COUNTY COURT, LA PLATA COUNTY, COLORADO Court Address: 1060 E. 2nd Ave. Durango, CO 81301 970-247-2304	
Plaintiff: THE PEOPLE OF THE STATE OF COLORADO Defendant: JEFFREY D. SHOOK	^COURT USE ONLY^
Plaintiff's Attorney: Aaryn R. Richardson, #40476 Deputy District Attorney Defendant's Attorney: William Herringer, #23220	Case No. 08T929

TRANSCRIPT OF EXCERPTS OF JURY TRIAL PROCEEDINGS
(Testimony of Cynthia Silva Burbach)

Excerpts of Jury Trial Proceedings(Testimony of Cynthia Silva Burbach) in this matter was commenced on the 21st day of May, 2009, before the HONORABLE MARTHA TINSLEY MINOT, County Judge, in Durango, Colorado.

This is a transcript of the proceedings recorded in this case on the above date.

I N D E X

(Whereupon, the following proceedings were conducted and entered of record:)

MR. RICHARDSON: Thank you, Your Honor. At this time, the People will call Cynthia Burbach.

THE COURT: Ms. Burbach, if you would step forward please. Thank you.

If you would also raise your right hand.

CYNTHIA SILVA BURBACH,

was called as a witness on behalf of the People and, having been sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. RICHARDSON:

Q. Good afternoon, Ms. Burbach. Would you please introduce yourself to the jury and spell your last name for the record?

A. My name is Cynthia Burbach, my last name is spelled, B-U-R-B-A-C-H.

Q. And Ms. Burbach, what is your professional address?

A. I work at 8100 Lowery Boulevard in Denver, Colorado, and it's the old Lowery Air Force Base.

Q. What is your current position, Ms. Burbach -- your occupation, I'm sorry?

A. I am a forensic toxicologist. I am the state toxicologist.

Q. How long have you worked in that capacity?

A. As the state toxicologist since November 1st of 2000.

Q. Okay. And could you describe to the jury the nature of your occupation, what exactly you do?

A. Well I am the supervisor of the forensic toxicology lab within the Colorado Department of Public Health and Environment, within the Laboratory Services Division.

My responsibilities are to run the day-to-day operations of the forensic toxicology laboratory. I supervise 5 analysts that perform biological specimens -- analyze biological specimens on scientific instrumentation.

I manage a half a million dollar budget, and I review data, and sign off on data daily, and another bit of my responsibility is to testify to jurors such as yourself.

Q. And in the -- I'm sorry -- just one moment.

In the normal course of your duties at your occupation, does that include review of analysis of blood samples for the determination of alcohol content?

A. It does.

Q. Could you elaborate on that for the court exactly what your review consists of?

A. In the laboratory there's different analytical processes, but in the case if we are talking about a blood sample, there will be an initial chemist that will do the testing, and then I have a work leader that's also the QA person,

which is the quality assurance, quality control person, and they are checking all the standards for that day that they run. And then there's a peer review of that data so another chemist will review it, and then I'll have the final review.

Q. How many times, if you know, would you say ballpark you've conducted either the analysis or review of the blood samples?

A. Well I started in the lab June 12th, 1984. So I'm on my 25th anniversary. So when I started I was a laboratory assistant and worked my way up to supervisor.

In the course of review, I've analyzed greater than 20,000 blood samples and probably close to 300,000 urine samples in that course of my career. So I have reviewed all of that data. And then since becoming supervisor, it's a daily review of about close to 50 to 100 records a day.

Q. Can you tell the jury what education and training you have received in order to be qualified to do this sort of review and analysis?

A. Well, working my way up from lab assistant, to technician, to chemist, then to supervisor, I've learned all the standard operating procedure and the processes of what happens in a laboratory. But I do -- my undergraduate is in biology. I have a bachelor of science in biology from New Mexico State University, and my masters is in Public Administration from University of Colorado, and I have postmasters work at University

of Colorado, School of Pharmacy, in a Ph.D. program.

I have learned in school that most the learning has been on the job, and attending courses with my peers in the field, learning about analytical specimens and how you test them, and that's been the course of 25 years.

Q. Would you say -- how many of those sort of on-the-job training seminars would you say you have participated in over the last, you know, 25 years?

A. Oh, I would -- well, on the job is learning from a senior chemist, and that takes a year before they even cut you loose on your own. But peer review, and also continuing education, I probably have greater -- in the course of my career, the last time I counted it was greater than 5,000 hours.

Q. And can you describe the particular method of analysis that you were trained on, your expertise --

A. Excuse me. Oh, I know everything in the laboratory because I have built the procedures from the bottom up. So I can do urine testing, urine drug testing, and blood alcohol testing. And that's just not me, everybody has to be cross-trained in the laboratory. In the event that somebody is sick, vacation, you have to be able to fill in in the spot that's needed and it's priority that day.

So my training is in the analysis of urine, blood alcohol, blood drugs, and we do a little bit of postmortem work, which is vitreous humor from a fatal. If you can't get bodily

fluid, like urine or blood, they will take it from an eye.

And we get things from citizens of the State of Colorado, such as syringes and pills, that they may find in their children's bedroom, or maybe they want a pill identified that they found in their house.

Q. And the method of analysis that you used in your laboratory was that approved by the Colorado Department of Health?

A. It is, and more importantly it's what my peers use all over the world and in this country.

Q. How do you know that?

A. Because I attend seminars with people that do what I do in the United States and in other countries.

Q. Okay. And does your lab have any certifications, you know, approving of the form of analysis that you use?

A. It does. We have the State certification. We are certified by an entity within the Colorado Department of Health and I'm working on our national accreditation currently.

Q. When you say working on the national accreditation, what's that mean?

A. It's a 4 year process to get your laboratory in order and all the paperwork. You have to get a lot of security, cameras, badge access to certain areas, storage of records to get it up to date to be able to pass the scrutiny of the inspectors, and that's been a 4-year long process of getting all our

procedures in order, and the inspectors are due to come out in November -- we had a preinspection and corrected those things, and we are having a final inspection in November.

Q. And that's for the national certification?

A. Yes. It's called the American Board of Forensic Toxicology and National Accreditation.

Q. And was your lab certified on December 16th of 2008?

A. Yes. It's never been decertified in blood alcohol.

Q. Okay. And what does your laboratory have to do to -- first, the State certification, obtain and retain the State certification, what must be done?

A. We participate in blind proficiencies in which we get samples that come in from an outside accrediting laboratory, and then we analyze those, and then submit the results back, and then that goes back to the certification unit and they look at our score.

Q. What type of quality control or quality assurance programs does your laboratory have in place with regard to the blood alcohol testing?

A. Well it's extensive. First of all, the lab has a big QA program, and within that QA program, there's a QA officer, and then our lab has a QA officer itself, and then we have peer review. So before a record even goes out the door there's at least 3 people looking at it and most of the time 4 people.

Q. And when you say -- what do those 4 people do? What's their title?

A. They are all chemists. So the original person doing the documentation, pulling the raw data, and there will be a work lead, and then a peer review of that. So they are looking to see what was put into the computer, what came off of the instrument, and every single piece of paper associated with the sample.

Q. What about quality control with regard to the instrumentation itself? How was -- do you have any sort of system in place to assure the system is working properly?

A. We do. It's called a maintenance log, and those are available for review. Every day the analyst will go in and start the instrument up and check -- the instrument runs on carrier gas. So he is looking to see that he has enough of that to run the instrument. He's looking at the temperature to make sure that everything is in operating order with the instrument, and he signs off, and then the QA officer comes in, reviews what he did and signs off.

Q. And have you had occasion in the past to testify in court in the State of Colorado regarding analysis of human blood for determination of alcohol content?

A. Yes, I have.

Q. Approximately how many times have you testified?

A. With regards to blood alcohol, about 600 times in

the course of my career.

THE COURT: I'm sorry, how many?

THE WITNESS: 600.

THE COURT: Thank you.

MR. RICHARDSON: Your Honor at this time I would tender Ms. Burbach as an expert in the field of toxicology.

THE COURT: Any objection or voir dire?

MR. HERRINGER: Your Honor I do not have an objection to the extent it's limited to the information that's been presented so far -- the areas that's been presented so far.

THE COURT: I'm sorry. You have no objection to her being --

MR. HERRINGER: Qualified in the area of forensic toxicology regarding the forensic analysis of blood results.

THE COURT: Okay. She will be qualified in that then. Thank you.

MR. RICHARDSON: Thank you, Your Honor.

May I have just a moment, Your Honor?

(Pause.)

MR. RICHARDSON: Your Honor let the record reflect that I'm showing opposing counsel what's been previously marked as People's Exhibit 1.

THE COURT: Record will so reflect.

MR. RICHARDSON: This form is in discovery Your Honor. This particular form was copied out of the litigation CD

so it doesn't have actual discovery markings on the bottom.

MR. HERRINGER: I am just comparing it, judge.

THE COURT: Thank you.

MR. HERRINGER: That's fine.

BY MR. RICHARDSON:

Q. Ms. Burbach I'm showing you what's been previously marked as People's Exhibit 1. Do you know what this is?

A. It appears to be a copy of a requisition that would accompany a blood kit test, a blood kit, and this is submitted by the law enforcement agency to the laboratory with the blood sample.

Q. How do you know that?

A. Because it has the State's seal, and it has all the markings of a record that was generated in the laboratory. Now it used to be generated, but now we do it in PDF file, and it would be sent out to law enforcement.

Q. And I am going to ask you a few more questions about that if you wouldn't mind. Does People's Exhibit 1 relate to a particular blood specimen?

A. It does.

Q. How can you tell that?

A. On the requisition form there is an area for law enforcement to fill out the name of the person whose blood accompanies this requisition.

Q. And does it say on that form who that person is?

A. It does.

Q. Who is that?

A. It says Jeffrey, middle initial, D, last is Shook.

Q. Is there a seal number on People's Exhibit 1?

A. There is.

Q. What function does that seal number serve?

A. It is a form of chain of custody. There's a seal number on the blood kit box that corresponds to the seal number on the requisition, and it's one form of chain of custody.

