THE SUBVERSIVE SIGNIFICANCE OF TRANSPACIFIC CONTACT

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Introduction

When we suggested more than 40 years ago that pottery making was introduced to the coast of Ecuador from the southernmost island of Japan around 6000 years ago, the reaction among U.S. archeologists was mixed (Meggers, Evans, and Estrada 1965). A few thought the evidence was convincing, but the majority did not. The latter argued that the decorative techniques were simple and easy to invent; that suitable watercraft did not exist and if they did, that the trip would have required more than a year and no one could have survived; that anyone who survived either would have been killed or absorbed without making any impact; that vessels would have stopped in California rather than continued to Ecuador; and, more recently, that to suggest Native Americans did not invent pottery independently is an insult to their intelligence. Interestingly, some opponents actually admit that if the Valdivia (Ecuador) and Jomon (Japan) complexes were both encountered in the Americas—no matter how widely separated—their relationship would not be doubted.

Rules of Evidence

Although a half dozen criteria for distinguishing diffusion from convergence and independent invention were specified decades ago, they are seldom applied (Meggers 1971).

- First, the features compared should be contemporary in the donor and receiver regions.
- Second, there should be a history of development in the donor region and a sudden appearance without antecedents in the receiver region.
- Third, there should be a wider geographical distribution in the donor region as a consequence of a longer time for dispersal.
- Fourth, the characteristics compared should not be related to function, which would favor convergence from independent origins.
- Fifth, the probability of diffusion is increased if several arbitrary features are combined, although each might be susceptible individually to independent invention.
- Sixth, there should be a route of communication between the donor and receiver regions.

Applying these criteria to the similarities between the prehistoric cultures of the southwestern United States and northwestern Argentina illustrates their utility for distinguishing diffusion from independent invention (Meggers 1964).

Northwest Argentina and Southwest United States

During the late 1960s and early 1970s, the U.S. component of the International Biological Program conducted a series of multi-disciplinary studies comparing convergent evolution in similar ecosystems in North and South America **(Figure 1)**. As a consequence of adaptation to similar climates and environmental constraints, the landscapes **(Figure 2)**, flora **(Figure 3)**, and fauna **(Figure 4)** of northwestern Argentina and southwestern United States are strikingly similar in appearance, although the species involved are different (Orians and Solbrig 1977).

Prehistoric cultural resemblances between the two regions are equally striking **(Figure 5)** (Meggers 1964). Dwellings evolve from pit houses to small stone-walled surface structures to large multi-room dwellings. Artifacts of similar form include stone mortars and metates, grooved axes, sandstone abraders, small stemmed projectile points, bone awls and gouges, copper bells, coiled and checker work basketry, knotted netting, crudely modeled pottery figurines with punctate

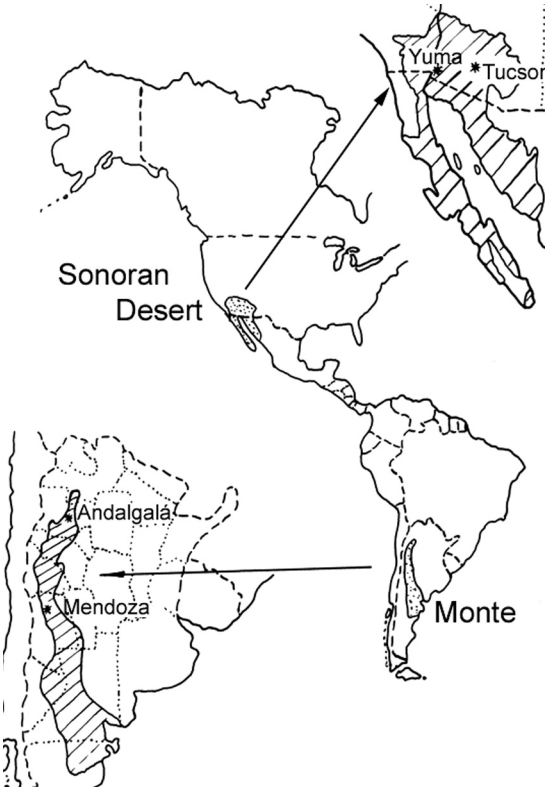


Figure 1. Locations of the Sonoran Desert in the south-western United States and the arid Monte of northwestern Argentina (after Orians and Solbrig 1977, Fig. 1.1).

