

THE UNDERGROUND WORLD OF EASTER ISLAND. POLISH EXPLORATION 2001–2008

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Abstract. This paper provides general information on Easter Island, the genesis of its caves, their role in the population's history and culture, and the various ways they have been used. There is a section describing the types of archaeological objects. An inventory of 315 caves by almost 30 eminent Polish speleologists (2001–2008) indicated that as many as 124 of them contain elements described as large architecture, and 50 caves contain structures characterized as small architecture. In 48 there were preserved human bones. In some caves without any structures the only signs of human activity were some remains. There were 23 moveable objects regarded as remains of material culture, located in 15 different caves. This reveals the disproportion between the number of caves and the low number of preserved objects. The explored caves seem especially barren in view of the wealth of cave furnishings described in the literature.

Key words: Easter Island, Rapa Nui, speleological exploration, cave archaeology and anthropology

INTRODUCTION

The volcanic caves on Easter Island (Rapa Nui) are a significant part of a history and tradition unique in the world. For the majority of inhabitants they are still very important. A complete inventory of the caves is needed as a basis for multidisciplinary and especially archaeological and anthropological studies connected with the caves. We wish it had been done earlier, because we know from earlier descriptions that many caves were filled with monuments of material culture which we will not be able to find.

The historical names of the caves, which are connected with their use, and not only current uses, are fading from memory, so this is the last moment to rescue from oblivion this part of a tradition and

material culture undervalued by archaeologists and the inhabitants. So far the work has concentrated on the inventory and on research on the cultural objects on the island.

The first serious work on the inventory began in the 1980s and has not been completed yet. The Polish initiative, dating back to 2001, is aimed at making a complete inventory of the island's caves to show the wealth and specific character of this world (Fig. 1).

Field work was conducted with the approval of the management of National Corporation de Forestation (CONAF) and in collaboration with the local authorities and many inhabitants. We thank them all and we are counting on their further cooperation.

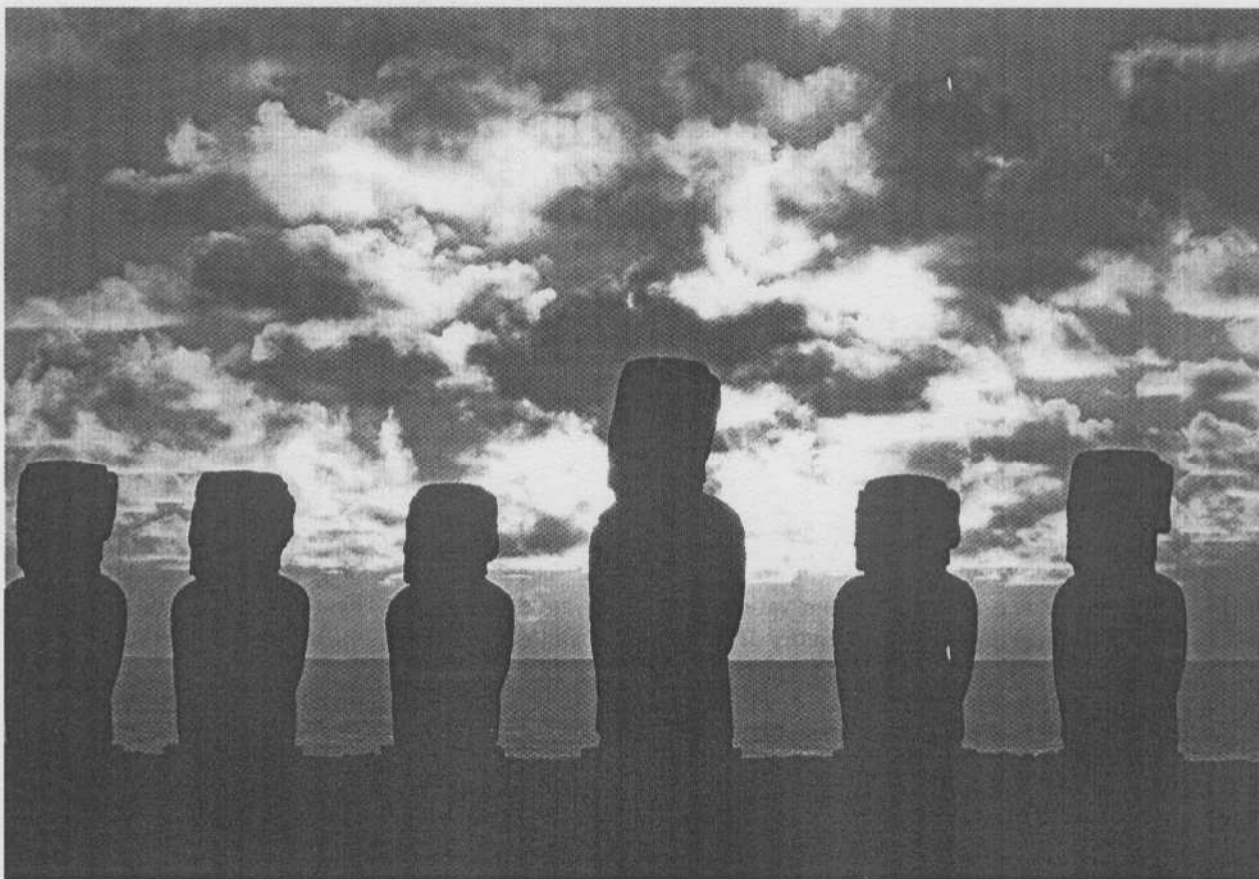


Fig. 1. Sunset on *Tahai* ceremonial center. Photo Z. J. Ryn.

Fig. 1. Atardecer en centro ceremonial *Tahai*. Foto de Z. J. Ryn.

As a result of the inventory, 315 caves were documented in three areas recommended by CONAF and having the greatest number of caves on the island. Nine submarine caves were also surveyed. Other information, including the cultural content of the caves, was given in a separate report to CONAF for its exclusive use.

This paper provides general information on the island, the origin of the caves, their role in the population's history and culture, and the various ways in which they have been used. The geology of Easter Island and the genesis of the caves are described in more detail. There is a section describing archaeological objects. An extensive bibliography, the first such wide-ranging one, will guide the reader through the world literature on the subject.

The plans of the 315 caves, with descriptions, are an integral part of the monograph *The Caves of Easter Island. Las Cuevas de Isla de Pascua* (Ciszewski *et al.* 2009). The book is a result of the

collective work of many experts bound together by a passion for discovery and exploration. From the beginning our expeditions were organized under the patronage of the Explorers Club. Speleological documentation was made by the members of clubs federated in the Polish Mountaineering Association. The expedition took place under the scientific patronage of the Jagiellonian University of Kraków, University of Warsaw, AGH University of Science and Technology in Kraków, and the Polish Society for Latin American Studies.

THE CAVES OF EASTER ISLAND, PAST AND PRESENT

PHYSIOGRAPHY AND GEOLOGY OF THE ISLAND

Easter Island is situated in the middle of the Pacific Ocean, 3800 km from the South American coast. Adverse sea currents and winds kept the island off



Fig. 2. *Te Pito o Te Henua* – The Navel of the World. Photo Z. J. Ryn.

Fig. 2. *Te Pito o Te Henua* – Ombligo del Mundo. Foto de Z. J. Ryn.

the main sea routes; hence it was 'discovered' by European sailors relatively late (Easter 1722). The original name given by the legendary king Hotu Motua was *Te Pito O Te Henua*, which means 'navel of the Earth' (Fig. 2).

Rapa Nui is a volcanic island covering 180 km². It forms a triangle with sides 16 × 18 × 24 km and perimeter 56 km. It formed as the youngest island of the Salas y Gomez submarine volcanic ridge separating vast basins of the Eastern Pacific. The oceanic Nazca Plate created along East Pacific Rise moves 10–15 cm/year eastward and melts over a hot spot where hot material from the Earth's mantle ascends, producing lava outpourings. The embryo of the island originated about three million years ago on the Pacific bottom some 330 km west of its present position, and the island itself emerged at least 700,000 years ago. The volcanic sequence is about 3500 m thick but only some 500 m rises above sea level. The youngest effusive rock radiometrically dated so far date to 130,000 BP, but some forms are believed to be as young as 2000 BP. This means that no volcanic eruption has occurred since colonization (Fig. 3).

The structure of Rapa Nui is a blend of several shield volcanoes, of which Poike, Rano Kau and

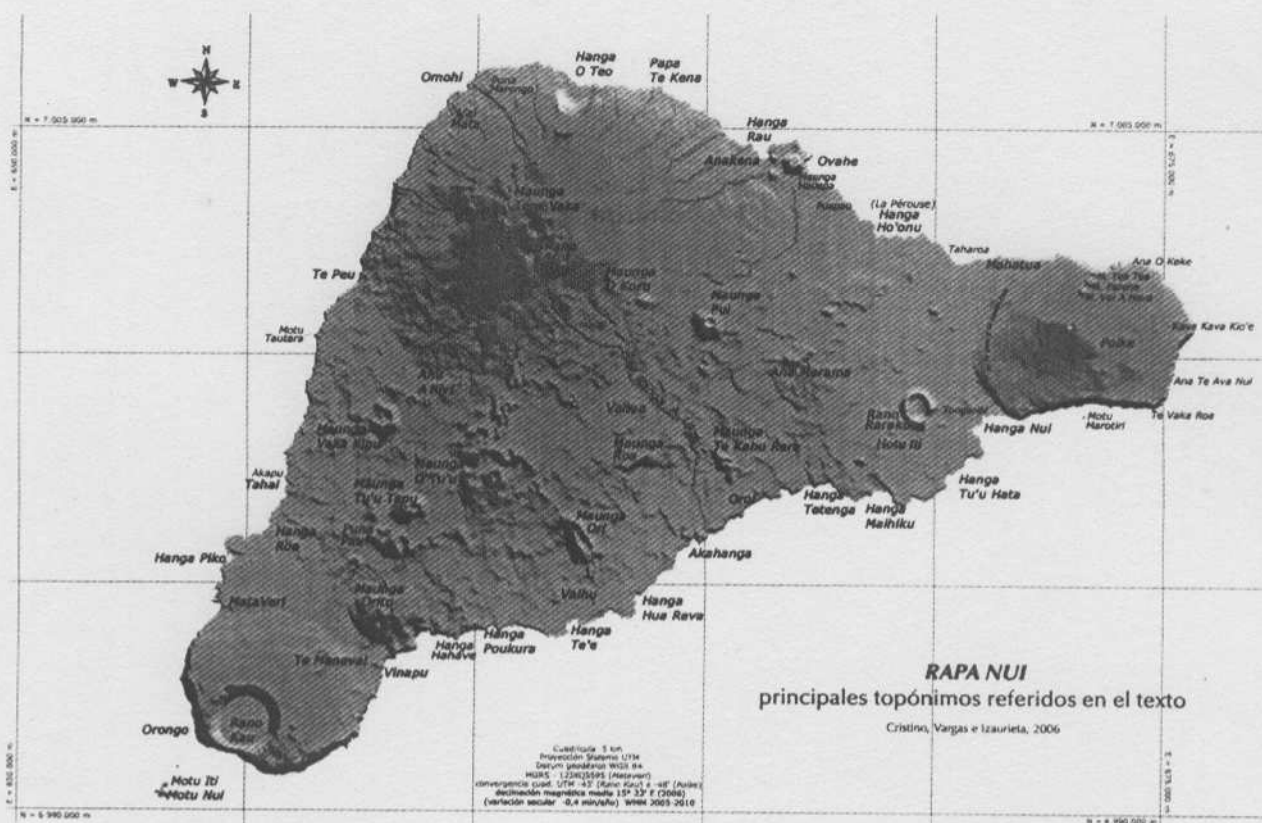


Fig. 3. Map of Easter Island (Rapa Nui).

