Witness: Alison Galloway

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Called by: People (prosecution)

Phase: Guilt

Examinations: Direct – David Harris; Direct; Cross – Mark Geragos; Cross; Redirect – David Harris

Day 1 of 1 for this witness

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Direct Examination by David Harris

JUDGE: Now we have Doctor Galloway.

HARRIS: Doctor Galloway.

CLERK: Raise your right hand. You do solemnly state that the evidence you shall give in this matter shall be the truth, whole truth, and nothing but the truth, so help you God?

GALLOWAY: I do.

Testimony of ALISON GALLOWAY, called as a witness, being first duly sworn.

CLERK: Be seated. State and spell your name for the record.

GALLOWAY: My name is Alison Galloway.

A-l-i-s-o n. G-a-l-l-o-w-a-y.

DIRECT EXAMINATION

HARRIS: Miss Galloway, what is your occupation?

GALLOWAY: I'm a Professor at the University of California in Santa Cruz.

HARRIS: And what do you teach?

GALLOWAY: I teach anthropology with a specialization in forensic anthropology.

HARRIS: For the specialization there forensic anthropology, do you have any background, education, or training that you can tell us about?

GALLOWAY: Yes. I received my Masters Degree from the University of Arizona in Tucson, with specialization in forensic anthropology. My PhD is actually in anthropology in general, but focuses, again, on skeletal biology, the examination of the skeleton. And I'm board certified as a forensic anthropologist by the American Board of Forensic Anthropology.

HARRIS: Can you explain to us what that last part means?

What is the board of forensic anthropology?

GALLOWAY: It's a nationwide organization that provides a testing mechanism for anthropologists to seek certification in the specialization. It takes -- there is an examination, which is a four-hour comprehensive exam, written exam, and a four-hour practical exam. And then there are annual updates, as well as fees, of course, to keep that certification intact.

HARRIS: And how long have you been in the field of anthropology?

GALLOWAY: Anthropology, ever since I started high school, which is a long time.

JUDGE: You don't have tell us. It's been a long time.

GALLOWAY: I have been doing forensic anthropology for about 20 years now.

HARRIS: Were you contacted -- I'm going to take you back in time.

JUDGE: Can we get -- are you offering her as an expert witness?

HARRIS: Yes.

JUDGE: Doctor Galloway, have you qualified as an expert witness before in the field forensic anthropology?

GALLOWAY: Yes, I have.

JUDGE: How many times?

GALLOWAY: I have testified about 12 times.

JUDGE: In which courts have you qualified?

GALLOWAY: Alameda County, Marin County, Santa Cruz, San Benito County, Monterey County, Kern County. And once in Arizona, I think. I forget the county.

JUDGE: Any questions, Mr. Geragos as to her expertise?

GERAGOS: No. Once I heard Alameda County I knew you will qualify her. Yes, I will accept Doctor Galloway as an expert in forensic anthropology, and competent to give an opinion.

JUDGE: Go ahead.

HARRIS: Thank you.

HARRIS: In April of 2003, were you contacted by the Contra Costa County Coroner's Office to assist them in examination of a remains that they had recovered?

GALLOWAY: Yes, I was.

HARRIS: And we have a stipulation that those remains are Laci and Conner Peterson, so we'll just use those terms for part of this. After this contact, did you actually go to the Coroner's facilities in Contra Costa?

GALLOWAY: Yes, I did.

HARRIS: And did you examine the remains of Laci and Conner Peterson?

GALLOWAY: Yes, I did.

HARRIS: Was this after the autopsies had been performed?

GALLOWAY: This was the after autopsies had been performed.

HARRIS: Is that standard in the field of forensic anthropology?

GALLOWAY: Yes, we -- normally we're consultants for the pathologists. We'll come in after their work is done.

HARRIS: At the time that you went in to do these examinations, obviously they were not identified at that point in time?

GALLOWAY: No, they were not.

HARRIS: And did you refer to them by any particular labels or names?

