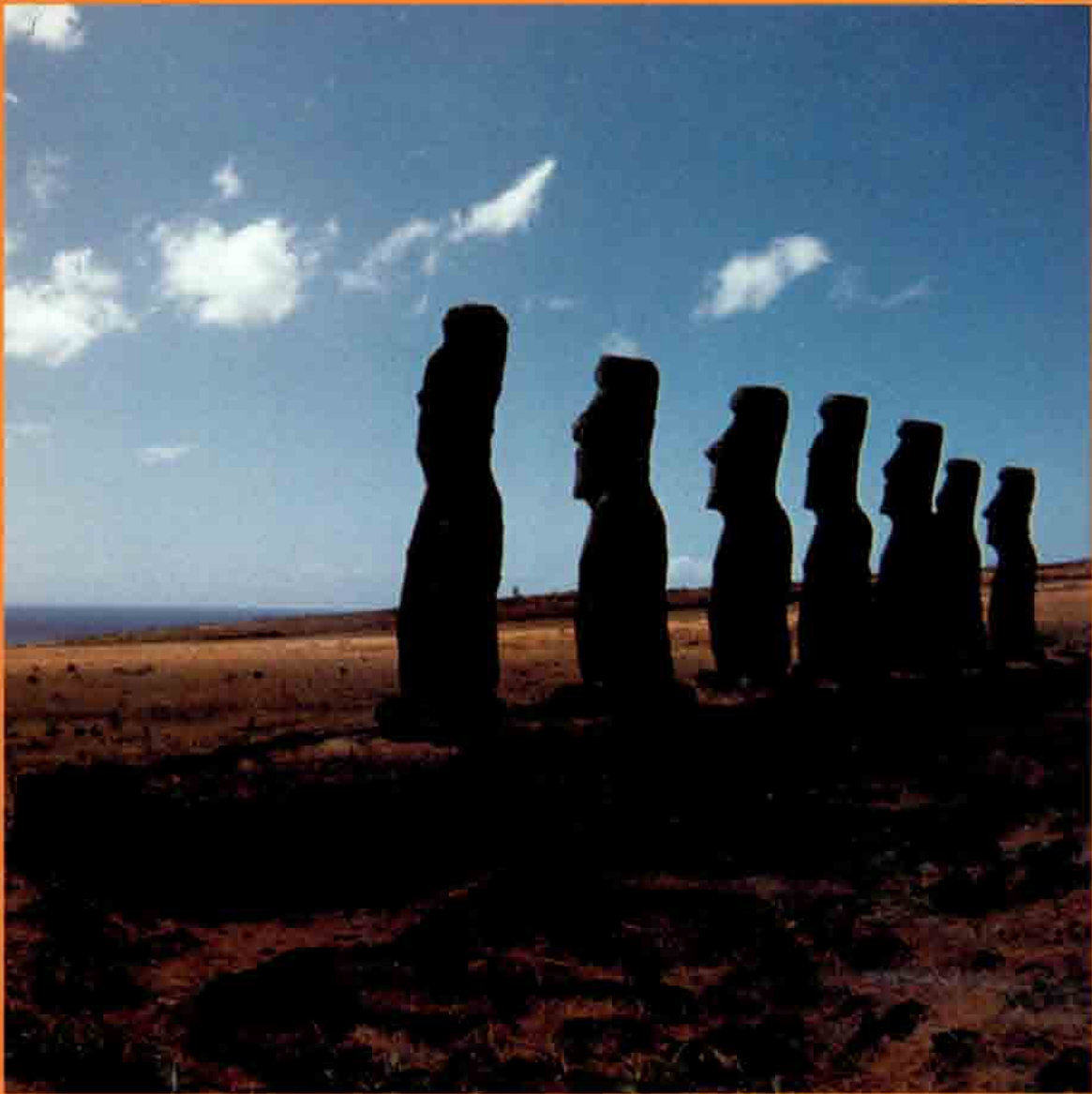
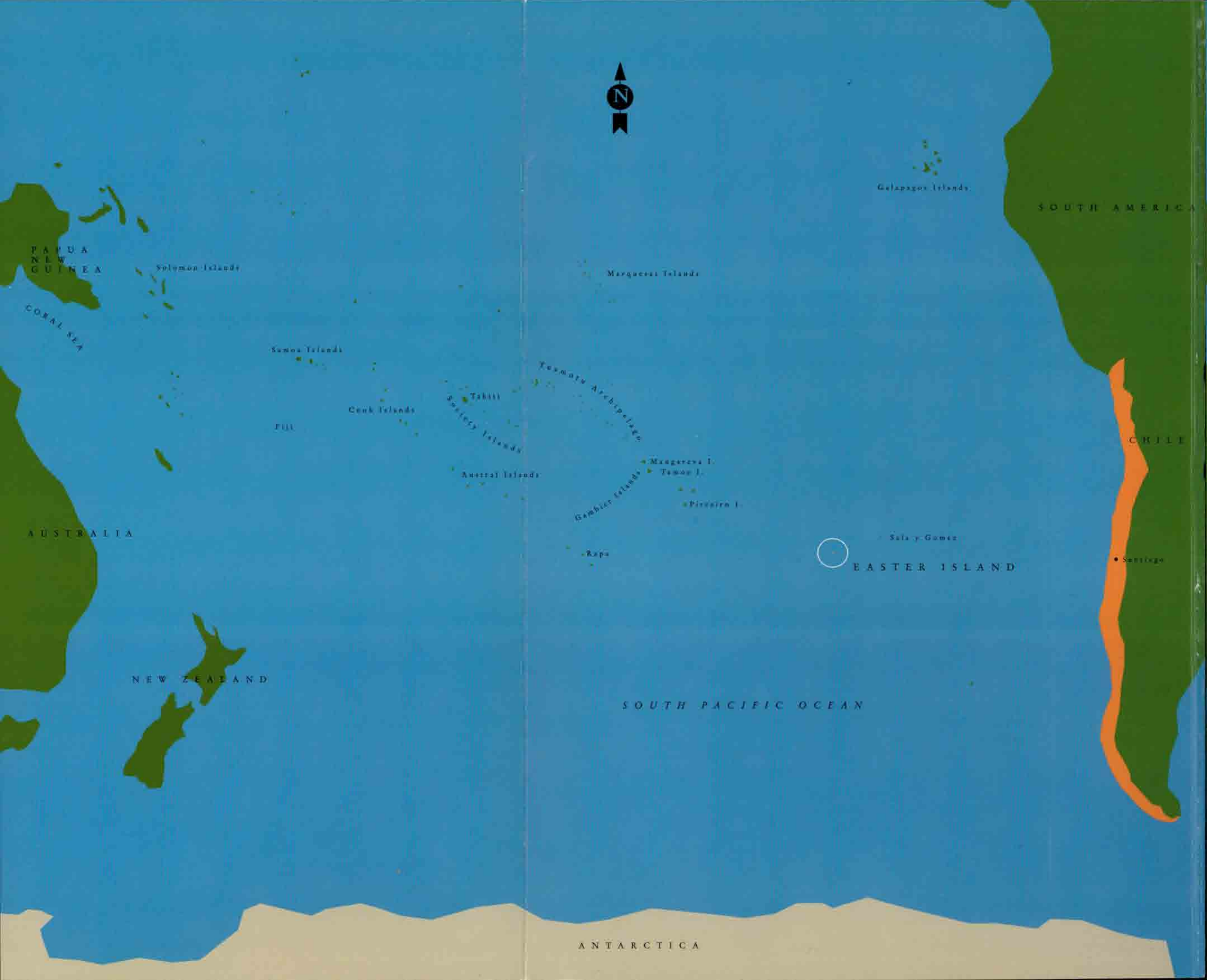


Easter Island

The Heritage and its Conservation





PAPUA
NEW
GUINEA

Solomon Islands

CORAL SEA

AUSTRALIA

NEW ZEALAND

Samoa Islands

Line

Cook Islands

Tokelau

Line Islands

Marshall Islands

Micronesia

Marquesas Islands

Galapagos Islands

SOUTH AMERICA

CHILE

Santiago

Salas y Gomez

EASTER ISLAND

SOUTH PACIFIC OCEAN

ANTARCTICA

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Based in New York City, the World Monuments Fund is the only private, non-profit organization that sponsors worldwide preservation activities. Its goal is to bring together public and private support to assure the survival of the world's most outstanding artistic and architectural treasures. This work focuses on the restoration of monuments and works of art that are in danger of loss or destruction. Through funding from its membership and philanthropic sponsors, WMF contributes technical and financial support to help save these works. WMF also supports research, training and advocacy activities as they relate to the restoration and safeguarding of monuments and sites. WMF's Easter Island program was initially supported by the Ralph E. Ogden Foundation and is now sustained by the Willard and Ruth Somerville Bequest.

World Monuments Fund

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Easter Island

The Heritage and its Conservation

A. Elena Charola

Future of the Past • I

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A. Elena Charola
New York City

Foreword

*"Austeros perfiles de cráter labrado,
...rostros de dura miel
silenciosas campanas cuyo sonido
se fue hacia el mar para no regresar."*

Pablo Neruda

"La Rosa Separada" (1973)

Poem XII, *La Isla*

Easter Island's location in the midst of the South Pacific is so remote that the almost miraculous arrival of the first discoverers must have been accidental. For those navigators in their frail canoes the island represented salvation; later it became homeland and lifelong prison. It is astonishing that this small human group, in such an insignificant territory lost in the great ocean, should develop one of the most extraordinary cultures on the planet.

It is generally believed that man's greatest creations have occurred in geographic areas of large population, with the merging of the ideas and inventions of many people. Nonetheless, on Easter Island spectacular advances were made, such as the development of a written language that has no parallel in the rest of the world, and the creation of innumerable sculpted and architectural stone works of great size and quality.

The ruins and monuments of this culture have such importance that they turn the whole island into an open-air museum – perhaps the richest in proportion to its size – with its great sanctuaries (ahu) and its colossal statues (moai), which stand on the ahu or on the slopes of the volcano that served as quarry.

The European explorers who rediscovered this island, some 13 centuries after the ancient Polynesians, found these statues and other structures in a ruined

state, as well as a society that appeared primitive and disorganized. This gave rise to all kinds of speculation and more or less fantastic interpretations, which dissociated the great works found there from the human reality present at the time.

Ethnographic information gathered since the end of the last century, and extensive archaeological excavations carried out during the middle of the present century, have shed some light on this enigma: the people seen by the first Europeans in the 18th century were intimately connected to those extraordinary creations, but they were suffering a decadence of sorts. As a consequence of internal wars stemming from the impoverishment of the environment caused by inadequate or excessive exploitation of the natural resources, the grandiose work of the natives' ancestors had been interrupted and was beginning to be destroyed. Investigations also indicate that once the original group of immigrants arrived, undoubtedly from Eastern Polynesia, the island was probably never again visited by new groups, from that area or any other. It is still not possible to be precise about the origin and arrival date of the first Polynesians, but it is probable that they came from the *Marquesas Islands*, or perhaps from the Society Islands, and that their arrival occurred toward the middle of the first millennium of our era.



*"Severe profiles from the carved crater,
...faces of hardened honey,
silent bells whose sound
went out to sea and never returned."*

Pablo Neruda

"La Rosa Separada" (1973)

Poem XII, *La Isla*

translated by William O'Daly

*Opposite: Bas-relief carving on the back of the
moai at Ahu Nannau.*

Therefore, until the 18th century, their singular culture was developed only from the ideas and elements the original group brought with them. The fundamental mystery regarding the exceptional creativity of these people in extreme isolation from outside influence remains unanswered. The enigma has important theoretical implications in relation to the conditions that are considered determinants for human creativity and for the development of cultures in general.

In spite of all the advances made through research, no one had seriously contemplated the conservation of the monumental heritage of Easter Island until some three decades ago. The notion was originally considered by the distinguished American archaeologist William Mulloy, who devoted to the island the best efforts of his life. The excavations and restorations of several ceremonial centers that he carried out in the '60s and '70s raised the general awareness of both the islanders and the rest of the world in regard to the appearance of these magnificent monuments, which had been destroyed during the internal wars of the ancient island society.

The restorations carried out by Professor Mulloy, and those carried out subsequently, provide a sufficient illustration of the appearance and original characteristics of these constructions. Now the moment has come to concentrate on

solving the serious conservation problems presented by most of these works of art and structures in stone. The moai, in particular, constitute the most critical case due to the destructive force of atmospheric and biologic factors acting on the volcanic tuff out of which they are carved. But the most challenging conservation effort regards the preservation of all this heritage within its natural context.

The text presented here by Dr. A. Elena Charola, internationally recognized for her work in conservation, provides an excellent synthesis of the current knowledge on this heritage, its characteristics and history within its natural and cultural context. The text is the product of years of labor and study, and it offers the interested reader a vision of a specialist on the subject. It is hoped that it will contribute to creating a worldwide consciousness of the urgency of establishing a general and permanent conservation program in which both institutions and highly qualified experts will participate. It is the duty of all of us to safeguard this important heritage for future humanity.

Gonzalo Figueroa G.-H.
Santiago de Chile



Introduction

Opposite: Motu Tautara, on the west coast of the island, as seen from the Ana Kekenga cave, usually referred to as the "two windows cave."

In the middle of the South Pacific, several thousand kilometers west of the coast of Chile, is the most isolated inhabited piece of land on earth: Easter Island. It was given this name by the Dutch commander Jacob Roggeveen, who first sighted it on Easter Sunday, 1722. In the 19th century natives from other Polynesian islands called it Rapa Nui, the big Rapa, by comparison with the smaller Rapa island. Although local tradition has it that the island was never given a proper name, a common legend tells that when settlers arrived on the island, King Hotu Matu'a called it Te Pito 'o te Henua, the navel of the earth. This example of contradictory information serves to illustrate the complexity that is typical of the Rapanui culture.

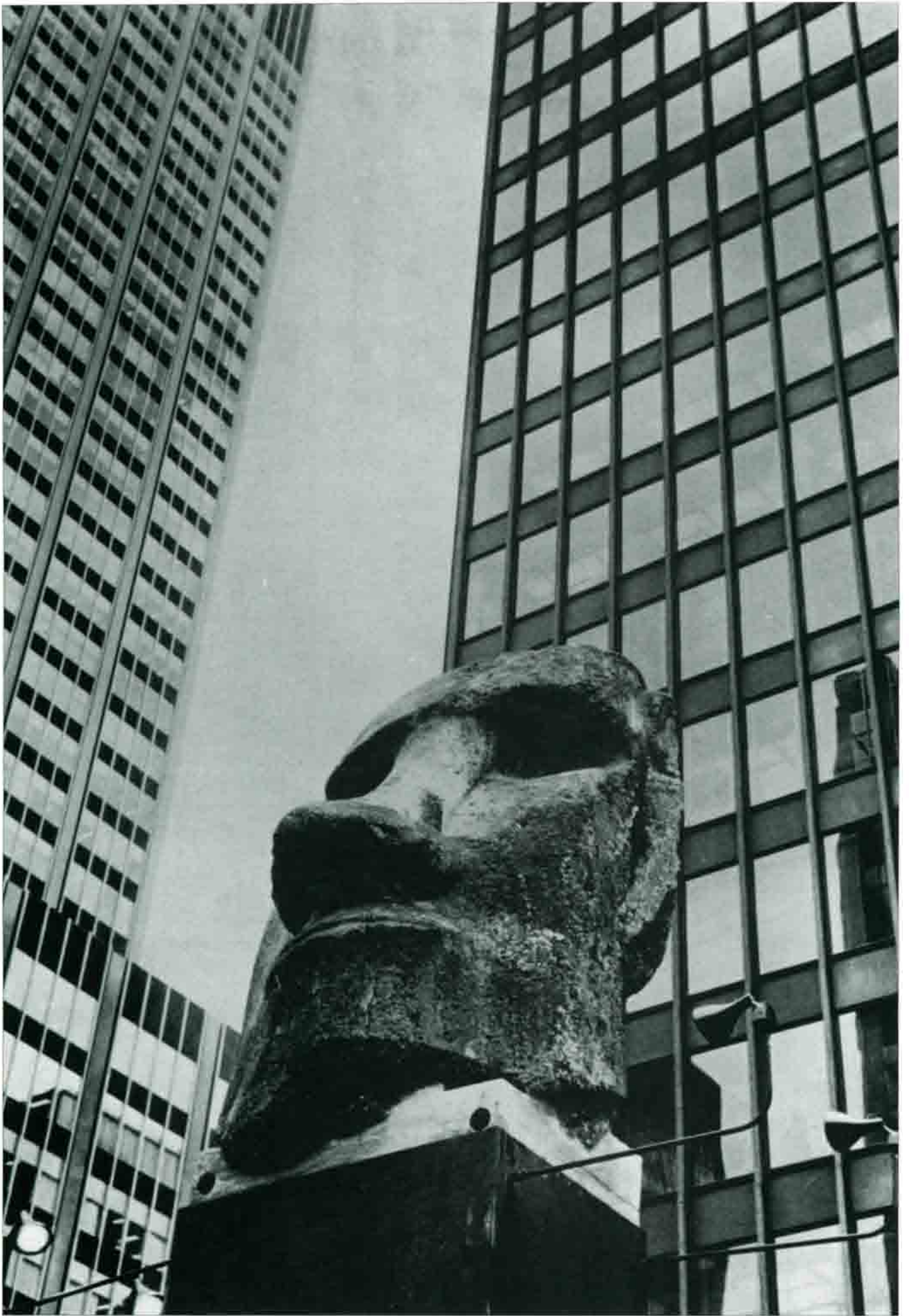
The island is famous for its huge statues and the mystery that surrounds them, a mystery that originated largely with the first reports of the European explorers who discovered and visited it in the 18th century. It was incomprehensible to them how these enormous sculptures and monuments could have been fashioned by an apparently primitive people.

To reach a better understanding of the mysteries of the island, one must review the history of its culture, which developed without contact with the outside world. This begins, of course, with the geological formation of the island and the evolution of flora and fauna. The history continues with the arrival and

establishment of man on the island, his sociocultural development and his interaction with a relatively poor environment over more than a millennium.

During that time the culture became sophisticated enough to create the megalithic monuments, simultaneously bringing about a serious ecological crisis. This led to intertribal wars and an overturning of the social system, in which the original cult of the ancestors was replaced by the birdman cult. The struggle for survival continued for nearly two centuries during which the environment remained impoverished. The discovery of the island by Europeans had a tremendous influence over the settlers and their surroundings.

Today there is an increasing awareness worldwide of the need to safeguard the heritage of this unique culture. The preservation of the monuments, symbols of the Rapanui heritage, can be achieved successfully only if they remain in their original context. This is essential for the relatively small island, in which monuments and environment are so much a part of each other. Only thus can the magic of Easter Island be maintained.



The World Monuments Fund on Easter Island

Opposite: Head of a moai on temporary exhibition at the Seagram Building in New York City. (photo: WMF Archive)

Colonel James A. Gray, founder of the World Monuments Fund (originally called International Fund for Monuments), visited Easter Island in the early 1970s. He traveled there at the invitation of United States Ambassador Edward Korry, whom he had met shortly before in Ethiopia, where the newly established WMF was carrying out its first field project, the conservation of the rock-hewn Coptic churches at Lalibela. Ambassador Korry had been the U.S. diplomatic representative in Ethiopia prior to his reassignment to Chile. From Chile, he contacted the Colonel and invited him to come and see the country's extraordinary monuments.

During his visit, Colonel Gray learned that an American archaeologist at the University of Wyoming, Dr. William Mulloy, had recently completed a detailed report at the request of UNESCO on the conservation of the island's heritage, and had already restored an *ahu* complex. He contacted Professor Mulloy, and a bond was forged between the two of them. WMF's Vice Chairman H. Peter Stern visited the island at that time and developed a special interest in its culture. He arranged for support from the Ralph E. Ogden Foundation to permit Dr. Mulloy to work on the island for six months out of every year. For five years beginning in 1973, three major projects were carried out by Mulloy, his collaborator Gonzalo Figueroa, and his graduate students William Ayres and

Patrick McCoy. The latter was also assigned to begin the complete archaeological survey of the island.

