CPT SOMERS: We would offer then that the blood type of Kimberly MacDonald is International Blood Group Type AB positive; that the blodd type of Kristen MacDonald is of the International Blood Group Type O EH negative; that the blood type of Colette MacDonald is of the International Blood Group Type A EH positive; that the blood type of Captain Jeffrey R. MacDonald is of the Internation Blood Group Type B.

The government calls Specialist Fourth Class Craig Chamberlain.

(SPECIALIST FOUR CRAIG STANLEY CHAMBERLAIN was called as a witness by the government, was sworn, and testified as follows.)

Questions by CPT SOMERS:

Q: Would you state your full name?

A: Craig Stanley Chamberlain.

Q: Your grade?

A: Specialist Fourth Class.

Q: Your organization?

A: United States Army Criminal Investigation Laboratory.

Q: Your station?

A: Fort Gordon, Georgia.

Q: And your armed force?

A: United States Army.

Q: What is your duty position?

A: I'm a chemist at the criminal investigation laboratory, sir.

Q: What is your formal education?

A: Sir, I have a Bachelor of Science degree from Sacramento State College in chemistry; also eight units of graduate work at the same institution.

Q: Have you received any training in chemistry in the Army?

A: Yes, sir, I've completed a six month intensive training program at the criminal investigation laboratory at Fort Gordon, Georgia in identification of marihuana, dangerous drugs, and narcotics, and also blood analysis.

Q: What do your duties consist of now at the laboratory?

A: Sir, I analyze exhibits given or sent to me by criminal investigators. Also I collect evidence occasionally. This is marihuana, dangerous drugs, narcotics and blood cases also.

Q: And how long have you been doing this?

A: I've been at the lab since the 1st of September and I believe I started working cases about three months since I got there and I'm still working cases now.

CPT SOMERS: Does the defense care to examine?

MR EISMAN: Just briefly.

Questions by MR EISMAN:

Q: Specialist Chamberlain how many units at Sacramento State dealt with blood analysis?

A: None, sir.

Q: And when did you complete the six months training in the Army?

A: The 20th of March.

Q: Of this year?

A: Yes, sir.

Q: How much of that six months dealt with the analysis of blood?

A: Approximately two months, sir.

Q: And when did you complete that?

A: In early January.

Q: Of this year?

A: Yes, sir.

Q: Is this the first matter you have worked regarding blood stains after you completed that course?

A: No, sir, it was not.

Q: How many other matters have you worked on?

A: I've worked one case previously, plus many training cases.

Q: So this would be your second case. Is that correct?

A: My second blood case, yes, sir.

Q: And what case or what tests were you trained on during that period to perform on blood?

A: The benzidin test.

COL ROCK: Would you spell the names of any of these technical words that you use, please?

WIT: Yes sir. Do you mind if I write them down, sir, so I will make sure that they are correct?

COL POCK: Certainly.

WIT: The benzidin test, b-e-n-z-i-d-i-n-e. The anti-human precipitin test; precipitin, p-r-e-c-i-p-i-t-a-n. The crust test. Absorption elution, elution, e-l-u-t-i-t-o-n; and absorption inhibition.

Q: These are the five tests you ran?

A: Yes, sir.

Q: Now which of these tests is reference to blood typing?

A: Three of the tests. The crust test, the absorption elution and absorption inhibition.

Q: And the other two tests are for what?

CPT SOMERS: I object your honor. At this point the witness is offered to the defense to go into his qualifications. He's going into the testimony of the witness.

MR EISMAN: I am not questioning his testimony. I am trying to get what tests he's able to perform in giving his expert testimony, whether or not he is qualified as an expert in the field which he is being called for.

CPT BEALE: The objection is overruled.

Q: What does the benzidin test regard?

A: The benzidin test determines if blood may be present.

Q: And the other test? The final test, anti-human precipitin test?

A: The anti-human precipitin test determines if a substance is or is not human blood.