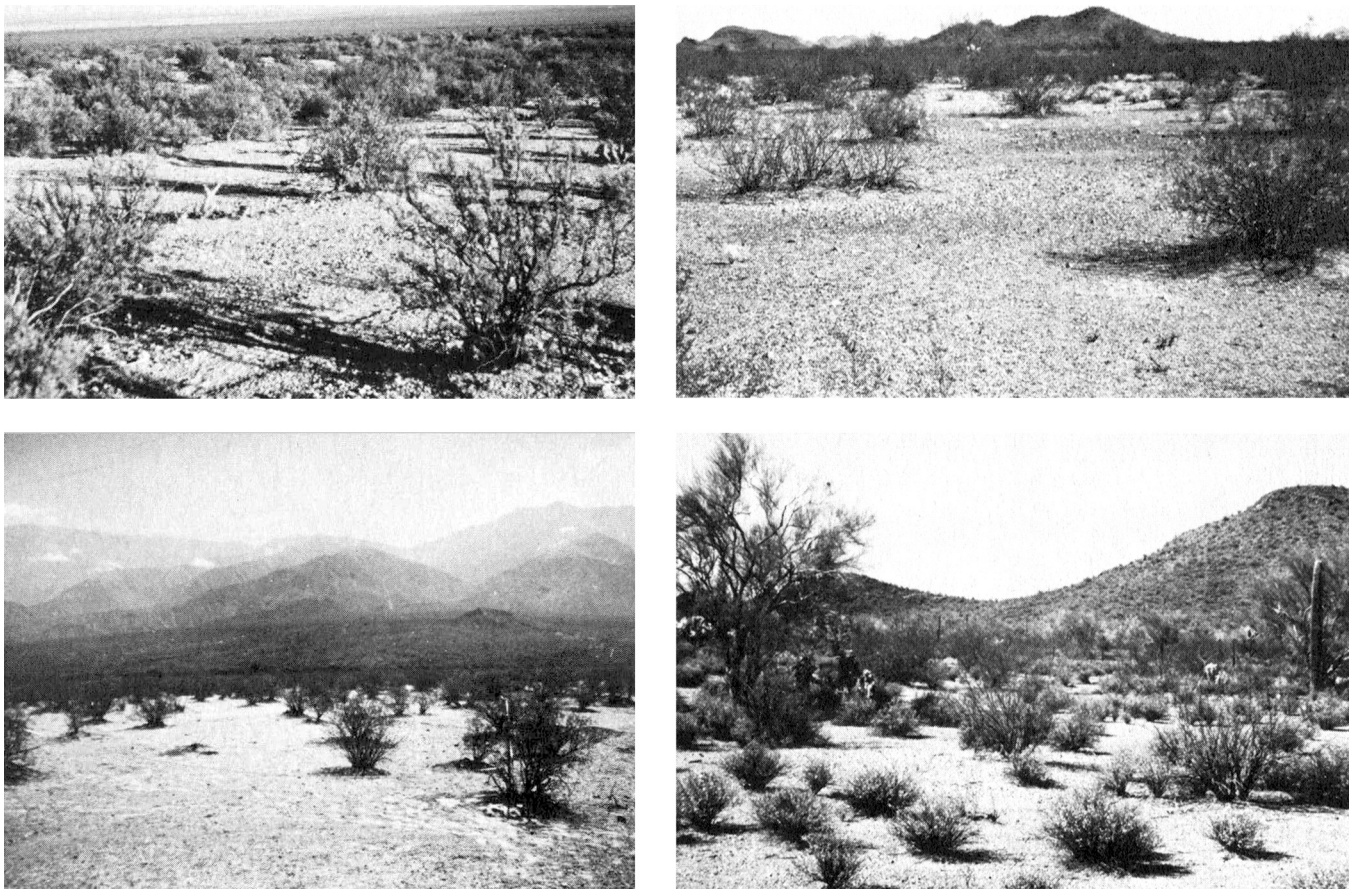


Figure 2. Similar landscapes in the southwestern United States (left) and northwestern Argentina (right; after Orians and Solbrig 1977, Figs. 4.4 to 4.7).

