semantics, but you're talking about a more subjective approach than counting -- excuse me, than having a set standard to which, for example, on an eight, I must find, as an examiner, eight matching striae before I can say it's a match. You don't have that?

A. We don't use that, no.

Q. But there is such a test out there?

A. Yes. CMS.

MR. HUMPHREY: I'm sorry, Judge.

THE COURT: No, I just was coughing. I wasn't trying to suggest that I disagreed with your question.

MR. HUMPHREY: No, you wouldn't. I'm sure you wouldn't, Judge.

Q. We're talking about when you're looking at these items of evidence, whether they are -- well, in this case, you looked at -- I think under the prosecutor's direct examination you looked at what we have -- as you've explained, cartridge casings or spent cartridges, a frag- -- fragments of lead and fired bullets; is that not correct, sir?

A. Yes.

Q. Now, when you looked at those items, either without the aid of a microscope or with the aid of a microscope or with some other instrument, you were looking at those items on a two-dimensional plane, were you not, sir? As opposed to three dimensions?

A. When I'm looking at them without a microscope?

Q. Yes. Well, yeah, that's a good question. When

you're looking at them without the microscope.

A. That's three-dimensional.

Q. Because you can turn them over?

A. Well, you have two eyes so you have a perspective view. You can see the objects in three dimensions.

Q. What about when you're looking at them with a microscope, sir?

A. Well, you're looking at an image that's still projected on your retina that is perceived -- you have a perception of depth because of the way we light the items, and so I would argue it's still perceived as a three-dimensional image.

Q. An inartfully asked question. You're not looking at the back side of the cartridge casing, sir, when you're looking at the front side, are you?

A. No.

Q. So in that sense, it's two dimensional, is it not?

A. Well, I don't see your back side right now but you're three dimensional.

Q. I'll be happy to show you my back side. No. Just kidding.

Okay. But there is a -- is there not, there is a technology that allows you as a toolmark examiner and firearms expert to look at the items we've talked about -- casings, fragments, and bullets -- in three dimensions realtime?

A. Yes.

Q. Do you know the name of that technology, sir?

A. Well, there are a number of different technologies that are out there that actually have been involved in scientific research into --

Q. You have?

A. I personally have not been involved in such research. Members of my staff have.

One instrument is called a confocal microscope. A confocal microscope can essentially scan the topography of the surface of a bullet and so you're looking in a three-dimensional -- you get a three-dimensional image from that.

There's also laser scanning in which the laser takes these tiny measurements and you can get a profile from the surface of a bullet, for example, and look at the toolmarks from a profile perspective.

For many, many years there's been a machine called a profilometer which is used in engineering to look at profiles of surfaces. And that's more like a stylus system in which a tiny stylus will be dragged across the surface, and as it moves, the movement is amplified just kind of like a record and you get a series of peaks and valleys which -- and analyze the surface.

So there are quite a number of different ways to do a three-dimensional topographical analysis of toolmarks.

Q. None of those ways are employed by the Oakland Police Department Crime Laboratory Firearms and Toolmark Recognition Division, sir?

A. No. We do not use that, no.

Q. Okay. As you look at a -- two casings, as the casings from -- that you were asked to look at in this case from the Terrance Brown crime, and I think the other one is entitled "Jackson Melissa - Hooper - Brown Dominique." I think that's the way yours is.

A. Yes.

Q. If you were to hold a casing in your right hand and a casing in your left hand and you were to compare those, you could turn those over, could you not, in your hand and determine if you can see anything with the naked eye before you employed an amplification device?

A. Well, my eyesight is not what it used to be. But certainly an initial examination, you would look at the casing and you could see things at least like the headstamp.

Q. Sure.

A. And make note of that. And some -- some markings are gross enough that you can see them with the naked eye.

Another stage is we have a stereoscope which is basically a microscope in which we can get a magnified -- we can look under this stereoscope and look at a larger -- look closer at a cartridge case.

The comparison microscope is really just simply greater magnification and a means to mount and manipulate precisely to look at much closer small areas.

Q. Sure. And that was going to be my next question, sir. If you were to take these same two cartridges that you looked at and either found or did not find significant imperfections and you put them in your comparison

microscope, how much of the surface of a cartridge would you be looking at? You indicated a small surface, a small amount of surface?

A. No. Initially I would look at the whole surface so I would rotate it. I would look at the whole surface and essentially it's a search. At that point you're searching for areas in which you want to concentrate where there are markings and see if that marking is on the other casing that you're comparing.

Q. It's called phasing?

A. Phasing is more you would relate to bullets because bullets have a certain number of grooves in them, and so phasing would be -- you know, you could have groove 1 to groove 1, groove 2 to groove 1, move it around, groove 3 to groove 1, so there's a number of different combinations you could have.

In that case, you're looking around the whole bullet. You're looking for a mark and then you're looking for the same mark on the other bullet.

So what I would do is I would take the one bullet, look at the -- a groove impression, see if it has any marks that maybe I could look for on the other bullet, and then I take the other bullet and I phase it.

So I look at each groove impression, land impression, I keep rotating it and see if I can find that same mark on the other bullet. That's phasing.

Q. Okay. So you were moving your hand as if you were turning something when you were explaining phasing. But

back for a minute to the cartridge casings. As you put them in the comparison microscope and before you move them, you're looking at how much of -- because these are round, are they not?

A. Yes.

Q. So they are three -- the object exists in nature in 360 degrees?

A. Yes.

Q. How much of that 360 degrees, sir, are you looking at with either side of that comparison microscope? 180 or less?

A. The microscope has a -- a number of magnification settings, so on the lowest setting or maybe the next setting up, I can see the entire casing and so that would be 180 degrees of the casing. If I didn't move it, I could see half of it.

Q. So it's either 90 degrees or 180 degrees? Would that be -- generally speaking?

A. Oh, so you're saying how much of the casing can you see at any one time?

Q. Yes. Yes, sir.

A. A maximum of 180 degrees.

Q. Correct. And when you got these items in the comparison microscope -- let's just stick with casings as an example -- and you -- you as a trained examiner with the experience that you have told us about, you don't see anything that appears to you to match from the left side to the right side. Two -- two different casings, correct?

A. If I don't see anything that matches --

Q. Yeah. You don't see anything that to you looks like a pattern?

A. Yeah. Well, that would either be -- if there's an insufficient, then I would report it as there are insufficient marks for comparison.

Q. Okay. But would you not turn one --

A. Uhm-hmm.

Q. -- and leave one alone? Would you turn one around 180 degrees to see if anything on the one on the left matched -- now we're talking about toolmarks now as you've explained under the prosecutor's direct examination. Marks left by the manufacturing process either inherently in the process or because the tool that was used -- whether it's a broaching instrument or -- I mean, we're -- because it became dull, and let's just say that you left the right one alone and you began to turn the left, whether you call it phasing or turning.

A hypothetical situation. As you turn the one on the left, hypothetically, you could find a scratch --

A. Yes.

Q. -- that matched the one on the right that you had not turned?

A. You could.

Q. Now, if you found a scratch that appeared to you to match in width, depth, and length, would that be sufficient corresponding individual -- a sufficient corresponding individual mark for you to find that these

were fired from the same weapon?
A. It depends on what you mean by a scratch. Are you talking about a single line or are you talking about a series of lines that have a spatial separation between them? It's -- I mean, I cannot answer your question -- I cannot say whether it's going to be sufficient for identification unless I actually see an example of what kind of mark you're talking about.
Q. Well, and I -- thank you. Because the question assumed that we're looking at one mark, either left by an extractor, left by the rear -- slight rearward motion of a cartridge in a chamber. But, in any event, you found one. You rotated one but you didn't rotate the other.
A. So when -- let me clarify. When you're saying one, you mean one line?
Q. Well, yeah. I meant one line but what I was saying, you rotated one cartridge -- one casing and found a line. Or let's say you found two lines.
A. Okay.
Q. And you -- and they matched the other -- you -- when you turned them they didn't match until you turned them, but after you turned them you say, Kind of looks alike, looks good to me, would that be a sufficient microscopic comparison?
A. Again, without looking at what you're talking about, but let's assume you're just talking about two lines --
Q. Yes, sir.