Q. And did your lab receive the original of that exhibit?

A. Yes, we would have.

Q. Okay. And do you know, if you know, do you know which parts would have been filled out when you received it?

A. Everything except for where we received it via U.S. Mail, when we received it, what time, the date we received it, and then when it was reviewed.

Q. Did you analyze any of the blood that came along with this form?

A. No, sir, I did not.

Q. Did you review the analysis of the blood that came with this form?

A. Yes, sir.

Q. Do you know when that analysis took place?

A. Not by this form. I would need the laboratory

result.

Q. Let me ask you another question. Before analyzing the blood, would your office know if the seals on the container were intact?

A. Oh, absolutely. We call it a sectioning, when the seal on the box would have been cut open, and the paper would have been pulled out, that's when the names on the seal of the blood are checked with the names on the paperwork to make sure they match. If there's any discrepancy that's not in accordance with the Colorado Board of Health Rules and Regulations, then that is noted in the discrepancy comments box, and there's none noted.

Q. There are none noted in this case?

A. That would be correct.

Q. Do you know what equipment was used to analyze this blood?

A. Yes. We use a GC, a gas chromatograph, and we use a tech mark, it's at HT3 headspace.

Q. And is that equipment regularly used by your office?

A. It is.

Q. And to your knowledge was that equipment operating properly on December 16th, 2008?

A. It was.

MR. RICHARDSON: Your Honor at this time I am

showing-- let the record reflect I am showing defense counsel what's been previously marked as People's Exhibit 2.

THE COURT: Thank you. The record will so reflect.

MR. HERRINGER: Your Honor may we approach?

(Off-the-record discussion)

THE COURT: You may continue, Mr. Richardson.

MR. RICHARDSON: Thank you, Your Honor.

BY MR. RICHARDSON:

Q. Ms. Burbach, I'm showing you what's been previously marked as People's Exhibit 2. Do you know what this document is?

A. I know what it is. It is a computer generated result that was generated in the laboratory by what we call the LITS system, laboratory information technology system, and then it would have been printed after the information was entered into that system.

Q. Okay. And how do you know what this form is?

A. Because I use it in the regular course of my daily work. I review hundreds of these a day.

Q. And as part of your review -- I think you testified a moment ago that you reviewed this test, as part of that review, did you review this document?

A. I did.

Q. And does it appear to be an accurate representation of the document that you reviewed?

A. It does. It is-- it looks to be a true and

accurate copy. The original would have been -- we keep a copy for 5 years in the laboratory, and the original goes back to the law enforcement agency.

Q. I'm sorry, and this document is kept in the course of business?

A. It is, for 5 years.

Q. And I just want to ask you one question, does that document tell you when this particular sample was analyzed?

A. It does.

Q. When was that?

A. It was December 16th, 2008.

Q. I'm going to switch back now to the other document and ask you just some questions about just the sample in general. How does the equipment that you use, the gas chromatograph, if I pronounced that correctly, how does that analyze blood? Can you tell the jury how that works?

A. Well, there's 2 parts to it. The gas chromatograph just separates and identifies the analyte. It's looking for volatiles. So it identifies it from, you know, ethyl alcohol, Methanol, isopropanol, and propanol, different volatile compounds.

In the tech market space, it works on the theory of Henry's Law, where all volatiles rise to the top when they are heated up. So you have the blood in a headspace vial where the volatile rises to the top, and it takes an aliquot of that

sample, and injects it into the gas chromatograph, and that identifies the volatile and the amount in the blood.

Q. Okay. I'm going to ask some follow up questions because I am not an expert on how this works. So when you said headspace, what does that mean?

A. It's just a scientific term that refers to a vial, and when the blood is put in the vial. And an aliquot means just a sample of-- like a mil of the blood.

And then what happens is when the instrument heats it up, the compound, the top, the space in the top of the vial, we scientists call it a headspace. Because at the top of the vial is the space where the volatile alcohol stays until it's separated.

Q. And then -- I'm sorry, if you wouldn't mind then so from that point forward how does the machine -- how does it work?

A. Well there's a thing -- an instrument called a column, and it's based on polarity. Meaning that based on the molecular rate of the compound, the heavier you are, the smaller-- the lighter you are, it's how you move through the column. And the column -- basically what I'm looking at is, it's an oven. So it's a little round column inside where it heats up, and then it's pushing that analyte through and it will break apart according to it's molecular structure.

And what all the instrument is doing is identifying it by its -- if you want to think of it this way as a

fingerprint. It's looking at its fingerprint and saying, oh, you're ethyl alcohol, oh, you're Methanol, oh you're isopropanol.

Q. And I mean is this technique of testing is that generally accepted in the scientific community?

A. It's what everybody uses to run blood alcohols. It's a very efficient method that can run them through, in a very efficient and timely manner. You wouldn't use a more expensive analytical instrument that is more detailed to look for drugs. Ethyl alcohol is unique and used around the world by headspace GC.

Q. Okay. Just for clarification, that is the technique you used in this case?

A. That's correct.

Q. And you know, is this -- is there just one test of the defendant's blood that's run as part of this process?

A. We always run it in duplicate and that's to avoid human error because you actually have to pick up the blood again out of the test tube rack. And so if you ever make a mistake, it's not likely that you would make it twice because you actually have to uncap the blood again, look at the number, match it up to the paperwork in front of you. So you will actually have the original paperwork in front of you.

You pick up the blood tube, you look at the name, you look at the name on the paperwork, and the number, and then you take some sample out. So we run them in duplicate, and then

we run them by dual column, which means it's being run on the front-end and the back-end, and then we take-- we get 4 numbers and average it, and then we round down.

Q. So you covered a lot of ground there. You say you get 4 numbers. What are those 4 numbers?

A. They are 4 numbers that correspond to that person's blood.

Q. So just for clarification is that two samples being run twice, is that how you get the 4 numbers?

A. Well, what happens is it's being run on -- without being too technical, it's run on the front-end column and the back end column. So what happens is you'll get -- there's 2 samples run of that person's blood in duplicate. So it's been run on the front-end and the back-end, and you get 4 numbers. You get 2 from the first sample and 2 from the next sample.

Q. Okay. I'm sorry, you say you average those numbers?

A. Correct. And then they have to be within 5 percent of each other. If they are not, then it has to be redone, and that's our protocol.

Q. Okay. To your knowledge, if you know, were any of the samples outside of that 5 percent difference in this case?

A. There were samples outside. I looked at the worksheet, and there were I think 2 or 3 samples. I can't remember exactly how many, but they actually stated in big bold

typed capped letters, "redo".

Q. Okay. And so the test was rerun then?

A. It would have been rerun the next day or when the -- if the analyst was absent that day or in court, it would have been run the next available day.

Q. Okay. So then those tests -- I'm sorry, they are rerun, and then what was the outcome when they were run the second time?

A. Oh, are you talking about this test? This test was not rerun.

Q. Okay. That was my question.

A. Okay. No. This test was not rerun.

There were samples -- see, the samples are run in batch. But there were some samples in that batch that were rerun, but this particular sample was not because it was within the protocol.

Q. Okay. So make sure I have this right. So you have got a big bunch of blood samples that are going to go into this machine at the same time, but the ones that apply to this incident, the case that we're talking about today, there were no -- nothing had to be rerun?

A. That's correct.

Q. Okay. Thank you.

A. I misunderstood.

Q. No. That's okay.

And then the outcome of that test, was that recorded somewhere?

A. It is. It's on exhibit -- People's Exhibit 2.

MR. RICHARDSON: If I can have just one moment.

(Pause.)

BY MR. RICHARDSON:

Q. Without stating what the result was, is the result typically in your test expressed in grams of alcohol per one hundred milliliters of blood?

A. It is.

Q. And then -- I'm sorry, I -- where is this form created?

A. In the laboratory, in the toxicology unit.

Q. And is this form kept in the normal course of business?

A. It is.

Q. And whose signature appears at the bottom of that form?

A. Harold Wells.

Q. But did you review this document?

A. I did.

Q. And how come your signature isn't on there?

A. Because I didn't review it at the time that the result went out to the laboratory. I did what's called the file review later.

Q. And is that standard, does that have an option?

A. It's standard. I can't be in the lab to sign every document. In this case I know for a fact on 12/22/08 I was on vacation. I take 2 weeks at Christmas always. So in order not to hold up results, it's not fair to hold them up for 2 weeks, Harold will have signature authority.

Q. And does People's Exhibit, I think it's 2, does that relate to any particular blood specimen?

A. It does. It relates to first name Jeffrey, last name Shook.

Q. How can you tell that?

A. This name is printed in the subject information box area.

Q. Are there any other numbers on this document that relate to the request for the test?

A. Yes. There's a lot of chain of custody that match. First of all, when a sample comes to the lab, it's given a tox number. So the tox number corresponds in each one to tox 2008008052, the name, DOB, date of birth, case number, seal number, collection date, collected by, received by, Matrix, and then I believe that is all.

The information -- there's a lot of information that's taken from the requisition that's put in the computer and then regenerated on the result.

Q. Okay. So the specimen of blood that came from

People's Exhibit 1 is the same in People's Exhibit 2, is that correct?

A. That's correct.

MR. RICHARDSON: Your Honor, at this time I ask that People's Exhibit 2 be admitted into evidence.

THE COURT: Any objection?

MR. HERRINGER: Your Honor, we object on the grounds previously --

THE COURT: Please approach.

(Off-the-record discussion)

THE COURT: People's 2 will be admitted. Thank you.

(Exhibit received in evidence.)

BY MR. RICHARDSON:

Q. Ms. Burbach, if I could draw your attention to People's Exhibit 2. Could you tell the jury what the blood alcohol concentration was with regard to the defendant's blood?

A. It was a 0.239 grams of ethyl alcohol per hundred milliliters of blood.

Q. Ms. Burbach, have you received any training -- you mentioned you had been schooled in the area of toxicology. Does that toxicology education and training provide you with any information about the effects of alcohol on the human body?

