JASON WIERSEMA,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

Q. (BY MS. FULLER) Good morning, Dr. Wiersema. Who are you employed by?

A. Harris County Institute of Forensic Sciences.

Q. And let's back up a little bit and talk about your educational background.

A. Okay.

Q. Can you tell the jury what your education is?

A. I have three degrees: Bachelor's degree in anthropology from Texas State University; master's degree in physical anthropology from California State University, Chico; and a PhD in physical anthropology from Texas A&M.

Q. And when did you achieve your PhD?

A. 2006.

Q. Can you tell the jury a little bit about what forensic anthropology is?

A. Yeah. Forensic anthropology, the definition we use is that it is the application of biological anthropology. I'll translate that after -- in a second but that is the application of biological anthropology inside of the forensic context. What that means is that we're essentially using our knowledge of skeletal anatomy to interpret things in the forensic context, meaning traumatic injury, things

like that.

Q. Throughout your years of education, have you been able to do a lot of fieldwork?

A. Yes.

Q. Can you describe for the jury some of the fieldwork that you've done over the last couple of years?

A. In forensics or in -- I have a lot of experience in archeology that's applicable and then forensics as well.

Q. Okay. Could you give us both?

A. I can tell you that before I took the job at the Institute of Forensic Sciences, I worked primarily as a contractor in the mass fatality context, meaning that I did a lot of -- I responded to a lot of mass fatality events. So, I worked in New York after the events of 9/11, I worked in New Orleans after Katrina, I also worked in Thailand after the tsunami and I also excavated mass graves in Guatemala.

Q. Tell us a little bit about what you did in terms of the mass fatality scenario.

A. Okay. It varied. A lot of what I did was fieldwork; so, it's actual excavation of graves. But there was some in the case of New York in particular, it was a lot of skeletal analysis. So, a part of what I did was I was part of a three-person team who completed what was called the anthropology verification project where that group of

anthropologists went back through most of the remains and confirmed that the -- what remains were in each of the packages.

Q. Okay. So, on the one hand you're actually in the field collecting the bones and then the other portion of it is actually analyzing what it is that you've collected.

A. That's correct.

Q. Okay. Can you tell us a little bit about the professional organizations that you're a member of?

A. Sure. I'm a member of the American Academy of Forensic Sciences and I have been affiliated with that organization for several years. I don't want to name a date. I'm also -- some of the groups that are relevant to this, to forensics, I'm part of -- I'm a board member of the Scientific Working Group on Disaster Victim Identification. This is a group that's generating best practices for mass fatality response. I'm also a member of a committee on the Scientific Working Group for Forensic Anthropology and this has to do with the particular committee that I'm on, has to do with comingling. Comingling is a term that we use for admixture of remains of multiple individuals.

Q. Okay. Are you also a professor in your field?

A. Yes.

Q. Where are you currently a teacher at?

A. I am adjunct; so, most -- this is primarily a

research position but we have -- all three of the anthropologists at our office have appointments at Texas A&M in the anthropology department and also a couple in the -- affiliated with the medical schools at University of Texas-Houston and Baylor College of Medicine.

Q. Are you published in any of your research?

A. Yes.

Q. Can you tell us a little bit about your publishing?

A. The most recent publications is I'm a coauthor with our two other anthropologists. We just published a book on fractures in child abuse. It's essentially a photographic atlas of child abuse fractures.

I also have articles that have -- pertain to forensic investigation. And let's see. What else? That's primarily what -- the two categories they fit into.

Q. Okay. Have you been deemed an expert in your field?

A. By -- yeah. I think so, yes.

Q. Okay. Have you ever testified before?

A. No, I have not.

Q. Okay. This is your first time?

A. That's right.

Q. Okay. I want --

THE COURT: Will you do me a favor? Will you just speak up just a little bit? I have the mic up as high

as I can get it but maybe turn that -- the part you speak into is kind of on the side.

THE WITNESS: Oh, I see.

THE COURT: See if that will help.

THE WITNESS: That better? I think I can hear myself.

THE COURT: No?

A JUROR: It sounds like it's not on.

THE COURT: Will you see if maybe when you played that tape through, because my stuff's working.

MS. FULLER: It's not coming up.

There we go. Audio muted. I think that's better. Try it now.

THE WITNESS: Is that better?

A JUROR: Yes.

A JUROR: Thank you.

A JUROR: Thank you.

A JUROR: Yes.

THE COURT: Okay.

MS. FULLER: Should we go back or?

THE COURT: Really the only important part of all that is that his PhD is from A&M. I was really -- that's --

Q. (BY MS. FULLER) Okay. I want to turn your attention -- first let's talk about what you do at the

Institute of Forensic Sciences. That is the new name for -- what did you used to be called?

A. The Harris County Medical Examiner's Office.

Q. Okay. Now the Institute of Forensic Sciences?

A. Yes.

Q. What is your position there?

A. I have a dual role. My primary role is as one of the three forensic anthropologists that are at our office. I am also the disaster preparedness coordinator for the office.

Q. Tell me a little bit about your duties in terms of being a forensic anthropologist for the office.

A. We split. There are three of us, like I said. We split the case work that comes in every year. We provide anthropology consults at autopsy. What that means is that if we are employed -- if our presence is requested by a pathologist during autopsy, we'll come in and we can do trauma analysis in situ or we can recover bones and look at them later. We also respond -- we also deal with cases like this one where we respond to scenes and then do a full skeletal analysis, which part of what we do is generate a biological profile and a biological profile is generating a description that we can use to sort of limit the number of people that match that description. So, we're talking age, sex, ancestry, things like that.

