UPON RESUMPTION

CMDR RUSH: Sir, I call Dr Denise Donlon.

<DENISE ANNE DONLON, affirmed: [2.20pm]

<EXAMINATION BY CMDR RUSH:

CMDR RUSH: Q. Dr Donlon could you state your full name to the Commissioner, please?
A. Denise Anne Donlon.

Q. Are you the Senior Lecturer in Anatomy and Forensic Osteology at the University of Sydney?
A. Yes.

Q. How long have you held that position?
A. For 14 years.

Q. Perhaps I should go from backwards to forwards. Could you indicate to the Commissioner your qualifications?
A. Yes. I have a science degree, majoring in anatomy and physical anthropology, followed by an honours in arts degree majoring in archeology and physical anthropology, and then I did a PhD in physical anthropology.

Q. As you have indicated, you have been in the position of Senior Lecturer at the University of Sydney since 2003. Prior to that, were you a lecturer in the same topics and the same subjects at the university?
A. No, I was actually a lecturer initially and then I have been a senior lecturer for about five years, I think.

Q. In that specific field, what are we talking about in anatomy and forensic osteology?
A. Do you mean what I teach?

Q. Yes.
A. I teach and do research in the area of, primarily, skeletal anatomy, so my area of expertise is in identification and description of skeletal remains and, in particular, looking at the variation in skeletal remains between different populations.

Q. In relation to that area, have you published extensively?

A. I have published in that area, yes, amongst others.

Q. Have you also done practical work in relation to it for the Coroner of New South Wales, for example, and the Police Department of New South Wales?
A. Yes. For the past 15 years I have been doing most of the skeletal identifications for the Department of Forensic Medicine in Glebe, and also I have done quite a lot for Westmead Mortuary, which has just now closed, and I also do recoveries of skeletal remains for the Police and for the Defence Forces.

Q. Dr Donlon, have you had involvement in relation to the search and recovery of remains of an unidentified person at Christmas Island?
A. Yes, I have.

Q. Did your contact with that start as a consequence of a search conducted at Christmas Island, I think in September of 2001?
A. Yes, that's right.

Q. Did you attend for the search in 2001?
A. Yes, I did.

Q. At Christmas Island?
A. Yes.

Q. Did you return to Christmas Island for the purposes of a further search in September of 2006?
A. Yes, that's right.

Q. In relation to the eventual recovery of remains in 2006, are you aware of a report that was prepared in July 2007 in relation to the archaeological excavation?
A. Yes, I'm aware of it.

Q. I wonder if we could bring up, sir, COI.003.0060.

THE PRESIDENT: I will mark the report of July 2007 of Messrs Casey & Lowe Pty Limited headed "Locating the grave of the unknown sailor Christmas Island, 2006" as exhibit 152.

EXHIBIT #152 REPORT OF JULY 2007 OF MESSRS CASEY & LOWE PTY LIMITED, HEADED "LOCATING THE GRAVE OF THE UNKNOWN SAILOR CHRISTMAS ISLAND, 2006 BARCODED COI.003.0060

CMDR RUSH: Q. Could I ask you to turn into that report at page 0062. There, Dr Donlon, an outline of previous searches is given. Could I ask you briefly, in September of 2001 was an excavation undertaken in the Christmas Island cemetery based on the recollections of Mr Kevin Lourey, who had worked at Christmas Island 20 years previous to that time?
A. Yes, that's correct.

Q. What was done there?
A. First of all there was a very short reconnaissance trip to the Island to determine if Mr Lourey could pinpoint the position of the grave, and so he attended with myself and Cartier from the Navy. Mr Lourey had some difficulty pinpointing the area, because the cemetery had been overgrown, but he felt that he could indicate a general area where the grave was. So we returned to the mainland and then I think maybe - I'm not sure exactly how long after, but we went back and we spent a few weeks excavating the area.

Q. Without success?
A. Without success, yes.

Q. Then the report refers to a further attempt by ground-penetrating radar, which was under taken by Mr Ted McGowan, who organised it, who had lost a brother on *Sydney*?
A. Yes.

Q. Again, as I understand from the report, that didn't show anything of any significance?
A. No. Actually, there was a ground-penetrating radar search before that search, and that was actually done just before we did our first excavation, and it indicated some anomaly in the area where we did excavate, but there was nothing there. That's not at all unusual with ground-penetrating radar, and particularly in the sort of soil we were digging in, which had very large nodules of phosphate, and of course we found large nodules of phosphate. So it really meant nothing.

I saw the area which had been excavated by Mr McGowan, but I really don't know anything about it. I didn't see any report or anything like that on it. I don't know if there was any.

Q. In 2006 a further expedition, as it was called, went back to Christmas Island, this time relying on accounts and photography of Mr O'Shannassy?
A. Yes. Mr O'Shannassy and also Mr Say Kit Foo.

Q. Mr O'Shannassy had worked at the Island in the 1950s as a clerk?
A. Yes.

Q. And Mr Say Kit Foo was the son of a Chinese person who worked on the Island who used to play in the cemetery?
A. Yes, that's right.

Q. I think you relied on a photograph that had been taken by Mr O'Shannassy, which is at page 0065?
A. Yes. I can't see the photo in front of me, but I think I know the photograph that you mean. Yes, that's it.