Q: Are there any other tests which you used in this case?

A: No, sir.

MR EISMAN: I have no further questions of the witness at this time regarding qualifications.

CPT SOMERS: I have one, I'm not sure this was made clear.

Questions by CPT SOMERS:

Q: What was your graduate work done in?

A: It was done in chemistry, sir.

CPT SOMERS: At this time the government offers this witness as an expert chemist in the field of blood analysis.

MR EISMAN: I would merely state that since this man only had two months of training regarding blood, and that this is only the second case he worked on, that the investigating officer corider this in determining what weight to be placed upon it - the testimony of this particular expert.

COL ROCK: As in all such matters, such judgments will be noted.

Questions by CPT SOMERS:

Q: Specialist, I show you now Government Exhibits 7, 8 and 9 and ask for you to look at them, please.

(Witness did as directed.)

Q: Did you assist in the work done on these reports?

A: Yes, sir.

Q: When did this case first come to your attention?

A: Approximately six o'clock on the morning of the 17th of February of this year.

Q: And how did it come to your attention?

A: I was called by the commanding officer of the laboratory by telephone.

Q: And what did he require of you?

A: He told me to come to the laboratory and be prepared to go on a field case.

Q: And did you go on a field case?

A: Yes, sir.

Q; Where did you go?

A: I came here to Fort Bragg.

Q: And when was that that you came to Fort Bragg?

A: On the 17th of February of this year.

Q: Do you have any idea what time you arrived?

A: May I refer to my notes to refresh my memory?

Q: If you feel it is necessary.

A: We arrived at the airport here at eleven o'clock.

Q: On what date?

A: That was the 17th of February.

Q: Where did you go from the airport?

A: We were taken from the airport to, I believe, 544 Castle Drive, Fort Bragg.

: And did you perform some function at 544 Castle Drive?

A: Yes, sir.

Q: What was that function?

A: I was taken into the house there and told about the circumstances, and then after helped in the processing of the crime scene.

Q: And did you help in the processing of the crime scene?

A: Yes, sir.

Q: Did you work with anyone?

A: Yes, sir.

Q: With whom did you work?

A: At all times I worked with Mr Robert Shaw.

Q: Who is he?

A: He is a criminal investigator stationed here at Fort Bragg.

Q: Now what were you doing in that house, actually physically doing?

A: I was looking for and collecting possible blood stains, as well as fibers, general debris and anything else that we thought might have been of evidential value.

Q: Now what would be a method of collecting say a blood stain on a wall?

A: If possible, we remove a portion of the wall, place it in a labeled vial.

Q: I see. And did you do this?

A: Yes, sir.

Q: How long did you work gathering evidence there?

A: Approximately five days.

Q: And what was done with the evidence when it was all collected?

: It was packed up and put on a plane on which I was aboard, and taken by the plane back to the criminal investigation laboratory.

Q: And did you participate in the work that was done there?

A: Yes, sir, I did.

Q: Specifically, did you participate in the typing of blood from the exhibits?

A: Yes sir, I did.

Q: Now explain for us, please, the process you go through to take an unknown sample and determine the blood type, if it is blood.

: Just to determine the blood type?

Q: Well, explain if you will from the beginning what tests you administer.

A: First we perform the benzidin test.

Q: Would you explain just a little bit about how that works?

A: Yes, sir. The benzidin test -- you take a regular swab, cotton swab, place a drop or two of saline on it, lightly touch the area you are examining to the swab, add a 10% soution of benzidin and glacial acetic acid.

Q: If you would, please, could you spell that acid that you just spoke of?

A: Yes, sir. That's glacial acetic acid, g-l-a-c-i-a-l, acetic, -a-c-e-t-i-c.

Q: Go on.

A: Then after waiting approximately a minute, add one to two drops of hydrogen chloride to this. If blood is present a dark blue color will show up on the swab.

Q: I see. And what is your next step in the process?

A: The next step in the analysis of blood stains is to perform the anti-human precipitin test.