Q. Okay. I want to turn your attention to June 25th, 2010. Were you called out to a scene on that day?

A. Yes.

Q. Do you recall what the address was or the general location?

A. 610 and -- I don't know -- it's a -- it's a -- I don't know exactly what the cross street was.

Q. Okay. 610 feeder road?

A. Yes.

Q. Okay. Can you --

MS. FULLER: May I approach the witness?

THE COURT: You may.

Q. *(BY MS. FULLER)* I'm going to show you what's been marked as State's Exhibits 105, 106 and 107 and also State's Exhibits 112 through 122. Can you take a look at all of those photos and let me know if they appear familiar to you.

A. Yes, they do.

Q. Okay. Are these fair and accurate pictures of what the pictures purport to depict?

A. Yes.

Q. Okay.

MS. FULLER: At this time, Your Honor, State moves to admit State's Exhibits 105, 106, 107 and also 112 through 122 for admission, tenders to defense counsel for inspection.

MR. CORNELIUS: No objections to these, Judge.

THE COURT: State's Exhibit 105 through 107 -- did I hear that right?

MS. FULLER: Yes, Your Honor. 105, 106, 107.

THE COURT: And 112 through 122 are admitted.

MS. FULLER: Permission to publish?

THE COURT: You may.

Q. (BY MS. FULLER) This is State's Exhibit 105. What are we looking at here?

A. That's a photograph of the scene from across the roadway.

Q. Okay. And when you got to the scene, what was the first thing that you did?

A. Well, what we did in this case was to -- before we -- we always -- our investigator -- we always accompany one of our investigators. That investigator goes to whichever officer is in charge at the scene and just gets a summary of what's going on.

Q. Okay. Once you got a summary of what was going on at the scene, what did you do next?

A. What we generally do is we will kind of stay back until our photographer, in this case it was also our investigator, takes overview photographs of the scene.

Q. Okay. When you arrived on the scene, did you notice -- I'm going to show you State's Exhibit 106 -- did

you notice that the scene -- that parts of the scene had already been flagged?

A. Yes.

Q. Okay. When you saw that those were flagged, what did you -- what did you do?

A. Well, the first thing we did when we actually got close to the scene was to try and figure out where the core of the scene was and those flags were an indication of what the police had already found.

Q. Okay. Why is it important to find the core of the scene?

A. Well, from the standpoint of searching the area, you want to make sure you know where the bulk of the remains are located.

Q. Okay. Once you found the core of the scene, what did you do next?

A. We put together a scene survey and there's a lot of different ways to do this. In this case we elected to use a straight line where we just put people in a straight line at regular intervals and walked through the scene. We had additional flags with us and we would flag additional elements as we did that.

Q. Okay. As you're flagging what you find -- when you say "elements," what are you referring to?

A. Bones.

Q. Okay.

A. Bones or bone fragments.

Q. Okay. When you find the bones or bone fragments and you flag them, do you do anything else at that point?

A. In this case we labeled them with the name of the element.

Q. Okay. So, for example, in State's Exhibit 106, can you read what that says?

A. That says "left tibia," which is your shin bone.

Q. Okay. So, once you have flagged the bones that you can see, what do you do next?

A. Once we've done that, then we'll actually go back and recover those bones, leaving the flags in place. Actually what we did before that was map them. I'm sorry. We mapped each piece in but you can do it either from the flags or the elements but in this case we did it from the bones still in situ. The police had already established a datum that we could measure from and we simply incorporated our measurements into their list of coordinates.

MS. FULLER: May I approach?

THE COURT: You may.

Q. *(BY MS. FULLER)* What did you do after you started collecting the bones?

A. We did what we usually do, which is to try and get some idea of what we have and what we don't have. So, we

laid them out in what we call anatomical order, which is sort of in the location that they are in in the body. That gives us some idea of what we have and what we're missing. So, we did that.

Q. I'm going to show you what's already been admitted as State's Exhibit 89. Is this what you are referring to by laying the bones out?

A. That's correct.

Q. Okay. Let me back up a little bit. Is there a science to how you collect the bones or is there a set procedure for how you actually physically collect them?

A. We have a standard operating procedure for how we approach scenes.

Q. Okay. And tell me a little bit about that when you're recovering bones.

A. You want me to go through the whole process?

Q. Please.

A. Okay. What we essentially do is any time we do this we look for the core of the site. In this case it was pretty obvious there was what we call a primary site of decomposition. That was a darkly stained area that may be visible in one of these photographs.

Q. I'm going to show you State's Exhibit 107. Is that what you're referring to?

A. No, that's actually after it's been cleared. But

you can see it there, the darkened, stained area at the far end of that -- of that cleared area is that primary site of decomposition. That is the area where that body likely decomposed, at least for the most part. After we've established that that's the primary site, we set up some perimeter around that area and we will set up a search method. In this case, like I said, we did a linear search, we had people at regular intervals and we walked through the site flagging everything. In this case we were flagging additional elements and then as -- once that's done, we map all of those pieces in so that if we have to go back to the scene, we can and we can know where each of those pieces was located. Once we do that, the remains are recovered and usually we lay them out in anatomical order like that and once that happens, we go back to the -- to the primary site of decomposition, as you see there. And in this case we expanded beyond that and cleared the ground all the way to the dirt level beneath the bones to make sure that we weren't missing anything.