GALLOWAY: We used Individual A and Individual B. We also were using the case number. Laci Peterson was 0808, and Conner was 0799, Individual B.

HARRIS: Behind you is something that's been marked as People's 259. Do you recognize that particular item?

GALLOWAY: Yes, this is an enlargement of the chart that we did for Laci Peterson's remains.

JUDGE: What happened to the pointer?

GALLOWAY: It's in the corner.

JUDGE: If you are going to use the chart, doctor, we ask you to use the pointer. Go ahead.

HARRIS: Doctor, I want to go through the process. When you to a forensic anthropological examination on remains, can you describe for us that process, what do you do?

GALLOWAY: We start with a look at the overall body to see what we can see. And then we really focus on the skeletal material. And so in this case we need to get access to as much of the skeletal material as we can. Bearing in mind that there was probably necessity for other examinations, we did not clean off the skeletal material, which is what we would normally do.

HARRIS: When you say clean off skeletal material, you basically removed flesh from the bones?

GALLOWAY: That's correct.

HARRIS: And that's why it's pretty much a standard practice that you come in after the pathologists do the autopsy?

GALLOWAY: Yes. If we do -- if we have to did a full cleaning on a remains, set of remains, then the soft tissue is no longer associated, and it's not possible to do an autopsy.

HARRIS: Now, in this particular case, we'll start with Laci Peterson. Did you do -- as you go through this process, do you do an examination of the entire body?

GALLOWAY: We went -- yes, we did an examination of the entire body. We went limb by limb, and through the thorax. Because some of the material was exposed, we could see in the chest cavity. Most of the ribcage -- all of the ribcage. And so we were able to do an examination there as well.

HARRIS: When you received the remains for you to do your examination. In that particular case with Laci Peterson, she's an unidentified individual. Can you tell things from just looking at the bones, such as age or sex?

GALLOWAY: Yes. We do what's called a biological profile. And this is to give an idea of the age, the sex of the individual, the ancestry, stature, things like that. For this individual, we could tell, first of all that it was female based upon the pelvis shape. Women have somewhat different shaped pelvises in order to allow the baby to pass through. We have a wider pelvis. And so this was definitely female. It was a younger individual, because there was no arthritic changes. But all of the symphyses, the ends of the bones, actually attached on to the bones. In other words, this person had stopped growing. So they were of their adult size. We knew at the time they were probably in the young adult years.

HARRIS: As you going through and doing this biological profile, do you also inventory or document all of the bones that are present, or any that are absent?

GALLOWAY: Yes, we do a full inventory on the skeletal material.

HARRIS: Do you also document if there is any injuries to the bones from an anthropological point of view?

GALLOWAY: Yes.

HARRIS: Looking at 259, does that appear to be a blowup of the inventory chart that you prepared?

GALLOWAY: Yes, it is.

HARRIS: If you will take a pointer. Now, if you can approach that, can you take us through what this chart represents?

GALLOWAY: What we have, the areas that are marked in black are the areas that were not present for our examination. The arms, including the hands, lower arms, the lower legs, except for one single bone on the right side, were all missing at the time of the examination. Also missing was the most of the neck. There are six vertebrae in the neck -- or seven vertebrae in the neck. The seventh one was present. And the top six were missing. And then the cranium and the mandible, which are the head and the jaw, were also missing.

HARRIS: And did you also -- just going through, down the middle of that, is there a key in that particular inventory that represents certain observations that you made?

GALLOWAY: Yes. We had the black area here noted as those not present. And underneath we noted two, what we call defects or changes to the bone. The postmortem defects are those that could be attributed, based on the characteristics, to a definite postmortem period. And the perimortem defect, because of the characteristics of the break, occurred closer to the time of the death.

HARRIS: In your original report or inventory sheet, did you use colors to identify those two categories of postmortem defect and perimortem defect?

GALLOWAY: I believe we have the perimortem is red, and the postmortem as blue. On this chart they are the orange and green.

HARRIS: And if could -- I don't know if you can do it from sitting down, or if you can stand up. Can you -- let's just go through the postmortem defects. What did you find in terms of Laci Peterson's remains or postmortem defects?