Fig. 3. Mapa de Isla de Pascua (Rapa Nui).

Terevaka are the most prominent and form the three corners of the island. The predominant rock type is dark basaltic lava. Younger units, especially the Hiva Hiva group and Roiho surmounting the Tangaroa group, abound with lava tunnels. In the southwest corner, two obsidian domes outcrop: Orito and Te Manavai. Less numerous but very important in the *moai* structures are pyroclastic rocks. The heads and bodies of the stone figures are made of grey submarine deposited tuff excavated in the Rano Raraku relict cone. The red 'hats' or hat-like coiffures are carved of red scoria dug in secondary scoria cones of the Tangaroa group.

Important evidence of climate and plant evolution comes from study of the lacustrine deposits, rich in organic matter, which developed in the only negative relief forms of the island – the caldera of Rano Kau and the crater of Rano Raraku. Radio-

carbon isotope dating suggests forest extinction at *ca* 1000 BP. There is no river network on the island.

An outstanding feature of Rapa Nui is the steepness of its shore (cliffs), caused by long and intensive erosion of the volcanic cones by sea waves. Landslides slow the development of beaches (Fig. 4).

CLIMATE

The climate of the island is considered tropical. Average daytime temperature is 25°C and nighttime temperature is 12°C. Temperatures are highest in July and August, and lowest in December and January. Rainfall is highest between March and October. Depending on altitude, total annual rainfall ranges from 1100 to 1500 mm. A shortage of constant sources of potable water is a serious

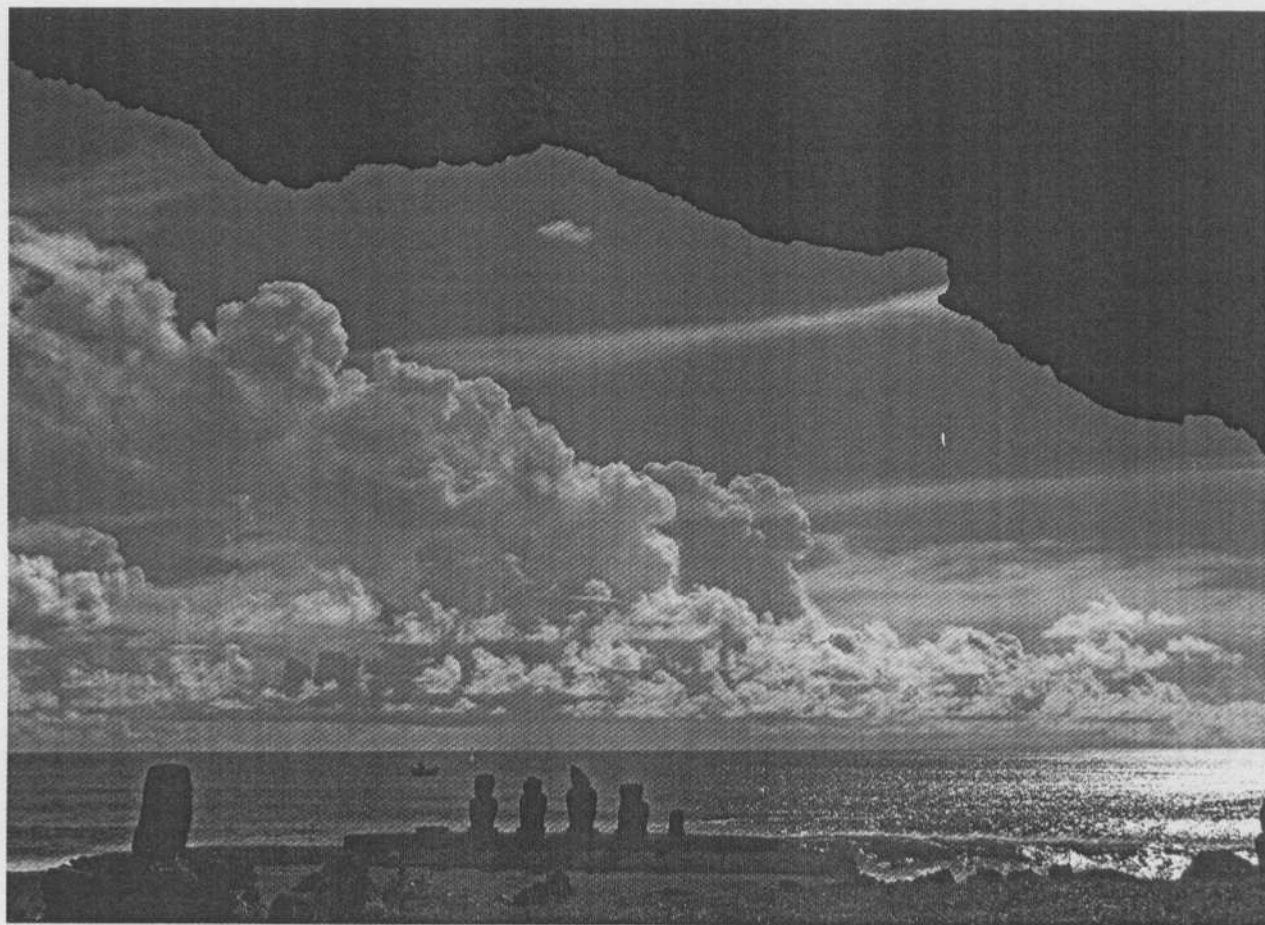


Fig. 4. General view of Tahai ceremonial place plaza. Photo Z. J. Ryn.

Fig. 4. La vista general a plaza ceremonial Tahai. Foto de Z. J. Ryn.



Fig. 5. Rano Kau Volcano. Photo Z. J. Ryn.

Fig. 5. El volcán Rano Kau. Foto de Z. J. Ryn.

problem on the island. Water is acquired from the rain or, recently, from drilled wells.

Because of the water shortage and the concentration of the population at the coast, there are more artificially drilled wells and stone containers on the surface or in caves there.

The density of the distribution of archaeological excavation sites, especially settlements and homesteads, reflects access to potable water. Access to water determined how the population concentrated in separate parts of the island, even more than the fertility of the soil. The main sweet water bodies were the volcanic craters of Rano Kau, Rano Aroi and Rano Raraku. The situation persists to this day, although recently the islanders have been using water from wells. Up to the 1960s the crater lakes were the only reservoirs of potable and usable water.

SOILS AND THEIR USE

The soils were formed as a result of weathering of volcanic rock and then were subject to erosion. The soil cover on the island is poor and thin, usually

less than a half meter thick; it is several meters thick in only in few areas.

Alcayaga and Narbon (1969) classified the soils of Rapa Nui into eight categories, depending on their utility grade. Surface erosion on the island has become a serious problem, especially on the volcanic slopes.

On the basis of their research, Vargas *et al.* (2006: 63–67) concluded that about 80% of the island's surface was once used agriculturally, and that the crops could have fed more inhabitants than mentioned by other sources. Carbon dating confirmed that Rapa Nui was inhabited at the end of the first millennium and that during the period of 1100–1750 the coast as well as the island's interior were inhabited.

Environmental damage became more extensive when sheep farming started and developed on an industrial scale in the first half of the 20th century, also causing damage to many archaeological objects. Recently, destruction of the natural environment has been continued by herds of wild horses (Fig. 5).

FLORA

Paleobotanical research indicates that when the first people arrived the island was covered almost completely by palm forests and lush vegetation. As the population increased the forests were almost entirely felled and many plants vanished, including endemites. Some think that the Polynesian rats that came with people may have contributed to the forests' destruction. Generally the island's flora is considered to be very sparse.

The volcanic island was formerly covered with coconut palm tree forests (*Paschalococos dispersa*) and endemic tree toromiro (*Sophora toromiro*). Both species are extinct in the wild and attempts at regeneration of *Sophora toromiro* are unpromising so far. There are 3 other surviving endemic flowering plant species: *Axonopus paschalis*, *Danthonia paschalis* and *Paspalum forsterianum* (Maunder 1997).

The mosses and lichens are relatively poorly known. Pilot studies on lichens by Knowlton (1888), Follmann (1961) and Rutherford *et al.* (2008) indicate two promising directions for work using lichenometric methods: research on environmental pollution and climate change, and, perhaps most interesting, dating of archaeological objects, the *moai* in particular.

FAUNA

The fauna of the island is sparse. No local mammal species ever existed. Wild, predatory or

venomous animals never lived here. Originally a mouse brought from other Polynesian islands (*kio*) occurred. Sheep, pigs, horses, dogs and cattle were brought from Europe. Birds were protected on account of their feathers, especially the white ones, which were used as sacred attributes of the chiefs and priests. They were also used to decorate women's and men's bodies. There were many stone chicken houses (*hare moa*) built to protect them. It is surprising that hens in the *rapanui* culture occupied such a privileged place among the whole fauna as well as in social, political and religious life. In contrast to other fauna, sea birds¹ and fishes² are abundant. The best known one is the mystery-wrapped seagull *Gaviotin pascuense* (in the *rapanui* language *Manutara*). The oldest petroglyphs depict lizards called *moko*. They served as a model for wooden sculptures (*moko-miro*) resembling phallic idols.