This work was interrupted when Mulloy fell ill and died of cancer in 1978. He remains, even today, the towering figure of Easter Island archaeology. No one has contributed so much to our knowledge of the island and its culture. Mulloy was also a proselytizer. He wanted to communicate his interest and passion for the special quality of the island's culture to as many people as possible. His field report of April 1973, for example, suggests restoring a ceremonial site near the village and airport so that visitors, many of whom stayed for only a few hours during layovers to and from Tahiti, could better appreciate the culture.

During his visit to the island, the Colonel also concluded that the culture needed more public exposure. He felt that the only way to interest people in the lessons of this astonishing culture was for them to see its sculpture firsthand. In order to accomplish this, Gray and Mulloy began planning for an exhibition of one of the Easter Island colossal sculptures in the United States. They selected the head of a *moai* for international exhibition and, assisted by the United States Airforce, arranged to have it flown to the U.S. During 1968, the head of the *moai* was erected for temporary exhibition before the Pan American Union in Washington and at the Seagram

Building in New York. (A friend told me, some 20 years later, that he remembered the exhibition well and that, in his opinion, "The Seagram Building never looked better!") The operation bore fruit some 25 years later, when a wealthy doctor from New Jersey, who had become interested in Easter Island after seeing the installation in New York, left a bequest of nearly half a million dollars to WMF to support conservation work on the island.

Before he died, Mulloy recommended that no further reconstructions should be carried out, as the destruction of these sites during internecine warfare is part of the island's history. In planning a program to succeed Mulloy's research and interpretative work, WMF has decided to focus its efforts on conserving existing conditions rather than re-erecting more ceremonial sites.

For the last 10 years, with the means provided by the Willard and Ruth Somerville bequest, WMF has sponsored a program of on-site conservation research and training, in cooperation with several Chilean and international institutions. In 1986, WMF collaborated with ICCROM and CONAF, the Chilean park service, in sponsoring a training course on the island for its park rangers, led by park management expert Carlos Weber, stone conservation scientist A. Elena Charola and site conservator Nicholas Stanley Price. In 1987, an interdisciplinary



1. Dr. William Mulloy with moai head at Tongariki.
(photo: George Holton)
2. North wing of Abu Ko Te Riku after Mulloy's restoration. (photo: William Mulloy)
3. The moai head during its travels.
(photo: WMF Archive)

nary international meeting was organized in Santiago de Chile in collaboration with ICCROM, CONAF and DIBAM, the Chilean organization responsible for museums, to establish priorities in the conservation of the heritage of Easter Island. Since then, Charola has directed WMF's collaborative activities with the Centro de Restauración in Santiago to monitor conditions in the Ana Kai Tangata cave and to capture and computerize unpublished research; and with the Chilean Park Service to develop an archaeological management plan, publish a guide, and prepare a training manual for site workers and guides. And presently, WMF is collaborating with the Easter Island Foundation in the republication of Mulloy's field reports, which remain key documents for all researchers on the island.

In 1988, WMF organized an international scientific competition for papers on the conservation of volcanic tufts, following the recommendations of the 1987 meeting. This concluded in a specialized meeting on the island which convened international stone experts to comment on the problems faced by its heritage today. From this meeting came the recommendation that a master plan be established and implemented over 10 years to bring the sensitive conservation problems of the island into a state of balance. Sadly, some four years later, there has been little progress toward the realization of this scheme.

This is due in part to the Chilean government's complex situation on Easter Island due to the overlapping jurisdiction of different ministries. Bizarre activities, including a motorcycle gymkhana, occur with a regularity that confounds and frustrates the worldwide friends of the island's culture. These events are relatively innocuous, however, compared to the narrowly averted threat, a few years ago, that a major hotel complex might be built on Easter Island's only beach (and adjacent to one of the island's most important sites). Even the visits of tourists, which provide most of the island's income, pose a threat unless the island is better equipped to maintain and guard its sites to prevent unintentional damage.

As of this writing, Easter Island has no permanent conservator or the facilities required for a constant monitoring of the sculptures. A chronic shortage of park rangers makes it impossible to oversee all the activities that affect its archaeological heritage. In spite of repeated recommendations by experts and extensive preliminary work by the government, Chile has not yet placed Easter Island on the World Heritage List, which would afford some protection and further prestige.

And yet, one must keep in mind the fact that Easter Island's recognition as one of the world's greatest cultural treasures is of very recent vintage. Rapa Nui resi-

dents received basic human and constitutional rights only in 1965. Until then, the island was viewed as a resource to exploit in any way possible. It is in a way fortunate that the island's monumental heritage is so large and numerous; otherwise, it would be totally dispersed around the world today as is the rest of the island's archaeological patrimony! As it is, we must weigh carefully the decisions we make, which will significantly affect the health of the island and its culture as it enters this new era of increased communication and contact with the outside world.

The present volume is a fascinating overview of the island's heritage and the challenges to be faced in maintaining it. We hope it will enhance the appreciation and enjoyment of every visitor who uses it as a guide and resource, as well as every reader who hopes someday to see this remarkable place firsthand. I am sure that every reader will be grateful to Dr. Charola for her unflagging and zealous crusade to make Easter Island workable as a protected but vital human environment.

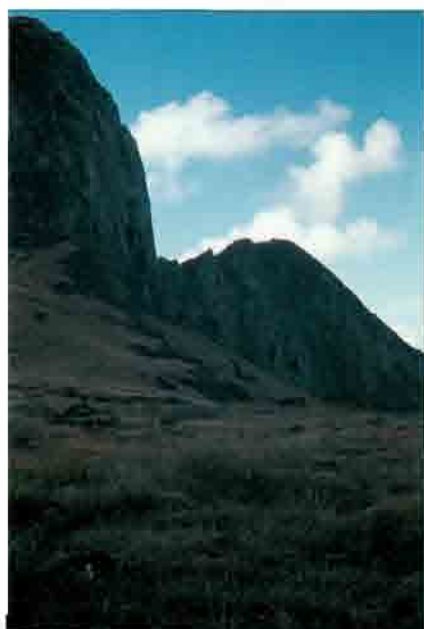
Bonnie Burnham
Executive Director



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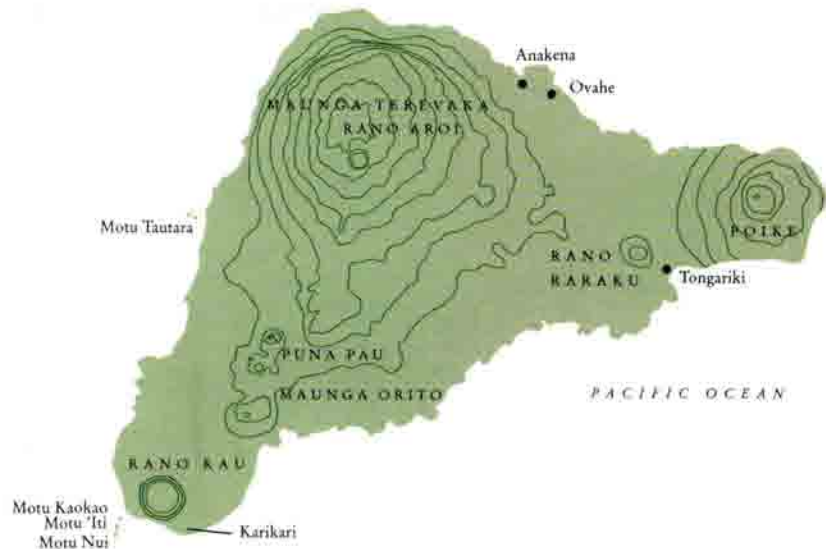
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Historical Overview

1. The cliffs of the Poike peninsula, seen from beyond Tongariki.
2. Rainbow over Anakena.
3. The sea-eroded cliffs on the east side of the Rano Raraku volcano.
4. Cliffs near the southwest coast of the island.



The Origin of the Island

Easter Island, at 27°09'S and 109°26'W in the South Pacific, lies some 4,000 kilometers west of Santiago, Chile, and about the same distance from Tahiti, in French Polynesia, the two endpoints of the air route that serves the island. The closest land is the small, uninhabited island of Sala y Gomez, 415 kilometers to the east; the closest inhabited land is Pitcairn Island, 2,200 kilometers to the northwest.

With a surface of about 166 square kilometers, the island is the summit of an underwater volcanic complex that was formed primarily through the eruption of three volcanoes – Terevaka, Poike and Rano Kau – which determined its triangular shape. The longest coast runs for about 24 kilometers from the east point, where the Poike volcano is located, to the southwest point, where the Rano Kau volcano is found.

Mount Terevaka, at the north corner of the island, is its highest point, rising 500 meters above sea level. It is the youngest of the three main volcanoes, with its last major activity dating to approximately 10,000 years ago and its most recent lava flows to 2,000 to 3,000 years ago. Most of the island was formed from the lava flows of this volcano. Poike is the oldest volcano, dating from approximately three million years ago; and Rano Kau had a complex eruption history ending

in the collapse of the central cone and the formation of a caldera, which holds a fresh-water lake.

The island's characteristic rolling landscape was created by many other subsidiary volcanoes. Among these are Rano Raraku, whose south slope served as the quarry for most of the statues on the island; Puna Pau, the source for the red scoria used to carve the topknots for the statues; and Maunga Orito, which provided much of the obsidian used in tools and arms. Obsidian was also quarried at Motu 'Iti, one of three islets off the southwest tip of the island.

The high cliffs that frame most of Easter Island speak of the intensity of the wave action that has eroded them. On the south side of the Rano Kau volcano, marine erosion has reached the edge of the crater itself; this thin edge, called Karikari, is over 200 meters high. The same phenomenon formed the cliffs of the southeast side of the Rano Raraku volcano, which stood by the sea until a lava flow from Terevaka filled the area around it. Though several bays and coves are found between the cliffs, only two small beaches, Anakena and Ovahe, formed on the north coast.

The soil, which is still covered in most places by lava debris, was formed by the decomposition of the various volcanic rocks. Caves and caverns can be found throughout the island. Many of these

originated from lava tubes, in which the outer layer of a lava flow hardens while the liquid interior drains away, leaving an empty tunnel. Caves in the cliffs and around the seashore may also have been formed by waves eroding the softer lava strata from between denser strata.

The porous nature of the lava, as well as the island's many caves, prevents the formation of creeks or watercourses, since rainwater is immediately absorbed by the ground; a few springs, however, are found near the north coast. There are only three lakes where rainwater accumulates: the craters of Rano Kau, Rano Raraku and Rano Aroi.

Climate

Easter Island's oceanic subtropical climate has moderate temperature variations, with a yearly average of about 20°C and a minimum and maximum average of 15.5°C and 27.3°C, respectively. Winds are everpresent. During spring, summer and autumn (September to May) the southeast tradewinds (ESE) are dominant, while in winter (June to August) they blow from the north-northwest. The annual rainfall is 1,130 millimeters at Hangaroa, but it can vary significantly – about 30 percent – from year to year and from area to area on the island. The rain tends to fall mainly in showers rather than storms, and most frequently in May and June.



1. *Totora* reed (*Scirpus californicus*), locally known as ngaatu, growing in the crater lake of the Rano Raraku volcano.
2. The flower of the tanoa (*Ipomoea pes-caprae*), the indigenous morning glory-like creeper growing on the Tongariki site.
3. Partial view of the Rano Raraku volcano lake from the edge of the crater, showing the eastern cliffs.
4. General view of the rolling landscape of the island. In the distance (center) is the restored Ahu Akivi.



The Original Landscape

The gently sloping grasslands and occasional wooded areas of the present-day island are the result of centuries of interaction between man and the environment. Many studies have been carried out to provide an accurate picture of what the island looked like at the time the first inhabitants arrived: covered with bushes and grasslands, it also had some wooded areas with palms and other trees; ferns, lichens and mosses were found in shady areas.

Of the flora indigenous to the island, the endemic palm tree *niu* (*Paschalococos disperta*), now extinct, is thought to have been similar to the Chilean palm (*Jubaea chilensis*). The presence of several now-extinct small trees and bushes (of the *Coprosma* species) and daisy trees (*Compositae*) has also been identified from pollen analysis. Other indigenous plants include the endemic *toromiro* (*Sophora toromiro*), a mimosa-like tree that grows up to three meters high; and the *hauhau* (*Triumfetta semitriloba*), a small tree whose bark was used to provide fiber for ropes and fishing nets. Among the main bushes are the *ngaoho* (*Caesalpinia major*), a prickly shrub that has fragrant yellow flowers; the *poporo* (*Solanum forsteri*), a small, hairy shrub that produces edible berries; and the *pua nakonako* (*Lycium carolinianum*), which also produces edible bright red berries.

But extremely few specimens of these indigenous plants remain on the island: six *hauhau* trees, three *poporo* bushes, a few *ngaoho* and *pua nakonako* shrubs and only two small *toromiro* trees, both of them cultivated abroad and reintroduced to the island. The *ngaatu*, or totora reed (*Scirpus californicus*), and the *tavari* (*Polygonum acuminatum*), a type of bistort that grows in the crater lakes, are indigenous plants that have survived the influence of man. Another such plant, the *tanoa* (*Ipomoea pes-caprae*), a morning glory-like creeper with white to violet flowers, is still found along the seashore. (It was especially visible at Tongariki before the reconstruction of the *ahu*, or ceremonial structure, began at this site.) Nonetheless, most of the vegetation around the island's coasts and cliffs has not changed significantly since it is still mainly composed of the indigenous grass (*Paspalum forsterianum*) and the coastal fern *Asplenium obtusatum*.

The fauna, like its flora, was poor in species in comparison with that of other Pacific islands. Apart from insects, mollusks and sea animals like turtles, octopuses, lobsters and dolphins, the animal population was mainly limited to migrating seabirds – like the albatross, the frigate bird and several species of petrels and terns – which no longer go there due to man's hunting and interference with their breeding grounds. Recent archaeological studies have found evidence that there were at least six land-bird species:

herons, two types of rails, two types of parrots, and barn owls. The two lizard species now on the island, *moko uruuru kahu* (*Lepidodactylus lugubris*) and *moko uriuri* (*Ablepharus boutonii*), are widely found throughout the Pacific islands; they may have arrived independently or with the first men.

The Arrival of Man

Current scholarship holds that the first and only settlers of Easter Island came from the Marquesas Islands, approximately 3,400 kilometers to the northwest. The archaeological, linguistic and botanical evidence seems to corroborate the oral tradition that tells how the legendary king Hotu Matu'a, on leaving his home island of Hiva, sailed toward the rising sun. The Polynesians had remarkable navigational skills, colonizing the islands by making long, single voyages carrying people, food, plants and animals in catamaran-style vessels – two thin canoes joined by a wide platform, with triangular sails.

Based on the available archaeological data, the most probable hypothesis is that there was only one colonization of Easter Island and that this occurred, judging from radio-carbon datings, around the fourth or fifth century A.D. According to legend, between 100 and 400 settlers arrived at the island with Hotu Matu'a, landing at Anakena beach.



1. Anakena beach, where Hotu Matu'a is said to have landed.

2. and 3. The Te Pahu cave, formed by a lava tunnel. Some parts of the roof tunnel broke down, leaving open pits that were used as "natural" manavai for planting.

The settlers brought with them seeds, tubers, plants and animals. Chickens, pigs and dogs were usually taken along on such voyages, but apparently neither pigs nor dogs survived the trip. The chickens, being the only surviving domestic animal, played an important role in the island's economy. Also, whether intentionally or not, the settlers brought with them the Polynesian rat, *kio'e* (*Rattus concolor*).

Among the plants introduced by the settlers were *kumara*, a sweet potato (*Ipomoea batata*) with 25 varieties; *taro* (*Colocasia esculenta*), which provided an edible root; *uhi* (*Dioscorea* sp.), a yam, which, judging from the many varietal names, was widely available; *kaha*, a gourd (*Lagenaria siceraria*); *maika*, banana (*Musa sapientum*); *toa*, sugar cane (*Saccharum officinarum*); *ti* (*Cordyline terminalis*), an agave whose sweet rhizome could be eaten cooked and whose leaves provided a colored substance for tattooing; and *pua*, turmeric (*Curcuma longa*), which also provided a dye.

The trees introduced were *mahute*, paper mulberry (*Broussonetia papyrifera*), from whose bark a textile, *tapa*, could be fashioned; *marikuru*, soapberry tree (*Sapindus saponaria*), whose fruit could be used as an equivalent to soap because it contains saponins; *mako'i* (*Thespesia populnea*), also known as Oceanian rosewood, whose wood was

used for carving; and *naunau*, a sandalwood that no longer grows on the island.

Except for the cultivated plants *kumara*, *taro*, *maika* and *toa*, few specimens, if any, remain of these introduced plants. Only two *uhi* plants, as well as some *ti* plants, are known to be growing in private gardens, though some specimens of the latter plant still grow in the wild. *Kaha* plants grow only in cultivation. No *pua* plant has been found in the last 80 years, and only a few non-fruiting specimens of *marikuru* have been seen. Most of the large *mako'i* trees have been cut down to use the wood for carvings sold to tourists. Though *mahute* is still fairly common, it is cut so that it looks like a shrub.

Social Development

Legend has it that Hotu Matu'a divided the island, which he called Te Pito 'o te Henua (the navel, center or end of the earth) into two parts: the Kote Mata Nui to the north and west, and the Kote Mata 'Iti to the east and south. Some boundary markers (*pipi horeko*) can still be found today. The north and west territory was occupied by various clans named Miru (*mata*), which eventually formed the Tu'uaro group of clans. The word *mata* can also be translated as "territory": in Polynesia no distinction is made between the social group and the land it occupies. The south and east ter-

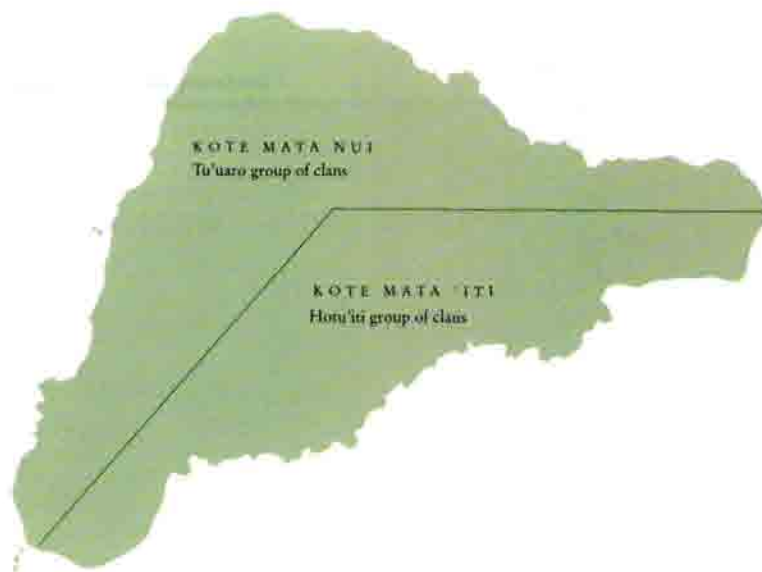
ritory was occupied by clans which later formed the Hotu'iti group. Each clan originated from a son or grandson of Hotu Matu'a and was made up of a number of *ure*, which are lineages in anthropological terms but which the Rapanui identify as tribes. Each *ure*, composed of a group of extended families (*ivi*), had its own ceremonial center.

The social structure was based on a religious aristocracy. The king (*ariki mau* or *ariki henua*), thought to be of direct descent from the gods, was of the Miru clan. He had *mana*, supernatural powers, and thus had influence over life and death and the fertility of plants and animals. Only he could perform the important ceremonies, and he was separated from the rest of the population through strict laws of *tapu*, the forbidden. All this gave him the authority and prestige necessary to maintain such a highly regulated system.

The royal family (*ariki paka*) and the priests (*ivi 'atua*) constituted the nobility. The warriors (*matato'a*) followed in importance, and then the crafts experts (*maori*), the heads of lineages (*tangata hōnui*), the common people (*hurumanu*) and the servants or slaves (*kio*).

