

1 **Easter Island mystery: Why did the native culture die out?**

2
3 Long before the Europeans arrived on Easter Island in 1722, the **native** Polynesian culture known as Rapa Nui showed **signs** of
4 demographic **decline**. **However**, the catalyst has long been debated in the scientific community. Was environmental **degradation**
5 the **cause**, or could a political revolution or an **epidemic** of **disease** be to blame?

6 A new study by a group of international **researchers**, including UC Santa Barbara's Oliver Chadwick, offers a different
7 **explanation** and helps to **clarify** the chronological **framework**. The **investigators** expected to find that changes **coincided** with
8 the arrival of the Europeans, but their work shows **instead** that the demise of the Rapa Nui culture began **prior** to that. Their
9 **findings** are published in the *Proceedings of the National Academy of Sciences*.

10 "In the **current** Easter Island debate, one side says the Rapa Nui decimated their environment and killed themselves
11 off," said Chadwick, a professor in UC Santa Barbara's Department of Geography and the Environmental Studies Program.
12 "The other side says it had nothing to do with cultural **behavior**, that it was the Europeans who brought disease that killed the
13 Rapa Nui. Our **results** show that there is some of both going on, but the important **point** is that we show **evidence** of some
14 communities being **abandoned** prior to European contact."

15 Chadwick joined archaeologists Christopher Stevenson of Virginia Commonwealth University, Cedric Puleston of UC
16 Davis and Thegn Ladefoged of the University of Auckland in **examining** six agriculture **sites** used by the island's statue-building
17 **inhabitants**. Their research **focused** mainly on the three sites for which they had information on climate, **soil** chemistry and land
18 use trends as **determined** by an **analysis** of obsidian spear points.

19 The team used flakes of obsidian, a natural glass, as a dating tool. **Measuring** the **amount** of water that had penetrated
20 the obsidian's **surface** allowed them to **gauge** how long it had been **exposed** and to **determine** its age.

21 The study sites **reflected** the environmental diversity of the 63-square-mile island situated nearly 2,300 miles off the
22 west coast of Chile. The soil nutrient **supply** on Easter Island is less than that of the younger Hawaiian Islands, which were also
23 **settled** by the Polynesians around the same time, 1200 A.D.

24 The first site the researchers analyzed was near the northwest coast. Lying in the rain shadow of a volcano, it had low
25 rainfall and relatively high soil nutrient **availability**. The second study site, on the **interior** side of the volcanic mountain,
26 **experienced** high rainfall but had a low nutrient **supply**; the third, another near-coastal area in the northeast, was characterized
27 by **intermediate** amounts of rainfall and relatively high soil nutrients.

28 "When we **evaluate** the length of time that the land was used based on the age distribution of each site's obsidian flakes,
29 which we used as an index of human habitation, we find that the very dry area and the very wet area were abandoned before
30 European contact," Chadwick said. "The area that had relatively high nutrients and intermediate rainfall **maintained** a robust
31 population well after European contact."

32 These results **suggest** that the Rapa Nui reacted to regional variations and natural environmental barriers to producing
33 **sufficient** crops rather than degrading the environment themselves. In the nutrient-rich center where they could produce food
34 well, they were able to maintain a **viable** culture even under the **threat** of **external** factors, including European diseases such
35 as smallpox, syphilis and tuberculosis.

36 "The pullback from the marginal areas suggests that the Rapa Nui couldn't continue to maintain the food **resources**
37 necessary to keep the statue builders in business," Chadwick concluded. "So we see the story as one of pushing against
38 constraints and having to pull back rather than one of violent collapse."

39
40 Adapted from [Science Daily](#)