

STARRING

Road to Niku VI



Amelia EARHART



and Fred NOONAN

When we launched The Earhart Project in 1988 there were two competing theories about what happened to Amelia Earhart and Fred Noonan. The public seemed to be evenly split between adherents of “crashed & sank” and fans of “captured by the Japanese.”

The theory that the lost aviators died as castaways on an uninhabited island wasn't even on the radar. Twenty-one years of science-based research, nine TIGHAR expeditions, and two critically acclaimed books later, that possibility has become so widely accepted that AT&T used it as the basis for a tongue-in-cheek television commercial about internet access.

As we once more take on the daunting task of planning and funding an expedition to Nikumaroro, it's worth reviewing how we got from where we started to where we are today.

distilling the facts of the Earhart case from the myriad myths and rumors.

The first big break came in 1998 with the discovery of documents confirming a story that a British Colonial Service officer had found the bones of a female castaway on Nikumaroro in 1940. The bones were sent to British headquarters in Fiji and apparently lost, but we reasoned that if we could locate the place on the island where Gerald “Irish” Gallagher discovered a partial skeleton, sextant box, fragments of a man's and a woman's shoe, campfire, etc., there might be other things there that he missed. Our initial excavation of the Seven Site in 2001 revealed artifacts and features that reinforced our suspicion that the site was where the castaway lived and died.

“We are on the line 157 337.
Running on line north and south.”
USCG Itasca radio log, July 2, 1937

The TIGHAR hypothesis is based on navigational logic and the assumption that Earhart was where she said she was and doing what she said she was doing in the last in-flight radio message heard by the Coast Guard. Two islands, McKean and Gardner (now Nikumaroro) are on the line she said she was following. If the flight reached either island, some remnant or relic of the airplane and/or its crew should still be there.

One day on McKean was enough to eliminate that tiny jumble of jagged coral with its reeking guano lagoon. Nikumaroro, however, proved to be rich with tantalizing clues. To be sure, our field work on the island turned up some false leads and dead ends, but nothing to contradict the basic premise that this was where the flight ended. Meanwhile, our archival research was

“It is a test of true theories not only to account for but to predict phenomena.”

William Whewell, 19th century polymath and scientist

We predicted that further archaeological work at the Seven Site would produce evidence supportive of the hypothesis that we had found the right place. Our prediction proved true. The 2007 Niku V expedition brought back artifacts that appear to be the personal effects of an American woman of the 1930s trying desperately to survive in a harsh and unfamiliar environment (see “Smoking Guns,” *TIGHAR Tracks*, Oct. 2008). We have also discovered that the serial numbers reported to have been on the sextant box found near the skeleton strongly suggest that the sextant it once contained was a type known to have

been carried by Fred Noonan (see “Numbers Game,” *TIGHAR Tracks*, Oct. 2008). Was Amelia Earhart the hapless soul who died at the Seven Site? Almost certainly, but almost isn’t good enough.

On The Way to DNA

Even the most ardent skeptics acknowledge that DNA from Earhart and/or Noonan would clinch the case. During our excavations at the Seven Site in 2007 we were under the impression (correct at that time) that to have any hope of extracting DNA we would need to find a bone or a tooth. We found plenty of bones – 1,401 to be exact – but they were the bones of small fish, birds, and turtles uncovered during the excavation of former cooking fire sites. No human bones, no human teeth. Bummer.

There were, however, some important finds; a zipper, a broken jack knife, some broken bottles – all of which, after extensive research, proved to be from the mid-1930s and consistent with items Earhart may have had with her. Other significant finds were less obvious at first. When you’re digging an archaeological site you collect anything unusual, whether you know what it is or not. What laboratory analysis later showed to be pieces of early twentieth century cosmetic were just tiny hunks of red-colored stuff to the volunteers sifting coral rubble at the Seven Site. A small shard of glass with a distinctive beveled edge was just a piece of broken glass until we got home and discovered that it fit another shard found on an earlier trip. Together, we had enough to match the object to an American 1930’s compact mirror.

Among the hundreds of artifacts, objects, and



samples collected from the Seven Site were a few desiccated chunks of an unidentified brown substance. We later wondered if they might be coprolites – the archaeological term for fossilized fecal material.

Experts were unable to give us a firm yes or no but, if the material was what we suspected it was, there just might be DNA present. TIGHAR member Dr. Ryan Parr of Genesis Genomics connected us with Molecular World, a top-notch DNA laboratory in Thunder Bay, Ontario that specializes in extracting “ancient DNA.”

A few of us had touched the material with our



bare hands before we realized what it might be so, to remove any contamination, the lab scraped off the exterior surface. After many tries they were successful in extracting DNA from the remaining material. It was mitochondrial (mt) DNA and it was badly degraded, but they were able to sequence it and determine its profile. MtDNA is passed in the female line and, given the apparent strength of the possibility that it was Earhart-related, an Earhart family member generously consented to providing a DNA sample for reference. For a while we thought we might have our long-sought smoking gun but, to everyone’s surprise, not to say dismay, the mtDNA from the island material did not match the Earhart sample. Instead, it matched Ric’s. He had briefly touched the material with ungloved fingers while initially trying to figure out what it might be. Molecular World’s extraordinary ability to detect, extract, and profile the faintest traces of DNA had defeated their own attempts to eliminate any contamination from the material being touched.