A. It does.

Q. Can you explain that to the jury what that training

involves?

A. When you ingest ethyl alcohol, it's absorbed of course through the esophagus down into your stomach. If your stomach is full, there will be a delayed time in which it will move from your stomach into the small intestine.

If your stomach is empty, there's a little valve between your stomach and the small intestine, called your pyloric valve, the ethyl alcohol will enter into the small intestine. The small intestine is very porous.

Ethyl alcohol is hydrofluoric. It's water loving and it seeks water. So once it goes into the small intestine and moves into the circulatory system, it goes right to the brain. The brain is made up of water and it sits in water.

So you will be effected cognitively first, thinking, judging and reasoning. Next it works on the cortex of the brain where your balance is effected, and your speech, and fine motor skills, and then you will see that later at high blood alcohol contents where you slur your speech. You will see dilated pupils because that's in the cyclo-active phase of the drug, a flushed, reddened face because it's also a vasodilator.

And then you will start to see psychomotor skills, that's your ability to stand, your gait, the ability to divide your attention. Divided attention is just sitting here listening to me, and thinking about maybe what you are cooking for supper, or what you are going to do Saturday. It's your brain's ability

to take in two stimulus at a time, and respond to that stimulus but still be able to listen to what the officer is asking you to do and then to respond that. You will see that at higher blood alcohol contents.

But you have to remember, if you have compensation and tolerance to the alcohol, that means you produce more of an enzyme called alcohol dehydrogenase, ADH, the body will get rid of that alcohol faster because alcohol is a poison. It's metabolized in the liver and then excreted in the kidneys as carbon dioxide and water.

And the more that you become an experienced drinker, the more of that enzyme you have, the faster you get rid of alcohol, the more you have to drink to maintain the blood alcohol content, and that may effect your ability to outwardly show signs, like the bloodshot, watery eyes, that comes from dehydration, or your speech, you can control that by slowing down your speech, or moving your feet apart, you can control your gait, but you can't control what's going on in your brain. So those are some of the signs and symptoms that you will see.

Lower blood alcohol, you will have a lower inhibition, as the alcohol increases, you will see outward signs.

Q. And how did you know that?

A. Many years of training with leading experts in the field, specifically Mr. Allen Wayne Jones of Sweden that's written over a thousand articles on the effects of alcohol. I

think I have attended at least 30 of his lectures in alcohol, and he is the most published person in the world with the effects of alcohol on the body, and studies in all different areas. And also, Dr. Kirk Dubowski, and Dr. Robert Forney, Jr., who I learned from the Borkenstein course that's taught -- it's a week long class, and you take a test afterwards. And then on the job experience, reviewing cases and looking at different things every day.

Q. And did you receive-- you mentioned you had taken some tests when you attended some of these seminars, did you receive any certifications in this area?

A. You know, no. And when I get my ABFT accreditation, I will have to take an exam. I'll either take it in Oklahoma City or Seattle next year, but once the accreditation is accreditation is in place then I'll have to take a certifying exam as a forensic toxicologist.

Q. Okay. And have you testified in court before on the effects of alcohol on the body?

A. Yes, I have.

Q. About how many times would you say you testified in that capacity?

A. I've testified a total of about 1400 times in the course of my career, and about 800 of those times, maybe, 60, 100, somewhere in there, with alcohol.

Q. So based on this blood alcohol result, can you

render an expert opinion in terms of what the level impairment may have been -- what the level of impairment may have been of the defendant that evening?

A. Well, absolutely. Based on -- even if I was just looking at the number as a scientist, I would know exactly where it would be based on the chart by Dr. Kirk Dubowski who invented the intoxilyzer. I know for a fact that most people that would be at a 239 would be in a stupor. Anything above that you are looking at shutting down the brain stem.

People who are in the 3's and 4's that don't have experience in drinking generally shut down the breathing system. It's a central nervous system depressant. It lowers the blood pressure. It lowers the pulse, and works on that brainstem to suppress your breathing. And most people that are above in the 3's and 4's that don't have experience actually can-- it's fatal. It can shut down your breathing.

Q. So that's at a much higher level, but what about the defendant, in this case, with a .239, if I am not mistaken, I mean, as opposed to, okay, we have a wide stream of, like you said, a 3 and a 4, but at this level, what type of impairment do you typically see in a person with this sort of blood alcohol content?

A. Well you have diminished reaction time, diminished peripheral vision, diminished depth perception, diminished divided attention. Braking, steering, scanning the roadways for

dangers, fine motor skills, memory recall, these are things that effect the way that you drive.

Driving is a divided attention task. It's the most complex thing that you do in a day, to brake and steer, to talk on the cell phone, to change the radio, to watch the light, to turn from lane to lane, to look in your side mirror, the rear view, that all requires divided attention, and you get diminished divided attention and you can't connect-- bring the coordination together to operate that motor vehicle in a safe manner. So you're looking at a blood alcohol content that's substantially impaired and unable to operate a motor vehicle safely.

MR. RICHARDSON: Your Honor may I approach for just a second?

THE COURT: Yes.

(Off-the-record discussion)

MR. RICHARDSON: Your Honor at this time I would ask that People's Exhibit 1 be admitted into evidence.

THE COURT: Any objection, Mr. Herringer.

MR. HERRINGER: Same objections as earlier Your Honor.

THE COURT: Thank you. Those will be overruled. People's 1 will be admitted as well.

(Exhibit received in evidence)

MR. RICHARDSON: Can I have just a moment, Your Honor?

THE COURT: Certainly.

BY MR. RICHARDSON:

Q. Ms. Burbach based on what you know about the processing of alcohol and your training and expertise and that blood alcohol number, is it possible to extrapolate how many drinks the defendant had on the evening in question?

A. Oh, absolutely.

Q. How would you know that? How would you be able to extrapolate that number?

A. Because I know from experience how many-- how much a drink raises your blood alcohol content and how much you would eliminate at the same time.

Q. Okay. Could you run through that with the jury?

A. Sure. You want me to write it down?

MR. RICHARDSON: Your Honor may the witness step down?

THE COURT: Yes.

THE WITNESS: These all pack the same punch, one 12-ounce beer, one 5-ounce glass of wine, one 1.5-ounce shot. According to Dr. Robert Borkenstein, they raise your BAC, blood alcohol content, 0.025.

So, one drink raises your blood alcohol 0.025, but at the same time an average elimination rate for a male equals 0.015. I am not going to put female down, but I'm going to tell you females have to move the alcohol faster because we have less

muscle mass, and it's more toxic to us, and we have more water so we become intoxicated faster than a male. So a male is about a .015.

So if you are thinking about one drink is an .025, so four drinks is a .1, eight drinks equal .2, but in this case we know that it's an 0.239. So one more is going to put you at .225, one more is going to put you at -- whoops -- 5. But we know at the same time that he's eliminating at least a half a drink.

So what you do is you go ahead and you look at the time of the incident, and the date -- the time of the incident is 11:15 hours, and the blood draw is 2:10, almost two hours later.

So I know in two hours he's going to get rid of two drinks. That's going to happen. But I know that if his BAC at the time of the test -- let me write that out. So we can look at the BAC. I know at the time of the test it's a 239. So I know that he at least had to have nine drinks, probably more like ten, but I know he has eliminated two. So I don't know because I don't have a crystal ball exactly how many, because I don't know if it's beer, wine, I don't know the proof of it, so I give a range. So between 10 and 14 drinks, has to, to maintain that BAC, to eliminate in that time, and two hours later have a blood alcohol content of a 239.

Scientifically what I have learned is I know he's in a range (unintelligible) 025, and that's in general. It

doesn't really matter what kind of experienced drinker you are. This will matter based on experience. If you are an experienced drinker, then you have a higher elimination rate, but then you have to drink more to maintain that level. But in general, because I don't know his elimination rate, I will be fair and give him the average. So I say anywhere between 10 to 14 drinks.

Q. Thank you, Ms. Burbach.

A. You're welcome.

Q. You can go ahead and have a seat.

MR. RICHARDSON: No further questions Your Honor.

THE COURT: Thank you.

Cross?

THE WITNESS: Ma'am, before we start cross, may I have a drink of water please?

THE COURT: Absolutely.

CROSS-EXAMINATION

BY MR. HERRINGER:

Q. Good afternoon.

A. Good afternoon, sir.

Q. How are you today?

A. Good.

Q. I will work a little bit backwards. We'll start by talking about these numbers that you put up there, and then we will come (unintelligible).

BAC, blood alcohol concentration, right?

A. Yes.

Q. And that is a reflection of the volume of concentration of alcohol over the weight, right?

A. The calculation -- if you are talking about the Widmark calculation?

Q. No. In your report this has a -- the result is part of grams over milliliter --

A. Per hundred milliliters, yes.

Q. Grams is to weight?

A. Correct. And milliliters is volume.

Q. So that's reported as the weight over the volume --

A. Correct.

Q. -- correct?

And when we are talking about that, we are talking about how alcohol essentially disburses through the body?

A. Correct.

Q. And at least initially when someone consumes alcohol they go through what's known as the preabsorptive phase?

A. Yes. There's less than 10 percent that we call -- it's actually called -- you are right, preabsorptive phase. It's actually -- excuse me -- it's called first pass metabolism.

Q. I'll also refer to it as preabsorptive phase which basically means that the alcohol has not been fully absorbed into the system, correct?

A. That depends on what you ate.

Q. Again, I am not asking about -- I am just asking you whether or not I have a proper definition of the term?

A. Correct.

Q. Okay. And in the preabsorptive -- the reason they refer to it as the preabsorptive phase is because alcohol doesn't work instantaneously on a person?

A. No, it doesn't in most cases.

Q. It has to go in -- the person has to consume it. It has to go into their stomach, and then most of it actually winds up getting taken up through the small intestines, right?

A. The large percentage of it, yes.

Q. And then it goes on and eventually reaches the brain and that's where you get the cyclo-active effects of alcohol?

A. Correct.

Q. And so when we are measuring a blood alcohol concentration, that basically -- that's kind of like a percentage of alcohol versus the amount of blood within a person, right?