Q: And please, just briefly, what does that consist of?

A: One takes a small portion of the suspected stain, dissolves it in a small amount of saline solution, and then places some anti-human precipitin serum in a small test tube. Upon this, one places the saline solution carefully so that two distinct layers are formed. In five to ten minutes, if blood is present, a white ring forms at the interface of the two solutions.

: Now what do you mean by interface?

A: You have your anti-human precipitin serum, this is placed in the bottom of the test tube. The saline layer with the suspected blood sample, dissolved, is carefully placed on top of this. So you have two distinct layers, which are separated by a line.

Q: The line - is that what you refer to as the interface?

A: Yes, sir.

Q: What is your next step?

A: Then we do the crust test.

COL ROCK: From that white line at the interface, how do you determine whether it is human or animal blood?

MIT: Sir, if there is a white line or a precipitate it is human blood.

COL ROCK: Okay, continue.

A: We then proceed to the crust test. In the crust test you take a small amount of the material, place it on a glass slide and add about a 2% concentration of red blood cells to this. This is done several times with AB and O red blood cells. One then waits approximately fifteen minutes and then examines the slide through a high powered microscope for agglutination.

Q: Would you spell that please?

A: Agglutination, a-g-g-l-u-t-i-n-a-t-i-o-n. And then verecord the results.

And this is which test?

A: This is the crust test.

Q: And what do the results tell you?

A: The crust tells us which agglutinins or anti-bodies may be present in the sample or actually are in the sample, which gives an indication of blood type.

COL ROCK: Is that same system used in Army hospitals just to type somebody's blood when he first come sin the service?

MIT: No, sir, not exactly, because the Army hospitals test fresh blood, wet blood. We are talking about dried blood stains.

COL ROCK: I see.

Q: And is there yet another test that you perform after the crust test?

A: Yes, sir, on dried blood stains we next perform the absorption elution test.

Q: And again, if you would, just basically explain that, please.

A: Yes, sir. One takes a portion of the material upon which the suspected - the blood stain is found; takes approximately fibers, places it in a small glass well, adds a drop of anti-serum to this and teases the fiber apart with a needle. Then you will allow the fiber to sit in the solution for approximately one hour. Then you wash the fibers, wash the anti-serum off the fiber with cold saline, using a vacuum pump. Then the fiber is transferred to another glass well and approximately two drops of 1/2% saline red blood cells solution of the same type as the anti-serum is added and this is placed in an oven at approximately 52 degrees for ten minutes. Then the sample is taken out of the oven, placed on a mechanical shaker and shook gently for approximately fifteen minutes and allowed to stand for approximately two hours. Then observed through a high powered microscope for agglutination. The results are then recorded.

Q: Now these tests that determine the blood type, could you possibly tell us what the theory is that works behind this?

A: Yes, sir. One can think of dried blood as composed of two portions, the red blood cells and also the antibodies or agglutinates that may still be present. If one can determine the antibodies using the crust test and also the agglutinogens or the type of red blood cells that is present, one knows what the blood type is.

Q: I see. Is that the normal sequence of tests that you used?

A: Yes, sir.

Q: Do you normally use any other test?

A: No, sir.

Q: Is it possible, using this method, to have a mixed batch of blood, that is to have perhaps two different types of blood present on the same stain and be able to detect this?

A: Yes, sir, we surely would detect it, assuming that there was no decomposition of the blood stain.

: How are these particular exhibits treated with respect to decomposing possibilities?

A: The exhibits that were collected in this case?

Q: Yes.

A: Well, if, as I said before, if we perform both the crust test and absorption elution, we find out if there has been any decomposition since the type of antibodies and the type of agglutinogens or red blood cells are complimentry; that is if you have an A red cell then you must have a B antibody or it is Type A.

Q: Now on a physical level, if these specimens were collected and transferred to the laboratory, how were they treated to protect them?