GALLOWAY: On the postmortem defects we have a section of the right 9th rib is missing, and the end is very frayed. This is characteristic of a postmortem defect. And then on the back of the scapulae, or the shoulder blades, the edges right here, and on this side, there was some fraying up at the top margin on the right side. There was considerable damage all along that margin of the bone, including sort of a punctured area right in here. Those were definitely postmortem. We also found two what we call perimortem defects. One of these was on the left fifth rib. One is on the left sixth rib. The lower one had been cut out already by the -- during the autopsy, so that was removed. We have the second one just above that. These are perimortem, because of the nature of the fracture. They are clean fractures. However, I have to explain that perimortem, to a forensic anthropologist, is a relatively long period of time. It includes the time prior to the person's death, when we don't see any healing. And skeletal healing will take a couple weeks to show up on the bone. So for that period before the person dies, we would still see it as a perimortem injury. To make it even a little bit more difficult for us, the postmortem period only sets in when the bones lose their resiliency, so they don't bend as well. And so that can take some period of time after the person has died. All of that period between when -- before you start healing, and to that when the bone loses its resiliency, all, to us, is a perimortem period.

HARRIS: So in terms of the terminology of perimortem, for an anthropologist, that's somewhat of a longer period of time than perimortem for, say, the pathologist?

GALLOWAY: That is correct.

HARRIS: You can resume your seat. Now, your examination of the -- of the remains of Laci Peterson, did you notice any type -- just back up for a second. You were describing for us in -- up there in the perimortem defect, the shoulder bone, indicating there was some type of puncture. Did you associate that with any type injury or activity?

GALLOWAY: It looked very typical for what we see of things like carnivore damage. Dogs. Dogs, coyotes, anything like that would get to it. They tend to crush the bones. They puncture the

canine teeth will make puncture holes in the bone. And the shoulder blade is very thin. It's easily broken.

HARRIS: Did you -- when you look at these bodies, and specifically this one, do you look for any of that type of activity, insect or animal -- sea life, animal life?

GALLOWAY: We look for any kind of damage that we will see to the bone itself. So, yes, anything that would affect the bone we will examine. We typically do expect bodies that have been out for a while, there will be some kind of scavenging on that body.

HARRIS: Did you happen to notice if there was anything adhering to these particular bones?

GALLOWAY: Yes. There was -- on the femur, the thigh bone there is an area that was exposed. And there was a barnacle, couple of barnacles attached to that.

HARRIS: And these barnacles, do you associate that with fresh water or salt water?

GALLOWAY: I have only ever seen them in salt water. But that's lay expertise.

GERAGOS: Be a motion to strike.

JUDGE: Sustained. Answer may be stricken. Jury will disregard it. Go ahead.

HARRIS: As part of your examination and the consultation with Contra Costa County Coroner's Office, were you asked to try and determine the how long Laci Peterson -- how long Laci Peterson's body had been in a marine environment?

GALLOWAY: Yes, I was.

HARRIS: And did you examine the body and try and make that determination?

GALLOWAY: Yes. In order to do that, we look not just at the bones, but at the decay state of the soft tissue. And, in this case, we had the presence of a substance known as adipocere, which is a white sort of soapy substance. And the body fats actually change into this. That was present in large quantities. Although it had not penetrated right through the body. That put us with a minimum of six months for being in the water, based on previous studies and my own experience in this area.

HARRIS: Did you say minimum of six months?

GALLOWAY: Minimum of -- a minimum of three months, and then a maximum of six months. That was based upon the presence of still red tissue deep in the muscles.

HARRIS: Let me go back through this. So from looking at the adipocere, you come up, in your experience as a forensic anthropologist of a range of three to six --

GALLOWAY: Three to six months.

HARRIS: And you indicated, that there is still some -- did you say redness?

GALLOWAY: There is sill some redness. It's hemoglobin present.

HARRIS: And where was this present at?