A. Yes, when you are looking at a snapshot in time.

Q. It doesn't make any sense to me about your calculation.

A. What doesn't make sense?

Q. Well, what doesn't make sense here is that there's no factoring of the weight of the person. You are telling me that a 90-pound woman who has one drink is going to go to an 025,

and a 300 pound man who has one drink is going to go to an 025, both of them are going to have the same blood alcohol concentration after one drink?

A. No. I didn't tell you that. What you are referring to is Widmark, and I don't use Widmark because it's speculative.

I would have to make a lot of assumptions, meaning that I would have to know their body weight, what they drank that day, and I would have to assume what they told me is true.

So what I use in general is what Dr. Robert Forney, Jr. taught me to use, and that's just to use an average elimination rate and absorption rate, because I don't know without having 3 blood draws what Mr. Shook's elimination rate is.

Q. I'm not asking you about the elimination rate. I'm just asking you about whether or not someone's weight factors into the issue of what their blood alcohol concentration is?

If we are talking about dispersion, someone who is larger, alcohol -- you have to have a greater quantity of alcohol in a larger person in order for it to disburse through them and reach a certain blood alcohol concentration, correct?

A. In general, yes.

Q. And that's why you have seen those little -- and I'm not saying they are necessarily entirely accurate -- you have seen those little wheels they have for how many drinks you have,

what you weigh, and what gender you are, and things like that, you have seen those things?

A. Correct, they are very general.

Q. But one of the things that they put in there is weight, and that's because weight factors in to what someone's ultimate BAC is going to be per drink?

A. Correct, but it's making assumptions, because you can weigh 300 pounds and be a fast eliminator, and be an experienced drinker, and have to drink a lot more, or you can weigh 300 pounds, and be an inexperienced drinker, and 4 drinks will make you very intoxicated.

Q. But if we are going to be fair here and we are not going to make assumptions, that's makes a whole bunch of assumptions also, right?

A. Yeah, in general, that's correct, and I think I made a caveat that I didn't know his elimination rate.

Q. You don't even know his weight?

A. No, but it doesn't matter to me because I am not doing the Widmark calculation.

Q. Lets move on. You testified regarding accreditation. Accreditation is something that forensic laboratories -- many forensic laboratories go through and accomplish, correct?

A. Correct. I think right now 22 have the ABFT.

Q. And I am correct in stating that your lab currently

does not have a national accreditation?

A. Not a national.

Q. And that's kind of like having a degree, I mean, you can't say I have a Ph.D or I have a law degree when you don't really have a law degree. You know, if I have almost finished my law degree and then decide I was going to go practice law even though I hadn't finished what I was supposed to do, I would get arrested for unauthorized practice of law, right?

A. Well, the difference is the State of Colorado requires you to have a law degree. The State of Colorado does not require me to have a national accreditation. It just requires me to be certified, which I am.

Q. But what I am saying basically the fact that you are going through the process of accreditation, until you actually take the exam, pass the inspection, you are not accredited, correct?

A. Right, and I don't have to do any of those. I'm doing them.

Q. Did I ask you if you have to do those?

THE COURT: That's argumentative. Next question.

The jury heard the answer. Thank you.

BY MR. HERRINGER:

Q. You testified during your direct examination regarding proficiency testing.

A. Yes, sir.

Q. It's my understanding you have proficiency tests that come in from two different sources?

A. Yes, sir.

Q. And basically what that means is you were sent unknown samples and asked to determine what those are and return them back to the organization that gave them to you, right?

A. Yes.

Q. And then you have to come within a certain degree of that, right?

A. Yes, there's a score.

Q. That's what's known as a single blind proficiency, right?

A. Correct.

Q. Single blind proficiency means basically when you are handling it you know you are handling the proficiency, right?

A. Well, yeah, I know because they come in from the place that's disbursing those.

Q. You are familiar with the concept of double blind proficiencies also, right?

A. Correct.

Q. And that's where the lab would not even know it's dealing with a proficiency?

A. Correct, and we do those internally.

Q. In terms of those, though, you do those internally. You don't have anybody externally audit them, correct?

A. Yeah, the certification unit, they are the ones that put them in without our knowledge. So it would be part of the batch that day, but not knowing where it's coming from.

Q. You do double blind proficiencies --

A. Internally.

Q. -- internally, but those are judged by the Colorado Department of Public Health and Environment, correct?

A. The certification, you are correct.

Q. Which is the same department of the government that you work for, right?

A. You are absolutely correct.

Q. Now my understanding is that you are responsible for drafting the regulations for the collection and analysis of blood tests in the State of Colorado, is that correct?

A. Not solely by myself, the 4 directors of the laboratory that would be present was Dr. Patricia Zuelich, she is from Rocky Mountain Labs, Sarah Irfer from Chematox, Dr. Bucks from El Paso County Coroner's Office, myself, and Mr. Graw from the certification unit wrote the toxicology section of the Board of Health Rules and Regs.

Q. And that's what I asked you, you are in part responsible?

A. Correct.

Q. So you're familiar with what the requirements are regarding the collection of a blood sample, the handling of blood

sample during its transport to your lab, and then obviously your familiar with what's the responsibility when the sample gets to your lab, correct?

A. Yes, sir.

Q. Now one of the things that's required is that a -- that the sample is collected inside a kit that has been approved by the Colorado Department of Public Health and Environment, right?

A. Yes, sir.

Q. And one of this things that's required in that kit is that you have to have a tube that's known as a Vacutainer tube that is used to draw the blood?

A. Correct, gray top.

Q. It's a gray topped tube, and it has a certain quantity -- supposed to have a certain quantity of sodium chloride?

A. And sodium oxalate.

Q. And the purpose of the sodium chloride is it's supposed to be a preservative, and the purpose of the other chemical is it's an anticoagulant, correct?

A. Correct.

Q. And in terms of these tubes that were used in this case, you don't have any personal knowledge -- you didn't make any observations regarding whether or not the proper amount of sodium chloride or anticoagulant --

A. No, our laboratory does not test for that.

Q. I'm assuming you operate some pretty sophisticated machinery. I would assume that a gas chromatograph can test for sodium chloride, is that correct?

A. If we chose to do so.

Q. And not only can you probably test to see whether or not this preservative is present, I bet you can even test to find out how much is in there, right?

A. If we chose to.

Q. And having a preservative in there is important from two standpoints because, one, it helps protect against both ethanol loss and it also helps protect against ethanol gain?

A. Correct, but there has to be certain factors for gain.

Q. I understand that. We are going to talk about that.

But in terms of this case, nothing was ever tested by you, correct?

A. That would be correct.

Q. And in terms of any inspection of the kit that took place prior, you know, during the collection of the sample, you have no knowledge regarding what the blood drawer in this case did, whether or not he or she --

A. No.

Q. -- inspected it to see whether or not the

preservative was in there, inspected to see how much of the preservative was in there already, correct?

A. That is out of the scope of my chain of custody.

Q. And you would agree with me that there are three different phases at least that a blood sample can become compromised in some matter. It could become compromised during the collection, right?

A. You would have to tell me how you think it can become compromised during the collection. I'm not just going to say, yes.

Q. Well lets use an example. This tube has a vacuum, right?

A. Correct.

Q. And the tube -- what the blood drawer does is sticks it in to the person -- sticks a needle into the person's vein that's connected to a hub, correct?

A. Correct.

Q. And that hub has the Vacutainer connected to it, correct?

A. Right, Eclipse needle.

Q. Yeah. And then a second vial is collected after that, correct?

A. Correct.

Q. And the second vial is put on there while the hub remains in the arm. So the hub doesn't come out. They take the

first vial out and they put the second vial into the hub, right?

A. Yeah. You don't want to restick.

Q. So if you have got the vacuum in the second tube and it's still drawing, and then the blood drawer pulls the hub out without disconnecting it from the Vacutainer, that would draw in air, using the vacuum, and air has possible contaminations in it?

A. I would disagree with you. No.

Show me a scientific study that's done by a valid author that air effects the vacuum.

Q. Well you don't have any scientific studies that show contrary to that, correct?

A. Oh, absolutely.

Q. You name one that shows that that's not a possible source of contamination?

A. Well there's two that were done in Sweden, one that was done by A.W. Jones about the collection and sterility of samples taken during the collection process, that was published in 2006. We could get it faxed over.

Q. I am asking you if it specifically addresses the issue of air contaminating the sample during the draw?

A. It addressed multiple things that are falsehoods about contamination of the sample; air was one of them.

Q. I'm asking you was there a question of air being drawn in during the blood draw process?

A. One study talks about things that come up regarding that. I believe that air is one. It talks about the antiseptic use, in candida albicans, and it also talks about heat and storage.

Q. Candida albicans, that's a yeast, correct?

A. Correct.

Q. And that's present throughout the air, right?

A. No. Well, I would disagree with that. That you have to have from inside the body. Candida albicans is produced in a moist, hot living environment.

Q. You are aware that there has been documentation regarding candida albicans producing ethanol in blood samples?

A. Yes, I have, but they don't rise to the level of producing a measurable -- extensive measurable blood alcohol content.

Q. You're familiar with this book I assume?

A. Yeah, I am. I don't mean, yeah; I mean, yes.

Q. This is "*Garriott's Medicolegal Aspects of Alcohol*".

A. Fifth Edition.

If I'm going to read something, I need my glasses.

Q. Okay. That's fine. Get your glasses.

THE WITNESS: May I step down?

THE COURT: Absolutely.

BY MR. HERRINGER:

Q. This book is considered to be one of the foremost treatises regarding the study of -- forensic study of alcohol, correct?

A. It is.

Q. It's an authoritative text that's used by toxicologists not just in the United States but throughout the world?

A. Correct.

Q. And it's written by various experts within the field, different experts having different chapters, correct?

A. Correct.

Q. I will be referring you to Chapter 5 of the Fifth Edition, which is entitled, "Blood, Urine and Other Fluid and Tissue Specimens for Alcohol Analyses." It's true that within that portion it states that --

MR. RICHARDSON: Objection, Your Honor, this is hearsay.

