CHAPTER SEVENTEEN

The Gathering Place of Men (Mangaia, Cook Islands, 1989–1991)

Settling into my new academic home at Berkeley in early 1989, I decided to shift the course of my research. Up until then, I had focused on the islands of the western Pacific—Futuna, Niuatoputapu, and Manuʻa in Western Polynesia, the Polynesian Outliers of Anuta and Tikopia, and Mussau in the Bismarck Archipelago. In these islands I had sought the deep roots of the Polynesians in the Lapita cultural complex as well as the later rise of Ancestral Polynesian culture in the Hawaiki homeland. But now there were new intellectual problems I wanted to tackle.

Anthropologists divide the vast Polynesian triangle into two distinct regions, Western and Eastern Polynesia. Western Polynesia—consisting of Tonga, Samoa, Futuna, ʻUvea, Tokelau, and Niue—is the original Polynesian homeland. It was in Western Polynesia that the Proto Polynesian language and Ancestral Polynesian culture developed out of its Lapita ancestor (see Chapter Fifteen).

For almost two thousand years, the Ancestral Polynesians stayed within this Western Polynesian homeland. But late in the first millennium AD, colonizing groups of Polynesians expanded across the central eastern Pacific. What inspired this unprecedented migration is not entirely clear, although the development of sophisticated double-hulled, deep-water voyaging canoes was certainly instrumental. Between about AD 900 to 1100, groups of Polynesians discovered and settled the Cook, Society, Tuamotu, Marquesas, and Gambier Islands (Mangareva). Then they radiated out to find and colonize the even more far-flung islands of Rapa Nui, Hawaiʻi, and New Zealand, reaching the last of these by AD 1250. The archipelagoes and islands that were settled during this incredible diaspora make up Eastern Polynesia.

The distinction between Western and Eastern Polynesia goes beyond simple geography.[1] Although sharing many patterns in common, the Western and Eastern branches of Polynesian societies each exhibited distinctive traits. For example, to the original creator god of Tangaroa (known in Western Polynesia) the early Eastern Polynesians added three primary gods: Tū, Tāne, and Rongo. Ceremonial places also varied—in Western Polynesia *malae* were open plazas where kava ceremonies were performed, whereas in Eastern Polynesia *marae* were usually

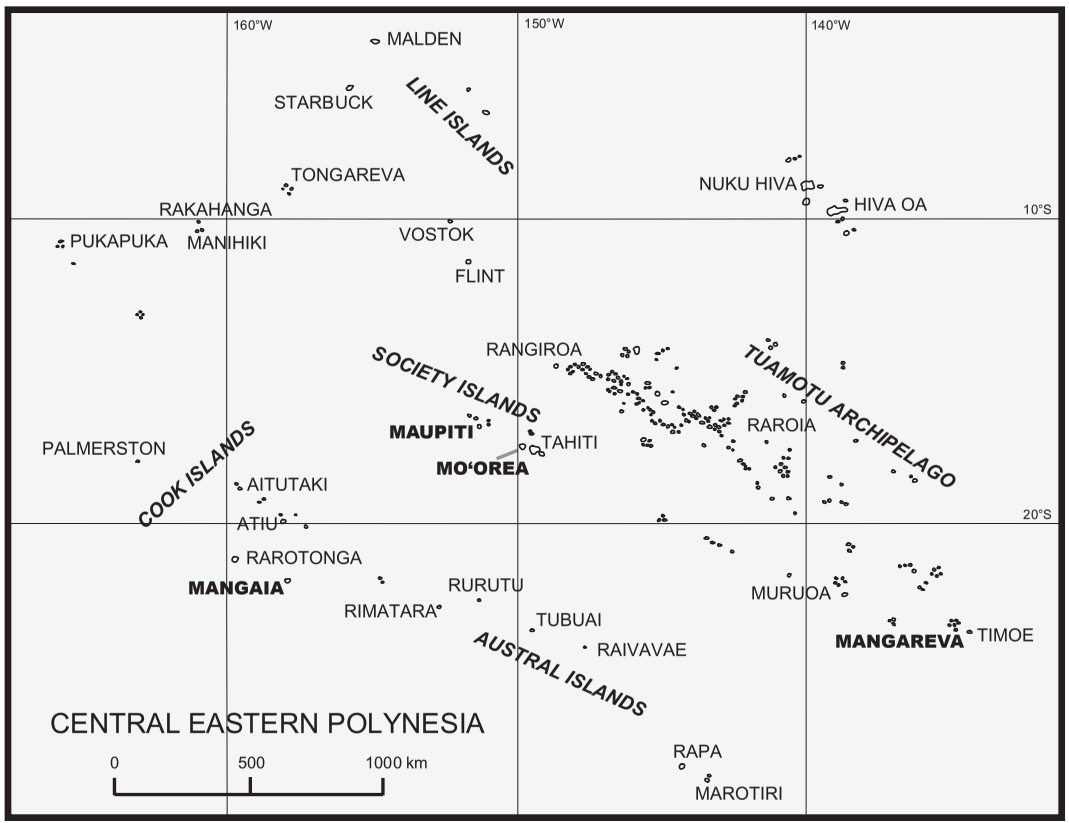
enclosed courts with altars and uprights (or images) at one end. Eastern Polynesian cultures also uniquely shared certain material culture traits, such as the ways that they manufactured barkcloth or made their fishhooks.