GALLOWAY: This is present very deep in the muscle tissues. So it's well protected from the marine environment.

HARRIS: So after you conduct this examination of Laci Peterson, what do you ultimately conclude and share with the Contra Costa Coroner's Office as to how long Miss Peterson had been in the marine environment?

GALLOWAY: My conclusion was, Miss Peterson had been in the water from three to six months.

HARRIS: Did you also look at the -- as you described it, Individual B, the remains of Conner Peterson?

GALLOWAY: Yes, we did.

HARRIS: And were you asked to try and to assist the Contra Costa County Coroner's Office with the determination of the age of that particular infant?

GALLOWAY: Yes, I did.

HARRIS: Can you explain the process that you go through for that?

GALLOWAY: The process on this is based upon the growth of the limb bones. We extracted some of the largest bones. These were the tibia, the femur and the humerus. The humerus is the upper arm bone from the elbow to the shoulder. The femur is the thigh bone. And the tibia is the shin bone. It's one of two bones in the lower -- lower leg. We take those out, and using calipers, we measure the length of those. And then a number of studies have been done that draw from that a conclusion about the age of the child. In this case the age that we estimated was 33 to 38 weeks.

HARRIS: These bones that are talking about, were they documented by being photographed?

GALLOWAY: Yes, they were.

HARRIS: If I could have marked next in order.

JUDGE: People's 260. Photograph of Bones

Marked as Exhibit 260 for identification.

HARRIS: Doctor, showing you what's been marked as People's 260. Do you recognize this?

GALLOWAY: Yes, I do.

HARRIS: What is depicted in this particular photograph?

GALLOWAY: This is a photograph of the bones from the infant. This is the humerus -- excuse me, starting on the right, it's the humerus, the femur, and the tibia.

HARRIS: And does this photograph accurately depict the bones as you observed them during your examination?

GALLOWAY: Yes, they do.

HARRIS: I'm going to project this up there. Looking at People's Number 260. You are saying you take measurements of these. We see the bones here. Can you explain for us how -- the process of taking these measurements?

GALLOWAY: Well, on an infant the end of the bones which we normally would expect to see in an adult are not present. The bone growth is such that there is just cartilage at the ends. These are cleaned just down to the -- just to the skeletal part of the bone. We then take calipers. We take measurements of the maximum length of these bones. The bone is actually moved in the calipers to the maximum length achieved.

HARRIS: Caliper just being some --

GALLOWAY: A regular sliding caliper, which is a sliding pair of arms that go in on each end of the bone, and then a scale along the bottom.

HARRIS: When you take these measurements, do you document those in your report?

GALLOWAY: Yes, we do.

HARRIS: And what are measurements for these particular bones?

GALLOWAY: For these particular bones, I believe -- check my notes. The femur was 63.8 millimeters. The humerus was 58 millimeters. 58 millimeters. And the tibia was 57.5 millimeters.

HARRIS: Now, you previously mentioned that by taking these measurements, you are able to come up with a range for this particular infant, Conner, between 33 and 38 weeks?

GALLOWAY: That's correct.

HARRIS: Now, I want to back up through that. When we're talking about age for an infant, is there actually a difference in how these measurements -- not measurements, but the date is determined?

GALLOWAY: There are some differences. Most people will call it a gestational age, which is the time since the last menstrual period. That's the way most of us tell how far along you are in a pregnancy. If you are looking at the actual growth, then you may be wanting to calculate the time from conception. So we put this into gestational weeks, which is a common way of understanding and using the growth for the baby.

HARRIS: So this range of the 33 to 38, which particular determination was this?

GALLOWAY: This is gestational age. That's from the last menstrual period.

HARRIS: All right. When you -- how do you go about making this determination? Is there reference material that you can consult with that gives you this range of 33 to 38 weeks?

GALLOWAY: Yes, there is. The most commonly accepted one has been Fazekas and Kosa, which is a Hungarian or Romanian. I believe it's a Hungarian book. It's from 1978. And the sample sizes are based on Eastern European population. More recently, Sherwood, et al, which is another publication, came out in 2001. Came out. And that was using radiographic means of looking at the skeleton. They compared the radiographs to skeleton measurements and other publications. That I used, because it's drawing upon people of the same background, same nutritional levels as what we would see in the United States.