Q. What was it about Mr O'Shannassy's recollection, Mr Say Kit Foo and the photograph which provided new information to justify the cost of a further expedition?
A. Well, after the first expedition, I actually recommended in my report that there be more historical research done in terms of locating the grave, and that was done and that's why Mr Say Kit Foo and Mr O'Shannassy were located and independently described a very similar area for the grave.

Mr O'Shannassy, apparently, in 1950 had been taken up to the old cemetery specifically to be shown the grave, and he took a single photograph, and this is the photograph.

Q. Is the site of the grave as excavated shown in that photograph?
A. Yes, it is, but it is actually quite difficult to see, really, because the grave which you can see in the far distance there would not have been there when the unidentified skeleton was buried.

Q. On this extra information, you commenced to search. Can you detail to the Commissioner the nature of the search and how long it took to find what you were looking for?
A. Yes. We spent two weeks searching - sorry, not two weeks. We spent a week searching, really, and we found the remains on the seventh day, and then we spent the next week

excavating the grave.

We initially actually excavated to the right of those graves that you can see there, because Mr O'Shannassy said that looking at the photograph again he remembered that the grave was down to the right-hand side of those graves that you can see there, and so that's where we commenced digging. So for six days we dug along that right-hand side of the graves.

It was only on the seventh day that CAPT Parsons looked at the photograph, I guess, more intently, and positioned himself as Mr O'Shannassy would have when he took the photograph and said that he believed that the grave must be in the middle of the photograph, because when somebody takes a photograph they always put the object in the centre, usually, and so he suggested that we actually excavate really at the end of the second grave that you can see there, even though there was actually only a small space between there and the next grave. It seemed perhaps an unlikely spot, but, in fact, that is where we found the remains.

Q. So if we are to look at that photograph, we see an elongated grave, if you like, and then a further elongated grave, and it is between those two, is it?
A. No, it is between the second and the third headstones.

Q. To ascertain that there may be a grave, what depth do you go to and what are the signs that you are looking for that would mean you dig deeper?
A. Grave fill, the actual soil that has been placed back in the grave, is usually different to the surrounding soil; it is extremely difficult to replace - in fact, it is impossible to replace - the soil in the same manner that it came out, and so you would expect it to be a little bit different.

The archeologist, Mr Tony Lowe, who was running the archaeological part of the dig, recognised that - he thought the soil was slightly different in that area, and so it was suggested that we just continue digging until we reached the depth of, I suppose, a normal grave, and then we found human remains.

Q. As you started to dig, did you find material consistent with a coffin?

A. At about 2 metres, actually after we found the first bone, we did find rotting timber, yes.

Q. Perhaps I could ask you to go to just above the photograph that is there to the text. You say that work commenced on trench 7 on the 29th:

> *Working to a depth of 50cm in the afternoon, the strata appeared to be mixed and without stratification.*

A. Mmm-hmm.

Q. Is that what you have referred to?
A. Yes, that's right, the disturbed soil.

Q. Then it is stated:

> *It appeared that the area had been disturbed previously. Several "edges" were noticed, indicating a possible grave cut or previous trenches looking for a grave in this area ... Work continued the following day and in the late afternoon several corroded nails and fragments of what appeared to be decayed timber was found, before a foot bone was recovered.*

A. Yes. Actually, I take that back, then. There were actually some objects found, nails and fragments of timber.

Q. So once that was recovered, what was the nature of the work that was undertaken?
A. Once the bone was recovered, we excavated very carefully, of course, to expose all the bones before we removed any bones at all, because we wanted to see the position of the skeleton. That is normal practice, to expose everything before it is removed.

Q. Perhaps if we could turn to page 0066 and the second paragraph. It states:

> *The excavation of the grave revealed a rectangular timber coffin (150cm by 80cm) at a depth of approximately 2m.*

Can you perhaps indicate whether what you did was dig to

that depth?
A. Yes, we did, yes.

Q. If I can ask you to turn page 0074, figure 14. We've referred to a nail before.
A. Yes. Roughly just to the right of the centre there is a nail, and there are a number of nails, actually, I think in there.

Q. And looking at figure 15, what are we looking at there?
A. Okay. In the centre you can see the two scales. They are really sort of outlining the end of the coffin or the box. You can see it is slightly darker. That's the timber. Then the arrow is actually pointing to what we call the grave cut, where the shovels actually cut through the undisturbed soil. So that was followed down. Just to the left of the arrow, you can see that we've actually cut into the undisturbed soil in order to make a little platform along the side of the grave so that we could actually access the grave without treading on the remains themselves.

Q. If we can go over the page to figure 16. So that's after further excavation.
A. Yes.

Q. When we think of excavation, we think of heavy equipment. How was this done?
A. No, everything was done by hand. Initially using shovels to get down to the level where we thought we actually saw nails and timber, and then we used trowels and then, when we actually started removing soil from the skeleton, we just used little wooden implements - actually, little wooden sculpturing instruments and satay sticks and plastic. No metal. Just to make sure that we didn't leave any impressions or marks on the bones that could be misinterpreted.

