PATTERNS OF INTERACTION IN SOUTHERN COOK ISLAND PREHISTORY

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ABSTRACT

Recent studies in the southern Cook Islands demonstrate the exotic goods, such as fine grained adze stone, ceramics, and pearlshell, moved between islands of the group and into the Cooks from other archipelagos. This sphere of interaction was regional in scale, minimally extending west to Samoa and east to the Societies. These communication links had been established by AD 1000 as demonstrated at four southern Cook Island sites spread across the archipelago. Regional interaction declined after AD 1600 but continued at a low level between islands of the southern Cook group until western contact.

Over the last two decades, our ideas about the voyaging capabilities of Pacific Islanders and the process of Pacific exploration have changed dramatically. Voyaging research (e.g., Finney *et al.* 1989; Irwin 1990, 1992) in particular has reshaped our thoughts on the character and relative success of island colonisation, with implications for patterns of cultural change and continuity. These studies underscore the possibilities of systematic and frequent interaction between communities separated by broad expanses of ocean. While islands can still be conceived as relatively isolated, untangling the contributions of history, natural selection, and random change now appear more challenging, and more important, than we once believed.

Stylistic analyses of material culture and provenance studies of ceramics and stone resources have provided new insights on the directions, extent, and character of interaction among Pacific populations in the prehistoric past. The long-distance exchange networks of Lapita colonists, in particular, have caught the imagination of Pacific prehistorians and been the subject of intensive study (e.g., Anson 1986; Best *et al.* 1992; Hunt 1989; Kirch 1988; Shepard 1993). Only recently have the possibilities of similar networks of interaction been entertained for East Polynesia. This paper contributes to these discussions with new data from the southern Cook Islands, an archipelago on the western boundary of East Polynesia, roughly midway between Samoa and the Societies. Evidence from the southern Cooks suggests not only communication between islands in the group, but also contact with more distant neighbours to both the east and west (Bellwood 1974). The term "exchange" is used loosely here, given that the degree to which formalised exchange was operative, versus more casual kinds of interaction, remains an open issue.

REGIONAL CONTEXT

The timing and origins of East Polynesian settlement remains largely unresolved. While dates of roughly 2000 years BP have been recovered from sites in the Marquesas Islands (Sinoto 1968; Suggs 1960; Kirch 1986), occupations throughout most of the region are no earlier than 1000 BP (e.g., Allen 1994; Chazine 1985; Davidson 1984; Sinoto 1979). Moreover, several of the older Marquesan radiocarbon dates have been recently questioned (Anderson *et al.* 1994), while new studies at old sites have left chronological questions unresolved (Rolett, pers. comm. 1994).

Traditionally, settlement of East Polynesia was conceived in terms of one or two discrete homeland archipelagos (first the Marquesas and later the Societies), colonised once from a West Polynesian source. Populations dispersed from these homeland islands, to settle other archipelagoes in the region (see Kirch 1986). More recently, scholars have entertained alternative models of East Polynesian colonisation and settlement (e.g., Davidson 1984; Finney *et al.* 1989; Green 1981; Irwin 1990, 1992; Kirch 1986: 36; Sutton 1987; Walter 1990). To