SOCIOLOGY AND CULTURE

POPULATION AND SOCIAL ORGANIZATION

The cultural, linguistic and biological affiliation of Rapa Nui to the people of eastern Polynesia is indisputable. According to one study the similarities are strongest to inhabitants of the Marquesas Islands, and another points to the inhabitants of the Gambier Islands. Anthropological, linguistic and archaeological evidence favors the latter.

After 50 years of research and discussion, previous data on the settlement of Eastern Polynesia have been corrected; the majority of researchers cite the period 600–800. Settlement of Western Polynesia, including Rapa Nui, took place probably after 800 AD. Thus it can be said that the original *rapanui* culture developed during a millennium in isolation from external influences (Fig. 6).

The Polynesian settlers brought their old systems of social and political organization to the island. King Hotu Matua was accompanied by priests of the royal background (*ivi atua*), warriors (*matatoa*)



Fig. 6. *Rapanui* children. Photo Z. J. Ryn.

Fig. 6. Los niños *rapanui*. Foto de Z. J. Ryn.

¹ For example, *tai-ho*, *tuvi-tuvi*, *kia-kia*, *tavake*, *ruru*.

² For example, *pei*, *kahi*, *matahuira*, *remo-remo*, *kana-kana*, *aku*, *mahaki*, *koiro*; 164 fish and 25 bird species are known.

and wise men (*maori*). They were also the ones responsible for the collective memory and knowledge of the *rongo-rongo* ideographic writing.

The settlers divided the island into sectors (*kananga*) and areas belonging to separate clans (*ure*). The most important central point in every sector was the ceremonial square called the *marae*. Every such place had a stone altar called an *ahu*. Stone or rarely wooden *moai* statues were put there. The majority of the great ceremonial altars (*ahu moai*) were built along the island's coast. Over 300 *ahu* have been registered on the island (Fig. 7). They formed the basis for the socio-economic, political and above all religious organization. In their vicinity there were living quarters, often inside caves, for the people performing important social or religious functions.

AHU ALTARS AND MOAI STATUES

The megalithic *moai* statues are the ones that attract the greatest attention. These have become the symbols of Easter Island. The *ahu*, the ceremonial and religious structures, were very important in the social, religious and political organization of the inhabitants' lives. During a period of about 500 years, 300 altars were built and about a thousand *moai* statues were sculpted, the majority of them made of volcanic tuff from the quarry of Rano Raraku volcano. There is one unfinished *moai* 21.60 m in length and weighing about 150 tons.

Almost all of the *ahu* are along the island's coast in elevated areas or bays. They form a characteristic ring of altars around the island, where religious and ceremonial life was concentrated, and funerals were conducted. The most spectacular is *Ahu Tongariki* in the eastern part of the island. This structure is higher than all the others, and also exceeds them in perfection. The largest sanctuary is almost 200 m long. Fifteen gigantic *moai* statues destroyed twice in the 1960s by undersea earthquakes have been reconstructed. Inside the stone *ahu* is the largest deposit of human bones, skulls mainly.

The statues were an expression of the eternal need for contact with the spiritual world and for a connection with dead ancestors. This power was attributed to the statues, altars, caves and cave



Fig. 7. *Ahu Nau Nau* ceremonial center. Photo Z. J. Ryn.

Fig. 7. Centro ceremonial *Ahu Nau Nau*. Foto de Z. J. Ryn.

paintings. The *moai* became the symbol of human immortality (Fig. 8).

For several centuries the *rapanui* built higher and higher giant statues. Then, overwhelmed by a mass passion, they toppled them to the ground. So we can view the work of the *rapanui* as an expression of 'the madness of mass creation' crowned by 'the fury of mass destruction'.

The underground world of Rapa Nui cannot be explored without facing its guardians, the *moai* statues. Under their feet, in the stone cemetery crypts, hundreds, thousands of human skeletons were gathered, turning the underground world into a great necropolis lost in the endless expanse of the Pacific Ocean.

CAVES IN LEGENDS AND CEREMONIES

Under the layer of volcanic rock covered with a thin bed of soil, there is a world shrouded in mystery. This is the world of caves that has attracted

discoverers and treasure hunters, as described by Thor Heyerdahl in his book *Aku-Aku* (1961). On the island's surface almost 30,000 archaeological objects have been found and described, while the underground world has been explored in fragments, randomly and often not from the not very noble motive of treasure hunting. From the beginning it was assumed, not without reason, that signs of human activity could be found in the caves. They were always used as habitations. Systematic research of the underground world of Rapa Nui did not start until the 1970s.

Caves also found their place in legends, and especially in the ceremonies of *take* and *manu*. The initiation rites of boys and girls are connected with the caves of Motu Nui (Small Island). The ceremony called *manu* was for boys as well as girls. It was the initiation rite proper, always organized in December. After the ceremony the girl or boy became *poki manu*, which meant that they were now taking responsibility for themselves (Fig. 9).

CAVES AND MANA

The locals believed in an archaic power called *mana*. It has special features on the island. In the ancient culture the *mana* power was represented by the king, *Ariki*. The force could be transferred to all objects touched by him. Then the objects became *tabu*, that is, inviolable on penalty of even death. The king was seen as a mediator between the supernatural and the people. The *mana* power was also invested in objects, especially in caves, on the *ahu* altars and the *moai* statues. The main motive for building *moai* was to follow the ancestral cult and to preserve their spiritual power, *mana*. *Mana* was also placed in caves and the stone crypts of the ceremonial *ahu* altars. According to the beliefs, 'signed' human skulls, that is, the ones with pictures or geometrical forms carved on the foreheads, belonging to the kings and were considered sacred because the *mana* power had been placed inside. This may be why the human skulls inside the caves are positioned differently from the skeletons.



Fig. 8. Ahu Tongariki ceremonial center. Photo Z. J. Ryn.

Fig. 8. Centro ceremonial Tongariki. Foto de Z. J. Ryn.



Fig. 9. *Puna Pau* – volcanic crater where the material for sculpting the *pukaos* (hats on the *moai* statues) originated. Photo Z. J. Ryn.

Fig. 9. *Puna Pau* – cráter volcánico de donde sacaron material para producir *pukaos* ('sombreros' para estatuas *moai*). Foto de Z. J. Ryn.

LEGEND OF THE CAVE OF THE VIRGINS

Some of the caves are associated with stories and legends. The Cave of the Virgins certainly is one of those (*Ana o Keke*, *La Caverna de las Virgenes*). It is the one most often mentioned and described by travellers and explorers. It has a place in the mythology of the *rapanui*. It is a chamber that climbs gradually and stretches a few hundred meters. To the right of the entrance there are numerous petroglyphs of sexual symbolism. The *komari* drawing has been well preserved. It symbolizes the female genitals in the local iconography. Small circles above it symbolize drops of semen. In the lower part there is a drawing depicting the uterus with ovaries.

Girls (*neru*) were placed there so that their skin, away from sunlight and even other light, would become completely white. That was what their future lovers expected, as it was believed that the offspring would be white-skinned as well. The

food for the girls kept in the cave was left at the entrance (Fig. 10).

CAVES IN THE REPORTS OF TRAVELLERS AND DISCOVERERS

The underground world has attracted the attention of almost every researcher and traveller visiting Easter Island. Only a few have entered the caves, either because of lack of preparation or because of respect for the stories and beliefs connected with the caves, thought to be holy places where the gods and the magical *mana* power resided.

One of the earliest observations indicates that many locals were living in caves despite the presence of many houses (*hare paenga*). The caves were used as shelters especially during fights between clans, when the grass and leaf roofs of the houses being burned by enemies (Englert 1995: 176). Undoubtedly the caves were places for living,

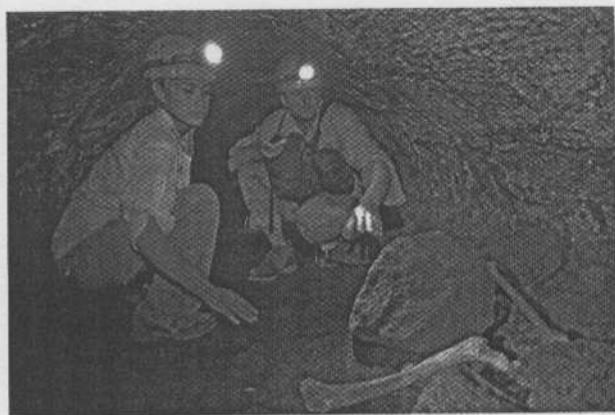


Fig. 10. Archeologists Suzana Nahoe and Maciej Sobczyk. Photo M. Jamkowski.

Fig. 10. Suzana Nahoe y Maciej Sobczyk – arqueólogos. Foto de M. Jamkowski.

as confirmed by the stone structures, petroglyphs, drawings and furnishings found inside.

WILLIAM J. THOMSON'S DESCRIPTIONS (1886)

William J. Thomson reached the island on December 1886. Here is what he wrote:

Natural caves are so abundant on the coast as well as in the island's interior. Some are ancient and have signs of being used by the first inhabitants as living quarters. It have been said that there were small objects, sculpted tablets and other interesting things hidden in those caves. Finally the objects went missing because of the landslides (Thomson 1980: 39; back-translated from Spanish).

According to his own observations, he suggested a division of the caves into two types. The first includes caverns cut by waves attacking the coast. The other includes caves formed by gases in lava. Some created by waves are extensive but usually inaccessible. They could be interesting to geologists. They are located along the coast and most of them are dry.

Thomson confirmed that the caves had various uses, not only as living quarters. They were shelters during wars and clan conflicts. In some of them cannibalism was performed, especially during those conflicts. The first locals lived in the caves. Later, houses in ship form were built. There were also half-underground rooms in shallow caves with openings in their ceilings.

At the end of December Thomson and his party climbed the slopes of Punta Tama where they came across many cave entrances but could not enter as they did not have a rope. Some of the entrances were covered with stone slabs.

KATHERINE ROUTLEDGE'S OBSERVATIONS (1914)

The caves attracted the special attention of Katherine Scoresby Routledge. She arrived at the island with her husband on their own sailboat in 1914, supported by British scientific institutions and the government. One chapter of her book *The Mystery of Easter Island: The Story of an Expedition* is devoted to 'hunting in the caves' (treasure hunting). She entered many caves personally, and described their appearance and contents. She also described many cave entrances in the cliffs but she could not reach them due to technical difficulties. She found out that some locals had forgotten where the hidden entrances of the family caves were situated. Even then it was said that everything 'mobile', that is, not sculpted in the stone walls of the caves, had been taken out by the locals and sold to travellers. Nor did Routledge return empty-handed from her expedition (Routledge 1919) (Fig. 11).

