

Marquesan Adzes in Hawai'i: Collections, Provenance, and Sourcing

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Abstract

In 1953, Jack and Leah Wheeler returned to Hawai'i with 13 adze heads and one stone pounder they had obtained during their travels in the Marquesas, Tuamotus, and Society Islands. The rather general provenance of these artifacts presents a challenge that illustrates the benefits of combining XRF with other sources of information, and the limits of current knowledge of Pacific geochemistry. EDXRF reveals that five of the artifacts are likely made of stone from the Eiao quarry, and the rest may represent five additional sources. Based on the Wheeler accounts, there is reason to think that three of these sources may be found in the Marquesas. Comparing the pounder to adze sources is probably not useful, given that stone used for pounders has different qualities.

Introduction

Over the last few years, geochemical sourcing of culturally used stone has emerged as a valuable analytical technique in Pacific archaeology. Researchers have used destructive wave length dispersive x-ray fluorescence (WDXRF) and non-destructive energy dispersive x-ray fluorescence (EDXRF) spectrometry to uncover the construction history of Nan Madol (McCoy & Athens 2012), rediscover long over-looked quarries (Mills & Lundblad 2014), define inter island group interaction spheres (Allen 2014), and examine patterns of intra island group exchange (Kahn et al 2013). XRF analysis is most useful when it is applied to artifacts with good provenance from quarries with well-known geochemical signatures. Archaeologists seldom are able to work with these ideal conditions, however. Many quarries have not yet been geochemically identified, and even known sources require thorough study to understand compositional complexity. In addition, many artifacts have poor provenance, among them those gathered from surface deposits, donated to museums, or held by private collectors. The origins of any artifact not obtained from an undisturbed context must be considered with the consideration that historical era travelers may have removed it from its original context. Linton (1923) tells of a German trading company that purchased "large numbers" of Marquesan pounders and then sold them all the way to Tahiti (77). Sinton and Sinoto (1997) discovered two artifacts that were a perfect match for a quarry on Kaho'olawe while analyzing specimens purportedly from the Eiao quarry, a major quarry in the Marquesas (202). Stone tools sourced to

outside the Marquesas have never been found in the island group (Allen 2014:11), but this groundbreaking discovery was spoiled by the revelation that a yachtsman who had visited both places had donated the artifacts, and apparently mixed them up before doing so (202). Researchers with access to other sources of information can avoid possible pitfalls. Garanger (1967) laments, "What amount of dispersed artifacts were illegally exported by the numerous voyagers drawn by the mirage of the "South Seas" and now irrevocably lost to science?" (390). It is my intent to honor the wishes of my maternal grandparents, Jack and Leah Wheeler, that the artifacts they (legally) brought home to Hawai'i from the East Pacific not be "irrevocably lost to science." I will attempt to source their stone artifacts, and discover what geochemistry can tell us of these tools of uncertain provenance. My experience strengthens my belief that combining non-destructive EDXRF with other sources of information such as oral history, written accounts, and morphological comparison, enhances the value of geochemical sourcing.

Background: The Wheelers

Jack (1919-2008) and Leah (b.1922) shared a lifelong love of the Pacific and sailing. They married in 1946, after both serving in World War II. In 1950, they completed their first boat, a 34-foot ketch, the Gemini, and outfitted her for their first long-distance voyage in 1952. On November 19, the Wheelers arrived in the Marquesas, where they stayed until spring 1953. Next, they sailed through the Tuamotus, and on to the Society Islands where they stayed through the summer. Upon leaving Tahiti on October 16th, their manifest listed 12 stone adze heads and one poi pounder evaluated to have "no value." A hafted adze with an elaborately carved handle is presumed to be among the six carved wood items mentioned on the manifest. Their voyage has been reconstructed from their collected letters, which give an in depth account of their experiences, including stories about how they obtained several of the adze heads and the pounder. Their information suggests that the Wheelers obtained most or all of their artifacts in the Marquesas, so my research has focused on this island group, although I have considered the material culture of the Tuamotus and Society Islands as well.