A. -- separated and they are similar width, same separation. Two lines typically does not meet a sufficient criteria for an identification.

Q. Even under the pattern testing? Is that correct?

A. That's correct.

Q. All right.

A. Because --

Q. It's not a pattern?

A. Two lines could just occur randomly by chance.

Q. Sure. I guess what I'm getting at, how do you know what's on the back side of the cartridge you did not rotate?

A. Well, when I do my examination, I do rotate and I look at the whole surface.

Q. Okay. So what we're doing is you get this thing and this microscope you told us about with the optical bridge and you're looking at it and you're looking at -- sticking with casings now -- and you keep turning these things around right and left, do you not, sir?

A. Right and left. We turn them head end this way or head end that way. We change the lighting. It's a search. At this point it's a search operation.

Q. Right. It's a search for compatible -- or comparability, is it not?

A. It's a search for a mark that might be of use for comparison.

Q. Well, before you put the items in the comparison microscope, do you make any kind of a mark, a reference

mark, a reagent, or a -- or some kind of a mark on it to let you know where you're starting? What -- what the starting point is?

A. Well --

Q. Do you understand the question?

A. Yes. Yes.

Q. Okay.

A. So you're saying that looking at a cartridge case, 360 degrees --

Q. Yeah.

A. -- is there a reference in terms of, say, 12 o'clock, 3 o'clock that I would be able to refer to the -- another casing.

Q. No, sir. Not so much 12 o'clock only but the starting reference point --

A. Uhm-hmm.

Q. -- where you first put them in the microscope. Let's just assume that you had a method of putting a little laser dot on either one, and as you move them, you can tell that the -- for example, and you found the scratches that you wanted to find, but the laser dots don't line up. You found sufficient scratches but they couldn't possibly be from the same extractor because one's on the left side of the thing and the other's on the right side. Is that possible?

A. Well, that's a vi- -- that is all part and parcel of our search. If I found, for example, I had an extractor mark at 3 o'clock and a chamber mark at 6 o'clock, say, on

one, and then on the next cartridge case I had an extractor mark at 6 o'clock -- sorry, at 3 o'clock but that same chamber mark is over at 12 o'clock, that would be something strange to me.

Q. Okay. But using the clock to give you a reference does not necessarily solve the problem of the -- of the starting reference point, does it, because you could be looking at face -- well, 180-degree face A of the one on the left, something is on 12 o'clock, and you could be looking at the back side of number B, something is on 12 o'clock, but it isn't the same side of the casing. It's the other side. You can't tell, can you, by using clock reference?

A. Well, you can. As I said, you can use other indicators for reference such as the extractor which is always at the same position in the same gun.

Q. Aah.

A. Or pin drag. Ejector mark. They are always going to be in the same relative location. You can then judge your relative locations of, say, chamber marks.

Q. So by using the -- you know, for example, if a -- I mean, you could tell from your experience whether a casing has come out of a 9-millimeter, can you not?

A. Yes.

Q. And just for the judge's and my edification, what very briefly is a 9-millimeter? What does that mean?

A. 9-millimeter is simply the caliber of the gun. So --

Q. In millimeters?

A. In millimeters. So it would refer to in terms of the bore of the gun, if you measure across from the top of the land to the top of the land, it's around about nine millimeters in diameter.

When you're talking about a cartridge, again, the cartridge has to fit in the -- in that particular gun so the bullet's going to be about nine millimeters across, a little bit wider because it gets squeezed down the barrel.

But you can also refer to caliber as the name of the cartridge. So 9-millimeter Luger caliber is the name of the cartridge and that's what, you know, if you were to go -- if you had a 9-millimeter Luger caliber gun, the chamber is 9-millimeter Luger. You go to the store, you wouldn't ask for 9-millimeter bullets because they might not know what you mean. They might think you might mean 9-millimeter short or some other 9-millimeter, but you would ask for 9-millimeter Luger. So that's the name of the caliber.

Q. Because although the bullet is the same because of the measurement between the lands, in other words, the diameter of the -- of the bore of the pistol's barrel, the casing can vary, can it not? That's what Luger means? It's a class of casing roughly?

A. The 9-millimeter Luger is -- it has a specification of case length, mouth diameter, rim diameter. So you can measure all of those and there's certain tolerances but there's a specification for a 9 Luger.

Q. So I could buy, could I not, sir, a 9-millimeter

projectile bullet and not specify Luger and get a different -- possibly get a different casing overall dimension, mouth -- mouth dimension, length, and so forth possibly?

A. You could. But, again, typically 9-millimeter Luger bullets have a specification of weight, diameter. And then the curvature of the bullet, you can usually tell what is consistent with 9 Luger because the curvature is a little bit more pointed than, say, a 380 auto which is also 9-millimeter, but those, the bullet nose is typically rounder. And comes down to design. So you can also make some determinations from design of bullets.

Q. Now, I think you've answered -- at least I think so. I'm trying to remember. My reference point that I was going to put in with the laser dot you've actually seen by an extractor mark. In other words, if you lined up these two casings in the microscope, extractor mark at -- at 9 o'clock and extractor mark at 9 o'clock, you make an assumption that you're -- that the -- that you're looking at the same place on both of those two casings; is that correct?

A. With some caveats. I mean --

Q. Okay.

A. I mean, you could have the -- there may be no extractor marks. Sometimes the mark's not picked up. But if there is, there's a possibility that the cartridge could be cycled through the gun, pick up an extractor mark, then rechambered in the gun so you have an extractor mark in a

different position.

Q. Okay.

A. So there's other things --

Q. But if you didn't have that and you just had one extractor mark on each side, that gives you some kind of a reference, does it not?

A. Yes. Yes. Yes.

Q. Now, when you're lining up these -- when you're looking for these toolmark identifications, a hypothetical for you, Mr. Bennett. You have in your lab -- in your hand a 9-millimeter weapon and you test fire that weapon whatever the number of times that your laboratory dictates. Let's say 20 times. Is it your belief as that 9-millimeter ejects its cartridges, each cartridge is going to have its ejector mark in exactly the same place?

A. If the ejector mark is present. Sometimes it doesn't get picked up, but if it is present, it should be in -- when you say exactly, I mean, there's tolerances. As the cartridge case is extracted, it could very slightly move.

Q. Wiggle?

A. Wiggle room, yeah. So let's say you have an ejector in the gun which would be at, say, the 8 o'clock or 9 o'clock position. An extractor at 3 o'clock, opposite sides. I would expect when I fire that gun that I'm going to get an extractor on the opposite side to the ejector mark.

THE COURT: So relative to each other.

THE WITNESS: Relative to each other.

MR. HUMPHREY: Thank you, Judge.

THE COURT: You could be mindful of the clock in terms of when you want to end or interrupt your cross-examination.

MR. HUMPHREY: Can I have a couple more questions?

THE COURT: Sure.

MR. HUMPHREY: Q. We are not talking about bullets at this stage, but since we're talking about test firings, is it possible in your experience, sir, that the same weapon fired repeatedly enough, whatever that enough is, is going to give you different markings, whether it's on the casing or it's on the bullet? Is that possible?

