Machu Picchu

Federico Kauffmann Doig

Then up the ladder of the earth I climbed
through the barbed jungle's thickets until I reached you
Machu Picchu.
…
Mother of stone, spume of condors. High reef of
the human dawn.

Spade lost in primordial sand.

Pablo Neruda

Machu Picchu lies at the heart of a landscape of imposing peaks covered with luxuriant vegetation. It was built sometime in the last third of the 15th century by the Incas, whose culture marked the final phase of six thousand years of Peruvian civilization. In common with other similar monumental structures of the period, it was built in relative proximity to Cuzco, in the Vilcabamba territory, a region of rugged slopes and cloud forest typical of the Amazonian Andes.

Although the details of its past may never be clarified, we can assume that its main functions were those of an administrative center for the production of the crops grown on its steep terraces and, at the same time, a religious center dedicated to the gods upon whom its inhabitants believed their existence depended: the Water God and Mother Earth, or Pachamama.[1]

Together with other agrarian centers in the Vilcabamba region, Machu Picchu was conceived within the context of a huge state project, the goal of which was the expansion of agricultural

[1] This proposition is based on careful research and ethnographic testimonies, as well as archaeological and iconographic observation and the study of ethno-historical sources (Kauffmann Doig 1986a; 1991b; 1996a; 2001a; 2001c; 2003a and 2003b).

activity into the Amazonian Andes beyond Cuzco. This hypothesis is based on the fact that in Peru land suitable for agriculture is scarce, both in the highlands and coastal Andes. Since the dawn of Andean civilization, soil availability has proved inadequate in the face of growing population density, a dilemma common to all ancient societies that chose to live from agriculture. However, this ecological imbalance inspired the development of diverse strategies aimed at addressing the problem of food production, including the expansion of agrarian frontiers.

In addition to the problem of limited land for farming, another factor has always affected food production in Peru and brought hunger to its people; the El Niño phenomenon, which regularly unleashes periods of drought and flooding, as well as other extreme weather events.

It was believed that such catastrophes could only be prevented through magical-religious practices; namely, worship of the supernatural entity said to control atmospheric phenomena. This was the Water God, the most important deity in the Andean pantheon, present in the sacred mountains known as *apus*, who was called upon to fertilize Mother Earth by drenching her with his rains. These divine beings are still venerated throughout large areas of the Peruvian highlands. It was in this context that Machu Picchu, in addition to being an administrative center for food production, was conceived as a religious site for the practice of rituals aimed at propitiating the gods upon whom the harvest depended. This hypothesis will be discussed at length in a separate chapter, as will a number of other theories that attempt to explain the mysteries surrounding Machu Picchu's role in the Pre-Hispanic Peruvian world.

Chapter 1
Machu Picchu:
Treasure of Inca architecture

Machu Picchu [Matshu Piktshu], the jewel of Inca architecture, is hailed in our own time as a wonder of the world. Because it expresses the ability of humankind to build in harmony with a

spectacular natural setting, UNESCO has declared the ruins a World Heritage Site in both its cultural and natural categories. Machu Picchu, together with other neighboring sites built in a similar style, is located within the Machu Picchu Historical Sanctuary, created in 1981 and covering an area of 35,592 hectares (INRENA 1999; Muelle, Bonavia & Chávez Ballón 1972). These ruins are nestled in a superb landscape of steep slopes covered in luxuriant jungle vegetation and crowned by great snow-covered peaks. Altitudes within the Sanctuary range from 2000 to 6000 meters, making it home to an extraordinary variety of fauna and flora.

Machu Picchu stands on the heights above the left bank of the Urubamba River, at an altitude of 2400 meters. Its buildings and agricultural terraces occupy a narrow and uneven saddle set between the peaks of Huayna Picchu [Waina Piktshu] and Machu Picchu, both of which rest on a perpendicular geological formation which has created precipices that fall away towards the racing waters of the Urubamba River, 400 meters below, at the point where its course forms a crescent-shaped meander, hugging the base of Huayna Picchu and Machu Picchu.

The ruins are reached from Cuzco by train. The Puente Ruinas station is 112.5 kilometers from the erstwhile imperial capital. From the station, a road zigzags up to the ruins. Machu Picchu can also be accessed via the Inca Trail, beginning at Qoriwayrachina [Qoriwairatshina], at Km.88 of the railroad line, or at Piscacucho [Piskakut-sho], at Km.82. It takes between three and four days to complete the route on foot. Trekking along this and other Inca pathways leading to Machu Picchu not only allows hikers to enjoy imposing scenery, but also to admire magnificent archaeological sites along the way, including Phuyupatamarka [Phuiupatamarka] and Wiñay Wayna [Winiai Waina].

Machu Picchu is usually translated as “Old Peak” (*machu* = old, *picchu* = peak or hill). Given that this name alludes to its geographical location, it is unlikely to have been the original name of the city. Also, the word *picchu* does not appear in the first Quechua dictionaries, such as that of Diego González Holguín (1608) or the more recent contribution of Ernst W. Middendorf (1890-1892, v.2), and it would seem to be a corruption of the Spanish *pico*, meaning the peak or

summit of a hill. González Holguín translates "summit" as *orcop uman* (literally, "hill head"), as does Middendorf, who spells it *orkoj uman*. The word "*picho*" or "*piccho*", in reference to Machu Picchu, first appears in recently discovered 16th century documents [Glave & Remy 1983, Rowe 1990, Varón 1993], but it does not feature in the aforementioned dictionaries under either "summit" or "peak". José Uriel García (1961b) and José G. Cosio (1912) challenged the definition "peak" for *picchu* and, assuming that Machu Picchu was the original name of the city, they suggest that it may be derived from the Quechua verb "*picchay*" (the act of chewing coca).

Machu Picchu has become the proud emblem of Peru's national identity (Flores Ochoa 2004; Karp de Toledo 2004b), and it will undoubtedly continue to inspire the admiration of the entire world for as long as it is properly conserved. The site must be protected from the tectonic movements affecting the subsoil upon which the walls rest (Bouchard *et al*. 1992; Carlotto & Cárdenas 2001; Kalafatovich 1963; Kauffmann Doig 2001b) and new strategies will be needed to cushion the negative effects of mass tourism, the growth of which threatens to overwhelm the city (INRENA 1999).

Chapter 2
Bingham's discovery and its antecedents

His search for the legendary city of Vilcabamba [Wilkapanpa], the final stronghold of the Inca rulers who sought refuge in the inhospitable Vilcabamba region between 1536 and 1572, led Hiram Bingham (1875-1956), a Yale professor and historian, to reveal the existence of Machu Picchu to the world.

In 1911, Bingham arrived in Cuzco in search of the lost city of the Incas. His plan was to venture deep into the region beyond the headwaters of the Vilcabamba, which flows into the Urubamba at Chaullay. Before he embarked on his journey, he received information in Cuzco regarding the existence of a site known as Machu Picchu. Because these reports indicated that the ruins lay on the route he would have to follow to reach Vilcabamba, Bingham paused at Mandorbamba,

from where he accessed the ruins. He remained at the site for just one day, and decided that it could not be the remains of the citadel he was searching for, given that the location did not coincide with the descriptions in the historical sources he had consulted, including the chronicles of the friar Antonio de la Calancha (1638).

At Mandorbamba, Bingham interviewed a peasant named Melchor Arteaga, who confirmed the scale of the ruins at Machu Picchu which Albert Giesecke had described to the American historian in Cuzco. Impressed by Arteaga's account, Bingham asked him to guide him in return for a financial reward. Accompanied by Arteaga and Sergeant Carrasco, the policeman assigned to protect him, the American set off up the steep, forested slopes separating Mandorbamba from the ruins.

The discovery of Machu Picchu occurred on June 24th, 1911. Until then, this marvel of Inca architecture had remained hidden from the world, with the exception of the occasional treasure hunter and the peasants who lived nearby, as the American explorer himself pointed out in his writings. Bingham tells how, on arriving at the ruins, he was met by members of the two peasant families who lived there. They had settled at the ruins just a few years earlier and were growing their crops on some of the site's ancient terraces, not far from their huts. It was a boy named Pablito Álvarez who led Bingham to where the imposing walls of Machu Picchu rose from the dense tropical vegetation that half covered them. Astonished, Bingham scribbled the following phrase in his journal: "Would anyone believe what I have found…?"

According to Bingham's own writings, (1913, 1949, p.264), thirty years had passed since, guided by rumors, the illustrious traveler Charles Wiener (1851-1913) had attempted to reach Machu Picchu, in his role from 1876 to 1877 as an explorer with the official backing of both Peru and Bolivia. In the map of the "Vallée de Santa Ana", which he included in his book *Perou et Bolivie*, he marked the names Matchopicchu and Huaynapicchu with astonishing precision, thanks to the information supplied to him by those who lived in the area (Wiener 1880). Daniel Buck has referred to an even older cartographic reference unknown to Bingham: the inclusion of the

names Machu Picchu and Huayna Picchu in the “Map of the Valleys of Paucartambo, Lares, Ocobamba and the Vilcanota Canyon”, produced by Herman Göhring (Göhring, 1877) and discussed by Buck (1993, p.29) in a study examining the debate surrounding the first visitors to reach Machu Picchu. Ten years after its publication, the map was reedited by Mariana Mould de Pease (2003) and a detail published in order to highlight the references to Machu Picchu and Huayna Picchu.

Bingham describes how in Cuzco he was informed of a trip to Machu Picchu made in 1902 by Agustín Lizárraga in the company of two peasant friends. He adds that in Cuzco Lizárraga “sold one or two ceramics he claimed came from Machu Picchu” (Bingham, 1949, p.261). Writing of those who preceded him, Yazmín López claims that Bingham tried to silence all references to Lizárraga; however, Bingham not only mentions Lizárraga repeatedly in his writings, but also describes the inscription left by the latter, carved on a wall of one of the site’s most beautiful buildings -graffiti which he quite rightly had removed.

In Cuzco it is said that before Lizárraga, in around 1894, Luis Béjar Ugarte reached Machu Picchu (Buck, 1993). It should be remembered, however, that those who visited the site before Bingham did so with no scientific purpose in mind. The two families living at the ruins went there to feed themselves by reactivating some sectors of Inca terracing. And the occasional visitors to the site before Bingham, whom many describe as the “real discoverers of Machu Picchu”, were motivated solely by the prospect of hidden treasure. In 1912, José Gabriel Cosio proclaimed: “Machupiccho has been visited by many, but it owes its celebrity to Dr. Bingham”.

Indisputably, it was Albert Giesecke (1885-1968), the well-known campaigner for university education and culture in Cuzco, who told Bingham how he might reach Machu Picchu, on the route chosen by the latter in his search for the neo-Inca bastion of Vilcabamba. Giesecke (1961, p.17) writes that Bingham “was often at my house before leaving Cuzco”. And Giesecke himself, just a year before Bingham’s arrival, had journeyed to Machu Picchu. Accompanied by Braulio Polo y La Borda, one of the owners of the Echarati hacienda, he traveled through the Urubamba

valley as far as Mandorbamba, at the foot of Machu Picchu hill. There they met Melchor Arteaga, the key figure Bingham would later seek out, who was to lead them to the ruins. However, intense rains thwarted the Giesecke expedition.

The fact that Bingham himself describes such antecedents, casts in a most favorable light the academic rigor with which he conducted his explorations, and although he was not the first to reach the site, there can be no denying the fact that he was the true scientific discoverer of Machu Picchu, as well as the pioneer in research related to the ruins. It was Bingham who, conscious of the importance of its architecture, revealed to the world this exceptional legacy of Peru's ancient past. It was in vain that Carl Haenel attempted to discredit Bingham by claiming in 1916 that Machu Picchu had been discovered years earlier by the explorer Georg von Hassel (Buck, 1993). Nor was the American explorer's prestige damaged by fallacious reports in the European press claiming that the true discoverer of Machu Picchu was the English missionary Thomas Ernest Payne (Buck 1993). Mariana Mould de Pease (2003) leads the current movement to discredit Bingham as the legitimate discoverer, grudgingly describing him as merely the "scientific informant".

Contradicting his initial criticism in 1915 in the newspaper *El Sol de Cuzco* (Camacho, 2004, pp. 43-46), in a belated effort to acknowledge Bingham the distinguished academic Luis E. Valcárcel (Valcárcel, 1964, p. 68), wrote: "As happens with all discoveries, there were precursors. In this case, those precursors were individuals incapable of appreciating the importance of the monument before their eyes. It would be narrow minded not to acknowledge the first person to comprehend the great value of what had been discovered. Bingham knew what he was looking for and his discovery was no mere chance occurrence. He was a professor of American History at Yale who had taken a profound interest in the study of the Inca state, and in particular research into the last stronghold of the Incas, the region ruled by the so-called "Incas of Vilcabamba". Not satisfied with references made in the chronicles, he delved into documentary sources held in the archives and constructed the necessary bibliography".

Chapter 3

Bingham's expeditions

Bingham's first contact with Machu Picchu in 1911 was brief, for his main objective was to identify the lost city of Old Vilcabamba, which according to his calculations could not be located at the site occupied by Machu Picchu. He returned a year later, in 1912, as the leader of a scientific expedition sponsored by Yale University and the National Geographic Society and boasting several distinguished scientists among its members. He returned to Peru again in 1914-15 to explore the area around the ruins, including the Inca highways leading to the site, traveling almost the entire route now known as the Inca Trail, from Qoriwayrachina to Machu Picchu. According to Bingham (1915), on that occasion his guide was Ricardo Charaja, whom he praises warmly in his writings. Along the route, he explored several ruins located in the vicinity of the Inca highway, including Patallacta [Pataiaqta], Runturacay [Runturaqai-i] and Sayakmarka [Saiaqmarka], which based upon information supplied by Charaja he named Cedrobamba. He also assigned to Clarence Maynard the task of inspecting the archaeological remains located on the left bank of the Urubamba River, including Chachabamba [Tshatshpanpa] and Choquesuisuy [Tschoqesuisui]. Years later, in 1940-41, Paul Fejos conducted a meticulous study of those sites (Fejos. 1944).

Bingham visited Peru in 1909, before his first visit to Machu Picchu. Passing through Cuzco, he headed for Abancay, where the governor of the Apurímac region encouraged him to seek the treasures presumed to lie hidden at Choquequirao [Tshok-kekirao], an important archaeological site situated high above the right bank of the Apurímac River. Bingham was surprised to discover that the local governor seemed incapable of comprehending that his was not a treasure-seeking mission. Nevertheless, Bingham took the opportunity to produce the first plan of the Choquequirao site (Bingham, 1910).

Based on his expeditions of 1909, 1911, 1912 and 1914-15, Bingham published several studies of Machu Picchu (Bingham 1912a, 1912b, 1913, 1915a, 1915b). In 1930, he produced his major

work; “Machu Picchu: A Citadel of the Incas”. Years later, he would publish extracts from this book in popular editions that sold well and would make Machu Picchu famous throughout the world (Bingham, 1948, 1953).

Although the excavation work undertaken by Bingham at Machu Picchu a century ago can be criticized today for the methodology employed –just as today’s work is likely to be criticized by future generations of archaeologists– its multidisciplinary nature should not be underestimated, for experts in several fields were included in the team. In this sense, Bingham’s work remains unsurpassed, for all subsequent studies have been made by individual investigators concerned principally with conservation of the site. The scientists who accompanied Bingham on his 1912 and 1914-15 expeditions were: K.C. Heald, engineer; George Eaton, osteologist; Herbert E. Gregory, geologist; Ellwood Charles Erdis, archaeologist; Albert H. Bumstead, geographer; Isahia Bowman, the celebrated geographer and author of “The Southern Andes”; H.W. Foot and O.F. Cook, botanists; Phillip Ainsworth Means, historian; H.L. Tucker, engineer/archaeologist; Kay Hendrickson, topographer; Luther Nelson and W.G. Irving, surgeons; Robert Stephenson, Paul Osgood Hardy, Joseph Little Prescott and P. Lanius, support personnel; Paul Bestor and P.B. Lanins, secretaries. The Cuzco-born engineer Carlos A. Duque also accompanied the expedition, and David Ford, Edmund Heller, E.L. Anderson, Clarence F. Maynard, J.J. Haasbrouk, G. Bruce Gilbert and G.H. Morkill joined the final phase of the project. Dominique R. Lacerte (2000) has produced biographies of the individuals who accompanied the 1911 and 1912 expeditions.

