Abstract

When Charles Darwin visited the Falkland Islands, he was puzzled to find only one species of land-dwelling mammal – a fox-like animal called the warrah [WAH-rah]. How could the warrah have reached the Falkland Islands? Until now, scientists have assumed humans weren’t responsible for bringing the warrah to the islands. However, we showed that it is very likely that Indigenous people from the Tierra del Fuego visited the islands centuries before the first European explorers arrived. The Yaghan people are traditionally nomadic hunter-gatherers and often traveled with domesticated foxes. We believe that the Yaghan people probably brought the warrah to the islands centuries ago.

Introduction

Charles Darwin visited the Falkland Islands in 1833 during his voyage on the HMS Beagle. To his surprise, he found only one land-dwelling mammal on the islands – a fox-like animal called the warrah. The warrah showed no fear or aggression towards the explorers. Because of this, Darwin worried that people would hunt the warrah to extinction. Unfortunately, he was right. The last warrah was killed in 1876.

Since Darwin’s visit, many scientists have tried to figure out how the warrah could have arrived on the islands. Maybe it swam from South America during the Last Glacial Maximum when the sea level was lower. But if that was the case, why did no other mammal make the trip? There is little evidence that there was enough sea ice in the area for animals to make the trip on foot. Could humans have brought the warrah there before Darwin arrived? That’s what we wanted to find out!

To answer this question, we needed to know

1. Did any humans visit the island before the European explorers?
2. How long ago did warrah arrive on the islands?
3. Who could have brought the warrah?
Methods

We decided to use tools from two fields of science: archaeology and paleoecology.

Archaeologists study humans who lived long ago by looking at artifacts. In 1976, a resident of New Island found a stone point on his property. We surveyed the area near where the stone point was found. We analyzed 7 bone piles found there that had bones from southern sea lions and rockhopper penguins. We also looked at fossilized warrah bones found in a different location to look for clues about warrah's diet and age.

We analyzed three fossilized warrah bones we found there to look for clues about the warrahs’ diet and age.

Paleoecologists study ancient ecosystems. They often use fossils of plants and animals along with sediment cores. A sediment core is like a natural journal of the landscape. The deeper you go, the older the soil and fossils you find. When humans arrived at other islands in the past, they made fires to cook, to keep warm, and to help them hunt. These fires left traces of smoke and charcoal in the soil nearby. By looking at charcoal in a sediment core, we can see a history of fire activity. Since wildfire is very rare in the Falkland Islands, signs of fire activity are likely signs of human activity.

We collected sediment cores from three sites: New Island, Mount Usborne, and Bleaker Island (Figure 1). New Island is where the stone point was found. Bleaker Island is one location where Darwin landed. Mount Usborne is hard to get to and not visited often, so we thought it would be a good control sample of a place with very few signs of people.

Figure 1:
The Falkland Islands is an archipelago (group of islands) 300 miles from the coast of South America. Orange stars mark where we dug up sediment cores.
Results

Archaeological evidence
Ancient people probably made the stone point locally as it used a kind of stone that is common in the Falkland Islands. On New Island, we found seven piles made up of bones from rockhopper penguins and sea lions. The piles were far uphill from the beach. That means that people probably killed the animals somewhere else and then brought their bones to the piles. Radiocarbon dating showed that the animals died about 600 years ago. Based on the position of the piles, the lack of other species, and the lack of teeth marks on the bones, we think these piles are likely midden heaps.

Paleoecological evidence
We used radiocarbon dating and a computer program to calculate the age of each part of the sediment cores. The amount of charcoal in the soil is a sign of fire activity. The sediment cores from Mount Usborne and Bleaker Island had very little charcoal. But at New Island we found signs of two huge spikes of fire activity in the last 1,000 years. One matches the time that Europeans arrived about 200 years ago. But the other spike occurred almost 600 years ago – close to the same age as the bone piles! We were able to measure the age of three warrah fossils (Figure 2). Two were between two and five hundred years old, but one was around 3,500 years old.

Discussion
The oldest warrah fossil we analyzed shows that warrah existed on the islands at least over 3,500 years ago! Our results also show that it is very likely that people came to the Falkland Islands before the Europeans arrived. The Yaghan people are a likely candidate. They are one of several Indigenous communities who have lived in Tierra del Fuego for thousands of years and traveled from island to island. The sediment cores we examined indicated an increase in fire activity centuries before the arrival of Europeans. Based on where we found the bone piles, the lack of teeth marks, and the kinds of bones, we also believe that the bone piles were probably put there by people. And don’t forget the ancient stone point found on the island!

Fun Fact! The fossilized warrah bones were first found by a young boy (Dale Evans) when he was around 12 to 13 years old. So keep your eyes peeled because you never know what you might discover!

Figure 2:
A fossil warrah skull found at Spring Point Farm on West Falkland. The skull is housed at the Falkland Islands Museum and National Trust. Photo by Kit Hamley.
Conclusion

It is incredible to think that the first warrah fossils found on the Falkland Islands were discovered by a boy around 12 or 13 years old. It just shows that you are never too young to become a successful archaeological hunter! Wherever you go in the world, there are ancient remains of long-gone societies. From pyramids and temples, to roundhouses and stone circles, archaeological remains are everywhere. The best way to get involved in archaeology or paleontology is to find out what opportunities for participation are available in your own neighborhood. Ask your teacher if there is an archaeology or paleosciences club in your school and see if there are any interesting talks or events happening in your area.

Glossary of Key Terms

**Archaeology** - the study of human activity in the past based on artifacts and historical sites.

**Artifact** - an object made by humans.

**Control** - a sample that provides a baseline to compare to scientists' research results. Every good scientific study must have a control if it wants to reach valid results. That is how the scientists confirm that their findings are not just a coincidence.

**Falkland Islands** - a group of large islands in the South Atlantic Ocean 300 miles away from the coast of South America.

**Last Glacial Maximum** - the most recent time in Earth's history when ice sheets covered most of North America and northern Europe, about 20,000 to 30,000 years ago. At this time the ocean level was lower, because so much water was on land in the form of ice sheets.

**Midden heaps** - piles of bones, shells, and other materials left by ancient people as a byproduct of food production.

**Paleoecology** - the study of the plants, animals and climates of the past.

**Radiocarbon dating** - a method of determining the age of a once-living thing by measuring the relative amounts of different forms of carbon.

**Sediment core** - a column of soil and rocks dug up from one spot, carefully removed so that it is left in its original state instead of being mixed up.

**Stone point** - a pointed tool that was usually attached to a shaft for hunting or carving, such as a spear or arrow.

**Tierra del Fuego** - an archipelago at South America’s southernmost tip, shared by Chile and Argentina.

**Warrah** - a fox-like mammal also known as the Falkland Islands Wolf. Warrah were hunted to extinction by 1876.

REFERENCES

https://www.science.org/doi/10.1126/sciadv.abh3803

National Geographic: New clues may explain the mysterious origins of the Falklands wolf.
https://www.nationalgeographic.com/animals/article/falkland-islands-wolf-fox-origin-people

Falklands Museum: The warrah.
https://falklands-museum.com/the-warrah
What clues did the scientists use to work out that humans had been to the Falkland Islands before European colonization?

The scientists hypothesized that humans brought the warrah to the Falkland Islands. What were their alternative hypotheses, and why were the alternatives ruled out?

Can you think of any ways that a stone arrowhead could have ended up on the islands if humans didn't bring it there?

Why did the researchers get sediment cores from Mount Usborne?

It is amazing to think that many years ago, people traveled great distances over rough oceans in small boats! Can you think of different kinds of things you do now in your everyday life that archaeologists might find amazing in the future?