A. It depends on the firearms. Some firearms give very good repetitive, reproducible marks.

Q. A quality firearm?

A. Not necessarily. It's just on a case-by-case basis. Some firearms, the way they are manufactured, they have a very, very smooth breech face or a very smooth barrel and they don't pick up marks very well. So you could fire three test fires in one gun and a mark might show up on one test fire but it may not be on the others. And that's just because there's a tolerance. The cartridge case is a little loose in the chamber and it either makes contact with a certain surface or it doesn't.

So because a mark is on one case and it's not on the other, it's not really a surprising thing. Some guns, every shot, shot after shot after shot, you get the same

marks showing up every time. So it's on a case-by-case basis.

Q. But if you had a weapon, Mr. Bennett, that always left a mark on its -- let's just say on either a bullet or a casing, it -- if it was that type and you fired it enough, isn't there a statistical possibility that you're going to get different scratch marks, different striae -- can't even talk -- scratch marks, even though it's the same weapon?

A. There have been studies done testing exactly what you're saying there on how do these marks change over time when you fire a number of rounds in the gun. So the studies are being shown -- you know, along the lines of the first test fire is compared to the hundredth test fire compared to the thousandth test fire compared to the five thousandth test fire to see how it changes and if it can change. And basically unless there is some significant change to the gun such as corrosion or deliberate alteration, the marks will persist for thousands of rounds.

Q. What about dirt?

A. Dirt can change the marks. If you get dirt in the gun, then that would be another potential for causing a change to the marks.

Q. And would it be a fair statement to say that every time a weapon is fired there are -- there's residue left on the barrel?

A. Yes.

Q. That residue can, in fact, be -- it's in crystalline form, is it not? Or at least some of it?

A. Residue buildup in guns typically of any significance would be -- today with modern ammunition, you have smokeless powder. It does not leave very much in the way of residues in the barrel. You would really have to fire a lot without cleaning it.

But older guns, black powder and lead, lead bullets like in revolvers if you're using lead bullets, the lead can get smeared onto the barrel and you get what is called leading and that can be a -- that's really more of a significant buildup of residues.

Q. Than dirt would be or some other foreign substance because the weapon was not properly taken care of?

A. Well, you can get dirt buildup. I've seen dirt in barrels. I've seen spiderwebs in barrels. I've seen lots of things.

MR. HUMPHREY: I think, Judge, this would be a good time. Thank you.

THE COURT: Thank you. So will you have additional cross?

MR. HUMPHREY: I do, Judge.

THE COURT: Well, then we'll see Mr. Bennett back at 1:30.

THE WITNESS: Thank you.

THE COURT: Thank you, sir.

MR. HUMPHREY: Thank you, Judge.

(Lunch recess.)

THURSDAY, FEBRUARY 17, 2011 AFTERNOON SESSION

PROCEEDINGS

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THE COURT: We'll go back on the record in the case of People versus Gumaro Baez. We're in the middle of cross-examination.

MR. HUMPHREY: Yes, thank you, Judge.

CONTINUED CROSS-EXAMINATION BY MR. HUMPHREY

MR. HUMPHREY: Q. Mr. Bennett, referring you to what we've called the Terrance Brown report, that would be 8267, Lab No. 5530, Request No. 1, you and I were just talking about that a minute ago before the judge took the bench.

A. Yes.

Q. You have that document there with you, sir?

A. Yes, I do.

Q. Going to page 1, paragraph one, two, three -- four, you indicate that when making the comparison between the WIN or Winchester 9mm Luger and PL1,3 that had the headstamp R-P 9mm Luger, you compared the cartridges with each other and found sufficient corresponding individual microscopic marks to conclude they were all fired from a single firearm; is that correct?

A. Yes.

Q. Now, the sufficiency of your findings, is that listed here in any way other than the adjective "sufficient"? I mean have you -- did you break that out anywhere in this document? Let me reask that.

When you say you found sufficient corresponding

individual microscopic marks, what specifically did you find, sir?

A. On those three casings, as documented in that same set of notes on page 3, I have photographs of comparisons between those casings.

Q. I'm sorry. So what you've given us, sir -- pardon me, I just spoke to the prosecutor for a moment. You've given us photographs; is that correct?

A. The photographs I used to support supporting documentation, yes.

Q. To support your conclusion that there were sufficient -- that you found sufficient marks?

A. Yes.

Q. All right. Now, for Court and counsel, that would be Bates No. 1227, page No. 3 of Lab Report 5330 dated 24th of November, 2008. Correct, sir?

A. Yes.

Q. Now, that is a page that if you look at -- under Comparison, it says, "Left stage, right stage." Is that correct, sir?

A. Yes.

Q. And under that -- well, over on the left side, "Comparison notes mag" -- mag meaning magnification?

A. Yes.

Q. "45X," 45 times, correct, sir?

A. Yes, yes.

Q. And left stage, PL-dash -- I'm sorry, PL-comma-3, that -- if we refer back to the page 1 of your conclusions, that

would be -- PL,3 would be one of the three fired cartridge casings, would it not, sir?
A. Yes. It's actually p-1-comma-3, which is the --
Q. Oh, p-1?
A. Yes. That's the method that the Property and Evidence Unit used to label the items. So they have pages of items and then numbers within the pages and there's ten items per page. So p-1-comma-3 means page 1 of the evidence, item No. 3.
Q. Whatever that item happened to be?
A. Yeah.
Q. Okay. And so on the left side of that photograph -- well, I have a copy of some kind, Xerox or some other copying process of what appears to be a photograph made through a microscope. Would that be correct, sir?
A. Yes.
Q. And on the left side, it says PL-comma-3, and on the right side it said PL-comma-4. Correct?
A. P-1-comma-3 and p-1-comma-4.
Q. I'm sorry, p-1-comma-3 and p-1-comma-4?
A. Yes.
Q. So what you're you doing there is comparing, if I understand the process, two different casings, one casing on the left and one casing on the right?
A. Yes.
Q. Now, as we look at -- as we look at the photographs, what part of the -- what part of the casing, if you know, sir, are we looking at?
THE COURT: Before you answer that, could I ask you a

question? Do you think any of this is necessary for the trier of fact at this hearing to see any of these photos, or do you think this is helpful or not?

MR. HUMPHREY: Yes, I think so. Would you like a copy of this, Judge?

THE COURT: No. I'm just pointing out that you guys are having a nice conversation with pictures in front of you.

MR. HUMPHREY: And you haven't a thing, I understand.

THE COURT: And I'm kind of the trier of fact here for today.

MR. HUMPHREY: You're absolutely right, Judge.

THE COURT: So I'm just kind of throwing that out there to see what you --

MR. HUMPHREY: I think that's an excellent observation. May I have defense next in order a group exhibit, Your Honor, consisting of page numbers 1224 through 1238 marked for identification.

THE COURT: Are we Defense C?

THE CLERK: Yes, Your Honor.

THE COURT: All right. Defense C, pages 1224 through 122 --

MR. HUMPHREY: 1238, Your Honor.

THE COURT: 1238?

MR. HUMPHREY: Yes, Judge.

(Defense Exhibit C was marked for identification.)

MR. HUMPHREY: If I may approach the witness, Judge?

THE COURT: Sure.

MR. HUMPHREY: Q. Just take a look at that, sir, and make sure we're talking about the same report, especially the photographs.

A. Yes.

MR. HUMPHREY: If there's no objection from the Prosecution, Judge, I'd like to publish this to the trier of fact.

MS. PETTIGREW: No objection.

THE COURT: All right. Thank you.

MR. HUMPHREY: Thank you, Judge.

THE COURT: The Court now is in possession of Defense C.

MR. HUMPHREY: And referring the Court to page 1227.