Q. I think we earlier described the coffin as a rectangular timber coffin 150cm by 80cm?
A. Yes.

Q. Is that what we would understand as the normal size for a coffin?
A. No. A coffin is usually narrower than that and longer. So this was an unusual shape for a coffin. Would

you like me to go further?

Q. Yes.
A. You can also see that the position of his body is also not what you would expect in a normal coffin, in that his legs are flexed at the knees and ankles and hips. So in that position he fitted into this coffin or box.

Now, I don't know whether he was placed in a box that was that size and so his legs were flexed to fit into the box. The other possibility is that he may have been partly mummified and it may have been impossible to straighten his legs and so a box may have been made to actually fit him.

Q. Figure 17 relates to other material that was found in the grave - there were some press stud buttons as shown there in the lower left quadrant of the photograph, amongst other places?
A. Yes. That's right. You can see the press studs - they must have had some copper component, because you can see the copper oxide, the greenish-blue copper oxide which has formed on the lower press stud there.

THE PRESIDENT: Q. Would those press studs be in a position of the body wearing trousers or not?
A. No. They were actually scattered from the neck down to the pelvis, mainly across the ribcage.

CMDR RUSH: Q. Could we then look at figure 18, over the page at page 0076.
A. These are what we thought at the time were eyelets. They were much bigger than the press studs and they were lying along the lower part of the coffin or box, pressed up right hard against the coffin.

Q. Was there any determination made as to where they came from?
A. Well, I think the War Memorial examined these and I'm not sure exactly - I know there was discussion about them possibly being eyelets from a piece of hessian which possibly the body had been wrapped in.

Q. Looking at figure 19, which is the next figure down, is that a photograph of the excavated coffin?
A. Yes. That's right. So I think that slide shows after the body has been removed and then it would have been the coffin and underneath, we excavated underneath as well.

Q. How deep did you have to go for the removal of the body, approximately?
A. I think the base of the coffin was approximately 2 metres, and then we excavated a little bit further underneath that, you know, in case something had been thrown into the grave before the coffin had been placed in.

CMDR RUSH: Q. Figure 20 shows the grave with grave fill removed.
A. Yes.

Q. Figure 21 shows the press studs, I take it, that were recovered?
A. Yes, that's right. And you can see a little of fabric still attached to some of those.

THE PRESIDENT: Q. Is that the protrusion to the left, on the left-hand side --
A. Yes, on that far left one, I think that's a little bit of fabric there around it, which is preserved, I understand, from the sort of effect of the copper which acts like a bactericide or fungicide.

CMDR RUSH: Q. How was the skeleton removed? Was it removed piece by piece or as a whole? How was it done?
A. It was removed, yes, bone by bone. Actually I wrapped every bone in aluminium foil, in Alfoil. That is usually a very good way to wrap fragile bone, because it sort of prevents it from moving around and falling apart. So every single bone was wrapped in Alfoil, sometimes with soil attached because it was thought better to do that, just a little bit of soil, and to clean them up back in the laboratory rather than doing the cleaning there.

Q. If we go to the figures on pages 0080 and 0081, firstly, is this a depiction of where the various items were found in the grave site?
A. Yes. You can see the press studs there and also you can see nails. The other thing that I might point out there, which we haven't talked about, is the position of the forearms and the hands, which are in black on that diagram. You will notice that they are lying sort of directly over the chest. Really, the elbows should be articulated with the lower end of the upper arms or the humerus, which they are not.

Now, I haven't seen anything like this before, so it suggests to me that when the man was buried, there must have been some decomposition around the elbows and so the forearms had been completely separated from the elbows. Perhaps they were still in clothing, but they would have decomposed.

THE PRESIDENT: Q. If one goes back to page 0075 and the top figure, the forearms below the elbow don't appear to be there?
A. That's right. Because they are actually under the chest, under the ribs. The man is actually lying with his chest down and his forearms are underneath there.

Q. So we're looking at his backbone?
A. Yes, that's right.

CMDR RUSH: Q. So the forearms are tucked across his body and he is lying on them?
A. That's right.

Q. You said, obviously, they are not articulated at the elbow joint.
A. No. You can get some movement of bone in the soil, but that's too much movement, really, for it to have happened, I would say, after burial.

Q. I think you said that you would put that down to the way he was placed in the coffin, because of decomposition of the body?
A. Well, I think that his forearms must have actually been placed over his chest.

THE PRESIDENT: Q. Is it normal for a body to be lain face-down at a burial?
A. No, it is not. I wondered about this, too. I don't know the reason, but I sort of hypothesised that perhaps if he was in a box rather than a coffin, that perhaps they may have lost track of which was the top and the bottom of the box and placed it in upside-down.

Q. Going back to page 0081, the black forearms are in fact underneath?
A. Yes, that's right.

CMDR RUSH: Q. So once the skeleton had been removed, from what I understand of your evidence thus far, bone by

bone, it was placed in aluminium foil for the purposes of bringing it back to Australia?
A. Yes. With the exception of one of the thigh bones, one of the femurs, which we immediately placed in a vacuum-sealed plastic bag and then we removed the air. The reason for that is that we thought it may be used for DNA analysis or chemical analysis at a later period.