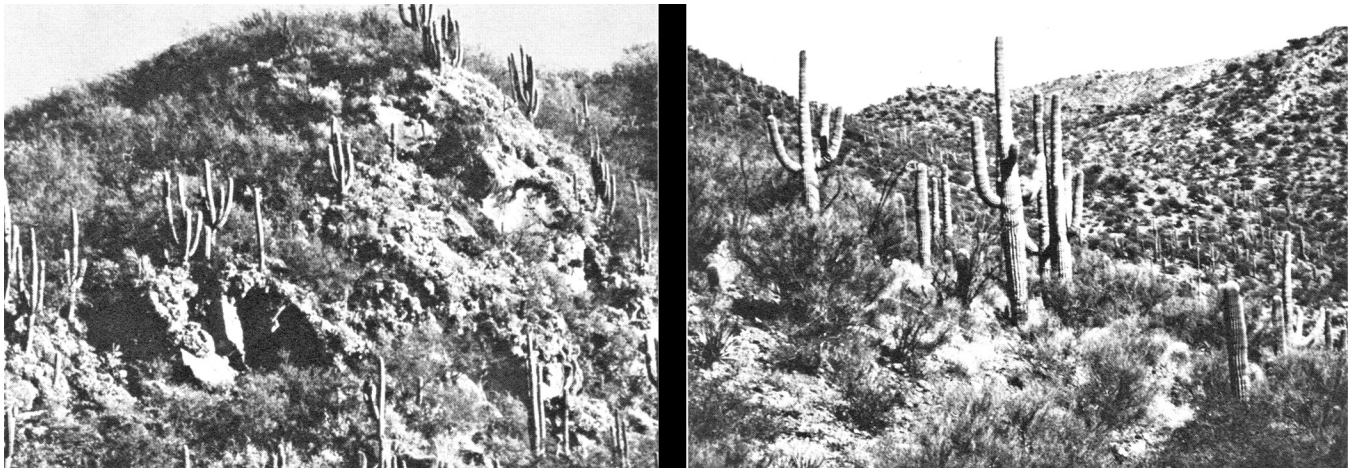


Figure 3. Columnar cacti in the southwestern United States (left) and northwestern Argentina (right; after Orians and Solbrig 1977, Figs. 7.3 and 7.4).

decoration on the forehead, disk-shaped spindle whorls, and pottery ladles, globular jars, and pitchers. Are these similarities the result of independent invention and convergence or of diffusion? Similar stone and bone artifacts are widespread throughout the Americas, suggesting dispersal by the earliest immigrants, and convergence in form is also favored by their function. Since the efficiency of a stone ax is related to its weight and shape, similar results are likely to develop independently. Small projectile points are appropriate for killing birds and small animals. Bone punches are also universal tools whose shape is controlled by function and raw material. These similarities are consequently attributable to common ancestry or convergence rather than diffusion. Common ancestry is the probable explanation for the existence of the same matting

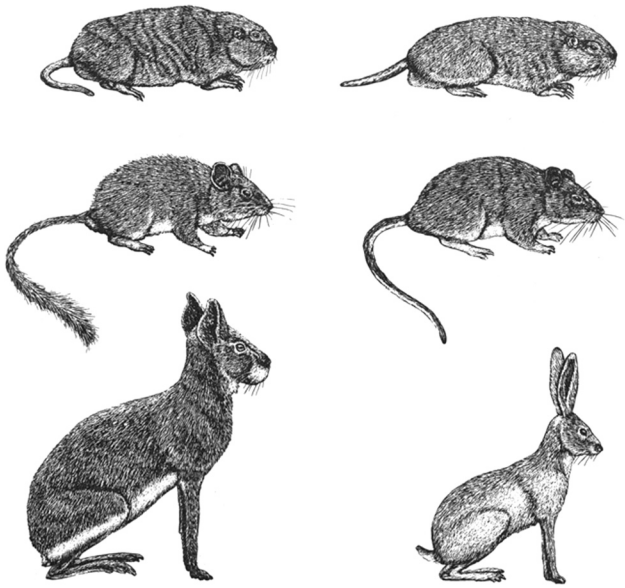


Figure 4. Convergent morphology in mammals of the southwestern United States and northwestern Argentina (after Orians and Solbrig 1977, Fig. 5.19).

and netting techniques, since these were invented during the upper Paleolithic. The disk-shaped spindle whorls used to produce the cords also fall into this category.

Although the similarity of the pottery figurines initially seems sufficiently arbitrary to be evidence of diffusion, this interpretation is jeopardized by the fact that they are atypical examples of a range of variation in both regions and are thus likely to represent accidental convergence. Globular jars with constricted mouths are the most efficient shape for conserving, transporting, and storing water in arid environments, making them subject to independent invention. The use of pottery ladles can be attributed to the absence of natural dippers, such as gourds and shells. Only the small pitchers with a vertical handle unique to these two widely separated regions seem free of functional or environmental constraints. The origin of identical geometrical motifs in the decoration of the black-on-white pottery is more problematical **(Figure 6)**. Although the birds with curved bills and the lizards are stylizations of similar fauna, the similarity of the abstract geometrical bands of curved and rectangular scrolls is sufficiently striking that, other things being equal, it would be interpreted as evidence of diffusion. However, things are not equal. Like the figurines, these motifs are part of a wide range of abstract geometrical designs that are less similar, favoring convergence.

Evaluating these similarities in the context of the criteria specified for favoring diffusion shows that only the figurines and the pottery decoration are free from environmental or functional limitations, but the fact that they are atypical examples of a broad range of variation makes their resemblance likely to be accidental. They are important as warnings that even complex abstract designs can be subject to independent duplication. Finally, both regions are inland locations inaccessible to one another by land or by sea.

Northwestern South America and Southern Japan

When we argued in 1965 for the introduction of the earliest pottery on the coast of Ecuador from Kyushu, Japan ca. 5000 B.P., we felt that we had met the criteria specified for diffusion: there was a long history of evolution in Japan from simple beginnings ca. 13,000 B.P., culminating in the complex that appeared suddenly fully developed on the coast of Ecuador ca. 6000 B.P. **(Figure 7)**; the Early Valdivia and Middle Jomon complexes compared were contemporary; the decoration consisted of arbitrary combinations of the same plastic techniques; there were no environmental or functional constraints; and both complexes were coastal manifestations accessible to one another by sea.