MS. FULLER: May I approach?

THE COURT: You may.

Q. (BY MS. FULLER) Let me show you what's been marked as State's Exhibit 73. What are y'all doing here in State's Exhibit 73?

A. This is that final stage after we've recovered

everything. Some of the flags are still there but I think that flag right there is actually marking something that we found during the process of clearing the material. We clear all the leaf clutter, all the vegetation down to the soil level. That's what we're doing there.

Q. Do you know from memory what element you recovered that represents that flag?

A. I know for a fact that there was a tooth but -- and I -- the body of the hyoid was also recovered during that process.

Q. Once all the bones are collected, what happens next?

A. At the scene they're bagged, the bag is closed and then they are -- decedent transport service, which is an in-house service, comes and picks them up and takes them to the office, directly to the office.

Q. Okay.

A. Yeah.

Q. Once you're done at the scene, what happens next back at the Institute of Forensic Sciences?

A. Once the remains arrive there, they're checked in by the investigator, in this case, Robert Lopez, and they await analysis by the pathologist, which happens the next morning.

Q. Okay. And when you say "pathologist," who is the

pathologist?

A. This case, it's Dr. Haden-Pinneri.

Q. Okay. So, Dr. Haden-Pinneri sees them the next day.

A. Yes.

Q. At some point do you get to analyze the remains for yourself in a controlled environment?

A. Yes.

Q. How does that happen?

A. Well, what first happens is that our presence is requested at the actual autopsy. She will have done her piece as well as she can and then she asks us to consult. In this case what we did was when she said she was finished with her part, we just -- what she does is sign a chain of custody form that signs those remains over to us. We then take them to our laboratory, which is just down the hall, and the rest of our analysis takes place in our laboratory.

Q. Okay. Let's talk about what you do when you get the remains into your laboratory.

A. Okay.

Q. What's the first thing you're going to do?

A. What we did in this case -- usually it takes some preparation to get the remains so that you can see the bone surfaces clearly. This case didn't take very much of that. What we did was wash them with water. That was all we did

to prepare them.

Q. Okay. Can you tell us what the condition of the bones were when you got them?

A. The bone quality itself, in other words, the quality of the bone surfaces was very good. It was still greasy, meaning that it had not fully dried out as bones will do over time. There was some carnivore damage to them. But primarily they were in pretty good shape.

Q. Okay. So, what is the purpose of you washing them when you get them into your lab?

A. Well, a lot of times there are materials adherent to them. Some cases it's soft tissue. Other cases it's soil or vegetation. In order to make sure we can see all the surfaces of the bones clearly, we need to get that material off the bones.

Q. Okay. Was there any soft tissue on these remains?

A. There was very little.

Q. Okay. Would it have been enough to remove from the bones and, say, have tested?

A. No.

Q. Okay.

A. Not as far as -- that would be a better question for Dr. Haden-Pinneri, but.

Q. Okay. Also when the remains show up at the Institute of Forensic Sciences, is a unique identifying

number assigned to those remains?

A. Yes.

Q. And do you know what the number was assigned to this case?

A. ML10-1866.

Q. Okay. So, now, they're in your laboratory. You've washed them. What do you do next?

A. Put them back in anatomical order on the table. That table is only used for that skeleton. So, that's the first thing we do.

Q. Okay. I'm going to show you what is marked as State's Exhibit 112. Is that what you are referring to?

A. Yes. That's the superior half of the skeleton, the upper half.

Q. And State's Exhibit 113.

A. Yes, that's the abdomen and upper -- and the pelvis and the upper leg bones.

Q. Okay. When you -- I'm going to put State's Exhibit 112 back up. What is the purpose of laying everything out like this?

A. It's standard practice. It's written in our SOP, but it is to make sure that we know what we have. The first part of our report will be a review of the inventory and this is how we establish that.

Q. Okay. Can you tell us a little bit about what

we're looking at here?

A. In terms of what bones are actually represented?

Q. Yes.

A. This, what you have there is the skull; you can see the vertebral column beneath that. You see two sets of ribs, the scapula, which are your shoulder blades, clavicle, which are your collarbones. The two long bones at the top there are your humeri, your upper arm bones. The paired bones beneath those are your radius and ulna. The collection of bones at the top right of the screen is what are fragments that are either -- not necessarily unidentifiable but they don't articulate directly with anything; so, we obviously collect them and inventory them but we don't --

Q. Okay. Is the hyoid bone in this collection of bones? And you can touch your screen to indicate where the hyoid bone is.

A. It is. It's just anterior or superior to the left clavicle right there, that little -- right -- not getting close. Can you guys -- it's missing a little bit.

Q. Is it right --

A. That's it. That's it.

Q. Okay.

A. That's the body of the hyoid. It's not the complete hyoid.

Q. Where is the hyoid bone located in somebody's body?

A. It's behind your mandible, high up in your throat. It's located right there.

Q. Okay. What's the next step that you're going to do after you inventory all the bones that you have?

A. In this case, since it was an unknown at the time, we developed what's called a biological profile. So, that was to look and see what -- whether we could give any indication of whether this person -- about this person's sex, age, ancestry, which is our term for race, and stature.