Ceremonial and Living Centers

The heart of each group's ceremonial center was the megalithic altar, or *ahu*,





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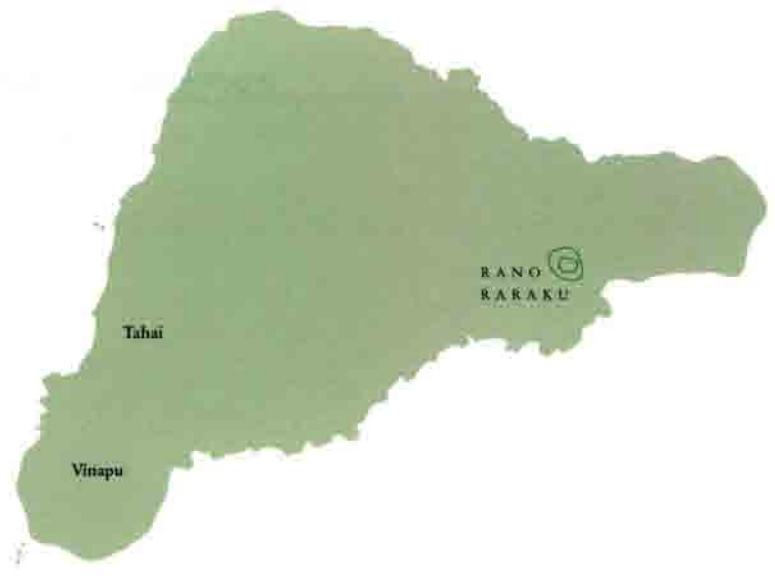


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1. *Ahu Ko te Riku at the Tahai site features a good example of a "classical" moai. The pukao is a modern replica. There is no archaeological evidence that the statue had eyes; they were installed by the local community for the benefit of tourists.*

2. *Hare paenga at the Tahai site. The rectangular basalt stones that served as foundations (paenga) had holes carved into them to hold the branches that formed the mainframe of the structure.*

3. *The ceremonial complex at Tahai includes three ahu: Ahu Vai Uri, with five moai (left); Ahu Tahai, with one moai (center); and Ahu Ko te Riku, with one moai with pukao (right).*



which was dedicated to the cult of the ancestors of each related group of families. Often the ahu, a raised platform, held more than one statue, or *moai*, representing the ancestors. Meetings or ceremonies of any consequence – such as initiation ceremonies, assemblies and the great feasts to distribute harvests and food – were held before the ahu and in front of the statues. During funerary rites, the dead body, wrapped in *tapa* cloth, was put on the ahu; it remained there until it had decomposed, when the bones were carefully washed and buried within the ahu structure in a stone-lined cavity (*avanga*).

The houses of the nobility were located near the ahu, most of which were along the shore, while those of the commoners were more inland. The houses (*hare paenga*) were simple structures whose elliptical outlines, created by rectangular basalt blocks, looked like upturned boats. Rounded holes carved into the surface of the basalt blocks served to hold the branches that formed the mainframe of the hut, which was then lined with banana leaves, palm leaves, or thatch made from dried sugar-cane leaves or tall grasses. The structure had one narrow, low entrance and no windows and sometimes had a semicircular front pavement of rounded cobbles (*poro*). The houses measured, on average, 10 to 15 meters in length and about two meters in width, although some were as long as 40 meters. These dwellings

served mainly for sleeping or as shelter from the rain. The only household goods were mats and blankets plaited from vegetable fibers, stone pillows (*ngarua*) and gourds that were used to hold food and water.

The houses of commoners were even more simple, in most cases without foundation stones. Also used as dwellings were the caves and rock overhangs that abound on the island. The islanders formed small settlements of two or three houses by the fields in cultivation. Each house was complemented by a stone-lined earth oven (*umu pae*). Other features included garden enclosures (*manavai*) that protected plants from water loss and wind exposure, and fortified structures that seem to have served as chicken houses (*hare moa*), an indication of the important role these animals played in the local economy.

Houses with other types of floor plans – square, rectangular or even circular – are found mostly in the interior of the island, and from archaeological data we can conclude that they were used for seasonal occupations related to particular tasks such as woodcutting.

Fields were cultivated intensively, and archaeological data supports the theory that the burn-and-slash method was used to clear them, promoting ground erosion and thereby diminishing the land available for cultivation.

Fishing was indirectly affected by this deterioration, since the loss of trees curtailed the manufacture of boats for deep-sea fishing, which seems to have been practiced mainly on the north coast. The disproportionate number of fish-hooks found along that coast confirms the tradition that the Miru tribe had the rights to deep-sea fishing. The archaeological records of fish-hook types also demonstrate a change from deep-sea fishing to shore fishing. A great variety of fish-hooks have been found that were used mainly for shore fishing. In shallow water, such as that on the south coast, nets were also used to catch fish.

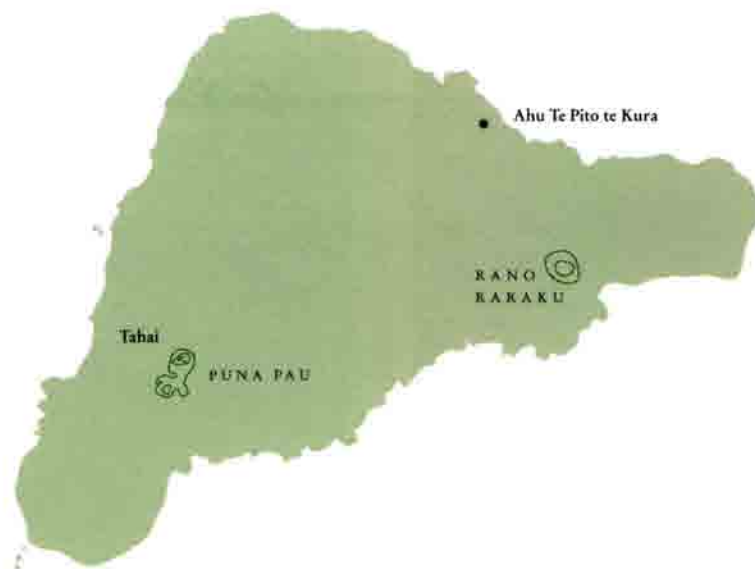
The Evolution of the Culture

Approximately three centuries passed before the construction of the first important ceremonial centers, still to be found on the island today: the centers at Tahai and Vinapu, which have been dated to around 700 A.D.

Like most of the moai on the island, the statues on these ahu were carved on site at the Rano Raraku quarry. The job was carried out by carving experts, *tangata maori anga moai maea*, who used mainly basalt picks or chisels (*toki*) for the purpose. Almost all the details of the statues were carved with the stone still in the quarry; the back side was finished at the foot of the quarry, once the statue had been released from its "bed."



1. Because the statues were lowered into pits, which over the centuries have filled with an accumulation of earth, only the heads remain above ground today.
2. View from the south of the Rano Raraku volcano, the location of the quarry from which most of the statues were carved.
3. A keel on the back of a moai keeps the statue attached to the bedrock in the Rano Raraku quarry.



According to island legend, the moai then walked from the quarry to the ahu of their destination. Although there is no record of how the moai were actually moved, several different methods have been suggested, all of which may have been used in different terrains or at different times. William Mulloy suggested that the statue, prone on its protruding front, was partly suspended from a vertical bipod, which served as a fulcrum for advancing the statue by rocking. Czech engineer Pavel Pavel demonstrated that a standing statue may have been moved by tilting and swiveling by means of ropes fastened around its head and base, requiring some 16 people to move it; and Charles Love proved that when the statue was placed on two logs carved to fit its base, and acting as sled runners over small wooden rollers such as palm-tree trunks, the same number of people with only two ropes could move it far more quickly and efficiently. It has also been postulated that the statues were mounted on rafts and floated along the coast to their ahu.

The average statue measures four meters and weighs an estimated 50 tons. The largest statue set on an ahu is the Moai Paro at Ahu Te Pito te Kura, which is about 10 meters high and weighs an estimated 80 tons. The largest statue left in the quarry measures close to 22 meters, and calculations estimate its weight at about 250 tons. After being stood on their ahu, some statues received

a topknot (*pukao*) on their head. The pukao were carved from the red scoria of the Puna Pau volcano and could weigh as much as ten tons. It is assumed that they represented the islanders' hairdo, in which the hair was dyed with red earth (*kiea*) and bunched on top of the head.

A few of the statues were fitted with eyes as a finishing touch. Manufactured in white coral with red scoria or black obsidian pupils, the eyes gave the statue its *mana*.

The design of the statues evolved over time, eventually becoming more stylized, and the "classical" moai, like the one at Ahu Ko te Riku at Tahai, date from the 12th century. Over the years, the statues became larger and larger, the result of a highly competitive society in which the statue's size represented the power of the particular tribe. During the period of intense moai carving, from the 11th to the 17th century, the ever-increasing manpower required to maintain the practice drained the natural resources to such an extent that they were no longer sufficient to sustain the economic system.

The Decline and Crisis

During the heyday of Easter Island culture, the population increased to an estimated 7,000 to 10,000 inhabitants. This

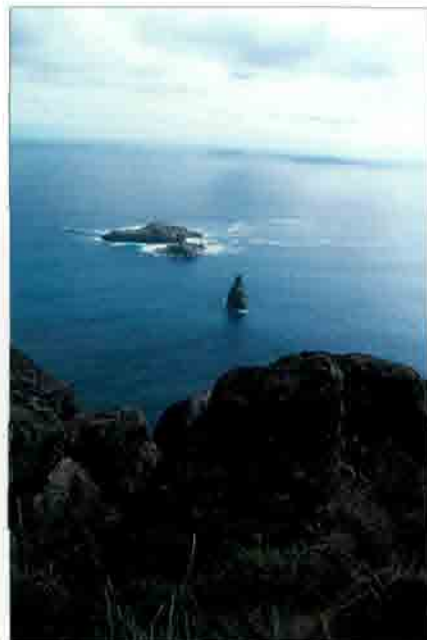
eventually led to a dwindling of the island's natural resources, especially the scarce trees, which were required for the transport of the statues and for building fishing boats, curtailing deep-sea fishing.

The palm tree became extinct; it was over-harvested and, because its nuts were eaten by both humans and the Polynesian rat, was not reseeded. The replacement of scrub forest by grasslands and the slash-and-burn method of agriculture brought about the loss of fertile soils, which in turn caused a shortage in the food supply.

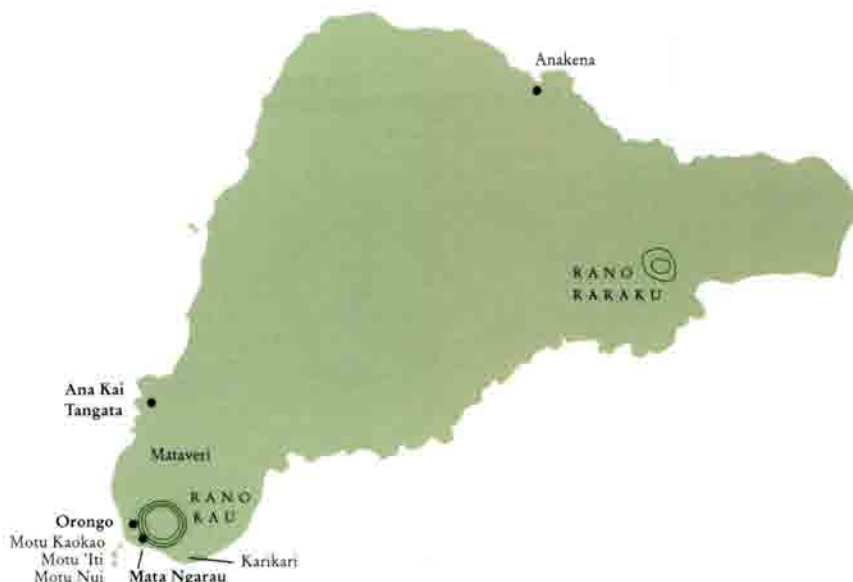
All of these developments combined to bring about a crisis, which peaked in the 17th century. Food shortages provoked intertribal wars, in which warriors acquired power by their control over different tribes, breaking up the established order. The moai of the vanquished tribes were toppled, the people taken prisoner. The ahu came to be used mainly for burying purposes, and with this change in function came a change in the ahu's shape; the semipyramidal ahu and the boat-shaped ahu (*ahu poe-poe*) originated at this time.

The Birdman Cult

During the time of intertribal wars the ancient cult of the ancestors was overshadowed by the ascendancy of the creator god Makemake and the cult of



1. The south edge of the Rano Kau crater, called Karikari, which separates the interior lake from the sea. (photo: R.V. Gianzone)
2. View of the three motu from Orongo.
3. In the foreground of this view of the Orongo village, part of the sacred precinct of Mata Ngarau can be seen. (photo: R.V. Gianzone)



the birdman, Tangata Manu, who represented Makemake on earth. This new cult was centered around the annual election of a birdman, held in early spring, with the arrival of the seabirds migrating to their nesting sites on the islets of Motu Nui, Motu Kaokao and Motu 'Iti, at the southwest corner of the island. The ceremony took place at Orongo, on the edge of the Rano Kau volcano. The priests, candidates and members of the dominant clans lived in a ceremonial village of stone houses built near the sacred precinct of Mata Ngarau, where stones are richly decorated with petroglyphs of birdmen, Makemake representations and vulva images (*komari*), important fertility symbols. The other participants gathered at the foot of the volcano by Mataveru.

The houses that constitute what is now called the Orongo village date from the mid-16th century. Looking toward the sea, they are roughly oval in shape and are built with slabs of local stone (*keho*), with roofs made of successive layers of large slabs cantilevered to produce an arch. The arches are covered with dirt, and grass grows on them. Inside, some of the houses are decorated with rock art: paintings on the vertical wall slabs or the ceiling, or incised petroglyphs.

The arrival of the seabirds could be seen from Orongo. The election of the birdman was based on the retrieval of the first eggs laid by the *manu tara*, the

sooty tern (*Sterna fuscata*) and the gray-backed tern (*Sterna lunata*). Each candidate had a servant (*hopu*), who swam to the islets, waited there until the birds laid their eggs, took one and swam back. The first *hopu* to present his master with an egg determined the winner. The new birdman then had his head shaved and painted white. For the next year the birdman lived in a cave or a house, either by Rano Raraku or by Anakena, depending on which clan he belonged to. He was under a strict *tapu*, segregated from his family, and his election gave his clan power and special privileges. These were often abused, however, leading to continuing intertribal fights.

Orongo had been a sacred site ever since King Hotu Matu'a went there when he felt his death was near and, standing on Karikari, called to his family spirits (*akuaku*). The site is also thought to have been used for solstice-oriented activities and other rituals many years before the competitions of the birdman cult.

Another site associated with the Orongo ceremonies was Ana Kai Tangata, which can be translated as "the cave where men eat" or "the cave where men are eaten," a reference to the cannibalism that supposedly took place during the crisis years. The cave was apparently used for ceremonial feasts, and the ceiling is decorated with rock paintings depicting the *manu tara*.

The Arrival of Europeans

The first recorded European contact with Easter Island was in 1722, when Jacob Roggeveen, commander of the Dutch ship *Afrikaansche Galei*, sighted the island and gave it its present name. Later in the 18th century, three other European expeditions touched the island. The first was headed by the Spanish captain Gonzalez y Haedo in 1770; the second, four years later, by Captain Cook; and the last by Comte de La Pérouse in 1786. The reports from these expeditions agree on the island's poor vegetation and its lack of large trees; they also describe the *toromiro*, *mahute*, *marikuru* and other smaller plants.

Slave Raids

The year 1805 marked the beginning of a disastrous period for the Rapanui people and their culture. The New England whaler *The Nancy* arrived that year and kidnapped 22 islanders to settle them on Más Afuera island, of the Juan Fernandez archipelago, for seal hunting. Several other kidnappings changed the relatively friendly approach the islanders had had toward Europeans, making it impossible for other expeditions to land at the island or forcing them to leave soon after landing. Whaling ships occasionally arrived at the island; it is believed that sailors aboard these ships introduced syphilis to the Rapanui.



1. Rock painting of manu tara at Ana Kai Tangata.
(photo: R.V. Gianzone)
2. The cave on the right is Ana Kai Tangata, located
to the south of Hangaroa.



The slave raids escalated, culminating in the raid of December 1862, when in a single incursion some 500 islanders were taken away. Among them were the king, his son and most of the learned men, those with the knowledge to read and interpret the *rongorongo*, the Rapanui's original script, which was usually done on wooden tablets (*kohou rongorongo*) and is believed to have served as a mnemonic device for recitation of sacred lore. The captives were sold as household slaves or sent as workers for guano exploitation on the islands off the coast of Peru.

It is estimated that between 1,000 and 2,000 men, women and children were captured during these slave raids. Official requests by the French and British governments to Peru resulted in the liberation of the 100 surviving islanders. Only 15 of those shipped back to the island arrived there, the rest having died before the end of the journey from tuberculosis, smallpox or sheer exhaustion.

The arrival of the returning slaves unleashed a smallpox epidemic on the island, which reduced the population, estimated at around 4,000 at the beginning of the century, to about 1,000 by 1866. This was the final blow for the native culture, which by this time had suffered the great loss of the learned people who guarded the traditions. When the missionaries arrived that year,

they were surprised at the natives' lack of interest in and knowledge of their own history and lore.

Eugène Eyraud, a layman of the Congregation of the Sacred Heart, was the first European to settle on the island. He arrived at the beginning of 1864 with some islanders rescued from a Peruvian ship. After a stay of less than a year, during which he was stripped of all his goods by the Rapanui, he was rescued from his ordeal by passing missionaries. He returned with Father Hippolyte Roussel in 1866, the same year that two other priests arrived. From that date on, the conversion of the islanders proceeded slowly but steadily. By 1868, when Eyraud died, all the islanders had been baptized. At about this time the last known birdman ceremony was held.

The work of the missionaries was interrupted by the activities of Jean-Baptiste Dutrou-Bornier, a French adventurer. When he arrived at the island he bought a parcel of the best land at Mataveru from the natives and settled there. A group of islanders came to live with him, and his opposition to the work of the missionaries led to war between his native allies and those settled with the missionaries at Hangaroa and Vaihu. In 1871, after three years of skirmishes, the missionaries left by order of their superior. Several hundred Rapanui accompanied them to Mangareva, one of the Gambier Islands. Others were recruited to work on plan-

tations in Tahiti belonging to John Brander, an associate of Dutrou-Bornier. Only 175 islanders were left behind.

While flying the French flag, Dutrou-Bornier established a Polynesian monarchy on the island and miserably exploited the remaining natives. Their number had decreased to 111 by 1877, the year Dutrou-Bornier was murdered as a result of his excesses. He was replaced by another associate of Brander, Alexander Salmon, who was more sympathetic to native ways and introduced many changes, including the raising of cattle and sheep. By 1886, when William Thomson of the USS *Mohican* carried out a survey of the island and its monuments, the sheep numbered close to 20,000.

In spite of requests by the natives for protection under its sovereignty, France showed little interest in the island, and it was annexed by Chile in 1888. In a first attempt at colonization, three families moved from the mainland to settle on the island, but they could not survive the local conditions. The situation was further complicated by the 1891 revolution in Chile, and during the last years of the 19th century the government leased most of the island to H. Merlet of Valparaíso, Chile, who obtained the interests held on the island by the representatives of Brander, Dutrou-Bornier and Salmon. Only the village of Hangaroa and its environs, approximately 21



1. The statue on Ahu Ature Huki in Anakena was re-erected by the local people at Heyerdahl's prompting in 1956.

2. View of Hangarua and a ship in the bay. Because there is no harbor, ships are unloaded by smaller craft that pull into the wharf at Hangarua.



square kilometers, remained the property of the Rapanui. Merlet sold his interests to the Compañía Explotadora de Isla de Pascua (CEDIP).

The 20th Century

At the beginning of the 20th century the island was completely devoted to raising sheep. The practice of selective burning to improve the pastoral value of the land, combined with the stripping of bark from trees and bushes by the sheep, managed to destroy the meager tree and shrub cover. Thus did the *toromiro* become extinct; and only a few specimens of the original trees, or those introduced by the settlers, survived in the few areas inaccessible to sheep.