However, the cultural and social diversity that arose in Eastern Polynesia—following the diaspora between AD 900–1250—offers anthropologists a remarkable opportunity to study how human societies change and evolve. The great biologist Ernst Mayr once pointed out that, to study evolution—whether biological or cultural—we should seek out "experiments of history." The diversification of dozens of Eastern Polynesian societies over about eight hundred years, in a variety of island ecosystems, provides an unparalleled opportunity for such controlled comparison.

One of the new research questions that I wanted to pursue was this: How had the arrival of Polynesians on islands that previously lacked humans (or large terrestrial vertebrates other than birds) affected these pristine ecosystems? My work on Futuna, Tikopia, and Niuatoputapu had given me insights about how humans transformed island landscapes. Pacific biogeographers such as Raymond Fosberg argued that remote islands were inherently vulnerable when their isolation was shattered.[2] What kinds of changes did the arrival of Polynesians initiate? On the flip side of the coin, how had the varied island environments of Eastern Polynesia influenced the evolving Polynesian cultures? Some islands had extensive reefs and lagoons; others lacked these resources. Some offered valleys suitable for irrigation, whereas others only had older, nutrient-poor soils. I would have to investigate both problems simultaneously, because on islands nature and culture are inseparably intertwined. In scientific parlance, humans and their environments were "dynamically coupled."

To carry out such a research program, I would have to enlist the collaboration of scientists in other fields. By the 1980s, archaeology was becoming a multidisciplinary endeavor, with specialists in zooarchaeology, archaeobotany, and geoarchaeology who focused on animal bones, plant remains, and stone artifacts, respectively. My earlier work in the western Pacific had mostly been done singlehandedly or with one or two student assistants. In the future, I would need to put together multidisciplinary teams to investigate collaboratively the dynamically coupled human and natural systems on the islands of Eastern Polynesia (Map 7).

Some days you just get lucky. One such memorable day was July 20, 1989. I was riding in the back of a rusting Toyota pickup truck driven by Ma'ara Ngu, our guide on Mangaia, southernmost of the Cook Islands. Following a little-used dirt track in Veitatei District, we passed through second growth and abandoned banana gardens toward the inner escarpment of the *makatea,* a ring of upraised reef



Map 7. Central Eastern Polynesia. Island names in boldface indicate where the author has conducted archaeological research.

limestone that encircles the island. Ngu told us that this was the only route to Lake Tiriara, whose sediments we wanted to sample in order to extract pollen and reconstruct the island's history of vegetation change.

I dodged low-hanging *Hibiscus* branches as Ngu negotiated the rutted track. Nearby, the *makatea* escarpment rose twenty-five meters above us, its whitish-gray facade pockmarked with solution caves where the limestone had dissolved away during earlier stages of tectonic uplift. The dark shadow of a large overhang in the cliff face caught my eye. I banged on the roof of the cab. "Maʻara! Dave! Can you stop for a minute? I want to check out something," I yelled to Ngu and David Steadman, sitting in the cab. Steadman, the world's expert on the biogeography of eastern Pacific birds, was my collaborator on this new project.

Jumping out of the truck, I grabbed a machete and slashed a rough path through the second growth toward the dark shadow in the looming cliff. Soon I was at the base of the huge overhang, towering overhead. The sheltered space had a dry dirt floor about a meter higher than the surrounding terrain. Rockshelters such as this one, where the overhanging cliff offers protection from the rain, were preferred living sites for ancient people. The elevated floor of the shelter suggested that the underlying sediments had most likely accumulated over centuries of use. I paced the shelter's floor, calculating that it had a usable area of about 225 square meters, enough to house an extended family or two.

I asked Ngu what the name of the place was. "Tangata-tau," he said. "It means the place where men gathered. In my father's day the people used to bring the oranges here when they were collecting them for export to Rarotonga. But it hasn't been used for a long time." I told Ngu that it was likely that Tangata-tau had been used well before his father's time, even before the missionaries had arrived on Mangaia. I had a gut feeling that I had just discovered one of those sites that archaeologists never forget all their lives.

The Mangaia Project had resulted from my meeting David Steadman at the Burke Museum several years earlier. Steadman was doing a postdoc at the Smithsonian Institution, learning the fine points of avian skeletal anatomy and bird taxonomy; his passion was the birds of the South Pacific. Together with the Burke's curator of ornithology, Sievert Rohwer, Steadman organized an expedition to the Cook Islands in 1987. After returning, Steadman proposed that we collaborate on Mangaia. He had found many bones of extinct birds in the island's limestone caves. Had the loss of Mangaia's bird fauna been a consequence of Polynesian occupation? It seemed likely, but more data were required.