Mariana Mould de Pease (2003), when discussing the failure of Yale University to return the material removed from Machu Picchu, in breach of the terms of signed agreements, attacks Bingham by describing him as a man of dubious morals, largely basing this assertion on certain passages in the writings of his son, Alfred Bingham, which touch upon familial conflicts (1987, 1989). Other authors who have followed a similar vein of character assassination include: Luis Barreda Murillo (2001), Darwin Camacho Paredes (2004), Yazmín López (2004), and Jorge Riveros Cayo (2004).

In this context, we should also mention recent research focused on Machu Picchu, particularly the invaluable contribution of Kenneth R. Wright in the field of hydraulic engineering (Wright and Valencia 1997, 1999), as well as the work of Jesús Puelles Escalante (2010) on the engineering techniques employed in the construction of Machu Picchu.

Chapter 4
Machu Picchu:
The material excavated by the Bingham expeditions

Although they lacked the scientific methods available today, their excavations yielded Bingham and his scientists some 555 pieces of pottery, almost 220 bronze, copper, tin and silver artifacts, and thousands of fragments of human and animal bones (Valcárcel, 1964). Most of these objects were found during the 1912 expedition, in tombs set into natural caves. The most outstanding pieces, held by the Peabody Museum of Natural History at Yale University, were first published by Bingham (1915a, 1930), and more recently by Lucy C. Salazar and Richard L. Burger (2004), in a catalogue including material not found at Machu Picchu but acquired by Bingham, as well as other archaeological objects included in the exhibition they organized.

The pieces unearthed by Bingham include examples of the finest pottery (Bingham, 1915b), while the metal objects, particularly the bronzes, show the high degree of skill achieved by Inca metalworkers (Gordon, 1986; Mathewson, 1915; Rutledge & Gordon, 1987). These include bracelets, ear adornments, knives, axes and tupus (brooches for fastening llicllas, or small shawls). Other objects were also found, including a collection of 156 small ceramic and stone discoid plates, a batch of 42 oblong stones of green schist no more than three centimeters long and two centimeters wide, as well as 19 triangular counters, stone mortars and decorated stone boxes, hammers and carved bones. The list of items (Valcárcel, 1964, pp. 81-82) in the Machu Picchu collection held by the Peabody Museum also includes three stone sculptures, but they were not found at the site. In fact, the majority of the pieces acquired by Bingham were not found at Machu Picchu (Salazar & Burger, 2004).

A very large number of bone fragments –both animal and human– were found at Machu Picchu.

The bones were unearthed by Elwood Erdis and George F. Eaton. Long after they were studied by Eaton (1916) and Charles W. Goff (1966), the bones at the Peabody were analyzed by George R. Miller (2003) and John W. Verano (2003).

The material removed by Bingham during his 1914-15 excavations was returned to Peru in several boxes, some of which were very large. There were a total of 74 boxes (Mould 2003), some of which are now stored at Peru's National Museum of Archaeology, Anthropology and History. Although the research department ordered the opening of the boxes in 1980 for inventory and analysis, the order was not carried out, and they remained sealed until 1984, when they were opened and the material transferred to cardboard boxes. Finally, in 2002, the archaeologist Fanny Montesinos produced an inventory (Mould 2003, pp. 171-173). Previously, in 2001 and 2002, Ken Ichi Shinoda was given access to a part of the dental remains for DNA analysis, just as Sara Gheler had been under the supervision of Professor Robert Benfer in 1976-77, as part of her university thesis (Personal information / Dr. Hilda Vidal 2003).

The resolution of this situation is long overdue, and all the material returned to Peru by the Bingham expeditions should now be located and the relevant studies undertaken. The batch housed at the Peabody Museum, already analyzed by the anthropologist George F. Eaton in 1916, and under the care of Richard L. Burger since 1981 (Burger & Salazar, 2003 p. XIV), should also be subjected to further tests, as many specialists, including Verano and Miller, have urged in their published work.

ADDENDUM: Repatriation of the material from Machu Picchu held by Yale University

Apart from the material recovered during the 1914-1915 expedition and returned to Peru in 1921 in forty-seven crates, Yale University held on to several thousand pottery objects, potsherds, metal items and human and animal skeletal remains. After a long struggle in which the efforts of Luis Murillo (2001) and Mariana Mould (2003) proved crucial, along with those of Luis Lumbreras and Eliane Karp, the Peruvian government eventually arrived at an agreement with Yale. This agreement led to the arrival in Peru in June 2011 of 360 archaeological artifacts, belonging to the first batch of objects retained for almost a century by that American university. The rest of the

material from Machu Picchu, collected by Bingham in 1912 and 1914-15, was returned in 2012.

The fact that an immediate accord was not reached when Peru called for the return of the objects retained –in direct contravention of contractual agreements- contributed to a number of hostile assessments of Hiram Bingham's legacy. There was a rush to gather historical data to support the fact that before his arrival at Machu Picchu, the ruins had been "discovered" several years earlier. This is an issue we have already addressed in this publication. In the photographs published in Bingham's own works, it can be seen that the material contained in the first batch returned by Yale included the most valuable artifacts excavated at Machu Picchu. However, in archaeological terms they cannot be considered especially important, as Krzysztof Makowski has pointed out, given that they were removed at a time when the field of archaeology was in its infancy, and current methodologies had not been developed. The value, therefore, of these objects is more artistic than archaeological. This is something which today's generation of archaeologists would do well to take onboard, now that a desperate race has begun to excavate Pre-Hispanic cemeteries using current methods, when in the decades to come new methods will certainly be developed that will prove far superior to those employed at present.

And so it was that those who had been awaiting the repatriation of great archaeological treasures were confronted with something of an anticlimax. In fact, the pieces sent to Peru by Yale in the first batch, while they are certainly the most outstanding of the items comprising the Bingham collection, cannot be said to compete in artistic terms with the superb creations left to us by the artists of the Nazca or Moche cultures, exhibited in the nation's museums and antedating the objects found at Machu Picchu by more than a thousand years. Before the repatriation of the material recovered by Bingham at Machu Picchu, the author (Kauffmann Doig, 2009, p. 32; 2011) wrote: "When they are exhibited in Cuzco's Casa Concha, the curators will need to complement the display with pieces from the collections of other local museums".

An important task will be the determining of the reasons for that apparent contradiction between the quality of the objects found at Machu Picchu and its prodigious architecture. Since Bingham, only a single gold object has been discovered, and the remains unearthed by Fernando Astete, are of purely archaeological interest, and this fact has fed the persistent rumors regarding the alleged plundering of Machu Picchu before Bingham.

August Berns has been included among the accused. It has been alleged that he removed marvelous gold objects in the 1870s and 1880s, having plundered the funerary offerings of high ranking individuals buried at Machu Picchu. However, to date no firm evidence has been discovered to support the theory that Berns visited Machu Picchu. The historian Daniel Buck is convinced that he did not access the ruins, and the argument he presents is convincing. He explains how the stories circulated by Berns regarding gold mines and rich sacred sites were invented by him in order to attract investors. Buck maintains that the tombs containing golden funerary offerings were another invention by Berns, and that the references to sites on his map do not refer to Machu Picchu, but rather to archaeological remains in areas located on the right bank of the Vilcanota-Urubamba, belonging to the complex of ruins known as Torontoy.

Another possible explanation for the relatively poor artistic quality of the objects found by Bingham is that the archaeological remains discovered at Machu Picchu were not necessarily produced at workshops located at the site. Or it may be that the administrators in charge of agricultural production and worship at the site were not particularly high-ranking, given that the overriding purpose of the settlement was to produce a surplus that could be transported to the Cuzco region for redistribution, to which end specialists would have been stationed there tasked with employing complex and labor intensive technologies and religious rituals, as part of an "agricultural strategy" designed to further the aims of the state.

Now that the objects unearthed by Bingham at Machu Picchu have been returned to their country of origin, to the delight of all Peruvians, it is imperative that we assume the responsibility of zealously guarding and conserving our national heritage by ensuring that no more scandalous thefts occur at our nation's museums. Over the years, such crimes have resulted in the loss of thousands of gold, silver and copper artifacts, while to date those responsible for such egregious attacks upon our nation's heritage have not been brought to book.

Chapter 5
Research and restoration work after Bingham

Since the Bingham expeditions of 1911, 1912 and 1914-15, the main focus of scholars has been

the repair and conservation work intended to satisfy the expectations of the growing tourist economy. Luis A. Pardo (1961a) has written on the work of this kind carried out between 1939 and 1966, as have Alfredo Valencia and Arminda Gibaja (1992), Alberto Martorell Carreño (2000), Arminda Gibaja (2001), and Roger Ravines (2012 / See Kauffmann Doig 2014, pp. 346 - 366), whose study examines the issues that have arisen since Bingham's time.

Many individuals have been involved in restoration, and not always successfully (Araoz, 2001; Wurster, 2001). The restoration work of Marino Sánchez Macedo (1990), as well as that of other archaeologists, may be considered satisfactory, together with that of Wilbert San Román Luna from 1985 to 1987 (San Román, 2001). The research carried out after Bingham has been documented by Alfredo Valencia and Arminda Gibaja (1992), and Fernando Astete Victoria (2001) has addressed the work done between 1994 and 2000. Generally speaking, research has been far more limited than restoration work. Alfredo Valencia (1977) excavated at the Sacred Rock sector (referred to here as the "Replica of the Apus"), and while working on his thesis Julinho Zapata Rodríguez (1983) excavated at the so-called Military Sector.

Astronomical observations have also been made (White & Dearborn, 1980) and some samples from the site have been subjected to radiocarbon dating (Berger *et al*., 1988). In the field of research, the studies and valuable conclusions offered by the Wright Water Engineers company between 1995 and 1999 deserve special mention (Valencia, 2004). Their research was centered on the water supply at Machu Picchu and was conducted jointly by American specialists and the Peruvian Alfredo Valencia Zegarra. The Wright Water Engineers researchers have published a copious bibliography, highlighting the contribution of Kenneth R. Wright, to which we will refer later. Another outstanding study we have already mentioned, focused on engineering, is that offered by Jesús Puelles Escalante (2010). Predating this is the work of Simone Waisbard (1989). And for his part, Manuel Chávez Ballón, in addition to his conservation work (1971), has contributed an analysis of pottery found at Machu Picchu (Chávez, 1955; 1961).

The cultural material recovered after Bingham can be regarded as poor in the extreme, in terms

of both quality and quantity, when compared to the splendid architecture of Machu Picchu. Such were the conclusions of Fernando Astete Victoria (2001) during his excavations between 1994 and 2000, when he explored the small natural caves used as tombs and unearthed bone fragments in a "terrible state of preservation".

It is interesting to note that the excavation work conducted by Astete and the anthropologist Elva Torres seems to "show that the identifiable individuals, in the majority, were male". This conclusion destroys the hypothesis that Machu Picchu was the resting place of predominantly female remains, as proposed by George F. Eaton (1916), which gave rise to several outlandish theories regarding the population of the city (G.F. Eaton, 1990). In addition, Astete and Torres have engaged in research focused on agricultural technology. Referring to purely cultural material, Astete states that he recovered 500 stone percussion instruments and hammers, which can be added to those already found by Bingham. He also discovered a half-smelted metal star-shaped club and, like Bingham, a number of pottery fragments that had been deliberately broken, in the manner of offerings. A singular discovery was that of a 16-carat gold bracelet, found in 1995 in the square "adjacent to the Condor complex".

In the field of interpretation, special mention must be made of the conclusions presented by Johan Reinhard (1991, 2007). His work focuses on magical-religious practices that have survived to the present day, as well as ethno-historic data, astronomical observations and the majestic scenery surrounding the site. He concludes that in order to understand Machu Picchu's purpose it is necessary to take into account its relationship with sacred geography. We will have cause to discuss further Reinhard's hypothesis, together with other theories regarding Machu Picchu's original function.

Chapter 6
Antiquity of Machu Picchu

The architectural characteristics of Machu Picchu are similar to those found at other Cuzco sites, suggesting that it dates from the same Inca period. Similarly, the archaeological remains

excavated belong, in style, to the same period: the so-called Historic Inca, or Expansionist, phase of the second half of the 15th century. If we accept that the site dates from this period, we can conclude that it was built during the rule of Pachacutec (1438-71). This interpretation was first proposed by Luis E. Valcárcel (1964) and is supported by later writings (Glave & Remy, 1983; Rowe, 1990). Building work may have continued during the reign of Tupac Inca Yupanqui (1471-93), Pachacutec's son and successor.

Of course, not all the buildings at the site were constructed at the same time. Wilfredo Yépez Valdéz (2001) believes that some of them were never completed. But nor would it be true to say that the greater or lesser antiquity of the structures obeys a gradual linear development and perfecting of architectural techniques. The differences in style within the site are explained by the function of each building, as well as other factors (Kauffmann Doig, 1965).

The hypothesis offered by José Gabriel Cosio, who believed that Machu Picchu was the product of "a Quechua civilization that predates the dynasty of the Children of the Sun…", and that the site was unknown during Inca times, can only be classed as implausible (Cosio, 1912 / Reed: Chevarría, 1992).

Tiahuanaco-Huari presence in the Vilcabamba region

The discovery of a Tiahuanaco-Huari era tomb in the Espiritu pampa area, in November 2010, came as a surprise to many scholars, given that no evidence had been found previously of remains attributable to that culture in the Vilcabamba region, which was occupied by the Incas, and later by the neo-Incas from 1537 to 1572. According to the archaeologist Vicki Galindo Blanco, the discovery of what would come to be known as the "Lord of Huari" was made by her colleague Javier Fonseca Cruz, although it was Noé Huamán who first reported the site. Nine tombs were identified, one of which belonged to the aforementioned "Lord of Huari". Only the teeth of this individual were recovered, but several items from his funerary offerings were unearthed, including an anthropomorphic mask, a silver breastplate, necklaces, gold bracelets

decorated with the mythical Andean felines known as "*oscollos*" [oskoilio], as well as two palm wood (Bactris sp.) staffs, covered with silver sheets.

It should be remembered that Espiritu pampa is not located in the Amazon region itself, but rather in the Amazonian Andes, given that the site is situated at an altitude of 1400 meters. It is therefore not strictly accurate to state, as several authors have claimed, that the discovery of the "Lord of Huari" confirms the presence of Tiahuanaco-Huari culture in the Amazon region, understood as the lowland forests of the Amazon basin. Given that no new architectural or other evidence of Tiahuanaco-Huari culture has been found in the Vilcabamba region, it would seem reasonable to conclude that the tomb in question was established at that remote spot in Espiritu pampa for ritual purposes. That is precisely what occurred in the case of the settlement of Cuzco, and earlier in the case of Chavín de Huántar, which we know were established at sites selected on the basis of divine intervention. Existing as they do in isolation, the remains found in Espiritu pampa and attributed to Tiahuanaco-Huari culture merely confirm the presence of a single, essentially funerary settlement.