Q. Were you able to make a determination in this case?

A. We make our estimations, but, yes.

Q. First of all, before we get to that, tell us how you can figure those things out with a skeleton.

A. It depends which question you're asking. If you're asking about sex --

Q. Let's start with sex.

A. Okay. The primary indicators of sex are on the pelvic bone. They have to do with childbirth.

Q. State's Exhibit 113, does that help?

A. Yes, it does. So, what you're looking at, the two fan-shaped bones in the middle, these, those are called your innominates. That's our term for the pelvis. Those are the two bones that articulate or pair or match with the bone that's in the middle, which is your sacrum, and together

they form essentially a bowl-shaped conglomeration that's your pelvis and those bones vary between men and women.

Q. How do they vary?

A. Well, they're built for childbirth in women. And so, what you have essentially is elongation of certain parts of it. So, in this case we noted things like a widened sciatic notch, which is -- oops. I missed. It's the notch that you see in sort of the center of the bones on the inside surface. That is much wider in females than it is in males. And then the pubic bones, which are the two bones that come together in the front, they tend to be longer and more narrow in females than they do in males.

Q. Okay. So, after examining these remains, did you make a determination about sex?

A. We did. We also -- the skull also gives some information about sex and so you can do -- take both --

Q. I'll put up State's Exhibit 112. Does that help?

A. Yes.

Q. Okay.

A. What we do is we take a series of measurements and we enter them into a multi-discriminant function analysis program and it will generate an estimate whether it's male or female and it gives you statistics along with that to tell you how strong that association is. There are also nonmetric, meaning non-measured traits that we look at. So,

we look at things like the brow ridge, muscle attachments on the back of the skull that gives some indication of whether it's a male or female. In this case everything indicated a female.

Q. Okay. Let's move on to age. How did you -- how were you able to determine age?

A. Age is -- with the skeleton in young people, you determine age or estimate age based on development of bones. Once you get to be an adult, what you're looking at is degenerative changes. Certain parts of the skeleton degenerate in predictable ways. The two best indicators are the fourth rib, the anterior fourth rib where it meets the cartilage and the other is the pubic symphysis. These are parts of the pubic bones that we just looked at where they come together in the middle of your pelvis. In this case the pubic symphysis was not there, was not recovered because of scavenging but the fourth ribs were there. There are also other indicators. We use suture closures. So, you've got all the bones -- your skull is made up of a number of bones. Those bones fuse together at predictable rates so you use -- you look at which ones were fused and how completely they're fused and you can generate an age estimate.

Q. Okay.

A. So, we use all those things in conjunction. In

this case it was the suture closure, it was the fourth rib end and then it was the level of degenerative changes to the rest of the skeleton, arthritis, things like that.

Q. And in this case were you able to give a range of age that would fit with these remains?

A. Yes, 40 to 60.

Q. 40 to 60 years of age?

A. Years of age.

Q. Let's now talk about ancestry. That's what you refer to as race?

A. That's right. We use the term ancestry.

Q. Ancestry?

A. Yes.

Q. How do you determine that?

A. It's almost entirely based on the skull. There are, again, metric and nonmetric traits that we look at, nonmetric being things that you don't measure. So, you're looking at the shape of the eye orbits, you're looking at the profile of the face, you're looking at the overall shape of the skull. And then when it comes to metric analysis, there are a series of measurements that you take of the skull and then you enter into -- that same program that does sex will also do -- the multi-discriminant function analysis program will also do ancestry. And again, it attaches statistics to that to give you some indication how likely it

is that that person fits into that category.

Q. Okay. And what did you determine the race was in this case?

A. She fit into the Caucasian/white category.

Q. Okay. Anything else that you can test to determine anything about this person?

A. You can do stature. Stature generally is more accurate with complete bones and I don't believe we had any complete long bones so -- but there are -- there are formulae for generating a stature estimate based on incomplete remains. We did that.

Q. Were you able to come up with a stature for this case?

A. Yeah. I think it was pretty wide because of the fragmentary nature of the bones, but I think it was 47 inches to 62 inches, I think, was our range.

Q. Can you relate that in height and --

A. Yeah. It would be -- 60 inches is five feet. So you're talking, you know, four-foot-nine to five-two.

Q. Okay. Okay. Now, after you have determined those factors, what do you do next?

A. What we do after that is a trauma analysis and that involves a very detailed review of every single bone, both grossly, meaning holding the bone in your hand, and under the microscope.

Q. Okay. I'm going to go through a few State's Exhibits. Let's see. State's Exhibit 114. What are we looking at there?

A. That is a scapula on the left of the screen, which is your shoulder blade and the clavicle next to it on the right, which is your collarbone.

Q. Okay. And what did you notice from these two bones?

A. Well, these may be just inventory pictures but I think what I notice right now is that there is carnivore damage to the lower portion of the scapula there, the shoulder blade.

Q. Okay. Can you point that out to us on the screen?

A. It's that whole bottom margin has been chewed away and -- just to the left of that arrow is an actual tooth puncture wound, pretty typical of canine scavenging.

Q. Show you State's Exhibit 115. Is that what you were just referring to?

A. Yes, that's a close-up.

Q. State's Exhibit 116.

A. What you have there is the opposite clavicle, so it's her other collarbone, and the sternum, which is your chest plate.

Q. Okay. And do you notice anything --

A. There is -- both of those bones exhibit carnivore

damage.

Q. Okay. State's Exhibit 117?

A. Those are left ribs and what you're looking at is sort of mid-shaft segments of them. Again, there is postmortem carnivore damage.

Q. State's Exhibit 118.

A. Those are the two innominate bones; in other words, your two pelvic bones. They're in roughly anatomical order. You see the sacrum, which is the tailbone, but behind them, there and again, a lot of postmortem carnivore damage.