Reading up on Mangaia's geography and ethnography, I became fascinated.[3] With a land area of about fifty-two square kilometers, Mangaia is a relatively small island, though much bigger than Tikopia or Niuatopuapu. A ring of upraised lime-

stone reefs, the *makatea,* surrounds a twenty-million-year-old deeply weathered volcanic cone in the island's center. Deep lateritic soil mantles the volcanic cone, covered in fire-resistant *Dicranopteris* fern and scrub *Pandanus.* Six small valleys furrow the old volcanic cone, their streams ponding against the *makatea* where the fresh waters had eroded caverns through the permeable limestone.

At the base of each valley there are small lakes or swamps. The Mangaians in precontact times had converted this swampy ground to irrigated taro fields, the primary source of their staple taro (Fig. 17.1). In *Mangaian Society,* Te Rangi Hiroa reported that, before the arrival of the London Missionary Society in the 1820s, the Mangaians had fought a succession of wars for control of these irrigated fields. Hiroa's portrayal of traditional Mangaian society was disturbing. Warriors terrorized the common people; cannibalism and human sacrifice were said to have been commonplace. Hiroa's account reads like a description of institutionalized thuggery. On Mangaia, it appeared that severe environmental constraints had channeled social evolution in a direction favoring overt force.

I realized that the taro swamps and small lakes would be ideal sediment traps, catching soil eroded off of the volcanic slopes, and thus a perfect environment for taking deep sediment cores. The successive layers of silt, clay, and peat could be

Figure 17.1. View of the Tamarua Valley, Mangaia. The valley floor is covered in artificial taro pondfields, the main source of food for the ancient Mangaian population. Note the fern-covered hillsides inland of the taro fields.

dated by radiocarbon. From samples of sediment, a palynologist (specialist in pollen grains) could extract microscopic pollen encapsulated within the layers and then identify and quantify the different species of plants represented. This would allow the reconstruction of a history of gradual—or sometimes abrupt—changes in the vegetation surrounding the swamp. A pollen history from Mangaia's swamps would tell us whether the fernlands covering the central volcanic cone were natural or whether they had come about through human land use.

Steadman and I invited John Flenley of the University of Hull, England, to be our project palynologist. I wrote a successful proposal to the National Geographic Society's Committee on Research and Exploration, requesting funds for an expedition to Mangaia in the summer of 1989. Our plan was to combine archaeology with avian paleontology and palynology to unravel the island's history of Polynesian occupation and land use.

Dave and Jenny Steadman, Melina Allen (a University of Washington grad student), and I flew to Mangaia from Rarotonga on the once-a-week plane on July 18, 1989. We settled into the government's Guest House, an old wooden building situated on the *makatea* bluff overlooking Oneroa Village. Nga Teaio, a gregarious middle-aged woman, kept the place spick-and-span, while serving up breakfast and dinner. Teaio's dinners usually consisted of boiled taro and a pot of stewed mutton neck rings imported from New Zealand.

We needed a truck to transport our team and equipment over the few rough, dirt roads that traverse the island. Fortunately, Ma'ara Ngu was willing to work with us as well as drive us around in his venerable pickup. Ngu, a towering, broad-shouldered man who had played rugby until a knee injury took him out of the game, had worked in New Zealand as a welder but had moved back to Mangaia to raise his kids. Skilled with his hands, Ngu could solve any practical problem that arose during fieldwork. Ngu and his Maori wife, Diane, became close friends as well as valued helpers in our work.

As is usual in Polynesia, we rose early. Teaio had coffee, biscuits, butter, and jam on the table before the sun rose. By 7 a.m. Ngu would drive up with his truck, accompanied by Sonny and Maru whom we had hired to help us excavate. We would spend the day at the rockshelter, returning in the late afternoon to shower, sip a pre-dinner whisky, and partake of another of Teaio's filling if rather boring meals.

Flenley and his students flew in the following week to begin the lake coring work. I had met Flenley at the International Congress on Easter Island in 1984, but I had never worked with him in the field. I was a bit alarmed when the two young British undergrads stepped off the plane, one of whom, Frances, was hold-

ing her teddy bear. "Teddy-baarrr," Frances told me, "goes with me *everywhere*." Yikes, I thought to myself, I hope you are not going to be holding onto that stuffed bear on the raft while you are trying to pull up a sediment core.

The next morning Steadman, Allen, and I were up early as usual, having our coffee and breakfast. Flenley's students appeared, but there was no sign of their professor. By now Ngu and the others had arrived, with everyone talking loudly in the Guest House's living room. There was no way Flenley could not have heard us, because his bedroom was separated from the living room by only a thin curtain. Steadman was getting agitated about this delay in heading out to the field. Just then an arm pushed the curtain aside and Flenley appeared, wearing a silk dressing gown and stocking cap, like an apparition out of Edwardian England. "I say," he calmly remarked, "is breakfast ready?" I thought Steadman was going to go ballistic, but it was all I could do to keep from laughing out loud.