Q. Where was the body brought when it came back to Australia?
A. It was brought to the Shellshear Museum of Physical Anthropology at the Department of Anatomy and Histology at the University of Sydney. That's a museum that I curate as part of my position.

Q. Then from your perspective, what work was undertaken?
A. Well, the first work undertaken was unwrapping and cleaning the skeleton. Then I proceeded to try to draw up a biological profile, which is what I would normally do in a forensic case, and that means determining the ancestry of the person, their age, their sex and their height.

Q. Is the biological profile done by examination of the skeleton itself?
A. Yes. It is just visual observation as well as measurements.

THE PRESIDENT: Q. Could we look at page 0068, please. This is a diagram which shows where the 2001 excavation took place and where the McGowan trench occurred in 2002. Those numbers, 1, 2, 3, 4, 5, are they the preceding days of the excavations which you did?
A. No, they are just the numbers that were given to the pit, the test pits which we dug in 2006. You can see that the seventh is the last one, and that's actually where we found --

Q. What is the red dot? Is that a datum point of some sort?
A. I think the red dot is actually - possibly, actually, this isn't my drawing, but it may be where Mr O'Shannassy stood to take the photograph, I think.

THE PRESIDENT: Thank you.

CMDR RUSH: Q. At the University, were you responsible for removal of soil and other debris from the skeleton?

A. Yes, that's right.

Q. Then you mentioned that you go about various examinations to determine sex and height and other features in relation to the body?
A. Yes.

Q. If I could ask you to go to CORR.012.0233, which is a report on our Summation system that you prepared, being an Anthropological Report on the Examination of Unknown Skeletal Remains from Christmas Island 2006, what we have there - and I hope you have in front of you - is a copy of your report?
A. Yes.

THE PRESIDENT: I will mark that exhibit 153.

EXHIBIT #153 REPORT OF DR DONLON ENTITLED "ANTHROPOLOGICAL REPORT ON THE EXAMINATION OF UNKNOWN SKELETAL REMAINS FROM CHRISTMAS ISLAND 2006

CMDR RUSH: Q. In the second paragraph of your report, doctor, you indicate that brittle or fragile bones and teeth were stabilised. What happens there?
A. I used what is like a liquid superglue painted over the bone which actually prevents it from falling apart and decomposing.

Q. Then the skull and long bones were radiographed.
A. Yes.

Q. What was the purpose of that?
A. To look for fractures which may have occurred around the time of death or to look for any objects which were not part of the skeleton.

Q. You indicate that the cranium of the skull was photographed, including a metal object that was in the skull, and then a cast was prepared both inside and out?
A. Yes.

Q. What is the purpose of that and do you have the cast with you?
A. Yes, I do have it with me. The purpose was really just to make a physical record of it, because it is sometimes difficult from a photograph to actually see.

Q. Perhaps by reference to the cast, could you tell us how it is done and perhaps if you could produce the cast so that we can have a look at it?
A. Yes. Okay. So this is a cast just of the very top of the skull. We didn't do the whole skull, because that's a much more complicated process. (Indicating) The object was actually just to look at the metal object. The way it was done, if you imagine that this was the original, then a silicone rubber mould is made over the top of the skull and that's allowed to, I guess, set, if you like, and that's removed and then a type of resin is actually poured into the mould and that actually picks up the features which the mould had formed and, again, a matter of time passes and various chemical processes occur, and then the cast is produced. So this is the resin cast. Then it was actually painted to look the same colour. So this is from the outside, here. As you can see, the metal object is here (indicating) and there is some staining around that. We also cast the inside of the skull which shows the other side of the metal object embedded.

Q. So from the point of view of the cranium that you hold in your left hand, which is the front and which is the back of the skull?
A. This is the front, this is the back (indicating). This would be inside, like that (indicating).

Q. So where we see what is shown as the metal object on the cast, on the outside, if you like, of the skull, the other part that you have in your right hand represents what it looked like inside the skull?
A. That's correct, yes.

CMDR RUSH: I was wondering, sir, if you would like to examine that before we move on?

THE PRESIDENT: Yes. (Casts shown to the Commissioner)

Q. So does this mean that the metal object was protruding both internally and externally?
A. Yes, that's correct.

Q. But had not passed through the skull, at least from the forehead?
A. That's right, yes.

CMDR RUSH: Q. Whilst the Commissioner has it,

Dr Donlon, is there an area of staining around the metal object?
A. Yes, there is, yes, and that is staining from the object.

THE PRESIDENT: Q. So whatever it was, it penetrated the skull but not much further.
A. That's correct, and it actually came from the front into the skull, not the other way around.

CMDR RUSH: Q. Perhaps if I can ask, while you are examining that, if we can go to page 0249. There is a depiction of the skull, if you like - a drawing?
A. Mmm.

Q. The metal object is pointed to and, as I understand your evidence, Dr Donlon, what you are saying is that that is, if you like, the area at the front of the skull where the metal object entered?
A. Yes, that's right.

Q. Whilst we're looking at this diagram, were there any areas of fracture lines around the area of entry of the metal object?
A. Yes. I have actually drawn those on the diagram. There are a couple of fractures coming from the metal object, but there are other fracture lines as well on the frontal bone.