Chapter 7
Machu Picchu before and after the Inca empire

When the highland Incas began to explore the Vilcabamba region, they would have found upland areas such as that subsequently occupied by Machu Picchu sparsely populated, at best. No vestiges of pre-Inca settlement have been found at Machu Picchu. The region was certainly inhabited since time immemorial by small farming communities, as Peter Frost (2004) confirmed with his discovery of both pre-Inca and Inca pottery around the Inca settlement of Qoriwayrachina, on the slopes of Cerro Victoria, 35 kilometers from Machu Picchu. Some of the findings identified by Frost correspond to a style characterized by anthropomorphic figures with the type of eyes known as "coffee bean". This detail recalls the pottery style from Cuzco known as Marcavalle, a formative site discovered by Manuel Chávez Ballón in 1954 (Valencia & Gibaja, 1991). According to Karen Mohr-Chávez (1980), who continued the study, Marcavalle dates from the first millennium before Christ, which would confirm that human occupation of the

Vilcabamba region not only dates from ancient times, but that the first inhabitants came from the eastern Andes, and not from the Amazon lowlands. Carbon dating of charcoal recovered from Machu Picchu to two thousand years (Berger, Chofhi, Valencia, Yépez & Fernández, 1988), confirms the early occupation of some parts of the area. The great age of the carbon-dated remains caused confusion in some academic circles, where it was mistakenly supposed that they belonged to the Machu Picchu we know today, which of course dates from the 15th century.

According to Luis E. Valcárcel (1964), a people related to the Incas of Cuzco, from the Tampu ethnic group, occupied the area around Ollantaytambo [Oliantaitanpu]. He discounted the possibility of their having come from the highlands rather than Amazonia and maintained that the Tampus did not occupy the heights of their territory, which would rule them out as the builders of Machu Picchu. Nevertheless, in an initial study (Valcárcel, 1961), he postulated that "Machu Picchu belongs to the Inca culture, possessing certain characteristics of the local Tampu style", which unfortunately he did not go on to define.

The colonizing of the Vilcabamba region by the Incas involved *mitmaes* and administrators and specialists from Cuzco schooled in the art of agricultural engineering. According to a 16th century document brought to light by María Rostworowski (1963, p. 237), Tupac Yupanqui was assisted by Chachapoyans, brought in to help populate the region. When they invaded the region the Incas did not encounter forest dwellers, for Machu Picchu lies at 2400 meters above sea level and has a very different climate to that favored by the inhabitants of the lowland forests, known to the Incas as "*chuncho*s", who in general prefer to live no more than around 1000 meters above sea level. There may have been isolated groups of Amazonians in highland areas, at Vitcos for example, where Manco Inca and his successors recruited the archers mentioned by the chroniclers (Murúa c. 1600; Rodríguez de Figueroa, 1565). Scenes on native ceremonial cups, known as *qeros* and made after the arrival of the Spanish, depict battles between Inca troops and Amazonian warriors, and probably represent neo-Inca incursions into the transitional zones between the Andes and the Amazon basin, designed to occupy territory or recruit combatants.

It is to be supposed that Machu Picchu continued to be occupied by successive peasant families over the centuries, and that they would have used the agricultural terracing in an informal manner and with the consent of local landowners. Equally, it is to be assumed that periods of occupation were interspersed with periods of abandonment, as evidenced by the presence of family Bingham found at the site in 1911, who stated that they had only been there for a few years.

Chapter 8
Machu Picchu:
Architectural characteristics

Several studies have been made of Inca architecture (Agurto Calvo, 1987; Bonavia, 1997, 1999; Bengtsson, 1998; Bouchard, 1991; Harth-Terré, 1965; Gallegos 2000, pp. 126-179; Kendall 1978, 1988; Protzen, 1983, 1985, 1986; Velarde, 1946, pp. 36-60). Graciano Gasparini & Louise Margolies (1977, 1980) are the authors of a major study of the principal monumental architectural sites built during the Inca period.

A general survey of the structures at Machu Picchu reveals an essentially rectangular shape to most buildings, which are of one story and arranged in compounds of different sizes. In one case, a *callanca* [kalianka], a large structure designed to shelter many people, can be discerned. Several three-sided buildings, known as *huayranas*, were constructed. This design created a well-ventilated space for the storage of food. *Huayranas* had a pillar in place of their "missing wall", which would have supported the roof on that side. Double *huayranas* exist in which the rear wall forms a divide that supports a second *huayrana* erected on the opposite side. The roof, normally pitched, consisted of a frame made from tree trunks that served as a base for a protective covering of thatched *ichu* grass (Calamagrostis sp., Stipa sp.). The roof rested on two lateral walls, rising to a triangular gable end. On the edges of the exterior wall, stone keys were inserted for fixing the roof, and stone rings were employed to secure the structure. The simple, three-walled single *huayranas* possessed a single pitched roof. In some cases, this roof was supported by a

pillar raised at the center of the "missing wall". The four-sided pitched roofs of other buildings, because they lacked gables, were supported by a frame of tree trunks resting on a ridge board.

In the case of buildings with gables, the steep pitch of the roofs allowed for a well-ventilated attic space ideal for the storage of large quantities of foodstuffs. To this day, in highland villages this space is used as a granary, or *colca* [koilka] in Quechua. At Machu Picchu, these spaces would also have been used for food storage. Access was via a ladder leaned against one of the sides of the hole made in the ceiling. In keeping with the typical pattern of Inca construction, the doorways at Machu Picchu are trapezoidal and are often double-jamb. The niches set into the interior, and occasionally exterior, walls are also trapezoidal. They may have been used as altars, for the displaying of sacred objects or even mummies. Windows are uncommon, but those that do exist are also trapezoidal.

Some doorways, such as the one providing access to the Sacred Sector, on the southern side of the complex, may have been barred on the inside by a framework of trunks. The door, lacking hinges, would have been secured to stone rings set into one of the blocks and in the middle of the lintel. In addition, it would have been attached to two cylindrical stone supports on either side of the doorway.

For building material, the preference was for white granite ashlars. At Machu Picchu, the blocks were dragged from nearby quarries to the construction site. Generally, the technique employed for transporting the blocks consisted of dragging and sliding them along, hauled using ropes over pathways covered with moistened clay. Stone sledgehammers were used to cut the blocks, and where possible natural cracks in the rock were exploited.[2]

Typically, the ashlars at Machu Picchu were cut and polished with great care, although there are also walls built with less care and a less meticulous finish. In his study of the variety of Inca building styles, Santiago Agurto (1986) analyzes the contribution of Jean-Pierre Protzen (1983)

[2] The hewing of the stone was not achieved according to the method seen in a well-known block at Machu Picchu. This stone was prepared just a few decades ago, as an experiment, to show that at Machu Picchu a process similar to the one employed by the Egyptians to cut stone may have been employed.

and maintains that this author gives “the impression that practically all Inca walls were similar in design, that is, they were built from rectangular blocks placed in horizontal courses”. And he adds: “…the designs were many, and so different that the carving techniques applied to some could not be applied to others. Such is the case of those ashlars with recessed or internal angles, where the carving process and the tools used were, without a doubt, not those described by Protzen” (Agurto 1986).

Finely-built walls could be constructed from regular blocks of a similar size or from polygonal blocks, and the blocks employed in walls not only differed in the way they were cut, but also in their relative size. Such variations can be seen within a single structure. One of the unique aspects of Inca building techniques present at Machu Picchu is the way in which ashlars have been shaped to fit the form of the living rock. Exquisitely wrought stone walls were meticulously worked not just on their visible surfaces and angles, but also on their hidden sides, with each stone fitting perfectly with its neighbors. In many cases, a wall consisted of two parallel courses, precisely finished, with the space in the middle filled with rubble and mud. In common with Inca architecture in general, the walls at Machu Picchu are not vertical, but instead inclined towards the center of each structure.

The walls at Machu Picchu are remarkably stable, due to the careful assembly of the individual blocks, the inclined overall design of each wall, and the foundations set deep into the earth, as evidenced by the excavations carried out by Elva Torres in the so-called Prison Sector (Wright & Valencia 2001, p.92, Fig.119). The retaining walls of platforms usually possess drainage systems. An important tool for the stonemason was the diorite hammer, or one fashioned from a meteoritic rock, *jihuaya*, which is exceptionally resistant. It “has been demonstrated that the Incas also used chisels made from tempered copper or bronze with a high tin content” (Agurto, 1987). Agurto believes that “without such tools it would have been impossible to produce the join between the mortise and the tenon, for example, or in the setting of two stones” (Agurto 1986).

The final polishing of the ashlars was achieved through abrasion, using wet sand. In some cases, stone walls were plastered with mud and painted red or in other colors (Gibaja, 2001). The

astonishing perfection of the cutting and polishing of the ashlars can best be appreciated on the north wall of the Temple of the Three Windows, or in one of the external walls at the rear of the Water God Shrine (Tower). In the Temple of the Three Windows, the polygonal stones have been gradually shifted from their original position by tectonic movement, and the resulting cracks reveal the meticulous care with which the ashlars were cut and polished, even on the sides that would not be visible, thereby ensuring that they would fit perfectly. The technique as a whole can be likened to a complex jigsaw puzzle, and it is unrivaled anywhere beyond the frontiers of the Inca empire.

According to Manuel Chávez Ballón, the urban plan of Machu Picchu was similar to that of Cuzco. For Fernando Cabieses (1983), the architecture at Machu Picchu expresses the Andean concept of the "three worlds", through the altars dedicated to the regions of *hanan* (celestial world), *hurin* (underworld) and *kay* (the earthly world). Víctor Angles (1972) points out that the urban plan of the site evokes the figure of a bird with its wings outstretched, which according to Fernando E. Elorrieta Salazar and Edgar Elorrieta Salazar (1996), is a condor (*Vultur gryphus*). If this is indeed the case, then at Machu Picchu we are witnessing another example of urban iconographic design, like those seen at Cuzco (Rowe, 1987) and Chavín de Huantar (Kauffmann Doig, 1985).

In order to explain the high degree of perfection in the carving and fitting of Inca stonework, the popular imagination created the myth of the *cacacllu* [kak-kaqliu]. This legend claims that the secrets of the stonemasons' art will never be known because the *cacacllu* bird stole Inca masons' tongues to prevent them from instructing future generations. Another supernatural explanation for the meticulous finishing of ashlars tells of how Pre-Hispanic Peruvians knew the secret of "kneading" stone using a solvent they extracted from an unknown plant. The myth goes on to tell of how men discovered the technique by observing the way certain birds pecked at rock walls with leaves in their beaks to make the holes they nested in.

The need for agricultural terraces was dictated by the region's rugged topography, for no other type of farming is possible on such steep slopes. Two types of terraces were developed: those intended exclusively for cultivation and those designed to prevent landslides on steep, unstable slopes. Some terracing systems would have fulfilled both roles simultaneously.

Chapter 9
Machu Picchu: A note on agricultural engineering

Prototypically, agricultural terraces consist of a wall built from irregular stones, supporting a platform. This wall was faced with ashlars, usually polygonal and carefully worked. The surface of the terraces was covered with fertile soil transported to the site. The terrace system prevented soil erosion caused by rainfall, as well as providing a level surface for the efficient cultivation of crops on steep slopes. The research conducted since 1994 by the company Wright Water Engineers of Denver, Colorado has provided much information regarding the water supply and drainage system at Machu Picchu (Wright, Witt & Valencia, 1997; Wright, Valencia & Lorah, 1999; Wright & Valencia, 2001). Water was collected from a spring located on the slopes of Machu Picchu hill and channeled by gravity along a 749-meter canal capable of providing 300 liters per minute.

In addition to meeting the needs of the inhabitants of Machu Picchu, this spring also provided water for worship at the series of artificial cascades known as the Fountains, or *Pacchas* [paqtshia]. The Wright research has established that the water system at Machu Picchu was not designed to irrigate the terraces, despite the fact that some of the channels flow through areas of terracing (Wright & Valencia 2001, pp. 95-97, 103-109, Fig.121). Farming on the terraces was non-irrigated, and the main purpose of the so-called Dry Moat would have been the collecting and drainage of rainwater.

Chapter 10
Machu Picchu and soil instability

Machu Picchu rests on a sector of the Vilcabamba batholith, a geological formation composed of intrusive strata of great depth and different rock types, including gray white granite, tonalite and granodiorite.

According to the pioneering geomorphological studies of Carlos Kalafatovich (1963), the "geological chaos" upon which the Machu Picchu complex and other neighboring sites stand has left its mark on many of the sectors (Alegría, 2001). For example, according to Luis A. Pardo (1961a), the group of structures known as the Intihuatana would have collapsed if it had not been repaired in the 20th century. The multiple factors causing the deterioration of the site have been examined by V. Carlotto Caillaux and J. Cárdenas Roque (2001), R. Benavente Velásquez (2001) and J.F. Bouchard, V. Carlotto and P. Usselmann (1992). Their conclusions are based on geomorphic and geological considerations and observation of the visible damage caused to the architecture.

Alarming conclusions regarding the rapid displacement of the ground upon which Machu Picchu rests were published in 2001 by Kyoji Sassa, of the Institute of Research into the Prevention of Landslides, at the University of Kyoto, Japan. In his report, published in the magazine New Scientist, he calculated that the geodynamic displacement at Machu Picchu was occurring at a rate of as much as one centimeter a month (Kauffmann Doig, 2001b). For Pablo Vidal Taype Ramos, this conclusion does not reflect the reality of the situation, given that the Japanese scholar made his observations on the ground surface, at depths of between 0.5 and 3 to 5 meters. He maintains that calculations should not be based on that stratum, but instead on the geodynamics of the intrusive rocks upon which Machu Picchu rests. According to Carlos Necochea and Bernabé Calderón (2001) it is the "granite massif" upon which Machu Picchu rests which prevents the complex from collapsing.

In common with the geologist Jaime Fernández (1955), after several years of research Kalafatovich (1963) concluded that "the intrusive igneous rock is profusely fractured", resulting in geological faults, water erosion and landslides. Experts from UNESCO have indicated that there is a risk of serious displacement of large areas of subsoil at Machu Picchu as a result of geological faults of varying magnitude, although they also point out that the movement is gradual. Landslides also occurred during the Inca period (Carlotto & Cárdenas, 2001; Kalafatovich, 1963).

These tectonic issues are evident in the deterioration suffered by some walls over time, for example at the Main Temple, the relatively slow advance of which can be appreciated from photos taken in 1912, when compared with the current condition of the structures (Vargas, 2001). Conservation of the site's walls faces another challenge: rainwater, particularly in the case of those walls unprotected by roofs.

In 2012, the proliferation of fungi and lichen which is corroding the stonework at Machu Picchu led Cusco's Regional Board of Culture to seek ways to counteract this problem, which had begun to spread like a kind of "cancer", gradually destroying the stone structures. In an effort to find a solution to this grave problem, from May 14th to 18th 2012, an international conference was held in Cusco: "Climate Change and the Bio Deterioration of the Stonework at Machu Picchu". Specialists from all over the world attended the event. During the conference, the professor of environmental biology at Madrid's Universidad Complutense, Asunción de los Ríos, revealed the results of initial analysis of the lichen and described the danger posed. From that moment, the race was on to find an antidote which might be deployed to control the spread of this lichen, which constitutes a very real threat to Machu Picchu.

Chapter 11
Description of Machu Picchu

Machu Picchu can be seen in all its splendor and magnitude from the pass known as Intipuncu [Intipunku], situated one kilometer from the ruins[3]. From this almost aerial view, the complex appears at it was conceived, with buildings arranged across an irregular topography surrounded by rugged, high peaks. The scenery is dominated by the tropical vegetation typical of the Amazonian Andes, while in the distance, in contrast, white snow peaks rise against the horizon. Located 2400 meters above sea level and at 13° 32' 23" LS and 72° 32' 34" LW, Machu Picchu extends for some 800 meters over a saddle between the peaks known as Machu Picchu and Huayna Picchu.