HARRIS: Let me have you explain that. If there is a difference in nutritional levels, does that mean a difference in size?

GALLOWAY: Yes. There are some things that suggest that environmental factors, the mother's environment, can affect the growth of the baby. So in areas where you have poor food, lots of disease, children tend to be born shorter because they have less nutrition they can draw from the mother. It's important to use studies that are similar to the population from which you are examining the body.

HARRIS: As you went through and consulted these reference materials, if you found particular measurements that matched a particular reference material, did you have to adjust it for that kind of American baby factor?

GALLOWAY: Not the Sherwood, et al, because that's based on the same populations.

HARRIS: And so after consulting with the reference materials and adjusting its information, the one chart, did you -- and the other chart at that you didn't have to, is that how you make this ultimate determination of the range of Conner Peterson?

GALLOWAY: That's correct.

HARRIS: Now, is there -- let's back up and go through this. Are all people at the same age exactly the same size?

GALLOWAY: No, they are not.

HARRIS: Can you make -- I don't want to be flip -- mini me and Michael Jordan is the same age, is that what you find differs in anthropology?

GALLOWAY: You find differences in almost everybody. People already classified as normal will range from the size of, say, Danny Devito and Michael Jordan. They are all normal people. There is nothing abnormal, medically wrong with them. They are just either short or tall. And so that is also reflected in babies. Also, babies grow. They have growth spurts the same as children do. So they grow very rapidly for short periods of time, and then have periods where they are the same

size, and then grow very rapidly. This could be a matter of just a few days. So where we catch them in that growth makes a difference where they are in the profiles.

HARRIS: So, again, taking that to consideration of how babies and people are different even at the same age, do you have to come up with a range for an individual?

GALLOWAY: Yes. What we do is, we take usually about a one standard deviation. That would put the 33 to 38 weeks. This would include the majority of children who are examined at that age would be within that range of length of the bone.

HARRIS: So the ultimate conclusion, based on your examination of Conner Peterson's remains, were his age that you reported back to Contra Costa County was 33 to 38 weeks?

GALLOWAY: That's correct.

HARRIS: Now, going back to Laci Peterson's remains. You describe there in a number of items that were missing in terms of bones? Did you have an opinion, when you went through your documentation and examination, explaining how those bones become absent?

GALLOWAY: Yes. There has been a number of studies on marine decomposition of bodies, including some in the Monterey Bay area that I have done. What you tend to have with bodies when they decompose in the water is that they eventually, as the gases form in the abdominal cavity, the body floats a little bit, leaving the arms and the legs and the head dangling down. As decomposition progresses, you tend to find that those areas drop off the body quickly. So you lose the head, you lose the hands and the arms and the feet and the leg, the lower part of the legs first. This leaves the torso and the upper portions of the limbs as one unit. That may often be recovered, because it has a little bit more ability to float than the other areas. So this was typical for what we saw with her.

HARRIS: Now, your findings of Laci Peterson's disarticulation being consistent with these prior studies, do you also examine the joints to see if there had been anything other than this normal decomposition process?

GALLOWAY: Yes. One thing we have to rule out in cases like this is, as the body disarticulates, is that somebody tried to dismember the body. We found no evidence whatsoever of tool marks on any of the surfaces adjacent to the areas that were missing.

HARRIS: People have no other questions.

Cross Examination by Mark Geragos

JUDGE: Mr. Geragos.

GERAGOS: Thank you, your Honor.

CROSS EXAMINATION

GERAGOS: Good morning.

GALLOWAY: Good morning.

GERAGOS: If I understand -- I'll start with Conner. You were estimating Conner -- you were estimating Conner's age; is that correct? You called him Individual B.

GALLOWAY: Yes.

GERAGOS: And you had to -- you took three measurements of these specific bones?

