And the figure she came up with, 3.4 percent, do you  
15 agree with that figure?

16 A For all of the blood characteristics, yes, which is  
17 lower than what I stated simply because it includes more  
18 characteristics which were identified from the blood and not from  
19 secretions.

20 Q Now, but the 3.4 percent does not deal with William  
21 Harris, is that correct, in this report? This is dealing with  
22 [REDACTED], the victim?

23 A Correct, from the standpoint of blood characteristics.  
24 This is blood stains compared to the known blood specimen of

1 Ms. Woods and the population that, the general population that  
2 these total blood characteristics which I did not go into  
3 earlier -- for example, an Esterase D 1, and EAP Type B, and AK  
4 Type 1, and an ADA Type 1 -- were additional blood  
5 characteristics that are obtainable from blood but not from  
6 secretions of the body. And with the addition of these blood  
7 characteristics it would lower the percent of the population that  
8 all of them could be identified from.

9 Q Was the EsD 1 and the EAP and the AK 1 and ADA 1, were  
10 those tests run on William Harris' submitted blood?

11 A Yes, sir, they were.

12 Q So those are included in your report dated October 30th,  
13 1985?

14 A Yes, sir, they are.

15 Q In fact, that report also was prepared by Gail Midkiff;  
16 is that correct?

17 A Yes, sir, that's correct.

18 Q And that report, October 30th, 1985, refers to the known  
19 blood specimen and known saliva specimen and known pubic hair  
20 specimen of William O. Harris?

21 A Yes, sir.

22 Q And the pubic hair results from Mr. Harris are,  
23 according to Gail Midkiff, that she feels once again that there  
24 was not a sufficient number of unique individual microscopic

1 characteristics to be positively identified; is that correct?

2 A If you are referring to the last paragraph  
3 under "Results Of Examination" on Page 2 --

4 A (Interposing) Yes.

5 Q (Continuing) -- that is a standard paragraph which that  
6 particular analyst used in her reports. The results of the  
7 examination were the same results which were given for [REDACTED]  
8 [REDACTED], and the similarities and differences of the hairs were  
9 exhibited microscopically.

10 Q But the similarities and differences were not enough,  
11 there was not enough information to make a positive  
12 identification; is that -- that's the point I'm trying to make.  
13 Do you agree with that statement or disagree?

14 A It's a standard paragraph. I would agree with that  
15 similarities and dissimilarities were exhibited to where she  
16 couldn't reach a more precise conclusion.

17 Q Well, when you are evaluating the pubic hairs, what are  
18 you looking for? What is the evaluation?

19 A You look at a total number of microscopic  
20 characteristics which also contain certain components of each  
21 characteristic. You could -- for example, our routines right now  
22 are the examine over 16 characteristics, not just of pubic hair  
23 but of all hair specimen, whether they be head hair, chest hair,  
24 bare hair, whatever. And from those 16 characteristics each

1 characteristic has certain components which you may go up to 25  
2 or 30 characteristics. There again, it's been the protocol of  
3 the section which I set that as far as individual analysis or  
4 examinations pertaining to hair would be left up to the  
5 discretion of that particular analyst.

6 Q Have you yourself analyzed pubic hairs before in any  
7 other case?

8 A Yes, sir.

9 Q And have you ever come to the conclusion and made a  
10 positive identification?

11 A Hairs cannot be 100 percent positively identified or  
12 assigned to an individual due specifically by microscopic  
13 comparison unless it's a very unique situation, although  
14 microscopic comparisons and accumulation with blood typings from  
15 that hair can narrow it down to, I would say, 99.99 percent  
16 exactness.

17 Q Have you ever had occasion for it to come to 99.9  
18 percent?

19 A Yes, sir, I have.

20 Q So you have had occasion when you are issuing a report  
21 such as this not to use this standard paragraph?

22 A I have never used that paragraph in my life.

23 Q Okay. Did you review the evaluation that was made on  
24 the pubic hairs in this specific case?

1 A I did not review the hair examinations.

2 Q Okay. I would like to refer you once again to the  
3 report dated October 30th, 1985 --

4 A (Interposing) Okay.

5 Q (Continuing) -- and the conclusion. Now, the conclusion  
6 that was reached by Gail Midkiff is that the combination of  
7 genetic markers, and she lists the various markers, occurs in  
8 approximately 4.6 percent of the population.

9 A Yes, sir.

10 Q And that is for William Harris.

11 A Yes, sir.

12 Q And you have reached the conclusion that it is  
13 approximately 6 percent of the male population; is that correct?

14 A Yes, sir, that's correct.

15 Q And how do you explain that difference?

16 A Okay, simply it's this. One, she concluded that the  
17 genetic markers identified from the secretions on the jeans, the  
18 vaginal swabs, and panties were consistent. She also has  
19 included in here to the extent to which markers could be obtained  
20 with the genetic markers identified from the known blood specimen  
21 of William O. Harris. The second part of the conclusion is  
22 simply that the combination of the genetic markers, which are an  
23 O, a PGM 1, and EsD 1, and EAP B, an AK 1, an ADA 1, and a  
24 LE a-b+, occur in approximately 4.6 percent of the population.