[3] At Intipuncu there are important remains that must have once served as a kind of control point guarding access routes to Machu Picchu, perhaps the main access.

In overview, Machu Picchu can be seen as divided into two main areas, known as the Agricultural Zone and the Urban Zone[4], respectively comprising fields for crops and architectural structures. These structures can be further divided into two sectors, the Sacred Area and the Residential Area[5]. Each of these contains groups of buildings with a varying number of chambers.

THE AGRICULTURAL ZONE

This zone is composed of agricultural terracing; successive stepped platforms set into the slopes of the rugged local topography (Cook, 1916). The retaining walls of the terraces reach an average height of over four meters. Stone steps are set diagonally into the walls, enabling access from one terrace to another. Among the foods grown at Machu Picchu, maize (*Zea mays*), the most widely consumed food in ancient Peru, was the principal crop. Because Machu Picchu stands at 2400 meters above sea level, coca (*Erythroxylon coca*) could not be grown, as it does not flourish at such altitudes.

We have shown that cultivation was non-irrigated (Wright, Kelly & Valencia, 1997; Wright & Wright, 1997). It is estimated that in the Inca period annual rainfall was around 1940 mm, contrasting with recent years, when rainfall has averaged 2100 mm (Wright & Valencia, 2001, pp. 103). The irregular rainfall average experienced today, which inevitably affects production negatively, would also have occurred in the past due to the El Niño phenomenon. Today, however, other factors have come into play, including the increase in greenhouse gases in the atmosphere contributing to global warming. In the Amazonian Andes the seasons are limited to wet and dry, and the rainy season continues from November to May.

[4] The groups in both areas bear universally recognized names, usually those coined by Bingham.

[5] Several authors have described Machu Picchu in varying degrees of detail. In chronological order, we list some of them: Hiram Bingham (1930, 1948, 1949, pp.199-280), Humberto Vidal (1958, pp.189- 200), Luis E. Valcárcel (1961, 1964), Hermann Buse (1961 and 1978), Juan Larrea (1961), Víctor Angles Vargas (1972), Luis Enrique Tord (1975), Fernando Cabieses (1983), Peter Frost (1989), Johan Reinhard (1991), Peter Frost *et al*. – Jim Bartle (Ed.) (1995), Antonio Zapata Velasco (1999), Elena González and Rafael León (2001), Ruth M. Wright and Alfredo Valencia Zegarra (2001), Hugh Thomson (2001, 2002) Federico Kauffmann Doig (2001a), Darwin Camacho Paredes (2004).

In common with the terraces on the steep slopes of Huayna Picchu, those located on the edges of the Urban Zone at Machu Picchu were not used principally for the growing of crops. As we have already described, they were designed to prevent landslides.

The Agricultural Zone contains few buildings: the group known as the Caretakers' Houses, the Watchman's Hut and the largest structure, the Callanca [Kalianka]. On the perimeter of the Agricultural Zone lies the so-called Funerary Rock, with its carved and polished surfaces, and the Upper Cemetery, to the east of the Callanca.

These terraces, like those of the neighboring agricultural and ritual center of Wiñay Wayna, were more than mere farmland. They were made beautifully to honor the Earth Goddess, Pachamama, the provider of all sustenance. The stepped form of the terraces may have inspired the Andean step motif. It is believed that this symbol, repeated often in Andean iconography, was the emblem of Pachamama, or Mother Earth, already present in ancient Peru more than 3000 years earlier (Kauffmann-Doig, 1991a. 2, pp.208, 209 / Fig.4).

THE URBAN ZONE AND ITS TWO AREAS

The division between the Agricultural Zone and the Urban Zone is marked by the so-called Dry Moat, which once served to drain rainwater.

The Urban Zone can be further divided into two large sections; the Sacred Area and the Residential Area. Both are separated by esplanades or plazas comprised of chambers and groups of buildings, including streets, stairways with a total of 3000 steps, and a system of stone-lined water channels, some of which were used in ceremonies associated with the worship of water. The urban system has been described in detail by Ann Kendall (1974).

As already mentioned, the names of these groups are universally recognized and, in the main, were suggested by Bingham according to his own analysis of their purpose. In the case of the "Tower" or "Temple of the Sun", in this publication we will abandon its conventional name in

favor of the “Water God Shrine”, and in the case of the “Royal Tomb”, we shall employ the term “Earth Goddess Shrine”. We will address these changes in a later chapter.

THE URBAN ZONE: THE SACRED AREA

The Sacred Area is accessed via the doorway known as the City Gate. The Inca Trail ends here, after passing the Intipuncu [Intipunku] on the upper slopes of Machu Picchu hill. Among the many buildings of the Sacred Area the most noteworthy are: the Gateway Group, the Water God Shrine, the Earth Goddess Shrine (Royal Mausoleum), the Royal Residence, the Temple of the Three Windows, the Principal Temple, and the Intihuatana, which occupies the highest part of the Sacred Area.

The Main or *Principal Temple*: A structure of the finest stonework, its plan is that of the classic three-walled building known as a *huayrana*. The central wall is eleven meters long. Behind and adjacent to the Principal Temple is the Chamber of Ornaments, one of the stones of which contains no fewer than 32 angles.

The Temple of the Three Windows: Adjacent to the Principal Temple. Bingham believed at first that its three windows alluded to the three caves of mythical Tamputoco, the metaphorical vagina of Mother Earth, or Pachamama, from where the ancestors of the Inca sovereigns emerged to found the city of Cuzco. These are not windows designed for ventilation, and they would almost certainly have possessed a magical-religious significance now lost to time.

The Water God Shrine (Tower, or Temple of the Sun): The ground plan of this structure would appear to recall the often repeated emblem of the Water God: the crest of a wave (Kauffmann-Doig, 1991a, 2001b, 2001c). The floor, formed by a rock with a carved and polished surface, evokes the realm of Mother Earth, or Pachamama. It is the crest of a wave emblem which leads the author to believe that the Tower represents the Water God, and to rename it so.

The Earth Goddess Shrine: Traditionally known as the “Royal Mausoleum”, this chamber is located beneath the rock outcrop upon which the Water God Shrine stands, forming a shallow

cave. The rock walls of the interior of the Earth Goddess Shrine have been covered with carved, finely polished stones. Access to the cave is partially blocked by a stepped, stone sculpture composed of two parallel segments carved from the living rock and projecting from one corner of the wall of the cave near the entrance. The stepped nature of the sculpture may be a reference to agricultural terracing, although it would also seem to represent the stepped symbol of Pachamama (Kauffmann Doig, 1986a, 1991a, 2003b). Perhaps the cave also represents the vulva of Pachamama, the universal mother of the ancestors of all living things. According to the myths recorded by the chroniclers, humanity emerged from several such caves.

The Royal Residence: This group is also known as the "Royal Palace". Although close to the Water God and Earth Goddess shrines, it is separated from them by the Central Stairway.

The Pacchas (Fountains): Running parallel to the Central Stairway, the *Pacchas* are sixteen cascades clearly associated with the worship of water.

The Intihuatana: The Intihuatana group is located in the uppermost section of the Urban Zone, which is the most important part of the Sacred Area and of Machu Picchu as a whole. Its remains rest on a rocky promontory reached via seventy steps. On the esplanade at the top stands an enormous sculpture with finely-polished surfaces, carved from the living rock. Its perimeter measures 8.60 meters and it is 1.76 meters tall. This enormous sculpture is topped with a carved column known as the Intihuatana, 66 centimeters tall and sheered horizontally at the tip. Basing our analysis on a suggestive myth, we will detail in a separate chapter the possible function of this structure which Bingham called the Intihuatana.

THE URBAN ZONE: RESIDENTIAL AREA

The Residential Area includes several groups of buildings: the Prison Group, the Mortar Building, the Three Doorways and the Upper Group, as well as the altar known as the Replica of the Apus, or Sacred Rock.

Some of these groups may have been the dwellings of administrators, such as the officiating priests at ceremonies and, according to Bingham's suggestion, perhaps also of the *acllas*, or chosen women, who, among their other duties, would weave the fine textiles which for the Incas possessed considerable diplomatic value. In fact, the buildings of the Residential Zone, like those of the Sacred Area (although to a lesser degree), are rich in sacred meaning.

The Altar of the Replica of the Apus: Usually known as the "Sacred Rock", the Replica of the Apus is a stone resembling the silhouette of a nearby group of mountain peaks charged with sacred meaning (Reinhard, 1991, pp. 54-55). This great sculpture is complemented by two of the three-walled structures known as *huayranas* (Valencia Zegarra, 1977).

The Water Mirrors: Located in the so-called Industrial Zone, this is a group of structures traditionally known as the "Mortar Group". The name derives from the presence, in one of the chambers, of a stone sculpture carved from one of the rocks in the floor of the building. This sculpture is composed of two circular cavities of an obviously ritual significance, which Bingham interpreted as mortars. They may have been used for divination through the reflections made on clear water or other supposedly magical substances. Therefore, the author prefers to call them Water Mirrors, and to extend that name to the entire complex of buildings where they are located.

The Prisons: This series of structures is located adjacent to the Water Mirrors complex, although it stands just below its neighbor. The walls contain niches of varying sizes and the damp narrow caves here are commonly believed to have been used as cells. An enormous rock outcrop dominates this complex, and it is partially covered with masonry on its upper surface, which seems to represent the figure of a bird. The caves contain three niches, with space to accommodate a seated person. This has given rise to speculation that the structure served the function of a jail. According to this theory, devices in the walls would have been used to secure the arms of prisoners. In one chamber of the Prison Group there is a rock with a carved figure. It

is believed to portray a condor (*Vultur gryphus*), and does seem to possess the ruff associated with that species. The author believes, however, that it does not represent a condor, but rather a bird of prey drinking from a round container. It should be remembered that a condor's ruff of feathers encircles its entire neck, and not just its nape, as in this sculpture.

Stone Shrine: This is a pile of rough stones, left exposed as a shrine to stone itself. Special powers are attributed to stones in Andean myth. They were believed to embody ancestors, for example in the story of the *purunaucas* told by Joan de Santa Cruz Yamqui Salcamayhua (c. 1627). In this story the stones are said to be warrior ancestors (*auca*), transformed from inert rocks into soldiers when called upon by the sovereign Pachacutec.

Chapter 12
The Intihuatana: A magical means of prolonging the day?

As we have seen, at the top of the Sacred Area stands the complex known as the Intihuatana [Intiwatana]. This most important of all shrines is crowned by a great sculpture carved from the rock outcrop, the surface of which is composed of several carefully cut and polished planes. From this plinth there rises a prismatic pillar pointing skyward, sculpted from the same stone that forms its base. This is the Intihuatana. It was Hiram Bingham who named this mysterious sculpture standing upright from its base. He chose to name it thus because of its similarity to a structure known as the Intihuatana at the ruins of Pisac, in the Urubamba valley, which was drawn –and captioned Intihuatana– by the traveler E. George Squier (1877). John H. Rowe (1946) has stressed the differences between the two sculptures, casting doubt on the accuracy of such an interpretation for the stone at Machu Picchu. They are certainly not identical, but both do rise like columns from the living rock. Intihuatana is a Quechua word usually translated as "tying the sun", or "place where the sun is tied". Several theories purport to explain the purpose of such a sculpture. Basing themselves on the etymology and the reference to the sun (*inti*), several authors believe Intihuatanas were astronomical devices (Zecenarro, 2004). According to these scholars, they functioned as solar observatories for predicting the solstices, particularly the

winter solstice, which in the southern hemisphere falls on June 21st / 22nd. Those who have observed the shadows it forms as the day progresses have described the Intihuatana as a sundial. It should be pointed out, however, that for much of the year the sky above Machu Picchu is cloudy, which would make it less than ideal as an astronomical observatory. The author believes that if this was indeed its purpose, then its function would have been limited to predictions regarding agricultural production, which would place its role more in the realm of astrology than that of astronomy. Johan Reinhard (1991, pp. 48-53) has made a detailed analysis of the so-called Intihuatana at Machu Picchu. His theory differs from those of his predecessors. He highlights the sculpture's relationship with the "sacred mountains" surrounding it. And, in addition to discussing the many theories offered by Max Uhle (1910) regarding Intihuatanas, he proposes that the upright stone at Machu Picchu is a replica of a mountain, perhaps Huayna Picchu. At the same time, however, he does not rule out the possibility that the Intihuatana may have been used as an astronomical observatory for establishing the equinoxes (Reinhard, 1991, pp. 48-50).

There may be a link between the stones known as *huancas* and upright sculptures like the Intihuatana. According to Ernst W. Middendorf (1990-92, 2, p. 431), any "great single stone" was once known as a *huanca*. We have seen (particularly in Peru's Cordillera Negra) this name applied to long stones thrust into sown fields to enhance their fertility. They seem to represent the penis, which, upon penetrating Mother Earth (Pachamama), symbolically inseminates her. The *huancas* at Chucuito, near Lake Titicaca, clearly represent phalluses, and they were originally sited in sown fields (Kauffmann Doig, 2001c, 2002, v.6, p. 965). The *huanca* tradition is an ancient one, for they are found at Caral, or Chupacigarro, in the Supe valley (Paul Kosok, 1965; Ruth Shady 1997). John H. Rowe (1946) suspected that the word Intihuatana might be of recent provenance, pointing out that no reference is made to it in early dictionaries and it only appears for the first time in the 19th century, in an 1856 work by Clements R. Markham (Reinhard, 1991, p. 48). In fact, it was recorded much earlier, as "Yntiquatana" (Oricain, 1790, p. 349). While its Quechua provenance is beyond doubt, it may not have appeared in earlier dictionaries because it is a composite of two terms, rather than a single word. A drawing by Guaman Poma (c. 1600, p. 240), seems to show an Intihuatana, in the form of an altar, the pillar of which emerges from a flat

base, as seen at Machu Picchu. As Max Uhle noted (1910), in the Cuzco region there exist other sculptures carved from the living rock and also known as Intihuatanas. The term is used in a myth still told today and clearly of ancient origin, which seems to prove that the word Intihuatana was not coined by Squier (1877), Markham (1856) or Oricain (1790). The myth tells of how ancient man was able to "tie down the sun" (Intihuatana).

As can be gathered from this myth, transcribed below, it was said that men could, through sorcery, "tie down the sun", thereby prolonging the daylight hours. The story says that this was done so that laborers would have more time to work the fields and produce the foodstuffs essential to their existence (Kauffmann Doig, 2002, 4, pp. 602-603).

With minor variations, the "tying down the sun" myth persists in remote parts of the regions of Apurímac and Cuzco. It also features in one of the versions of the myth of Inkarrí, published by Alejandro Ortiz Rescaniere (1973), which tells of how Inkarrí "tied the sun so time would slow". Although this story does not specify why Inkarrí would wish for time to be slowed, it does demonstrate that it was believed the day could be prolonged by "tying down the sun".[6]

The version of the myth we transcribe here, in Quechua and in translation, confirms the Pre-Hispanic origin of the word Intihuatana, as well as allowing us to propose a hypothesis regarding the purpose of these sculptures which departs from the usual theories. This version of the myth was recorded in the mid-20th century by Rubén Aucahuasi, in his native Apurímac. In 1979, when I asked him to transcribe myths from his native land, he kindly provided this story. One passage refers to the Intihuatana (Kauffmann Doig, 2002, 4, pp. 602-603):

[6] There exists another story that might offer a different version of the Intihuatana myth transcribed here. It was known to Bingham, and tells of how ancient Peruvians feared that one day the sun might stop shining, causing the end of the world. Perhaps these shrines were erected to prevent such a cataclysm by "tying down the sun"? It was certainly thought that the sun might disappear during an eclipse, never to return. Garcilaso (1609, II, Chapter XXIII) tells of how during eclipses the people gathered on esplanades and begged aloud, to the accompaniment of pipes and drums, for the sun to survive this potentially cataclysmic event. Garcilaso also says that during lunar eclipses the same ritual was performed, and that part of the ceremony was composed of the torture of dogs, so that their howls would be added to the pleas of their masters. Such a ritual is still performed during eclipses, according to information gathered by the author in Cachora, Apurímac. But today pigs, rather than dogs, are whipped by their masters (José Quispe, Cachora, 1993).