While Flenley and his students cored Lake Tiriara, Steadman and I dug in the spacious rockshelter (Fig. 17.2), starting with a one-meter test pit in the shelter floor. You are always "digging blind" in the first test pit, not knowing what you will encounter or how deep the deposits will be. After peeling off the upper layer with historic period glass and iron, I started digging into some ashy lenses full of charcoal and thousands of well-smashed fragments of marine shell. Each thin lens probably represented a cooking and feasting event.

I was now down sixty to seventy centimeters into a grayish deposit with less shellfish and more bone. Several fishhook fragments made from *Turbo* shell turned up, along with adz flakes and coral files. At the sifting screens, Steadman was picking through the tiny scraps caught in the 1/16-inch mesh. "OK! Wow, look at this," he called out, holding up a small, well-preserved bone between his thumb and forefinger. I got out of the test pit to have a look. "What is it, Dave?" I asked, knowing that it did not look like fish and certainly was not dog or pig. "The tibiotarsus of an extinct fruit dove, in the genus *Ptilinopus*," Steadman confidently replied. I had no reason to doubt him; he had paid his dues studying thousands of comparative skeletons in the Smithsonian's storerooms.

More bird bones appeared as I dug deeper through the ashy sediment. After several more hours the blade of my trowel exposed the top of a reddish-orange layer—decomposed limestone that formed the shelter's original, natural floor. My trowel flicked up several bones, which I handed to Steadman. There were bones of seabirds, frigates, and shearwaters, as well as those of land birds, including a flightless rail and more fruit dove bones. The pre-occupation stratum proved to be chock full of bird bones, along with some bones of the Polynesian-introduced Pacific rat, *Rattus exulans*. The presence of the rat bones showed that people were

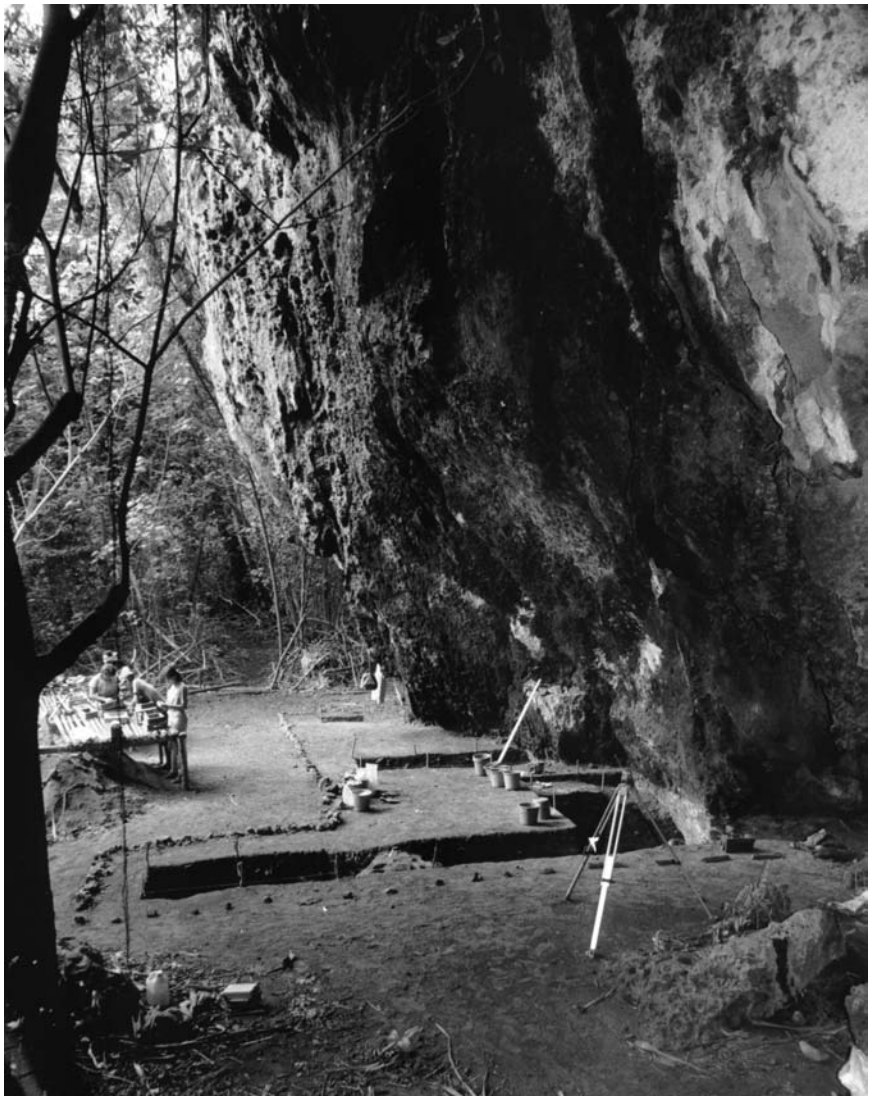


Figure 17.2. The Tangata-tau rockshelter on Mangaia Island during excavation. This spacious shelter contained occupation deposits spanning the entire course of Mangaian history.

already on the island at the time that the bird bones were deposited. Over the next several weeks we expanded the initial test pit into a five-meter trench. In all, we would recover more than 200 bird bones, along with about 10,000 other bones of fish and fruit bats, as well as those of Polynesian-introduced dogs and pigs.