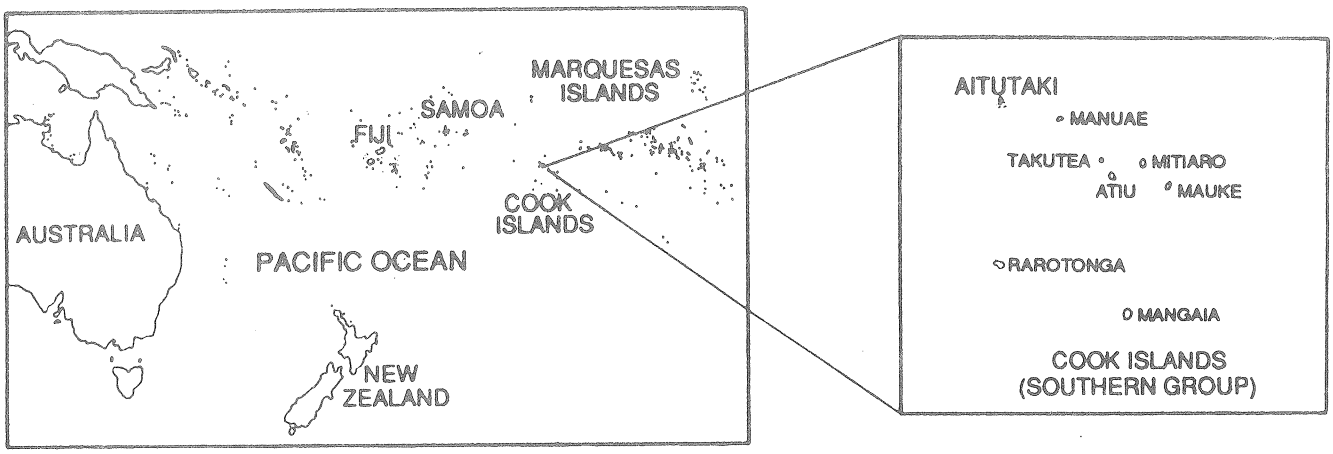

Figure 1. Map of the southern Cook Islands.

varying degrees, these models accommodate the possibilities of:

1) two-way intentional voyaging;
2) exploration preceding actual settlement;
3) multiple colonisations of a given archipelago;
4) a larger interacting homeland region made up of several archipelagos;
5) continued and frequent interaction between islands after initial settlement.

These models reflect both the emerging evidence and a theoretical shift within the region to more processual frameworks (e.g., Allen 1992a; Graves and Sweeney 1992; Hunt 1989; Hunt and Graves 1990; Kirch and Green 1987; Sutton 1987; Terrell 1986).

EXPECTATIONS FOR INTERACTION IN THE SOUTHERN COOK ISLANDS

The southern Cook Islands consist of 8 main islands (Fig. 1) varying in size from 2 sq km (Palmerston) to 67 sq km (Rarotonga). They represent the full range of geological diversity of the region with Rarotonga, a high volcanic island; Aitutaki, an almost-atoll; Mangaia, a high raised limestone or *makatea* island; Ma'uke, Mitiaro, and 'Atiu, heavily eroded low *makatea* islands; and Manuae and Palmerston, atolls. For the most part, the islands are not intervisible and sails between the furthest of them average one to two days. Resources within the group are heterogenous; among the key resources with limited distributions are adze-quality stone, lagoon fauna such as pearlshell (*Pinctada margaritifera)* and elongate clams *(Tridacna* sp.), wet taro, and certain sea and forest birds favoured for foods and feathers.

Given these conditions, exchange might develop here for a variety of reasons. The risks and uncertainty of initial settlement, coupled with the heterogenous distribution of resources, might be particularly important factors favouring exchange. Moreover, the small size of several islands ('Atiu: 26.9 sq km, Mitiaro: 22.3 sq km, Ma'uke: 18.4 sq km, and Aitutaki: 18 sq km), might encourage exogamous (e.g., extra-island) marriage, and oral traditions suggest that extra-local marriage alliances were not uncommon in the prehistoric past, at least among the chiefly elite.

Considerations of distance suggest that Ma'uke, 'Atiu and Mitiaro were most likely to have been in regular communication with one another. Aitutaki, Rarotonga and Mangaia, are all roughly equidistance from the former group. Notably, Ma'uke, 'Atiu and Mitiaro are also small islands, and ecologically less diverse than their larger neighbours. 'Atiu stands out as a "central place" being closer to Aitutaki, Mitiaro, and Ma'uke than any other island and roughly equal the distance that Rarotonga and Mangaia are from one another. Palmerston, located roughly 375 km northwest of Aitutaki, is the smallest of the southern Cook group, the most isolated, and at European contact was not settled.