Q. State's Exhibit 119?

A. That's the skull and mandible.

Q. Did you note any signs of trauma or animal activity on the skull or mandible?

A. No.

Q. State's Exhibit 120.

A. That's the mandible.

Q. And that's your upper or lower jaw?

A. Lower jaw. Sorry. And that's looking down at it like that.

Q. Okay. State's Exhibit 121?

A. It's just an inventory photograph of the mandible and maxilla, which is your upper jaw, and showing that there are teeth missing.

Q. Okay. Now, did you look at every single bone that

was recovered in this case?

A. Yes.

Q. And tell us a little bit about -- you started to say that you look at it visually.

A. Uh-huh.

Q. What else do you do?

A. We look at every one of them under a microscope, stereo microscope.

Q. Okay. I want to draw your attention to the hyoid bone that we talked about in State's Exhibit 112. You stated it is this bone right here?

A. That's correct.

Q. Is that right? Did you inspect that bone under a microscope?

A. Yes.

Q. And I'm going to show you what has been marked as State's Exhibit 122. What are we looking at here?

A. What you have there, that is a portion of the body of the hyoid. The hyoid is a bone, again, that's in your throat. It's a three-piece bone in younger adults. In most adults it fuses to their -- what you have is the body, which is the central portion and you have two horns, greater horns, that in most people fuse; in some people they don't. Some people, they fuse only on one side. In this particular case what you're looking at is on the left side of the body

of that -- of the body of the hyoid, this is the articulation or the point at which the left horn and the body meet. That's what you see here.

Q. Okay. Let me stop you there.

A. Okay.

MS. FULLER: May I approach the witness?

THE COURT: You may.

Q. *(BY MS. FULLER)* I'm going to show you what has been marked as State's Exhibit 125. Do you recognize that photo?

A. I do.

Q. What is that a photo of?

A. That is a photograph of a -- example photograph of a hyoid bone. It's not from this case.

Q. Okay. Not what you recovered in this case?

A. No.

Q. Not the complainant's case?

A. Correct.

Q. Not her hyoid bone?

A. Correct.

Q. Would this picture aid the jury in understanding what the hyoid bone looks like and the parts that you're about to testify about?

A. I think so, yes.

Q. Okay. It's a fair and accurate depiction of the

hyoid bone?

A. Yes.

MS. FULLER: State moves to admit for demonstrative purposes only State's Exhibit 125, tenders to defense counsel for inspection.

MR. CORNELIUS: No objection, Judge.

THE COURT: State's Exhibit 125 will be admitted.

MS. FULLER: For demonstrative.

THE COURT: For demonstrative only.

MS. FULLER: Thank you, Your Honor. May I publish?

THE COURT: You may.

Q. *(BY MS. FULLER)* State's Exhibit 125, tell us what we're looking at here. You can use your screen to help point items out.

A. What you're looking at -- it might be helpful if you flip it over from the standpoint of explaining it.

Q. Okay.

A. What you're looking at is the exterior or back surface of the hyoid bone. Like I said, the hyoid bone begins in three pieces. I use this particular bone as an example because it has a unique feature but what you have are -- those are two what are called the superior horns of the hyoid and that is the body of the hyoid. Those three

bones in children and young adults are unfused. Generally they'll fuse at some point in a person's life but they don't always and there's no real understanding of why that happens. In this case this person has fused on one side.

Q. Okay.

A. So, you can see the point of articulation is roughly in that area. It's in the same area as it would be on the opposite side.

Q. Okay. I'm going to clear this. If you would, can you sort of illustrate using your screen what was recovered in this case using this example?

A. Yeah. It's just that central portion. So, from that point to the left and then from the same point on the other side to the right.

Q. Okay. And again, can you sort of point out where that bone is located in your body?

A. It's up here.

Q. Okay. And that would be right under your lower jaw?

A. Yes. It's actually kind of behind it. It's not below it. It's pretty far up there.

Q. What does that bone -- what do bones in your body do? What's the function of bones?

A. A lot of them have mechanical value; in other words, they're there to help with locomotion, things like

that. In this case it's essentially a tether for a lot of the muscles of the neck.

Q. Okay.

A. So, it doesn't articulate with any other bones. It only has ligaments and muscles attaching to it.

Q. Okay. And what other areas are around -- what other things are near the hyoid bone?

A. In terms of bone?

Q. Anything.

A. Well, you have the larynx. So, you have several -- immediately beneath it, you have the thyroid cartilage and the cricoid cartilage. These are cartilage you can actually feel on the front of your neck here. That's the cricoid cartilage, which is a ring-shaped cartilage. Those are immediately beneath the hyoid bone. You have the trachea behind that and then there's a lot of musculature that surrounds this.

Q. And the trachea is used for what?

A. Breathing.

Q. Breathing?

A. Yes.

Q. Okay. When you studied the portion of the hyoid bone, did you -- when you did a visual inspection of it, is it large enough to visually inspect in your hand?

A. Yeah.

Q. When you did the visual inspection, did you note anything, aside from the fact that it's missing the two -- you called it horns?

A. Yes.

Q. Aside from it missing the two horns, did you notice anything else about that piece of hyoid bone?

A. Yes. There was what appeared to be a fracture.

Q. Okay. And State's Exhibit 122, what are we looking at?

A. You are looking at the point of articulation; so, where the bone's two pieces meet, between the body of the hyoid and the left greater horn, okay? So, this whole -- this whole surface is where that horn would have attached to.