Q. Is it you or are there other people who are going to give evidence that should tell us from the fracture lines that are depicted there what is caused by the metal object and what isn't?
A. Yes, Associate Professor Duflou, a forensic pathologist, examined the metal object, and this is really his area of expertise.

Q. While we're looking at it, was there a healed depressed fracture of the skull?
A. Yes, there was, a very small one, if I can perhaps point to it on my own skull (indicating).

Q. Could you tell us where you are pointing to?
A. I am pointing to the rear on the right. It was back here (indicating).

Q. How can we determine that that's a healed depressed

fracture?
A. Because there are no sharp edges and the bone has what we call remodelled, which means that it has really grown over any sharp fractures and it just presents a very smooth area. It is not actually on the cast there. It would have been further down.

CMDR RUSH: Sir, with your leave, depending on the view you take, we can have some photographs taken of the cast at the conclusion of Dr Donlon's evidence, both internally and externally, and return the cast to Dr Donlon.

THE PRESIDENT: I will mark them as an exhibit, then we will return them to Dr Donlon. So I will mark the two casts as exhibit 154 and 154A.

EXHIBIT #154 EXTERNAL CAST OF CRANIUM OF SKELETON FOUND ON CHRISTMAS ISLAND

EXHIBIT #154 A INTERNAL CAST OF CRANIUM OF SKELETON FOUND ON CHRISTMAS ISLAND

CMDR RUSH: Q. Doctor, going back to pages 0234 and 0235 of your report, I want to ask you a general question, because I am going to come to particular matters later. Did you undertake an examination of the skeleton, apart from the skull, with a view to ascertaining whether damage to the bones was post-mortem or peri-mortem?
A. Yes, I did.

Q. You set out there substantial damage to the bones - the ribs, the arms, et cetera. You have indicated that it is all post-mortem?
A. Yes. I think that my impression was that the damage to the skeleton below the skull was probably post-mortem. They were very sharp fractures. They were in positions where you often find fractures, possibly from the collapse of the coffin on top of the skeleton. The skeleton was very fragile. Actually, as we picked up the bones, pieces would break off. I saw no good reason to think that any of the fractures in the post-cranial skeleton were anything but post-mortem. It is possible, though, that some of them could have been, but they didn't really appear to be to me.

Q. In relation to the teeth of the body, was there any particular feature in relation to the dentition, as you have referred to it at page 0236 of your report?

A. Yes. One of the first things I noticed - of course, the dentists would probably have a more detailed description, was that he was missing one of his anterior teeth, in fact, it was the lateral incisor of the upper jaw, the right lateral incisor. Perhaps if we could look at a photograph, that might be useful.

Q. I am just looking for one. If we go back to page 0252.
A. Yes. If I point to it, this is the central right incisor and this is the canine (indicating) and there should be a tooth in between here, a lateral incisor. You can see one on this side. Now, with this one, you can see there is very little space between those two teeth, which means that this was lost at a much younger age and certainly, probably, before he enlisted in the Navy.

Q. Doctor, could you keep your voice up a little bit.
A. I am sorry. Again the dentists would probably be able to say when it was most likely lost, but it has been some years since he lost that tooth, because the space has been filled up and the central incisor there has moved across to sort of fill that space. That's an unusual thing to see, actually, in a dentition. He also was missing a first molar, also during life, and the bone had healed over that. That had probably been extracted. That's not so unusual, I think, to have a molar extracted, but perhaps a little bit more unusual to lose a front tooth like that.

Q. It is perhaps difficult to pick it up from figure 11 but would it be readily picked up in a photograph or something like that, that the person was missing that incisor?
A. If you had a good, open, smiling photograph of someone, you should be able to pick that up. It would have to be a big smile, though, to be able to see it.

THE PRESIDENT: Q. And a close-up?
A. Yes.

CMDR RUSH: Q. Was there much dental work? We will get other evidence on this, but I just ask you in general terms. Was there much dental work that had been carried out on the teeth?
A. Yes, there was a lot of dental work, both amalgam fillings and gold fillings.

Q. One of the matters that you mentioned that you look at in your particular area is to determine the race of the skeleton.
A. Yes.

Q. What do you look for and what conclusion did you come to? Perhaps if we can bring up page 0236, further down the page. It sets out there that the features were caucasoid. What were you looking for?
A. Perhaps I might just first of all mention what "caucasoid" is. It is a term often used by anthropologists to describe people who originated from Europe and right across through Eastern Europe to Russia, down through the Middle East, parts of North Africa and India. So people in those regions share a similar morphology or shape of the bones, particularly in the skull. So these features which I have listed here the skeleton had and are typical of people of caucasoid ancestry. I brought along a plastic skull, if that would help.

Q. Yes.
A. This is actually a caucasoid plastic skull. The features which show that he was caucasoid are the lower border of the nasal aperture, which is very sharp. That's a particularly good feature for identifying caucasoids, and he had that. Round or oval eye sockets. These sockets are actually a little bit more rectangular.

This is actually a replica of an Indian skull, and while I said Indians are caucasoids, their features are a little bit different to Europeans.