Irwin's close proximity analysis of mutual accessibility (after Renfrew and Sterud 1969), suggests those neighbouring archipelagos that the southern Cooks would most likely interact with on geographic grounds (Figure 2). This analysis is based on a minimum accessibility matrix, which provides coefficients of similarity between all pairs of Polynesian islands (see Irwin 1992:197, Table 22). The matrix expresses "both distance and angle of island target combined into a single similarity value"

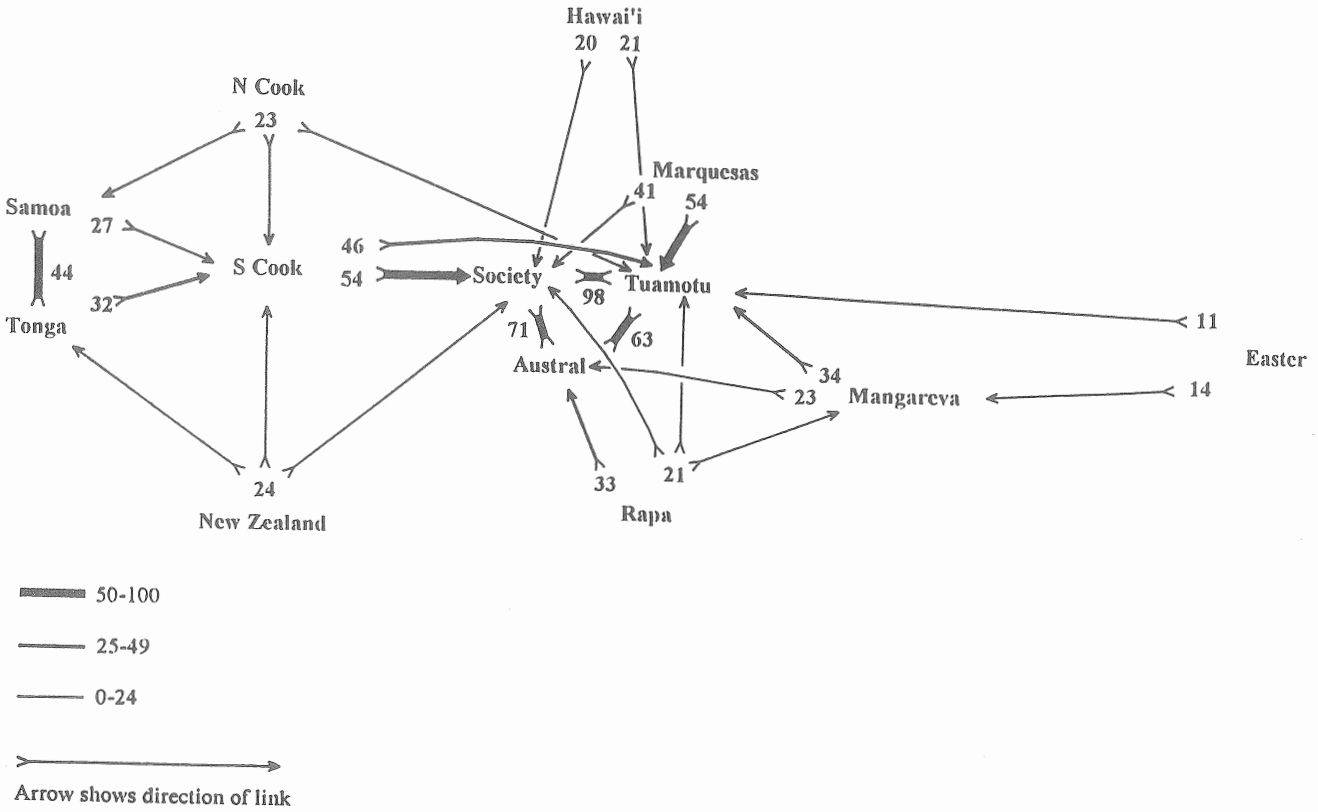

Figure 2. Irwin's (1992) mutual accessibility model for Polynesia, highlighting most likely directions of interaction for southern Cook Island communities, based on geographic considerations (adapted from Irwin 1992: 198; see text discussion).