THE COURT: Please approach.

(Off-the-record discussion)

BY MR. HERRINGER:

Q. I'm going to read you a statement from the text, and then if you want to take a look at the text, you are welcome.

A. Oh, absolutely. Because what I find is it's taken out of context and not read in its entirety. So I want to read the whole chapter.

Q. The whole chapter?

A. Not the whole chapter, but the whole section. Sorry.

THE COURT: Just read what you want and then she will be allowed to (unintelligible) --

THE WITNESS: Thank you, ma'am.

THE COURT: Absolutely.

BY MR. HERRINGER:

Q. "Many reports from the literature have shown that there may be decreases, as well as increases, in ethanol concentration with time. In properly sealed containers, microorganism oxidation of ethanol, and temperature-dependent conversion of ethanol to acetaldehyde have resulted in decreases in ethanol concentration." And then it reports, Brown, et al., 1973, Smalldon and Brown, 1973; Chang, et al., 1984, while increases in ethanol concentration have been attributed to microbial conversion of glucose to alcohol. To prevent these changes, blood specimens should be well sealed and stored at low temperatures. Anticoagulants such as oxalate salts, citrate salts, or Heparin should be added to prevent clotting. Microorganism growth can be inhibited by adding fluoride salts, mercuric salts, or azide salts."

MR. RICHARDSON: Your Honor, can we approach?

THE COURT: Yep.

(Off-the-record discussion)

THE COURT: So Ladies and Gentlemen, we are going to take a break and recess because I think there's a better way to skin this cat, and it will be more understandable to listen to and better for the witness also.

So again, I would ask you not to talk about this case yet. You have not received all of the evidence. It would be premature. Thank you.

If you would please rise while the jury is escorted out.

(Jury out)

THE COURT: Just have a seat for one second if you don't mind.

So what I was going to suggest to you he is going to do and I want to make sure this facilitates your testimony as opposed to hampers it, is copy the section that he's reading from and maybe highlight and mark where she is going to be reading and then you can read it in context --

THE WITNESS: That would be great.

THE COURT: -- before you answer.

So Mr. Herringer what I would ask is if you would copy like on that page clearly it's the whole page and it goes on the next page. Just use your common sense. You are welcome to use our copier as well as your common sense.

MR. HERRINGER: That's great.

THE COURT: And copy more rather than less.

MR. HERRINGER: I won't copy all of the chapters.

THE COURT: Court will be in recess for 10 minutes.

(Recess.)

THE COURT: Thank you. Please be seated.

Courts back on the record in the presence of the jury in 08T1929.

Mr. Herringer you may continue.

BY MR. HERRINGER:

Q. Ms. Burbach I made copies of the other portions of chapter 5 and chapter 10, what I wanted to talk to you about, and as a courtesy I provided the District Attorney my book. So if you could refer to the pages if you mention something, and I will try to do the same.

One of the things the chapter mentions -- chapter 5 -- it mentions the fact that studies reported increased ethanol concentration, have been attributed to the microbial conversion of glucose to alcohol. Would you agree with that?

A. Yes, I would agree with that.

Q. And the -- one of the things that it recommends regarding -- (unintelligible) in order to prevent that, the importance of having oxalate salts or citrate salts or something to avoid clotting a sample, correct?

A. Correct.

Q. And also recommends having chloride salts, something like sodium chloride, inside the sample as a

preservative, correct?

A. Correct.

Q. And you would agree with me that in terms of the testing that was done here, there's no testing or confirmation regarding the presence of oxalate salts or of the fluoride salts, correct?

A. No. I don't have to do that because I get a certification from the company that tells me they have already done it.

Q. I understand that, but you certainly understand that error can happen in the process, right?

A. Well, certainly.

Q. And one of the ways that we can avoid that error is by having the person who collects the blood draw, looks at the tube initially, inspect the tube to make sure that the tube has some sort of substance inside of it and that it looks appropriate, correct?

A. Correct.

Q. And we don't have that information -- at least you don't have that information here that that actually took place, correct?

A. Do I have the information here? No. I have not spoken to the phlebotomist.

Q. And going on to the next paragraph on page 206 of chapter 5, second -- or first full paragraph. One of the things

it talks about is the importance of the blood being drawn into a sterile container?

A. Correct.

Q. And the reason you want that -- the reason you want it to be sterile is this -- again, this is the section talking about ethanol gain -- the reason you want it to be sterile is because you don't want any microorganisms in there, right?

A. Correct.

Q. And if the needle is drawn out during the process and air is brought into -- by the vacuum is brought into the tube, that is no longer a sterile environment, that has taken air from the environment and introduced it into the sample, correct, it's no longer a vacuum, it's no longer sterile?

A. Well I disagree with you because I guess there would have to be a rhyme ripe, and all the factors in the universe would have to be correct to have bacteria in that little space, and that would have to be yeast on the arm. It would have to be the person having a sepsis infection, and that would require 104, 105-degree temperature to produce the levels of a 239. It wouldn't even get up to a 239. The case -- the scientific research shows that it doesn't even get up to an 08 -- a .08.

Q. What we have is -- what -- when there has been emphasis where alcohol has been produced inside a -- is a blood sample -- let me make sure I've got the process correctly. You

have to have -- you have to have a proper substrate, which is basically something that a microorganism can feed on, correct?

A. It's a microorganism that converts to -- that can convert chemically to glucose.

Q. Okay. But I'm asking about substrate first. There has to be something there that the microorganism --

A. Yeah, exactly.

Q. And specifically when you are talking about yeast, you are only talking -- for fermentation purposes, you are talking about sugar?

A. Correct.

Q. And we are all familiar with diabetes and the idea of blood sugar. Blood contains some measure of glucose and sugar in there, correct?

A. I'm absolutely familiar because I'm a diabetic.

Q. And so you would agree with me that there is sugar that's contained within the human blood, correct?

A. I measure it 4 times a day.

Q. And you would agree with me that when you are talking about the -- what's been reported in terms of ethanol being due to microbial contamination, essentially what you have is you have some sort of microorganism that's essentially eating that sugar, fermenting, and producing ethanol, correct?

A. I would agree with you.

Q. And ethanol, in terms of ethanol that might be in

someone's body as a result of them having consumed alcohol, would be indistinguishable from the ethanol that would be produced by a microorganism; is that correct?

A. No. No, they are not indistinguishable. Ethyl alcohol is ethyl alcohol.

Q. I am talking about ethanol?

A. Ethanol, yes.

Q. And you test what you test for with the GC?

A. We test for ethyl alcohol.

Q. So I want to go on to chapter 10 and the first page 275, but I include that just sort of as a reference so that we'd know what chapter we are talking about, and that's the chapter on "Collection and Storage of Specimens for Alcohol Analysis".

There's a whole section there, section 10.3 regarding ethanol gain.

THE COURT: Is that a question?

BY MR. HERRINGER:

Q. Do you recognize that, are you with me? Page 277.

A. Pardon me. Yes. No. I dropped that one. Let me put that over here so it doesn't blow -- I have 10.3.

Q. "10.3 Ethanol Gain".

A. Yes, sir.

THE COURT: What was your question?

MR. HERRINGER: I am just making a query to the witness, Your Honor.

THE COURT: Right. She's at 10.3. You are at 10.3. Go ahead and ask your question.

BY MR. HERRINGER:

Q. So, there it talks about the fact -- when I said contamination can take place before during or after collection, correct?

A. Correct.

Q. And then there's two types -- basically two types of contamination that you're worried about, one is physical contamination, and the second is the contamination with microorganisms that are capable of producing ethanol, right?

A. Yes, sir.

Q. And while we are talking about, you know -- we will follow the order of the chapter here. We've talked about physical contamination.

They talk there about the issues regarding the type of swab that's used, and how Dubowski and others had determined that if you use a swab containing ethanol that that can falsely elevate the reported result?

A. Correct.

Q. Okay. And that's why the person who draws the blood is supposed to use a povidone iodine swab, correct?

A. Correct.

Q. Now one of the things that -- I'm sorry, do you have the exhibits or -- (unintelligible).

One of the things that the officer testified to and is contained on here is the expiration date of the kit -- you are aware that these kits come with expiration dates?

A. I am aware.

Q. And the kits have an outward expiration date, but then also the contents inside the kit have an expiration date also, correct?

A. Correct.

Q. The Vacutainers have an expiration date also, the little tubes, right?

A. The expiration date on the Vacutainer is with regards to not the contents within it but to the vacuum of the tube. The company found out that it loses its vacuum after a certain period of time. So the expiration date corresponds to the tube and not the contents within the tube.

Q. And then also those little swabs, they have basically like a -- I want to say Braille but it's not in Braille, but basically an embossed -- an embedded expiration date on those, also?

A. Yes, sir.

Q. And to your knowledge nobody inspected the swabs that were used in this particular case, correct?

A. Well, yeah, who we bought the kit from inspected it.

Q. Did anybody make -- what was the expiration on

those -- on those swabs, can you tell me?

A. No. Because I wouldn't open the kit. The kit comes sealed.

Q. So we could write that down, someone could put that information down, correct? They could look at it and say, oh, this was the expiration date on this swab?

A. That's not required by the Board of Health, Rules and Regs.

Q. Well, I'm not asking if it's required. I'm asking if it's something that could reasonably be done?

A. Anything can be done. Anything's possible.

Q. And in fact that's not done in this instance, right?

A. No, it's not protocol.

Q. And as a matter of fact, those swabs are thrown away at the conclusion of the process; they are not saved?

A. The blood draws that I have been involved with have been at Denver Health Medical, and I have seen them thrown away, yes.

Q. So in terms of one being available for any sort of testing or any sort of confirmation, those are gone forever. Nobody can look into those and make sure that they were what they were supposed to be, right?

A. Well you would be the first person in 25 years that ever asked to have that tested.

Q. Well are you aware that there has been testing in Illinois on povidone iodine tested as disclosed alcohol?

A. No, I don't work in Illinois.

Q. But you do try and keep up with things like that and do try and have knowledge regarding whether or not there's issues like that?