According to press information at the time, CEDIP managed its land along feudal lines, and natives were not allowed to leave their assigned territory for fear that they would steal sheep and cattle. Their deteriorated living conditions led the Rapanui to a revolt in 1914, which increased public attention to their plight and resulted in the temporary revocation of the lease to CEDIP in 1916. At the time of the revolt, Katherine Routledge was on the island documenting and collecting information on native language and legends.

In 1917 the island was included in the maritime territory of Valparaíso. CEDIP

was given a new lease, this time for the whole island, and with different terms. It established, among other clauses, that CEDIP was to prevent any further loss of statues or other artifacts, to provide 30 square kilometers around Hangarua to be divided among the Rapanui and to provide a leprosarium to treat those infected with leprosy, which had been introduced to the island by a native returning from Tahiti in the late 19th century.

In 1933 the land surface of the island was registered as state property and was officially placed under military jurisdiction, and in 1935 the island was designated both a national park and a historic monument. That same year, Father Sebastian Englert arrived at the island, beginning a 33-year residence, during which he contributed much toward recording and documenting the cultural heritage of the Rapanui. The year before, a Franco-Belgian expedition had brought Alfred Métraux and Henri Lavachery to the island; while Métraux gathered ethnographic information, Lavachery documented the petroglyphs found around the island.

The lease to CEDIP was revoked in 1953 and Chilean naval authorities took over administrative control. The islanders, who numbered about 1,000, were still confined to Hangarua; the navy followed the same rule established by CEDIP forbidding the Rapanui to move

out of their allotted land. Permits were required to leave the island, but few were given, partly due to fear of leprosy transmission. Under naval rule the disease began to be treated systematically.

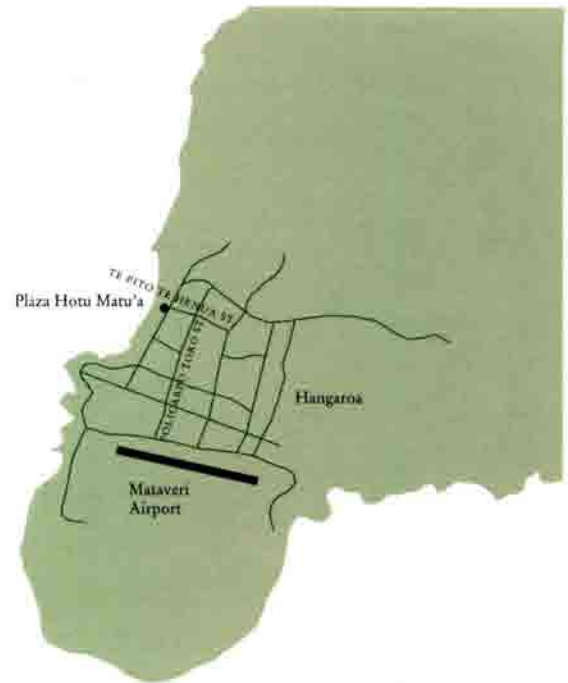
Thor Heyerdahl's well-known Norwegian Archaeological Expedition to the island took place in 1955-56. Along with important archaeological excavations, the expedition group restored Ahu Ature Huki in Anakena, re-erecting the first moai on its ahu. Archaeologist William Mulloy, who participated in the Norwegian expedition, returned to direct several investigations and site restorations in the 1960s and the mid-1970s. Also to be mentioned is the Canadian Medical Expedition, which in the summer of 1964-65 conducted a thorough medical and scientific examination of the native population under the aegis of the World Health Organization.

Meanwhile, the Rapanui were increasingly dissatisfied with their treatment and began to demand their civil rights. Their unrest resulted in a public outbreak in 1964-65, which brought about the designation of Easter Island as a department within the province of Valparaíso, the inauguration of a municipal government system in Hangarua and a revocation of the ban on Rapanui leaving the island.

In 1965 an airfield was constructed at Mataverí, and regular commercial flights



1. Moai at Plaza Hotu Matu'a, at the end of Te Pito te Henua Street, set on a pedestal by Govenor Tejeda in 1938. Note that the moai is looking out to sea, instead of inland.
2. Fish market on Policarpo Toro Street.
3. Houses and fishing boats near the wharf at Hangaroa. (photo: R.V. Gianzone)



were landing there by 1967. That same year a NASA station was established on the island to track artificial earth satellites; the U.S. military contingent associated with the station left the island in 1971. In 1986 the airport runway was extended to serve as an alternate landing for the U.S. space shuttle.

The original settlement at Hangaroa has grown into a small town of about 3,000 residents. Conditions have improved significantly over the last 30 years: in 1967 piped water supply was provided for the first time; in the early 1970s the village was fully electrified; and in late 1992 the paving of the main street, Te Pito te Henua, was completed. However, other problems, such as garbage disposal and increased vehicular traffic, have come along with the improvements. Primarily because utilities would be too expensive to provide in more remote areas, Hangaroa remains the only urban center on the island.



The Monuments of Easter Island



Opposite: The moai at Ahu Huri a Urenga, which Mulloy restored in 1972, has four hands.

Easter Island's most visible archaeological heritage is its monuments: the ahu with moai, the moai still left in the Rano Raraku quarry, the pukao quarry, the Orongo village and its richly decorated ceremonial precinct, and the many petroglyphs found at various sites around the island. The ahu with their moai, some of them partially destroyed during the islanders' internal wars and later abandoned for many years, are the only remains of the many ceremonial centers that dotted this island centuries ago.

William Mulloy emphasized the importance of conserving this heritage as early as 1966, when he proposed the idea of developing the island as an open-air museum and undertook the restoration of some of the ahu for that purpose. To appreciate the work involved in a restoration we need to look at the ahu and their toppled moai, left essentially as they were when abandoned. Although the ahu may have been left untouched for many years, the landscape around the sites has changed.

The Unrestored Ahu

There are about 300 ahu on the island, half of which held one or more moai. The dimensions of these ahu can vary significantly, as well as the technique of their construction and the number and size of the statues. Some ahu were also

decorated with petroglyphs or were crudely painted.

One of the most interesting sites is Ahu Akahanga, known for its connection with the Hotu Matu'a legend. The ahu, located toward the middle of the south coast, is also called the King's Platform, and the grave of Hotu Matu'a is said to be nearby. The ahu clearly shows the various phases of its construction: it has four platforms, twelve moai of different sizes and eight pukao. A boat ramp rises from the adjacent bay. Inland from the ahu the foundations of boat houses and earth ovens can be seen.

Ahu Vinapu, on the west end of the south coast, includes three separate ahu. Vinapu I, the first ahu a visitor will encounter to the right of the path, is remarkable for its beautifully fitted stone wall, whose construction technique has been compared to that used in the stone walls at Cuzco and Machu Pichu in Peru. (The comparison is only superficial, since the wall is made not of solid square blocks like the Peruvian one but of large slabs which hold the stone fill forming the main body of the platform.) The ahu is astronomically oriented to the winter-solstice sunrise.

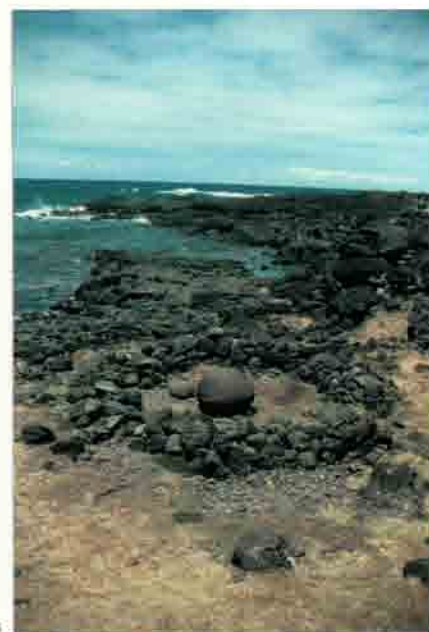
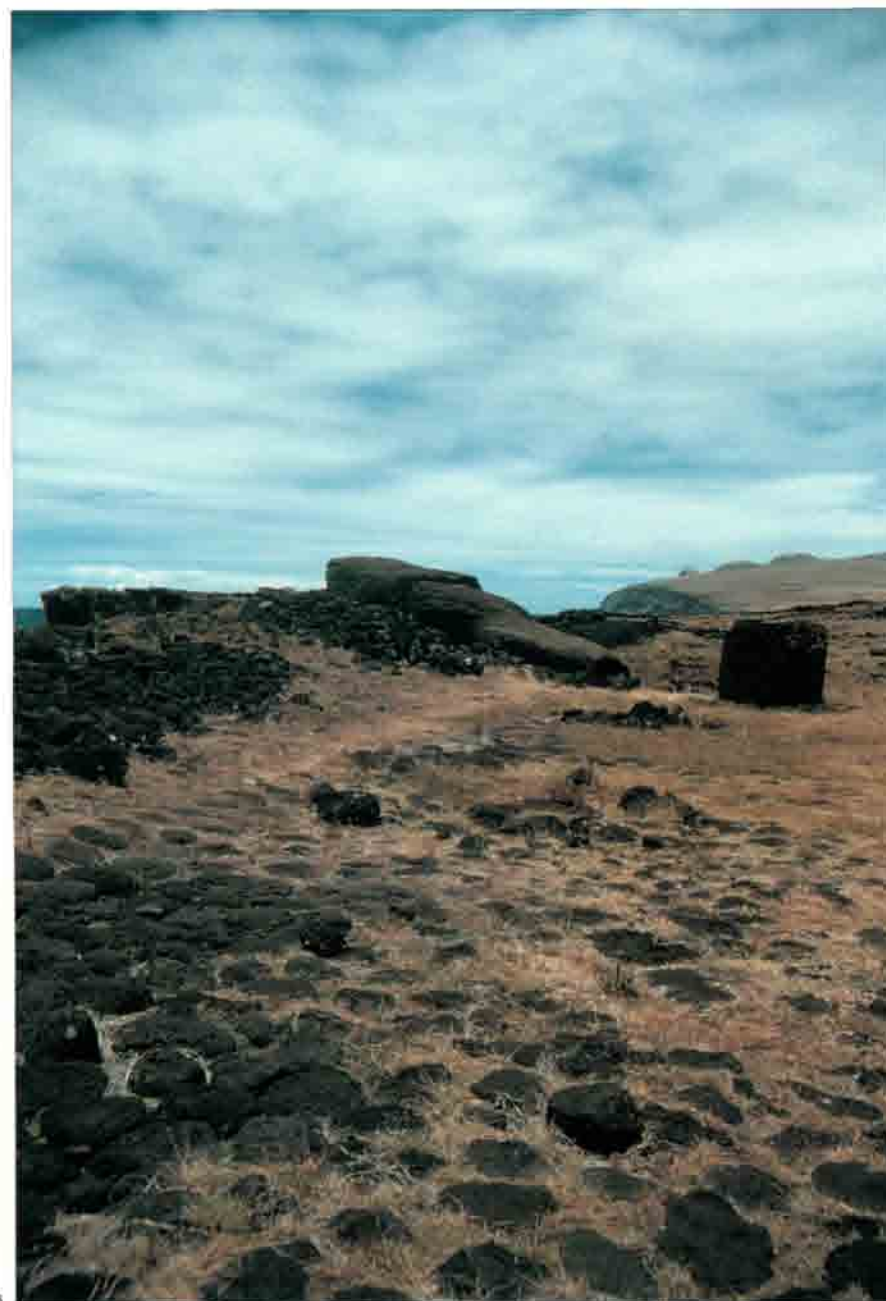
Six statues originally stood on the platform, but they now lie fallen on the land side. From the observations of Métraux we know that these were once colored red. A half-buried moai near the back

wall appears to have been put into a pit that was dug specifically for the statue.

Vinapu II, which is located beyond Vinapu I, is older and is also astronomically oriented. A headless red scoria statue, re-erected by Mulloy, stands in front of the ahu. This supposedly female figure originally had two heads, which are believed to have served as one end of a device used to hold the wooden rods that supported bodies of the deceased, which were wrapped in *tapa* cloth and left until they decomposed. It has also been suggested that it was used as a column for human sacrifices.

Of the third ahu, which is found to the left of the path and is perhaps the earliest one, only a pile of stones remains. The area around them was greatly disturbed by the installation of airport fuel tanks in 1968-69.

Ahu Te Peu, midway along the west coast, consists of two ahu. The northern ahu has a back wall of enormous blocks that are also well fitted, though the workmanship is not as good as that of Ahu Vinapu. Part of this wall collapsed due to excavations carried out during the Norwegian Archaeological Expedition in 1955-56. Four moai lie toppled in front of the platform, which houses a tomb holding several bones, including, until a few years ago, a skull. Beyond the plaza are the foundation stones of one of the island's largest boat houses, which is



1. Detail of the back wall of Ahu Te Peu.

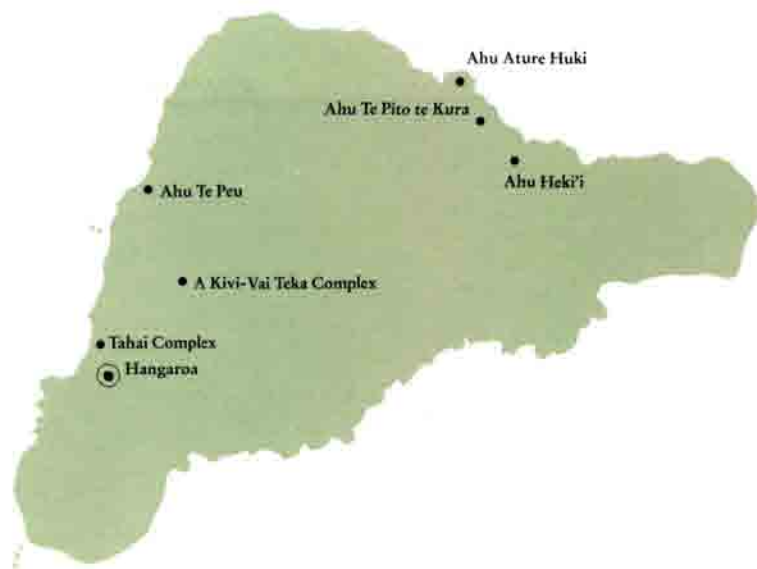
(photo: R.V. Gianzone)

2. Tomb by Ahu Te Peu.

3. Ahu Te Pito te Kura, which holds the island's largest statue, called Moai Paro, measuring close to 10 meters in length; the pukao is estimated to weigh 11.5 tons. In the foreground is the cobbled ramp.

4. The red scoria statue in front of Ahu Vinapu II is said to represent a female. It had two heads, which served as a device to hold bodies of the deceased.

5. The stone known as Te Pito 'o te Henua, or "the navel of the earth," by Ahu Te Pito te Kura.



further distinguished by having two entrances rather than the usual one. Other features found around Ahu Te Peu are garden enclosures and, farther away, several caves and lava tubes that were used for habitation. The cave closest to the ahu, Ana Te Pora, has an earth oven under an overhang by its entrance.

Ahu Heki'i, located on the north coast by La Pérouse Bay, has two platforms, both of which are astronomically oriented. The larger one, which supported six statues, has an enormous back wall set to face the rising sun at the winter solstice. The smaller one is skewed to face the rising sun at the summer solstice. On the large plaza in front of the smaller platform lie the statues and their original pukao.

At Ahu Te Pito te Kura, on the north coast but farther to the west than Ahu Heki'i, is the largest statue that ever stood on an ahu, measuring about ten meters in height and weighing an estimated 80 tons. The pukao is also enormous, with an estimated weight of 11.5 tons. This statue, called Moai Paro, is believed to have been the last one toppled, which is known to have occurred sometime after 1838.

Near that ahu, by the edge of the water, is a round stone called Te Pito 'o te Henua, "the navel of the earth," which legend says was brought to the island by Hotu Matu'a. As with other items said to have been introduced by this legendary king, the stone is of local origin. The stone was

originally described in the late 19th century by William Thomson in his report to the National Museum.

The Restored Ahu

Ahu Akivi was the first ahu to be restored after the statue at Ahu Ature Huki was re-erected at the prompting of Thor Heyerdahl in 1956. The restoration was carried out by William Mulloy and Gonzalo Figueroa in 1960. The seven moai on this ahu, according to recent folklore, represent the seven young men who were the first detachment to prospect the island before Hotu Matu'a arrived. The platform is oriented to face the rising equinoctial sun. The original structure of this ahu has been dated to around 1500. Behind the ahu are the remains of other structures such as crematoria and funerary cists. An interesting detail of the restoration is that not all of the small pebbles used between the rounded cobbles of the ramp to the ahu are originally from the island. Some may have been ballast on a ship that sunk near the coast and were later recovered by divers. The nearby Ahu Vai Teka was restored at the same time as Ahu Akivi. It is a small ahu, with only one incomplete statue (the head of the moai was never found).

The Tahai Complex, near the Hangaroa village, provides the best example of a ceremonial center. It has three ahu – Ahu

Vai Uri with five moai, Ahu Tahai proper with one moai and Ahu Ko te Riku with one moai that may have been adorned with a pukao – and surrounding boat houses, earth ovens, chicken houses, a garden enclosure, a *paina* circle (used in certain ceremonies), stone houses, a wharf and boat ramp, and caves.

The complex was restored from 1968 to 1970. The archaeological excavations and the restorations involved were done under the direction of Mulloy, Figueroa and William Ayres. The restoration began with the raising of the moai of Ahu Ko te Riku. In a project carried out for the benefit of *Paris-Match* magazine, a replica pukao was set on top of the moai, with the intention of removing the topknot after the photographic coverage for an article about the island was completed. But the local inhabitants objected, requesting that the pukao be left on the statue, where it remains. Islander informers to the archaeological team claimed that a pukao that had been on the site had been cut up to use as building material; the pukao could presumably have been from this statue. In 1990 a pair of eyes was installed by the islanders for the benefit of tourists, although there is no archaeological evidence that the statue ever had eyes.

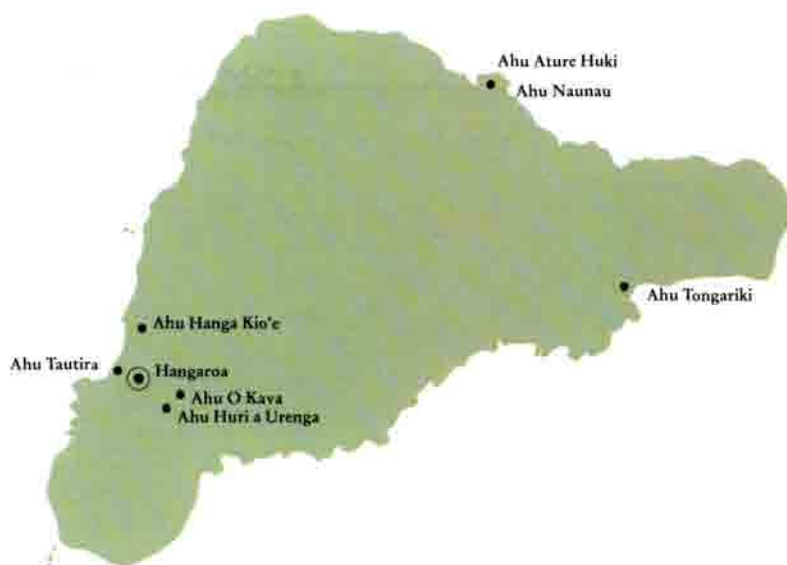
Later phases of the project were the restoration of Ahu Vai Uri, including the wharf and boat ramp and the stone



1. The two ahu at Hanga Kio'e, restored by William Mulloy in 1972. The ahu in the foreground has a complete moai, while the other has only a fragment. (photo: R.V. Gianzone)

2. Ahu Naunau at Anakena was restored between 1978 and 1980. In the background Ahu Ature Huki can be seen.

3. The seven moai of Ahu Akiwi.



houses. The wall that forms this structure closes some natural caves. It is unknown whether this was used as dwellings or as a large *tupa*. The purpose of these towerlike structures is not known but it is presumed they were used for astronomical observation. In some instances evidence has been found that they were used as dwellings. Not far from the Tahai complex is a small monument marking the tomb of William Mulloy, who died in 1978.