Background: Archaeology of Marquesas

This study benefits both from recent XRF studies, and from descriptions of material culture created by 20th century ethnologists and archaeologists. Written accounts about the culture of Te Fenua Enata, henceforth called the Marquesas by Westerners, began with a tragic encounter in 1595. The accuracy and completeness of these early accounts naturally varies, but some writings like the journal of Robarts (1974), who spent years among the people, offer some interesting detail. Robarts is one of the first to describe how the people "beat the food on a shallow trough" with "a stone

in the shape of a hand bell" (274). Early 20th century anthropologists like Brigham (1902) and Buck (1927) focused on describing and categorizing material culture. To Linton's (1923) credit, he based his classification of adzes on information given him by cultural descendants. Suggs (1960, 1961) derived a culture history of the Marquesas from his excavations, and Kellum (1966) attempted to improve the typology of Marquesan adzes, but archaeologists' interest in description based research diminished soon after. Although the limits of typology are now appreciated, descriptive works proved useful for the present study. XRF sourcing has greatly improved our understanding of the composition of select quarries in recent years, yet even at a prominent fine-grained basalt source like Eiao, our information is based on relatively few studies. Only 23 samples of Eiao stone had been analyzed prior to the Charleux et al (2014) study, and the team discovered a second geochemical signature while analyzing over 200 samples from the quarry (75).

Methods

The fourteen artifacts were weighed, photographed, and given designations. The adze heads were numbered 1-12, but all adzes bearing a label penciled onto the stone will henceforth be referred to as Ua Huka 1-3, and Ua Pou 1. The pounder and hafted adze will be referred to as Pounder and Hafted Adze. These designations reflect the form only and are not an evaluation of function. Distinguishing characteristics and factors that might interfere with EDXRF analysis such as patination or the possible presence of crayon were noted.

Geochemistry was obtained with a Thermo Noran QuanX TM EDXRF at the University of Hawai'i at Hilo. Each artifact was run under vacuum at a medium count-rate with four sets of operating systems as follows: high Zb at 50k with a thick Cu filter and 150 seconds live time, mid Za at 16 kw with a thin Pd filter for 200 seconds live time, mid Zc at 28 kw with a thick Pd filter and 200 seconds live time, and low Za with no filter at 6 kw for 300 seconds live time. The spectrometer analyzed 22 major and trace elements. The artifacts were not cleaned or treated in any way before analysis, but Adze 2 was cleaned and analyzed for a second time.

The results were compared to data from previous studies on adze grade basalt from several island groups. Most if not all of the Eiao data came from fresh cut samples, to avoid the effects of weathering (Charleux et al 2014:78). The other comparison samples came from Kamaka and Agatautai islands in Mangareva, and Mo'orea, Ra'iatea and Tahiti within the Society Islands.

Results and Discussion: Information from Wheeler Letters

In an interview, Leah says she remembers bringing back "lots" of adzes from the Marquesas, but Westerners had visited Tahiti more, and they were "all traded out" of readily available artifacts. This last remark

agrees with Garanger's statement that, "This interest in curiosities and it is a very old one explains in large part why artifacts in the Society Islands are now so rare on the surface" (1967:390). The Tuamotus were less visited, Leah says. She felt uncomfortable taking the adzes because she thought they should be "catalogued and preserved." But people continuously proffered the adzes as trade items, and so she and Jack accepted a number of them, though they apparently turned some down. Jack was irked that his friends at home assumed he had brought "trinkets" to trade with the "natives", when in fact their trade goods were worth "a lot of dough."

The Wheeler letters only mention receiving the pounder and four adzes on Tahu Ata, Nuku Hiva, and Huapu. Three more adzes are marked as being from Ua Huka, and one is marked as Ua Pou. It appears, therefore, that the Wheelers obtained at least eight adzes and the pounder in the Marquesas. Before leaving the island group, Jack wrote "We have stone adze heads from each island." The Wheelers visited at least six islands: Tahu Ata, Nuku Hiva, Huapu, Ua Huka, Ua Pou, and Fatu Hiva. The letters make no mention of receiving adzes or other artifacts in the Tuamotus or Society Islands. It is possible that all the artifacts were obtained in the Marquesas, or that a minimum of the Pounder, the Hafted Adze, and seven adze heads, four of which can be identified, came from the Marquesas, and the remaining five adze heads came from elsewhere.