(Irwin 1992:196). The model suggests that the most accessible islands from the southern Cooks would be the Societies (ca. 800 km distant), the Tuamotus (ca. 1200 km), and the Australs (ca. 600 km). Tonga (ca. 1600 km) is somewhat more accessible than Samoa (ca. 1400 km distant), while Samoa is more accessible than the northern Cooks (ca. 1000 km). Notably, Irwin's (1992: 198) analyses also suggest that it is easier to get *into* the southern Cook Islands from Samoa, the northern Cooks, and New Zealand than it is to get from the former to either of these three locations.

EVIDENCE FOR INTERACTION IN THE SOUTHERN COOK ISLANDS

The Imports

Current evidence indicates several kinds of materials moved between, into, and out of the southern Cook Islands in the prehistoric past. These include pearlshell, fine grained stone, ceramics, and a limited number of edible shellfish. These are discussed in more detail below.

Pearlshell *(Pinctada margaritifera)* is a large nacreous bivalve that primarily inhabits lagoons. The sizeable valves were favoured by Polynesians as raw material for fishhooks, with the products being valued for their luring qualities and strength. Pearlshell breast ornaments (*ti'a*) also were used throughout the southern Cook Islands (Buck 1944: 117). Archaeological evidence from Ma'uke Island further indicates the use of pearlshell for tattoo needles, spear points, ornaments, graters and other tools (Walter 1990: 195–6). In East Polynesia, pearlshell has a heterogenous distribution, being most abundant in the Tuamotus, Mangareva and the northern Cook Islands, and less common in the Australs, Marquesas (Rolett, pers. comm. 1994) and Societies. In the southern Cook group, pearlshell is largely limited to the lagoons of Aitutaki and Manuae. Despite this restricted natural distribution within the southern Cook group, three early sites

(dating between the 11th and 15th centuries AD) provide ample evidence of a pearlshell fishhook industry: Moturakau Rockshelters (MR–1) on Aitutaki, Tangata Tau Rockshelter (MAN–44) on Mangaia, and the Anai'o site (MKE–1) on Ma'uke. More limited evidence for pearlshell fishhook manufacture also comes from the 14th century site of Ngati Tiare (RAR–40) on Rarotonga (Bellwood 1978). On Aitutaki (Allen 1992a, 1992b) and Mangaia (Kirch *et al.* 1991), where there is a temporal sequence, pearlshell fishhooks are common in the earliest strata but decline through time, being replaced by *Turbo* shell hooks. On Aitutaki, shell hooks eventually disappear from the archaeological record altogether (Allen 1992a) and at European contact were unknown (Buck 1927).

Elsewhere, I (1992a:57–8) suggested that Aitutaki's hooks were made from local materials and raised the possibility that the island's pearlshell was traded to Ma'uke, Mangaia, and possibly other southern Cook Islands. Although largely hypothetical, I further suggest that the documented declines in pearlshell on Aitutaki might be related to an increase in terrigenous sediments to the lagoon from the volcanic mainland. Alternatively, the pearlshell found throughout the southern Cook Islands could be coming in from more distant sources, as for example, the Tuamotus (one of the more accessible island groups from the southern Cooks) or the northern Cook Islands.