A moderate or prominent glabella, which is the area here between the eyebrows; a narrow nasal aperture or narrow nose; the narrow and prominent nasal bones - they are the two little bones just above here, so they give the nose its projection; the prominent nasal spine down here, which again indicates, gives us some idea of a long prominent nose, which is typical of Europeans; a long face; a narrow rami of the mandible. The ramus is this part of the mandible, and it is usually quite narrow on caucasoids. A prominent mental eminence. The mental eminence is just another word for a chin, so, again, caucasoids have prominent chins. And then an obtuse inside angle of the mandible, which is this angle here. The unknown skeleton had a very obtuse, very long mandible.

Q. Were there any features inconsistent with that determination of race?
A. No, there was nothing that indicated another racial group.

Q. As the next step, did you go about determining sex?
A. Yes.

Q. In relation to that, could you explain to the Commissioner what you did to determine the sex of the body which you have already in your evidence referred to as "he"?
A. Well, the best part of the skeleton to use to identify sex or gender is the pelvis. He showed some male features, which I have listed here. Sorry, I don't have a pelvis to show you, but there is actually a photograph, I think, of the sulcus area. It is just part of the pelvis there.

Q. If we go to 0252?
A. Yes, that's it. It might be a bit difficult to perhaps imagine exactly where this is on the pelvis, but it is to the side of the pelvis, and that notch there is called the greater sciatic notch. Just in front of where the arrow is pointing (indicating) is a very, very slight groove. In males, that tends to be either absent or very slight. In females, it is much deeper and pitted. In this skeleton, it was very, very slight. That's usually a feature that I would give a lot of weight to in determining sex.

The other feature was the subpubic angle, and I am sorry, I don't have a photograph of that.

Q. I think that's page 0253?
A. Oh, yes, sorry, there is. These are the two pubis bones right at the front of the pelvis. The angle here is quite narrow, which is typical of a male. Females tend to have relatively much broader pelvises, and he showed those two features, and they are ones that I would give most weight to in determining sex.

He did, however, have a couple of features which were more female-like. One was a broad greater sciatic notch, but I still am sure that he was male, even though he had that. That's not a feature that I would give so much weight to.

Q. Were there any parts of the skull that demonstrated or were of assistance in relation to determining male from female?
A. Yes. He had a deep, bony palate, so in here (indicating). He had large mastoid processes, which are the bony processes behind the ear. There is a very large muscle attached to that. Males having larger muscles generally, their muscle attachment areas on the bones will almost always be larger. He had, as I mentioned before, a moderately prominent glabella, which is used for determining both ancestry and sex, and that is generally larger in males. He had well developed malar tuberosities or cheek bones here, for attachment of muscles, and he had a square chin, which again is a male characteristic, with females tending to have a pointed chin.

Q. You made the comment at page 0237, after detailing the matters that you just referred to, that the skull does not have a very strongly male appearance; that most of the muscle attachments are not particularly well developed; and in your opinion the remains are those of a male.
A. Yes. There are others areas where muscles are attached, particularly at the back of the skull for the neck muscles. They weren't all that well developed. Also the muscles along the side here, the temporalis muscle, wasn't all that well developed. But, again, I would put more weight on the pelvis, and I have no doubt that it is a male skeleton. It is not unusual to find some features which you might classify as female in a male skeleton and vice versa.

Q. Then from the position of determining his age, what would you look for there?
A. With age, I would look at as many features as I could, really, on the skeleton. So I looked at what I call epiphyseal fusion, which is the fusion of the caps of the bones as the bones grow, and so, for example, in a child, the thigh bone, or femur, will have a shaft and then it will have epiphyses or caps at either end, which will eventually fuse with the shaft. They fuse at regular ages. There is a bit of variation, usually plus or minus four years, and we have tables which we compare with.

The epiphyses were fused on all of his bones, with the expectation of the end of the clavicles, or collar bones, here (indicating). At this end, what we call the sternal end of the clavicle was not completely fused, and this is

actually the last epiphysis to fuse in the human skeleton. So his were still on the point of fusing. That indicated an age of between 23 and 31 years. I used other methods as well, the pubic synthesis, which we have a photograph of.

Q. That's at figure 15 on page 0254.
A. These two pubis bones come together and change throughout life. They change in their appearance. I have brought along a series of casts to show those changes, which we use to give a score. These are just casts of people of known age. This is the pubic symphysis representing a particular age group. These are actually based on some hundreds of, in this case, European skeletons of known age, in an attempt to come up with a method to age people on this basis. This end (indicating) represents young individuals, and this end (indicating) represents older individuals.

The face of the symphysis starts off as being very ridged, deeply ridged, and flattens out as the person becomes older and then becomes, in the end, sort of almost arthritic and the surface degenerates. This is considered quite a good method for ageing skeletons once growth has stopped. In this man's case, growth had stopped and the last epiphysis was in the process of fusing.

I used this method and this indicated an age range of 24 to 30 years. He fell into this second stage (indicating).

I used another method of pubic symphysis, which was based on drawings. I used the end of a rib, which undergoes similar changes to the pubic symphysis, and I used an articular surface, the auricular surface of one of the hip bones or the innominates. Again, there have been many studies done on the ageing of people based on these bones, and there are tables to compare. So I came up with a whole series of age ranges and I used the extremes of those age ranges, with the exception, actually, of the sternal end of the rib, which gave an age of 20 to 29 years, but I felt that because all the epiphyses of the long bones had fused, and they fuse by 22, we could take it up to 22.