SEBASTIAN ENGLERT'S DESCRIPTIONS (1935–1969)

Although a missionary, Father Sebastian Englert was also one of the first foreigners to make systematic observations of the caves, and he left written documents. He noted that the caves of Rapa Nui were of various kinds. The ones on the cliff coast open to the sea were used not as living quarters but only as temporary shelters by fishermen during bad weather.

The inhabited caves were situated far from the coast. Most of them are natural but some were built or converted. The entrances to many caves were hidden. The conditions inside were more than primitive: the rooms were low, wet and cold. The entrances were protected by artificially built walls or stone covers. At the entrances Englert observed layers of food remains: eggshells, fish bones and sea shells. Even in Englert's times the caves were pillaged and almost completely devoid



Fig. 11. Moai – icon of Easter Island. Photo Z. J. Ryn.

Fig. 11. Moai – icono de Isla de Pascua. Foto de Z. J. Ryn.

of precious cultural objects such as statuettes or stone tools, bone needles, fishhooks, coral necklaces, obsidian arrowheads, etc. In Englert's view, at that time the caves already had no value at all in this respect.

There were also hidden caves, the private property of different families. The entrances were known only to the eldest members of the family. These caves were used as storehouses of precious things: wooden tablets filled with *rongo-rongo* writing or statuettes. Some of the caves were used as burial sites.

Englert also distinguished cave refuges where fugitives (*kio*) hid during intertribal wars. Their entrances were barely accessible and guarded (Englert 1995: 185).

Father Englert quotes an interesting story of an islander called Andres Teave who in his old age left his family in secret to depart from his life alone in a cave of the Hanga Oteo sector. He was never found (Englert 1995: 46) (Fig. 12).

THOR HEYERDAHL'S DESCRIPTIONS (1955–1956)

Thor Heyerdahl's books have helped popularize knowledge about the island and its caves worldwide. Although the caves were not the main objects of his observation, he devoted much attention to them.

He visited among other the Cave of the Virgins, guided by Father Sebastian Englert. Here is his description:

At the beginning it was tight but soon the ceiling was rising and one could feel some unusual peace and safety in this mountain's stomach. After shining the pocket torch I noticed many strange drawings and figures on the arched walls. [...] The cavern was not more than 1.5 m high. Father Sebastian showed a small hole in the back of the cavern and told me that it was the 380 m long way leading into the heart of the mountain. Approximately halfway the passage narrowed so much that a man had to push his way; in the other part of the passage there were lying teeth and human bones in an amount suggesting that the cave was used as a burial site (Heyerdahl 1961: 84–93; back-translated from Polish).

RAMÓN CAMPBELL'S DESCRIPTIONS (1964–1994)

Campbell was a doctor who also took an interest in the archaeology and geology of the island. The underground world of Rapa Nui became the main object of his interest. In recognition of



Fig. 12. Burial cave. Photo Z. J. Ryn.

Fig. 12. Una cueva funeraria. Foto de Z. J. Ryn.

his accomplishments in this field he was made a member of the Chilean Archaeological Society.

Campbell distinguished and described various cave types according to their structure. Three forms were distinguished: *karava*, *ana kio* and *ana*.

The *karava* type includes the rather small open caverns usually located on the coast, on cliffs and in the more densely populated areas. Each cave had its own name, as it was used formerly as temporary or permanent living quarters. The caverns decorated with petroglyphs and cave paintings stand out from the others. Unfortunately, the majority of those elements have been damaged by natural factors or human activity (tourism). Some of the *karavas* have very high vaults, such as *Ana Kai Tangata*, the Cave of the Cannibals, with preserved bird images on the vault. Another one is *Ana Nga-heu* in the northeastern part of the island. This

rather small and almost invisible cavern is known for its petroglyphs, numbering about 30, depicting the *Make-Make* god.

The *ana-kio* type includes the prisoners' caves, which are natural, usually bigger and converted into living quarters (*kio* means 'prisoner'). As mentioned, they were used as hiding places (Fig. 13).

The most abundant caves are those of the *ana* type. The word has been used as a general term describing a cave regardless of its structure and dimensions. The locals created a mysterious and magical aura around the caves. The world of magic overlaps with the observations of travellers, scientists and finally speleologists. About one thing there is no doubt – Easter Island is an absolute labyrinth of caves which are still partly hidden from the outside world.

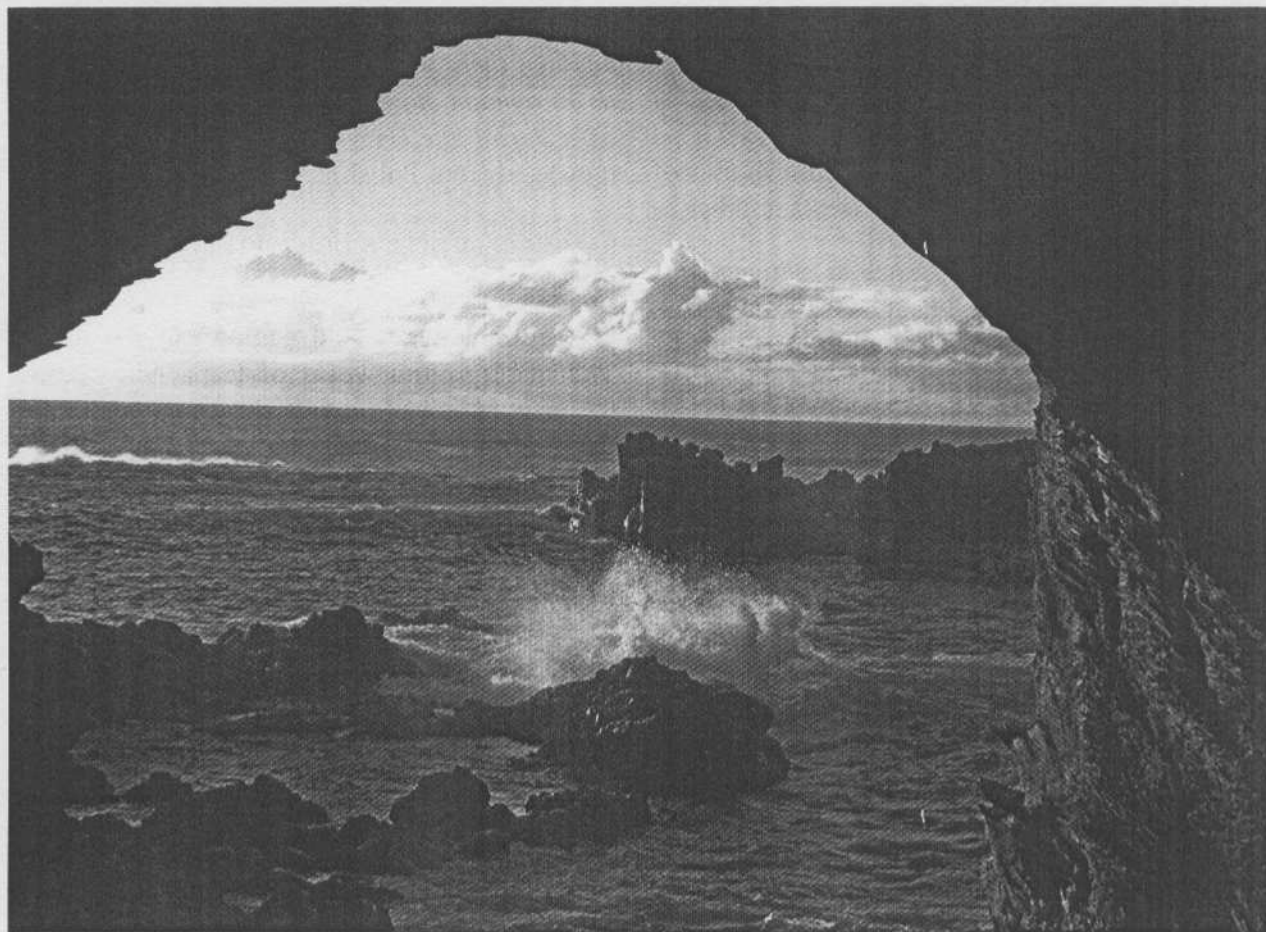


Fig. 13. View from the Cave of the Cannibals – *Ana Kai Tangata*. Photo Z. J. Ryn.

Fig. 13. Vista de la cueva de canibales – *Ana Kai Tangata*. Foto de Z. J. Ryn.

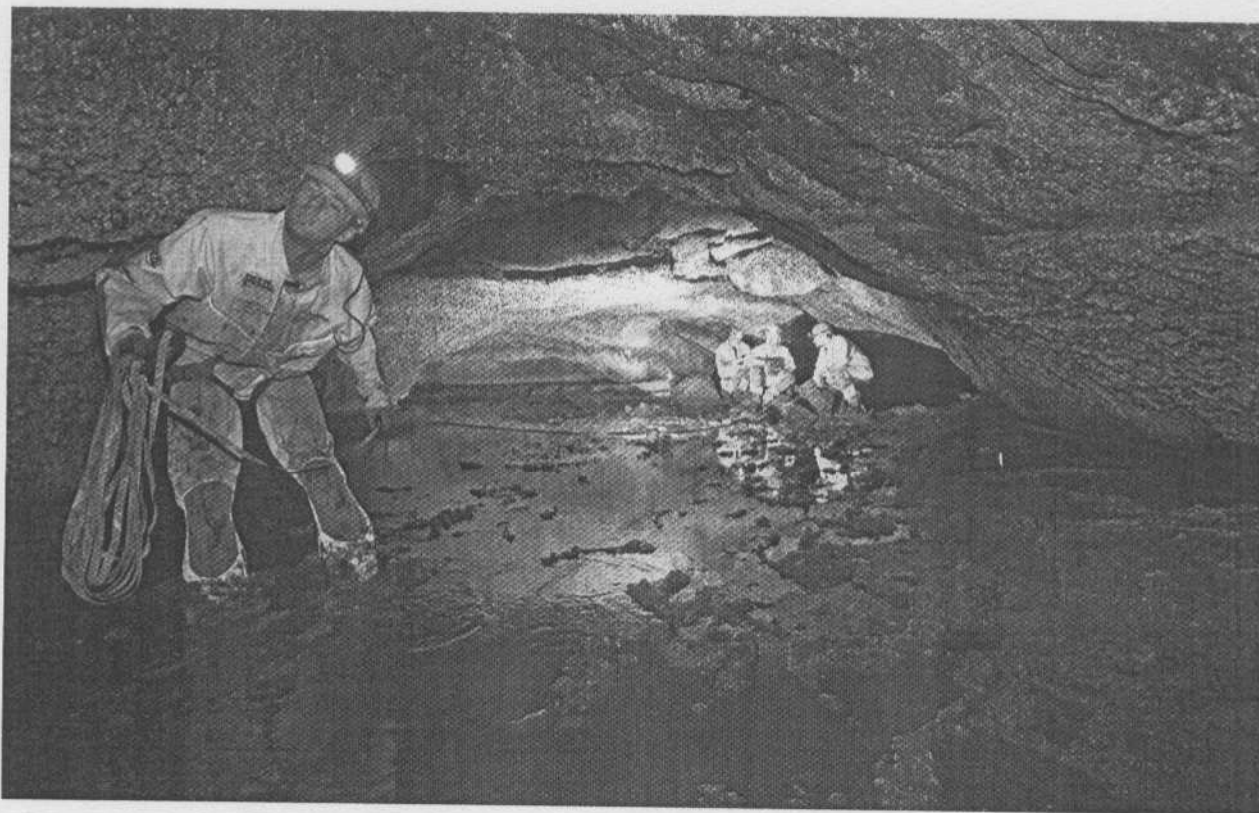


Fig. 14. Measuring the caves. Photo M. Jamkowski.