Since 1965, the case for the transpacific introduction of pottery from Japan to South America has been strengthened by several kinds of archeological, biological, and geological evidence.

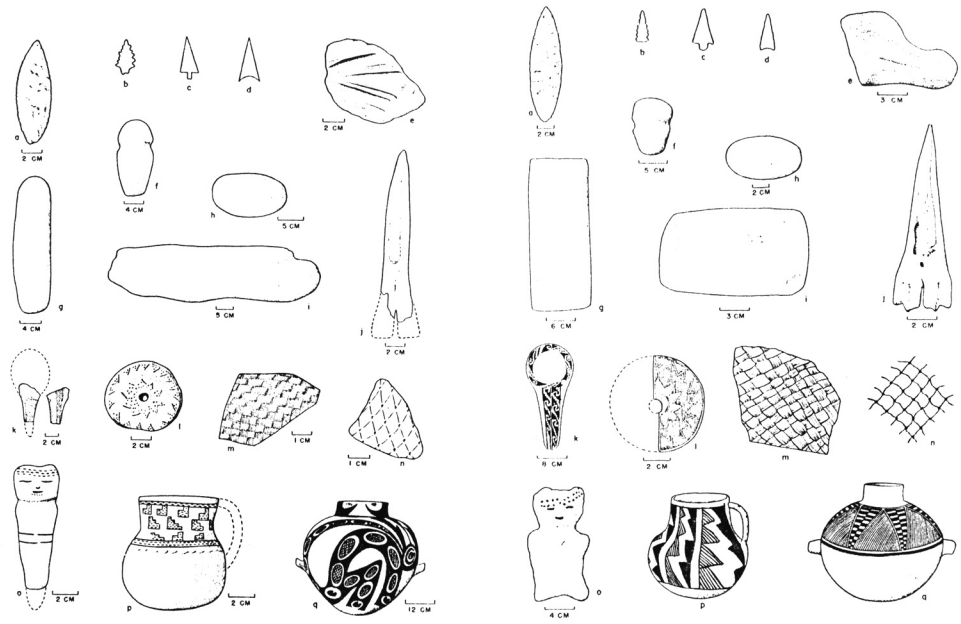


Figure 5. Stone, bone, textile, and pottery artifacts from the southwestern United States and northwestern Argentina (after Meggers 1964).

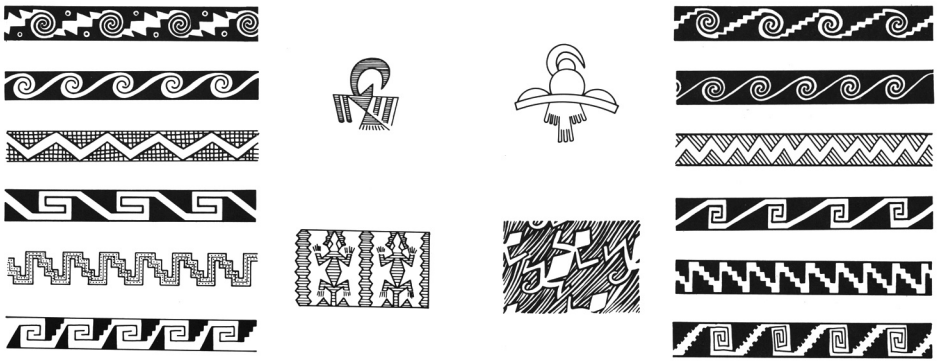


Figure 6. Black-on-white decoration on pottery from the southwestern United States and northwestern Argentina (after Meggers 1979, Figs. 83 and 90).

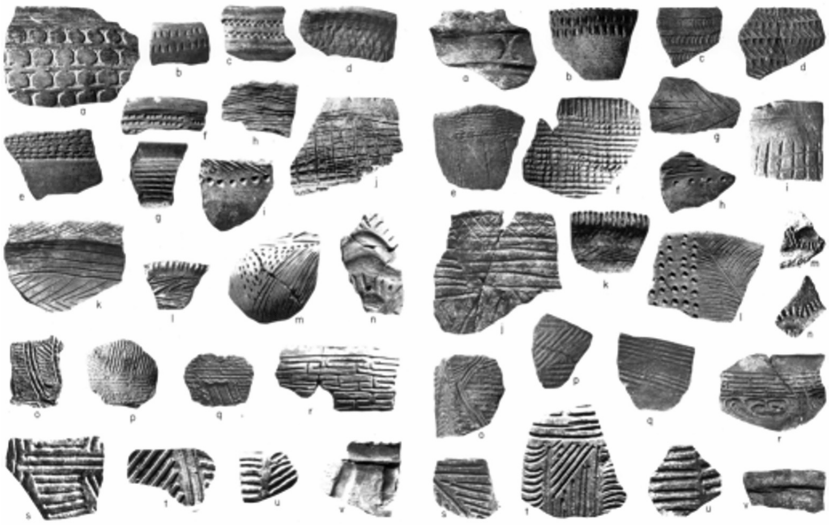


Figure 7. Comparison of decorated techniques and motifs on Valdivia (left) and Kyushu Jomon pottery (right).