A. Only if it's peer review and published.

Q. Well you also have conversations with other forensic scientists, right?

A. You know, I only know one from Illinois. She's actually seeking a job in Colorado. So when I leave here today I will confirm that with her.

Q. But those are gone at this point, correct?

A. Pardon.

Q. To your knowledge those are gone?

A. Yes, sir.

Q. And one of the things that's -- when the sample comes in we're talking about -- we talked about the fact it has a vacuum -- that vacuum is supposed to draw a certain amount of blood in, correct?

A. Correct. The amount depends on the person drawing the blood. I have seen them full, and I have seen them half full, and I have seen them less than a mil.

Q. And the amount that's supposed to be drawn is 10 millimeters, right?

A. The desired amount, yes.

Q. That's what the vacuum is designed to do is between 9 and 10 millimeters?

A. Correct.

Q. And in terms of Mr. Shook's sample, was there any sort of determination as to whether or not we had -- what the volume of the -- of the sample was within the Vacutainer?

A. Can you please provide me with exhibit 1? I think you took it. If there was less than the required amount, it would have been in, discrepancies and comments. Generally if we have a half a tube or a mil, it is there. And I know for a fact, Mr. Herringer, you picked up the second sample, and if there was not that much in the tube --

Q. I didn't pick up anything.

A. Well, Rocky Mountain Labs picked it up and if there was a discrepancy --

MR. HERRINGER: Your Honor --

THE WITNESS: -- it would have been noted.

THE COURT: Can I ask a favor, it feels a little argumentative to me. Could you just answer the question he's asking, and then I promise the D.A. is going to stand up --

THE WITNESS: Yes, ma'am.

THE COURT: -- and ask you any other information.

THE WITNESS: I'm sorry, ma'am.

THE COURT: That's all right. You don't owe an

apology, but lets just keep it to the questions that are asked and the answers --

BY MR. HERRINGER:

Q. First of all, I'm asking about the sample that you tested in your lab.

A. No, there's no discrepancy.

Q. Okay. Basically what you are relying upon is you are relying upon somebody else -- your assumption that somebody else did their job properly, right?

A. Well it's standard operating procedure, yes.

Q. But there's nothing -- you didn't personally do that, right? You weren't present?

A. Personally --

Q. You weren't present when this took place?

A. When what took place, sir?

Q. The inspection of this tube.

A. No.

Q. And there's no documentation of the tube. Your lab doesn't take additional photographs or anything like that?

A. No, it's saved in the laboratory for a year.

Q. Did you go in and look at it before you came and testified?

A. Prior to coming.

Q. You went to the lab and looked --

A. Yes, I always do because it's going to be dumped.

It will be dumped in December approximately 2009.

Q. Okay. And where in anything that you've provided to us that it make any sort of notation regarding the fact that you physically inspected this?

A. I don't have to document that I physically inspected it. It's protocol for me. And I tell you why, because I want to be able to answer that question truthfully that I did. So we have a room specifically designed to store samples for the Board of Health, Rules and Regulations, so to pull it out is very easy. It's got this tox number. The trays are numbered by the numbers, a range, pull it out of the refrigerator, go by section to that number, pull it up, and look at the tube and the side of the tube.

Q. But my question was did you do anything to document that, to provide notice to either me or the prosecution that you had performed that function?

A. I did it yesterday morning.

THE COURT: So the answer would be no.

BY MR. HERRINGER:

Q. The answer would be no?

A. No.

Q. And in terms of that, you did that -- said you did this thing that we are told now that nobody knew about -- but in terms of that you did that you said yesterday, right?

A. Yes, sir.

Q. Now the physical handling of the sample, that was all done by a person in your department by the name of Joel Faye?

A. Yes.

Q. And Joel Faye is a blood analyst, right?

A. Yes.

Q. It's true that Mr. Faye does come to court and testify regarding his work in your lab?

A. Yes.

Q. In one of these runs what Mr. Faye would do is he would be working with a large number of samples, around probably 40, 50 samples at a time, is that fair?

A. No more than 50.

Q. And what he does is essentially he goes through this process that you talked about. First he has to obtain the sample and then before he tests it he's supposed to mix the sample, correct?

A. We don't hand mix it. It's on an inverter.

Q. So it's supposed to be placed on an inverter and mix it?

A. Correct.

Q. And that's your standard operating procedure, but you don't necessarily have any individual way of confirming that that happened other than that's what's supposed to happen?

A. In this case, no.

Q. And the reason that you mix the sample is to make

sure that it hasn't separated, specifically because one of the things that can happen when it separates is the red blood cells can move towards the bottom and that can create something that's more similar to serum or plasma on the top as opposed to a straight blood sample, correct?

A. Correct.

Q. And the problem with having something that's more like serum or plasma on top is that serum or plasma has a higher blood alcohol concentration than whole blood?

A. Correct.

Q. And what you're supposed to test, you're supposed to test whole blood?

A. We can test either.

Q. But in terms of blood alcohol concentration for a case like this you are supposed to test whole blood?

A. If all we have is plasma -- the answer for this is yes, in this case we test whole blood, but not solely in the case of our procedure because sometimes only plasma is drawn.

Q. I understand that. There can be instances where you get plasma.

A. Correct.

Q. But the purpose of mixing is to make sure that you don't have that separation?

A. Correct, and plus you want it fairly mixed before you analyze.

Q. And also that's something that the blood drawer is supposed to do when they take the initial collection of the sample, correct?

A. That would be correct.

Q. They are supposed to -- specifically you're familiar with the company Bedadictine (phonetic) the company that makes the Vacutainers?

A. Yes.

Q. What they say is a person is supposed to invert the tube 8 times after collection of the sample in order to mix in the anticoagulant and mix in the preservative.

A. Correct. It's more important in the anticoagulant, because I can tell you if they don't, then the blood clots and we are unable to analyze it.

Q. Okay. And in terms of whether or not this sample was inverted the proper number of times, there's no documentation regarding that. The person didn't write that down on that exhibit that you have there or anything like that?

A. That would be correct.

Q. As we continue with the article on physical contamination you would agree with me that there are -- besides just, you know, alcoholic beverages, there are a large number of things in our world that contain ethanol?

A. I would agree.

Q. And one of the things ethanol is used -- it's

particularly effective for is a sterilizer, it kills bugs pretty well, right?

A. You're correct.

Q. So one of the things it's commonly used in is the hand sterilizers?

A. Correct, about 60 percent.

Q. And you don't know whether or not this person who was handling Mr. Shook's blood sample, whether or not she cleaned her hands with any sort of hand sanitizer or anything like that containing ethanol?

A. No, I don't.

Q. We've talked about some of this more generally. I'm going to talk to you a little bit about the section B of 10.3. The first thing it refers to is -- first thing I am going to refer to is the comment regarding a statement, author by the name of Corry. This is on page 277. "It has been recognized for some time that ethanol can be produced by many different microbes under favorable conditions." Would you agree with that statement?

A. I certainly agree with favorable conditions, yes.

Q. And then it says, "For significant alcohol to be produced, a microorganism capable of producing alcohol must be present in sufficient numbers, appropriate substrate must be available, and the temperature must be appropriate." Correct?

A. Correct.

Q. I want to go to page 280, section 10.4. First it talks about the historical use of sodium chloride as a preservative to prevent the growth of microorganisms. And to be fair, microorganisms can cause both the loss and the gain of ethanol -- there's some microorganisms that eat ethanol, feed on ethanol and result in a lower result, and there's some that eat substrates, things like sugar, and then can produce ethanol, is that a fair statement?

A. That's fair.

Q. And it talks about the importance of using sodium fluoride in samples from living people in order to prevent that?

A. Correct.

Q. I want to talk to you a little bit about the manner in which -- we talked about the fact that your lab does not use -- does not make any sort of -- take any sort of picture or any sort of media, digital documentation regarding the condition of the sample. You're aware that certain labs do that or one of their processes is when it comes in they will take a picture of the box and the samples?

A. No, I don't know of any lab that does that.

Q. You have never heard of that?

A. Oh, I have heard of it, but personally I don't know of any -- I have never reviewed a data packet from another lab in Colorado that I have seen a picture.

Q. You know that Dr. Jones' lab actually does that.

Have you heard that?

A. No.

Q. Or you're not familiar with it?

A. I have never reviewed anything from Sweden. So I didn't know that.

Q. You've heard him speak, right?

A. Correct.

Q. I am sure he has spoken to you regarding the importance of preservation, and avoiding the contamination, and that's an important issue in your field, right?

A. Correct.

Q. Likewise, you don't have any sort of bar code tracking, computer tracking that goes on? You are aware that sum labs use scanners now that basically they can put a bar code on there?

A. Yes, we do have a number.

Q. Do you have a scanner on there?

A. It's not a scanner, but it can be scanned by a computer if we wanted to but we don't. We enter this number. This number follows it all the way through. So the sample is never identified by anything but that number. We don't care about the name anymore but that number.

Q. All right. I understand. But I am just saying different labs will use a scanner coding mark like that, but you apparently you can do that, but you are not presently doing that,

is that right?

A. Well that would never be approved by the Governor, no, that costs money. No. I'm a state agency.

Q. We talked about the fact you have -- you and I talked about it but I am not sure if we talked about it today. You have one gas chromatograph in your office, correct?

A. Yes, we have two that run blood, and one that runs urine and toxic vapors.

Q. And when you run your samples, you said that you test on two different samples. First of all, you have the same analyst, at least in this instance, doing those tests, right? You don't use separate analysts to run the test, to prepare the sample and --

A. For this case?

Q. Yes.

A. No, only one analyst.

Q. And you would agree with me that if somebody is doing something incorrectly and they are doing it repeated, one way you can avoid having duplicate error is to have somebody else perform the same procedure?

A. I think, you know, if we had the resources for that, I think that would be a great idea.

Q. And that's actually that's -- some would have to use that as one of their quality control protocols, right?

A. I think there's a lab in Wisconsin that does that.

Q. And likewise, another thing that can be done is you can have one sample run on one gas chromatograph and one run on another gas chromatograph. So you can run it on different gas chromatographs so you can see whether or not -- you know, compare whether or not there's something going on with the machine that might be an issue, right?