Fig. 14. Mediciones de las cuevas. Foto de M. Jamkowski.

The greatest number of caves is in the Roiho sector to the north of the island's capital city, Hanga Roa. Ramón Campbell was convinced that this underground world was worth systematic research, and the prospect of entering them presented an unusual and dangerous adventure. Some of the caves have lateral tunnels and it is easy to get lost. Some of the entrances are interesting and varied in the forms of stone construction. In some of the caves there are tropical plants growing, such as banana trees, reeds, pineapples, cotton plants and melons. Others have entrances barely visible or covered with large stones.

Some of the tunnels widen, forming extensive chambers. *Ana Kakenga* is about 80 m long and ends in a vast room that opens two windows to the sea in the vicinity of Motu tautara.

According to Campbell the caves are so abundant that even the locals do not know all of them. The caves that were family property and used as living quarters and larders were better known. They were also used as reservoirs during droughts (Fig. 14).

On the coast, in the region of Mataverí o tai, are the best known and most frequented cave formations. This is *Ana Kai Tangata*, 'the cave of those who eat humans'. This cave type is called a *karava*, a shallow cave, no longer than 20–30 m. Once it was smaller but with time rocks fell, making it more spacious. Sea waves enter the cave entrance, adding to its interest. According to tradition, ceremonies were supposed to have taken place there, including human sacrifice and anthropophagy.

Unlike the shallow caves on the southern coast, there are extensive caves on the eastern coast of the Poike peninsula. There are two caves called *ana hue neru* or caves of the virgins. One of them, *Ana o Keke*, on the edge of a cliff, has an interesting history. The cave extends 380 m. Naturally formed, parts of it were built by man. Its height varies from 30 cm to 2 m. To the right of the entrance there are interesting petroglyphs of various forms. This was a cave especially for the girls, called *neru*, who were imprisoned there during their adolescence to get lighter skin. Then the caves were used

for ceremonies of religious and sexual initiation. All the archaeological objects such as figures and statuettes were removed from this cave and handed over to European museums.

That reminds me of the words of Ramón Campbell written in his book *El Misterioso Mundo de Rapanui* (Campbell 1973: 61–62) about the underground world of the island:

Under the rocky layer, partially covered with short grass called toroko, an invisible world stretches out, full of legends and secrets. This is the underground of Rapa Nui that became the source of so many marvelous stories. No scientific exploration of this world has yet been organized on a serious scale. The caves stretching over long distances, with their surprising shapes and drawings, have been only partly explored. It is probable that there are remains of great archaeological value. If only someone would conduct research using modern equipment [...] This is still to come.

It is a shame that Campbell's assessment was not taken to heart by archaeologist earlier, that they did not make a detailed inventory and did not protect these genuine treasures. Treasure hunting preceded the visits of scientists and explorers, and the island's most precious objects were bartered away.

ARCHAEOLOGY IN THE CAVES

The caves of Rapa Nui have been the subject of archaeologists' and anthropologists' interest from the



Fig. 15. There are many human skulls inside the caves. Photo Z. J. Ryn.

Fig. 15. Hay muchos cráneos humanos en las cuevas. Foto de Z. J. Ryn.

very beginning, when it became apparent that the archaeological wealth on the surface corresponded to the wealth in the underground world. Besides the archaeological excavations, the caves have precious anthropological objects, that is, human skeletons and skulls. The first foreigners coming to the island learned of this, as up to the beginning of the 20th century many locals were still living in the caves. The caves were used as storehouses for possessions, food supplies and products including artistic and religious objects (e.g., statues of divinities, amulets, *rongo-rongo* tablets).

The most interesting caves for us are the ones converted into mass or family (clan) burial mounds. It appears, however, that apart from the usual burial places in the crypts of the ceremonial altars (*ahu*), the dead or their skeletons were placed in selected caves (Fig. 15).

Written records, especially travel reports by explorers, sailors and scientists, indicate that as the years passed the caves' contents became impoverished, as the artistic objects presented a tasty morsel. It is hard to estimate today how many of them fell into the hands of private art collectors or museums. The archaeological objects removed from the island even include *moai* statues! The locals did not attach much significance to them and exchanged them for everyday articles and clothes. A peculiar barter developed, and many treasures of the *rapanui* culture were transported off the island. A comparison of the collection in the Father Sebastian Englert Anthropological Museum on the island with the collections of European and American (including Chilean) museums confirms this.

ROCK ART

The many petroglyphs and cave paintings seen everywhere are expressions of ancient *rapanui* culture. It is no overstatement to say that there are only a few places where traces of human existence have not been recorded. At least 673 archaeological excavation sites with rock art have been registered: from single drawings to complex paintings with intricate structure and content. About 4000 artistic motifs have been recorded! The techniques used in making the petroglyphs include hitting with a sharp stone tool and cutting. Many of the petro-

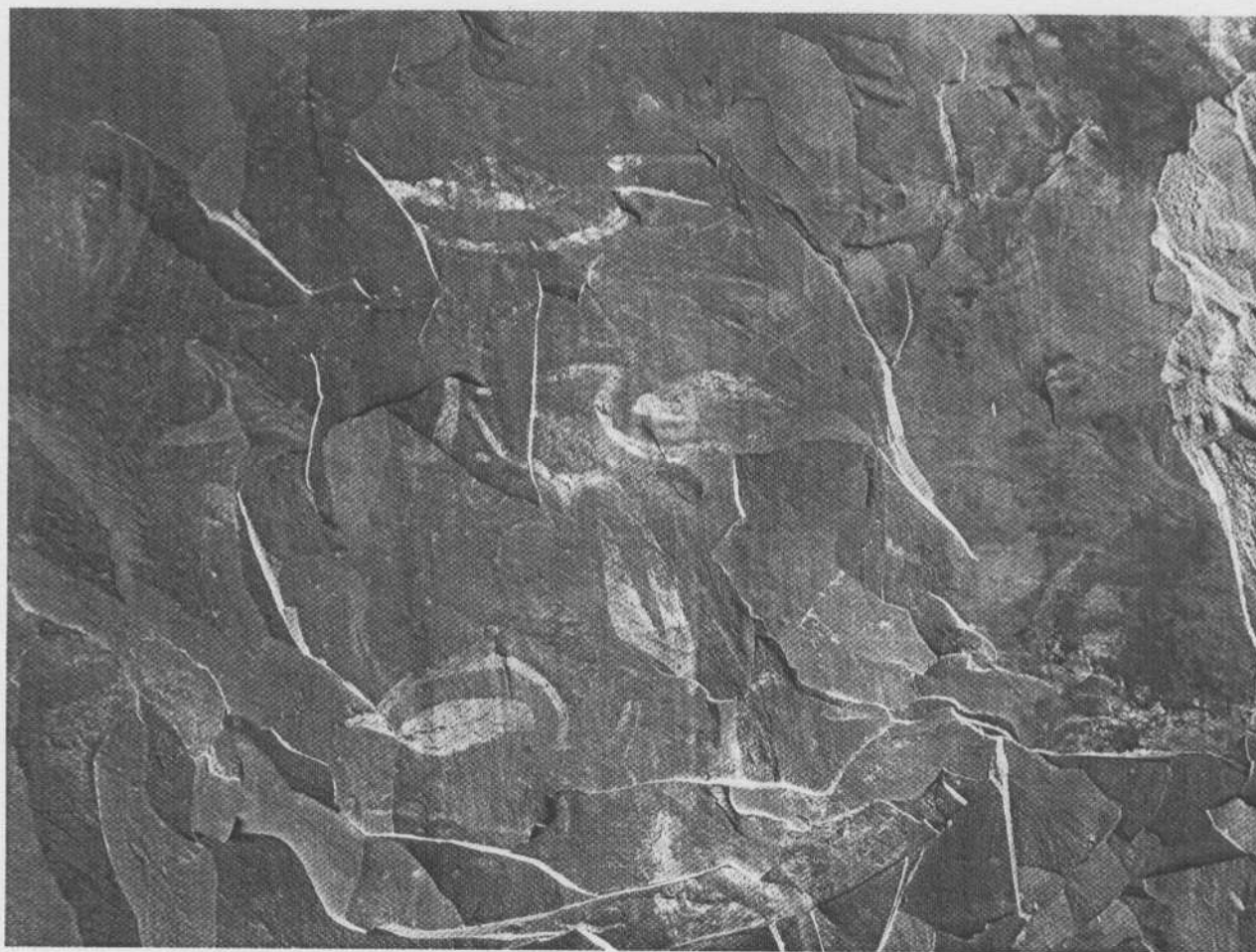


Fig. 16. Legendary *manutara* bird painted on the vault of *Ana Kai Tangata* cave. Photo Z. J. Ryn.

Fig. 16. Legendario pájaro *manutara* pintado sobre el techo de la cueva *Ana Kai Tangata*. Foto de Z. J. Ryn.

glyphs are in caves, often near their entrances. The petroglyphs are the book in which the most ancient history of their creators is recorded. They need to be protected and read anew (Fig. 16).

In terms of their content the petroglyphs have been sorted into the following categories of motifs: anthropomorphic, zoomorphic, phytomorphic, astromorphic, meteomorphic and abstract (Cristino *et al.* 2006). The most common motifs are those depicting the female reproductive organs (*komari*), Bird-Man (*Tangata Manu*) and the face of *Make-Make*.