THE PRESIDENT: Q. 22 to 31?
A. So in the end I came up with a range of 22 to 31

years.

CMDR RUSH: Q. Then you looked at trying to ascertain height. That estimation is undertaken by examining the femur?
A. Yes, the femur is the bone most highly correlated with a person's height or stature. The left femur is normally used. You can see, actually, three sets of formulae - well, actually, it is the one formula, but this is based, again, on caucasoids - in this case American caucasoids, American Europeans - and I substituted the length of the femur, 49 centimetres, into the formula. I have given three results there depending on how many standard deviations are used, which is like an error.

If one standard deviation is used, it means that there is a 68 per cent probability that that height range is correct for this person. If two standard deviations are used there is a 95 per cent probability it is correct that the person falls into that range. If we use three standard deviations, 99.7 per cent probability. So I have actually given the height there with three standard deviations.

Q. So with the three standard deviations, the height, in old terms, is between 5 feet 6 inches and 6 feet 2 inches?
A. Yes.

THE PRESIDENT: Q. With two standard deviations, the height is between 5 feet 7.5 inches and 6 feet 7.5 inches?
A. Yes. I have put those actuals heights there because the actual heights that were recorded of the sailors do go to that and even more detail, actually, in height.

CMDR RUSH: Q. In relation to other aspects of the skeleton, were there areas of degeneration of the bony structures which were inconsistent with the age range that you have worked out as a consequence of the investigations that you have just spoken to us about?
A. Yes.

Q. You have referred at page 0239 to the thoracic vertebrae and the lumbar vertebrae showing Schmorl's nodes. What was the significance of that? I think it is shown in figure 16 ?
A. It is the figure above that one. This is the vertebral body, and there is a dip in the centre. That's a compression of the body of the vertebra. It is thought to

result from constant compression of the vertebra. It is found today, for example, in trail bike riders. So it is found in younger individuals these days, but generally, in the past, it was more commonly occurring in older people as a result of perhaps carrying weights or something over a longer period of their lives.

Q. Is it consistent with people doing a very heavy type of lifting and carrying, physical work?
A. It is thought to be, yes.

Q. For it to develop, can it be congenital or is it a matter of developing as a consequence of the sort of heavy loads associated with the lifting and carrying and the like?
A. I think it is thought to occur during the life rather than being congenital. But, of course, I suppose if somebody may have these and not have had them x-rayed or scanned and so may not know - it may be possible.

Q. Just on that view, just so that we understand it, we're looking down, if you like, on a vertebra of the back?
A. Yes.

Q. You make the comment that this is a common ageing process in older men over 45 years?
A. Yes.

Q. You also refer at page 0239 to unusual ankle joints?
A. So these are the lower ends of the tibiae or shin bones. The arrows point to what are called squatting facets. If you imagine underneath those tibiae or shin bones there is a very smooth articular surface. These are really an extension of that articular surface on to the front of the bone, and they result from what we call dorsiflexing, or flexing the foot back against the shin bone. So I suppose if that was my foot (indicating) then it would be flexing it back like that against the shin bone constantly.

Q. From your position and expertise, lateral squatting facets are normally associated with what type of people or race or what type of position?
A. They are very commonly found in people who live a hunter-gatherer lifestyle and who have no chairs and who squat. So, for example, in Australian Aboriginal prehistoric remains, which I'm quite familiar with, I would

say that, you know, 100 per cent of those people have squatting facets.

It is not really a racial characteristic so much as the result of a cultural alteration, and so people who squat, whether they are hunter-gatherers - a lot of Asian people squat', even rural people, farmers, may squat. So these people you might assume would get squatting facets. I guess there is not a direct causal relationship, we don't know for sure, because it is very rare to have a skeleton where you actually knew the person's medical history and their lifetime activities, so there is an assumption there, but I think it is a good assumption that these would be caused by an activity like squatting or pressing of the foot back against the shin.

Q. Just so we understand it without me demonstrating, it is sitting right down on your haunches?
A. Yes, that's right.

Q. And for prolonged periods of time?
A. Yes.

Q. And for that to develop in a person of the age that you have determined, the frequency of that activity, having regard to the findings that you have told us about, can you measure that as to --
A. No, I can't say, you know, how many years, but I think it is certainly something that would take years rather than months to form.

Q. You make the comment at page 0240 that it is an unusual finding, I take it from your point of view, in people of European ancestry?
A. It is unusual, but you do see it sometimes, yes. I do see it sometimes, for example, in forensic cases, but I don't know the reason for them having them.

THE PRESIDENT: Q. Is there any other cause apart from squatting?
A. Well, I would think that anything which involved that action of the foot back against the shin, you know in a very repetitive way.

Q. Cycling?
A. Possibly, but I don't know for sure, because we don't actually have a skeleton of cyclist to know that. I

imagine there could be activities that could cause that.

CMDR RUSH: Q. Is there somewhere a suggestion of horse riding?
A. Possibly --

THE PRESIDENT: No, that's the bad backs.