Meanwhile, Flenley and his students were having success at the lake. Working from a raft constructed of four truck tire inner tubes and a couple of sheets of plywood, they had taken a fifteen-meter-long sediment core from Lake Tiriara. This was deeper than we had dared to hope for, suggesting that it might span a considerable time period. Each one-meter segment was carefully protected in rigid plastic sleeves, labeled as to depth and orientation, ready to be air freighted to Flenley's laboratory at Hull.

A few months later, when we had received our radiocarbon dates and Flenley had analyzed the pollen samples from the TIR-1 core, Steadman and I sat down to review the results of our first expedition to Mangaia.[4] The trench in the Tangata-tau rockshelter had produced one of the best faunal sequences then known from any island in Eastern Polynesia. The deepest layers (dating to around AD 1000–1200) had yielded lots of bird bones, not only from nesting seabirds but also from many kinds of land birds, some of which were now extinct on the island. The upper layers had very little bird bone, showing that something had happened to greatly reduce the biodiversity of birds on the island during the period that the Polynesians had occupied it.[5]

The sediment core from Lake Tiriara and Flenley's analysis of pollen grains contained within the layers of lake mud offered a likely explanation for this loss of biodiversity. The core went back 5,800 years, well before any humans lived on the island. The older sediments contained pollen of indigenous and endemic trees, such as *Ficus* and *Weinmannia,* leaving no doubt that the volcanic cone was once covered in a pristine forest. Then, around 1,500 years ago according to the radiocarbon dates, something happened.[6] The forest trees disappeared, to be replaced rapidly by a fire-adapted association of ferns and scrub *Pandanus.* The timing of this change strongly implicated the arrival of colonizing Polynesians. With much of the island's original forest gone, the native bird populations no longer had the habitats needed to support their populations.

Steadman and I knew that the Mangaia story was too rich to leave at this; another field season was called for. Using our initial results as the "hook," we drafted a successful proposal to the National Science Foundation for more fieldwork in 1991.

Before we returned to the island, however, the Tangata-tau rockshelter produced yet one more startling find. Jon Hather, a young British archaeobotanist, was working as a postdoc at the Australian National University in Canberra,

fine-tuning methods for identifying different root crops from carbonized tubers (what is technically called *parenchyma*) found in archaeological contexts. Hather asked if he could visit my lab to examine carbonized plant remains from sites I had excavated. When he arrived at Berkeley, I brought out some bags of charcoal from Tangata-tau. He immediately recognized some of the charcoal as charred parenchyma and asked if he could take the specimens back to the Institute of Archaeology in London. There, he would be able to examine the anatomical structure of the parenchyma under a scanning electron microscope, allowing him to discriminate taro from yam, giant swamp taro, or sweet potato.

Shortly after returning to London, Hather informed me that these specimens—from the bottom layers of the Tangata-tau rockshelter—were of sweet potato. I was stunned. Unquestionably of South American origin, sweet potatoes were cultivated in the islands of Eastern Polynesia at the time of Captain Cook's voyages. However, some scholars had suggested that the plant had been introduced by Spanish explorers such as Mendaña. Others, especially Doug Yen, argued that Polynesians had crossed the Pacific to South America, bringing the crop back with them.

The scraps of carbonized sweet potato parenchyma from the Tangata-tau rockshelter were a "smoking gun" in support of Yen's hypothesis. There was no way that these sweet potato tubers, dated to ca. AD 1100–1300, had come via the Spanish, who did not enter Pacific waters until the late sixteenth century. I realized that we had the first undeniable evidence of Polynesian contact with South America in pre-Columbian times.[7]

In late May 1991, everything was ready for our return to Mangaia. The swamp coring and pollen work would be continued by Joanna Ellison, a Berkeley graduate student in geography. My two new graduate students, Pia Anderson and Julie Endicott, would help in the survey and excavations, gaining field experience. To analyze the fishbones from Tangata-tau, I invited zooarchaeologist Virginia Butler to join us. Jon Hather would also be part of the team, making botanical collections so that he could identify the carbonized plant remains from the excavations. Finally, my girlfriend Thérèse Babineau, a photographer, planned to join us to photograph the island and our excavations.