Results and Discussion: Preliminary EDXRF Results

It would be expected that some of the artifacts would be sourced to Eiao, since Eiao stone artifacts are fairly common on Nuku Hiva (Rolett et al 1997:146), and possibly the other Marquesan islands as well. Furthermore, even artifacts from the Tuamotus or Society Islands could be Eiao stone, since the quarry has the largest known distribution of any in the Pacific, and Eiao adzes have been found in the Tuamotus and Society Islands (Allen 2014:10-13). The Tuamotus lack basalt, so any adze found there would be imported. Besides Eiao, stone from the Cook and Society island groups have also been found in the atoll archipelago (Emory 1975:99-100). The Society Islands have several adze quarries of their own (Kahn et al 2013:1194).

The spectrometer results do not show a clear dominance of Eiao stone in the Wheeler assemblage, however. Only five specimens, Hafted Adze, Ua Huka 1, and Adzes 2, 9, and 10 are good matches for the main Eiao group. Adzes 10, 9, and 2 could not be linked to the Marquesas by information from the Wheelers, so this finding confirms the minimum number of Marquesan adzes at eight. It does not appear that any of the adzes are Society Islands stone. The artifacts form six groups on the basis of strontium-zirconium, termed Groups 1-6, from lowest strontium values to highest. (Figure 1) Adze 8 and Ua Huka 2 form Group 1, and resemble several samples from Mangareva. Group 2 consists of Adzes 3, 4, and Ua Pou, and Group 3 is Ua Huka 3. Group 4,

Adzes 1 and 6, have strontium values similar to Eiao, but higher zirconium values. Group 5 consists of the five Eiao matches. Group 6 is the Pounder, which has a far greater strontium value than the main Eiao group. The groups are the same for strontium-niobium, with the exception that Group 2 merges with Group 3.

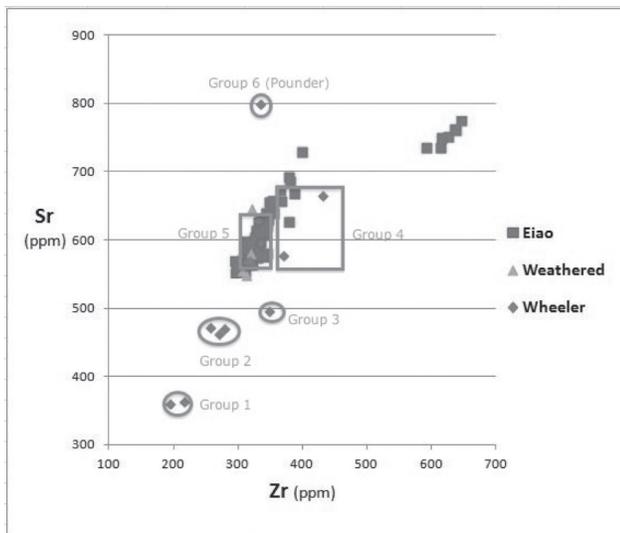


Figure 1: Wheeler Groups outlined in red

The results suggest that the Wheeler artifacts come from five to six sources. As the Charleux et al (2014) study showed distinct sources could be found in close proximity. Assuming that Ua Huka 1-3 and Ua Pou 1 are made of Marquesan stone, then it is possible that Groups 1-3 represent Marquesan sources. This conclusion would raise the minimum total of Marquesan adzes to eleven. Groups 4 and 6 could be other Marquesan sources, or non-Marquesan sources. Of course the resemblance between Marquesan adzes like Ua Pou and an unidentified adze like Adze 4 could be a coincidence. But it is not unlikely that some or all of the non-Eiao groups represent Marquesan sources, since people were known to work stone from Nuku Hiva and probably other islands besides Eiao (Charleux et al 2014:80).

The Wheeler results appear to be affected by weathering and contamination. The majority of the artifacts exceed most of the reference samples for zinc, copper, and lead. Adze 2, which already had the lowest lead value, decreased after it was cleaned, but it was still well above the other Eiao samples, in a range not unusual for Mo'orea. Strontium has an inverse relationship with the other metals. It is unclear whether the elevated metals have lowered strontium values, but the majority of the artifacts are on the low end of the Eiao range, or below it completely. Weathering and patination interferes with the measurement of SiO₂, making it appear artificially low. All the Wheeler artifacts except Adzes 6 and 10 show lower SiO₂ values than the fresh cut Eiao or other reference samples. To control for

weathering, the Wheeler artifacts were compared to four samples of Eiao stone, analyzed using the same methods. Both the artifacts and the weathered samples show lower yttrium values than most of the reference samples. One of the weathered Eiao samples even dropped out of the Eiao range. This is another sign of weathering, because yttrium migrates with time, lowering surface values (Mills Interview 2014).