Fine grained adze-quality stone was also transported between islands of the southern Cook group. Geochemical studies of materials are currently underway by Allen and Johnson (1994) on Aitutaki, by Kirch and associates on Mangaia (Weisler and Kirch in press), and Shepard *et al.* (1994) on Ma'uke, Rarotonga and elsewhere. On Aitutaki, the XRF work of Johnson and myself documents imports from Mangaia, between the 11th century AD and the early historic period. Imports from Raiatea, one or more eastern Samoan quarries, and possibly Upolu Island are also indicated (Allen and Johnson 1994). In addition to the flakes processed with XRF, two Duff Type 2C adzes (e.g., untanged with trapezoidal cross-sections) from a stratum dated to the late 13th to mid-15th century, are both stylistically and geochemically Samoan in character (Allen 1992a:300; Allen and Johnson 1994).

Four additional imports are reported from Ma'uke Island. At the 14th century AD site of Anai'o, Walter (1990) recovered simple tools made from two species of bivalves *(Asaphis* and *Codakia)* which reportedly do not occur in the Ma'uke marine environment. Unworked fragments of clam shell were also found. The nearest plentiful source for these three bivalves is Aitutaki, where they are favoured foods and well-represented in the archaeological record (Allen 1992a).

Ceramic sherds have been recovered from two southern Cook Island localities. Three small fragments were found at Anai'o and analysis of the temper indicates that they were manufactured in a West Polynesian locality, most likely Tonga (Walter and Dickinson 1989:465). Walter (1990:289) suggests that they "may have been brought in prior to establishment of the Anai'o settlement and its exact place in the Anai'o assemblage remains uncertain". A single ceramic sherd also was recovered from 'Atiu by Sinoto and colleagues (in Altonn 1988). Temper analysis suggests this sherd originated in an unspecified Melanesian locality.

Other Indications of Interaction

Connections between the southern Cook Islands and other parts of Polynesia are also revealed through stylistic features of artifacts and architecture. In particular, early fishhook assemblages excavated by Allen (1992a), Kirch and colleagues, and Walter (1989) suggest communication between islands of the southern group. Fishhook line attachment devices, which Sinoto (1991), Allen (1992a) and others (Emory, Bonk, and Sinoto 1968) have demonstrated to be indicators of homologous relationships, are remarkably similar across the southern Cook Islands between AD 1000 and 1400 (Allen 1992a: 318–9). This stylistic similarity cross-cuts functionally distinct hook forms, being found on both rotating and jabbing types (Allen 1992a: 319).

In addition to the geochemically analysed adze from Aitutaki, early connections with Samoa are also suggested by stylistic features of several adzes recovered from the 14th century Ngati Tiare Site (Bellwood 1978: 60–2). Found in a cache, 5 of the 6 complete adzes were untanged, triangular-sectioned forms (e.g., apex of the triangle oriented forward or distal with adze in position of use), with distinctive upturned bevels, which so far have only been found at this site and in Western Samoa (see Green 1974:261; Green and Davidson 1969: 26–7). Best *et al.* (1992:66) suggest that at least one, if not all of these adzes, came from quarries on Tutuila (see also Green 1974: 261).

Connections with islands to the west are also suggested by stylistic features of *marae,* or sacred places demarcated for religious activities. *Marae* on Rarotonga show affiliations with those of the Society Islands, typically consisting of low platforms or terraces (occasionally stepped), pavements and occasional stone alignments and uprights (Bellwood 1978). More simple *marae* are also known from Rarotonga and could repre-

sent ancestral forms. At least one *marae,* (RAR–104), has strong similarities to West Tuamotuan *marae* (Bellwood 1978:86).

The *marae* of Rarotonga, however, contrast markedly with those of Aitutaki, Ma'uke, and 'Atiu. On these islands, *marae* often take the form of a series of uprights, sometimes in alignment. In some cases, we found that areas lacking formal structures are referred to as *marae* (see also Trotter 1974:116; Walter 1990:252). Elsewhere (Allen 1992a:57–8) I have suggested that the *marae* of Aitutaki represent a form intermediate between the open *malae* of West Polynesia and the more formalised structures which typify central East Polynesia. Of relevance to present discussions, however, is the implication that external influences on the southern Cook Islands, and their *marae* development in particular, appear to have been uneven.

