



## What Happened to Amelia Earhart?

### *The Case for Nikumaroro*





## What Happened to Amelia Earhart? The Case for Nikumaroro

Aviation pioneer Amelia Earhart and her navigator, Fred Noonan, disappeared over the Pacific on July 2<sup>nd</sup> 1937. TIGHAR hypothesizes that they landed and died on *Nikumaroro*, then called Gardner Island, an uninhabited island in what is now the Phoenix Islands Protected Area of the Republic of Kiribati. Detailed documentation of our basis for the Nikumaroro Hypothesis is found in two books published by TIGHAR members<sup>1</sup>, and on TIGHAR's worldwide web site<sup>2</sup>. I've also published a novel that imagines the circumstances surrounding the discovery of what may have been Earhart's bones<sup>3</sup>. I have prepared this short paper to summarize the reasons we believe we are right about Earhart's fate. Here they are:

1. In the last radio transmission that all authorities agree came from Earhart, she said she was flying "on the line 157 337" – this is generally understood to be what is known as a "line of position," a navigational line oriented 337° (NNW) and 157° (SSE). The strength of the transmission indicated that she was relatively close to Howland Island at that time. She was not understood to say which direction she was flying on the line but U.S. Navy experts, Earhart's husband George Putnam, and her technical advisor Paul Mantz all agreed that the flight probably proceeded southeastward in the hope of reaching land<sup>4</sup>. Such a line passing through the vicinity of Howland Island also passes within visual range of Nikumaroro.
2. Nikumaroro is much easier to see from the air than Howland Island; it is bigger, tree-covered, and has a brilliant aquamarine lagoon<sup>5</sup>.
3. After her disappearance, over 180 radio messages were received by stations around the Pacific and elsewhere, most of them by professional radio operators, some of them in a voice identified as Earhart's by operators who had heard her in past transmissions. When the U.S. Navy's extensive search didn't reveal anything, the Navy decided they were all mistakes or hoaxes. If even one of these messages was really from Earhart, she had to be on land with a fairly intact airplane capable of generating power for the radio<sup>6</sup>.
4. Radio stations at Wake Island, Midway Island, and Hawaii took radio direction finding (RDF) bearings on six of the transmissions. Four of these bearings crossed in the vicinity of Nikumaroro<sup>7</sup>.

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<sup>1</sup> *Amelia Earhart's Shoes*, by T. F. King, Karen Burns, Randall Jacobson and Kenton Spading; AltaMira Press 2004 (<http://www.altamirapress.com/Catalog/SingleBook.shtml?command=Search&db=^DB/CATALOG.db&eqSKUdata=0759101310>) and *Finding Amelia*, by Ric Gillespie; Naval Institute Press 2007 (<http://www.findingamelia.com/>)

<sup>2</sup> [www.tighar.org](http://www.tighar.org)

<sup>3</sup> *Thirteen Bones*, by Tom King. Dog Ear Press, 2009; see [www.tomfking.com](http://www.tomfking.com).

<sup>4</sup> See *Finding Amelia* pp 127-8.

<sup>5</sup> See for yourself. Have Google Earth fly you to 0° 48' 21" N latitude, 176° 37' W longitude to view Howland Island, then to 4° 40' 30" S latitude, 174° 31' W longitude to view Nikumaroro

<sup>6</sup> See *Finding Amelia*, pp. 180-194.

<sup>7</sup> See *Finding Amelia*, p. 164.

5. The only radio (other than, we suspect, Earhart's) documented as having been in the Phoenix Islands was in the possession of John William Jones, a coconut plantation supervisor on Hull (now Orona) Island, about 150 miles east of Nikumaroro. Jones' radio is reliably reported to have been out of order between early June and late August of 1937<sup>8</sup>.
6. TIGHAR analysis of the whole body of radio messages indicates only two plausible explanations for them. Either an extremely well-informed hoaxer with an undocumented radio was on one of the western Phoenix Islands imitating Earhart's voice, or Earhart was there<sup>9</sup>.
7. Search plane crews from *USS Colorado*, flying over Nikumaroro seven days after the disappearance, reported "signs of recent habitation" but, believing the island to be inhabited, concluded that they were not related to Earhart, so the *Colorado* did not land a search party<sup>10</sup>. The island had not been officially inhabited since 1892.
8. British colonial officers who visited Nikumaroro in October of 1937 to see whether the island could be colonized said they saw evidence suggesting an "overnight bivouac" (camp)<sup>11</sup>.
9. A photograph taken by one of the officers shows an anomaly on the edge of the island's northwestern reef that looks very much like an overturned airplane's landing gear<sup>12</sup>.
10. Residents of the colony established on Nikumaroro in December of 1938, which lasted until 1963, report aircraft wreckage on the northwestern reef flat and in the lagoon. A US Navy pilot who visited the island during World War II reported local residents using aircraft control cable as a fishing line, which they said came from a plane wreck that had been on the island when they came<sup>13</sup>.
11. TIGHAR has recovered a number of pieces of aircraft wreckage from the remains of the colonial village on Nikumaroro; these appear to have been brought to the village to use in fabricating handicrafts. Some of these are from a B-24, probably one that crashed on Canton Island, some 230 miles to the northeast (people from Nikumaroro worked on Canton after World War II). Other pieces, including aluminum fragments and fragments of plexiglass, do not appear to match a B-24 but are consistent with a Lockheed Electra like Earhart's<sup>14</sup>.
12. In 1991, TIGHAR recovered parts of two shoes on Nikumaroro, identified by footwear specialists as a woman's shoe and a man's shoe. The former was identified as a "Blucher-style oxford" dating to the 1930s. Earhart wore such shoes on her flight, though the only example that can be measured in photographs appears to have been smaller than the one found by TIGHAR<sup>15</sup>. Photographic evidence indicates that Earhart had at least three pairs of footwear on the plane, two of them Blucher-style oxfords, and there is documentary evidence suggesting a pair of hiking boots<sup>16</sup>.