Comparison of EDXRF Results with Wheeler and Other Information

The letters describe the Hafted Adze, one of the Eiao matches. Jack wrote, "for Christmas, Mrs. MacKittrick gave Leah a (sic) adze with carved handle and ancient stone blade" (Jan. 3, 1953). Leah called it "a carved hatchet with stone head" (Dec. 31, 1952). This was on Nuku Hiva, and the MacKittricks were English shopkeepers. Eiao stone is not unusual on Nuku Hiva, and the island once served as a distribution center for stone from Eiao, according to oral history (Charleux et al 2014:86). The head is set at a greater than 90-degree angle with the handle, unusual for an adze, and the tool may not have been used as an adze (Linton 1923:69).

Comparison of adze morphology may help refine the possibilities. None of the adzes resemble Society Islands adzes, which are usually fully ground (Kellum 1966:16-17) and may have distinct shouldered tangs (Oliver 1974:136-137). It is interesting to note that both the adzes of Group 4, the group with the weakest link to the Marquesas, resemble Tuamotuan adzes. Adze 1 is like the one pictured by Emory (1975) in 80.b., and Adze 6 looks like 80.c. (101), or 82.c. (103). Morphology alone is often not sufficient to provenance an artifact, however. In this case, both adzes look slightly less like Marquesan forms (Suggs 1961:107; Linton 1923:63), but the Marquesas cannot be ruled out. Anyone who employs typology must remember that individual variation, damage, and rejuvenation may cause a stone tool to change type.

Morphology was helpful, though, for unraveling the mystery of the Pounder. Evidence from the Wheeler letters, morphology, and oral history link the Pounder to the Marquesas, not Mo'orea as geochemistry would suggest. On Fatu Hiva, Jack wrote, "We got an ancient rock which resembles a poi pounder (Feb. 28, 1953). Leah says a man sold them "a pounder of stone, maybe a poi pounder" (Feb. 25, 1953). The morphology is uniquely Marquesan (Brigham 1902:370; Linton 1923: 83-84). The Pounder's knob is divided into two lobes by a groove down the center, and each lobe is carved symmetrically with facial features in low relief. Only Marquesan pounders bear anthropomorphic knobs. Also of interest is Jack and Leah's shared observation that the Pounder was "much smaller" than a poi pounder, and "might have been to pound herbs and stuff for medicine" (Feb. 28, 1953). Suggs claims that "two trends are noticeable in the prehistoric poi pounders of the Marquesas: a gradual increase in size continuing to the

present, and a trend towards highly polished finishes." He reported that these changes led his informants "to state that a given archaeological pounder is useless as a poi pounder because it is too small... according to these modern standards [they] are actually medicine pounders" (1961:102). Suggs believes the conical pounder was the first to be carved with a double head, and the Wheeler Pounder is much more like a short necked, rough finished conical pounder, than the more recent "tiki headed" pounders with their polished finish, long necks, and high relief features (1961.) Finally, it is probably not useful to compare a pounder to adze quality sources, because fine-grained basalt is unlikely to be used for pounders. Linton's informants, who still made pounders, reported that Ua Huka and Ua Pou have the best stone for pounders, and this stone was traded throughout the islands (1923:77).

Conclusion

EDXRF was helpful for provenancing three adze heads that could not have been securely assigned provenance by other methods. Geochemistry connects five adzes to Eiao; only two of them had been previously identified as Marquesan. On the basis of adzes labeled as Marquesan, three more groups, one of which has geochemistry similar to sources in Mangareva, could tentatively be assigned to unknown Marquesan sources. The Wheeler letters confirm the Hafted Adze as Marquesan, and also link the Pounder, which has geochemistry similar to Mo'orea, to the island group. The distinctive morphology of the Pounder supports Marquesan provenance. It was not possible to suggest a provenance for the remaining group by morphology, geochemistry, or information from the letters. This study has increased the number of adzes identified as Marquean from five to eight, and possibly eleven. None of the adzes exhibited geochemistry typical of the Society Islands, potentially eliminating the island group as a possible source for these artifacts. Some of the Wheeler artifacts are visibly patinated, and all show chemical evidence of weathering. Cleaning the artifacts and repeating analysis may refine the results. Further EDXRF study of alternative Marquesan quarries and sources of pounder quality stone is needed to test these conclusions.

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