On the way to Rarotonga, I stopped off in Honolulu to attend the Seventeenth Pacific Science Congress, where Terry Hunt and I chaired a day-long symposium on "Environmental and Landscape Change in Prehistoric Oceania." We wanted to bring together archaeologists and natural scientists with interests in human impacts on island ecosystems. A few years later the collected essays were published under the title *Historical Ecology in the Pacific Islands*.[8]

On June 7, seven hundred kilos of baggage and gear were loaded onto our chartered Air Rarotonga aircraft for the forty-minute flight to Mangaia. Ma'ara and Diana Ngu greeted us, the old pickup looking even more battered but still running. After a few days at the Guest House, we moved into an empty house up on the *makatea,* relieving us of the daunting prospect of eating Teaio's boiled taro and mutton rings for two full months.

Ellison began by re-coring Lake Tiriara to check the results that Flenley had obtained in 1989. Then, she moved systematically around the island, coring every swamp and pond. By cross-checking the stratigraphic sequences in each valley, Ellison confirmed that the Veitatei sequence was not unique; the same changes had occurred across the entire island. After returning to Berkeley, Ellison would date selected core samples and extract pollen from two of the longest cores, elaborating the record of vegetation change that Flenley had first outlined.[9]

Ellison's work confirmed that, prior to Polynesian settlement, a pristine rain forest had cloaked Mangaia's central volcanic hill. Soon after Polynesian arrival, the interior slopes were cleared and burned, as people practiced shifting cultivation. But the old age of the underlying rocks—and their severe lack of nutrients—prevented the native forest from recovering. Instead, the hillsides became covered in a fire-resistant mix of fern and scrub *Pandanus.* After this, agriculture would have to be limited to the valley bottoms and swampy areas, where the soils were richer and could support continuous cropping.

While Ellison was busy with the coring, the main team went to work in the Tangata-tau rockshelter. Beginning from the cleaned-up sidewalls of our 1989 trench, we peeled back the complex succession of layers and fine lenses. Rockshelters such as this—where people lived in a relatively confined space over many centuries—tend to have complex stratigraphic sequences; Tangata-tau was no exception. I used a Harris Matrix to keep track of the complex vertical and horizontal relationships between the nineteen discrete stratigraphic zones and more than fifty individual "features" such as pits, earth ovens, and hearths.[10]

Opening a large block of squares against the shelter's rear wall, we came upon early deposits representing a period when the site had been used as a primary habitation. One or more families had cooked their daily meals in the earth ovens we uncovered; the scraps of their meals were incorporated into the sooty dirt of the floor. Some of the occupants had been expert stone tool craftsmen, leaving hundreds of basalt flakes as they knapped adzes. We found a dozen or so finished adzes, beautifully polished, and a score or more adz roughouts ready for grinding. Other craftsmen worked at carving out fishhooks from pearl shell, using files of branch coral. People had also been tattooed within the shelter: We found eight tattooing combs of varying sizes.

Steadman and Butler were delighted with the faunal remains they were recovering in the fine-mesh sifting screens. More than seven hundred bird bones represented seventeen species of native land birds and twelve species of seabirds. Most of the bird bones came from the deeper, older layers. The fishbones were even more abundant, totaling nearly 32,000 specimens. Mostly these specimens represented smaller reef fish, but there were also bones of freshwater eels that had been captured in the nearby lake.

When the missionaries arrived in the 1820s, there were no pigs on Mangaia, but the people said they had once possessed them. The archaeological record bore out this claim. We found more than two hundred pig bones, concentrated in the lower and middle layers. Apparently, the first Polynesians to settle the island brought pigs (as well as dogs) with them, raising them for some centuries. But prior to European contact they had exterminated the pigs, probably because it was too "costly" to feed them. On a small island, pigs have to be kept penned or they will devastate the gardens. And when food supplies are tight, feeding taro or sweet potatoes to pigs becomes a luxury that hungry stomachs may not tolerate.

The faunal sequence from Tangata-tau revealed a history of gradually intensifying pressure on food resources, what archaeologists call "resource depression." First, there was the decimation and in some cases extinction of the many species of land birds and seabirds that had originally populated the island, reducing one potential food source. Second, the sizes of fish being caught became smaller over time; the early layers had larger fish, whereas the upper layers yielded fishbones with much smaller jaws. These changes were also evident in the shellfish. The sizes of *Turbo* shells, for example, an important food item, steadily decreased over time, reflecting harvesting pressure. In all, the story is one of an island ecosystem under serious pressure from its human population. All this evidence brought to mind Te Rangi Hiroa's account of contact-era Mangaian society, with its constant wars and competition over limited areas of irrigated taro.