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<sup>8</sup> See *Finding Amelia*, p. 210.

<sup>9</sup> See *Finding Amelia*, pp. 116, 135, 157-9.

<sup>10</sup> See *Finding Amelia*, p. 206.

<sup>11</sup> See *Earhart's Shoes*, p. 137.

<sup>12</sup> See [http://tighar.org/Projects/Earhart/Research/Bulletins/57\\_Bevingtonphoto/57\\_HidinginSight.htm](http://tighar.org/Projects/Earhart/Research/Bulletins/57_Bevingtonphoto/57_HidinginSight.htm)

<sup>13</sup> See *Earhart's Shoes*, pp. 117, 182-86, 267-71.

<sup>14</sup> See *Earhart's Shoes*, pp. 110-39, 157, 188-93, 362-7

<sup>15</sup> See *Earhart's Shoes*, pp. 125-134

<sup>16</sup> See [http://tighar.org/Projects/Earhart/Research/Bulletins/31\\_ShoeFetish2/31\\_ShoeFetish2.html](http://tighar.org/Projects/Earhart/Research/Bulletins/31_ShoeFetish2/31_ShoeFetish2.html)

13. In 1940, the Nikumaroro colonists found thirteen bones of a human skeleton on the southeast end of the island next to the remains of a campfire with bird and turtle bones. Nearby the remains of a woman's shoe and a man's shoe were found, together with a sextant box and some small corks on chains. The bones were examined by two medical doctors. One said the bones came from an elderly Polynesian, the other said they were from an adult male of European or mixed race. The bone measurements taken by the second doctor have been analyzed by modern forensic anthropologists, whose studies indicate that they may more likely be those of a woman of European ethnic background, about 5'5" to 5'9" in height. Earhart would have fit this description. The bones have been lost<sup>17</sup>.
14. The sextant box – which has also been lost – is recorded as having had two numbers on it: 1542 and 3500. Recent research has shown that during World War I, the U.S. Navy acquired a large number of nautical sextants, some of which were converted for aviation use. Known sextants acquired by the Navy from the Brandis Instrument Company carried serial numbers ranging from 3227 to 5760, and were assigned Navy numbers 845 through 4705; these numbers were stamped into the boxes as well as the instruments themselves. The numbers on the Nikumaroro sextant box thus suggest that it held a Brandis instrument owned for a time by the U.S. Navy.
15. The second number on the box – 3500 – is also close to the number 3547, which is written on a sextant box held by the Museum of Naval Aviation in Pensacola, Florida and is documented to have belonged to Fred Noonan<sup>18</sup>. Fred Noonan is known to have used a nautical sextant as a back up and a photograph of the navigation room aboard a Pan Am clipper shows a box for a Brandis sextant. One of Noonan's jobs in the 1930s was as a navigator trainer and a photograph of one his students shows a Brandis sextant.
16. In 1946 the late Floyd Kilts, a U.S. Coast Guardsman on duty on Nikumaroro, was told about the bones discovery by a local resident. Other Coast Guardsmen purchased wooden boxes built by the residents, with inlaid pieces of aircraft aluminum<sup>19</sup>.
17. TIGHAR has identified a site on the southeast end of the island (the Seven Site) that closely matches the description given in British colonial records of the bones discovery site. Here we have found the remains of several cooking fires containing bird, fish, and turtle bones. There are also two clusters of giant clam (*Tridacna* sp.) shells on the site, apparently brought there so their meat could be consumed. Many of the clams in one cluster appear to have been opened by someone who tried to pry them open on the hinge side (as eastern U.S. oysters and some clams are opened); others have been opened by smashing them with rocks<sup>20</sup>. Fishbones from the remains of cooking fires on the site suggest that whoever camped there was unselectively catching mostly rather small reef and lagoon fish, cooking them on the coals, and disposing of their bones in the fires; none of this behavior is consistent with fishing and fish preparation by indigenous Pacific islanders<sup>21</sup>.