The appearance of the petroglyphs and cave paintings is connected with ceremonial sites. The drawings and petroglyphs decorating the caves were created to satisfy spiritual needs. The material object thus acquired significance and magical function. The statuettes of gods usually placed at

the cave entrance were to guard its inhabitants (Fig. 17).

KINDS OF CAVE USES

CAVES AS BURIAL SITES

As already mentioned, some of the caves were used as burial sites. Often the human skeletons are incomplete, with bones jumbled together or even scattered around the cave. This has been attributed to the activity of animals or treasure hunters. The present islanders maintain an air of mystery about the caves, especially the private ones.

Anthropologists bold enough to enter the caves have found human skeletons or only skulls (Mulloy & Figueroa 1963; Murrill 1968; Gill & Owsley 1993, etc.). Some of the caves resembled mass

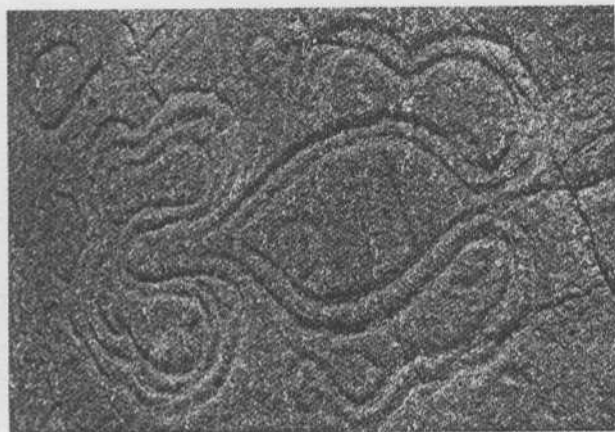


Fig. 17. Some petroglyphs. Photo Z. J. Ryn.

Fig. 17. Algunos petróglifos. Foto de Z. J. Ryn.

graves, and others, the private or family ones, contains single burials. It is hard to determine how many skulls and skeletons from the burials have been moved to the collections of museums and scientific institutes all over the world. On the basis of information in some museum catalogues and anthropological publications the number

of such items can be estimated in the hundreds (Fig. 18).

Despite these losses there are still many deposits of human bones found in altar crypts and caves. Small Easter Island is a huge necropolis. No doubt there are more dead in the graves of the ancient burial sites than in the Tahai cemetery or the leper cemetery inland. The use of a cave as a burial site was probably handed down from generation to generation within the same family or clan.

We hope that anthropological and genetic studies of the burials in the caves explored by the Polish expedition will broaden our knowledge of the first inhabitants of the island.

CAVES OF THE LEPERS

It is already known that the people of Easter Island were afflicted by leprosy. The disease was brought from Tahiti in 1888. The first primitive leprosarium on the island was located in a squalid cave where the sufferers lived in miserable conditions (Camus Gundian 1951). The epidemic spread rap-



Fig. 18. Expedition archaeologist Maciej Sobczyk. Photo M. Jamkowski.

Fig. 18. Maciej Sobczyk – arqueólogo de la expedición. Foto de M. Jamkowski.

in the Tahai sector. From 1912 to 1960 about 70 children were born in the cave, the last on the 20th of October 1960. He gladly accepted an invitation to meet in the cave where he was born.

His best childhood memories are connected with this cave. From his mother he learned that it was his birthplace. He liked the cave for that reason and spent every free moment there. He often stayed there with his grandmother, who made tools of the *totorá* reed. He preferred sleeping in the cave to staying at home. He regards the birth cave as a holy place, as all the people born there do (Fig. 20).

Marcelo Pont Hotus is regarded as the last local of Easter Island born in a cave. Up to the mid 20th century some of the elders preferred to live in caves rather than move into the houses built by their children.

Every place and every object on the island – sculptures, structures, stones covered with petroglyphs,

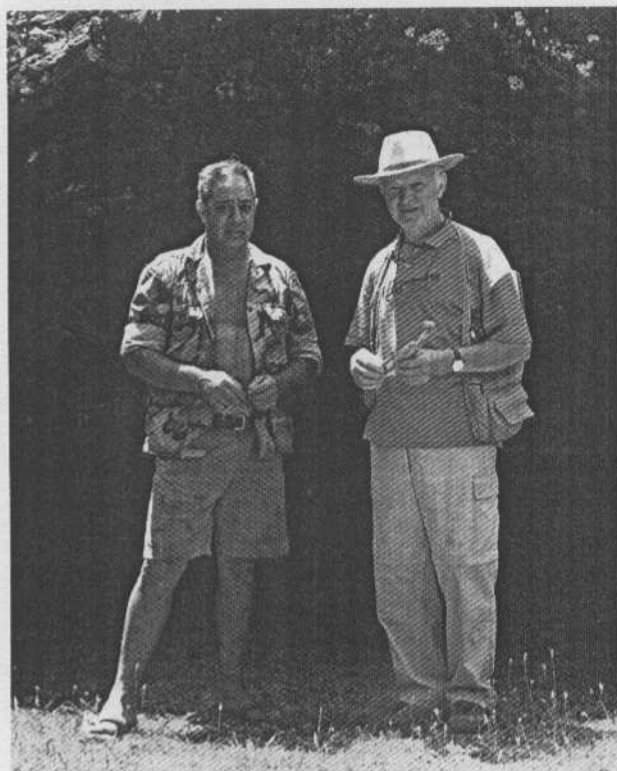


Fig. 20. With the last native born in the birth cave. Photo Z. J. Ryn.

Fig. 20. Junto con último *Rapanui* nacido en la cueva. Foto de Z. J. Ryn.

almost every formerly inhabited cave – everything is filled with a spiritual, magical element, *mana*, the power handed down by the ancestors, the healing power contained in natural remedies, herbs and other plants. The rich world of myths and legends is not only a figment of imagination, but also a magical reality. Every loss of archaeological objects, especially statues, figures or amulets, is seen as sapping the strength of *mana*. Among the elders there is a growing nostalgia for a fading tradition, and the beliefs and ceremonies connected with it. Modern feasts and artistic performances are slowly losing the power of the ritual, the *mana* power.

POLISH INVESTIGATIONS

HISTORY AND COURSE OF THE RESEARCH

The first Polish speleologist to visit some of the Rapa Nui caves, in 1992, was Dr. Jerzy Grodzicki of the University of Warsaw, an outstanding karst researcher and speleologist. He called for a complete inventory of the island's caves, and in particular the ones in cliffs.

Zdzisław Jan Ryn, Ambassador of the Republic of Poland to Chile from 1991 to 1996, was made aware of its underground world during an official visit to the island, when he was led into some of the caves by Sergio Rapu, who is an expert on the archaeology of Rapa Nui, and Cipriano Pakarati, a local guide. Even the first cave, *Ana Kai Tangata*, made a great impression and suggested the anthropological and archaeological wealth in other caves (Fig. 21).

Andrzej Ciszewski, chairman of the Caving Commission of the Polish Mountaineering Association, accepted the idea of exploring the Easter Island caves, and a great adventure in research was launched under his direction. Almost 30 Polish speleologists, alpinists, divers and paragliders have participated in this project so far.

In Poland we established cooperation with the Jagiellonian University, the University of Warsaw, the Polish Society for Latin American Studies and the Polish chapter of the Explorers Club. On the island we gained the support of Isla de Pascua National Park, local authorities of the island (gov-



Fig. 21. Zdzisław Jan Ryn – face to face with *moai*. Photo T. Snopkiewicz.

Fig. 21. Zdzisław Jan Ryn – cara a cara con *moai*. Foto de T. Snopkiewicz.

ernor, mayor) and the Council of Elders (*Consejo de Ancianos*). Isla de Pascua councilwoman Amelia Olivares San Juan helped us considerably in dealing with logistics. In Santiago we cooperated with the Easter Island Research Center at Universidad de Chile and the management of the National Forestry Corporation (CONAF). On the island we were helped by Susana Nahoe, an archaeologist of Easter Island National Park, and by local cave experts Lazaro Pakarati and his daughter Victoria.

In 2002 Andrzej Paulo made a short visit to Rapa Nui and pursued his interest in the geological forms of the island.

The first two stages of the expedition were carried out under the patronage of the then-mayor (*alcalde*) of Isla de Pascua, Pedro Edmunds Paoa. Later on we gained the patronage and the flag of the Explorers Club and the National Geographic Society.

During the early period (2001, 2004) about a hundred caves were explored, mainly in the lava

Roiho sector and on the cliffs of the northern wall of Rano Raraku and Rano Kau volcanoes. In many caves we spotted signs of the former dwellers: stone structures, petroglyphs, fire pits, obsidian tools, skulls and the remains of human skeletons. A diving team reconnoitered the western coast of the island and the vicinity of Hotu Iti islet.

The participants in the first stage of the expedition (21 Nov. to 1 Dec. 2001) were Andrzej Ciszewski, Michał Ciszewski, Henryk Nowacki, Agnieszka Gajewska, Lesław Oprowski, Krzysztof Recielski, Zdzisław Jan Ryn, Magdalena Słupińska, Piotr Słupiński, Wiesław Wilk, Ewa Wójcik, Grzegorz Gaj (film director), Andrzej Tylanda (photographer) and Władysław Vermessy and Igor Miłoszewski (paragliders). The second stage entailed a survey of the caves of Robinson Crusoe Island (Juan Fernandez Archipelago) and Diego de Almagro Island (Patagonian Archipelago, Chile) (Fig. 22).

The participants in the second stage of the expedition (3–10 Dec. 2004), which was logistical and exploratory in nature, were Andrzej Ciszewski, Agnieszka Gajewska and Zdzisław Jan Ryn.

The main stage of exploration was during a six-week-long expedition from November 5 to December 12, 2008. Eighteen speleologists took part: Andrzej Ciszewski (Explorers Club, leader), Zdzisław Jan Ryn (Explorers Club, scientific director), Miłosz Dryjański, Marcin Jamkowski (Explorers Club), Rafał Kardaś, Marcin Kubarek, Beata Michalak, Henryk Nowacki, Mirosław Pindel, Włodzimierz Porębski, Piotr Słupiński, Tomasz Snopkiewicz, Maciej Sobczyk, Mariusz Szelerewicz, Zbigniew Wiśniewski, Jan Wolek, Ewa Wójcik and Jerzy Zygmunt. We made topographical surveys and also archaeological and anthropological inventories of caves. From this work came documentation of 315 caves of about 10 km total length, located in various parts of the island.

A number of publications has been devoted to the activity of the Polish expedition. Extensive reportage was published in *National Geographic Polska* (Jamkowski 2009a), *National Geographic Traveler* (Jamkowski 2009b) and *Poznaj Świat* (Lisowski 2006; Ryn 2008). The expedition drew the interest of the National Geographic Society,



Fig. 22. Members of the Polish Rapa Nui Expedition. Photo Z. J. Ryn.