In 1972 the restorations of two ahu at Kio'e bay (hanga Kio'e), north of Tahai along the west coast, were also conducted by Mulloy. The first ahu has a complete moai and is usually called Ahu Hanga Kio'e, while only a fragment of a moai stands on the second ahu. To the north of the second ahu are the ruins of Ahu Akapu, which formed part of this ceremonial complex. A restored chicken house is located on the landside edge of the plaza. Ahu Hanga Kio'e is perhaps one of the last ahu-moai to have been built on the island (ca. 17th century).

That same year, 1972, Mulloy also restored Ahu Huri a Urenga, set on private property in the vicinity of the village of Hangaroa. Its single moai is distinguished by the fact that it has four hands. This ahu has a sophisticated alignment and orientation: it is aligned with two nearby hills, Maunga Mata-engo and Maunga Tararaina, as well as with two other small ahu, Ko Te Pei to

the east and O Kava to the west, and the skewed platform faces the rising winter sun.

In 1976 Mulloy started the first phase of the restoration of Ahu O Kava, which has only one moai and is also on private property close to Ahu Huri a Urenga. This project was not completed by Mulloy due to his illness, and the restoration was finished in a second phase (1978) by Figueroa with the assistance of Sergio Rapu, who had worked closely with Mulloy on other projects.

Ahu Tautira, located at the sea edge of the village, in front of the soccer field, was restored in 1979-80 by Rapu, Charles Love and Andrea Seelenfreund. The ahu, which had been much larger and had consisted of three or more structures with four moai, was cannibalized extensively in the 19th century. Now only one moai remains in the center of the platform. The remnants of another moai – a torso and a head – stand nearby.

Between 1978 and 1980 Ahu Naunau at Anakena beach was restored by Rapu. This is a complex site with many construction levels, as can be seen from the ahu's seaside wall. There are five complete moai, four of which have pukao, and two broken moai re-erected on the ahu. The back of the moai and some of the stones in the back wall of the ahu are decorated with petroglyphs.

During the excavations at this site, an eye in white coral with a red scoria pupil was found. (It is now on exhibition at the Anthropological Museum on the island.) After the eye was excavated, replicas were made and installed, on occasion, in the four moai with pukao. Due to the archaeological community's criticism, this practice was discontinued.

Ahu Tongariki, close to the Hotu'iti bay (hanga Hotu'iti) by the Poike peninsula, is the largest ahu. There is evidence that it held as many as 30 statues through its long history. The sea wall is 215 meters long and is oriented to face the rising sun at the summer solstice. When Katherine Routledge saw the ahu in 1914-15, 15 statues lay toppled in front of it. In 1960 the ahu was completely destroyed by a tidal wave. The statues, boulders and large stone slabs used in the construction of the ahu were strewn over an area of more than 1.4 hectares (3.5 acres). The ahu is now under reconstruction by the Institute of Easter Island Studies (IEIPA) of the University of Chile.

Inland from this ahu, beyond the plaza and near to where the foundations of the dwellings are found, is an important petroglyph site. These have been carved into the *papa* (lava flows) that surface there. Figures of tunafish and turtles, faces representing the god Makemake, birdmen in bas-relief and even a *rongo-rongo* figure are all present. Also carved into the stone are a *tabeta*, a small basin



1. The quarry side of Rano Raraku.
2. A smaller moai was carved from the top part of a statue that may have cracked while it was being lowered from the Rano Raraku quarry.
3. Moai Tuturi or Tukuturi, the kneeling moai.
4. Some of the statues released from the quarry were half buried by the accumulation of earth over the centuries.



that probably served to collect rainwater, and many cupules, cup-shaped indentations that have been used as counting devices. Since the *papa* have a rough surface, with cracks running across them, the petroglyphs are difficult to see; they are most easily viewed by raking light, in the early morning or late afternoon.

The Rano Raraku Quarry

Most of the island's moai were carved from a quarry of coarse yellowish volcanic tuff found on both the outer and inner slopes of the south side of Rano Raraku. The quarry is probably one of Easter Island's most awe-inspiring sites. As Heyerdahl wrote in *Aku-Aku*: "Rano Raraku remains one of the greatest and most curious monuments of mankind, a monument to the great lost unknown behind us, a warning of the transience of man and civilization."

Close to 400 moai, in various stages of completion, have been recorded on this site. Some moai, like many of the heads that dot the lower part of the slopes, are complete statues that were lowered from the quarry and set vertically in specially prepared pits where the carving of the backs would be carried out. These statues got further buried by earth piled up over the course of centuries. Others are in different stages of quarrying, from those ready to be let down to those that are barely outlined.

The many statues concentrated in this spot make the variations between them more noticeable. Probably the most outstanding and best known is Moai Tuturi, the kneeling or squatting moai. This is a corruption of its original name, Tukuturi, which means "to squat on the heels," while Tuturi means "to kneel." The statue has a rounded head and is squatting with its arms along the body and thighs. It is considered an "early" type of moai and has been dated to the 10th century. Nonetheless, this is still a controversial point for some archaeologists.

Another moai is distinguished by a three-mast ship with square sails carved on its chest. The vertical line from the ship appears to have a turtle at the end rather than an anchor. The torso of this statue, which had been buried nearly up to its shoulders, was uncovered by the archaeological team of the Norwegian Archaeological Expedition, revealing the petroglyph.

As would be expected, some statues cracked or broke when they were lowered from the quarry. One statue with a deep crack across its chest was obviously reused, with the sound top part – the head and shoulders – being recarved into a smaller moai.

The Orongo Site

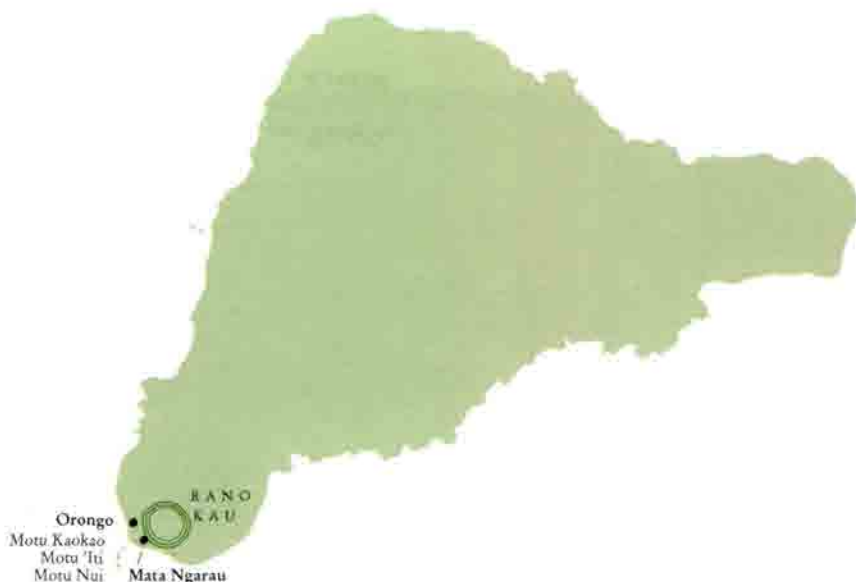
The approximately triangular Orongo site is located on the southwest corner of the Rano Kau volcano, between the edge of the crater and the cliff leading to the sea. The sea-cliff rises close to 300 meters and provides a good view of the islets Motu Nui, Motu 'Iti and Motu Kaokao. The 50-odd houses of this "village" are laid out roughly in two offset rows, one higher than the other, all facing the sea. The lower row, which begins slightly before the upper one ends, extends to the sacred precinct, Mata Ngarau.

The stone houses are elliptical in shape and about two meters wide, eight meters long and 1.5 meters high. The exterior walls, which consist of two layers of stone with dirt between them, are about two meters thick. A small square entrance, which one can pass through only by crawling, provides the structure's single opening, facing the sea.

The site was first described in 1870 by J. L. Palmer, who was surgeon aboard HMS *Topaze* when it stopped at the island for a visit two years earlier. During this visit the only moai ever found at Orongo was removed and taken to England; it remains on view at the British Museum (Museum of Mankind) in London. Called Hoa Haka Nana Ia ("wave-breaker") or Hoa Hakananai'a ("friend that has been stolen"), the statue is carved out of basalt and is decorated



1. A house left unrestored at the Orongo village shows the condition of some of the structures before restoration.
2. One of the restored houses has been left half open to show its structure: a double stone wall filled with earth. The roof was made of cantilevered slabs covered with earth.
3. Motu Kaokao, Motu 'Iti and Motu Nui as seen from Orongo on the southwest side of the Rano Kau volcano. The sacred precinct Mata Ngarau is in the foreground.



with many petroglyphs and bas-reliefs on its back. Some of the motifs used for these carvings are unique for a moai – *tangata manu* (birdmen), *ao* (dance paddles) and *komari* (vulva forms) – and indicate that the statue was a transitional element between the ancestor cult and the birdman cult. It also had residues of red and white paint, which were lost in the process of transporting the statue to the *Topaze*.

The moai, 2.5 meters high, had been found buried up to its shoulders within one of the houses, which suffered extensive damage in the process of extricating the statue. Other stone houses that form the village were also partially dismantled during early archaeological probings by expeditions such as the one arriving on the German sloop *Hyäne* in 1882, when drawings were made of the rock paintings and sculptures found within the houses. Most of the images in the rock paintings are of dance paddles, sailing vessels, bird motifs and faces, while the sculptures consist of stone heads and small statues.

Four years later William Thomson spent two days surveying the site and pulled apart several houses looking for painted slabs, several of which were then taken back to Washington and stored by the Smithsonian Institution. Some of these have recently been returned to the island, where they are kept in the Anthropological Museum at Hanga-roa.

The first restoration attempt at this site was undertaken by Father Sebastian Englert in 1947. Of the 46 houses surveyed, only the 20 or so in most need of repair were restored. The first archaeological excavations on the site were carried out by Edwin N. Ferdon, a member of the 1955-56 Norwegian expedition, and his descriptions served as a basis for understanding the construction technique of these houses. Between 1974 and 1976 a major investigation and restoration of the site was carried out under the direction of William Mulloy. In 1983 Hans Niemeyer and Luis Arrau studied some of the previously restored houses that were threatening to collapse and reconstructed a partially destroyed one.

The Mata Ngarau precinct, the heart of the birdman cult, is the most richly decorated area on the island: every boulder is carved with petroglyphs, in some instances superimposed on previous carvings. In Polynesia stone was considered the most permanent medium that could contain *mana*; adding sacred symbols to rocks enhanced their divine power. Of the 1,785 petroglyphs on this site the most common carved motif is the birdman, sometimes holding an egg in his hand. Also frequent is the *manu piri* (two birdmen facing each other and joined by hands and feet), Makemake masks, frigate birds and *komari*.

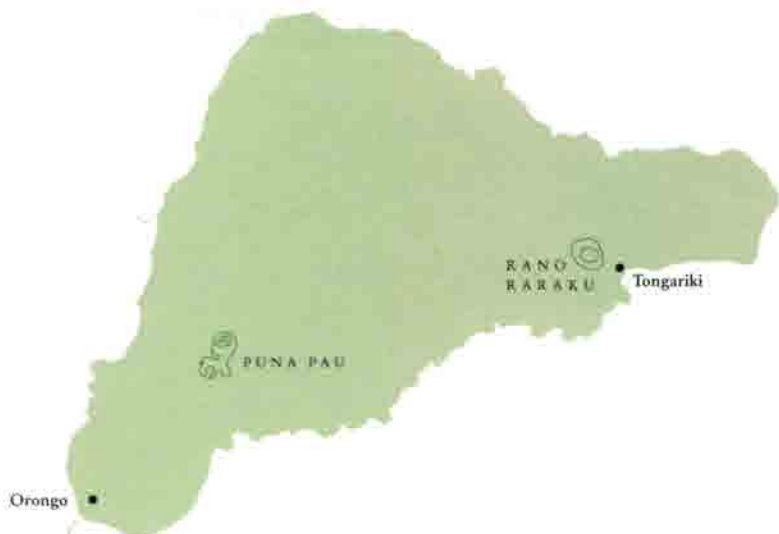
The precinct is formed by seven narrow houses whose doorways, at the long end

of each house, form a semicircle overlooking a terrace of carved boulders at the edge of the cliff. Large rocks, also covered with petroglyphs, separate this terrace from the east and the west. Tradition has it that only special priests with the power to chant the *rongorongo* tablets could stay in the precinct, where they would chant endlessly throughout the birdman ceremony.

The viewer cannot help but be overwhelmed by the spectacular site. The description of the island by Katherine Routledge, in *The Mystery of Easter Island*, applies equally well to this site, which seems to embody the essence of Easter Island: "Everywhere is the wind of heaven; around and about all are boundless sea and sky, infinite space and a great silence. The dweller there is ever listening for he knows not what, feeling unconsciously that he is in the antechamber to something yet more vast which is just beyond his ken."



The Preservation of Easter Island's Monuments



Opposite: Weathered moai at the slope of the Rano Raraku quarry.

As defined in the 1976 UNESCO recommendation, historic monuments “represent the living presence of the past which formed them.” They are, therefore, of vital importance to the people, serving as both an “expression of their way of life and one of the corner-stones of their identity.” With the increasing consciousness of the unity of human values, the “common responsibility to safeguard this heritage for future generations” becomes paramount, as emphasized in the 1964 ICOMOS Venice Charter, the credo of heritage conservation.

Safeguarding the monumental heritage of Easter Island is a complex task, made more difficult by the unique setting that frames the statues and petroglyphs. The imposing character of these monuments would be lost if they were placed in a museum or even if the landscape around them were changed. Any preservation attempt must take into account the monuments’ natural context.

There are two main reasons for undertaking the restoration of an archaeological monument. First, a monument in ruins is generally not respected and is therefore subject to vandalism by the local population, which may lead to its total loss. Second, restoration makes the monument comprehensible for the average visitor and serves as an incentive for tourism, which is an important revenue source.

The question that arises in relation to the Easter Island monuments, especially the ahu, is whether they should be kept in their (destroyed and) abandoned state or restored to their previous state. The meaning of “previous state” is problematic, since monuments go through various stages over time. On Easter Island monuments are usually restored to the last stage before their destruction. In the case of Ahu Tongariki, where both the platform and the statues were thrown about by a tidal wave, the restoration must be considered a reconstruction, even if it is a faithful re-creation based on existing documentation. But in the case of the ahu, their destruction was a significant phase in their history; the toppled moai represent more than just an abandonment. This point was strongly emphasized by William Mulloy and Gonzalo Figueroa in their recommendations about the preservation of monuments to UNESCO in 1966.

The restoration of archaeological sites, particularly those involving excavation, brings about irreversible changes. The information latent in the ruin is lost forever as the monument is rebuilt, and it is therefore advisable to leave some sites or parts of sites untouched for future investigation. The amount of information that can be retrieved from any archaeological site increases over time as new scientific technologies are developed. Far more information can be gathered from an archaeological excavation

today than could have been obtained in the 19th century, yet it is still less than what will be retrievable in the future.

But regardless of whether the ahu should be restored, they must be preserved. To preserve means both “to make lasting,” i.e., to keep in existence, and “to maintain,” i.e., to keep up. Both meanings apply to the preservation of Easter Island’s monumental heritage. The various factors that threaten this particular heritage have to be taken into account when devising appropriate preservation methods. Those factors may be natural or anthropogenic and may act both on the material of the monuments and on the sites around them.

Natural Deterioration Factors Acting on Stone

Most of the island’s monuments are carved out of or into stone and are thus subject to weathering. Though stone is generally considered a resistant material, it does break down over time, depending on the type of rock and its environment. In developing protection measures, the nature of the stone, the age of the object and the various agents acting on it all have to be examined.

The main types of stone used in the monuments were Rano Raraku tuff for the moai; red scoria, from the Puna Pau quarry, for the pukao; and basaltic lava



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1. *Ahu Vaihu on the south coast.*
2. *Detail of weathering on the back of a moai at Ahu Vaihu. Erosion of the softer strata of the stone leaves the harder portions exposed, indicating the amount of material that has been lost due to deterioration.*
3. *Lichen growth on a moai at Ahu Akivi.*



for the construction of platforms and houses, as well as for the carving of petroglyphs. Volcanic tuff, formed through the consolidation of volcanic ash, has a glassy matrix that includes small crystals and rock fragments, such as basalt, of varying size, some several centimeters in length. Clay is usually present as a result of weathering. Red scoria, in essence the solidified “froth” of the volcano’s lava, is a highly porous material and even more susceptible to weathering than the tuff. Basalt, a fine-grained, sometimes glassy rock formed from rapidly cooled lava, is the most resistant of the three types of stone.

Of the various factors that contribute to the weathering of the tuff and the scoria, rain is probably the most important. Heavy showers combined with strong winds erode the stone mechanically, an effect that is very visible in the eight toppled moai at Ahu Vaihu, located on the south coast. The difference in hardness between the tuff and the basalt fragments it includes results in the eventual protrusion of the basalt as the softer tuff is eroded. This same mechanism also emphasizes the differences in rock stratification and quarrying orientation since the Rano Raraku tuff is not a uniform material, and variations in hardness from one stratum to the next can be seen within the quarry itself. Even the coloration of the rock has a wide range, as is demonstrated by the last two statues on the left (east) side of Ahu Vaihu.

The mechanical effect of the rain is compounded by the chemical dissolution of the glassy matrix of the stone in water. The slow corrosion process occurs when the stone is wet; the dissolved material is eventually deposited on or near the surface of the stone when it dries. These surface deposits of silica are visible in protected areas such as under the arms of horizontal statues or under the chins of standing statues, where they cannot be removed by the rain’s mechanical erosion.

The climate of Easter Island, with frequent showers, promotes yet another type of alteration. When the stone is wet, the clays present in it absorb moisture and expand; as the stone dries, they contract. The internal stress of these repeated expansions and contractions results in microfissures within the stone, which serve as channels for water migration and its corrosive effects.

Another factor contributing to the deterioration of the stone is the growth of algae and lichens on its surface. These organisms can have a dual action on the stone: they selectively leach out ions, thus weakening the stone matrix, and/or induce mechanical stress by retaining moisture and contributing to the wet/dry cycles of the stone. In the case of lichens, the penetration of rhizines or hyphae causes a mechanical stress that contributes significantly to the detachment of flakes from the stone surface.

The effect of these biological agents can be observed best on Ahu Akivi, where algae have produced a dark patina on the statues and lichen growth is noticeable on the front of the statues. Particularly responsive to their micro-environment, lichens often colonize certain areas while only inches away they do not flourish. Petroglyphs are especially susceptible to such damage: because the carving is only a few centimeters deep, it can be totally obscured by the growth of lichens, and any loss of the stone surface is far more destructive since proportionately more detail is lost.

Deterioration of the stone is caused by other factors as well, including salt from sea spray, wind action and temperature changes. Of these, the most pronounced effect is caused by the combination of sea spray and wind action, which produces the weathering pattern known as alveolar deterioration. This occurs only in localized areas close to the shore – for example, on stones in the back wall of Ahu Akahanga. The usual damage is magnified in these lava blocks, which sometimes have a harder outer crust that was formed during the cooling of the lava, trapping gas bubbles below it. Basalt boulders may also have an outer skin with an empty space below created by the contraction of the cooling lava. Because it has two exposed sides, this surface crust is more susceptible to weathering: moisture condenses behind it, micro-organisms grow on either side,



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1. Moai at Hanga Kio'e covered with a protective tent during conservation treatment in the summer of 1986-87.
2. Stone walls, constructed during the island's sheep-farming period in the 19th century, incorporated stones from hare paenga, hare moa or even ahu.
3. Hanga Kio'e moai after conservation treatment.
4. New "petroglyph" carved into a stone by Ana Kekenga.
5. Cattle, like these in the Tahai complex, can dislodge boulders and erode the petroglyph-covered papa as they pass over them.



and eventually fissures develop. The petroglyphs on boulders at Orongo show several stages of deterioration due to this phenomenon.