Archeological Evidence

Additional evidence for the transpacific introduction of Valdivia pottery from Japan has been provided by the discovery of another intrusive complex of similar age on the north coast of Colombia, known as San Jacinto (Oyuela-Caycedo and Bonzani 2005). By the Middle Jomon Period when these contacts occurred, Japanese pottery had diversified into regional styles that differ more from one another than Kyushu Jomon does from Valdivia. Although Valdivia and San Jacinto share basic features of the Jomon Tradition, San Jacinto decoration includes cord impressing, incisions terminating in a punctation, zigzag appliqué, modeling, and elaborate castellated-rim treatment that are absent in Kyushu, but are characteristic of Middle Jomon pottery from central Honshu **(Figure 8)** (Meggers 1995). As in the case of the Valdivia/Kyushu comparison, the techniques and motifs are identical, including the details of the complex castellated rim treatment of the Jomon "flame ware."

Biological Evidence

The cultural evidence for prehistoric transpacific introductions from Japan is increasingly supported by biological evidence that cannot be dismissed as independently evolved or introduced via the Bering Strait. Two species of intestinal parasites of tropical Old World origin—*Ancylostoma duodenale* and *Trichuris trichiura*—which are distributed as far north in Asia as Kyushu, have been identified in human coprolites from pre-Columbian sites in the New World tropics. The requirement of warm moist soil during a terrestrial phase of their life cycle eliminates the possibility of an introduction by land (Allison et al. 1974; Ferreira et al. 1988; Confalonieri et al. 1991).

Another pathology shared by Japanese and Andeans is the human T-cell leukemia virus HTLV-1, which is transmitted between adult males and females by sexual contact and between nursing mothers and infants. Today, the highest occurrence in the world of carriers of the HTLV-1 antibody is in Japan, where it reaches a frequency of 6% in Kyushu **(Figure 9)** (Tajima et al. 1990). Among modern populations in the Americas, it is restricted to the Andean area. Like the parasites, a post-Columbian introduction is ruled out by its presence in the bone marrow of 1500-year-old Chilean mummies (Tajima et al. 1998-99; Li et al. 1999; Núñez et al. 1998). Among modern carriers are the Nanoama, an indigenous group that lives on the lower San Juan River, which drains into the Pacific coast of Colombia **(Figure 10)** (Meggers 1998; Núñez et al. 1998). A comparison of the global distribution of 13 genetic markers also identifies the closest affiliation of the Nanoama with people of Jomon ancestry in Japan (Léon et al. 1994:133-134). The possibility that the bottle gourd (*Lagenaria sicerania)*—an Old World cultigen that appeared in the Americas ca. 6000 B.P.—was among the Jomon introductions is supported by its presence in Japan by the Initial Jomon Period (Habu 2004).

Navigational Capacity

More than 50 dugout canoes have been encountered in Japanese sites, the oldest from the Early Jomon Period (Habu 2004). Long-distance voyages during the Paleolithic are implied by the presence in mainland sites of obsidian from a flow on the island of Kozushima. The existence of terminal Early/beginning Middle Jomon pottery on Hachijo-jima in

Figure 8. Comparison of San Jacinto and Honshu Jomon decoration (after Meggers 1995).

the Izu Archipelago off eastern Japan has "confirmed that Jomon people had gone across the Black Current in dugout canoes to islands more than 300 km away from the Japanese mainland" as early as 7000 B.P. (Oda 1990). Jomon pottery originating from northern Honshu and dated by thermoluminescence (TL) to 5500-3500 B.P. has been encountered in a site on Efate in Vanuatu (Dickinson et al 1999).

Geological Evidence

The sudden appearance of two Jomon ceramic complexes on the north coast of South America ca. 6000 B.P. is remarkable, but consistent with the capacity of Jomon people for ocean travel as early as the Paleolithic, as well as the existence of an ocean current that would have carried a drifting vessel eastward north of Hawaii and down the Pacific coast. However, since pottery was invented in Japan millennia earlier, the interesting question is why the Valdivia and San Jacinto introductions did not occur before they did.

An answer is provided by the catastrophic eruption of Kikai volcano off the southern coast of Japan ca. 6300 B.P., which deposited up to 40 cm of ash on Kyushu, more than 20 cm on Shikoku to the northeast, and lesser amounts as far north as central Honshu **(Figure 11)** (Machida and Arai 1983). This was the largest explosive event during the Japanese

Figure 9. Distribution of the average positive rate of occurrence of the HTLV-I antibody among adult Japanese blood donors in 1984: highest rate (6%) in Kyushu, second highest rate (3%) in Kii/South Shikoku, intermediate rate (1.5%) in urban areas of Osaka/Hyogo (after Tajima et al. 1990, Fig. 1).