Ñaupa runakunaqa, sinchi ñakarikuywansi kausayta tarisqaku	*The men of ancient times made their living with great difficulty.*
Monaraq achihaymanta, allin tuta yaykuykamas llank'asqaku.	*From before dawn, until late at night, they worked.*
Paykunapaqsi, p'unchauqa pisillaña kapusqa.	*For them the day was too short.*
Chaysi, pallay chumpikunawan INTITA WATASQAKU, sapay p'unchau llamk'ay usianankama.	*That is why it is said that, using decorative ribbons, THEY TIED DOWN THE SUN each day until their work was*

Clearly, this story tells of how, in ancient times, men were able to "tie down the sun". And it explains why they did so: to stay its course, in order to prolong the day and give peasants more time to produce the crops that gave them sustenance.

Even if the upright stone at Machu Picchu known as the Intihuatana was not an altar used to "tie down the sun", myths like the one transcribed here enable us to intuit the purpose of Intihuatanas in general. The story demonstrates the urgency with which ancient Peruvians worked to produce enough food in the face of climatic phenomena such as El Niño, and how they had recourse to magical formulae in order to neutralize the recurring swings of fortune unleashed by the supernatural powers governing the elements (Kauffmann Doig, 1986a; 1991b; 2003b).

Many other archaeological remains are situated in the vicinity of Machu Picchu, such as those on the hill known as Huayna Picchu, visible from Machu Picchu. The Temple of the Moon is also located nearby. Below we describe these sites in more detail.

Chapter 13
Around Machu Picchu

- Huayna Picchu: Usually translated as "young peak", this is the name given to the rocky height standing some 400 meters above the main plaza of Machu Picchu. As we have already seen, the word *picchu* would seem to be a corruption of the Spanish word "*pico*", meaning the summit of a mountain. The Marquis of Wavrin (1961) climbed Huayna Picchu in 1929, accompanied by his guide Valdivia, and vividly described the adventure.

  The structures near the top of Huayna Picchu are reached via a path leading from Machu Picchu and beginning at the Replica of the Apus, or Sacred Rock. A section of the path is formed by a steep stairway cut into the rock, which ascends almost vertically for more than 40 meters. The structures on Huayna Picchu would have possessed considerable religious significance. They consist of a doorway and a series of carved stones, which may have been part of a ruined or uncompleted shrine. There are many miniature terraces on Huayna Picchu. The limited surface area and the steep slopes would seem to indicate that they served to prevent landslides.

- The Pachamama Shrine (Temple of the Moon): This site is located on the steep slopes falling away to the north of Huayna Picchu, some 400 meters below Machu Picchu, at 2050 meters above sea level. Known to Bingham, who named it the "Great Cave", it has been described in detail by Hermann Buse (1961) and Ann Kendall (1969).
  In 1997, Ernesto García Calderón and Roger Prada Honor cleared a complex of structures in a sector discovered by Fernando Astete and Rúben Orellana in 1987. These are located close to the rock chamber lined with finely-carved stonework known to us as the Pachamama Shrine, and comprise two octagonal chambers. The stones lining the cave were cut and polished with the greatest care and contain niches and blind double-jamb doorways. Judging from the quality of the stonework, the site would have been an important place of worship. We call it the Pachamama Shrine because it is a cave converted into a shrine. Caves appear to have symbolized the vulva of Pachamama or

Mother Earth, from where according to myth the ancestors of the Incas emerged. A path leads from Machu Picchu directly to the Pachamama Shrine, beginning near the Replica of the Apus, or Sacred Rock. Another path skirts the conical hill of Huayna Picchu and continues for another two kilometers.

- The Drawbridge: The so-called Drawbridge is situated some two kilometers from the entrance to the Sacred Area. The path follows a stairway that climbs past the Callanca and ends at the ancient Inca path leading beyond the ruins. At the other end of the bridge, this path continues on its way. Beyond the Drawbridge, the path narrows and continues along a kind of shelf carved into the cliff face. The bridge was originally completed with logs which when removed impeded passage.

Chapter 14
What might Machu Picchu have been? Diverse opinions

Many theories have been proposed to explain the original purpose of Machu Picchu, beginning with those formulated by Bingham.

At first, on discovering the beautiful building with three large windows known today as the Temple of the Three Windows, Bingham speculated that Machu Picchu may have been Tamputoco [Tanputoko], the mythical cradle of the Inca dynasty. Without revising his initial opinion, he later began to believe that he may also have discovered what he had been seeking, Old Vilcabamba [Wilkapanpa], the final stronghold in the campaign of resistance against Spanish invasion waged from 1536 to 1572 (Guillén, 1994; Hemming, 1970; Kubler, 1947; Lee, 1985, 2000; Lohman, 1941, Regalado, 1997; Vega, 1964). Scholars now agree that Machu Picchu was neither Old Vilcabamba nor Tamputoco. The former was traced to Espiritu pampa as a result of later exploration work (Savoy, 1970; Lee, 1985), although as we will see later doubts have emerged regarding this hypothesis. The site of legendary Tamputoco has been located south of Cuzco, in the vicinity of Pacarictambo (Bauer, 1992, pp. 41-63; Muelle, 1945; Pardo, 1946; Urton, 1990).

Luis E. Valcárcel (1964, pp. 88-91), believed that Machu Picchu was the historic Pitcos, which Baltasar de Ocampo Conejeros (c. 1611) described as a place located "on a very high hill [with] lavish buildings of great majesty […]". His hypothesis emphasizes the similarity between the words "*pitcos*" and "*picchu*", and focuses on the high-flown description of Pitcos provided by Ocampo, which might easily be applied to Machu Picchu. Valcárcel did not believe that Ocampo's Pitcos was in fact Vitcos, the fortified temple site in the Vilcabamba river basin, in Rosaspata, near the present-day village of Huancacalle, the geographic location of which is supported by precise historical references (Rodríguez de Figueroa, 1565; Murúa, c. 1600; Calancha, 1638). Regarding the question of who lived at Machu Picchu, Bingham believed the majority of the inhabitants were women, based on an apparently high incidence of female remains among those found at the site. According to the first analysis of 135 sets of bones exhumed, 109 were women, 22 men, and 4 those of children. Based on these preliminary findings, Bingham reasoned that they must have been *acllas*, and that therefore Machu Picchu had been an enormous *acllawasi*, inhabited by chosen women dedicated to a variety of state sponsored tasks and to prayer, who could be traded as diplomatic gifts.

In their research, Richard Burger and Lucy Salazar-Burger (1993, p. 24) benefited from revisions made in recent years to data regarding the bones recovered by Bingham, indicating that the ratio of male to female skeletons was in fact roughly equal, as was the case in the discoveries of Fernando Astete Victoria, who in 1994 found 18 skeletons in the eastern sector of the ruins, some 60% of which were those of adult males. Marino Sánchez Macedo (1990) continues to support Bingham's original conclusions.

If Pitcos is indeed Machu Picchu, as Luis E. Valcárcel firmly believed, it is interesting to note that Ocampo Conejeros (c. 1611) described Machu Picchu as an *acllawasi*, and as a "fortress […] on a very high hill, from where it dominates a great part of the province of Vilcabamba, with a most grand, flat plaza and lavish buildings of great majesty, skillfully constructed and all with lintels over their doorways, both large and small, and beautifully sculpted from marble […]". According to Ocampo, Tupac Amaru the First was raised in the Pitcos *acllawasi*.

The idea that Machu Picchu may have been a fortress designed to prevent incursions by Amazonian tribes is a theory Bingham himself rejected. Forest dwellers, known by the Incas as "*chunchos*", tended to occupy areas below 1000 meters above sea level. For such people, Machu Picchu's climate would have represented an insurmountable barrier. Also, strictly speaking, the word "citadel", defined as a fortified city and often used to describe Machu Picchu, is inappropriate (Harth-Terré, 1961), for the site was not fortified. The so-called Dry Moat separating the Urban and Agricultural Sectors was in fact a drainage ditch. Nor did the city's location or the walled sector on the edge of the site make Machu Picchu impregnable.

Pachacutec's tomb: at Machu Picchu?

What appeared to resemble the sealed entrance to an intact tomb was spotted by the Frenchman David Crespy. Informed by his fellow countryman, the archaeologist Thierry Jamin abandoned for a time the exploration work he had been engaged in since the final years of the last century in parts of the Amazon, in search of the mythical city of Paititi. He was determined to unearth whatever might be hidden in that sealed cavity.

Having received authorization from the government, in 2012 Jamin began exploratory work on what he assumed was a sealed chamber. In order to avoid damage to the wall sealing the entrance to what he believed was a manmade cavity, and to guard against the risk of a landslide, he proceeded to sound the interior using electromagnetic resonance equipment. This ground penetrating radar provides a 3D image of the subsoil to a depth of 20 meters.

In this way, Jamin was able to demonstrate the existence of a large funerary chamber behind the wall sealing the entrance. In addition, he determined that it contained "a considerable quantity of gold and silver". He concluded that it may have been a crypt belonging to relatives of the sovereign Pachacutec (his *panaka*).

This leads one to recall the theory proposed by the archaeologist Luis Lumbreras, who believes that Machu Picchu contained the mausoleum of Pachacutec, the greatest of the Inca state's dynastic leaders. He bases his theory on the work of the chronicler Betanzos, who wrote that the Inca sovereign was buried at a place called Patallacta, which according to the historian María del Carmen Martín Rubio was the original name of Machu Picchu.

In this regard it is important to bear in mind that another significant Inca settlement located, like Machu Picchu, in the Vilcabamba region, is also known as Patallacta. And they are relatively close, if we remember that for a local person today they are located just over one day's walk from each another. The place name Patallacta is also repeated in the city of Cuzco, in the vicinity of the San Sebastián district, as the archaeologist Piedad Champi has pointed out. It should also be remembered that Betanzos offers no detailed information when he states that Pachacutec was buried at Patallacta. And in this context it is important to recall the Inca custom involving the fashioning of a funerary bundle representing the mummified remains of the emperor: his *huauque* [wauke], or double.

Regarding the mummified bodies of Inca sovereigns, it is also essential to bear in mind the information recorded by the chroniclers, who all agree that they were kept in Cuzco, at a sanctuary known by the name Curicancha [*kuri* = lightning-thunder; *kantsha* = enclosure]. This tells us that they were not interred in crypts or mausoleums. We are also told that the mummified remains were on occasion taken into the streets of Cuzco as the focus of solemn processions.

And to all this it should be added that Juan Polo de Ondegardo had a number of the mummified bodies of the Incas sent to the City of Kings, or Lima. Upon their arrival, the mummies were housed in the San Andrés Royal Hospital. From the writings of José de Acosta, we can be certain -as Teodoro Hampe has pointed out- that among these mummies was that of Pachacutec. This distinguished historian has been overseeing a project at the aforementioned hospital since 2001, with the aim of locating the royal remains, particularly those of the Inca Pachacutec (Hampe, 2003, 2010).

Returning to the speculation on the part of some colleagues regarding the theory that Pachacutec's crypt was situated at Machu Picchu, as the reader will now appreciate, such claims cannot be substantiated. On the other hand, this does not rule out the possibility that the sealed cavity in question may contain the burials of important individuals. In fact, judging from the results obtained by the Incari Institute, presided over by the archaeologist Thierry Jamin (Jamin, 2012; Rocha, 2012), it is clear that there exist two passages leading from the sealed entrance. Also, 3D imaging produced by Jamin has established the presence of "a stairway leading to a funerary chamber [and] several cavities among which a square chamber stands out, containing what appear to be objects made from precious metals".

News of the discovery has led to protests from some conservationists, who fear that removal of the wall sealing the chamber could lead to a landslide. According to Jamin, such fears are unfounded.

Tomb on the hill adjacent to Huayna Picchu known as Uñawaynapicchu [Uniawainapiqtshu]

A tomb lined with carved stones which may have originally housed the remains of a high-ranking individual was identified at Machu Picchu in 2012. It is located in the northeastern sector of the hill adjacent to Huayna Picchu, known as Uñawaynapicchu [Uniawainapiqtshu]. According to the archaeologist Fernando Astete, the tomb was plundered centuries ago.

The Intipunku would have controlled access to the city from Wiñay Wayna, but it cannot be said to have been a fortress. And even if it had been, against whom was it intended? The theory of a correlation between magical-religious practices and the majestic surroundings of Machu Picchu has been addressed at length by the American anthropologist Johan Reinhard (1991, 2002), who arrived at significant conclusions based on the following premise: "Machu Picchu can be better understood if the site is analyzed in the context of the topography surrounding it, which was considered sacred". Reinhard details his theories regarding the magical character of the area's geography, which he supports with astronomical observations. Many studies have been made of the astronomical aspects of the site, including the work of Raymond E. White, David S.P.

Dearborn and Katharina Schreiber, who, supporting the Johan Reinhard thesis, place the site at the center of a vast "sacred geography" and discuss the importance for the Incas of the high peaks, most notably Mount Salcantay (6271 meters). Such conclusions are also supported by ethnographic data. It should be remembered that high peaks were seen by the people of the Andes as "protectors and providers of economic stability". Reinhold's studies contribute to our picture of the role of *apus*, those great mountains where the Andean Water God is still said to reside (Kauffmann Doig, 2002, 2003a and b).

A new hypothesis emerged when Luis Miguel Glave and María Isabel Remy (1983) revealed to the world a 17th century document featuring the name Picho, which they believe refers to Machu Picchu.

These authors (Glave & Remy, 1983, p. 191) demonstrate that in 1657 the Augustinian order rented lands known collectively as Machu Picchu. John H. Rowe (1990) analyzed the document published by Glave and Remy, as well as older copies of the same document, and concluded that Machu Picchu had originally formed part of a vast estate "owned" by the sovereign Pachacutec.

The Rowe "royal hacienda" hypothesis -private property owned by the historical Inca sovereigns- has enjoyed acceptance among many scholars, particularly in the United States. Susan A. Niles (2004) has looked in detail at the concept of Machu Picchu as one of these royal estates, built by Pachacutec for his and his family's personal use. The author does not share this opinion, although it is endorsed by many experts in the field, including researchers of the stature of Richard L. Burger & Lucy Salazar (2004; Burger & Salazar 2004; Salazar 2004b). Regarding this controversial suggestion of the existence of private property in the Inca state, other documents revealed by María Rostworowski (1963) and dating from the 16th century are pertinent. In one of these, dated 1579, the Spaniard Gerónimo de Genares declares that since the time of the governor Lope García de Castro he had been the owner of the lands of Guaman Marca in the Amaybamba valley, and he mentions that these "belonged to the Inca Yupanqui who had them for his own recreation".