GALLOWAY: That's correct.

GERAGOS: Based on the measurements of the three specific bones, you then compared him to a chart -- them to a chart?

GALLOWAY: That's correct.

GERAGOS: And one of these charts are the Sherwood chart. That was done in the year 2001?

GALLOWAY: That's correct.

GERAGOS: And based upon the chart, do I understand correctly that the figures that came back on the Sherwood chart, which is -- you said was based on the same population. I assume that means it was an American study?

GALLOWAY: Yes. And it was done on radiographs.

GERAGOS: And radiographs are what?

GALLOWAY: X-rays.

GERAGOS: Okay. So this was a study that was done based on x-rays?

GALLOWAY: That's correct.

GERAGOS: And the study that was done based on x-rays of Americans. And that was in 2001?

GALLOWAY: Yes.

GERAGOS: So it occurred about one year prior to this --

GALLOWAY: Yes.

GERAGOS: -- taking place. The three results were 35.6 weeks, 35.1 weeks, and 36.3 weeks; is that correct?

GALLOWAY: That's correct.

GERAGOS: And that's -- and that produced an average for you of -- I believe in your report, you wrote that that gave you an age assessment, using the Sherwood, that placed Conner at 35 to 36 weeks; is that correct?

GALLOWAY: 33 to 38 weeks once what I gave the interval.

GERAGOS: Looks like what you did was, if I understand correct, you took those three measurements. And the three measurements, once again, were 35.6, 35.1, 36.3. You averaged those three, came to 35 to 36, right?

GALLOWAY: Yes.

GERAGOS: And then you just threw an -- I won't say just threw. You put a two-week variation on it; is that correct?

GALLOWAY: Yes. That is out of the study. They said one standard error on this was two weeks. Two standard errors includes 95 percent of the population as four weeks plus or minus.

GERAGOS: So if I understand correctly, when you actual did the measurements the baby came back at all three measurements a -- between 35 to 36. And then when you came to your conclusion, what you did is, you put a two-week window or kind of a cushion on either side of the 35 to 36?

GALLOWAY: That's actually the protocol for the study.

GERAGOS: So am I correct, you went this -- 35 to 36 on the measurements?

GALLOWAY: Yes.

GERAGOS: Put two weeks on 36 to get you to 38, put two weeks on the 35 to get you to 33?

GALLOWAY: That's correct.

GERAGOS: And then did you measure specifically the crown-rump length?

GALLOWAY: No, I did not. We calculated the body length from the right humerus, the tibia, and the femur on -- actually I noticed yesterday there was an error in my stature calculation. The

crown-rump length should say crown-heel length.

GERAGOS: That's under stature?

GALLOWAY: Yes.

GERAGOS: Okay. So you have got crown-rump length. And that's not correct?

GALLOWAY: That's incorrect.

GERAGOS: Should be crown-heel length?

GALLOWAY: Crown-heel length.

GERAGOS: That would be from the top of the head to the bottom of the feet?

GALLOWAY: But that is calculated from the long bones and not from the individual.

GERAGOS: Right. And so you never did -- you never used Conner's remains to measure from the top of his head to the --

GALLOWAY: No. I'm afraid the body was too decomposed to allow that.

GERAGOS: Also was post-autopsy as well, was it not?

GALLOWAY: Yes. But the limbs, if even if it had been autopsied, we couldn't have laid it out to get an accurate measurement.

GERAGOS: Are you aware that there were x-rays taken?

GALLOWAY: Yes.

GERAGOS: Did you use those x-rays, the x-rays that were taken when he was laid out fully?

GALLOWAY: No.

GERAGOS: If you had used the x-rays that were taken out fully, wouldn't that have given you an accurate crown-heel length?

GALLOWAY: Based on the level of decomposition that was present, I would be very wary of using that, because the resilience of the body allows the skeleton to lay flatter than a normal baby would.

GERAGOS: But you didn't -- that didn't stop you from estimating the crown-heel length, did it?

GALLOWAY: No.