1           As I stated earlier, the percentage population which I have  
2 on the board there takes into account three blood  
3 characteristics. This takes into account not only more than  
4 three but also is a different percentage because she has reported  
5 a PGM 1 instead of a subtyping which, according to her result  
6 sheet, she was unable to obtain from the known blood specimen of  
7 Mr. Harris for comparison. That would give you the percentage,  
8 and I would agree with the percentage based on the blood  
9 characteristics she identified.

10           Q    As a matter of fact, the reason for the additional blood  
11 submission by William Harris was for you to try to subtype the  
12 PGM; is that correct?

13           A    It was to specifically run for comparison with what had  
14 been identified previously and to possibly obtain a PGM  
15 subtyping, yes, sir.

16           Q    Can you explain why at one time a subtyping could not be  
17 obtained and at another time a subtyping could be obtained?

18           A    Yes, sir. It could be a variety of reasons. It could  
19 be the type of blood sample that was, the way it was withdrawn  
20 even, whether it was in a preservative, whether it was not in a  
21 preservative, whether some of the cells last. It could be  
22 basically from the standpoint of the interpretation of the PGM  
23 type. And at the time and place, which I don't recall back in  
24 1984, but the testing results are if an analyst cannot 100

1 percent identify a particular blood characteristic through the  
2 process of testing, then it is not reported. And if the analyst,  
3 no matter who it is, is uncertain to the point or a result is not  
4 obtainable, then it is definitely not reported. So she did  
5 report what she did see and what she did test for and identify.

6 Q The PG 1 -- excuse me, the PGM 1 is less specific than  
7 the PGM 1+; is that correct?

8 A That is correct in a sense, but it's more realistic to  
9 say that the PGM 1, which I show on the board there as can be  
10 subtyped into a 1+ or a 1- or a 1+1-, is a broader-based  
11 population also. In other words, a PGM 1 statistically before  
12 subtyping was incorporated and accepted in the scientific  
13 community, it would occur in approximately 56 percent of a given  
14 population; whereas, by the subtyping it allows it to narrow it  
15 down to give more information from that particular blood  
16 characteristic.

17 Q And so a PGM 1+ comes to 40 percent of the population, a  
18 much narrower group than a PGM 1; is that correct?

19 A That's correct.

20 Q Still even in light of that, Gail Midkiff's calculations  
21 using the PGM 1, which is a broader group, she came up with a  
22 narrower population percentage, is that correct, than you did?

23 A Well, sir, there again, you are adding three more  
24 population statistics or frequencies of blood characteristics,

1 such as if you take an ABO Type O and a PGM Type 1 and a  
2 Lewis a-b+, it's going to be larger than the population  
3 percentage I place on the board there. By using an EAP B blood  
4 type alone reduces it 40 percent. It cuts it in half. And then  
5 by an Esterase D 1 would reduce it by 82 percent, and an AK 1 by  
6 90, and ABO by 92. So it's the combination of the blood  
7 characteristics identified from the blood not from the secretions  
8 that have come up with the 4.6 percent by genetic frequencies of  
9 the blood characteristics.

10 Q Thank you.

11 Q Could I ask you what method was used to, for you to  
12 determine your PGM?

13 A PGM typing is done by electrophoresis.

14 Q Is that isoelectric?

15 A IEF is what -- we do did PGM by three methods for the  
16 confirmation and analysis. We use a regular PGM by  
17 electrophoresis, a subtyping procedure for PGM by  
18 electrophoresis, and also isoelectric focusing of PGM subtyping  
19 and regular PGM.

20 Q I understand how you came up with the figures you use  
21 for the O was a 43 percent --

22 A (Interposing) Yes, sir.

23 Q (Continuing) -- the O blood type. And the PGM type, the  
24 PGM 1+ was a 40 percent.

1 A Yes.

2 Q And the Lewis Type a-b+ was 72 percent?

3 A Yes, sir.

4 Q And that figure came up to 11.8 percent; is that  
5 correct?

6 A That's correct.

7 Q That was for the general population?

8 A Yes, sir.

9 Q Okay. Is it true that you used to figure the male  
10 population, that you simply divide that figure by 2 and came up  
11 with 5.9 percent?

12 A No. More specifically, in the 1980 census of the State  
13 of West Virginia it occurs in 46 to 48 percent of the state, is  
14 male population; is that 54 to 52 percent of the state of West  
15 Virginia consists of female population.

16 Q So what are you saying?

17 A I'm saying that it's, the percentage of 5.9 percent of  
18 the general male population of West Virginia is simply based on  
19 the 1980 statistics of 46 to 48 percent male population, and that  
20 multiplied by the 11.8 gives also you what I have reported on  
21 the blackboard.