Holocene, and the bulk volume of tephra extruded has been estimated at more than 150 cubic kilometers. The ash falls caused severe landslides and slope erosion in the mountainous areas of central Kyushu and Shikoku, and deposits of thick water-laid ash bearing large quantities of logs transported by floods have been found in all deltaic sediments (Machida 1990:32-33). According to Machida, "It would be expected that the Jomon culture in the southern part of Kyushu would have perished in the holocaust of pyroclastic flows and that almost the whole of southwestern Japan…would have been significantly devastated by ash falls (probably damp) and associated events such as tsunami. Torrential mud-rain and perhaps eruption-induced storms might have taken place and caused the death or significant decline of plants. The extensive occurrence on alluvial plains of large amounts of volcanic sand derived from the ash suggests that many large sand dunes were formed immediately after the eruption on the coasts of southern Kyushu and Shikoku."

Pumice covered the ocean as well as the land, with results that must have exceeded those observed following the eruption of Krakatau in 1883, given Kikai's significantly greater magnitude. Ships traveling between the Maldives and Ceylon reported that "for miles and miles the sea is covered

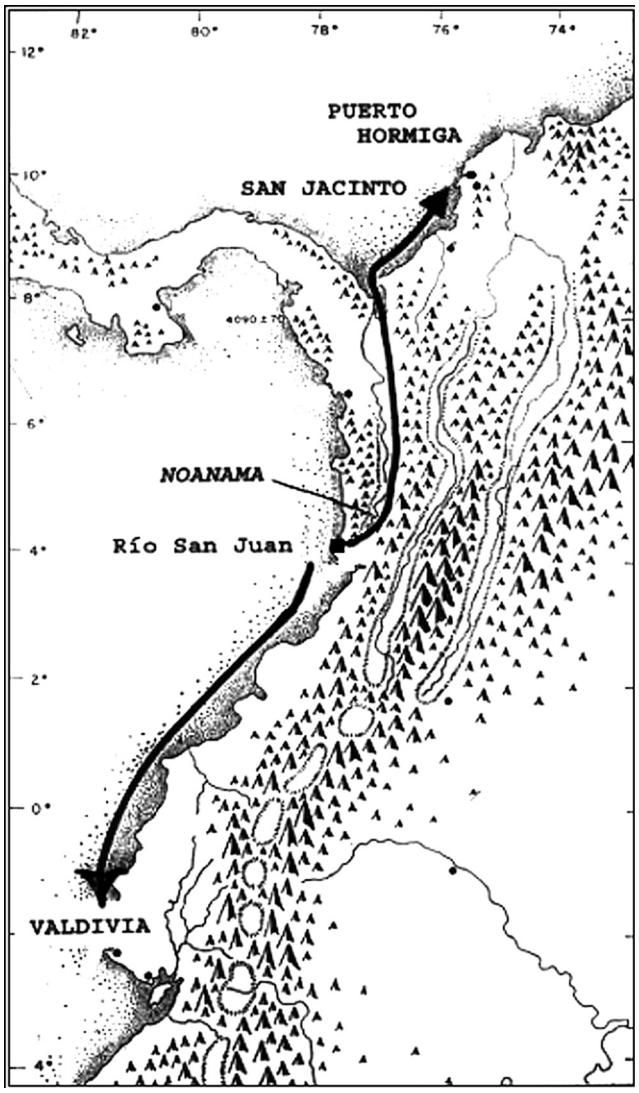


Figure 10. Location of the contemporary Nanoama on the lower San Jorge river on the Pacific coast of Colombia, intermediate between the north coast of Colombia and the central coast of Ecuador.