Finally, oral traditions point to connections with several other Polynesian archipelagos. The traditions of Karika (allegedly Samoan) and Tangi'ia (said to be Tahitian) refer to wide-ranging voyages and inter-island political exploits (Gill 1856; Henry 1928:121–7; Williams 1837). These chiefly voyagers reputedly settled Rarotonga around AD 1300 (Williams 1837). Other oral traditions refer to inter-island warfare, conquest, intermarriage of chiefly personages, and other forms of interaction (Gill 1876, 1880). One account relates that a 17th century visitor from Tahiti named Ue saved Aitutaki's paramount chief from a Samoan invasion by rallying forces from 'Atiu, Rarotonga and Mangaia.

INTENSITY OF INTERACTION

The most compelling evidence for formalised exchange in the southern Cook Islands comes from the 14th century site of Anai'o on Ma'uke Island. Ma'uke is a small, heavily eroded *makatea* island, with no lagoon and very limited adze-quality rock sources. The Anai'o locality, located on the northwestern coast of the island, produced an exceptional quantity of imported goods (Walter 1990). Ma'uke inhabitants appear to have been dependent to an unusual degree on exchange for basic raw materials for tools. Based on Walter's (1990:226-41) initial identifications of exotic materials, ca. 60% of his shaped artifacts, primarily those of pearlshell and fine grained stone, could be considered imports. Fine grain stone and pearlshell debitage are also found on the site and indicate that some exotic goods entered as raw materials rather than finished products. If this debitage is included in the artifact counts, then roughly 90% of the Ma'uke artifacts are exotic in composition. More recently, Shepard *et al.* (1994) have suggested that some of the fine grained stone found at Anai'o could be local in origin. Notably, Anai'o is adjacent to a major reef passage, which would have facilitated voyaging and frequent interaction with other islands during the 14th century Anai'o occupation (Walter 1990).

Evidence for exchange also comes from the Ureia site on Aitutaki. Here fine grained stone is the only documented import. The diversity of fine grained stone is greatest in the 11th century occupation, where both local and exotic provenances are represented (Allen and Johnson 1994). The relative abundance of imports contrasts markedly with Ma'uke, being less than 30% of the artifact assemblage, even in the early 11th century occupation layer. Many of the materials recovered at Ureia are small flakes, some with polish, which probably represent resharpening of finished adzes. Their spatial distribution, spread over a roughly 1600 square meter area, coupled with their variable geochemistry, indicates that several tools are represented.

Direction of Interaction and Geographic scope

As the foregoing discussion reveals, the southern Cook Island sphere of interaction extended from at least as far westward as Samoa and Tonga, and possibly to Melanesia. To the east, it reached to the Society Islands, and possibly to the Tuamotus. Despite these fairly well demonstrated connections, interaction appears to have taken place at a low intensity. Interaction between islands in the southern group was probably more common than that with islands outside the archipelago. Nevertheless, the number of sites and islands within the southern Cooks that have produced exotic materials suggests we are seeing more than the accidental voyage or curated heirloom.

Temporal Patterns

Walter (1990) has suggested that interaction within the southern Cooks peaked between AD 1000 and 1500, declined thereafter, and by European contact the southern Cook Islands, with the exception of the Ngaputoru Group, were no longer in contact. This model is based on four lines of evidence:

1) an historical account which suggests that separate islands had little knowledge of one another by late prehistory;
2) the lack of pearlshell in surface and other presumably late contexts on Ma'uke, 'Atiu, and Rarotonga;
3) oral traditions, "deemed to lie in the distant past" (Walter 1990: 270) which recount inter-island communication;
4) historical accounts which indicate pig was present in the Ngaputoru Group (Ma'uke, 'Atiu, and Mitiaro)

but absent from Aitutaki during the late prehistoric period.