A. Yeah, if you had the luxury of doing that, yes.

Q. And again that's something that some labs do and it's basically an extra measure of safety and quality assurance, right?

A. Yes, it can be.

Q. I want to talk with you about how this instrument works.

MR. RICHARDSON: Your Honor can we approach?

THE COURT: Yes.

(Off-the-record discussion)

BY MR. HERRINGER:

Q. You probably can't recognize this but these are meant to represent headspace vials, and headspace vials, just to orient the jury, those are the vials that contain the actual sample of the person's blood for purposes of testing, along with some other controls and other things, but that's what the blood would be put in for testing?

A. Correct.

Q. When you get -- when it first comes in, it comes

in the little tube, that's what we are referring to the Vacutainer tube --

A. Correct.

Q. -- and then gray stopper tube, right? So it looks like something -- it has to be removed from this tube, and then a portion of it's put into the headspace vial, correct?

A. Correct.

Q. And you are going to have a portion of this put into one headspace vial and then a portion of this put into another headspace vial, correct?

A. Correct.

Q. And then you add some other things. You add -- I believe you add a buffer and then you add also --

A. No. The only thing that's added is water and then propanol.

Q. Okay. The water is not considered to be a buffer I guess?

A. No.

Q. So distilled water I assume?

A. Yes.

Q. And propanol? And then this thing is sealed with a cap on top, correct?

A. It has a gray topper and then a metal cap.

Q. Then you crimp it on?

A. Correct.

Q. And then the same thing would happen here?

A. Correct.

Q. And I want to be sure that we are clear on what happens here. This down here is not tested directly?

A. No.

Q. The actual fluid is not tested directly. What happens is a needle comes down off the machine and punctures this top and goes into here into the headspace. And what happens is this little vial is heated up, which causes a vapor to be present in here at a certain concentration, and then this needle sucks the vapor out, correct?

A. Correct.

Q. Okay. And that's what's known as headspace because this area here is the headspace. It's basically the area above the substance that you actually are trying to determine the concentration of the volatile, correct?

A. Right. You would never inject the blood into an instrument.

Q. And then this needle will be removed by the machine. This is all happening automatically. You don't have Mr. Faye or somebody else there sitting there pulling the needle out and putting in the next thing --

A. That's the old school.

Q. Okay. So you don't have -- this needle comes back out, and then it's cleaned, and then it comes back down, and it

goes down, and it tests the next vial, correct?

A. Yes, sir.

Q. And I don't mean this in a pejorative way. It's going to sound pejorative because I don't know how else to -- but the machine is essentially a dumb machine. It has to be taught what it's looking for, right?

A. It's all programmed, yes.

Q. And that's the purpose of putting in calibrations and things like that, is to basically teach it what alcohol looks like for this particular run that you're going to go through?

A. We set parameters.

Q. The result -- we are looking at Exhibit 2. Actually I will get my own copy so you can follow along. The result there, and it's reported as a .239, it's not reported with any sort of margin of error regarding the machine, correct?

A. That's correct.

Q. And you stated basically when you are running the test that things have to agree within 5 percent, and that's testing the same sample it has to be within 5 percent, that it's now within 5 percent, you throw out that particular test?

A. But there is variability also that scientists look at between labs and that would be 20 percent.

Q. And that's basically recognizing the difference between, you know, one lab to another. I mean the machine -- no machine -- even the atomic clock has to be adjusted occasionally.

No machine has absolute, you know, perfect measurement capabilities. You would agree with me regarding that?

A. Well, yeah, but I would agree -- I would agree with you that but I call it an instrument.

Q. An instrument. Fair enough.

And I assume as a scientist you are familiar with the concept of uncertainty?

A. Well, yes, it's with ISO.

Q. And basically what is recommended is that laboratories build what's known as an uncertainty budget. Are you familiar with that term?

A. Yes. It's called validation of the process.

Q. And basically an uncertainty budget takes into account the different -- not just the margin of error on the machine, but all the things that could happen in the handling process, assigns the values for how much potential error that can introduce into the system, and then you add up those numbers, and you come up with an uncertainty reporting?

A. Yes, sir.

Q. And in terms of -- you are familiar with NITS, which is the National Institute of Standards, correct?

A. Traceable standards, yes.

Q. And you are familiar -- you referenced ISO --

A. Yes.

Q. -- which is International Standards Organization,

is that correct?

A. Yes.

Q. They recommend that reporting a result like this, that you report also regarding the uncertainty, right?

A. If you are ISO certified.

Q. Which you're not presently ISO certified, right?

A. No, and I wouldn't be seeking ISO.

Q. I assume you are familiar with the National Academy of Sciences?

A. Yes.

Q. And I imagine you are also familiar with the recent report that came out in the National Academy of Sciences?

A. Correct.

Q. And one of the things that was a report criticizing the manner in which forensic science is being conducted throughout the country, right?

A. Correct.

Q. And one of the things they recommended is that when reporting results, is that uncertainty is something that needs to be acknowledged and reported in the actual results?

A. Yes, but there are parameters to meet to get to that.

Q. It's not an easy process. It's something that has to be developed. It has to be evaluated. It has to go through and then has to be reviewed, right?

A. Absolutely.

Q. And at least at this point you're not in a position where you are yet reporting that uncertainty as part of your results?

A. That would be correct.

Q. And also one of the things that also is introduced -- I mean, there's uncertainties also that you have no controls over. I mean, we are talking about the uncertainty within your laboratory, but then there's also, if you were really going to look at the entire uncertainty of the process, results in the uncertainty of the collection process, the handling process, the transportation process, and all of those things that go along from start to finish, basically from vein to the paper that's ultimately presented, correct?

A. Well, if you are looking at the big picture, yes.

Q. And you've talked a little bit about A.W. Jones, also known as, Wayne Jones or Dr. Jones, one of the things that -- one of his mantras for criminal cases is that when you are doing a criminal case you always want to provide the criminal defendant with the benefit of the doubt, right?

A. Yes.

Q. You have heard him say that before?

A. Yes, I have.

Q. And so what he talks about is in terms of when you have an uncertainty -- now certainty is going to be reported as a

plus or minus, generally, correct?

A. I have seen it reported as that.

Q. But also you report an uncertainty that is basically -- reports just what the minus value would be, and that's what you would do if you were looking to say, okay, what's the lowest that this could possibly be under the circumstances, right?

A. Yes.

Q. Of your blood alcohol test, how much of that is done on behalf of law enforcement?

A. Blood alcohol? Oh, we do do some defense work on the western slope. We have been sent samples in the metro area where the sample that has been analyzed has been tested at either Rocky Mountain or Chematox or Forensics, and they want it tested in our lab for a second opinion.

Q. And what I am trying to get at is I understand you do some testing like that. I am trying to figure out what portion?

A. If I was thinking percentage wise, I would say it's probably 90 percent law enforcement, 10 percent other.

Q. And would "other" also include those things like, you know, mom and dad who find the pill underneath the bed?

A. No. It would include coroner fatals, fatals from the coroner's office.

Q. From the coroner's office. Okay.

One of the things you stated that you don't have any certifications -- actually I will withdraw that question.

MR. HERRINGER: If I can have a second, judge?

THE COURT: You may.

(Pause.)

MR. HERRINGER: I believe that's all I have. Thank you for your time Ms. Burbach.

THE WITNESS: You're welcome, sir.

THE COURT: Thank you, sir. Redirect?

REDIRECT EXAMINATION

BY MR. RICHARDSON:

Q. Okay. Ms. Burbach, we covered a lot of ground when you were speaking with defense counsel. When you were talking to defense counsel about the contents of the tubes prior to them being filled with blood, the Vacutainer tubes, could you just -- I guess a couple of clarification questions.

Do the contents of those tubes effect the blood alcohol content of the blood that's in the tube, does it effect that value at all?

A. The sodium fluoride or the sodium oxalate? No.

Q. And I think you testified that if they weren't present then the blood would clot, is that correct?

MR. HERRINGER: Your Honor I ask that he not lead the witness.

BY MR. RICHARDSON:

Q. What if those items were not present, what would -- what would likely happen?

A. Well if the oxalate wasn't present, and it has happened, it's happened in a tube that was not a gray top, that did not have the preservative with the oxalate, the blood came in kind of like rubber.

MR. HERRINGER: She is speaking softly. I can barely hear her.

THE WITNESS: I'm sorry.

MR. HERRINGER: I want to make sure she's on the record.

THE COURT: She's on the record, but I need you to speak up, too.

THE WITNESS: Yes, ma'am.

If -- when this happened, when it's been a drug facilitated sex assault, and they're checking for alcohol, and it's a purple topped tube, instead of a gray top, and there was not any oxalate in there, then essentially what I have seen happen is the blood rubberized. It clotted and it was essentially just a big rubber glob inside the tube.

As far as the sodium fluoride, if it's not refrigerated, and if there's bacteria present in the collection process or in the person themselves, they would have to be sepsis, then potentially you could probably get contamination, and it possibly could produce ethanol. But in 25 years I've

never seen it happen, but you know, everything is possible in science.

BY MR. RICHARDSON:

Q. So how probable would you say that is that there would be contamination?

A. Not likely.

Q. If they were so full of contamination or the chemicals that are present in the tube were not there, how would the analyst know it?

A. Well we wouldn't know, but I know how you would know it. Because lets say you had bacteria in the tube and it's not going to stop producing. If you read the literature and it says that candida albicans, the preservative is not going to stop that. Then when that second tube is analyzed, that ethanol is going to be higher because it's still producing ethanol. So there's two independent tubes, there's our tube and then there's the other person's tube.

MR. HERRINGER: Objection, same issue, not appropriate comment for the witness, and I ask the District Attorney make sure we don't go there again.

THE COURT: Well he didn't ask a question that implied that answer, so carry on. Objection overruled.

BY MR. RICHARDSON:

Q. And to your knowledge based on what you know and your review of the blood that was tested here, did it appear that

there was the presence of contamination based on what you know?