Fig. 22. Los miembros de la expedición polaca *Rapa Nui*. Foto de Z. J. Ryn.

which made a documentary movie about the Polish expedition, released in June 2009 ('Rapa Nui Underworld').

Information about Polish speleological activity on Easter Island has appeared in Polish and international publications. Articles were published in *Jaskinie* magazine, the organ of the Caving Commission at the Polish Mountaineering Association (Ciszewski 2002; Ryn 2002, 2008; Ciszewski & Recieliski 2005) and in its English version, *Polish Caving*. Details about our exploration of the Easter Island caves was presented at the Explorers Club head office in New York.

In recognition of these achievements the expeditions received two Colossi awards in 2001 and 2008 (Ciszewski *et al.* 2008)³. Several dozen

reports documenting the expedition have been published on the Internet. The success of the expeditions is due to good logistical preparation and the qualifications of the members.

METHODOLOGY OF CAVE INVENTORY

The Easter Island inventory lists 315 caves so far. The criterion for qualifying a cave was length of no less than 3 m. Cave exploration and surveying was done in 2001–2008. The work in 2008 was done in areas where we were able to obtain permission from CONAF. These are the most important cave regions on the island (Roiho, Poike).

The location of entrances was determined using a GPS in the WGS84 system. On this basis the entrances were marked on a digital map based on the topographic map published by Instituto Geográfico Militar. The caves on Rapa Nui were measured using the method of polygonal traverses with offsets and the triangle method.

³ The last stage of the expedition was supported either financially or materially by *National Geographic*, Petzl, AMC, Małachowski, Leica, Hilti and Piotr Chmieliński.

During the first expeditions we used mainly Suunto and Sisteco devices and measuring tapes. Because they are simple and reliable, they were also used during the last expedition, especially in areas where surveying conditions made extremely difficult by, for example, mud and water in the cave. However, the main measurement tools were a Leica laser radar with a triaxial magnetic compass and triaxial accelerometer module. The integrated device allowed us to make complete metric descriptions of cave length.

Ferromagnetic interbeds occur in the caves of Rapa Nui; this often required the use of different measurement methods. In many cases, magnetic field disturbances distorted the results and sometimes even made it impossible to survey. These disturbances were the result of ferromagnetic occurrences in the cave floor and walls (Fig. 23).

CAVE PLANS

The documentation contains descriptions and diagrams. The GPS data were not provided as they

are at the exclusive disposal of CONAF. The cave plans use a system of graphic symbols and are to 1:200 scale. The plans contain general information such as the altitude of the entrance, location, exposure, character and length of the cave. This paper includes selected plans of the caves. Full documentation is found in *The Caves of Easter Island* (Ciszewski et al. 2009).

ARCHAEOLOGICAL OBJECTS IN THE CAVES

From the moment the first inhabitants arrived, caves became an essential element of the social, religious and functional space. Over time the functions of the caves probably changed. Some of them became established as ceremonial places. Others were good as night shelters and protection against the whims of the weather because they were comfortable, dry, heated by the daytime sun and easily accessible. During times of inter-clan conflict, caves became refuges from the enemies, with inaccessible, usually camouflaged entrances. Some of the caves were natural water reservoirs, a resource of the



Fig. 23. After cave exploration – the pleasure of bathing. Photo M. Jamkowski.

Fig. 23. Después de la exploración subterránea – el placer de nadar. Foto de M. Jamkowski.

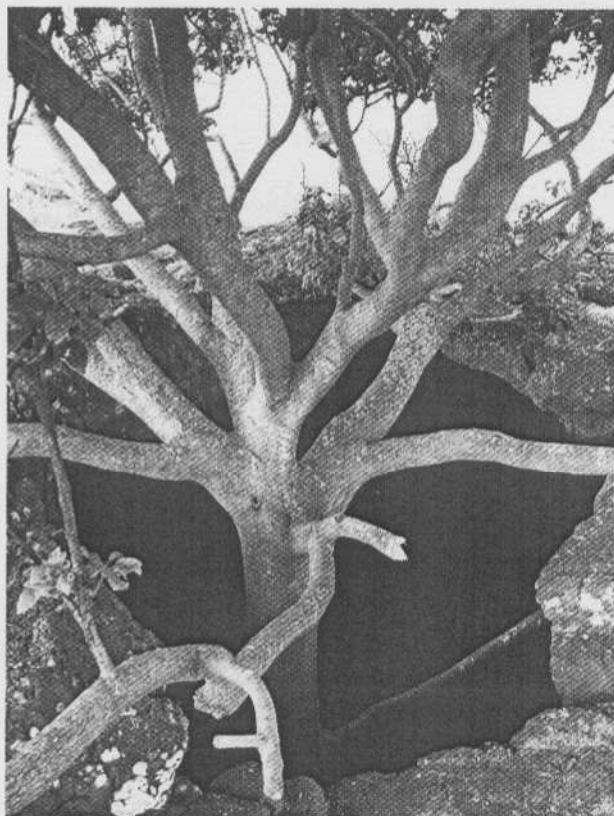


Fig. 24. Tree growing from a cave. Photo Z. J. Ryn.

Fig. 24. Arbol creciente de una cueva. Foto de Z. J. Ryn.

utmost importance. In other caverns and corridors, cultivated plots (*manavai*⁴) were made; these were gardens protected from the wind, where even today fruit trees grow. Finally, caves were used as tombs and as storehouses of social memory in the form of collections of cult objects, clan mementoes and everyday articles (Fig. 24).

The caves are a permanent element of the architectural setting, which forms one complex. Other elements are shelters (*hare paenga*), chicken houses (*hare moa*), towers (*tupa*) and earthen ovens (*umu pae*). In the context of this functional complex, the garden or the reservoir became its central point.

In the largest architectural complexes, which

⁴ *Manavai*, or garden protected from the wind. Two types can be distinguished: surface and underground. The surface ones are stone circular walls 1.0–1.5 m high and a few meters in diameter, protecting the plants growing inside. The underground ones use the spaces in caves where the ceiling has collapsed. Those spaces were also built up with stone walls.

have *ahu* altars together with stone *moai* statues standing on them and broad ceremonial squares, the role of the caves remains constant. This is the case in, for example, the complex of three *ahu* at the *Tahai* site (Fig. 25).

The majority of the architectural complexes were sited in areas where at least one or a few caves could be used. This is how caves were assigned to specific clans. In fact the caves have their own names which have survived to this day.

Many of the 315 inventoried caves revealed signs of human activity. These signs can be divided into three groups: rock art, moveable monuments, and caves with signs of architectural intervention (Fig. 26).⁵

MOVEABLE OBJECTS

The caves were used for storing functional and cult objects. Some of the caves were used as graves. This was an expression of a death cult, strongly developed on the island. Some human remains have been found there. These are mainly bones, badly preserved due to the microclimate inside the caves. In only a few cases we found human skeletons laid out in natural positions in the space allotted for the dead. In most cases we come across fragments of skeletons and randomly scattered, partly decomposed bones.

Sometimes the skulls and long bones were secondarily arranged so as to be exposed, on a rock ledge for example. Owing to this they survived longer in the unfavorable cave conditions.

Among the remains found recently there certainly are none older than the remains of the dead of the 19th century epidemics. A large part of the bone material was taken away to museums in various countries for anthropological study.

Among the special objects found during the research is a bone needle discovered in a cave of the Roiho sector on a small rock ledge. Another find, also from the Roiho sector, is a stone bowl made of soft tuff, standing in the entrance of a rather small cave overgrown with grass. This

⁵ All the archaeological objects are amply documented with photographs, a small selection of which are presented here.

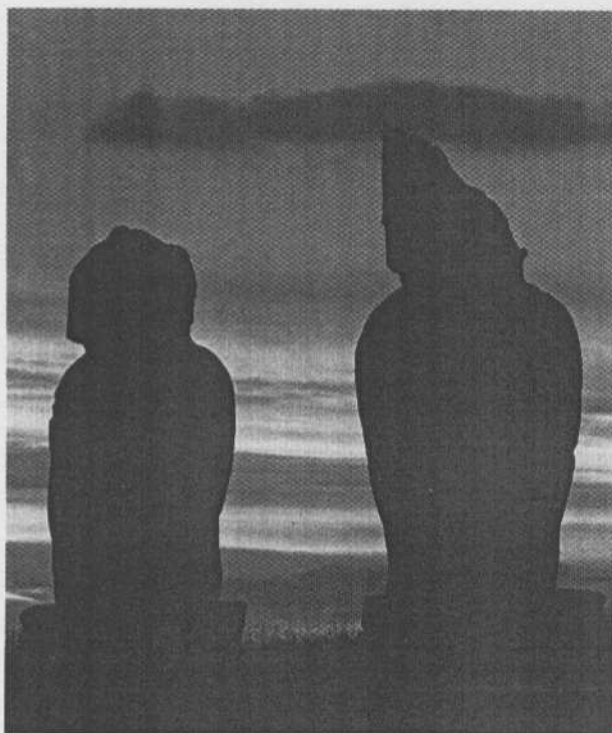


Fig. 25. Tahai ceremonial center. Photo Z. J. Ryn.

Fig. 25. Centro ceremonial Tahai. Foto de Z. J. Ryn.

is a typical stone vessel occurring in areas where people did not know how to make ceramics, the only example of a moveable object capable of carrying water.

Another find is a rather small, precisely made basalt chisel called a *toki*, 10 cm long. It was found on a rock ledge in the cave called 'the cave of *moai* builder' in the context of one of the best-preserved burials. An obsidian scraper⁶ was found; this is a blade used as a farm tool, 10 cm long with a half-circular edge along its whole length. It also was found in the Roiho sector.

ARCHITECTURE IN THE CAVES

The elements of architectural intervention in caves can be divided into two groups. The first one includes the large architecture, usually connected with alteration of the entrance or the internal space around it. The other is so-called small architecture;

this includes structures facilitating everyday life inside the cave.

The first group includes surrounding structures that hinder access to the cave. Through extended stone banks we reach a low, narrow tunnel leading inside. The tunnel itself is precisely made of ceiling stones fitted well without the use of mortar. Stones from the foundation of the *hare paenga* shelters were secondarily used in their construction. The tunnels change directions vertically and horizontally, indicating their defensive character. The artificial rockslides were elements hiding the entrances to underground shelters. Inside the cave we can admire the precise, solid stone construction; the external structure resembles a natural scree, and one can barely find the entrance. The entrances of many caves are camouflaged with bigger stones so that they could not be found easily (Fig. 27).