When analyzing such documents, it is important to remember that all the informants of the Spanish period, of both mixed and indigenous blood, were obliged to apply and adapt the Spanish

vocabulary and the characteristics of western institutions to the concepts and societal structures of Andean culture, which were displaced almost from the very first moment of European irruption. For that reason, translations from the period do not always reflect reality, for example in the case of the "ownership" of land in Pre-Hispanic times. It is likely that references to "haciendas" simply allude to those building projects ordered by a sovereign. And we must ask ourselves, with whom would Pachacutec have traded the produce of his "royal hacienda"? And what of Tupac Yupanqui, his successor and the "owner" of Chincheros? Or Huayna Capac, the "owner" of Yucay? The resources required by the state apparatus came from the two thirds of all food production paid in tribute by each family. These foodstuffs covered the necessities of the ruling class and of public servants. Most of this tribute was stored for years of famine when recurrent periods of catastrophic weather events adversely affected production. The preservation of the sovereign's legacy, the conservation of his mummified remains and the chambers he had occupied, were all tasks assumed by his *panaca*, or kin group. As the reader will have gathered, the author finds the conclusions drawn by Rostworowski (1963) and Glave and Remy (1983) implausible, for they imply that Pachacutec built Machu Picchu for his own recreation, a city which Rowe (1990) has described as having buildings appropriate for the residence of "a king and his court…". Such a conclusion would beg the question: Did other administrative and religious complexes in the Vilcabamba region, such as Wiñay Wayna, Phuyupatamarka and Patallakcta, also serve as private places of relaxation and leisure for the sovereign?

Chapter 15

A different hypothesis: Machu Picchu as part of a state Project for the expansion of the agricultural frontier

It would seem clear that Machu Picchu, in common with other nearby archaeological sites such as Intipata and Wiñay Wayna, which are similar in design, was an administrative center for food production and propitiatory rituals. We can also assume that only urgent necessity could have led a highland people to build places like Machu Picchu in the Amazonian Andes, a cloud forest

environment quite alien to them. As we will see, their motive was the pressing need to expand their agricultural frontiers. Nothing else could have persuaded the people of Cuzco to move to such an inhospitable region, where work in the fields required the additional effort of forest clearance, an activity unknown in the highlands. The scale of such a project can be measured by the effort required to erect the administrative and ritual centers needed to control agricultural production, as well as the terracing that tamed this rugged region. Such tasks could only have been accomplished within the context of a state program, the success of which only a sociopolitical structure as solid as that of the Inca state (or, previously, Tiahuanaco-Huari) could guarantee.

The labor required for such a project could only have come from the institution known as *mitmac*, under which entire peoples were transferred to other areas for political purposes. Chroniclers including Pedro Cieza de León (c. 1550) recorded how people were moved to unpopulated areas in order to increase food production. In a document from 1576, published by María Rostworowski (1963, p. 229), the informant had "seen and heard" that in the Amaybamba valley, near Machu Picchu, "in times past in that valley more than 1500 Indians lived… [and] all the Indians were *mitmaes*". The author adds that the people moved to Amaybamba "were *mitmaes* from all parts of the kingdom…", implying that they were highlanders and not Amazonian forest-dwellers.

The *mitmac* would have been overseen by Inca administrators. Engineers and stonemasons from Cuzco would have participated also, judging from the refined Inca style of the walls at Machu Picchu. The agricultural "colonization" project in Vilcabamba probably began under Pachacutec in the Vitcos valley around 1440, after his defeat of the Chancas (Cobo, c. 1653, Book XII, Chapter XII). The choice of the Vilcabamba region for the expansion of the agricultural frontier may have been due to the absence of an existing sedentary population, particularly in areas such as that occupied by Machu Picchu, where no evidence of pre-Inca inhabitants has been found. Also, the region is relatively close to Cuzco and, in the case of the Vitcos and Vilcabamba river basins, access was facilitated by the Urubamba River, which flows through Calca, Ollantaytambo, Amaybamba and Choquechaca. In Choquechaca, according to Bernabé Cobo (Cobo, c. 1653, Book

XII, Chapter XII), Pachacutec encountered hostile inhabitants, a problem repeated during the first incursions into the Vitcos river basin and around the headwaters of the Pampacona River, “which is before entering the mountains” (i.e. the Amazon basin).

It should be reiterated that the process of colonization in the Vilcabamba region was overseen by the governors of the Inca state (administrators, priests and, of course, experts in the art of construction). Machu Picchu is one of many sites built in the region. The presence of extensive agricultural terracing, which covers the greater part of the site, in common with Intipata and Wiñay Wayna, for example, confirms that Machu Picchu’s purpose was agricultural production. Whether or not the agricultural terracing was extensive enough to produce a surplus is another issue. Sites like Machu Picchu were also important centers for ritual worship, for the central role played by religion lay in supplying the magical assistance required to secure food production. To these motives for Inca expansion into the Amazonian Andes, perhaps we should add the supply of coca leaves (*Erythroxylon coca*); although coca did not flourish on Machu Picchu’s terraces due to their altitude, it would have been possible to grow it nearby at lower altitudes.

Beyond the practical aspects of colonial expansion, we must ask a more fundamental question: Why expand the agricultural frontier? There can only be one answer: the increasing demand for food resulting from demographic pressure, due to the extreme scarcity of land suitable for agriculture in the ancestral territories of Pre-Hispanic Peruvian civilization.

This ecological imbalance can be traced to before the rise of the Inca state, some four thousand years ago, when ancient Peruvians began to plant crops and domesticate American members of the camel family (llamas and alpacas), abandoning the precarious existence of the hunter-gatherer. An agricultural economy provided a reliable food source, but at the same time it generated population growth and increased demand for food. To the challenge of limited land was added the El Niño phenomenon, which periodically disrupted production. Paradoxically, the recurrent natural disasters and shortage of agricultural land which have defined Peruvian history

at all stages of its development also account for the growth of civilization, through what Toynbee called the “response to challenge” (Kauffmann Doig, 1991b, 1996a).

The objective of agricultural colonization at places like Machu Picchu, Wiñay Wayna and Intipata was not self-sufficiency, but rather the production of a surplus that could be exported to other regions to cover periodic food shortages. Circumstances obliged the people of the Andes to provide for years of famine, and in the Inca state the peasant farmer was obliged to work his fields with optimum efficiency in order to ensure the surplus necessary to meet the tax of two-thirds of yield demanded by the government. While this tribute was required to sustain the elite who managed the economy, a far greater proportion was stored for redistribution during difficult times (Huaycochea, 1994; Morris, 1967).

Traffic from Machu Picchu and the other administrative and religious centers of the region followed the trail from Machu Picchu to Patallacta [or Llactapata = Iaktapata] in the Cusichaca [Kusitsha-ka] river basin, and from there to Cuzco via Calca. Concerns over whether such a project might fail rather than produce satisfactory results would have been overridden by the urgency of the primary objective: the initiation of a strategy to fight hunger. The study made by Alfredo Valencia and Arminda Gibaja (Frost *et al*. – J. Bartle (Ed.) 1995, p. 23) of the yields Machu Picchu was capable of producing is not, it is true, encouraging. They calculate that harvests would have hardly sustained fifty-five individuals –far fewer than the estimated population of Machu Picchu itself, which may have been home to as many as three hundred (Wright & Valencia, 2001, p. 98). Considering such figures, Ann Kendall (1974, p. 130) concludes that “the population [of Machu Picchu] may have been partly or largely subsidized…” and she suggests that such a food subsidy may have been furnished by the farming settlements at Patallacta, in Cusichaca. It should be remembered, however, that the agricultural terraces at Machu Picchu extend all around the site, and are still covered in places by dense tropical vegetation, as demonstrated by the work of Fernando Astete and Rubén Orellana (1988). If Valencia and Gibaja are right, then it may be the case that Machu Picchu was a production center still in its implementation stage.

Machu Picchu is not an isolated case of agricultural expansion. The vast "colonization" program in the Vilcabamba region produced other centers for farming and related religious practices. Some possess areas for crops much larger than their urban zones, where administrative and religious personnel resided. Such is the case at Intipata, Wiñay Wayna, Vitcos and, especially, Patallacta-Quente [Pataiakta-Qente] in Cusichaca.

Emilio Harth-Terré supposed that Machu Picchu was conceived as a "self-sufficient city" (Harth-Terré, 1961). But surely the objective of such a program would have been the production of a surplus? Such a supposition would tally with the calculations made by Ann Kendall in the Cusichaca area, which she maintains was capable of "feeding some 100,000 people a year", adding that Cusichaca produced four times more than it required to feed its inhabitants (Frost *et al*. J. Bartle (Ed) 1995, p. 111). Our theory regarding the presumed function of Machu Picchu coincides with the opinion of Richard Burger and Lucy Salazar-Burger (1993, p. 21), who maintain that Machu Picchu "can only be properly understood in the larger context of Inca social, economic and political structure". But to this should be added the role played by the city in a magical-religious context, perhaps making it more important than the other power centers associated with the control and management of agricultural production and related rituals. Although we do not know the details of such religious practices, their obvious aim was to ensure a growing (or stable, at the very least) level of food production. Ceremonial worship was designed to propitiate, through magic, the supernatural beings upon whom the securing of food depended: the Water God and the Earth Goddess, or Pachamama. The former was feared for his ability to bring disaster to humankind, which is why Andean iconography depicts the Water God with threatening fangs, often decapitating his victims. To this day, he is venerated in the form of the Andean peaks known as *apus*. From ethno-historical information, the images drawn by Guaman Poma (c. 1600) and scenes depicted on the native *qeros* of the 16th century, we can deduce that the sun was none other than a symbol or personification of the Water God (Kauffmann Doig, 2003b, pp. 56-57). On the other hand, the Earth Goddess, his feminine counterpart, was a passive deity who awaited fertilization by the Water God. The presence at Machu Picchu of both these major deities of the Andean pantheon is expressed in buildings of

great votive significance: the Water God Shrine (Temple of the Sun), the Shrine to the Earth Goddess, or Pachamama (Royal Mausoleum) and, particularly, the altar known as the Intihuatana. In addition, the care with which the agricultural terraces were built can also be seen as a form of homage to the Earth Goddess, embellishing the land as they do, while at the same time making it more productive (Kauffmann Doig, 1986a, 1996a, 2001b, 2003a).

The colonizing urge must have been in evidence before the Incas, during the Tiahuanaco-Huari period, when some time in the 8th century highlanders occupied northern parts of the Amazonian Andes. However, in contrast with the process undertaken in Vilcabamba, these colonists gradually lost contact with their Andean brethren on the other side of the natural barrier formed by the Marañon River. In isolation, their cultural knowledge was gradually modified, leading to the creation of a separate Andean culture, that of the Chachapoyas (Kauffmann Doig, 1986a, 1986b; Kauffmann Doig & Ligabue, 2003).

The agricultural and ritual function we attribute to Machu Picchu can be seen in a much larger context, one that supposes that all the monumental centers of ancient Peru were built for the same purpose, from the dawn of Peruvian civilization some 4000 years ago (beginning with Caral, Mina Perdida, etc.).

Chapter 16
Why was Machu Picchu abandoned?

With European irruption and the destruction of the socio-political structure and power of the Inca state, Machu Picchu was probably abandoned due to its location in what was a rugged and relatively inaccessible territory. The evacuation of its inhabitants may have been brought about by the resistance to Spanish dominion led by Manco Inca and his successors from 1536 to 1572, who sought refuge in the Vilcabamba region, particularly in the valleys of the Vilcabamba-Vitcos and Pampaconas-Concebidayoc river valleys. Manco Inca would have sought new recruits from among the general population of the areas through which he passed. There is evidence to support this hypothesis. The inhabitants of Amaybamba were recruited by Manco Inca before he crossed

the Urubamba via the Chuquichaca [Tshukit-shaka] bridge on his way to Vilcabamba. A document from 1579, published by María Rostworowski (1963, p. 229), refers to this evacuation, describing how the area was depopulated when the people followed Manco Inca on his way to Vilcabamba or Vitcos. The document says that "there were more than 1500 Indians in that valley […] of whom [c. 1579] only 57 remained". It should be remembered, however, that part of the populace, which included the Chachapoyas *mitmac*, had long since been removed from their original homeland, possibly on the orders of the Inca Tupac Yupanqui. Even earlier documentary evidence backs the hypothesis that the population of Machu Picchu was recruited by Manco Inca. Rodríguez de Figueroa (1565) was charged with the mission of persuading Titu Cusi Yupanqui, Manco Inca's successor, to submit to Spanish rule. The Spaniard writes that on passing Condormarca, on his way from Amaybamba, "three leagues from the land of the Inca", he noticed that the area "was depopulated, because all have hidden in those mountains [Vilcabamba]".

The abandonment of Machu Picchu, unlike that of Amaybamba, was probably not total, given the evidence found at the site in the form of European-derived objects (Bingham, 1949, p. 264). Bingham unearthed a bovine bone and two peach seeds, of obvious Spanish origin. Based on reports by George F. Eaton, Bingham adds that he also found a fragment of a bovine tibia. To such findings can be added cultural objects of European origin such as shards of glass and post-Inca pottery (Manuel Chávez Ballón / personal information 1964). Other remains not of late colonial manufacture may be supposed to have been introduced to Machu Picchu at a later date. To the findings mentioned should be added, perhaps, the 555 mysterious discoid objects found by Bingham, which some authors have interpreted as poor copies of Spanish coins. For 400 years Machu Picchu was unknown to all except local peasants and landowners. John H. Rowe (1990) cites an early mention of Picho, which he interprets as a reference to Machu Picchu. In his chronicle, Diego Rodríguez de Figueroa (1565, p. 94), writes that on the road from Cuzco to Vilcabamba, in the village of Condormarca, "there was a bridge in ancient times that crossed the Vitcos river on the way to Tambo and Sayacmarca and Picho…" Rowe checked copies of the 16th century manuscript in the Cuzco Departmental Archives, which had been mentioned previously by Luis Glave and María Isabel Remy (1983) in their own monumental and methodical research.

These documents mention Picho, or Picchu, referring to the geographical area rather than to any structures. Another 16th century document found by John H. Rowe (1990) refers generically to "a list of the agricultural lands in the Picchu canyon". For his part, Rafael Varón Gabai (1993) has found in a document from 1550, kept in the General Archive of the Indies in Seville, another mention of Picchu. This document refers to the tribute paid by the native population. Another document found by Varón, dated 1560, makes reference to an inspection or "visit" made of Picho by Damián de la Bandera. The document establishes a tax payable exclusively in coca. As coca was ill-suited to the terraces at Machu Picchu, the inhabitants of this Picho, if it was indeed Machu Picchu, must have grown the leaf in the surrounding valleys, at altitudes below one thousand meters. The landowners of the 16th century knew that the heights above the Urubamba valley where Machu Picchu is located were unsuitable for agriculture. Varón (1993) points this out, citing documents discovered in the early 1990s. The difficulties involved in accessing the terraces at Machu Picchu and neighboring sites such as Phuyupatamarca, in the absence of the Inca state structure, meant that it became impossible to levy taxes in the area. And it is symptomatic of this situation that in 1911, the year of the scientific discovery of the ruins, then part of the Cutija hacienda, only two families were living at what is today the most celebrated archaeological site in Peru. Another early mention of the names Machu Picchu and Huayna Picchu appears in a 1782 document transcribed by José Uriel García (1961a, p. 177 / Kendall 1974, p. 134). However, it does not refer to the ruins, but rather to some lands "without farm implements, livestock or houses".

Clearly, Machu Picchu was never totally forgotten. A few 19th century travelers and explorers heard about the ruins and made brief references to the site in their sketches and maps (Gohring, 1877; Wiener, 1880). And when, in 1911, Bingham scaled its heights, captivated by the vision before him, members of two humble families came out to meet him.

As has occurred with so many other vestiges of a great past, the ruins of Machu Picchu were known locally long before an enthusiastic foreigner like Hiram Bingham arrived to marvel at them. And a century later, it might almost be described as puerile xenophobia, or at the very

least simple pettiness, to deny that it was through Bingham that this incredible marvel of Peruvian architecture was revealed to the world.