A: Well, if a stain had been wet at the scene, it was first dried, and then placed in a vial. These were protected from sunlight. They were kept at room temperature.

Q: And why these precautions?

A: Well, sunlight may tend to decompose the antibodies in the stain.

Q: You were protecting against decomposition. Is that it?

A: Yes.

Q: Now in some of the exhibits which were tested, we find that your report has used the word "indicated." I draw your attention to, for instance,

MR. ROOK: Which exhibit, counselor?

Q: - to, for instance, paragraph 13 on page 12 of Government Exhibit 7. You will find the sentence which says "Further examinations indicated same to be of the International Blood Group Type AB." Would you tell us what this word "indicated" means in this context?

A: Well, indicated means that we have found either the agglutinogen or antibodies or the agglutinins, but not both, not so that they'd compliment one another, so we can't absolutely say that it is this blood type although we are fairly certain that it is.

Well, can you give us any idea mathematically what your percentage of certainty is? Is it more than 50%?

A: Oh, yes, sir, much more so. We say indicated because there may be possible decomposition. However, in this case since the laboratory collected it,

the specimens most likely was not significant decomposition. I would say it is above 90%.

Q: I see. I beg the investigating officer's indulgence for one moment.

MR. KISHAN: May I interpose an objection at this point until we clarify this term "indicated." I think that the witness has testified that either the agglutinates or the antibodies would not be present so that a scientific determination could not be made, and in my estimation, that would be at least a 50% change for error if either of these two items were not present. And until we get a clarification from the witness as to how much each of these two items were contained in each of the alleged findings, we won't know whether or not it is 90% or 50% or less, and it would be highly unfair to permit this type of testimony come in unless we have a direct clarification of each of these two items regarding blood typing.

CPT SOMERS: The government respectfully disagrees with the defense counsel as to its figures. The witness has been offered as an expert, he has given us his opinion as an expert as to the percentage possibility with this word "indicated"; he's told us what it means to him, and he's told us what he thinks the percentage would be, that they are correct. The 50% figure suggested by defense counsel is one of his own choosing. I do not think he attempts to set himself forth as an expert in this field.

MR. KISHAN: Just a point of clarification at this point. The witness has said either one of two things missing which he has described as necessary elements of blood typing. Now if it is either/one or two, I think my figure of 50% could be as accurate as his figure of 90% unless it is clarified.

COL ROCK: I'd like to ask the witness at this time in clarification of this specific point, what percent accuracy do you think that your report errs in the work which you have done? You have indicated a figure of 90% assurance, or I believe your words were perhaps over 90%. Do you stick by this figure, or do you think it is closer to 50% accuracy?

WIT: I would say the actual report, it's accuracy is greater than 99%. If you will notice, in the report it says indicates the presence of Type A or Type O. It is approximately 100% of these two things, one or the other, or it is the most likely that it is the first mentioned.

COL ROCK: Well, now let me ask another question for clarification of the point that you made. Suppose that two people had the same type blood and it was in one sample. Could you detect the fact that there was more than one person's blood in the sample through means of your tests?

WIT: If they had the same International Blood Group Type, no, sir, not very likely.

COL ROCK: When I say the same blood type, this is what I meant, the same International Blood Type that we have heard referred to here today.

CPT SOMERS: If I may, sir, I think I can clarify this even more.

COL ROCK: All right, proceed.

Q: Let me take one or two steps before I get into this. There are paragraphs in your report such as paragraph two of Government Exhibit 7, which simply says revealed the presence of human blood of a specific type. By percentages now, what percent sure are you when you say that?

A: If we say revealed the presence of human blood of International Blood Group Type A, we are approximately 100% sure.

Q: Now in excess of the 90% figure that you have given us, this applies to instances where you use the word indicated. Is that correct?

A: Yes, sir, it is.

Q: I see. Now to deal with this discrepancy between what the defense counsel calls a 50% possibility of being correct, in which you give to be in excess of 90%, why do you say where you have an indicated that you are in excess of 90% sure? Relate this if you can to the likelihood of decomposition and such, factors as this.