THE COURT: All right. Very well.

MR. HUMPHREY: That's in the lower right-hand corner, Your Honor.

THE COURT: Thank you.

MR. HUMPHREY: Q. And the two -- or the single top photograph that's bisected by a vertical line labeled p1,3 and p1,4, that -- I guess my question was what area of the cartridge casings are we looking at? The side, the end, what?

A. That actually is a close-up of the firing pin impression, and the bulged area around the firing pin impression. If you go back one page and look at the previous page, there's an overall picture of the head end of the casing.

Q. That would be, Judge, 1226.

A. And in the middle of the casing is the primer. And in the middle of that is where the firing pin struck and left an indentation. And there's also a bulged area and there's also a

series of scrapes or striata marks. And that is what is depicted on the next page at the top picture.

Q. Okay. So the scraping marks that you see there would have been left by the breach?

A. By the breach face, yes.

Q. By the breach face.

A. Actually, the --

Q. The back of the --

A. -- very back of the hole where the firing pin comes through, the primer, when the firing pin strikes, the primer material bulges into that hole. And as the casing is extracted, it gets scraped along the edge of the hole and it leaves those striations.

Q. So you were able to determine, sir, were you not, that casing No. -- labeled to you No. 3 had sufficient scrape marks that you concluded that casing No. 3 and casing No. 4 were fired from the same weapon?

A. That's correct.

Q. But there was another casing, was there not, sir?

A. Yes.

Q. And it was not compared with the scrape marks?

A. The third casing of those three, which is page 1, No. 2, did not have that particular scrape mark.

Q. So are you saying that you -- it is your belief that the three casings irrespective were fired from a single weapon?

A. Yes. And the page 1, No. 2 casing which did not have that particular mark does, however, have other marks which I can identify to one of those two casings.

Q. Before we get to that --
A. Okay.
Q. -- the hypothetical 9mm that fired No. 3 and No. 4, you believe fired No. 2, even though the scrape marks were not on No. 2; is that correct?
A. Yes.
Q. And these are the scrape marks that you've blown up 45 times for us on page -- well, you don't have that -- it would be page 1227, your page No. 3?
A. Yes.
Q. How do you account for that, sir?
A. Well, as -- as I remember, I described to you the process of test firing, which is the same as firing any cartridge. There is always variations from shot to shot. Some marks don't get picked up or they may get picked up. Some guns consistently leave the same mark every time. Some, they might and they might not.

In this particular case, as the primer -- the primer material bulges into the hole and then gets this sheer, if for some reason it doesn't bulge as much, then you don't get that sheer mark. And in this particular case, on the third casing, it just did not pick up that sheer mark.

Q. Did you photograph that third casing for us?
A. I did, in different areas.
Q. Okay. But not in the areas of these scrape marks?
A. No.
Q. So are you saying that you -- you didn't photograph that missing casing No. 2 at all or you just didn't include a picture

of that casing in this area in your notes?
A. That particular casing did not have that mark in that particular area, so I did not take a picture of that particular area for that casing.
Q. That would indicate to you, at least initially would it not, sir, that it was not fired from that firearm?
A. No, not at all.
Q. Well, if you didn't have anything else initially --
A. Okay.
Q. -- would that indicate to you that it came from -- it might have come from a different firearm?
A. If I found no other marks on it --
Q. Yes, sir.
A. -- and all I had was caliber and general class characteristics, I would not be able to conclude one way or the other. I would not be able to eliminate it as being fired from the same gun, and I could not identify it, if that was the case, that there were no marks on it.
Q. Well, all right, sir. How would you ever eliminate a casing?
A. If there was a difference in class, for one. Let's say the firing pin had prominent concentric circles within it. Some firing pins do. This one has a smooth hemispherical firing pin. Then that, if the difference is there, I could use that to say, well, that is not on these casings. That indicates that it was fired in a different gun.
And the shape of the firing pin, sometimes firing pins are a different shape. They're circular, but they may be

elliptical. That's a class difference. That's a different elimination.

Q. But -- but -- I'm sorry.

A. But if there's no difference in class --

Q. Right. Individual characteristics?

A. -- and no difference in individual characteristics and not enough individual characteristics for identification, then it's an inconclusive result. I cannot say one way or the other.

Q. So what you're saying is you can never say no, this didn't come from the firearm, it's just inconclusive? I mean you can say that it did, or it's inconclusive?

A. Unless the class was different.

Q. Yeah, strike that. Bad question.

Assuming for a moment that we're talking about individual characteristics, those left by the machining process, not class. Are you telling us that you can, in your profession, tell us whether or not you have a match, if you will, but you would never say anything other than inconclusive on the other side of the equation?

A. No, that's not true. We can eliminate on individual characteristics.

Q. All right.

A. As I mentioned, if there's a -- let's say, for instance, that there was some sheer mark which are considered individual on the third casing, but those sheer marks for some reason were significantly different because they had, you know, a very different spatial arrangement or a thickness, or maybe there's a prominent mark that is individual, but you wouldn't consider it

class, you can eliminate on significant differences even in individual marks, which was not the case in this one, but....

Q. But once you found no scrapings on the -- on the I guess it would be the head end of the casing on No. 2, you went to a different -- you analyzed a different part of that casing, did you not?

A. Yes.

Q. And compared it to, for example -- how do I say this? Up at the top, left stage, that's No. 3. No. 3 compares to No. 4. Correct?

A. Correct.

Q. And we can see the scrapings there. And if you believe those scrapings look the same to you, then that's a comparison?

A. That's an identification, yes.

Q. All right. Identification, yes, sir. Now, if you take, and we're after No. 2, so if you take a known No. 3, which is on the left stage of the next photograph down --

A. Yes.

Q. -- now you're looking at a different portion, are you not, sir, of the casing itself?

A. I am.

Q. And what are you looking at?

And that would be left stage, Judge, p1,3.

A. The lower photograph shows --

Q. The one on the left, sir, as you're looking at the page. I'm sorry.

A. The one on the left?

Q. Yes.

A. Page 1,3.
Q. Yes, 1,3.
A. Is chamber marks.
Q. And they would appear where, sir, on the casing?
A. On the wall, the side wall of the casing.
Q. Now, you compared 1,3 to 1,2, which is the one that didn't have the scrape marks on the head. Correct?
A. Yes, yes.
Q. And 1,2 is depicted on the -- well, it's depicted where it's depicted on 1227, also divided by a vertical line. You compared those two together?
A. Yes.
Q. And in your opinion?
A. In my opinion, that was sufficient agreement between those two marks for an identification.
Q. All right. Now, so using a bit of extrapolation, if 1 matched 4 -- if 1,3 matched 1,4 and 1,3 matched 1,2, then in your opinion, they all match?
A. Yes.
Q. Going down to comparison left stage 1,3 and 1,2, when they were in the comparison microscope, sir, by some means you're turning that casing or those casings around to try to find -- to try to see if they're matching -- I guess these are impressions -- impressions, correct, to see if there's some that match?
A. These are striated marks. Different from impressions.
Q. Oh, they're marks?
A. Impression is like if you take your thumb and stick it

into putty and you leave an impression of your thumb.
Q. Yes.
A. Striated mark is if you take a chisel and you scrape it along the surface of some lead or something, you leave a scrape mark. So one is impressed; one is striated. These are striated.
Q. All right. So you found a -- and I have a really bad picture. And I'm assuming the judge's picture is not much better than mine. But in your opinion, those striated marks were -- indicated to you that 1,3 and 1,2 came out of the same weapon?
A. You're right, this is a bad picture. It's a photocopy of a copy. When I look at it under the microscope, the resolution is far higher than what you see here.
But even looking at this copy, there is a lot of corresponding detail there which, in my opinion, is -- far exceeds anything that I would ever see in a known nonmatch. And it's consistent with an identification.
Q. Now, sir, if you were to take 1,3 and 1,2 when they're in the comparison microscope and turn them just slightly, you're going to disalign those striation marks, are you not?
A. Yes.
THE COURT: When you say twist, turn them just slightly, you mean turn one and not the other or turn them both equally or --
MR. HUMPHREY: That's a good question, Judge. Let me reask that.
Q. If in the comparison microscope, if you have 1,3 and 1,2

the way you have here, and you were to turn them both at the same time just slightly, you're going to take them -- I guess out-of-phase is not the right word, but certainly at some point you're going to get -- they're not going to match any more. Would that be fair?