Appendix A
The Inca Trail to Machu Picchu and the archaeological sites it links

A vast network of highways crisscrossed the land of the Incas. John Hyslop (1992), calculated that in total the system covered more than 23,000 kilometers. It traversed deserts and mountains, and the Spanish chronicler Piedro Cieza de León (1553) commented with astonishment that the Inca roads were "made with great difficulty in that harsh and impenetrable land, and provoke admiration". The roads were partly built over routes already established before the rise of the Inca state. The Inca road system was known as the Inka Ñan [Inka Niam] or Qhapaq Ñan ("Royal Road"). The main highways were reserved for the state and not open to the general populace, and access to bridges was strictly controlled. The populations in the vicinity of the highways were obliged to maintain them in good condition. Today, the Inca Trail to Machu Picchu begins at Qoriwayrachina, an archaeological site located at Kilometer 88 of the railroad from Cuzco to Machu Picchu. It is also possible to begin the trail at Piscacucho at Kilometer 82, or Chilca at Kilometer 77, reached by the present-day road.

Another access route to Machu Picchu was discovered by Fernando Astete in July 1995. This route, clearly of Inca manufacture, had been covered by a landslide, and it and other pathways led to Machu Picchu via the left bank of the Urubamba River. The path discovered by Astete begins at Kilometer 104 of the Cuzco-Machu Picchu railroad, before the Machu Picchu station, near the ruins of Chachabamba. It passes the ruins of Wiñay Wayna before joining the Inca Trail from Qoriwayrachina to Machu Picchu. The Chachabamba route covers some twenty punishing kilometers, climbing steps cut into the almost vertical rock. A 37-meter footbridge, built by Sonia Guzmán, crosses the Urubamba-Vilcanota River, where an Inca suspension bridge would have originally stood. Another trail, which leads from Choquesuysuy (Tshoqesuisui) to Machu Picchu, via Wiñay Wayna, discovered and traveled for the first time by José Koechlin, will be mentioned later.

Other access routes to Machu Picchu

A network of roads in the Vilcabamba-Urubamba region linked agricultural-ritual centers, including Machu Picchu. As well as the "classic" access route to this splendid site preferred by, and marketed to, tourists, which leaves from Qoriwayrachina and has already been described in detail, other ancient highways are still used today and have been partially restored or adapted to modern use.

In addition to the routes already mentioned, beginning at Choquesuysuy and Chachabamba, which present few difficulties to walkers, the first years of this century have seen new opportunities emerge for the adventure traveler wanting to access Machu Picchu from a number of other places, including the ancient routes from Choquequirao, Huancacalle and Mollepata.

Inca Trail from Choquequirao to Machu Picchu

This route has been used by adventure travelers since 2002, when restoration work at the magnificent archaeological site of Choquequirao began. Choquequirao is located in what was once the territory of the neo-Incas of Vilcabamba, high above the right bank of the Apurímac River. From this region, during the second third of the 16th century, the neo-Incas harried the Spanish forces that launched incursions from Cuzco and Huamanga (Ayacucho) (See Appendix "C").

In 2005, the Lima-based magazine "Rumbos de Sol y Piedra" organized an expedition along the route from Choquequirao to Machu Picchu (Velarde and Hupiu, 2005). The team left Cuzco on the road to Abancay, passing Anta, Limatambo, Curahuasi and Saywite, before taking the dirt road that leads to the village of Cachora, from where they trekked to Choquequirao.

From the main square of Cachora (3050 meters above sea level), the trail leads to the Choquequirao Pass (3270 meters). From here, the trail follows the course of the Apurímac River, descending to around 1800 meters, before climbing again to the campsite at Maizal (2850

meters), 25 kilometers from Choquequirao. From Maizal the route climbs once more to the Victoria Mine (3800 meters), an old copper and tin mine that once belonged to the Romainville family. Beyond Choquequirao, after reaching the San Juan Pass, the trail descends to the small village of Yanama (3520 meters), situated 18.8 kilometers from Maizal. Condors are often seen along this section of the trail. From Yanama Pass (4690 meters), the imposing peak of Mount Salkantay [Salqantai] can be seen. From the pass, the trail descends to the small village of Totora (3400 meters), which is a good place to camp. From Totora it is an eight kilometer walk to the small community of Colcapampa (2870 meters), where there are thermal springs. From Colcapampa it is a further 12.5 kilometers to Playa Sahuayaco, where it is possible to camp and access the road via which it is a forty-minute drive to Santa Teresa, not far from Machu Picchu.

Inca Trail from Huancacalle to Machu Picchu

An extensive network of Inca highways ran through the domain of the "Incas of Vilcabamba", the neo-Incas who resisted the Spanish from 1536 until 1572 (See Appendix "C"). One of the alternative trails for adventure travelers wishing to access Machu Picchu is the route that follows stretches of the old Inca highway from Huancacalle to Santa Teresa, not far from Machu Picchu itself. This route has been trekked by the Peruvian journalist Alvaro Rocha (2004, pp. 54-55).

Huancacalle is situated on the left bank of the Vilcabamba River, and is reached from Cuzco via the road to Quillabamba, traveling through an imposing landscape dominated by high peaks, including Mount Veronica/Waqaiwillka ("sacred tears" in Quechua). The route descends to Chaullay, from where a road leads to Huancacalle, following the course of the Vilcabamba River. The route to Huancacalle passes through picturesque villages such as Lucma. Close to Huancacalle stands the archaeological site of Vitcos-Ñustaispana, a complex composed of the Inca's Residence, the imposing shrine of Ñustaispana and majestic agricultural terraces (See Appendix "C"). In Huancacalle there is a comfortable hostel (Six Manco), established by Vincent Lee, the great explorer of the Vilcabamba region. The hostel is run by the Cobos family, whose patriarch is a valuable source of information, having accompanied Lee on several expeditions.

Several ancient highways can be accessed from Huancacalle. One leads to Espiritu pampa, while another continues as far as Choquequirao. The Huancacalle to Machu Picchu route is a continuous climb in an easterly direction to the village of Yanatile and on to Santa Teresa (the two villages are located close to the Urubamba River and Machu Picchu). These communities are linked by a road. The route from Huancacalle to Machu Picchu skirts the base of Mount Sacsarayoc (5936 meters). Alvaro Rocha has described how the trail took him as far as the Asuntina Pass, "leading us to the Racachaca River and the village of the same name, which the INC has established as the final stage, for now, of its work to recover this Pre-Hispanic road system. But, of course, the Inca highway does not end here, as we were later able to see for ourselves".

Inca Trail from Mollepata to Machu Picchu

To Santa Teresa and from there to Machu Picchu, this route also follows another stretch of Inca highway, which begins at Mollepata and is also being discovered now by backpackers. Mollepata (3875 meters) is located in the province of Anta, close to Limatambo in the Apurímac river basin. This route to Machu Picchu runs from south to north.

From Qoriwayrachina, the hike to Machu Picchu can be made in three or four days, with nights spent at established campsites. Three passes must be crossed along the way: Warmiwañusqa (4200 meters above sea level), Runkuraqay [Runturaqai-i] (3950 meters), and a third just before descending to Phuyupatamarka [Puiupa-tamarka]. On this route a 20-meter tunnel leads to Sayakmarka [Saiakmarka] and Phuyupatamarka. This route allows walkers to appreciate construction techniques employed in Inca highways and also to visit archaeological sites along the way, including Wiñay Wayna and Phuyupatamarka, which rival Machu Picchu as testaments to the colonizing efforts of the Incas in the Amazonian Andes. Travelers can also enjoy beautiful scenery, amid exotic tropical flora and the snow-capped peaks that dominate the horizon, including Salkantay (6271 meters), Pumasillo (6010 meters) and, in the distance, Verónica/Waqaiwillca (5700 meters), all of which can be seen from the Phuyupatamarka

archaeological site[7]. The Inca Trail we describe here and the majority of the sites it links were brought to light by Hiram Bingham, who walked the route as far as Sayakmarka in 1915. Many years later, they were more rigorously explored by Paul Fejos (1944), and by Julio C. Tello and Manuel Chávez Ballón in the area around Wiñay Wayna. In 1985, Leoncio Vera Herrera (2001) located the complex of Kantupata. The Inca Trail and related archaeological sites have been meticulously described by Víctor Angles Vargas (1972, pp. 335-380). Peter Frost (1989) has written a very practical description of the route. A more recent contribution is that of Rafael León *et al* (2000).

On the Qoriwayrachina-Machu Picchu route there are grueling stretches, such as Warmiwañuska Pass (4200 meters). The original Inca highway, with steps carved into the rock, is only visible along certain sections. Along the route a 20-meter tunnel is negotiated. At Qoriwayrachina, the start of the Inca Trail, a bridge takes walkers across to the left bank of the Urubamba River. Here a cliff face has a stairway carved into it. Remains of the foundations of the original Inca suspension bridge can still be seen. The modern bridge was built by Ann Kendall's Cusichaca Project.

After crossing to the left bank of the Urubamba over the Qoriwayrachina bridge, the terraces of Quente [Qente], Machuquente and Waynaquente can be seen in the distance, among a grove of eucalyptus trees. After three kilometers and just before crossing the Cusichaca River, the enormous Patallacta site appears (2300 meters above sea level), in the triangle formed here by the Urubamba River. The Patallacta group is composed of the sites known as Willcaraqay [Wilkaraqai-i], Pulpituyoc [Pulpitulioq], Leoniyoc [Leoni-ioq] and Tunasmoco [Tu-nasmoqo], all in the Cusichaca area. These sites have been studied by Ann Kendall (1974, 1978 and 1988) and some of the terracing has been reactivated.

[7] According to statistics from the National Institute of Culture (INRENA 1999, p.233), while in 1984 6,263 visitors walked the Inca Trail, in 1997 266,033 hikers made the trek. Numbers have continued to grow, damaging a trail which during the Inca period was restricted to a few barefoot or sandal wearing travelers. In response, the relevant authorities have established new regulations governing the carrying capacity of the trail and protecting the almost virgin ecosystem through which it passes.

After crossing the Cusichaca, leaving Patallacta behind, the trail follows the river upstream, along its right bank. Crossing the river again, this route leads to the Llulluchayoc [Liuliutshaioq] gorge and the village of Huayllabamba [Wailiapanpa], at an altitude of 2500 meters. The walk from Qoriwayrachina to Huayllabamba takes approximately three hours, not including the time needed to visit the ruins of Patallacta and the other sites in the Cusichaca area. Huayllabamba is the only village on the Inca Trail to Machu Picchu. Its simple houses rest on archaeological remains, and stones from the ancient site have been used in their construction.[8]

It is from Huayllabamba that the original Inca highway can be distinguished clearly. It runs uphill, following the Llulluchayoc River [Liuliutshaioq], which flows into the Cusichaca. The climb ends at the Warmiwañusqa Pass ("Where a Woman Died") at 4200 meters above sea level, the highest point of the route. From the pass there are fine views of Mount Verónica/Waqaiwillca (5700 meters). Here there stands an *apacheta*, a stone cairn. Following an ancient tradition, local travelers each leave a stone as they pass, in order to thank the mountains for allowing them to continue their journey without mishap.

After crossing Warmiwañusqa Pass, the trail abandons the course of the Llulluchayoc River [Liuliut-shaioq] to descend into a swampy river basin (3500 meters) that must be forded. The trail then climbs again, crossing the Pacamayo [Pakamaio] ravine and continuing to the ruins of Runcuracay (3800 meters). The hike from Huayllabamba to Runcuracay [Runkuraqai-i] takes about eight hours. Bingham found the name Runcuracay on a map, but he may have misunderstood what he read, for Víctor Angles calls the site Runturacay. In Quechua, "*runtu*" means "round", and this certainly describes the ground plan of the site. "Racay" [raqai-i] means "settlement". From here, the trail climbs a slope to the second pass at an altitude of 4000 meters,

[8] From Huayllabamba an Inca road follows the course of the Cusichaca River, known as the Huayllabamba at this point. It heads in the direction of Pampacahuana [Panpaqawa-na], and leads to the ruins of Inkaraqay ("settlement of the Inca"), known also as Paucarcancha, after the village of the same name located nearby. Just before reaching Incaraqay, the trail forks. One trail leads east and crosses the Silke River on its way to Ollantaytambo. The other leads to the Aobamba River at its confluence with the Urubamba, west of Machu Picchu. On the way, below Mount Salcantay, this trail forks again and the new route leads to the headwaters of the Santa Teresa and ends where the Huadquiña joins the Santa Teresa, which flows into the Urubamba. These routes require stamina and the necessary logistics.

before descending to the ruins of Sayacmarca [Saiaqmarka] at 3730 meters. This section can be completed in a couple of hours.

Bingham visited these ruins in 1915. The area may already have been known as Cedrobamba, and this was the name he chose to give the ruins. Sayacmarca, meaning “inaccessible city”, was named by Paul Fejos (1944). The ruins are reached along a seemingly interminable stairway hewn from the rock. The chambers at Sayacmarca are laid out in three groups set at different levels and crowning a rocky promontory. They were almost certainly associated with the worship of rainfall or water. From Sayacmarca the trail continues to another set of ruins on the edge of Cedrobamba, at 3570 meters above sea level. These ruins, two hours from Sayacmarca, are known as Phuyupatamarka. From here the peaks of Salcantay (6180 meters) and Verónica/Waqaiwillka (5750 meters) can be seen. A pass is crossed on the way to Phuyupatamarka, before the trail continues through a 20-meter tunnel. Bingham explored these ruins in 1915, and named them Qoriwayrachina. Phuyupatamarka (“City in the Clouds”) is the name given to the site by Paul Fejos (Fejos, 1944). Extensive agricultural terracing hugs the sinuous topography. The shrines located here would have been dedicated to the worship of water. The stone used is white granite. Between Sayacmarca and Phuyupatamarka the Inca highway is impressively well-preserved, except for the final stretch, from which several side trails can be accessed.

From Phuyupatamarka, the trail descends from cold high grasslands to a warmer region covered with the tropical vegetation of the Amazonian Andes. The ruins of Wiñay Wayna and Intipata can be reached in a couple of hours, and from there it is just a three hour walk to Machu Picchu.

One kilometer before Wiñay Wayna stands the Intipata archaeological site (2800 meters), with its 48 agricultural terraces divided by four stairways. Projecting stones set into the retaining walls provide access to the different levels. The highest part of Intipata is composed of 23 small buildings. An Inca pathway, unknown before 1983, links Phuyupatamarka with Intipata, opposite the ruins of Wiñay Wayna. This alternative route was discovered by the archaeologist Justo Torres in 1983-84. The Torres Trail, paved with slabs, is 5 kilometers long, has 3500 steps and is

on average 2 meters wide. A tunnel provides rapid access to the trail's two levels, via a stairway composed of two flights, with 28 steps in the first, and a further 32 in the second. Of particular interest on this route is the spiraling series of steps carved into a rocky promontory. Percy Ardiles and Wilbert San Román restored this alternative route in 1986 (Ardiles, 1990).

In 2001, in the area between Phuyupatamarka and Wiñay Wayna and the route described above, Leoncio Vera came across a site he named Kantupata (at an altitude of 3370 meters). The site is composed of buildings and terracing "the scale of which had gone unrecognized". Julio C. Tello explored the ruins of Wiñay Wayna (2630 meters) in 1941. The name Wiñay Wayna [Winiai Waina] means "forever young", and is derived from the local orchids known by the same name (*Epidendrum secundum*), found at altitudes of up to 3000 meters. The archaeological site is composed of compact groups of buildings and extensive terracing.

Wiñay Wayna is situated five kilometers from Machu Picchu. Halfway along this section of the trail stands Intipunku, effectively controlling access to Machu Picchu. From here a trail leads to the top of Machu Picchu hill, which would once have been considered a sacred peak. From Intipunku a trail descends to Machu Picchu, and from this point the city can be appreciated in all its majesty. Several trails originate at Machu Picchu. One climbs Huayna Picchu, while others lead to the Temple of the Moon and the Drawbridge. Another pathway which descends to the banks of the Urubamba was discovered in 1998-99 by researchers from the company Wright Water Engineers (Wright, Valencia & Crowley, 2000). In the area around Machu Picchu other Inca highways link important archaeological sites lower down, close to the Urubamba River, including Intihuatana [Intiwatana]. Other sites, such as Chachabamba [Tshatsha-panpa], Salapunku and Choquesuysuy [Tshoqesuisui], were accessed via Ollantaytambo, following the course of the Urubamba. From Chachabamba there is also a route to Salapunku, and from there to other archaeological remains located in the area of Torontoy, on the right bank of the Vilcanota-Urubamba.