We still don’t know whether or not the stuff is coprolite and what the heck it is if it’s not. What is painfully apparent is that, given the recent advances in DNA extraction capability, had we been careful to handle artifacts like the zipper and broken pocket knife with tweezers or gloves, we might well have been able to extract the castaway’s DNA from those objects. Needless to say, archaeological protocols at the Seven Site during Niku VI will be designed to protect any recovered artifact or material from contamination.

Although all of the cleared surface area at the



Seven Site has been swept with metal detectors, only about 5% of the area has been archaeologically examined (dug and screened). Non-metallic artifacts, such as the compact mirror and cosmetic, were found because they happened to be near a metal detector “hit.” Based on what has been found already, the probability that more non-metallic artifacts will turn up seems high – as does the possibility for recovering DNA.

The Plane That Will Look for the Plane

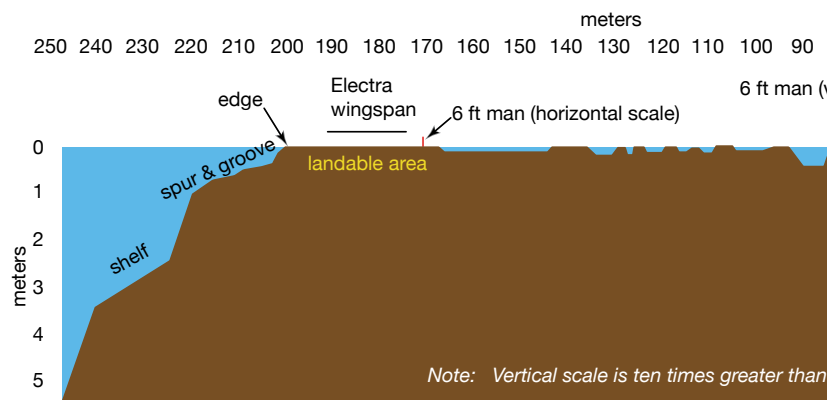
Funding permitting, Niku VI will include a deep water search for wreckage of the Earhart Electra off the island’s western reef. The available evidence suggests that the plane was landed on the reef just north of the Norwich City shipwreck and remained there for several days and nights while Earhart and Noonan used the radio to call for help. The hypothesis we’ll be testing goes something like this:

At some time before the Navy overflight on July 9, rising tides and surf washed the aircraft over the edge where it hung up and was obscured from view by breakers. Battered by the sea, the plane broke up; some components tumbling down the steep reef slope into deep water, some remaining wedged on the reef edge to be seen by the Gilbertese settlers who began to

arrive in 1939. By 1944 any obvious trace of the wreck seems to have been gone. In the 1950s, debris from the plane, possibly churned up by storms, started to appear on the reef-flat and beaches where it was salvaged, brought to the village, and cut up to make fishing lures, combs, and decorative objects. By the time the island settlement was evacuated in 1963, the plane wreck on the reef edge was an old story known to only a few. TIGHAR’s searches in the abandoned village have turned up scraps left over from the consumptive use of airplane skins and components – some are clearly WWII debris imported from other islands (probably Kanton) but some appear to be civilian in origin and consistent with Earhart’s Electra.

Our previous searches of the reef edge and

Cross-section of reef flat at presumed low tide, landable area dry, c

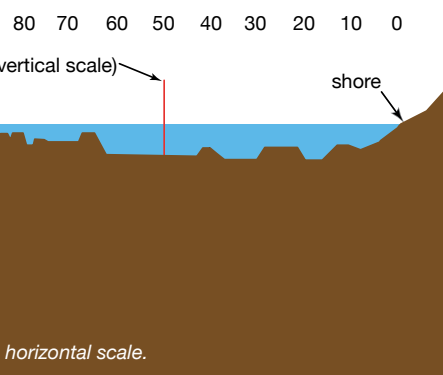




slope have found no aircraft debris down to the relatively shallow depths accessible to scuba divers but, of course, those depths are also susceptible to storms. What has always been needed is a way to search the greater depths of the reef slope where wreckage would rest undisturbed. Complicating the search is the fact that during a storm in January 1939, the stern half of *Norwich City* broke off and tumbled down the reef slope in that same area. Ship wreckage is a much better magnetic target than the few steel components of the *Electra*, so magnetometry is out. Sonar paints an image with sound, but if pieces of airplane are mixed in with pieces of the ship it might

be hard to distinguish which is which. The best search technology for this difficult environment would seem to be the Mark One Eyeball. The job calls for a manned submersible capable of reaching depths down to a thousand feet, equipped with strong lights (it's dark down there), capable of traveling at a reasonable speed, but

**aircraft location;
alm sea.**



able to stop and hover over a suspicious object. The sub must also be compact and portable enough to be transported on, and deployed from, our expedition ship *Nai'a*.



Fortunately, there is such a sub. TIGHAR and *Nai'a* are working with Sub Aviator Systems of Seattle, Washington (www.subaviators.com) for the deployment of their advanced underwater airplane “Super Aviator” as part of the Niku VI expedition. Watch the TIGHAR website (tighar.org) for news as this exciting new aspect of TIGHAR’s search takes shape.