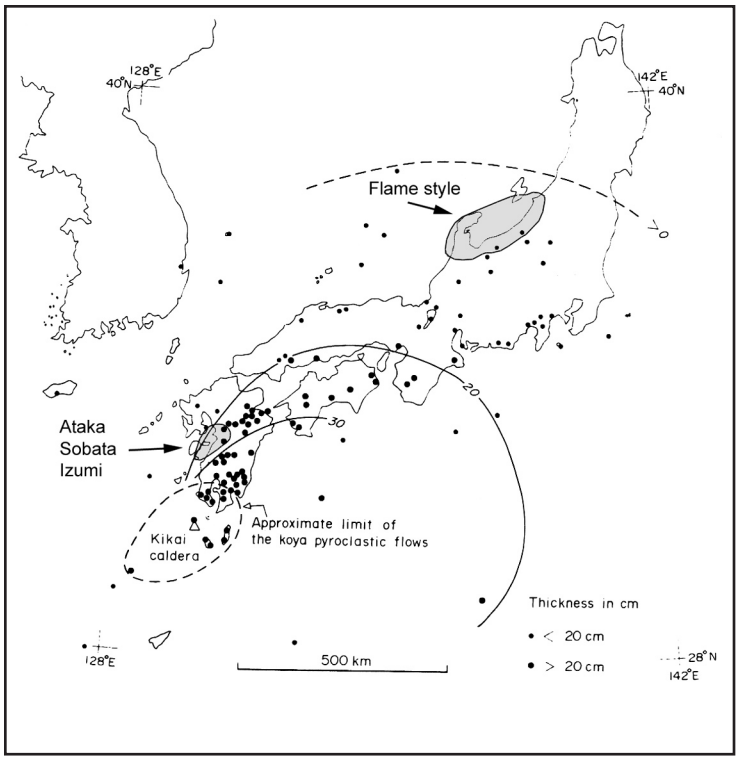
with a thick coat of pumice, on top of which are numerous crabs." A field "at least several miles in extent" was observed near Batavia in Java. "Also the depth of the pumice-stone bed was very great, offering considerable resistance to the ship's progress…. Large trunks of trees were not floating in the water, but resting on the surface of the pumice…. Sometimes the masses were so thick round about the vessel that the seamen walked about on the patches." Pumice remained floating in the Indian Ocean for 21 months and reached the coast of Africa by 1885" (Simkin and Fiske 1983:152-153). Similar conditions following the Kikai eruption would have trapped Jomon fishing boats in the Black Current and carried them across the Pacific to the Americas. An indication of the impact on the Jomon population is provided by the existence of one site per 100 km² on Kyushu during the Middle Jomon Period versus one site per 10 km² on the northern island of Hokkaido and one site per km² on Honshu **(Figure 12)** (Koike 1992). It is noteworthy that the sites on Kyushu with the pottery most closely resembling Valdivia, Ataka, Sobata, and Izumi, are in the portion that received the heaviest impact of the eruption **(Figure 11)**. Although the Echigo region on the west coast of central Honshu, occupied by the Flame style related to San Jacinto, received a much lower volume of pumice than Kyushu, there was a marked decline in the number of sites during the latter part of Middle Jomon and an associated demise of the pottery style. According to Kobayashi (2004:70), "This phenomenon…is considered to represent a dramatic fall in population at this time. Elsewhere, however, there is no such reduction in site numbers."

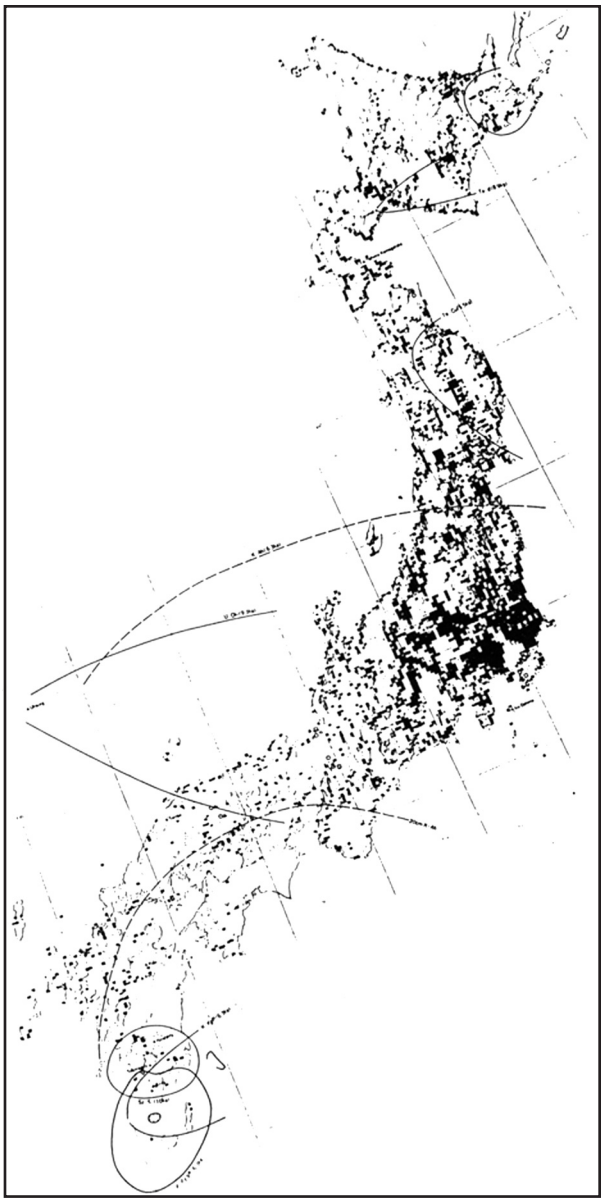
Forty-one samples of humus, muck, peat, wood, and shell from locations throughout the impact region provided radiocarbon dates extending from 9000 to 4000 B.P., generally averaged as 6300 B.P. **(Figure 13)** (Machida and Arai 1983). The earliest date obtained thus far for Valdivia is 6195 ± 215 B.P. (GX-5269) from the site of Real Alto; the earliest date for San Jacinto is 5940 ± 60 B.P. (Pitt-0155). Given the statistical uncertainties of radiocarbon dates, the Kikai and Valdivia/San Jacinto results are contemporary.