A: Okay. Well, sir, the crust test we perform, if there is no decomposition, will tell us what blood type we have. It is one method of determining the blood type. The absorption elution test, on the other hand, is an entirely different method, based on a different theory, which will also

if there's no decomposition, tell us what type we have. In other words, there is cross-referencing. If we say that it is type A blood, both tests have worked and tell us the same answer. If we say indicated, then maybe perhaps because there is not enough sample, one of the two tests does not show up, and agglutinogen or an antibody, and so on this basis since we don't have both tests, we just say it is indicated. However, we are, in our minds, we are reasonably certain that it is the type that we listed.

COL ROCK: And by reasonably certain, do you mean 90%?

WIT: Yes, sir.

COL ROCK: How rapidly does blood deteriorate - let's say that it is spotted on a wall for instance - how rapidly does the blood deteriorate as far as your scientific appraisal of the types of blood?

WIT: Assuming we have enough sample to run both tests on it, if - in this room for instance - well, mainly we are worried about deterioration of the antibodies, the agglutinogens don't decompose very fast. So in this room it could take several months.

COL ROCK: Well, let us take the specific instance in the MacDonald house where there was some light available.

WIT: Well, I don't really believe the light is that critical a factor, since there wasn't really direct sun light. The shades were drawn.

COL ROCK: What are the factors that affect the deterioration?

WIT: Sun light, heat, maybe bacteria. The chance that it didn't decompose I believe are very small.

COL ROCK: In this instance?

WIT: In this instance, yes, sir.

CPT BEALE: Mr Kiernan, I believe, that legally speaking, the Article 32 officer is now satisfied with this witness' answers and therefore your objection which was interposed a while back is now overruled. You may continue.

Questions by CPT SOMERS:

Q: I gather from your answer earlier that it took you approximately five days of work in the residence to collect everything that you wanted. Is this correct?

A: Yes, sir.

Q: Can you give us some idea what you were doing ad why it took that long?

A: We had to very carefully investigate the whole house, not only for blood stains, possible blood stains on the walls, the ceilings, the floors, articles of clothing, items of furniture and everything, but we also had to collect debris, hairs and fibers and so forth. And it took approximately one day per room to do this work, say 14 hours a day.

Q: Did you exercise care while you were doing this?

A: Yes, sir.

MR EISMAN: Objection. It calls for a conclusion on the part of the witness. You have to ask the witness what he did do.

CPT PEALE: Sustained. Do you want to rephrase your question counselor?

CPT SOMES: That's all right. I withdrew the question. Excuse me one moment.

Q: When you gathered exhibits other than blood stains, for instance in gathering such as a fiber, how was this done?

A: It was collected, probably with tweezers, but into a vial and labeled and recorded in my notes.

Q: Well, who labeled each exhibit as it was taken?

A: I did.

Q: Were they labeled as to the location from which they were taken? Some were and some weren't. However, a number was assigned to each exhibit and the location which was also in the notes.

Q: And did the notes describe the location?

A: Yes, sir.

Q: I show you again Government Exhibits 7, 8 and 9. Let me ask you first, are you the only chemist who worked on the blood typing in this case?

A: No, sir.

Q: How many others worked on this blood typing?

A: I believe four others, three or four.

Q: Did some of these others have more experience than you?

A: Yes, sir.

Q: Now with reference to Government Exhibits 7, 8 and 9, did you help to prepare those exhibits?

A: The reports, sir?

Q: The reports themselves.

A: Yes, sir, I did.

Q: Now then in the rendering of your reports, do they state the conclusions you reached?

A: Yes, sir.

Q: And are these statements accurate with respect to the conclusions you reached?

A: Yes, sir.

MR EISMAN: Well, I am going to object if this witness is being offered as an expert as far as what other people did. Naturally he can't tell what other people did or what other people found. He can only tell what he did or what he found. Unless the people who actually performed the tests tell us what they did, this witness is not competent to say what occurred in somebody else's laboratory. Therefore I'd object to him testifying as to any other person's conclusions because he would not be competent to do so.