Subsequent research on Aitutaki has shown the latter historical account to be inaccurate, as pig was recovered from the earliest occupations into the historic period (Allen 1992a:384–91). However, the Aitutaki evidence does broadly corroborate the timing of interaction decline as proposed by Walter. By roughly the 1500s, pearlshell hooks had begun to decline. Initially there is limited evidence of experimentation with other raw materials, and *Turbo* hooks become more common. By historic times, shell hooks are no longer present. Similarly, our geochemical work (Allen and Johnson 1994) reveals a decreasing number of stone provenances through time, suggestive of decline in inter-island contacts.

While several lines of evidence suggest both a contraction of geographic scale, and possibly a decline in the frequency of contacts, there are also indications that interaction between islands of the southern Cook group continued into the late prehistoric period. At Western contact, complex social, political and ritual relationships bound Ma'uke and Mitiaro together under 'Atiu's rule (Crocombe 1967; Siikala 1991:84–104). Historical accounts (Tama 1906:215) indicate that Manuae Atoll came under Aitutaki control a few centuries before European contact, being claimed by Tupu Ariki about 1823. Inter-island marriage alliances also continued until shortly before contact, with Gill (1876:24) reporting a recent union between an 'Atiu chief and the reigning Makea Ariki of Rarotonga. Moreover, our own recent studies (Allen and Johnson 1994) indicate that fine grained stone from southern Cook Island sources (e.g., Mangaia and possibly Rarotonga) continued to circulate between islands during the late prehistoric period (see also Walter 1990:235).

CONCLUSIONS

The foregoing discussion allows for several general comments on the nature of prehistoric interaction in the southern Cook Islands (Figure 3):

1) A variety of goods were moving between, into and out of the southern Cook Islands in the prehistoric past; these documented materials are largely utilitarian, although this may be an artifact of archaeological visibility;
2) One of the more important goods, pearlshell, apparently was exchanged as a raw material rather than finished products given the debitage found at sites where it is an exotic;
3) Another important import, fine grained stone, may have moved primarily as finished adzes (and possibly other tools); evidence for resharpening indicates that the adzes were utilitarian rather than prestige goods;
4) The southern Cook Island sphere of interaction was regional in scale, minimally extending west to Samoa and east to the Societies - roughly 2000 km;
5) Several southern Cook Island localities were involved in this contact sphere, although the extent to which any given settlement was reliant on imported goods, or influenced by external sources, seems to have been quite variable;
6) This regional scale communication was in place by at least AD 1000; after ca. AD 1600 interaction between the southern Cook Islands and other archipelagos declined, but islands within the group continued to be in contact with one another.

To briefly return to Irwin's (1992) geographic accessibility model, the predicted connections with the Societies are realised in the available material evidence. We would have, however, anticipated a stronger connection with Tonga than is currently represented archaeologically. Interestingly, Katayama and associates (Katayama and Tagaya 1988) have found biological affinities between the human populations of Mangaia and those of Tonga. Katayama (1988:16) goes so far as to suggest that either early settlers to the region passed through the Cooks, with some remaining there, or "there was a considerable amount of coming and going between the Cook Islands and West Polynesia in the late prehistoric period". Samoa is better represented than we might expect based on the geographic model, both in terms of material culture and in Cook Islands oral history (see Siikala 1991:42). Within the southern group, the available evidence most strongly connects Aitutaki, Mangaia, and Ma'uke. However, this could reflect factors such as limited work on Mitiaro and 'Atiu.

The findings reviewed here suggest that Polynesian archaeologists are on the verge of new and important discoveries which may change our views of East Polynesian prehistory. East Polynesian populations may been significantly more mobile and at home on the highways of the sea than we have previously thought. Future research promises a better understanding of the broad patterns of interaction and the scale of regional integration.