A. If you turn them both at the same time, you're essentially keeping those marks together as you move them.

Q. All right. If you turn them one way, sir, you turn one one way and one the other way?

A. Okay. Well, if you do that, you're kind of shuffling up the marks then, yes.

Q. And that's right. And at some point, they're not going to match up, right?

A. Correct.

Q. And you said even as an expert, even looking at this bad copy, you can tell that there's enough similarity to say, hey, these are from the same gun?

A. If I was to make an examination and this is all I had and I had not made the examination, I would not make an identification from a bad photocopy of the thing. But what I'm saying is it represents what I did see sufficiently.

Q. Well, all right. And that's an excellent answer.

Let me ask this. What did you not see? We don't know what's on the back side of this -- the other 180 degrees, do we?

A. Well, I --

Q. Not from this picture, at least?

A. Not from this picture, no.

Q. Well, is it --

A. But I -- sorry.
Q. I'm sorry.
A. But it's not that I did not examine the entire surface of the casing. I searched the entire casing to find these marks.
Q. Okay. And I guess that goes back to my question this morning that I was trying to get to when I was talking about a laser dot trying to get a starting point. When you make the comparison, at least the comparison between 1,3 and 1,2, you took two cylindrical objects and under a microscope set at magnification 35, you move them in such a way -- you moved them until you found an area that you believe looked the same both on the right and on the left side. Correct?
A. Yes.
Q. Now, that does not necessarily mean that that bullet casing looks the same on the right and the left side on its other hemisphere, does it?
A. No. It could be completely devoid of marks on the opposite side.
Q. I see. So when you're looking at pattern identification as opposed to consecutive strata, that's enough, what you found here is enough to, in your discipline, to say that's -- those -- that came out of the same gun?
A. It absolutely is, yes.
Q. And even though No. 2, which is on the right side, didn't have those prominent marks that we see at 1 and 3 and 1 and 4, even though that's not there, the match on one of the hemispheres was enough to say they all match?

A. That on its own, that area right there is sufficient for identification. But despite that, on the next page, there is more. There's more.
Q. Okay.
A. I did do item 2 against item 4. So I have item 2 against item 3, item 2 against item 4, and this is in a different area again. This is the one I described before as a breach face mark. And again there's a set of marks on the breach face mark, which it also was an identification.
Q. Okay. So you're saying, if I understand, on page -- that would be Bates, Judge, 1228, page 4 of that report, left stage 1,2, that's the same No. 2 that did not have the scrape marks in and around the area of the firing pin?
A. Yes.
Q. Okay. And so you compared that to 1,4. Correct?
A. Yes.
Q. And that's what we have here?
A. Yes.
Q. And that looks the same to you?
A. Yes.
Q. Okay. Now, did you compare 2 -- well, strike that.
The area that we're looking at on Bates No. 1228, page 4, you say that's a different area, sir?
A. Yes. That's a breach face mark.
Q. Okay. So that would be what you term the head of the casing, the area where the firing pin would hit the primer?
A. Correct.
Q. Okay. And on the one -- and in 1,4, that defect that

we're looking at at 1,4 which appears to be a crater-like defect, that's where the firing pin hit that casing, is that right, or not?

A. Are you referring to the far right?

Q. Yes, sir, yes, sir.

A. That is actually called a firing pin drag mark. And so what happened in this gun, the way this gun works is the firing pin comes through the firing pin hole, strikes the primer, leaves an indentation. The gun then on the recoil comes back and it has a locking mechanism whereby the barrel unlocks by dropping a certain distance down from the slide to unlock. And during that motion, that's the motion which causes -- the pin is still sticking into the primer. The primer gets pulled down and dragged, so you get a pin drag.

And also that is the cause of those striated marks on the edge of that bulge also.

Q. But -- but --

A. But that's not the area that I used for --

Q. Oh, I'm sorry.

A. -- identification in this particular photograph. This particular photograph I used the breach face impression.

Q. Yes. But if you look at 1,4, it doesn't look like we're looking at the same area as we are when we're looking at 1,2. It looks like one's got a drag mark or a hole in it and the other one doesn't have that.

A. Well, that's because it's -- on the other side of the prism line, you can't see that. If you imagine we have two -- two images and a prism down the middle, and you move this

cartridge case this way towards the prism line, the firing pin is going to come out of your field of view. It's going to be underneath this side of your view. So that's why you can't see this part of the --

Q. But if -- I see. But if I could see it, sir, I might see differences, might I not, between 1,2 and 1,4? I don't know if there are differences or not because I can't see them.

A. There are always many differences in cartridge cases fired by the same gun. You never expect -- you'll never see an exact replication of marks on two different cartridge cases. There are always differences. But that does not detract from the similarities which you can use for identification.

Q. Okay. You have a picture of what appears to be a bullet fragment below that. And that's on the same page, 1228, Judge. That bullet was not tested -- or was it tested, at least in this report?

A. In what way tested?

Q. For comparison to something else.

A. It was compared as part of the other report.

Q. Okay, we'll get to that. You -- the way I understand it, and I'll end it with this, but if you were to bring all of your bench notes to court, you would probably not have made a notation of all of the areas between 1 and 4, 1 and 3, and 3 and 2 that didn't match, would you?

A. No. We don't do that. It's not practical to do so. Once we've made an identification, that's sufficient. There's really no point in making notes on everything that's on there that does not identify it.

Q. Well, I think you'd agree it makes cross-examination go quicker.

THE COURT: Maybe he doesn't know what's in your mind, though.

MR. HUMPHREY: Strike that.

THE COURT: Speculation. That's okay.

MR. HUMPHREY: Q. Going back to the back of the report, you've listed a bunch -- not a bunch, several manufacturers of ammunition. Correct?

A. Several manufacturers of firearms.

Q. Oh, firearms. Okay. Firearms, yes. You're absolutely right.

And then on the side, on the left side, you've indicated the type of ammunition that that firearm would use. Correct?

A. Yes.

Q. In the United States, in your experience, would you consider the manufacturer of the casing or the bullet that's shown on 1226, WIN 9mm Luger to be an unusual manufacturer or a usual manufacturer?

A. It's not unusual. WIN is Winchester. And Winchester is one of the big four or five manufacturers of ammunition.

Q. So during your experience in the laboratory in Oakland, it would not be uncommon to be processing Winchester casings?

A. No.

Q. What about R-P? Well, first of all, could you tell the Court what R-P is?

A. R-P stands for Remington-Peters.

Q. Remington what?

A. Peters.
Q. Peters?
A. Yes.
Q. And Remington-Peters is a manufacturer of 9mm ammunition?
A. Yeah. Mainly they go by the name of Remington, but earlier they were known as Remington-Peters, or Remington UMC, Union Metallic Cartridge. But R-P historically is Remington-Peters.
Q. Would that be in the United States at least a relatively common cartridge?
A. Yes. Remington is one of the other big four manufacturers of ammunition.
Q. Would it -- in your experience, sir, would it be unusual in any way for a person who had a 9mm semi-automatic to use a combination of ammunition, some from Remington, some from Winchester?
A. From experience, I've seen mixtures of different types of ammunition being submitted with firearms.
Q. Well, okay. So is that a yes or a no, sir?
A. Well, I mean I can't tell you whether it's -- how common it is. I mean I see firearms submitted and they all have the same type of ammunition. I see firearms submitted; they have Winchester, Remington, Federal, a whole mix of ammunition in there. You know, whatever they can get their hands on.