A. Based on what I know and the whole review of the packet, no.

Q. And would there be some indication somewhere in the packet if there had been contamination?

A. In this packet, no, but the big picture I know.

Q. Explain what you mean by big picture?

A. I think the Judge said that I could not talk about it.

Q. Oh, okay. All right. The defense brought up a lot of issues. I want to talk about contamination from hand sanitizers. Have you in your experience, in your training and your knowledge, have you ever seen or do you know of a phlebotomist ever doing a blood draw with their bare hands?

A. No, I haven't.

Q. What do they typically wear?

A. Gloves.

Q. In your training and experience, have you ever come across a blood sample that had not been properly mixed?

A. Yes, and that would be a nongray top tube. It was a drug facilitated sex assault, purple top, and it came in rubberized. So I know it wasn't properly mixed and didn't have the oxalate.

Now sometimes even if it doesn't have the oxalate but they properly mixed it right afterwards, then you know, we

have some time before it clots. So -- but it's been a nongray topped tube that's required per the Department of Health, Rules and Regs.

Q. And what color topped tube did this tube have that was tested?

A. Gray top.

Q. What's the significance of the gray top?

A. It's a forensic tube.

Q. And in your training and experience, have you ever known an analyst not to place the vial on to the machine that mixes it?

MR. HERRINGER: I'm going to object Your Honor. I think that's beyond anybody's possible knowledge whether or not --

MR. RICHARDSON: Your Honor I asked what she knew.

THE COURT: Ask her if she does know and then she can testify to what she does know.

BY MR. RICHARDSON:

Q. Ms. Burbach do you know if -- or would you know, I guess, yes or no -- would you know if an analyst had not properly mixed a tube before its analysis?

A. I only know about my lab and I know that that doesn't occur.

Q. At your lab?

A. That's correct.

Q. How do you know that?

A. Well because I walk around, and I walk in, and I have been in all processes. And we have this thing called on-the-spot training. It's part of the training program where I walk in or the senior analyst, and see, observe what they are doing. And I have walked in and out of the blood alcohol lab when Mr. Faye is prepping. And I've come at -- I work 8:30 to 5. He works 6 to 2:30. So I have come in at 5:30, and when he's prepping, walked through to see what he is doing and how he's prepping.

He has not known that I am there because he wears an iPod, and the ear phones were in his ear while he was getting the tubes ready and I looked over under the hub and they were on the little what we call the mixer, it's a little flat electronic thing that pulls the samples back and forth.

Q. Would there ever be a reason not to place a blood sample on that mixing device?

A. The only reason would be is if he didn't follow standard operating procedure, and then he would be disciplined.

Q. In Mr. Faye's time with your lab have you ever known him not to follow the standard operating procedure?

A. No, he's a Type A, that would never occur.

Q. Okay. And based on your knowledge of this case, your review of what you know personally, do you know -- do you have any reason to believe that the standard operating procedure

was not followed in the case in the testing of Mr. Shook's blood?

A. I have no reason to believe that it was not followed.

Q. You feel like if it had not been followed you would have some indication of that?

A. If it was not followed, and I didn't walk through, I probably would know it. But there's multiple people walking through, not only myself, but the work leader and other chemists that have to go through there. So I think if it happened one time maybe I wouldn't know or we wouldn't know, but if a person is going to do it one time and take a short cut, they are not just going to do it one time, they are going to do it all the time, and it would eventually be caught.

Q. I want to talk to you a little bit about blood kits. You testified a little bit about expiration dates and what they mean and expiration dates on the inside of the contents, things like that. In your experience -- in your 25 years of experience, have you ever personally encountered a kit where the outside expiration date was not expired but the contents of the kit were expired?

A. Oh, absolutely. It actually happened in November. I got a call from I believe it was Louisville Police Department, and he said the tubes inside say, November, 2008, but the box says May, 2009.

And he said well, really, can you send me a box.

And I called Fairfax, and I said, I have a box. I'm going to Fed Ex it overnight. Tell me how this happened.

He called me the next day and he said, well I found out how it happened. I went back and the quality control process and the person that was running the -- changing the date --

MR. HERRINGER: Your Honor I object to secondary hearsay, and also I think we are kind of far afield. She can say she's seen it happen --

THE COURT: Sustained.

MR. HERRINGER: -- and I don't think we need to go much further.

MR. RICHARDSON: Okay. May I have just a moment Your Honor?

THE COURT: Yes.

BY MR. RICHARDSON:

Q. Ms. Burbach, we're talking about -- when you were talking about the different samples that were tested, as part of the normal testing procedure, defense counsel asked you about a range of results, and I guess just for clarification for myself, why -- how is it that you addressed this issue about possible range of results in a blood test?

A. Well, because -- well I'm not ISO certified and ISO is more of a crime lab certification. So I don't think I have received that. But the range is addressed internally in our quality control. I have an entire range within the two samples

and then the outside range between two labs is 20 percent. So we stay within the American Board of Forensic Toxicology accreditation.

I have seen reports with the uncertainty, but that is addressed in a crime lab, and eventually the FT will probably go ISO but not for four years, and then I will put it on my report, but it's not required for me to do it because I can show it in the litigation packet that I'm just as tight on my numbers.

Q. And just a clarification for the jury, when you get the two -- is it two or four results?

A. Four results.

Q. Four results. And are those results, of the four that you get, which one is the one that's the published result of the test?

A. Well, they are averaged, and then it's rounded down. So the -- on the worksheet you'd get the result that's the lowest.

Q. Lastly, are you a law enforcement officer?

A. No.

Q. Do you work at the discretion of law enforcement?

A. No.

Q. Does the Colorado Department of Health and Environment have any association with law enforcement, any official association with law enforcement?

A. No.

Q. If you know, do law enforcement entities in Colorado go elsewhere to have their blood or urine samples tested?

A. They absolutely do. There's two other labs, King Tox and Rocky Mountain.

MR. RICHARDSON: Thank you. No further questions.

THE COURT: Any recross, sir?

RECROSS-EXAMINATION

BY MR. HERRINGER:

Q. You're not law enforcement -- I am correct, you are married to a law enforcement officer though?

MR. RICHARDSON: Objection, Your Honor, this is not relevant.

THE COURT: Please approach. Please approach. Please approach.

(Off-the-record discussion)

BY MR. HERRINGER:

Q. I'm sorry, let me repeat the question. You are married to a law enforcement officer?

A. Well, actually I'm getting divorced.

Q. I'm sorry.

A. Thanks for bringing it up.

Q. Now in terms of the various factors that enter into this, you would agree with me that there is human error?

A. I do.

Q. And you would agree with me that the fact that something is unlikely does not mean that it didn't happen?

A. Well I agree with that.

Q. And you would agree with me that also that there can be two types of errors in forensic testing, errors which can occur and can be backtracked and can be identified, correct?

A. That's correct.

Q. And then there's errors that can't necessarily be backtracked and identified?

A. That would be correct.

Q. So, like, for an example, if you have a sample and that sample is contaminated in the first instance, it doesn't matter what you do in the laboratory possibly to identify that, I mean, if there's been alcohol introduced or an outside substance you might not ever be able to tell that what you're testing is higher than what it should be?

MR. RICHARDSON: Objection, Your Honor. This question calls for speculation.

THE COURT: Please approach.

(Off-the-record discussion)

THE COURT: Do you mind reasking the question.

MR. HERRINGER: That's fine Your Honor.

BY MR. HERRINGER:

Q. In terms of the -- my question was if ethanol was introduced into a sample externally and that falsely elevated the

result, if that happened in the first instance, you might not necessarily be able to determine that?

A. That would be correct.

MR. HERRINGER: Ms. Burbach, I don't have any other questions, and I apologize for bringing up a tender subject for you. I did not mean to hurt your feelings. I apologize.

THE COURT: Ladies and Gentlemen do you have any questions for Ms. Burbach? If you do, you are welcome to right them down and the bailiff will come pick it up. Thanks.

Counsel please approach.

(Off-the-record discussion)

THE COURT: There's a question but it's not for the witness. The jury does get to see the exhibits that are admitted.

So I have two questions for you, Ms. Burbach.

THE WITNESS: Yes, ma'am.

THE COURT: Were all the samples tested per this case within the plus or minus 5 percent tolerance on the first run?

THE WITNESS: Yes. In the whole batch everything is within the tolerance and then anything that falls outside of that is a redo, and then there and then there will be in bold that it's going to be redone that day or the day after.

THE COURT: Thank you. If you could look on one of the exhibits, I don't know if it's 2 or 1, but what was the time

of the sample that Mercy Hospital has shown on the exhibit, the state toxicology report?

THE WITNESS: The collection date -- the time of the collection?

THE COURT: The time of the collection, please.

THE WITNESS: Let me get my glasses out again.

The blood was collected on 12/2/08 at 2:10:00 a.m.

THE COURT: Thank you. D.A. do you have any further questions based on the jury questions?

MR. RICHARDSON: I do not Your Honor.

THE COURT: How about you Mr. Herringer?

MR. HERRINGER: Nothing additional Your Honor.

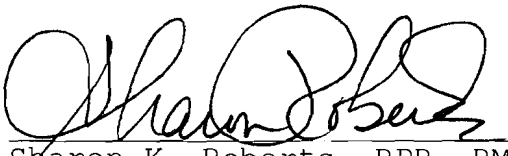
THE COURT: Ms. Burbach, thank you for your time and testimony today. You are free to step down.

(Conclusion of Proceedings)

TRANSCRIBER'S CERTIFICATE

I, Sharon K. Roberts, RPR, RMR, do hereby certify that the foregoing proceedings were reduced to typewritten form by me, personally, from a digital taped recording of proceedings held on May 21, 2009, in the County Court, La Plata County, Colorado, in Case No. 08T1969 entitled, People vs. Jeffrey Shook, and the foregoing is a true and correct transcript of the digital taped recording to the best of my ability.

Dated at Durango, Colorado, this 11th day of June, 2009.



Sharon K. Roberts, RPR, RMR