

BY CHERYL JONES

The bone sailor

Techniques used on ancient remains may solve the riddle of the sailor who escaped HMAS Sydney's sinking.

JEREMY AUSTIN is used to reading the grand narrative of our species written in DNA recovered from human remains tens of thousands of years old.

He deploys the powerful tools of genetics to answer big questions about the evolution and dispersal of *Homo sapiens*. It is difficult to identify with the long-dead subjects of his research, however.

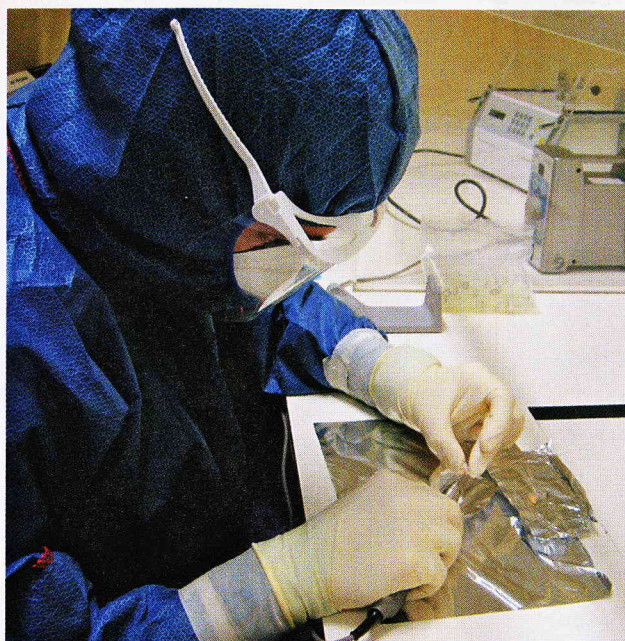
Now, for the first time, he is immersed in the story of one man, someone who died relatively recently and probably has living relatives.

Austin, a geneticist at Adelaide University's Australian Centre for Ancient DNA (ACAD), is part of a team attempting to identify the HMAS Sydney sailor whose remains were recovered from Christmas Island last year.

The sailor, who had horrific head wounds, struggled onto a life raft after the German raider Kormoran sank the Sydney off Western Australia in November 1941. All 645 crew members were lost. The sailor died at sea and his raft drifted for months, eventually reaching Christmas Island, where he was buried. His grave was lost until last year, when the Navy mounted a search, using an old photo as a clue.

The push to identify the sailor comes as the American shipwreck hunter who found the World War II battleships HMS Hood and Germany's Bismarck prepares to lead a renewed search for the Sydney, expected to begin in February. The \$5m project will be funded by the federal, WA and NSW governments.

In the identity search, the Navy eliminated 500 Sydney crew members on the basis of dental records and historical and physical anthropological research. It came up with a short list of three engineering officers as the most likely candidates for a match. DNA samples from living relatives could be used for an ID.



DIGGING FOR TRUTH
Jeremy Austin, left, probes the tooth of the Sydney sailor exhumed from his grave on Christmas Island, above

That's when ACAD was mobilised. DNA degrades rapidly in the tropics. The chances of recovering DNA from the sailor were slim, and beyond the capability of standard forensic laboratories. ACAD scientists, who have winkled DNA out of 30,000-year-old Neanderthal remains and the teeth of extinct giant bears, are specialists in recovering minute amounts of surviving genetic material.

Austin, wearing a body suit, surgical mask and gloves to prevent contaminating the material with his own DNA, drilled tiny samples from two of the man's teeth, more likely than bone or hair to yield DNA. He was working in the facility's clean laboratory, protected from contaminating DNA by positive air pressure and physical isolation from the rest of the campus.

He was stunned to find that DNA had survived. He sequenced DNA from the mitochondria, tiny energy sources within cells. Mitochondrial DNA, inherited exclusively from mothers, is central to ancient DNA research, partly because there is more of it than nuclear DNA, which codes for most of our physical and behavioural traits. Forensic scientists used it to identify the badly burnt bodies of victims of the 9/11 attack, Austin says.

DNA sequences from people related to the three shortlisted sailors through their mothers failed to come up with a match, so

the unknown sailor was someone else. The Navy has issued a list of another 13 candidates from the Sydney, and will start interviewing relatives soon.

Austin read the unknown sailor's genetic code to work out his position on the global human family tree. The man was of European descent but carried unusual mutations that put him in the haplogroup J1, rare but widespread in Europe. Haplogroups - twigs of the family tree - are big groups of people with a common ancestor.

Austin says research on other sections of the genome would be needed to pin the sailor's lineage down to a place in Europe - another possible clue to his identity.

The geneticist knows the tall sailor, who had a mouthful of gold fillings, well, but he won't be able to finish the story until he gets a DNA match.

"This is unlike other ancient human DNA work, apart from research on indigenous remains," he says. "Indigenous people feel a real connection to their distant ancestors.

"But most of our work is academic. It doesn't quite have the human interest. With the unknown sailor, you feel like you're working on someone who's more alive. There are people out there who are interested in the results - it's more than just an interesting story. They can say, 'It's my uncle or brother who went missing.' It puts even more importance on getting a result, and getting it right."

Says ACAD director Alan Cooper: "The history of this guy is amazing. With the head wound, he had little chance of surviving the battle and getting onto the life raft. The odds of his raft reaching Christmas Island were low, and the chances of getting DNA from him were vanishing small. We really owe it to him to work out who he was." ●

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