Conservation Treatments for Stone

Two types of conservation treatments have been developed to reduce the rate of the stone's weathering: consolidation, which hardens the material and makes it more resistant to erosion; and hydrophobization, which makes the surface water-repellent, preventing or reducing the penetration of liquid water into the stone.

There are many different consolidation and hydrophobization products developed for different types of stone and for different environmental problems. These products should not be applied indiscriminately. They require laboratory tests to determine which product is most appropriate for the particular stone, and in situ testing to confirm that the chosen product will resist the object's environment.

During the summer of 1986-87, a first test application was carried out on the moai at Hanga Kio'e. This intervention, which consisted of both consolidation and hydrophobization, was undertaken by the National Conservation and Restoration Center of Santiago (Centro Nacional de Conservación y Restau-

ración) with the assistance and support of Wacker Chemie, GmbH. The treatment has so far proved successful and offers hope for extending the life of other moai.

Natural Deterioration Factors Acting on the Sites

It is not just the monuments but also the sites around them that are deteriorated by natural agents. Wind and rain can erode the soil, especially in hilly areas, which can endanger the site itself, as is the case with the dome over the Ana Kai Tangata cave. As the topsoil is washed away, boulders and larger blocks are loosened and dislodged, threatening the eventual collapse of the dome itself. This erosion also causes problems for visitors when trails on slopes are gouged out during downpours, as is the case at sites like the Ana Kai Tangata cave or the Rano Raraku quarry.

The unchecked spread of unwanted vegetation can overgrow a site completely. Such is the case with the guava bushes (*Psidium guajava*) that propagate easily and grow almost anywhere, as well as the grass (*Melinis minutiflora*) that was introduced for fodder some years ago and now threatens to cover all sites.

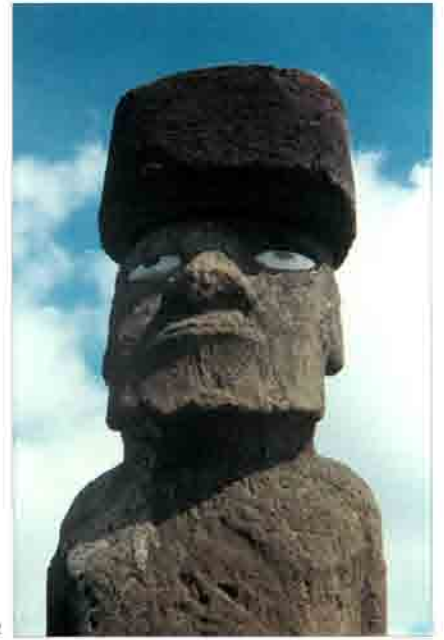
Finally, there is the damage caused by free-ranging livestock. Cattle and horses can dislodge cobbles from the ramps of

restored ahu, wear away petroglyphs carved on the lava outcrops and endanger the structural stability of the village houses at Orongo as they ramble over them.

Anthropogenic Deterioration Factors

The destructive effects of man on this heritage, both the stone and the site, can be manifold. Numerous examples of vandalism can be cited, one of the latest and most serious instances being the defacing of the rock painting in a cave on Motu Nui in 1991. In general, vandalism is limited to graffiti added on to rock art, which occurs most frequently near Hangaroa, at sites like Hanga Piko or Ana Kai Tangata. At this last site, a 20 percent increase in graffiti coverage was recorded during the two-year period from 1988 to 1990. Recently, a new petroglyph has been carved by the entrance to one of the caves (Ana Kekenga). The large majority of the culprits have been local residents.

Pilfering, often to obtain artifacts to sell to tourists, prompts a variety of actions, ranging from unauthorized excavations to cutting down one of the main trunks of the only large *mako'i* tree on the island to get wood for carving. Some tourists are avid souvenir hunters and will take any small obsidian or basalt tools they find, regardless of the prohibition on removing archaeological objects



1. Fires on the island sometimes reach the Rano Raraku quarry, where the thermal shock causes fissures in the stones, greatly increasing their deterioration.
2. There is no archaeological evidence that Moai Ko te Riku at Tahai ever had eyes. The red scoria pukao is a modern replica.
3. Front view of Ahu Naunau with the "blind" moai.



from the island. Tourists have even been known to throw stones to dislodge the decorated slabs in the Ana Kai Tangata cave.

Another type of problem within the commercial context is illustrated by the following instance. During the excavations and restoration of Ahu Naunau an eye in white coral with a red scoria pupil was found. Copies of this eye were made and put into the restored statues, an action that was strongly criticized by the archaeological community. The eyes were removed from the statues, but many photographs had been taken and widely publicized. Tourists coming to the island expected to see the statues with eyes and were disappointed to find them "blind." Local inhabitants immediately responded by establishing a system of setting in the eyes temporarily – at a price that has been known to reach \$1,000 – for photographs to be taken. To stop this traffic, which also caused damage to the stone from the extra handling, the Rapanui Council of Elders determined that one statue should have permanent eyes. The moai selected was the one at Ahu Ko te Riku, to the dismay of archaeologists, since no evidence points to it ever having had eyes.

Damage can also be caused by a lack of interest in or respect for the local culture. In the 19th century, for instance, when stone walls were built for sheep and cattle raising, nearby boat house

foundation stones were included in the construction, even though plenty of other stones were available. Damage has also been done to the spaces underneath some of the toppled moai, which were used, and continue to be used, as temporary shelters.

The construction of roads and buildings may destroy valuable sites. An example is provided by the destruction of what was called the "calendar stone," a rock almost as large as a two-story house. According to meteorologist Karl Schanz, lines engraved on the rock indicated the direction of the sun descending into the ocean on the shortest and the longest day of the year, and other lines served to divide the year into 30 equal sectors. Lines on a smaller rock nearby formed two compass roses indicating winds, with each quadrant divided into three sectors. During construction of the Mataverí airport in 1965, it was determined that the rock was too close to the runway and had to be removed for security reasons. A proposal to cut out the significant area of the rock and relocate it in the same orientation in the local museum was never carried out. The rock was dynamited and the smaller rocks were removed, and no information exists as to their whereabouts. Since the construction company (Longhi) had difficulty finding sufficient gravel, many rocks may have been broken up to serve as landfill.

Grassland fires are yet another cause of deterioration. These are generally started by local inhabitants to burn off the long dry grass and provide fresh shoots for the cattle. The thermal shock that such fires produce in stones causes fissures and eventual shattering.

The demands of the tourist trade and ignorance of the frailty of this heritage can also be damaging. Local residents, acting as tour guides and proud to show off their heritage, will outline petroglyphs to make them more visible and easier for tourists to photograph. In the best case, they will use chalk to highlight the carvings, but often they rescore or add details to them. Unfortunately, the current Chilean legislation includes no restrictions or licensing system for these self-appointed guides.

The traffic of tourists who unknowingly walk on half-buried petroglyphs or statues causes severe erosion that eventually obliterates carvings. The houses at the Orongo village are also susceptible to traffic. Their construction was never meant to support weight, and over time they collapse due to stresses caused by visitors and occasional free-ranging horses, who manage to get into the area even though it has been fenced off.

While local residents and tourists may be excused by their ignorance, this is certainly not the case with professionals working on the island. As mentioned



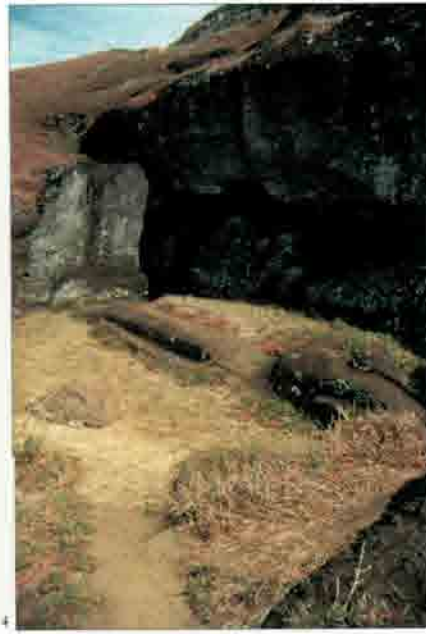
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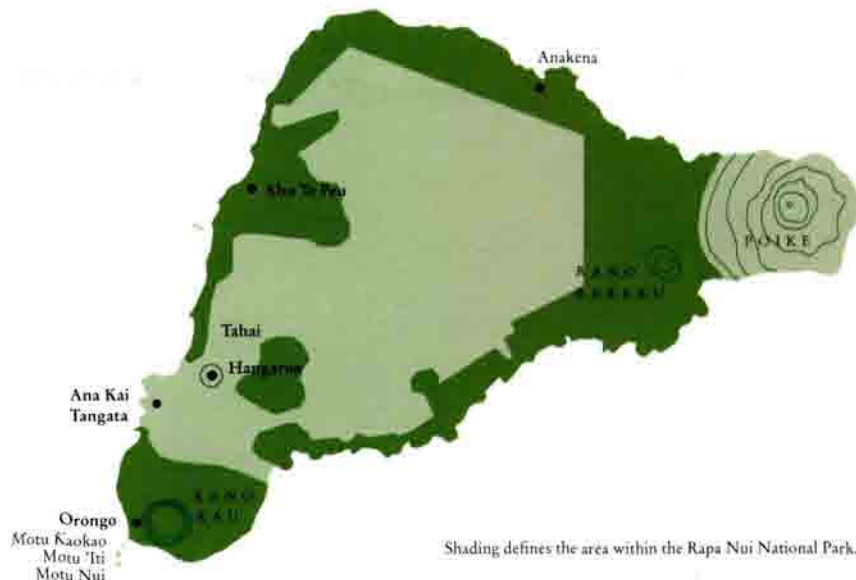


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1. House damaged in the Orongo village during recent filming on the island. The three moai above were movie props. (photo: Tricia Allen)
2. and 3. Head of a moai at the Rano Raraku quarry. Photograph in fig. 2 was taken in 1986; fig. 3 photograph, taken in 1990, shows the detrimental effect of a 1988 casting, which removed the lichens and the surface patina.
4. Erosion on the neck and bosom of a half-buried statue in the quarry, which tourists walk over.



Shading defines the area within the Rapa Nui National Park.

earlier, in 1960 part of the back wall at Ahu Te Peu collapsed because a trench was left unfilled by the archaeological team of the 1955-56 Norwegian expedition. In 1987 a Hawaiian firm (International Chemical Systems) applied a "conservation" product on some statue fragments at Anakena. During the treatment, the stone turned blue-gray; the color has faded over the years, but no documentation or information about this treatment is available. The following year casts of two moai heads at the Rano Raraku quarry were made to prepare replicas for the 1989 Frankfurt exhibition. Since the surface of these statues is very friable, the casting detached all the powdery and flaky material, as well as pulling off lichens and the surface strata they were attached to. The patina was totally removed.

One last example needs to be mentioned. During 1993 a film crew received permission to film a fictional history of the Rapanui. The impact on the population of the island was tremendous, as was the disturbance and damage caused to various archaeological sites. The alteration of the floor of the Ana Kai Tangata cave to accommodate a boat ramp is a relatively minor, and reparable, damage compared to the major disruption of the delicate micro-environment around the painted ceiling caused by the filming lights, by fires called for in the script and by the number of people concentrated in this small space over many hours.

A temporary iron structure was mounted at the Rano Raraku quarry that required the drilling of pits and the pouring of concrete to support it. Even though care was taken, some fragments of statues were broken with the intense traffic this operation required. At Orongo the process of constructing a fake ahu caused the final collapse of an already unstable house.

These are just a few examples of the threats posed by careless human actions; it is not the aim here to provide an exhaustive list.

Protection Measures

In 1935 Easter Island was designated both an historic monument and a national park, but it was not until 1966 that official personnel were established on the island. The administrator and local staff, employees of the Ministry of Agriculture, were devoted primarily to developing a field-management system, with the initial emphasis on the afforestation of eroded areas and an increase of tourism. In 1972 the Corporación Nacional Forestal (CONAF), under the aegis of the Ministry of Agriculture, was established to manage all of Chile's National Parks and Reserves.

The Rapa Nui National Park covers an area of 66.66 square kilometers, approximately 42 percent of the total surface of

the island, and roughly follows the coast, except for the Poike peninsula and the coastline by Hangaroa. The park contains most of the island's monumental archaeological heritage within its boundaries, and its aim is to provide the protection and long-term maintenance needed to preserve these monuments within their natural setting. Unfortunately, the means provided for this purpose do not adequately support the demands placed on the institution.

The park is visited annually by 7,000 to 8,000 visitors, not including the local population of approximately 3,000. Until 1992 there were only eight rangers, whose duties were to guide and inform visitors and to patrol the park. Of these, four were permanently posted at each of the major sites: Tahai, Orongo, Rano Raraku and Anakena. The other four patrolled the rest of the island. Four maintenance workers were responsible for the upkeep of the sites (with only two weed trimmers available), as well as overseeing the nursery where native trees, bushes and other ornamental plants are grown and administering fire control and prevention measures.

The situation is even more problematic when tourist ships, carrying about 1,000 passengers, arrive at the island. Since they usually make only a one-day stop, this results in a practically uncontrollable invasion by the many visitors who try to make the most of their short stay.



1. Detail of the petroglyphs on the boulders of the sacred precinct Mata Ngarau at Orongo, worn down by tourists walking over them.
2. Flaking and spalling on a petroglyph-covered boulder at Orongo.
3. Petroglyph eroded by traffic at Tongariki.
(photo: Georgia Lee)
4. Weathering produces this flaking of a boulder carved with petroglyphs at Orongo.
5. Detail of the boulder in fig. 4.
6. Petroglyphs carved on papa at Tongariki, outlined in chalk by islanders.



Any change in the park that may entail a new tourist attraction, such as the restoration of an ahu, requires the development of an appropriate plan for site conservation, interpretation and management, which must be carried out simultaneously with the restoration so as to be ready at the same time.

The circumstances are even more complex when local development programs are considered. The relevant government agencies may not take into account the problems posed by their activities, such as the construction of new roads, hotels, restaurants and recreation areas. These activities may interfere with the preservation of an archaeological site in its natural setting or may even destroy some of it, as described above.

CONAF is to be commended for the fact that under these conditions it has been able to improve its organization and develop a better management plan. During the film project the number of park rangers was temporarily increased to 12. Two full-time archaeologists have been added to the permanent staff, as well as an anthropologist under a temporary contract.

Past Conservation Actions

The 1956 restoration of Ahu Ature Huki served as the impetus for William

Mulloy and Gonzalo Figueroa's restoration of the Akivi-Vai Teka complex in 1960. As a result of these restorations, the Chilean government requested support from UNESCO for a general study of the island's monuments. In 1966 UNESCO's first mission to the island was overseen by Mulloy and Figueroa with the assistance of architects Charles Peterson and Raul Bulnes. The mission's report elaborated a project for the investigation, conservation and restoration of the archaeological heritage as well as outlining suggestions for a master plan for the Rapa Nui National Park.

Following this mission, the moai at Ahu Ko te Riku was raised by Figueroa (1968), with the sponsorship of *Paris-Match*, which devoted two long articles to the island that served to promote tourism. The remainder of the Tahai complex was restored by Mulloy and William Ayres (1968-70), a project that comprised the restoration of Ahu Tahai and Ahu Vai Uri. These last two restorations were sponsored in part by the International Fund for Monuments (IFM), now the World Monuments Fund (WMF). This institution continued to support Mulloy in his restoration of Ahu Huri a Urenga and two ahu at Hanga Kio'e (1972).

The restorations of Ahu O Kava, Ahu Tautira and Ahu Naunau (1978-80), carried out under the aegis of Sergio Rapu,

then director of the Anthropological Museum on the island, were supported in part by the Fundación del Pacífico, a Chilean private organization that is no longer active.

In early 1972 UNESCO sponsored a second mission to the island, in which conservator Giselle Hyvert was sent to study the state of conservation of the statues and to suggest possible treatment procedures.

The restoration of Orongo took place from 1974 to 1976 under the direction of Mulloy and was continued by Hans Niemeyer and Luis Arrau, supported in part by IFM.

At the request of the Chilean government, a third UNESCO mission was conducted by Wieslaw Domasłowski in late 1981. The main purpose of this mission was to suggest possible treatments to stop or slow down the deterioration of the monuments. As a result, and following the recommendations given, a conservation treatment was applied to the Hanga Kio'e moai in 1986-87. This was accomplished by the National Conservation and Restoration Center of Santiago within the framework of the CHI/79/013 project, with support from the United Nations Development Program (UNDP) and UNESCO, and the assistance and collaboration of Wacker Chemie, GmbH.



1



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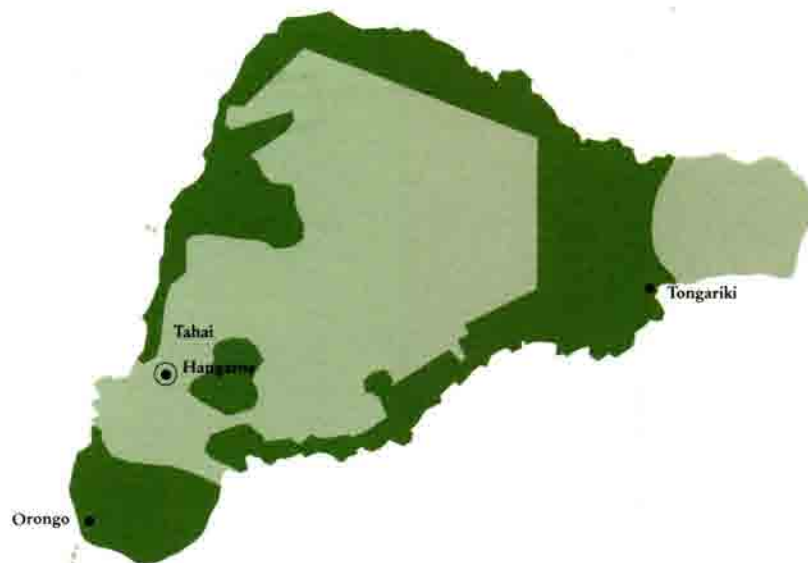


3



4

1. Islanders sometimes use the space under the toppled moai as temporary shelter, occasionally even lighting fires there.
2. The standing moai by Tongariki, locally known as the "traveling moai," was sent on loan to an exhibition in Japan, and upon its return was left in this position. The crane in the background was used during the reconstruction of the ahu. (photo: R.V. Gianzone)
3. This house at Orongo collapsed due to the weight of free-ranging horses and careless visitors walking over it.
4. The site of Ahu Tongariki, which was destroyed by a tidal wave in 1960. More than 15 statues were tossed and tumbled over some three and a half acres.



In 1988 a small international meeting was called by the Dirección de Bibliotecas, Archivos y Museos (DIBAM), CONAF and the International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM), with the sponsorship of WMF, to survey the conservation needs for the preservation of the Easter Island heritage. As a result of the meeting's recommendations, a two-year study of the deterioration problems of the Ana Kai Tangata cave was undertaken, sponsored in part by the Organization of American States (OAS) and with some support from WMF.

Another outcome of these recommendations was the International Meeting on Lavas and Volcanic Tuffs, held on Easter Island in 1990. Organized by DIBAM, CONAF, ICCROM and WMF and sponsored mainly by the last two organizations, the meeting served a twofold purpose: to prepare a volume incorporating the current knowledge on the deterioration and conservation of these particular types of stone; and to formulate recommendations for the preservation of this heritage.

The current reconstruction of Ahu Tongariki, under the direction of the Institute for Easter Island Studies of the University of Chile (IEIPA), was begun in late 1992 with support from a private Japanese crane company (Tadano) as part of a commercial campaign.

Only those programs related to conservation and restoration have been discussed. But many archaeological studies have also been undertaken. Of these, documentation projects, the basis for any preservation action, deserve special mention. The central project, carried out by the IEIPA, is still under way and the results will be published upon completion. Included in this project were the six-year (1981-87) survey and documentation of the island's petroglyphs by Georgia Lee and the survey and stylistic analysis of the moai by Jo Anne Van Tilburg (1982-86). Both of these surveys have been published.