CPT SOMERS: If I may, sir, I am only offering his testimony as to his own conclusions.

CPT BEALE: Can you/specific in these reports which of these conclusions was be Specialist Chamberlain?

CPT SOMERS: We can do that if the investigating officer wishes. It is a long list. This witness is here as one of a class of witnesses who worked on this report. All of the witnesses who could have testified with respect to the blood in this case were not available to be brought here and could not have been brought here to testify for an Article 32. We brought this witness as one of the chemist who worked on these exhibits and who did a great deal of work on these exhibits. They all, I think he will tell us, if he is asked, used the same methods. However, we do not purport to ask this witness whether he saw and can testify to the result of any specific exhibit that he did not personally work on.

MR EISMAN: As long as he's not being called to testify as to any other person's findings, I have no objection, but we have to get on the record what this witness found, which of the conclusions filed in this report are

his so that the investigating officer knows what in fact this person can testify to as his own personal knowledge. Anything else would be something that he could not; it would be purely hearsay.

CPT SOMERS: I'd like to point out at this juncture that it is not only unusual but it requires an exception to policy from the highest command, from Continental Army Command to bring this type of witness here for an Article 32 investigation. If we could bring all these witnesses here, we would. This one is here, however, only as a representative of a class of witnesses. He's here to testify as to the tests which are done at the laboratory. He can answer specifically as to accuracy and specifically as to what was done on any given exhibit only to those which he personally did. The rest of the exhibits must stand by itself at this juncture. And I might add that one of the reasons that this man specifically was brought here is that he is one of the chemists who collected this evidence, and therefore would be most relevant and of most interest to the investigating officer.

CPT BEALE: Mr Bisman, your objection is going to be overruled to the extent that the Article 32 investigating officer is considering this witness for the expertise that he has in explaining to him how these experiments are in fact conducted. He is not considering this witness' testimony for the correctness of the experiments themselves, the results throughout it. He is, in fact, accepting the report as an official military document, and that the conclusions drawn therefrom are satisfactory to him, and unless you have evidence to the contrary to show that some of these findings in here are not in fact correct, then this report will be accepted as it is.

MR BISMAN: Well, the problem is that this person, what this particular witness might say indicated means - of a certain blood type - might be the same testimony as far as some other expert witness is concerned. His meaning of indicated might not be the same percentage, and therefore have him testify as to what somebody else's impression of that term would be, I think would be unfair.

CPT SOMERS: I think it's clear to the investigating officer that this is his definition, for what ever weight that may be.

COL ROCK: Yes, I took it in this particular context. However, I would like to ask one additonal question of this witness at this point. Specialist Chamberlain, in using words like indicated is this standard procedure at the lab?

WIT: Yes, sir.

COL ROCK: And to your knowledge is your assessment of 90% considered standard with the use of that word?

WIT: 90% isn't a standard, however, I'd say it is accurate and I'd say that the other people would agree.

COL ROCK: Continue please.

CPT SOMERS: All right, sir.

Q: Now the tests that you have described having done yourself, are these tests standard ones used at the laboratory?

A: Yes, sir.

Q: Do you know of your own knowledge whether these tests were used by the other people who worked on this report?

A: I didn't watch the other people perform every test, however, these are the only tests that we use, and when I did see them working, these were the tests they were using.

Q: With respect to the exhibits that you collected, are the descriptions or the locations from which they are taken, which can be found in Government Exhibits 7, 8 and 9, are those descriptions correct?

A: Yes, sir.

CPT SOMERS: Your witness.

Questions by Mr EISMAN:

Q: Are any of these tests which you used in determining blood types measure the quantity of blood found at a particular area?

A: No, sir.

Q: In your training, did you learn any specific test to test the quantity of blood, weight or volume or size of blood stains?