

News

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DNA reveals how the chicken crossed the sea

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Abstract

Ancient Polynesians may have brought birds to the Americas.

The discovery of chicken bones with Polynesian DNA at an archaeological site in Chile has added to a controversial theory that ancient seafarers from the south Pacific visited the New World long before

When the Spanish conquistador Francisco Pizarro first visited Peru in 1532, he noted the importance and religious rituals of the Incas. But how the birds got there was a mystery. Chickens were first absent from archaeological sites in the Americas indicates that they were not carried by migration from Asia to Alaska.

One alternative theory — that Polynesians visited the Americas, bringing livestock with them and a technological development in the region — has long been disparaged by mainstream archaeology by supposition rather than evidence.

So Alice Storey of the University of Auckland, New Zealand, was not particularly enthusiastic with the sequence DNA from a trove of ancient chicken bones she had excavated at El Arenal, a site occupied since prehistory if their origins could be traced to the Pacific islands. "I thought, 'Well, we'll give it a go'," she



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It's all relative: Chile's Araucana chicken shares its DNA with ancient birds from Polynesia.

Storey and her team reconstructed a 400-base-pair fragment of mitochondrial DNA from both the bones excavated on five archipelagos in Polynesia. Mitochondrial DNA doesn't mutate much and so is highly conserved. The Chilean sequences were identical to those from prehistoric sites in Tonga and Samoa (A. A. Storey *et al.* *PNAS* doi:10.1073/pnas.0703993104; 2007). Radiocarbon analysis dated the bones to between 1,000 and 1,500 years old, before Europeans arrived on the east coast of South America in the 1500s. The same sequences are also found in the Araucana chicken, an odd Chilean breed that has tufted 'ears', lays blue eggs and lacks a tail.

The study has left the research community cautiously optimistic that hard evidence for migration. Jaime Gongora, a molecular geneticist at the University of Sydney, Australia, says the paper is a but warns that the small fragments obtained from ancient DNA may tell only part of the story. To get extensive DNA data to make a full family tree of both modern and ancient breeds, he says.

Archaeologist Terry Jones at California Polytechnic State University in San Luis Obispo, who has evidence of contact in the New World, is less circumspect. "It's essentially unequivocal evidence," he says.

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Evidence of contact between the communities has been put forward in the past. In 1947, Thor Heyerdahl's journey by raft from Peru across the Pacific to try to prove that South Americans could have settled the theory was at odds with much of the evidence.

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More recently, Jones, along with Kathryn Klar at the University of California, Berkeley, has argued that complex fish hooks and sewn plank canoes were used by the Chumash and Gabrielino Indians in southern California in Chile (K. A. Klar and T. L. Jones *Am. Antiquity* **70**, 457–484; 2005). Others argue that Polynesians traveled the west coast of South America in order to bring back the sweet potato and the bottle gourd. The voyage was more daunting than other trips Polynesians are known to have made.

Even so, one of the co-authors on the chicken study, Atholl Anderson at the Australian National University, is accused of overestimating the extent of this cultural diffusion without further study. Although the chickens support transoceanic contact, the evidence that large-scale cultural exchange occurred remains largely circumstantial.

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