But as to how often I see that and to the degree of each, I really don't know.
Q. All right. Let me ask it this way. If I owned a 9mm

semi-automatic pistol, would there be any disadvantage to me to have gone down to the store and bought WIN 9mm Luger ammunition on Monday and bought Remington R-P ammunition 9mm on Friday? Would it make any difference to me in the operation of the weapon?

A. No. It all should work in the right caliber gun.

Q. So it wouldn't make a difference?

A. No.

Q. So in that respect, they're fungible, they're interchangeable?

A. Oh, yeah.

Q. I believe you have another report.

And if I may have this marked defense next in order for identification, for publication.

(Defense Exhibit D was marked for identification.)

MR. HUMPHREY: If I may approach, Judge.

Q. If you could look at this. This is what we've been referring to as the Jackson, Melissa/Hoover-Brown, Dominique, I think that's the same as you have, Mr. Bennett. That would be Bates numbers, for counsel, the first three, 947, 948, 949, and then 1236 through 1259. The same thing you have, sir?

A. It appears to be, yes.

THE COURT: Defense D?

MR. HUMPHREY: Yes, Judge.

THE COURT: Thank you, Mr. Humphrey.

MR. HUMPHREY: Q. Now, this Defense C for identification, this is Request No. 2 submitted for -- by

Sergeant Cruz to you on the 3rd of February of 2008, Mr. Bennett?

A. The date of the crime --

Q. Oh, I'm sorry. Strike that. It was submitted to you on March the 12th?

A. Yes, that's correct.

Q. Okay. And you signed off on it I think down on the lower part of the document, I can't read that, but it looks like 8 December of '08, sir, on page No. 1?

A. I notice my pages are out of order from yours. Yes, 8th of December?

Q. Yes.

A. Yes.

Q. Okay. Just going to page 948 for Court and counsel, second paragraph, Explanation of Bullets. You received --

THE COURT: I'm sorry. What page are we on?

MR. HUMPHREY: I'm sorry?

THE COURT: What page?

MR. HUMPHREY: It would be 948, Judge. It should be the second page in that package you have. They may be out of order, I'm not sure.

THE COURT: I thought you said it went from 1236 to 1259.

MR. HUMPHREY: Well, the first three pages are, at least on the one I have, are marked 947 through 949.

MS. PETTIGREW: 947 is the same as 1236. It appears to be.

MR. HUMPHREY: If I may approach, Judge?

THE COURT: Sure. Yeah, I don't see -- I don't have anything with the 900 series. I didn't get those pages.

MR. HUMPHREY: C?

THE COURT: Oh, we're in C?

MR. HUMPHREY: Yes, Judge.

THE COURT: These are still 1220. I -- I don't have anything here. C was the original exhibit.

See this looks like this one. Show me what page you're referring to.

MR. HUMPHREY: That's odd.

THE COURT: All right. Well, there you go. I don't have that page.

MR. HUMPHREY: That's not the same document.

THE COURT: There you go.

MR. HUMPHREY: Just a minute, Judge. If I may approach the witness?

THE COURT: Um-hmm.

MR. HUMPHREY: Do you have this?

THE WITNESS: Yes.

MR. HUMPHREY: You have the same thing I have.

Your Honor, may I withdraw -- either withdraw Defense D for identification or mark a new document, a Group Exhibit E and --

THE COURT: Given the charges with what we're dealing with here, why don't we do E?

MR. HUMPHREY: Okay.

(Defense Exhibit E was marked for identification.)

THE COURT: Do you want to have the clerk make a copy of that rather than --

MR. HUMPHREY: That would be -- either that, or I can go back and forth with Mr. Bennett if he doesn't mind -- yeah, a copy would be better.

THE COURT: Why don't you make a copy, Brian, of what will soon be D, of what he just handed you. And then we'll give the original copy back to Mr. Humphrey.

THE CLERK: Okay.

MR. HUMPHREY: Thank you, Judge.

Q. Maybe I can ask a couple of questions to speed things up. You were asked at a later date after you did the analysis on the piece of lead, the three fired cartridge and the three single bullet that was labeled Terrance Brown, you were asked to do another analysis, were you not, sir?

A. Yes.

Q. And you did that analysis?

A. I did.

Q. And you produced a multipage document of conclusions and photographs?

A. Yes.

Q. Okay. And that second request involved several items, did it not, sir?

A. Yes.

Q. And since you have the, right now, have one of the few copies left, could you indicate for the Court what items you were asked to look at?

A. I was asked to look at fired casings and -- from the

victim's vehicle as described, bullets from autopsy and the request said there's a possible cross-reference to 088267, the prior case. So that was the request I got.

The items I examined were nine fired 9mm Luger cartridge cases, one unfired .45 auto caliber cartridge, and then a number of fired bullets, five fired bullets, and then also a number of bullet fragments, one, two -- and then five bullet fragments, and also two pieces of lead.

THE COURT: Thank you, sir.

MR. HUMPHREY: Just to make sure, Judge.

THE COURT: That's what I got.

MR. HUMPHREY: Q. Okay. Just referring you to that second page of this later analyses, you under Examination of Bullets, you describe the weight and shape of these bullets being consistent with 9mm Luger caliber?

A. Yes.

Q. You used the word "consistent." What, in lay terms, does that mean? Are they 9mm Luger caliber or maybe are they or what does that mean?

A. Well, as I described, a 9mm Luger, the typical style of a 9mm Luger has a certain pointed nose shape to it and a particular diameter and weight. So I can look at those characteristics. There are other bullets that have the same diameter and the same weight, but not necessarily the pointed nose characteristics.

I would say that based on those characteristics of these bullets in my opinion, they are -- they were from a 9mm Luger caliber cartridge.

Q. Are you saying it's possible they're not, but in your opinion, based on what you saw, they are?
A. That's correct, yes.
Q. Now, could you tell the Court what IBIS is, I-B-I-S?
A. IBIS is an acronym. It's the digital database that we use and it's a database of unsolved crimes, actually images of the very toolmarks that we've been looking at, firing pin impression, breach face marks.

You take a digital image of those marks under a microscope. And the digitized image is put into the database. And the role of IBIS is a tool for allowing you to look at lots of different images fairly rapidly and determine if possibly the marks on one casing from one particular shooting incident are similar to marks on casings from any other unsolved incident. In other words, possibly was the gun used in this particular case used in any other crime that's of yet unsolved.

So like I say, IBIS is -- it's a national database that it also has a -- some sort of an algorithm where it kind of scans the image. I don't know exactly how it works, but it's supposed to rank them in terms of similarities.
Q. Probable matches?
A. Well, it does not make matches. It really -- like I said, it's more like a tool that we use in order to scan a lot of different cases quickly and determine if there are any other cases that are similar out there.

In the old days when I first started, we didn't have IBIS. We used to have what's called an open case file. And an open case file is literally a drawer, drawers and drawers and

drawers of fired casings from different incidents. And we would have to manually to check unsolved cases go to the 9mm Luger drawer and one by one go through each one under the comparison microscope and do the comparisons that way.

And in IBIS, the great thing is I can get on a big screen a matrix of all these images, and I can quickly look through them. And if one looks similar to me, then I can go get the evidence and do that comparison.