Future Preservation

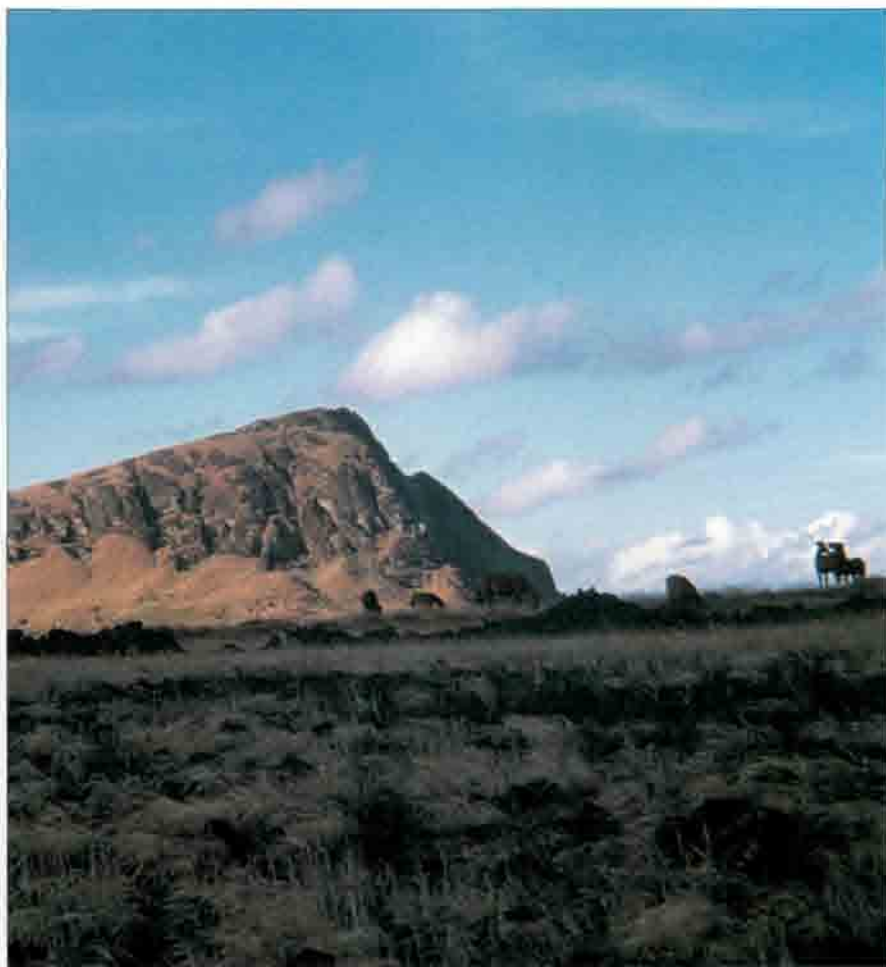
The monuments of Easter Island represent a unique cultural heritage, not only for the Rapanui community but for the whole world. It is therefore fitting that their preservation be carried out with international support. Given the various complicated problems that can affect this heritage and its sites, a concerted effort at conservation and protection is needed. Even though restoration and conservation interventions are necessary, these do not ensure future preservation, which requires day-to-day maintenance: monitoring, repair and upkeep of monuments and sites. Unless regular and consistent support is provided for these apparently humble tasks, any effort toward restoration and conservation will be to no avail.

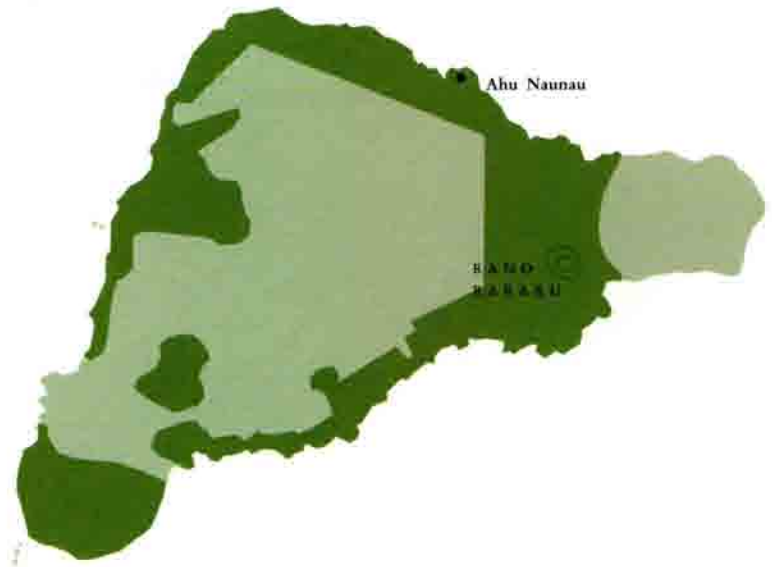
While international cooperation has contributed substantially to many of the programs carried out on the island, long-term support and a better coordination of efforts is required. A more flexible system is needed to combine international contributions with the national programs for the island.

The key national agencies involved in this effort are the Council of Monuments (Consejo de Monumentos Nacionales); CONAF, through the Rapa Nui National Park; DIBAM, through the National Conservation Center and the island's Anthropological Museum (Museo Antropológico Sebastián Englert); and the University of Chile, through the IEIPA.

Any study, archaeological investigation or related activity to be undertaken on the island must be authorized by the Council of Monuments, and any activity falling within the Rapa Nui National Park also requires authorization from CONAF. Professionals from the National Conservation Center are in charge of studying the deterioration of specific monuments and the appropriate conservation measures, while the curator of the Anthropological Museum is responsible for the study and care of the relatively small collection housed there.

While the museum and the IEIPA deal with the archaeological investigation of the monuments, the National Park and





1. The interior slope of the Rano Raraku with statues.
2. Rano Raraku volcano, as seen from the south.
3. Ahu Naunau seen from the seaside.

National Conservation Center staff are primarily responsible for preservation. The park staff is in charge of "maintaining" the monuments and their sites, whereas the center staff is responsible for "making them last." Unfortunately, the center does not yet have a resident conservator or the necessary facilities on the island to carry out this difficult task.

The preservation of this monumental heritage requires the cooperation and collaboration of all entities responsible for the various activities on the island, including local development, environmental conservation, socio-anthropological and archaeological research, and the establishment of a comprehensive conservation plan for the monuments and sites. These programs must be constructively interrelated to assure adequate conservation measures as well as the commitment to long-term maintenance.

To establish a comprehensive conservation policy, government officials must be fully informed. But good legislation is not enough to bring about a successful policy; implementation and enforcement are also necessary. Only public pressure is capable of motivating the government to take these actions; thus, raising public awareness of the threats to this heritage is crucial for its preservation.

In late 1992 an Interministerial Commission (Comisión Chilena Interministerial) was established for the conservation,

preservation and restoration of the cultural heritage of Easter Island. The aims are to coordinate the activities of the various government agencies on the island in order to prevent conflicting actions, and to increase the general awareness of the monuments' susceptibility to damage. But the Chilean government has yet to request that the island's monuments be included in UNESCO's World Heritage List.

The challenge of preserving Easter Island's heritage for the future is a complex and variable one. The problem has no unique solution; it can be approached only through an ongoing, continuous effort that matches the changing nature of the problems.

Appendix I:

The Archaeological Elements of Easter Island

The following text, revised by Gonzalo Figueroa G.-H., describes the most significant archaeological elements of Easter Island. It has been adapted from the *Archaeological Field Guide, Rapa Nui National Park*, published by CONAF (Corporación Nacional Forestal), Ministry of Agriculture, Republic of Chile. The guide was prepared and edited by the academic staff of the Institute for Easter Island Studies (Instituto de Estudios Isla de Pascua) of the University of Chile. Illustrations are by R. Förster M. The text and the drawings are reprinted with the permission of CONAF.

Ahu

Ahu are ceremonial and burial structures where ancestors were worshiped. They were sacred places protected by specific *tapu*. The essential element of an *ahu* is an elevated rectangular platform, delimited by large blocks of cut or shaped selected stone, filled with cobbles, gravel and earth. The upper part is flat and paved, and associated with an open space or plaza in front of it. *Ahu* are generally located on the coast and oriented parallel to it. Some have astronomical orientations related to the solstices and the equinox. The oldest structures of this type have been dated to the eighth century. These structures were the politico-religious centers of the different tribes and lineages and find their direct equivalent in the *marae* of central and eastern Polynesia.

Ahu evolved over a period of more than 1,000 years, incorporating numerous architectural, aesthetic and cult elements. Among these are stone pavings, lateral wings, crematoria and statues.

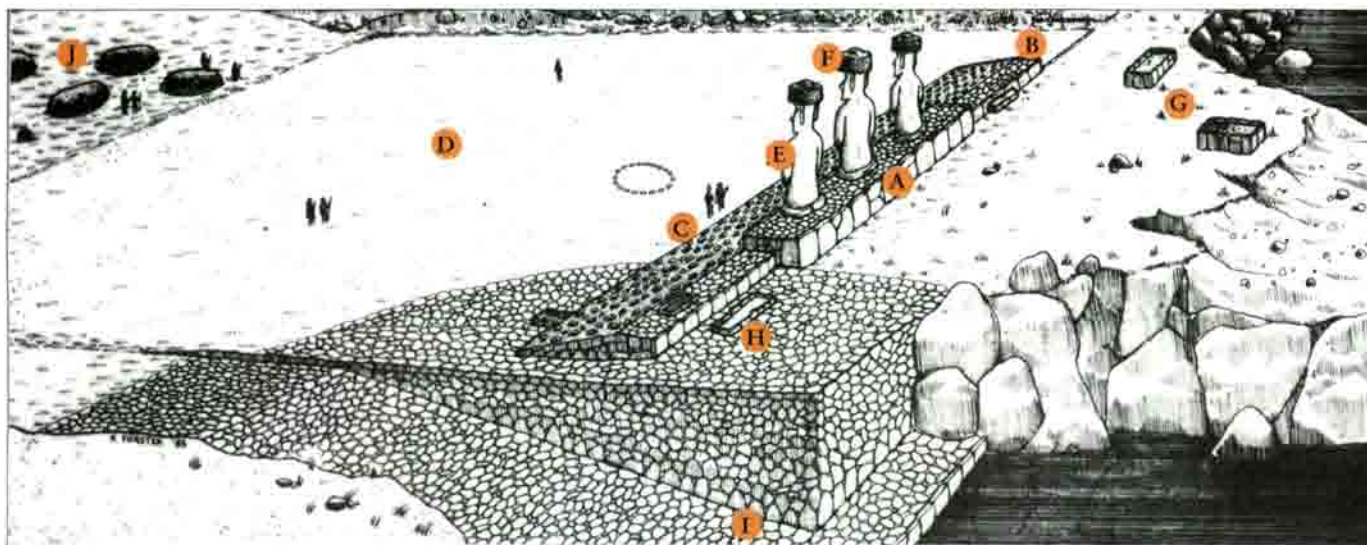
In general terms we can refer to three types of *ahu*: the *ahu moai*, the *semi-pyramidal ahu* and the *ahu poepoe*. With the exception of the *ahu moai*, they seem to have been constructed with the primary function of containing burials. During the Late Period (1680-1868) the great majority of *ahu moai* were transformed into large collective tombs.

Ahu Moai

Ahu moai constitute the most outstanding aspect of Rapanui prehistoric architecture. Their distinctive features are the megalithic statues (*moai*). These sanctuaries are more elaborate than any other of the various types of *ahu*, exhibiting high quality in their stonework.

The interpretive drawing at the top of the following page represents an *ahu* of the Middle Period (1100-1680), with all the elements that might be associated with it.

- A** The **central platform**, where the statues were placed (some held as many as 15), is set on a large base of cut stone. The front wall generally consists of worked rectangular slabs, very well fitted together, and, sometimes, above these a cornice composed of rectangular blocks of red scoria.
- B** The **wings** extend from the limits and toward the sides of the central platform. On occasion there are lower platforms or inclined ramps, paved with stones and delimited by a rear as well as an end wall.
- C** In front of the central platform and abutting it is an **inclined ramp**, paved with cobblestones of marine origin.
- D** The **plaza**, an open space extending inland, served as a meeting place for all the ceremonial and religious community activities. In the plaza of some *ahu* circular areas were defined by an alignment of stones. Known as *paina*, these areas were



used in ritual commemorative ceremonies to honor famous deceased men.

E. Moai are statues of volcanic tuff, the majority of which were carved in the quarries of the Rano Raraku volcano.

F. Pukao, topknots or headdresses of red scoria, were carved in the quarry of the Puna Pau hill.

G. Crematoria are situated in the rear part of the ahu, generally on high ground. They are rectangular structures defined by walls or, in some cases, mounds delimited by an alignment of stones. They now contain fine debris, including small fragments of red scoria; among them can be found fragments of burned bone.

H Near or abutting the rear wall of some ahu are rectangular **funerary cists** (*avanga*, a general term denoting any type of burial), in which deposits of burned bone have been found. In other ahu, there is evidence that the structure was reutilized and that large chambers or funerary cists were constructed on the ramps or on the central platform and wings. The skeletons found in these cists show signs of having been exposed to the sun.

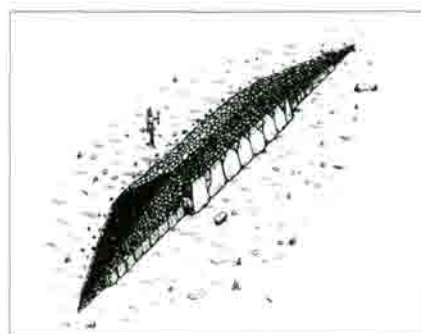
I Some small bays in the vicinity of an ahu moai have areas paved with stone and walls defining a **canoe ramp**.

J In front of the ahu, on the inland side, there is usually a cluster of **hare paenga**, houses used by chiefs, priests and other people of high rank.

Semipyramidal Ahu

The major intertribal wars that began around the 17th century resulted in the destruction of the ahu moai and the deliberate toppling of their statues. Many of the ruined ahu were converted into enormous heaps of stones (*tumuli*) that completely covered the original structure. Beneath these large masses of stones, and below the big toppled statues, large chambers and funerary cists were built.

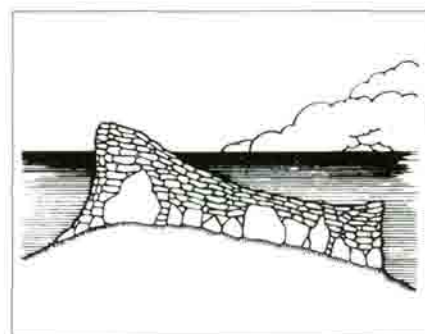
These transformed ahu moai, as well as other structures originally built as *tumuli*, have been called semipyramidal ahu because they resemble low, bisected pyramids with slopes inclined toward the front and perpendicular rear walls. Although these structures are commonly called ahu, they are only *tumuli* or collective funerary platforms. Their chronological position has not been satisfactorily determined, but they appear to be late, and many show signs of having been used into the first half of the 19th century.

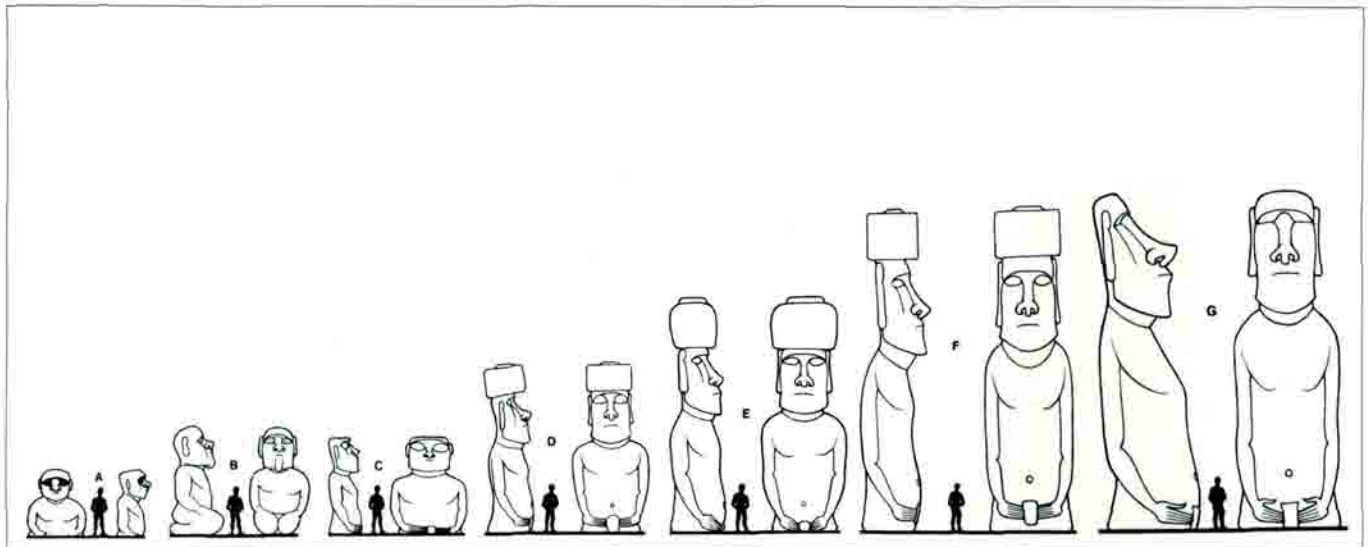


Ahu Poepoe

The name of this type of ahu derives from its shape: it is an elongated structure with both extremities raised, resembling a boat (*poepoe*). Ahu poepoe were constructed of selected stones, closely fitting but not cut. They usually contain a collective funerary chamber in the interior that extends the length of the structure. There are few of these ahu and the majority can be found on the north coast.

There are also wedge-shaped variants of this type of ahu in which the long axis is usually oriented perpendicular to the coast. In some, a stone covered with coral or a lump of scoria is set up as a marker in the center of the ramp at its highest point. Ethnographic evidence indicates that these ahu were probably constructed after the European discovery of the island.





Moai

The extraordinary proliferation of monumental stone statues constitutes one of the outstanding expressions of Rapanui culture. They represent the founding chiefs of different lineages and form part of the cult of deified ancestors, a common feature in Polynesia. There are about 1,000 statues on the island, the majority conforming to a single stylistic form carved in volcanic tuff from the quarries of the Rano Raraku volcano.

Analysis of the statues seems to indicate that over time they became progressively stylized and increased in size. Evidence also shows that those found farthest from the quarries are consistently smaller, suggesting an atemporal relationship between size and distance of transport. The earliest date for the classic Rano Raraku statue, as exemplified by the moai from Ahu Ko te Riku (Tahai complex), is 1100-1205. Its average size (5.2 meters high) suggests a date limit of perhaps A.D. 900 for the appearance of the classic form, on the premise that the first statues were smaller in size. Earlier dates have been proposed for aberrant or prototypical forms, which were generally carved in other materials (basalt and red scoria) and tended to be smaller and more naturalistic, with rounded heads and lacking the lobes of the elongated ears. It is estimated that statues were probably first associated with ahu around A.D. 700.

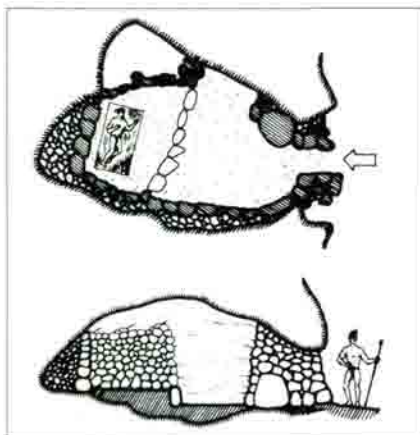
In the quarries and slopes of the Rano Raraku volcano, 394 moai have been recorded in different stages of quarrying or abandonment during transport. Three of them have prominent breasts, which suggests female representations. The largest statue measures 21.6 meters in length and is still attached to the rock in the external quarries; the (completed) weight is estimated to be between 250 and 300 tons. Among those that were transported to an ahu, the largest is the Moai Paro of Ahu Te Pito te Kura (on the north coast), with a height of about 10 meters and an approximate weight of 80 tons.