The Subversive Significance of Transpacific Contact

Scholars are expected to base their interpretations on evidence, but in the case of transpacific contact, the evidence is not evaluated. It is simply ignored. By contrast, revolutionary proposals unsupported by evidence often quickly become fashionable, among the most recent being the coastwise introduction of Paleoindians from Asia to North America and the existence of dense sedentary pre-Columbian populations in Amazonia. What makes transpacific contact different? My search for an answer has led me to the history of controversies in other disciplines, especially the dispute over the existence of continental drift.

Continental drift has been the subject of two fascinating books whose authors combined archival research and interviews with individuals in all the relevant scientific disciplines and institutions—including students as well as professionals—to identify the reasons for their acceptance, neutrality, or rejection of the evidence. All of the irrational requirements for proof demanded by opponents of transpacific contact were also put forward by opponents of continental drift. Like transpacific contact, it was rejected "not merely as unproved, but as wrong, incorrect, physically impossible, even pernicious" because it violated the paradigm of terrestrial stability on which the science of geology was founded (Oreskes 1999:5). Proponents were ridiculed and denied employment, and their manuscripts were rejected by scientific journals. The discovery of plate tectonics, which provided an explanation for the movement of continents, not only settled the controversy but transformed geology into geoscience (Oreskes 1999, Stewart 1990).





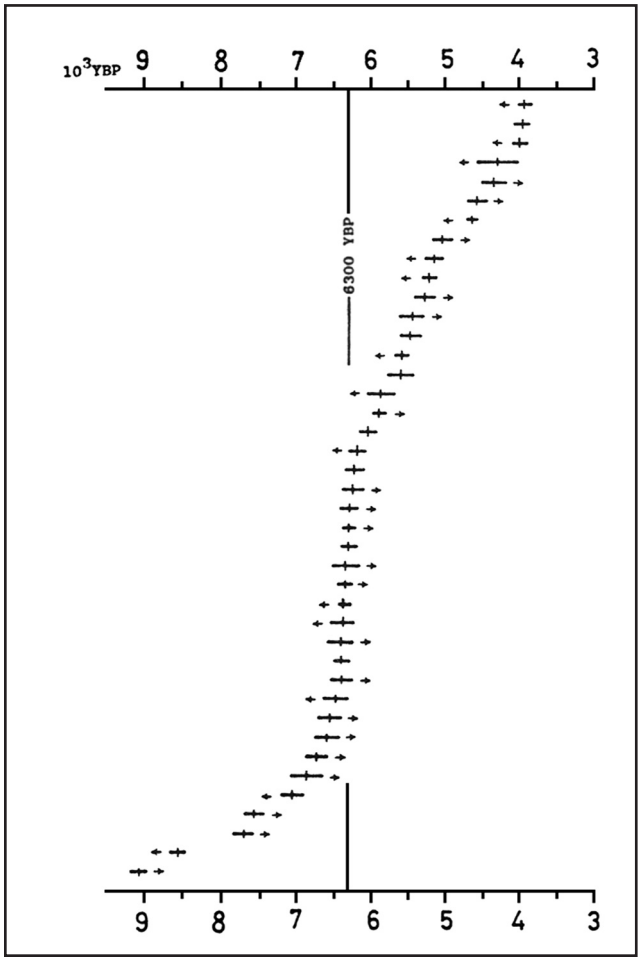


Figure 11 (Top Left). Distribution of fall-out from the eruption of Kikai volcano off the south coast of Kyushu and the locations of Jomon sites with pottery related to Valdivia (Ataka, Sobata, Izumi) and San Jacinto (Flame Style; after Machida and Arai 1983, Fig. 6).

Figure 12 (Above). Density of sites on Kyushu, Honshu, and Hokkaido during the Middle Jomon Period (after Koike 1992, Fig. 2).

Figure 13 (Bottom Left). Distribution of 41 radiocarbon dates from humus, muck, peat, wood, and shell samples associated with fall-out from the Kikai volcanic eruption (after Machida and Arai 1983, Fig. 3).

The same behavior has been manifested by the opponents of transpacific contact, for the same reason. Like continental drift, it is incompatible with the paradigm on which interpretations of cultural evolution are based; namely, that the Americas were peopled by hunter-gatherers during the late Pleistocene or early Holocene and that subsequent cultural development proceeded independently of that in the Old World. Efforts to derive rules of increasing complexity are based on the conviction that similarities in material culture, architecture, subsistence behavior, social organization, and religion reflect innate human ingenuity or universal human needs. Recognizing the existence of transpacific introductions, particularly of traits we equate with civilization, requires abandoning this paradigm and reevaluating the interpretations based thereon.

Recognizing the existence of continental drift and its underlying mechanism transformed understanding of the history of the earth and its biota, and revolutionized the theory and practice of geology. Recognizing that this was "one world" long before the Internet will have an equally significant impact on our understanding of the history and process of cultural development. The problem is to overthrow the isolationist paradigm.

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