Q. You're saying that the machine doesn't make the, quote, "match;" you as a human being, as an expert make that match based on what IBIS or IBIS has given you?

A. Well, what IBIS gives me is no basis for any of my opinions on a match.

Q. Okay.

A. But it does help me narrow down what I would like to look at.

Q. Now, you made a notation, sir, on the one, two -- third paragraph down, "These bullet jacket fragments were not suitable for entry into IBIS."

A. Yes.

Q. And why is that, sir?

A. Well, the fact is IBIS really is not very good -- it does not have very good images of marks for bullets. IBIS is designed for both casings and you can also take images of those land impressions. And it will digitize those and do the same thing as it does with the casings.

However, after years and years of using it, and really very few hits to talk of using the system, we came to the

conclusion we were not gonna put bullets into IBIS. It just doesn't work. So --

Q. So you're -- oh, I'm sorry.

A. -- by default -- I'm sorry. By default, bullets are not suitable for IBIS.

Q. So you're not saying that the bullet jacket fragments were not scratched up enough or not identifiable enough for IBIS; it's just because of the IBIS format, it's just not worth your time to make the entries?

A. That's absolutely right.

Q. But those bullets could be used for comparison to other bullets, if you wished to do so?

A. Yes.

Q. Maybe?

A. Yes.

Q. Okay. In fact, going back to page 3 of your report, "Comparison of bullet and jacket fragments with bullet 3-2 under RD 08-008267." And that I believe is the earlier case, the Terrance Brown case?

A. Yes.

Q. You made a determination there, sir, that again you found sufficient corresponding individual microscopic marks to conclude they were fired in a single firearm?

A. Yes.

Q. Did you list anywhere in this multipage document whether or not the 3-2, when you compared it to the Terrance Brown case of 8267 had sufficient corresponding individual microscopic marks that didn't match?

A. Again, there are always going to be marks that do not line up. And again, that does not detract from the corresponding marks that do match. If you have a matching area and the very next land impression, it doesn't match at all, it doesn't make any difference.

Q. Okay. You indicated under the prosecutor's direct examination that as a technician or scientist, you are required to read material in your field; is that correct?

A. Yes.

Q. And that material is coming out all the time, is it not?

A. Yes.

Q. And does the laboratory have a protocol that requires you to read a certain amount of material per day, week or month, or is it just up to you as a scientist to keep yourself abreast of what's going on out there?

A. As a scientist, we would expect all our analysts to keep abreast of what's going on out there. We have a training budget and we go to conferences. We subscribe to a number of different journals. *Journal of Forensic Sciences*, *The AFTE Journal*, CAC publications, things like that. And we have a library. And that's open to anyone who wants to go and read those materials.

But we don't have a -- we don't enforce that, that they go and read a certain amount of literature.

Q. When you say anyone, you mean anyone in your section?

A. It's within the laboratory.

Q. I mean not the public?

A. No. We don't usually have members of the public come in to read.

Q. If you did not read the required material, you just didn't like reading the stuff, could you still pass your proficiency test?

A. I -- I would say a proficiency test -- once you reach a certain level of expertise once you've completed your training, in the field of firearms in particular, the field is not changing so rapidly that if you did not read this year's latest, you know, this quarterly *AFTE Journal* and you had a proficiency test come up, you would end up failing that test, so no.

Q. Well, especially when the test you use is just a general agreement, sort of pattern identification method. I mean once you -- I think you said under my questioning or maybe it was Miss Pettigrew's, that in this proficiency test they gave you a bunch of bullets and you're supposed to match them up --

A. Yes.

Q. -- or not?

A. Yes.

Q. But assuming you're using that, the test that you talked about today, once you learn that, if you want to close your mind to all other scientific happenings out there, you're going to be able to do that whether you read this stuff or not, are you not?

A. That's not a good practice. I mean there are things that come along which might help you certainly in the work that you do. Like I said, the 3-D analysis is a new and emerging thing that seems to be -- currently there's a fair number of articles on that.

But basically the comparison technique is the same technique that's been around since the '20s. We use the

same -- the very same methods and techniques that were developed way back in the '20s.

Q. Okay. Do you recall ever reading in 2005 from the *Columbia Science and Technological Review* an article written by Adina Schwartz, an associate professor at the John Jay College of Criminal Justice at the Graduate Center, University of New York? Have you ever heard her name?

A. Oh, yes.

Q. And do you recall reading, and getting back to CMS again, and that just for everybody's, just so we know, that's consecutive multiple scratches or striations?

A. Consecutive matching stria.

Q. Stria. Ms. -- Professor Schwartz had to say, did she not, "Because of systematic scientific problems without CMS, firearms and toolmarks identification should be inadmissible across the board."

A. Well, that's her words.

Q. But have you read that?

A. I have read that.

Q. Now you may comment.

A. That seems to be her comment. I don't know where she -- I mean she's not an expert in the field. She's not a firearms examiner. She's never done a comparison in her life. She claims to be an expert in the literature of firearms identification, which I don't know how you -- you know, that's like me saying I've read some books on playing guitar and now I'm Eric Clapton. That just doesn't make sense.

But I -- I understand what she says there. And the

actual -- the people who developed CMS, a number of them are in the Bay Area, they strongly disagree with what she says also.

Q. So there is some -- some professional disagreement about -- well, let me put it this way. There's professional disagreement going on right now about the techniques that should be used in toolmark and firearm identification, is there not?

A. Not within the firearms community.

Q. Well, maybe not within the Oakland Crime Lab, but certainly CMS and 3-D imaging technology is being talked about, is it not?

A. Certainly CMS is -- within the firearms examiner community, CMS is used by some, and it's not used by others. CMS has been around for a long time, since the 1950's. Some see utility in using it.

Many firearms examiners feel that the traditional band matching method, which is how they were all trained, is tantamount to the same -- you come to the same conclusions, so why change -- why fix something that's not broke is basically what they think.

Q. Not broken, I see. One last question or at least one last set of questions. Give me just a moment here. I can't even read my own notes.

There is a national group set up by -- it was originally set up by Congress. Let's see if I can find that notation. NRC. Are you familiar with NRC?

A. That's the National Research Council?

Q. Yes, sir.

A. Yes.

Q. And the National Research Council was initially funded and set up by Congress to advise the federal government on scientific and technological procedures. Would that be correct?
A. If you'll -- I think the article you're talking about is ballistic imaging, is that --
Q. I think so.
A. Yes.
Q. I guess what I'd like to ask you, that according to the Association of Firearm and Toolmark Examiners, I believe which you go -- which you are a member of, your standard, the standard we've been talking about and the identifications you've made are based upon the following premise: "Agreement of a combination of individual characteristics and all discernible class characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different tools is consistent with the agreement demonstrated by toolmarks known to have been produced by the same tool." Does that make sense to you?

THE COURT: The question is does that sentence make sense?

MR. HUMPHREY: Yes, Judge.

THE COURT: All right. Go ahead, do you --

THE WITNESS: It makes sense because I'm familiar with it.

MR. HUMPHREY: Q. Is that what you do?
A. I could see how it would be confusing. But yes, it makes sense.
Q. Okay. The NRC, however, this august body apparently

that advises the federal government, said in its report at page 3-26, "In essence, this scientific standard is reducible to," and I quote, "it's a match when it's not a match and I know it when I see it. The I-know-it-when-I-see-it description is, with some level of chagrin, accepted by examiners in the field as a valid description."

A. I am aware that they made that comment. And they also -- they also wrote that the purpose of this article in which they were tasked was not to make any comment at all on the validity of the science in that they -- part of their investigation did not involve the validity of the science. And yet then they make a comment like that. Which there is a response from AFTE addressing that very thing.