The structures inside the caves include ramps made of stone, sometimes made of soil, which

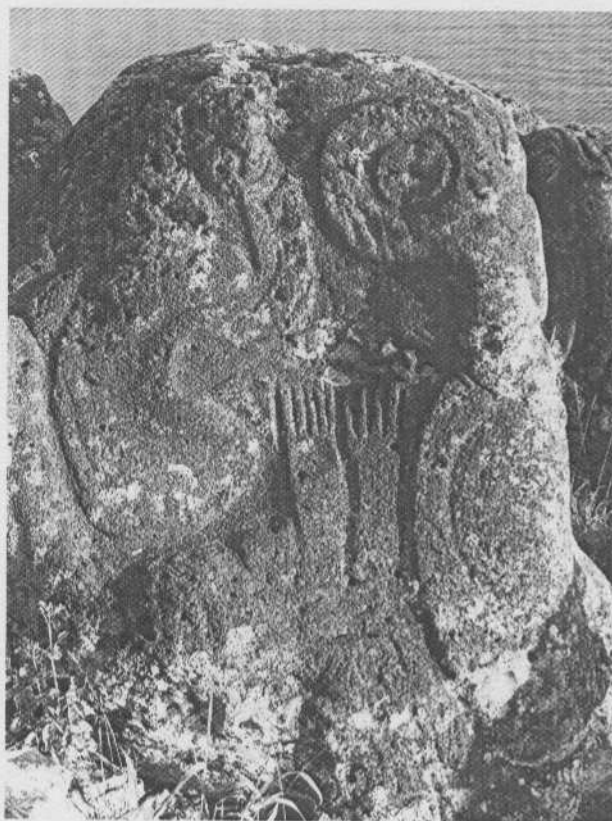


Fig. 26. There are 30,000 archeological sites on the island. Photo Z. J. Ryn.

Fig. 26. Hay 30 mil sitios arqueológicos superficiales. Foto de Z. J. Ryn.

⁶ The scraper is a chipped obsidian tool with a rounded end. It was used in timber and bone processing, as well as for cutting softer objects.



Fig. 27. Typical cave entrance. Photo Z. J. Ryn.

Fig. 27. Entrada típica a una cueva. Foto de Z. J. Ryn.



Fig. 28. Some caves are huge reservoirs of potable water. Photo M. Jamkowski.

Fig. 28. Algunas cuevas son grandes reservorios de agua potable. Foto de M. Jamkowski.

were supposed to make it easier to move around the cave when there were large differences in height. In a few large caves are ramps several meters in length.

Stones in a more or less regular arrangement demarcate the sacred space for the dead, symbolically closing off the burial site where the remains and their accompanying sacrificial objects were laid down. Today the majority of the human remains in caves are scattered in total chaos.

Having made an inventory of 315 caves, we concluded that as many as 124 of them have elements described as large architecture. Fifty caves have structures described as small architecture. In 48 of them there were human bones preserved. In a few caves without any structures the only signs of human activity are some remains; in total, 23 moveable objects regarded as remains of material culture were found, located in 15 different caves. There is a huge disproportion between the number of caves and the small number of preserved objects. The barrenness of the explored caves stands in sharp contrast to the wealth of cave furnishings described in the literature (Fig. 28).

We hope that this material will facilitate multidisciplinary research on the underground world of Rapa Nui, which still conceals secrets of the most ancient past of the island and its inhabitants.

REFERENCES

- ALCAYAGA S. & NARBONA M. 1969. Reconocimiento detallado de suelos de la Isla de Pascua. Publicación técnica (3), CRFO, Santiago.
- CAMPBELL R. 1973. El misterioso mundo de Rapanui. Colección: Viajeros 9: 61–62. Edit. Francisco de Aguirre, Buenos Aires – Santiago de Chile.
- CAMPBELL R. 1988. La cultura de la Isla de Pascua. Mito y realidad, Editorial Andrés Bello, Santiago de Chile.
- CAMUS GUNDIAN D. 1951. Salubridad y Morbilidad en la Isla de Pascua. In: *Runa. Archivo para las ciencias del hombre*. 4: 85. Universidad de Buenos Aires, Buenos Aires.
- CISZEWSKI A. 2002. Rapa Nui. *Jaskinie* 26(1): 9–12.
- CISZEWSKI A. & RECIELSKI K. 2005. Rapa Nui. In: *Expeditions – Easter Island, Polish Caving, 2001–2005*, pp. 26–27. Published on the occasion of 14th International Speleological Congress, Kraków.
- CISZEWSKI A., JAMKOWSKI M. & KARDAŚ R. 2008. Rapa Nui: jaskinie w 'Pępku świata'. <http://www.kolosy.pl/kolosy2008.php>.
- CISZEWSKI A., RYN Z. J. & SZELEREWICZ M. (eds) 2009. The Caves of Easter Island. Underground World of Rapa Nui. Pracownia Kreatywna Bezliku, Kraków.
- CRISTINO C., ESTRADA A., IZAURIETA R., PALMA R. & MORALES R. 2006. Memoria en la Piedra. Contribución al estudio del arte rupestre en Rapa Nui. Universidad de Chile, FAU, Instituto de Estudios Isla de Pascua, Santiago.
- ENGLERT S. 1995. La Tierra de Hotu Matua. Historia y etnología de la Isla de Pascua. Ediciones de la Universidad de Chile, Santiago de Chile.
- FOLLMANN G. 1961. Estudios liquenométricos en los monumentos prehistóricos de la Isla de Pascua. *Revista Universitaria (Universidad Católica de Chile)* 46: 49–154.
- GILL G. W. & OWSLEY D. W. 1993. Human osteology of Rapanui. In: S. R. FISCHER (ed.), *Easter Island studies: contributions to the history of Rapa Nui in memory of William T. Mulloy*, pp. 56–62. Oxbow Books, Oxford.
- HEYERDAHL T. 1961. *Aku-Aku*. Iskry, Warszawa.
- JAMKOWSKI M. 2009a. Podziemny świat Rapa Nui. *National Geographic Polska* 5(2009): 70–77.
- JAMKOWSKI M. 2009b. Rapa Nui. Wyspa kolosów. *National Geographic Traveler* 2(2009): 18–27.
- KNOWLTON F. H. 1888. Lichens from the Easter Islands. *Botanical Gazette* 13: 94–95.
- LISOWSKI A. 2006. Prof. Zdzisław Jan Ryn. Nie dogonisz... *Poznaj Świat* 10(2006): 23–28.
- MAUNDER M. 1997. The Conservation of the Extinct Toromiro Tree. *The Curtis's Botanical Magazine* 14(4): 226–231.
- MULLOY W. & FIGUEROA G. H. 1963. Excavación de una cueva en las proximidades de Ahu A Kivi. *Antropología* 1: 34–42.
- MURRILL R. I. 1968. Cranial and Postcranial Skeletal Remains from Easter Island. University of Minnesota Press, Minneapolis.
- ROUTLEDGE K. 1919. *The Mystery of Easter Island: The Story of an Expedition*. Unlimited Press, London.
- RUTHERFORD S., SHEPARDSON B. & STEPHEN J. 2008. A Preliminary Lichenometry Study on Rapa Nui – The Rapa Nui Youth Involvement Program Report. *Rapa Nui Journal* 22(1): 40–47.
- RYN Z. J. 2008. Polskie odkrycia w jaskiniach Wyspy Wielkanocnej. *Poznaj Świat* 9(2008): 36–42.
- RYN Z. J. 2002. Wyprawa do Pępka Świata. In: J. CZERWIŃSKI

- (ed.), *Księga przygody*, pp. 190–197. Wydawnictwo Diecezji Pelplińskiej, Pelplin.
- THOMSON W. J. 1980. El descubrimiento de la Isla de Pascua. In: *Estudios sobre la Isla de Pascua. Anales de la Universidad de Chile* (1980): 39.
- TORRES CAUTIVO X. 2002. Papiano Ika Tuki de Isla de Pascua. El último leproso. *El Mercurio*, supl. Sábado (13 IX 2002): B4.
- VARGAS P., CRISTINO C. & IZAURIETA R. 2006. 1000 años en Rapa Nui. Arqueología del asentamiento. Editorial Universitaria, Instituto de Estudios Isla de Pascua, Universidad de Chile, Santiago de Chile.

El Mundo Subterráneo de Isla de Pascua. Exploración Polaca 2001–2010

Las cuevas volcánicas de Rapa Nui han formado parte significativa de la historia y cultura de los habitantes, una situación que se mantiene en la actualidad. Por esta razón, la elaboración de un inventario de las cuevas lo más completo posible sirve como base de cara a la realización de investigaciones interdisciplinarias, fundamentalmente de carácter arqueológico y antropológico.

El equipo polaco de los espeleólogos polacos bajo la dirección de Andrzej Ciszewski en los años 2001–2010 ha explorado 315 cuevas, es su mayoría en los sectores Roiho y Poike. La ubicación de las entradas a las cuevas se ha determinado por medio del GPS, por el sistema WGS84. Posteriormente se señalaron en un mapa digital de la isla preparado en base a un mapa topográfico publicado por el Instituto Geográfico Militar. Todos los planos de las cuevas comprendidas se han elaborado en una escala unívoca, 1:200. Los planos contienen información básica como la altitud de la entrada indicada en metros sobre el nivel del mar, su exposición geográfica, la extensión de la cueva, la ubicación y el carácter del acceso a la misma. En consecuencia se ha explorado una red de túneles de diez kilómetros de extensión.

La exploración polaca abarca los aspectos topográficos, cartográficos como también arqueológicos y antropológicos. El presente capítulo contiene información básica acerca de la isla, de origen de las cuevas, de su rol en la historia de la población y de su cultura. También informa sobre los diferentes modos de utilización de las cuevas.

En numerosas cuevas se hallaron indicios de la presencia del hombre: construcciones de piedra (arquitectura mayor y menor), petroglifos (arte rupestre), monumentos móviles como restos de fogatas, utensilios hechos de obsidiana, etc. Un valor excepcional representan calaveras y otros restos de esqueletos humanos. Los objetos arqueológicos y antropológicos significan una fuente constante e imprescindible para la lectura y reconstrucción del pasado, tanto en la dimensión material como en la psicológica. Pocos espacios hay en la Tierra donde el hombre, sin conocer la escritura, haya registrado tan amplia y detalladamente su historia. Lo hizo en piedra, tanto por encima como por debajo de la superficie de la tierra – en las cuevas.