GERAGOS: Okay. So you thought it was better to estimate the crown-heel length rather than actually measure it or look at the x-rays?

GALLOWAY: Because looking at the x-rays or measuring from the body would not have been accurate at all.

GERAGOS: So you used three bones that were pulled out and you estimated, as opposed to just taking a look, or even as a scientist -- forensic anthropologists are scientists, are they not?

GALLOWAY: Yes, that is correct.

GERAGOS: Okay. As a scientist, were you not curious in the least to see what the x-rays showed as to the crown-heel length as when you are estimating it?

GALLOWAY: No. Because that can be very inaccurate, given the state of decomposition of these remains.

GERAGOS: Okay. At the same time, it could also confirm your estimate, couldn't it?

GALLOWAY: It could.

GERAGOS: Now, the -- specifically you also compared the measurements that you made to this other study, the 1978 study; is that correct?

GALLOWAY: That's correct.

GERAGOS: Okay. And it appears that -- I went through this with Doctor Peterson. But looks like for the humerus, it was 36 to 38 weeks?

GALLOWAY: That's correct.

GERAGOS: For the femur, 36 to 38?

GALLOWAY: That's correct.

GERAGOS: For the right tibia, 36 to 38?

GALLOWAY: That's correct.

GERAGOS: The parietal cord height 40 weeks?

GALLOWAY: Correct.

GERAGOS: Perimeter height, 34 weeks

GALLOWAY: Correct.

GERAGOS: Cord width, 34 weeks?

GALLOWAY: Yes.

GERAGOS: Perimeter width, 36 weeks?

GALLOWAY: Yes.

GERAGOS: And the right frontal cord height, 38 to 40 weeks?

GALLOWAY: That's correct.

GERAGOS: Perimeter height, 34 to 36 weeks?

GALLOWAY: That's correct.

GERAGOS: Cord width, 36 to 38 weeks?

GALLOWAY: That's correct.

GERAGOS: Perimeter width, 34 to 36 weeks?

GALLOWAY: That's correct.

GERAGOS: Now, out of this one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen measurements, by comparison to these two database total; is that correct?

GALLOWAY: That's correct.

GERAGOS: Okay. Out of those fourteen measurements, did one of those come back at 33 weeks?

GALLOWAY: No.

GERAGOS: Out of those fourteen measurements, did all but three come out at 36 or more -- I'm sorry, 35 or more?

GALLOWAY: Yes.

GERAGOS: And could you give me, one more time, the millimeter measurements for the tibia?

GALLOWAY: The tibia Diaphyseal length is 57.5 millimeters.

GERAGOS: And femur?

GALLOWAY: Femur is 63.8 millimeters.

GERAGOS: And the humerus?

GALLOWAY: 58 millimeters.

GERAGOS: And since were you comparing this to the Sherwood radiographic study -- radiographic study, did you take a look at the ultrasounds of Conner Peterson that were taken early on in the pregnancy?

GALLOWAY: No, I did not.

GERAGOS: Are you aware that there is much in the literature that the ultrasound taken of the baby at the sixteen week period is the best time to estimate what the age is?

GALLOWAY: I'm aware of that in the literature. But in this case I was examining the skeleton material.

GERAGOS: Do you want to use that to compare and try to gather more information, so to speak, so you can make an estimation of the age?

GALLOWAY: I could. But then I might lead myself into the possibilities of biasing my own opinion. That's why I based it purely on the skeletal material.

GERAGOS: When you looked at the skeletal material, so I understand, you are saying that these figures are from the date of the last menstrual period; is that correct?

GALLOWAY: That's correct.

GERAGOS: Which can vary, approximately, how long from the date of conception?

GALLOWAY: It's usually around two weeks.

GERAGOS: And did you make a determination, or look at the record, to try to determine when the date of the last menstrual period was?

GALLOWAY: No. I didn't even remember the due date.

GERAGOS: Did you look at the records for Laci Peterson at all?

GALLOWAY: No, I didn't.