My previous fieldwork had been on isolated islands such as Anuta and Tikopia, where ancient lifestyles were still preserved, or in Futuna and Niuatoputapu where, in spite of Western contact, traditional social and political structures remained largely intact and people farmed and fished more or less in the old ways. On Mangaia, in contrast, I was witness to the profound effects of a century and a half of missionization and acculturation. There were no thatched *fale,* the Mangaians having adopted wooden or concrete houses with tin roofs. Everyone dressed in Western clothes; there were even such modern institutions as a post office. The island's three villages (Oneroa, Tamarua, and Ivirua), which each centered around its large Congregational church, were themselves nineteenth-century develop-

ments; originally people had lived in dispersed hamlets near the taro fields. Some families still cultivated a few of the irrigated taro fields, but mostly they lay abandoned. Our Mangaian friends consumed more rice and tinned foods than they did homegrown produce or fish.

The London Missionary Society, under the direction of Rev. John Williams, had first attempted to land Christian missionaries from Tahiti on the island in 1823, but Mangaian warriors had forced them back to the ship. The following year two Tahitian converts, Davida and Tiere, gained a foothold. By 1825, Davida had converted part of the population, including the high priest Numangatini. In February 1828, a vicious battle ensued between Christian and pagan factions, with the Christians emerging victorious. As Hiroa wrote in an unpublished history of the advent of Christianity on Mangaia:

> In the substitution of Jehovah for Rongo, a clash occurred between different cultures. The Mangaian social system was so interwoven with the religious system that it was impossible to root out the Mangaian gods without destroying other institutions that had been evolved for the guidance and government of society. In order to substitute, the new religion had to destroy its opponent.[11]

Davida became Mangaia's new high priest and his church the most influential social and political institution.

We attended Sunday services at the imposing Oneroa church with its massive stone and coral-lime mortar walls, constructed in 1891. The service and its rituals continue the Congregationalist traditions of the London Missionary Society. Men, dressed in long pants and black coats over starched white shirts, sit on the right side of the aisle, while women, decked out in flowing white dresses and large-brimmed hats, sit on the left with the younger children. The hymns, sung a cappella style in the Mangaian language, reverberate throughout the massive sanctuary.

Davida and his successors worked tirelessly to stamp out cultural practices that they associated with the heathen religion. Traditional dancing, singing, and tattooing were banned, as was kava drinking. Today, instead of the communal socializing of men around a kava bowl as I had so pleasantly experienced in Futuna and Niuatoputapu, male friends periodically go on drinking binges. They call this practice "going to the bucket." A man brews up enough bush beer—a concoction of sugar, water, and the juice of locally grown oranges or other fruit—to fill a fifty-five-gallon drum. When the mash has fermented, he calls his friends together who then literally sit around a bucket of the sweet liquor, inebriated for the several days it takes to consume the drum's contents.

Walking along Oneroa's back roads, Steadman and I were once called to join such a group. The three drunken middle-aged men loudly insisted that we join them around the plastic bucket in the side yard of the host's house. Dipping the single, sticky glass into the bucket, our host filled it to the brim and urged me to drink it down in one gulp. After several rounds the low alcohol content had only a mild effect on my mental faculties, but the not entirely fermented sugary liquid was making me belch queasily. After an hour or so Steadman and I feigned drunkenness, pleading that we had to go sleep off the effects. Our hosts reluctantly let us leave; they were still at it the next afternoon.

Yet not all of the old manners had entirely disappeared. We gradually discovered that deep-seated animosities between ancient tribal groups on the island—tracing back to the pre-Christian times of endemic warfare over the limited taro lands—still lurked in the shadows. When I suggested to some Oneroa Village friends that we might spend some time in Tamarua Village to work on sites there, they looked at me aghast. "You can't stay in Tamarua," they protested. "Those people are nasty, they smell, and they will steal from you." On a later occasion, one of the Tamarua folks said to me, "Why are you living in Oneroa? The people there are nasty, they smell, and they are stealing from you." And both the Oneroa and Tamarua groups claimed that the Ivirua villagers were even worse! Rugby games between teams of young men from the three villages are a real blood sport, playing out the old tensions inherited from their ancestors.

Although the history of what happened in Mangaia was most fully evidenced at Tangata-tau, we obtained additional evidence from several other sites. One was a large rockshelter in Keia District, called Ana Manuka. Unlike Tangata-tau, this was a specialized site, containing exclusively the remains of earth ovens and human bones. The bones were charred, evidence of having been cooked in the ovens. Later excavations in this shelter by Steadman showed that dozens of humans, including women and children, had been "processed" there.[12] I have little doubt that Ana Manuka once witnessed the gruesome practice of cannibalism.

Another site dating to the period when war and social terror were rampant on Mangaia was a large cavern in Tamarua District, called Tau Tua. Our guides told us that it had served as a refuge during times of war, with people retreating into this nearly impregnable cavern. The entrance sits seven meters up a sheer limestone face, inside a much larger cave that opens onto the Tamarua taro swamp. Our guide scaled the slippery face barefoot, his toes gripping fissures in the rock. Arriving at the entrance he then let down ropes so we could haul ourselves and our equipment up into the cavern. Exploring the branching chambers, which flowing water had once eroded out of the limestone, we found a miniature village,

including house platforms, a small *marae* or temple, and cooking areas with earth ovens (Fig. 17.3). Radiocarbon dates on the oven charcoal showed that the refuge cave had been used in the century prior to European contact.