Above:

- A. Red scoria moai at Tahai.
- B. Moai Tuturi at Rano Raraku.
- C. Moai from Ahu Vai Uri (Tahai).
- D. Moai from Ahu Ko te Riku (Tahai).
- E. Moai from Ahu Tongariki.
- F. Moai Paro from Ahu Te Pito te Kura.
- G. Largest unfinished moai at Rano Raraku quarry.

Pukao

On the heads of some statues, like those of Ahu Naunau, was a kind of cylinder of red scoria that was brought all the way from the quarry of Puna Pau in the vicinity of Hangaroa, and could weigh up to 11 tons. The significance of these *pukao* is unclear: some authors claim that they represent the hairdo or topknot observed on the islanders when the first Europeans arrived; others suggest that they represent a hat. The absence of pukao on a large number of statues suggests that they were a later feature, added for embellishment.

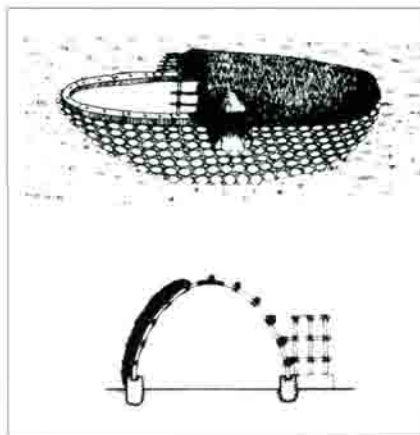


Ana

Because of its volcanic nature, Easter Island has a large number of caves. These were utilized in prehistoric times as permanent or temporary dwellings and as hiding places; during the protohistoric and historic periods, many of them were used as places of burial. The great majority of the skeletons found in the caves today represent deaths occurring during various epidemics that devastated the island during the last century.

Caves used for occupation were frequently modified by adding stone walls that blocked their natural openings, leaving a small access passage in the form of a long, narrow tunnel (either vertical or horizontal) that connected the cave chamber with the outside.

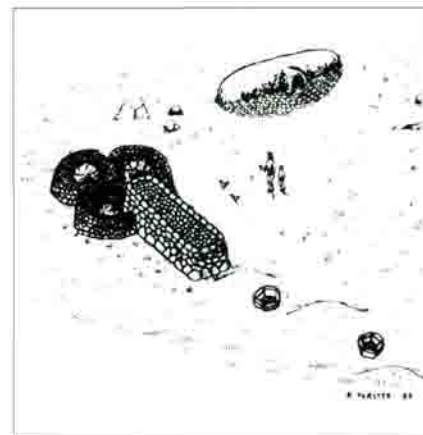
Rock overhangs and small caves, called *karava*, were used for temporary occupation and were usually left unmodified. Some caves, called *ana kionga*, were used by the defeated in time of war for refuge or concealment and were considered *iapu* (forbidden) places.



Hare Paenga

Throughout Rapanui prehistory *hare paenga* were used as the living quarters for people of high rank; some continued to be inhabited into the historic period.

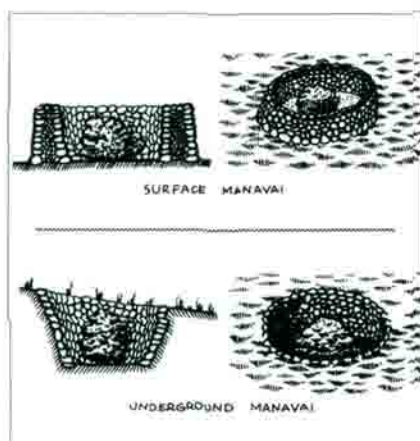
Commonly called boat-houses because of their similarity in shape to an up-turned boat, hare paenga have an elliptical plan and are made up of carefully cut basalt plinth blocks. Posts to support the superstructure of vegetal material were inserted in cavities in the upper surfaces of these blocks. The entrance was a narrow, low passage, defined by slabs and covered with straw. In front is an exterior semicircular pavement made with rounded stones (*poro*) alternating in parallel rows. The interior space was generally very simple and served only for sleeping; all other activities took place outside. The average hare paenga is 10 to 15 meters long and 1.5 to 2.5 meters wide, although some houses are as long as 40 meters.



Common House

The majority of the houses found in the interior of the island are common houses, comprising the family domestic unit. They seem to have had basically the same form as the hare paenga, although the blocks, when present, are not of cut stone. Generally the remains of these houses include only a socle defining the entrance and part of the exterior pavement, which is usually smaller than that in the hare paenga and not as carefully laid out. The absence of plinth blocks suggests that in these cases the posts were inserted directly into the soil.

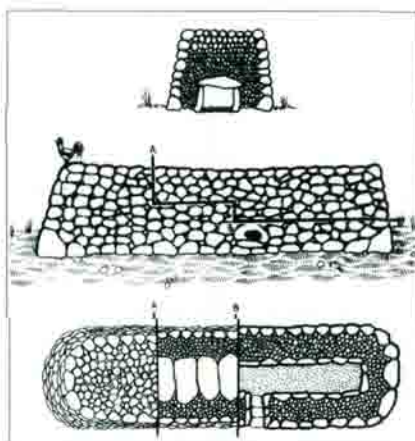
The domestic units were usually composed of a house (*hare*) and one or more earth ovens (*umu pae*), garden enclosures (*manavai*) and stone chicken houses (*hare moa*), a typical complex of elements that varied slightly due to the presence of other structures suggesting a more varied function. The secondary structures tend to be within 20 meters of the house.



Manavai

Manavai are garden enclosures or agricultural structures that, like the stone chicken houses, seem to represent an adaptive response to an ecological change. They were constructed to protect plantations from wind and salinity, and to conserve humidity. They are generally associated with family domestic structures.

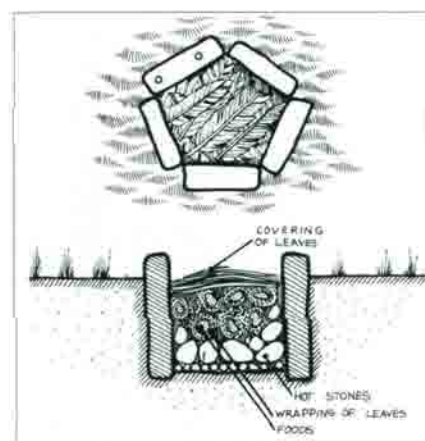
Manavai appear on the surface and underground. Those on the surface are structures of various shapes defined by thick double walls of unworked stones filled with gravel, standing between 1 and 1.5 meters above ground level and delimiting an area of 3 to 10 meters in diameter. They are found as individual examples or in groups of up to 40 structures. The underground *manavai* were built by deepening or making use of a natural depression and defining it with simple walls of superimposed rocks. Their depth varies from one to three meters. Although they are of smaller size, they fulfill basically the same function as the surface *manavai* and are associated with the same type of structures. They are typically found at the foot of slopes and in low-lying sites.



Hare Moa

Hare moa are structures of rectangular plan with rounded ends, thick double walls of unworked stones with gravel fill, and heavy foundations. A narrow chamber runs the length of the structure's interior and has access to the exterior via one or more small passages in the sides.

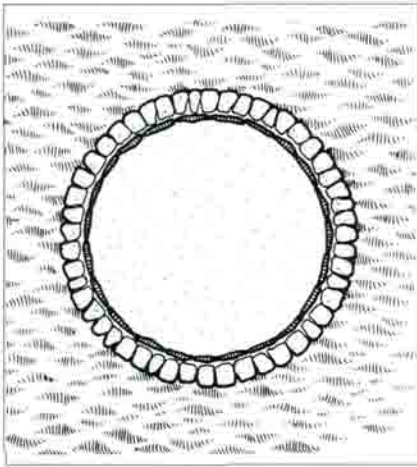
The *hare moa*, which has a wide distribution on the island, is commonly found on living sites and is associated with agricultural structures. Although they have been identified ethnographically as chicken houses, a detailed study of them indicates that there are two types of very similar structures that may have fulfilled different functions and differ fundamentally in the type and size of the interior chamber. According to Patrick McCoy, the *hare moa* seems to be a structure characteristic of the late prehistoric period.



Umu Pae

Before the introduction of European cooking utensils, the islanders cooked their food using hot stones in earth ovens, hearths excavated in the soil to an average depth of 60 centimeters and defined by stones. *Umu pae* of pentagonal, rectangular and circular shape have been found, made with five, six or seven rectangular stones set on edge in the ground. In some cases stones from the foundations and pavements of *hare paenga* were reused.

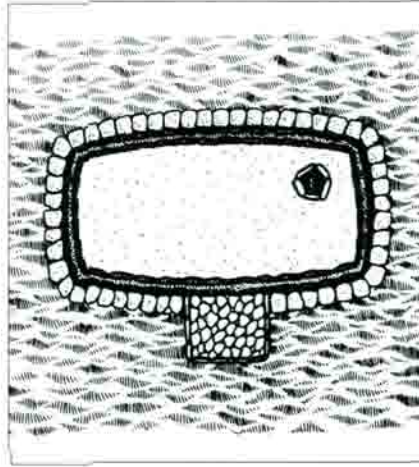
The diameters of *umu pae* vary from 50 to 65 centimeters; they are frequently found in the center of an artificial mound approximately three meters in diameter. Some hearths were surrounded by a circle of stones that seem to have been used to support a kind of wind-break.



Hare Oka

The foundations of these circular-plan houses are made with basalt slabs that show no signs of having been cut. In some cases, these foundation stones were inserted in the ground, slightly inclined toward the interior, and another concentric alignment was formed by stones that were set horizontally in the ground and seem to form an external paving. In the small space between the two alignments the posts and curved framework of the vegetal superstructure were installed. *Hare oka* are found in the interior of the island, usually close to sources of raw materials. Near the structure are frequently found small areas covered with obsidian chips and debris.

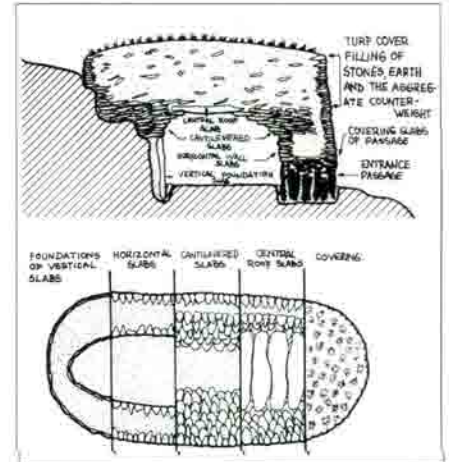
Based on archaeological evidence, it is believed that these houses were temporary habitations. In general, they have neither the secondary domestic structures nor the deposits of associated refuse characteristic of permanently occupied sites.



Houses of Rectangular Plan

Since rectangular-plan houses were not discovered until the 1960s (by Patrick McCoy), they are not mentioned in ethnographic accounts. About 250 of this type of house are found in the highest areas of the island's interior, many of them on the southeast slopes of Maunga Terevaka and some on Rano Kau in the vicinity of the basalt quarries.

Their foundations are of rectangular stones inserted on edge in the ground, often in parallel lines. A small exterior pavement, rectangular and composed of flat, irregular stones, is found in front of the structure or, occasionally, surrounding the entire structure. The superstructure was of vegetal material, but its shape is not known. These were presumably huts of seasonal or temporary use, and they are usually associated with lithic working sites and large pens built of stone. The encampments situated among the ravines of Maunga Terevaka are probably related to the exploitation of timber, which existed in good supply in areas 350 meters or more above sea level. The structures that have been dated correspond to the Early Middle Period (1100-1200).

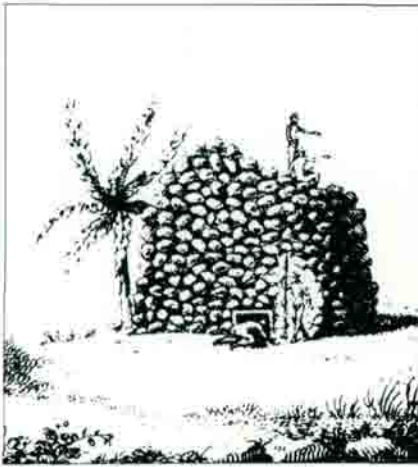


Houses of Stone Masonry

The ceremonial village of Orongo occupies a small triangular area between the precipice of the Rano Kau crater and its exterior edge at 300 meters above sea level. It is composed of 53 structures of masonry, built in contiguous groups and forming a unique architectural complex that has interesting features with prototypes in other structures of the island.

The basic form of the dwellings is a long and narrow ellipse, with a low lateral entrance passage and a vaulted interior. The houses are oriented toward the three islets that are related to the cult and located near the foot of the cliff. They are arranged in an irregular half-ellipse, in a series of continuous structures adapted to the upper part of the sloping ground.

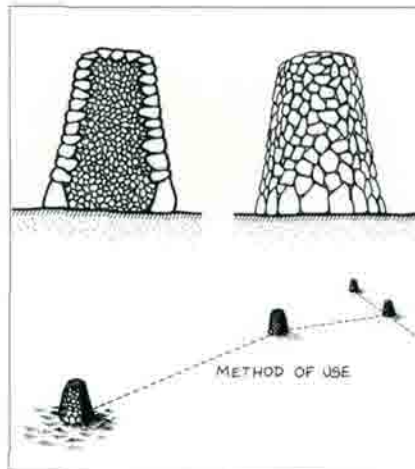
The walls of the houses are very thick and are constructed of two dry stone skins – angular basalt slabs obtained from quarries in the area – and earth filling the space between them. The roof is a corbeled dome formed of cantilevered slabs covered with earth. The site is related to the most recent period of local prehistory. The earliest dating corresponds to 1410 and the last ceremonial activity seems to have taken place in 1876.



Tupa

The function of *tupa* has not been determined archaeologically, but ethnographic accounts report that they were dwellings used by priests to carry out observations of the stars. Their astronomical observations allowed them to predict changes in the equatorial marine current, which brought turtles to the island (a sacred food and one destined for the king), and to determine the beginning of the lunar year, the time for planting, harvesting and religious festivals, and the arrival of the migratory birds and fish that constituted important food resources.

Tupa are round stone towers of oval or circular plan with a flat roof. The interior, a room with a vaulted roof, is connected to the exterior through a straight, narrow passage. The width of the room varies from two to four meters at ground level and the interior height reaches a maximum of three meters. About 30 of these structures still remain, the majority distributed around the coasts.



Pipi Horeko

Pipi horeko are stone landmarks of different forms, ranging from small heaps to elaborate round towers in the form of truncated cones. They were constructed with selected unworked stones, reaching a maximum height of 2 meters and a basal width of up to 1.8 meters. The interior was filled with stone rubble.

Certain sources report that some of these constructions carried a flag or distinguishing mark on the upper part to indicate their function. Some served to mark *tapu* areas or family and tribal properties, while others were used by fishermen to identify spots for fishing.

Appendix II: Glossary

- ahu:** ceremonial platform on which statues (moai) may have been erected
- ahu moai:** ceremonial platform on which statues (moai) were erected
- ahu poepoe:** boat-shaped ahu
- akuaku:** supernatural spirit
- ana:** cave
- ana kionga:** caves used by the defeated for concealment
- ariki:** chief; head of descent groups; king
- ariki henua:** paramount chief
- ariki mau:** paramount chief
- ariki paka:** royal family
- avanga:** sepulchral niche in an ahu
- hanga:** bay
- hare moa:** chicken house
- hare oka:** house of circular floor plan
- hare paenga:** boat-house
- hauhau:** indigenous small tree or shrub (*Triumfetta semitriloba*)
- heriki hare:** indigenous grass (*Paspalum forsterianum*)
- hopu:** servant or proxy for the birdman contest
- hurumanu:** common people
- ivi:** extended family
- ivi 'atua:** priest
- kaha:** gourd (*Lagenaria siceraria*)
- karava:** small cave or rock overhang
- keho:** thin basalt slabs used in the construction of stone houses like those at Orongo
- kia:** red earth
- kio:** servant; slave
- kio'e:** Polynesian rat (*Rattus concolor*)
- kohuo rongorongo:** wooden tablets inscribed with Rapanui script
- kumara:** sweet potato (*Ipomoea batata*)
- mahute:** paper mulberry tree (*Broussonetia papyrifera*)
- maika:** banana (*Musa sapientum*)
- Makemake:** creator deity
- mako'i:** Oceanian rosewood (*Thespesia populnea*)
- mana:** supernatural power
- manavai:** stone-walled garden enclosure
- manu:** bird
- manu piri:** motif of two birdmen facing each other, joined by hands and feet
- manu tara:** sooty tern (*Sterna fuscata*)
- marikuru:** soapberry tree (*Sapindus saponaria*)
- mata:** clan
- matato'a:** warrior
- moai:** statue; carving
- moko:** lizard
- moko uruuru kahu:** indigenous lizard (*Lepidodactylus lugubris*)
- moko uriuri:** indigenous lizard (*Ablepharus boutonii*)
- motu:** islet
- motu 'iti:** small islet
- motu kaokao:** craggy islet
- motu nui:** big islet
- naunau:** sandalwood (*Santalum* sp.)
- ngaatu:** totora reed (*Scirpus californicus*)
- ngaoho:** indigenous bush (*Caesalpinia major*)
- ngarua:** stone pillow
- niû:** endemic palm tree, now extinct (*Paschalococos dispersa*)
- paenga:** carved and smoothed stone shaped for structures
- paina:** circular area located in the plaza in front of an ahu and used in ritual ceremonies
- pipi horeko:** small stone cairn that served as boundary marker
- poepoe:** boat
- poporo:** indigenous shrub (*Solanum forsteri*)
- poro:** rounded cobble
- pua:** turmeric (*Curcuma longa*)
- pua nakonako:** indigenous bush (*Lycium carolinianum*)
- pukao:** cylindrical topknot of red scoria adorning some moai
- rano:** crater lake
- rongorongo:** Rapanui's undeciphered script; by extension, the wooden tablets inscribed with it
- tangata:** man; human being
- tangata honui:** head of lineage; chief of clan other than the Miru
- tangata manu:** birdman
- tangata maori:** craft expert
- tangata maori hanga moai maea:** expert in carving stone statues
- tanoa:** morning glory-like creeper (*Ipomoea pes-caprae*)
- tapa:** bark-cloth, textile prepared from the bark of the mahute
- tapu:** forbidden; taboo
- taro:** edible root (*Colocasia esculenta*)
- tavari:** kind of bistort, subaquatic plant (*Polygonum acuminatum*)
- Te Pito 'o te Henua:** navel of the earth; end of the land
- ti:** shrublike agave (*Cordyline terminalis*)
- toa:** sugar cane (*Saccharum officinarum*)
- toki:** basalt pick used for carving
- toromiro:** endemic mimosa-like tree (*Sophora toromiro*)
- tupa:** towerlike stone structure usually found by the coast whose original function is still unclear
- uhi:** yam (*Dioscorea* sp.)
- umu or umu pae:** stone-lined earth oven
- ure:** lineage; tribe

Appendix III: Bibliography

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Easter Island's Key Sites

- 1 Orongo
- 2 Ahu Vinapu
- 3 Ahu Vaihu
- 4 Ahu Akahanga
- 5 Rano Raraku quarry
- 6 Ahu Tongariki
- 7 Ahu Heki'i
- 8 Ahu Te Pito te Kura
- 9 Ahu Ature Huki/Ahu Naunau
- 10 Ahu Te Peu
- 11 Ana Te Pahu
- 12 Ana Te Pora
- 13 Ana Kekenga
- 14 A Kivi-Vai Teka Complex
- 15 Ahu Hanga Kio'e
- 16 Tahai Complex:
Ahu Vai Uri
Ahu Tahai
Ahu Ko te Riku
- 17 Ahu Tautira
- 18 Ana Kai Tangata
- 19 Ahu Huri a Urenga
- 20 Ahu O Kava

Easter Island

The Heritage and its Conservation



CREDITS

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Cover: Ahu Akivi, the first ahu restored by William Mulloy and Gonzalo Figueroa in 1960.

(photo: R.V. Gianzone)

Back cover: The moai on Ahu Hanga Kio'e, the first to receive conservation treatment (1986-87). Mulloy restored this ahu in 1972.



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