Q. Okay. And again, I want to go back to State's 125. Point out where you're talking about, where that point would be that they would meet.

A. Well, for illustration I'll use this side but it's actually to the left of that. It's on the body of it. But in this particular decedent, it's actually on the left side.

Q. Okay. So, we're talking over here?

A. That's right.

Q. Okay. And you can't tell whether or not it was fused --

A. But it's not on the horn. It's on that opposite

surface. The arrow's just missed. It's on the body itself.

Q. Okay. On the -- here?

A. Right. Exactly.

Q. So, State's Exhibit 122, you see that there is a fracture?

A. Yes.

Q. Okay. Does that tell you anything?

A. In terms of interpretation?

Q. Yes.

A. Unfortunately, no, given the level of postmortem damage there was to the rest of the skeleton. There's nothing we can glean from that fracture. It is a fracture but where it came from, we can't tell, can't interpret.

Q. Do you recall where you recovered it at?

A. It was within that primary site of decomposition once we removed the leaf litter.

Q. Okay. And let's say that somebody out on the scene stepped on it when they were recovering the bones. And we're talking about when you guys were actually out there recovering. If somebody had stepped on it and caused that fracture, would you find the other piece in close proximity to the bone? Do you know what I --

A. Well, our interpretation of this fracture is that in order for it to happen, that they -- the superior horn was actually partially fused to -- at that point. And the

fracture is actually right there. And so it looked like it was actually partially fused which means that the fracture came when those two pieces were broken apart.

Q. Okay.

A. So, yes, if they were articulated and it was -- something happened at the scene, then -- I would suspect that the horn would be in association with the body.

Q. Okay. Both pieces would be recovered?

A. Right.

Q. And in this case were you able to recover the horn?

A. No.

Q. Was there anything else that you discovered -- let me back up. After you inspected everything visually and under a microscope, what did you do next?

A. Well, generally what we do once we're -- we write a report, we submit that to the pathologist. These -- the bones are put back in the body bag. In this case they're put in a box within a body bag and placed within the morgue cooler for release to the family.

Q. At this point you turn your findings over to Dr. Pinneri for her to complete her investigation?

A. That's right.

MS. FULLER: Pass the witness.

THE COURT: Ladies and gentlemen, why don't we go ahead and take our morning break at this time so we don't

have to interrupt the doctor's cross-examination. We'll be in recess until 11:15, please.

(Jury not present.)

(Recess.)

(Jury present.)

THE COURT: Be seated, please. Mr. Cornelius, you may proceed.

MR. CORNELIUS: Thank you, Judge.

CROSS-EXAMINATION

Q. *(BY MR. CORNELIUS)* Dr. Wiersema, am I saying that correctly?

A. That's correct.

Q. We've never met, have we?

A. Nope.

Q. At the start, in fairness to the jury, you're talking about bones and bodies and stuff, which is what you do every day, correct?

A. That's right.

Q. It's probably pretty hard for people to sit there and listen to this. We realize that, don't we?

A. Yes.

Q. With all due respect to the jury, we'll go back into the bones and bodies right now.

Do you do any DNA work? Do you know about DNA? Has that been ever a part of your study?

A. No, no it has not.

Q. Okay. So, you would have nothing to do with trying to get DNA in this case to determine the identity of the person whose bones were found?

A. I don't.

Q. All right. You work for the Medical Examiner's Office or what we used to call the Medical Examiner's Office, correct?

A. Yes.

Q. You don't work for the police department or the sheriff's department, correct?

A. No, that's correct.

Q. You're not a policeman.

A. That's correct.

Q. You're not a law enforcement personnel.

A. That's correct.

Q. You're a professional that works in the Institute of Forensic Science. Is that what we call it now?

A. That's right.

Q. And you're not taking sides in this case or trying to shape your testimony to fit the State's theories in this case. You're just talking about what you as an expert saw, correct?

A. That's correct.

Q. And your opinions about things.

A. That's right.

Q. Among the questions that you were asked concerning the hyoid bone, you can't say how that bone was broken, correct?

A. That's right.

Q. You're not even positive it was broken, I take it.

A. There is a fracture.

Q. Okay.

A. But I can't interpret it.

Q. The question about the horn that apparently was attached to that bone not being found, neither of the horns were found, correct?

A. That's correct.

Q. So, it probably didn't happen by somebody stepping on it because somebody stepping on it wouldn't cause both horns to disappear, right?

A. That's probably correct.

Q. I mean, we don't know for sure.

A. Right. I don't know.

Q. Somebody could have stepped on it.

A. That's right.

Q. And maybe somebody stepped on it not the day y'all were out there but maybe some other day and after somebody stepped on it and broke the horn or horns, then an animal took them off. I mean, that could have happened, right?

A. Sure.

Q. Okay. The fracture that you saw on the hyoid bone could have been caused by an animal itself, correct?

A. That's correct.

Q. I mean, the animal could have bit right there and separated the -- is it called the central part?

A. The body of the hyoid.

Q. The body of the hyoid bone to the horn, correct?

A. That's correct.

Q. An animal could have done that, right?

A. Yes.

Q. There's really just not any way to know.

A. That's right.

Q. The estimate concerning sex and the study that you did and the information you gave the jury, is that to say that you're completely certain this was -- these were bones from a female?