Q. A highly-trained sprinter would normally run on their toes and there would be great flexibility in the ankle joint, I would have thought. They wouldn't do that all day, but they might train five days a week. Would that sort of thing be sufficient to cause this, or not?
A. I'm not sure that running on your toes would cause squatting facets. However, he did actually show that there would be a lot of mobility around those ankle joints, and there was actually some degeneration of those ankle joints as well. So I think he was doing something which involved a lot of movement of the ankle joints.

CMDR RUSH: Q. You refer, Dr Donlon, at page 0240 also to bowing of the fibulae. Could we look at figure 1 on page 0245. If we scroll down, we're looking, if you like, at the outside bones of both legs.
A. So these (indicating).

Q. There is bowing, if you like, of what is the left leg as we look at it but I think it is the right leg of the skeleton. Is that what you are referring to?
A. Yes, that's right.

Q. What is the significance of that bowing?
A. Well, normally that bone is quite straight. Bowing can occur, and one of the most common causes of bowing in limb bones is rickets, where the bones do not have enough calcium and so on, and so the weight of the body causes them to actually bow. The fact that the tibiae are not bowed would suggest that this is not the result of rickets. So it may be that it is the result of some kind of activity, again causing bowing. To give you an example, I have seen in a forensic case the upper arm bones or the humeri of a man who was an archer who had very bowed upper arm bones, and so certain activities can cause bowing. I'm really not sure what could cause this, but I suspect it may be related to the mobility around the ankle joint and the degeneration of the ankle joints.

Q. Looking at the commentary, you say the bowing can be as a result of occupational stress due to repetitive movements or possibly due to carrying heavy weights?
A. Yes.

Q. You mentioned that there was a depressed healed fracture of the skull, at page 0241. You also commented that there was an old healed fracture of the right toe?
A. Yes.

Q. Is that something he would know about necessarily?
A. Not necessarily. I think it is not that uncommon to fracture toes.

Q. From an occupational point of view, is the bowing of the tibiae and the degeneration of the spine suggestive of someone doing a heavier type of occupation, or can't you say?
A. Yes, I think it does indicate some repetitive movement, perhaps a little bit outside the usual.

Q. Dr Donlon, you also examined the time that elapsed since death from an examination of the skeletal remains. What was your finding there?
A. The bones I found were consistent with someone who had been buried for many years. It is very difficult to say how long, but the bones were not at all greasy, there was no tissue attached and they were very fragile, and from my experience of looking at buried bones, of bodies in New South Wales, these were certainly, I would say, at least decades old. The condition of the coffin and the nails, which were very heavily corroded, and the press studs also indicates a long period - decades.

Q. I suppose the question is: are the bones consistent with a person buried in 1942?
A. Yes, I think they are.

Q. Dr Donlon, you also refer at page 0242 to the potential of one mark on the skull having been caused by birds. I think that is at page 0251, figure 9?
A. Yes. There was just a very small hole there. We didn't cause it when we excavated the remains, and I have seen photographs of bones that have been scavenged by birds and it is a similar sort of mark.

THE PRESIDENT: Q. What sort of size is that hole?

A. It is on the right side of the frontal bone.

Q. Yes. What size?
A. It is 2mm in diameter, so it is very tiny.

Q. It is very small.
A. Yes.

CMDR RUSH: Q. It may be more a matter for dental expertise, but if we look at figure 10 immediately under that, which I haven't taken you to, there is slight shovelling of the incisors. What is the significance?
A. Shovelling - the scooping out appearance there of the inner side of the incisors - is a feature which is present in a much higher frequency in some racial groups than others. It is actually present in a very high percentage - 90 to 100 per cent - of Asians, and it is present in about 5 to 10 per cent of caucasoids or Europeans. I guess that one of the things that anthropologists often look at are these little sort of morphological features of the skeleton and the teeth, and it can be useful sometimes in sending you along a certain direction.

THE PRESIDENT: Q. Is it due to diet or something else?
A. No, it is actually genetic. It is definitely genetic. These are not really strongly shovelled, but there is certainly shovelling there. It doesn't necessarily mean that the person has Asian ancestry, but it is a feature, I suppose, which a person themselves may be aware of.

Q. What happens if somebody is of mixed race?
A. Actually, they tend to either have them or not. In fact, I actually had a PhD student some years ago who was working on these kinds of features on teeth, and she was actually of mixed race. She was Eurasian. She had shovelled incisors and she also had another feature called Carabelli's cusp which is typical of Europeans. So she actually had both, but it is possible she could have had neither. But you don't get a merging of them; you either get them or you don't.

CMDR RUSH: They are the matters that I have for Dr Donlon.

THE PRESIDENT: Thank you very much, Doctor. CMDR Rush will take control of this skull and get it back to you in due course.

CMDR RUSH: Yes, sir.

<THE WITNESS WITHDREW

CMDR RUSH: That concludes the evidence for today, sir. The next evidence of the Commission of Inquiry is to be taken in Perth during the week after next.

THE PRESIDENT: Very well. Thank you very much. I will adjourn until Tuesday week.

AT 3.45PM THE COMMISSION WAS ADJOURNED
TO PERTH ON TUESDAY, 2 FEBRUARY 2009 AT 10AM