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<sup>17</sup> See *Earhart's Shoes*, pp. 206-48; also see *Thirteen Bones*.

<sup>18</sup> See *Earhart's Shoes*, pp. 230-34

<sup>19</sup> See *Earhart's Shoes*, pp. 54-6, 226; also see *Thirteen Bones*.

<sup>20</sup> See *Earhart's Shoes*, pp. 349-51

<sup>21</sup> See [http://www.tighar.org/Projects/Earhart/NikuV/Analysis\\_and\\_Reports/Faunals/NikuVanalysisfaunals.html](http://www.tighar.org/Projects/Earhart/NikuV/Analysis_and_Reports/Faunals/NikuVanalysisfaunals.html)

18. Finally, we have found a variety of artifacts at the Seven Site. Some of these are clearly of colonial or Coast Guard origin, but others are not<sup>22</sup>. Among the artifacts recovered from the site in 2007 and 2010 are:

- a. a broken bottle made by the Owens Illinois Glass company in New Jersey in 1933 containing traces of a substance containing oil and lanolin, probably either a skin cream or hair dressing;
- b. a shattered bottle with the word “Mennen” embossed on its side in Art Deco lettering, apparently a 1930s cosmetic container of American origin;
- c. a broken glass vessel identified as a small ointment pot;
- d. two broken, partially melted bottles identified as dating to before World War II, found in the remains of a cooking fire where it appears they may have been used in attempts to boil water;
- e. a U.S. manufactured jackknife, comparable to one carried on the Earhart Electra, that appears to have been taken apart, perhaps to re-use its parts;
- f. the pull and slider from a size 06, “auto-lok” Talon brand zipper manufactured in the U.S. sometime between 1933 and 1936;
- g. what may be the back of a small brooch or pin;
- h. small fragments of red material chemically identified as probable cosmetic rouge;
- i. two small pieces of thin beveled glass that match the mirror of a known 1930s vintage American woman’s compact.

Earhart is known to have carried a compact which, if it was like others of the period, would have contained rouge. U.S. Coast Guardsmen, island colonists, and British colonial officials are unlikely to have had such items. The apparent cosmetic containers are also more consistent with the presence of a Euroamerican woman on the site than with any of the others known to have used it. Zippers were used extensively by Earhart in her own clothing design, and by her friend Elsa Schiaparelli in designing some of Earhart’s wardrobe. The bottles in the fire suggest an effort to boil or distill drinking water – there is no fresh surface water on Nikumaroro except what can be caught during sporadic rain squalls.

### **Current Status of Research**

TIGHAR conducted its most extensive excavation of the Seven Site in May-June 2010<sup>23</sup>, and analysis of results is currently underway.

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<sup>22</sup> See *Earhart’s Shoes*, pp. 333-51

<sup>23</sup> This expedition also included a robotic search of the reef face in the location where we suspect Earhart and Noonan landed, down to a maximum working depth of 300 meters. This work revealed that the reef face is almost sheer to a little below that depth. Exploration to greater depths, where the underlying mountain slope becomes more gradual and airplane parts could have been caught by protruding rocks and in crevices, is being planned as the major focus of a proposed 2012 expedition.

## **Immediate Need**

One thing that has become apparent from our work at the Seven Site is that the site was the scene of some sort of land clearing and construction activity, probably in the late 1940s or 1950s. It is important for us to understand what this activity entailed, since it introduced material (corrugated iron, fiberboard, nails) that confuse and obscure the record of site use during the period when Earhart and Noonan might have been there. People living today in the Solomon Islands, to which the Nikumaroro colonists were relocated in the 1960s, may well be able to advise us about this. There are also likely to be records relevant to the island in the Solomon Islands archives in Honiara, which we have not yet searched. We are urgently seeking financial support for a short (ca. 2-3 week) visit to the Solomon Islands by a small (ca. 4-5 people) team of trained volunteers to conduct both archival research and oral historical interviews. The cost of this project is estimated at US\$50,000.00.

***For further information or to join the search***, please visit [www.tighar.org](http://www.tighar.org), or contact:

- TIGHAR Executive Director Ric Gillespie at [TIGHARIC@mac.com](mailto:TIGHARIC@mac.com), or
- Senior Archaeologist Thomas F. King at [tfking106@aol.com](mailto:tfking106@aol.com).

## ***Books Related to the Research***

- *Amelia Earhart's Shoes*, AltaMira Press 2004; see <http://www.altamirapress.com/Catalog/SingleBook.shtml?command=Search&db=^DB/CATALOG.db&eqSKUdata=0759101310>
- *Finding Amelia*, Naval Institute Press 2007; see <http://tighar.org/Projects/Earhart/Books/Books/findingamelia.htm>
- *Thirteen Bones*, Dog Ear Press, 2009; see [www.tomfking.com](http://www.tomfking.com)

*(or from any bookseller)*

## ***Forthcoming Media Coverage***

The Discovery Channel is scheduled to air a documentary on TIGHAR's project on November 29, 2010.