Q. Scandalous. No more questions. Thank you, Judge.

THE COURT: Um-hmm.

MR. HUMPHREY: Thank you, Mr. Bennett, for your patience.

THE COURT: Thank you, Mr. Humphrey.

Any redirect?

MS. PETTIGREW: Just one area, Your Honor.

REDIRECT EXAMINATION BY MS. PETTIGREW

MS. PETTIGREW: Q. Mr. Bennett, you indicated you're familiar with studies regarding the emerging 3-D analysis.

A. Yes.

Q. What have those studies indicated regarding the traditional methodology of the pattern comparison that you've been using?

A. Well, the 3-D systems are systems which introduced a

quantitative aspect to comparisons. And so basically now you're using a machine that scans the surface and you have a set of data, numbers which shows a profile of, say, a bullet or a cartridge case. And some of these studies have included comparisons of these known matches and known nonmatches.

And the studies have really shown the same thing that firearms examiners really have been saying all along is we can distinguish between no match and known no match and we do it using our brain, whereas the machine uses actual quantifiable numbers. And the machine essentially can -- it shows that there is a quantifiable difference between known matches and known nonmatches and you get sort of a peak of correspondence separates for known matches and then a much less peak, a lower peak of correspondence for known nonmatches.

So what that's basically saying is there's a difference between the two. And firearms examiners know there's a difference between the two, and that's what we use. But we can't articulate it like a machine can give numbers and statistics to it.

So the great utility of 3-D analysis, one thing, if it could move forward to such a machine that's practical to do the analysis quantitatively, that would be useful. But alternatively, up until that point, if it can validate what firearms examiners are saying currently, then that's got a lot of utility, too.

Q. And two follow-up questions on that last part of your answer. Number one, is it practical at this point in time?

A. At this point in time, it's not practical. The problem

with this system is it -- it uses -- well, one system, for example, confocal microscopy, and it's a very lengthy process just to scan one single area of a cartridge case into the system. In order to scan the whole casing to look at chamber marks and firing pin or to scan every land and groove on a bullet is a very labor-intensive system. And also the algorithms that are used to do the comparisons then, you really need a pretty hefty computer to do that analysis.

So it's not -- and it's not at a practical stage at the moment.

Q. And my second follow-up question is have the studies about the new 3-D analysis in any way negated the methodology that you and forensic firearms examiners across the world use today?

A. No. Like I said, it's quite the opposite. It actually goes a long way to validate what we do.

MS. PETTIGREW: Thank you. At this time, Your Honor, I have no further questions. But I would re-offer Mr. Bennett as an expert in the field of firearms and toolmark identification fully qualified to give an opinion as to whether bullets and cartridge casings were fired from a single firearm.

THE COURT: All right. Let me just ask you a couple questions.

VOIR DIRE EXAMINATION BY THE COURT

THE COURT: Q. You used the word "topography" once in referring to pattern recognition and then also in relation to the -- again when you were talking about confocal microscopy and laser scanning and profilometer examinations. When you say --

when you do, as opposed to pattern --
A. Yes.
Q. -- which is what you do --
A. Yes.
Q. -- I hate this word, so I'm going to use it, would you say that pattern is more nuanced in that it is not -- because it's not quantified, it's more nuanced, in that you exercise your judgment in a way that's consistent with what you're observing visually?
A. I believe that the analysis of a pattern by a experienced and qualified examiner is every bit as valid as a machine that can scan the topography of the surface of a bullet. We essentially are subconsciously making that sort of comparison of topographies by looking at the 3-D surface. And we're looking at the spatial arrangements, the curvature, the thickness of the lines, and we take that all in.

And it's difficult to -- the problem with pattern recognition is the articulation of what you're seeing, and to be more articulate than just saying I know that's a match because that doesn't work.

And the analogy I would use is face recognition. You recognize a family member, you know that -- you know who that is. But if someone then says to you, Well, what's the statistical probability that that's your brother? Well, I recognize it's my brother; I know his face. But it's then very difficult to articulate.

But what you're actually doing is you -- everyone's an expert at facial recognition because everyone practices looking

at facial features every day. Firearms examiners are experts at looking at toolmarks because they are trained and they look at toolmarks every day.

But then when we're asked what -- how do you place a statistical analysis to that, how do you quantify that this is the same pattern, we run into the same problem that you would come against if you were trying to explain, okay, well, you know, the eyes are a certain distance apart and, you know, it -- you know, articulating why you know you recognize someone, that's the difficulty. But in terms of how valid it is that you can recognize that person, you know it when you see it.

THE COURT: Okay. She's on for --

MR. HUMPHREY: Judge, I just have a follow-up question.

THE COURT: Go ahead.

RECROSS-EXAMINATION BY MR. HUMPHREY

MR. HUMPHREY: Q. The one -- the one thing that you get from any of the tests, if you will, CMS or 3-D or any of the machine analyses that you've talked about, Mr. Bennett, is a quantifiable result. Would you agree with that?

A. CMS and the 3-D topography systems do give you a quantifiable result, yes.

Q. And by that I mean I would have something here to say, hey, wait a minute, you've only got, you know, the industry standard for a three-dimensional statistical match is five. You've only got three here, Mr. Bennett. I can't do that when we're talking about the pattern method, can I?

A. You can employ a defense -- qualified defense firearms examiner who can re-examine the pattern. And if he sees there's

insufficient information there for an identification that all firearms examiners should agree upon, then you can say, Let me present my expert, my firearms examiner who is trained in pattern recognition, he doesn't agree with you. You could do that.

Q. But short of that, I couldn't do it cross-examining you, could I, sir?

A. No.

Q. And the -- wouldn't you agree that the analogy that you used with His Honor about recognizing a family member somewhat begs the question because you are probably ten feet apart, you're looking right at him when you said that. Suppose you caught a glimpse of a family member in a -- on a rainy, dark night going into a disreputable establishment, and you made a pattern recognition that that's your daughter and you're going to ground her when you see her again. It might not have been your daughter, correct? You could be wrong, could you not, in that instance when it's not clear?

A. But in the same instance, I never do examinations of bullets in the dark when it's raining. I always have really good lighting looking under a microscope at high power, so....

Q. And bullets to you, sir, have faces as familiar as your family?

A. Well, it's a different concept.

Q. Thank you. Nothing further.

THE COURT: Do you want to be heard on the expertise?

MR. HUMPHREY: No, Your Honor. Submitted.

THE COURT: All right. Well, it's been an education.

I do find that Mr. Bennett is -- has more than sufficient training, education and experience upon which he draws when he reaches his conclusions. I find that he's qualified as an expert and is certainly qualified to render the opinions that he has rendered or other opinions within that kind of scope of his expertise. And I'll accept his testimony.

Can Mr. Bennett be excused?

MS. PETTIGREW: Yes, Your Honor.

MR. HUMPHREY: He may, Your Honor. Thank you, Mr. Bennett, for your patience.

THE COURT: Okay. Thank you.

And we have Defense C, D and E. D will remain marked for identification. Did you want C and E in the record to the extent the Court has reviewed them?

MR. HUMPHREY: Sure, yes.

THE COURT: So D is for identification only. C and E are in evidence.

(Defense Exhibits C and E were received in evidence.)

THE WITNESS: Thank you, Your Honor.

THE COURT: How about we take a recess until three o'clock or thereabouts and then we'll resume.

(Recess taken.)

THE COURT: Good afternoon. We'll go back on the record in People versus Gumaro Baez. And we've concluded with the testimony of Mr. Bennett.

Inspector Cruz is back on the stand. Did you have any further direct for Inspector Cruz?