A. Like I said, they are estimates. I mean, there's no certainty, you know, in most of the forensic sciences.

Q. So, we can't be positive that these bones were from a female? We can't be positive.

A. Well, she was positively identified as the missing person by dental records.

Q. I guess somebody's told you that, but no one identified her to you, did they? I mean, no one came to the

morgue and said that's whoever the State says it is.

A. Our odontologist came in and did a comparison of dental records.

Q. Okay. We'll get to that in a minute. Did you have anything to do with that?

A. No.

Q. Okay. Well, I just want to kind of examine your testimony and your part of this.

A. Okay.

Q. I'm not being sharp with you in any way.

A. Okay.

Q. But from your standpoint, being called in as an expert to look at the bones, not being influenced by what somebody else may have told you, okay, can you say for certain that these bones belong to a female?

A. No. Our methods don't give us certainty.

Q. All right. And when you -- the report that was filed, I guess it's under Dr. Pinto's name?

A. Uh-huh.

Q. But you signed it also?

A. That's right.

Q. I was concerned. At one point it estimated the age between 40 and 60, as you told the jury, and another point is estimated between 45 and 65. Is there a difference? Is there a different formula there?

A. No, it's not a different formula. We use our discretion to pick an age range within the ranges that are provided by the different methods we use. I think that was just an oversight.

Q. Was it two different methods?

A. No, no. It was just written one -- if you look at the notes, it's actually got, I think -- I believe 45 to 65 and then crossed out and 40 to 60.

Q. Oh, okay.

A. It's just a correction.

Q. All right. So, that -- but your belief is 40 to 60?

A. Yes.

Q. Not 45 to 65?

A. Right.

Q. Was it somebody else that placed the person possibly as old as 65 or maybe you didn't agree with somebody else and y'all had two different opinions?

A. Well, what -- the original age estimate was made by Dr. Pinto under my supervision and then Dr. Love, who also cosigned this report, the three of us worked on this case together. So, we came to the 40 to 60.

Q. Who was it originally saying -- I don't know if it's original or not. Who was saying 45 to 65?

A. I can't be certain.

Q. Is that just a misprint maybe?

A. Yes, I think so.

Q. Just a typo?

A. Yes.

Q. Okay. That's fine. So, that's a pretty wide range, 40 to 60. That would include a lot of women, if we accept the fact that it's more than likely a woman, that would still include a lot of women, right?

A. That's right.

Q. Now, the race. You found consistencies with the bones belonging to a Caucasian or white person. That's the way you put it, right?

A. Uh-huh.

Q. Are you positive about that? Is that an absolute certainty?

A. No.

Q. No?

A. No, it is not.

Q. Okay. And the height, I think you told the jury 47 to 62 inches. I think you meant 57 to 62 inches, right?

A. That's correct.

Q. But you also explained that because of the absence of some of the long bones, you can't be very certain about that either, correct?

A. That's correct.

Q. So, the person might have been taller or shorter than even the estimate?

A. No, generally it just makes the estimate wider, the range wider than it would have been if we had complete bones. So, it's probably within the range.

Q. Okay. If you had those longer bones, you maybe get the range down a little?

A. Narrower, right.

Q. So, we're -- our range is, like, five inches.

A. Yeah.

Q. Gotcha. Now, the missing teeth. There was a lot of missing teeth. How many missing teeth?

A. I believe we recovered 14 teeth, 13 teeth.

Q. Let's see.

A. Some were missing postmortem. Some were missing antemortem.

Q. Can I give you your report to look at that?

A. Yes.

Q. Let me give you your report. Do you need these charts at the back to comment on that?

A. You mean the dental chart? Yeah, I can use that. I can use either one.

Q. Just for identification purposes, I'll mark this Defendant's Exhibit No. 1, if I had a pen.

THE COURT REPORTER: Here.

MR. CORNELIUS: I got it.

May I approach the witness, Judge?

THE COURT: Sure.

Q. *(BY MR. CORNELIUS)* Just to identify what we're looking at, it's marked as Defendant's Exhibit No. 1. What is that that you're going to look at now?

A. This is the report, the anthropology report for this case.

Q. And the three of you signed that report, correct?

A. That's right.

Q. Go to the dentition part or the teeth part and tell me how many teeth were present and therefore how many teeth were missing.

A. 14 teeth of the 32 are present and then what you have is 11 teeth are missing antemortem which means that they were lost before the person died and that we can tell that because the bone has healed after the loss of those teeth. And then the third molars are absent and we can't tell whether they ever developed, which is the case in some people, or whether they were extracted or lost.

Q. Is that four more teeth or three more teeth?

A. The third molars? That's four more teeth.

Q. Okay. Four were uncertain whether they were ever there in the first place?

A. That's right.

Q. So, that leaves what? Three other teeth?

A. And then it looks like -- and then we have a couple of -- yeah, the others were missing postmortem, meaning that -- the way we can tell that is that the socket that they fell out of is still -- the edges are sharp. There's no indication the bone healed after that tooth fell out.

Q. Okay. Now, the 11 teeth that were missing before she died, where were those teeth? I mean, what part of the mouth?

A. Let's see. Teeth Nos. 4, 5, 8, 9, 12, 15, 21 and 28. And so, I can tell you that that means -- what you've got is essentially the two premolars on either side, which are teeth that are sort of behind your canines. Let's see what else. So, those four are missing from the top. The two front teeth, missing.