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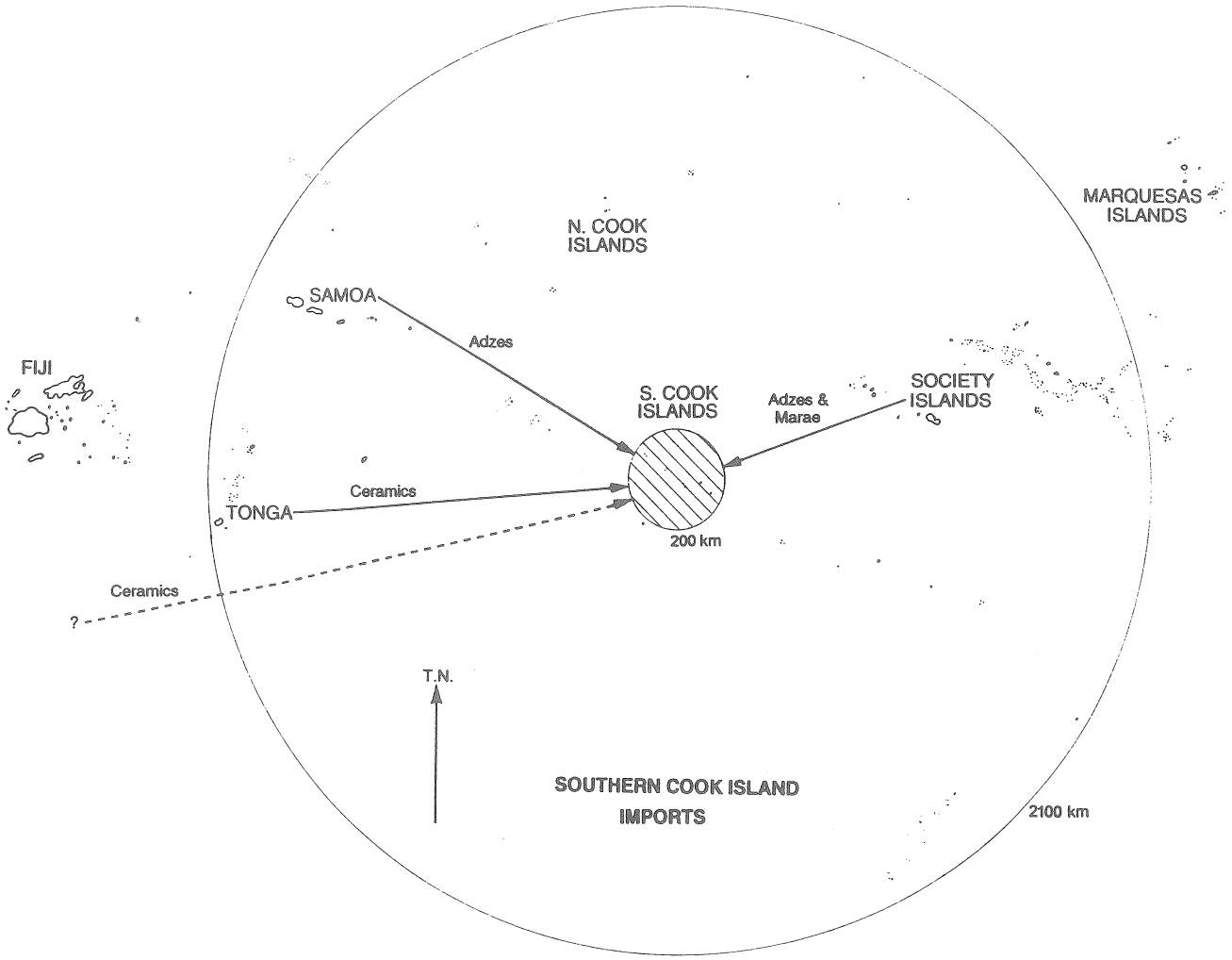

Figure 3. Summary of southern Cook Island regional contacts as evidenced by imported goods and concepts.

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