Our 1991 expedition to Mangaia, with its interdisciplinary team of specialists, produced a huge amount of data on Mangaian precontact history, land use, and ecological change. It would take many years in various laboratories for all of the results to be analyzed; indeed, I still have not fully published all the data from Tangata-tau. But the outline of what transpired on Mangaia over about eight

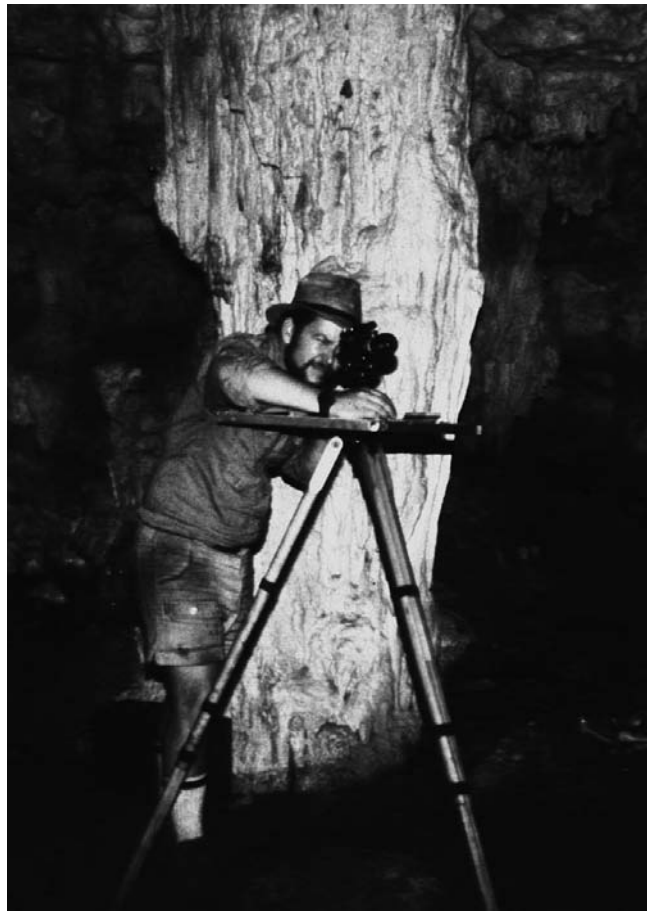


Figure 17.3. Mapping the interior of the Tau Tua limestone cavern in 1991. This difficult-to-access cave was used as a refuge during intertribal wars on Mangaia.

centuries is clear.[13] What made Mangaian history different from that of Tikopia or some other small Polynesian islands was that the island of Mangaia was inherently vulnerable to human disturbance. About twenty million years old, Mangaia's deep lateritic earth had all its rock-derived nutrients leached out. Once the first inhabitants cleared and burned the forest through shifting cultivation, allowing the thin soil to be eroded away, the forest could not rejuvenate.

Within a few centuries at most, Mangaia's population was no longer able to plant gardens on the hillslopes. They had to confine their agriculture to the narrow valley bottoms, totaling a mere 2 percent of the island's land area. Fights broke out between families over control of these precious taro lands. Meanwhile, the once abundant land and seabirds had been decimated, partly through hunting and partly through large-scale reductions in their nesting habitats. The narrow fringing reef came under constant pressure, with smaller and smaller fish and shellfish available for the taking.

By late prehistory, this combination of factors resulted in a "socio-ecosystem" in which there was relentless pressure on resources and competition for limited arable land; as a result, people often went hungry. The old Polynesian system of social organization based on hereditary rank had broken down, giving way to one in which charismatic leaders and their gangs of warriors seized control. The oral traditions recorded by Te Rangi Hiroa recount no less than forty-two wars fought for control of the taro lands and hegemony over the island. To the victorious went the irrigated lands, while the defeated tribes were banished to the *makatea* to eke out a living growing sweet potatoes in small pockets of dirt between the limestone pinnacles. The weak and unsuspecting were likely to be seized as sacrifices to Rongo, the Janus-faced god of war and taro—or worse, consumed at cannibal feasts as in the Ana Mauka rockshelter.

The deep history of Mangaia is disturbing. It speaks to the darker side of human nature, when circumstances beyond their control forced people to behave in ways that they would otherwise find abhorrent. Yet what happened on Mangaia in the late period is not unique within Polynesia. Similar scenarios are evidenced from Mangareva, Easter Island, and parts of New Zealand. There is a lesson lurking in these "microcosms of history," if we care to heed it. It is a lesson about the balance between population and resources, about the fragility and vulnerability of natural systems, and about the terrifying ways that people can behave when their backs are up against the wall.