Q. So, how many teeth at the top are missing?

A. Let me see.

Q. Her front four teeth, they are missing, right?

A. Yes. Yeah.

Q. And that was before she died?

A. That's correct.

Q. And what else on the top?

A. Let's see. Well, it extends beyond -- then you also have the premolars are lost. So, essentially everything from one side on your -- on the left side from

the canine all the way across to the premolars on this side. So, roughly from here to here.

Q. And you know those were before she died because they had already healed.

A. That's right. The bone sockets had healed.

Q. Let me make sure I'm clear for the jury. These are not gone because somebody knocked them out at the time she met her death, for whatever reason, why she met her death?

A. That's correct.

Q. These are nothing to do with her dying.

A. Right.

Q. They were gone before that day?

A. That's right.

Q. Because they had -- how long would they have had to have been gone for them to be healed the way you saw them?

A. It's hard to say but we're talking months to years.

Q. Months to years?

A. (Nods head affirmatively.)

Q. Okay. Now, what about on the bottom?

A. There is just two. So, it would be the first premolar on the bottom on the left side and the first premolar on the right side. So, there's two teeth on the bottom that were missing post -- or missing antemortem.

Q. So, that's a total of 11 that you know were missing before she died because the places where the teeth were had

healed.

A. That's right.

Q. And they had been gone somewhere between months and years.

A. That's right.

Q. Now, have you had any studies on the effects of chronic alcohol and drug use and people losing their teeth?

A. I can't answer that. It would be a better question for Dr. Pinneri.

Q. Okay. Let me look at the report myself. I'll give it back to you if you need it.

MR. CORNELIUS: Can I just stand here for a second, Judge?

THE COURT: Sure.

Q. *(BY MR. CORNELIUS)* I'm just putting State's 112 up here. Let me make sure I get it all as a reference point. Is there anything -- any of the bones that are depicted in 112 that indicate any fractures or trauma that you can say occurred before she died?

A. No, there's not.

Q. Okay. I'll just put up here State's 113, which also includes the below-the-waist bones, correct?

A. That's correct.

Q. I know that's not a correct way to say it but whatever. Anything that you observed, shown here in State's

113, in any of these bones that indicate any trauma or damage to the bones that occurred before she died?

A. No, there's not.

Q. Is there anything in either of these photographs, from your personal inspection, that showed any injury causing her death?

A. I can't speak to that. No. Not in -- not from an anthropologist standpoint, no.

Q. Okay. I mean, sometimes you might find the -- is this the femur?

A. Yes, it is.

Q. And this is the femur?

A. That's correct.

Q. Okay. You might have a case where you find the femur shattered, correct?

A. Yes.

Q. And it might be shattered in such a way that it would have perhaps severed the femoral artery and the person probably would die from that. So, you might, as an anthropologist, say that that happened timely with the person's death because you couldn't live like that. Could you form that conclusion?

A. We wouldn't go so far as to say that. What we would say is the fracture happened within this time period. We wouldn't interpret. That would be for the pathologist to

take from there.

Q. Okay. If there were a bullet hole, this hole right here is what?

A. That's called the obturator foramen. That's actually a natural --

Q. That's not a bite mark or a bullet hole?

A. That's correct.

Q. You -- can you tell the difference between a bullet hole and a bite mark?

A. Yes.

Q. If there was a bullet hole through this bone or this bone or through one of the leg bones or up here, the arm or the clavicle, whatever, you could tell that a person was shot, right?

A. Yes.

Q. You don't see any evidence of that?

A. No.

Q. Stab wounds. You might could see that in the bones, correct?

A. That's correct.

Q. But no evidence of that.

A. Right.

Q. The fact that the person had been beaten, you might see that. It might be healed fractures or unhealed fractures in the bones.

A. Right.

Q. Especially around the head, right?

A. Right.

Q. I mean, you might have had somebody that had had blunt trauma with the head consistent with the time they died or maybe in times past, you might see a healed fracture in the skull, correct?

A. Yes.

Q. You might see that, right?

A. Uh-huh, yes.

Q. None of that on this case?

A. No.

Q. Right? Did you ever tell anyone in the Medical Examiner's Office or the police department or the DA's Office that you felt that the fact that that hyoid bone was fractured meant that she had been strangled?

A. No. What we said is what's in the report and that is that there is a fracture but we can't tell whether it's perimortem, meaning at or around the time of death, or postmortem.

MR. CORNELIUS: All right. Pass the witness.

THE COURT: Ms. Fuller?

MS. FULLER: Nothing further, Your Honor.

THE COURT: May this witness be excused?

MS. FULLER: Yes, Your Honor.

MR. CORNELIUS: Yes, Your Honor.

THE COURT: Thank you, Doctor. You are free to go. Please don't discuss your testimony with any of the other witnesses.

THE WITNESS: Thank you.

THE COURT: Thank you.

Call your next witness, please.

MS. FULLER: State calls Dr. Haden-Pinneri.

THE COURT: Come on up, Doctor. Right around up here, please.

(Witness sworn.)

THE COURT: You may proceed.

KATHRYN HADEN-PINNERI,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

Q. *(BY MS. FULLER)* Good morning.

A. Good morning.

Q. Could you please state and spell your name for our court reporter.

A. Yes. My name's Kathryn Haden-Pinneri, and it's H-A-D-E-N-P-I-N-N-E-R-I.

Q. Dr. Pinneri, who are you employed by?

A. I am employed by the Harris County Institute of Forensic Sciences.

Q. And that used to be referred to as what?