GERAGOS: And if I understand correctly, as far as Laci Peterson, your opinion that she was in a marine environment for three to six months. This disarticulation that you talk about, is that something that you have seen before?

GALLOWAY: Yes.

GERAGOS: And disarticulation basically just means that certain portions of the body end up being separated from the torso?

GALLOWAY: That's correct.

GERAGOS: Okay. And that happens as a natural phenomenon when -- or as a process of decomposition?

GALLOWAY: That's correct.

GERAGOS: And there is nothing that connects that necessarily to weights or anything else; isn't that correct?

GALLOWAY: As far as I know, there is nothing.

GERAGOS: There is nothing that connects --

GALLOWAY: That I have seen that would connect it to anything other than decomposition.

GERAGOS: Okay. And that's based upon your examination of the skeletal remains and the autopsy of the remains of Laci Peterson; is that correct?

GALLOWAY: That's correct.

GERAGOS: Thank you. I have no further questions.

Redirect Examination by David Harris

HARRIS: Doctor Galloway, just going through the protocols, the studies real quick. You were starting to give an answer. I believe you said that was the protocol of the study to use that two-week window?

GALLOWAY: That is correct. Every time you do a study, what they are saying is that the mean measurements -- if you have a measurement, the mean of the -- or the average length of time that a child would have to grow that length of a bone would be 35.6 weeks. Not every child is going to be at that point. And they realize there is a scatter of children who may be younger or older. They add that standard one deviation -- one standard deviation that is close about two thirds of the children if you as on plus or minus two weeks. In order to include 95 percent of the children, you have to actually add on plus or minus four weeks.

HARRIS: Now, go back through this, so maybe we understand it all correctly. When these authors were doing this study, they are measuring -- taking bone measurements of these individuals. And it's not just one individual?

GALLOWAY: No. There were 72 normal children that they looked at. What they had to -- they were all children who were being autopsied. They were spontaneous abortions. They were normal in every appearance, in terms there was no developmental problems to them. They had acute reasons why the child had been lost. They were put down directly on the film. There are other studies which show that there was negligible differences between an x-ray length of a bone and regular lengths of a bone taken out of the body. And then they took radiographs of them, measured the radiographs.

HARRIS: So when we're talking about studying 72, they come up with an average. That's what listed in the charts?

GALLOWAY: That's what's listed in the chart. And then, in addition do that, there is also a plus or minus factor, which is always given for people. Only time I put in a mean is on a chart like I did at the appendix in the text of my report. I always give an interval. This is a range within which that child most likely would appear.

HARRIS: And so, again, taking what you are just telling us about that Conner Peterson falls within the range of these charts with the adjustments, and doesn't change your determination it's 33 to 38 weeks; is that correct?

GALLOWAY: That's correct.

HARRIS: You were asked about doing the measurement based on the long bones and versus doing the crown-rump or crown-heel measurements.

GALLOWAY: Yes. The crown-heel measurement requires -- or is based upon measurements of living children, or on ultrasounds. In those cases, the tissues between the bones -- and in children there are many soft -- good deal of soft tissue between the bones. Provides some resilience and pulls the bones together. In this infant, because of the state of decomposition, the child is sort of -- it was so decomposed that there was sort of -- I hate to say mushy, but that was sort of the way it was. And that doesn't allow you to get an accurate measurement. You could easily sort of stretch the body another inch or two just in positioning it. We didn't take --

HARRIS: In your experience, from anthropology, are there formulas designed to allow it to get these kind of measurements from measuring the long bones?

GALLOWAY: Yes, there are.

HARRIS: And is that a standard practice in anthropology to do that?

GALLOWAY: That would be for examination of infant remains, yes.

HARRIS: And is that what you did?

GALLOWAY: That's what I did.

HARRIS: People have no other questions.

JUDGE: Mr. Geragos any recross on any of those issues?

GERAGOS: No, your Honor.

JUDGE: All right. May the doctor be excused?

GERAGOS: Yes, your Honor.

HARRIS: Yes.

JUDGE: Doctor Galloway, thank you very much. Thank you for your time.