22 Q Okay. Thank you. Did you figure the numbers of the  
23 population?

24 A No, sir.

1 Q Now, is it your testimony that if you were to use, or to  
2 seek to figure the percentage not in the just general male  
3 population but in the black male population, that these  
4 calculations would lead you to a figure less than 5.9 percent?

5 A What I stated earlier was that it could very probably  
6 reduce the 5.9 percent if you reduce it to a small or less  
7 confined population, which would not be realistic and which is  
8 why it was not done, because the population studies that have  
9 been done, including the one that I have done and have under  
10 publish, you know, being submitted for publication right now, is  
11 based upon a total population and not on a specific or isolated  
12 population, which in this report by stating that 5.9 percent of  
13 the general male population would have these, or could have these  
14 characteristics is simply an estimation. And I do believe I  
15 stated it would be probably 6 people in a hundred, six males in a  
16 population of a hundred.

17 And I might add also that every blood characteristic and  
18 every factor that is added into it would reduce that population  
19 distribution. That's why with your example of, on one report in  
20 reference blood characteristics of Mr. Harris where there are  
21 seven blood characteristics, you have a 4.6 percent of the  
22 population; in another report we have different blood  
23 characteristics, say, identified from Ms. [REDACTED] as far as the  
24 number is 3.4 percent. These are all in general populations and

1 it would be quite confusing. The bottom line is that the blood  
2 characteristics that show consistencies of Mr. Harris and  
3 Ms. [REDACTED] and the secretions identified are the same blood, same  
4 blood characteristics and occur in the same population  
5 percentage. And that's not saying that it's one person or  
6 specifically another person. That's just the way it comes down.

7 Q Do you know how long spermatosa can live?

8 THE COURT: Spermatozoa?

9 MR. JACOBS: Yes.

10 Q (BY MR. JACOBS) Is that in the range -- I don't know --  
11 is that in the range of your expertise?

12 A Well, the studies that have been done, it would depend  
13 on the type of environment. If it's like postcoitus samples, the  
14 longevity have been I think detected up to from 24 to 48 hours,  
15 which is a broad range as far as detectability. As far as motile  
16 sperm, it would all depend on the individual primarily, because  
17 every individual is different, and the pH of the vagina is  
18 different, and degradation rate is different. 6 to 8 hours after  
19 intercourse there have been motile sperm identified, not by  
20 myself but I know on examination reports where they have  
21 identified motile sperm.

22 THE COURT: These are the still living sperm that could  
23 theoretically swim to the egg and impregnate a female human;  
24 right?

1 THE WITNESS: Yes, sir, that's correct.

2 Of course the longer the time after the intercourse occurs  
3 the less chance there is of live sperm cells being present  
4 because it's a natural function of the female body to -- sperm  
5 cells are foreign. They are going to start being destroyed and  
6 killed off, in a matter of speaking, as soon as they enter the  
7 body.

8 MR. JACOBS: Thank you very much. That's all of the  
9 question also I have.

10 THE WITNESS: You're quite welcome.

11 THE COURT: Mr. Casto, will there be anything before we  
12 adjourn this evening here?

13 MR. CASTO: Yes, sir.

14 THE COURT: You have redirect?

15 MR. CASTO: Just one thing here.

16 THE COURT: All right.

17 Then we'll adjourn, ladies and gentlemen, as soon as  
18 Mr. Casto is finished.

19 REDIRECT EXAMINATION

20 BY MR. CASTO:

21 Q Sgt. Zain, all of these percentages and all this and the  
22 ABOs and PGMs, the bottom line of that is that the blood, the  
23 three known factors in the blood of William Harris match the  
24 three factors in the seminal fluid that was injected into [REDACTED]

1 [REDACTED] body on that day; is that right?

2 A The blood characteristics which are identified were the  
3 same blood characteristics of Ms. [REDACTED] and also are the same  
4 blood characteristics identified that could exclude -- no blood  
5 characteristics identified from the secretions that could exclude  
6 the seminal fluid as coming from Mr. Harris.

7 MR. CASTO: Thank you. That's all.

8 THE COURT: All right, may I release the witness, at least  
9 unless he's needed some other time?

10 MR. JACOBS: Yes, your Honor.

11 THE COURT: -- For the evening at least. I realize that he  
12 travels about West Virginia quite a bit. I don't know what his  
13 schedule is next week, and I don't need to inquire right now.  
14 But as for right now I'm going to excuse him.

15 (The witness then stood aside.)

16 THE COURT: Ladies and gentlemen of the jury, I'm going to  
17 excuse your attendance for this afternoon, and I'll let you take  
18 a rest. It's after 5:00 o'clock. It's been a long day for you.  
19 As I forewarned the jury earlier, I will not be using the jury in  
20 this case tomorrow. So that's going to mean that it's Friday.  
21 So you will not be hearing any evidence tomorrow, nor will you  
22 sit on Saturday and Sunday, but you'll come back on Monday and  
23 resume taking evidence in this case.

24 While you are out, please heed the instructions that I have