The route to the ruins of Choquesuysuy and Wiñay Wayna is a demanding hike. Although it was discovered in 1991, it was walked for the first time in 1997 by its discoverer José Koechlin von Stein and the other explorers who accompanied him. The Koechlin Trail is sometimes known as

the “Purification Path”, a reference to the presence of large circular structures known as *pacchas* [p’aqtsas], built at ground level in the lower sector of Choquesuysuy, which would have originally contained water and been used in ceremonial worship.

The archaeological site of Choquesuysuy was visited by Hiram Bingham and explored by the Fejos expedition (1944). It is located on the left bank of the Urubamba, at Kilometer 107 of the Cuzco-Machu Picchu railroad. Beside a small group of buildings, there stands a fountain divided into five sections, clearly associated with the worship of water.

Fejos also investigated the Chachabamba site, located like Choquesuysuy on the left bank of the Urubamba, not far from the river. Situated at Kilometer 104 of the railroad, the overall layout of the site resembles a bird, with its head formed by a great rock; not the first time we have come across iconographic Inca architecture (Kauffmann Doig, 1985).

The ruins of Salapunku form part of the Torontoy complex, which unlike the other sites described here is located on the right bank of the river, between Kilometer 80 and 100 of the railroad. At Kilometer 83, where the Urubamba gorge narrows markedly, Salapunku contains several agricultural terraces built on very steep slopes, around a walled platform, which in its zigzagging design resembles Sacsayhuaman, although on a much smaller scale.

The landscape surrounding Machu Picchu

Rugged topography covered in the tropical vegetation typical of the Amazonian Andes region and rising to altitudes in excess of 3000 meters, surrounds Machu Picchu and the other archaeological sites in the Vilcabamba region.

Appendix B

The Machu Picchu Historical Sanctuary

Its flora and fauna

Geographically, Machu Picchu is located in the transition zone between the Andes and the Amazon, an area covered in dense tropical vegetation and sometimes referred to as the Amazonian Andes. The archaeological site is located on the edge of the Machu Picchu Historical Sanctuary, created in 1983, covering a total area of 32,592 hectares, and declared a World Natural and Cultural Heritage Site by UNESCO. As well as Machu Picchu, other imposing archaeological groups are situated in the area, principally those linked by the Inca Trail that runs through the Machu Picchu Historical Sanctuary between Qoriwayrachina and Machu Picchu. According to the experts Alfredo Valencia, Fernando Astete and Octavio Fernández, there are more than 150 archaeological sites within the Machu Picchu Historical Sanctuary (National Institute of Culture – Lima / National Institute of Culture – Cuzco).

The archaeological heritage of the Machu Picchu Historical Sanctuary combines magnificently with the splendid natural surroundings that are the habitat of unique species of flora and fauna (Vargas Calderón, 1961, 1992), some of them threatened with extinction.

The flora is luxuriant, particularly in the humid zones between 2000 and 4000 meters above sea level. In the highlands several species of high Andean grasses are found. In the lowlands, enormous ancient trees flourish: alder (*Alnus jorullensis*), pisonay (*Erythrina falcata*), walnut (*Juglans neotropica*), intimpa (*Podocarpus glomeratus*), quisuar (*Buddleja incana*), queuña (*Polylepis racemosa*), cedar (*Cedrela* sp.) and other species occupy the gorges and forested riverbanks. High altitude palms of the genus *Geomoina* and arborescent ferns (*Cyarthea* sp.) can also be found, as well as many orchids (more than a hundred species) of the *Cynthea* genus, which flower throughout the year on both open ground and within the forest. Among the most beautiful orchids are *Masdevallia barlaeana* and *Maxillaria floribunda*. Among the bromeliads found in the sanctuary are *Puya weberbauerei* and *Tillandsia rubra*, to name just two (Christensen, 2002).

The Sanctuary's fauna varies across the ten life zones to which Machu Picchu is home. Among the birds there is of course the condor (*Vultur gryphus*), as well as more than sixteen species of hummingbird. Mammals include white-tailed deer (*Mazama chunyii*) and puma (*Puma concolor*),

the ocelot (*Leopardus pardalis*), and species of monkey from the genera Cebus, Saimiri and Aotus (with the latter in danger of extinction). Snake species include boas (*Boa constrictor*) and vipers from the genus Bothrops.

Several species of fauna found within the Sanctuary are in danger of extinction, including the cock-of-the-rock (*Rupicola peruviana*), the spectacled bear (*Tremarctos ornatus*) and the river otter (*Lontra longicaudis*), as well as the "colocolo" or wild cat (*Felis colocolo*). (Source: INRENA / SINANPE, 1996)

To counteract the negative impact on Machu Picchu resulting from the enormous and growing influx of tourists, as well as to protect the varied fauna and flora in the diverse life zones within the wider Machu Picchu Historical Sanctuary, some of which are threatened with extinction, in 2004 and 2005 the National Institute of Culture (INC) and the National Institute for Natural Resources (INRENA) elaborated a Master Plan. This plan was led by a team of recognized experts in a number of fields. The overview of the project also took great care to emphasize the sacred character of the area occupied by Machu Picchu, an aspect of its location studied in considerable depth by Johan Reinhard (1991, 2002). Significantly, the documentation supporting the project also relied heavily on the arguments presented by Margaret Mould de Pease, also included in the Master Plan proposed by the INC-Cuzco in December 2002 and addressing the need to protect the Machu Picchu Historical Sanctuary as a whole, rather than the more traditional focus for conservation, which had always concentrated on the ruins of Machu Picchu, which is of course the main attraction of Peru's multi-million-dollar tourism industry.

Appendix C

Machu Picchu and the "Incas of Vilcabamba"

Machu Picchu is situated in the region known as Vilcabamba, which in general terms lies northeast of Cuzco between the Apurímac and Urubamba rivers. The territory is bordered by the Vilcabamba range which, like the topography of the Amazonian Andes in general, is characterized

by steep slopes covered in lush tropical cloud forest vegetation. These green slopes contrast strikingly with the region's white peaks, the highest of which is Mount Salcantay (6271 meters).

This region became the center of neo-Inca resistance to the Spanish occupation of the Inca state. The campaign was fought between 1536 and 1572 by Manco Inca and his descendants: Sayri Tupac, Titu Cusi Yupanqui and Tupac Amaru (the First). The sovereigns of this neo-Inca dynasty are known collectively as the "Incas of Vilcabamba". As the historian Edmundo Guillén emphasizes, Manco Inca's initial objective was the extermination of the Spanish and the reestablishment of the Inca state.

The military operations of the Incas of Vilcabamba were focused in the river basin of the same name, also known as Vitcos or Uiticus. Over time, the Pampaconas area also gained prominence. The key locations, in terms of the events that would take place in these river basins, were Rosaspata, where the archaeological sites of Vitcos and Ñustaispana [Niustaispana] are located, and Espiritu pampa, where the majority of scholars believe the city of Old Vilcabamba was founded by Manco Inca. Machu Picchu, located beyond the geographical region of Vilcabamba, was not involved directly in the main events of the resistance, perhaps because it did not offer the enormous natural obstacles to access presented by the Vilcabamba and Pampacona river basins. Nevertheless, the depopulation of Machu Picchu may have been the result of Manco Inca's recruitment campaign, or even those of his successors, as documented in the Amaybamba valley.

An enormous amount of information regarding the Vilcabamba campaign has come down to us through the chronicles, often written by men who took part in the hostilities. Such was the case of Juan de Betanzos (1551-61/Part II, Chapters 28-34) who actually journeyed to Vilcabamba in 1558, Diego Rodríguez de Figueroa (1565) and Baltazar Ocampo Conejeros (c. 1611), as well as Titu Cusi Yupanqui, who left us his celebrated *Ynstrucción* (1570).[9]

[9] More information is provided in the work of Martín de Murúa (c. 1600) and Felipe Guaman Poma (c. 1600). The former compiled data from previous sources, including oral histories, while Guaman Poma seems to have relied on oral history alone. Precise data, particularly with regard to the first teaching of the catechism and the location of the temple at Vilcabamba, was supplied by the Augustinian priest Antonio de la Calancha (1638). Although he wrote after the event, Calancha had access to early documents. Calancha did not have access to Murúa's writings, however, and therefore does not mention some of the events described in that chronicle. According to Calancha, the documents he

Many more recent studies have also been produced (Bingham, 1948, pp. 117-171, 1949, 2002, pp. 93-144; Guillén, 1974, 1977, 1978, 1981, 1984, 1994; Hemming, 1970; Kubler, 1947; Lee, 2000; Mackehenie, 1908-1913; Martín Rubio, 1988; Pardo, 1972; Regalado de Hurtado, 1997; Savoy, 1964; Vega, 1963, 1964, 1980, 2000).

The work of Víctor Angles Vargas (1972, pp. 73-154 and 239-280), as well as recounting the events in Vilcabamba, also describes the principal archaeological sites where major historical events took place. Edmundo Guillén (1977, 1994) trekked in the region on two occasions, following in the footsteps of Manco Inca and his successors, and identified several of the sites where combat described in the chronicles took place.

With the same motive, María del Carmen Martín Rubio and Santiago del Valle Chousa have also ventured into the region, identifying in 1997 the historic site of Rangaya or Layangalla, in the highlands north of Vitcos. They also claim to have located, together with the Cuzco-born archaeologist Octavio Fernández, the old settlement of Pampaconas (Del Valle, 2005). In his own writings, Bingham tells of how in 1911 he passed through the village, but found no remains of Inca structures. After identifying in the surrounding area a plaza, walls and the remains of buildings, María del Carmen and Santiago del Valle reasoned that this, and not the present-day settlement of Pampaconas, was the historic site of the same name cited by the chroniclers; the place where Titu Cusi Yupanqui finished dictating his celebrated "*Ynstruccion*" in 1570, and from where, two years later, the forces led by Hurtado de Arbieto launched their final assault on Old Vilcabamba.

Santiago del Valle recounts how, continuing his explorations in 1998, he traveled through the territory west of present-day Pampaconas, an area never previously described (Del Valle, 2005).

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used to describe the events in Vilcabamba were sent to the Vatican. There can be no doubt that the detailed description of the execution in Cuzco of Tupac Amaru by Diego Francisco Altamirano (c. 1700) is based on eyewitness accounts, with the exception, perhaps, of the speech purportedly made by Tupac Amaru before he was beheaded, with which the author seems to have embellished his tale. The work of Diego de Esquivel y Navia (c. 1750) –the authentic Peruvian historian of the 18th century– although written long after the events its describes, is based on early documents. The principal virtue of Calancha's work is its chronological ordering of events in general, while Esquivel y Navia provided the first chronological account of the events that took place in Vilcabamba

The Pampaconas River flows into the Apurímac. Santiago del Valle explored Patibamba and Pintobamba, valleys situated to the north of the area's principal *apu*, Mount Choquezafra (5164 meters), and claims to have discovered the true location of Old Vilcabamba (or "Great Vilcabamba"). According to Del Valle, the settlement was not located in the Espiritu pampa area, as the current consensus would have it.

Santiago del Valle also claims to have identified Wayna Pucara, the fortress that once protected the Inca capital at Vilcabamba, as well as the ruins of Marcanay, where the Spanish forces rested the day before their assault on the Inca's final refuge. Together with the archaeologist Wilbert Bolivar, and funded by Discovery Channel, in 2002 Santiago del Valle excavated for the first time the remains of an Inca religious building in the area. If successful, his explorations in Patibamba, aimed at identifying the complex of structures and urban core of what may turn out to be Old Vilcabamba, would prove that the last refuge of the "Incas of Vilcabamba" was indeed located here and not at Espiritu pampa.

Vincent R. Lee (1985, 1989, 2000) is the author of a valuable body of work which covers practically all the archaeological remains in the Vilcabamba and Pampaconas-Con- cebidayoc river basins. Roberto Samanez (Samanez & Zapata, 1996) has produced meticulous plans of Ñustaispana or Yuracrumi [Iurak-rumi], the principal shrine of the Incas of Vilcabamba.

The story of the neo-Incas of Vilcabamba really begins at the end of 1533, when Francisco Pizarro journeyed from Cajamarca to take control of Cuzco, the Inca capital (Varón, 1996). Manco Inca went out to meet Pizarro before he reached the city, in order to secure the Spaniard's support for his claim to the throne as the legitimate successor to his father, the expansionist ruler Huayna Capac. Manco was also the brother of Atahualpa and Huascar, who had been embroiled in civil war when the Spanish arrived and were both now dead (Temple, 1937-48). Pizarro decided to "crown" Manco Inca, recognizing immediately the value of what would effectively be a puppet ruler under his control. In Cuzco, Francisco Pizarro's two brothers, Gonzalo and Juan, made ever greater demands for gold on Manco Inca. Gonzalo even went as far as to insist that the Inca give him his wife. In 1535, Manco Inca was charged with conspiring against the Spanish and jailed.

Several months later, in 1536, Hernando Pizarro arrived in Cuzco and freed Manco Inca, with the condition that he remained in the city. However, Manco tricked Hernando, promising to bring him a gold corncob of prodigious size from the village of Yucay, and convincing the Spaniard to allow him to leave the city. Inevitably, from Yucay Manco resolved not to return to the city where he had suffered such humiliation, and vowed to fight the Spanish. In Yucay and then in Calca, he convened the indigenous nobility and gathered a mass of followers, who pledged themselves to his cause. It was in Calca that Manco Inca and his captains swore to fight "to the death to throw the Spanish out of Peru" (Guillén, 1984, p. 291).

When he realized that Manco Inca had deceived him, Hernando Pizarro sent his brother Juan in pursuit, at the head of a squadron of cavalry. In a daring maneuver, Pizarro crossed the river at Yucay. The neo-Inca troops on the opposite bank were forced to withdraw, before regrouping and attacking the Spanish in force. After several prolonged skirmishes the Spaniards withdrew, with their rearguard harried all the way to Cuzco.

Encouraged by his victory, Manco Inca ordered his army to attack Cuzco, take the city and annihilate the Spanish force of two hundred. In early 1536, under the command of Villa Omo, Manco's troops occupied Sacsayhuaman, and the great temple complex above the city became a fortress. The siege of Cuzco lasted for months. Meanwhile, troops loyal to Manco Inca unsuccessfully attacked the Spanish city of Lima.

In the fighting to expel the neo-Incas from Sacsayhuaman Juan Pizarro was mortally wounded and died a few days later. It is said that as the Spanish gained the upper hand, one of the Inca captains, known as Cahuide, resolved to take his own life rather than surrender. He wrapped himself in his cloak [*llacolla* = liacolia] and threw himself from the top of one of the fortress's towers. Finally, the neo-Inca troops occupying Sacsayhuaman were forced to withdraw. There are references in the chronicles of the 16th century indicating that Inca troops withdrew en masse because they were obliged to return to their fields for the planting season. An anonymous author (1539) has left us a firsthand account of the siege of Cuzco, as did Juan de Betanzos (1551-56).

Numbering just two hundred, the Spanish were astonished that they had been able to save themselves. Their incomprehension in the face of triumph gave rise to a myth. It was said that while the thatched roofs of the city burned from the besiegers' arrows, the Virgin Mary had come down from heaven to the Sunturwasi, where the Spanish had taken refuge. To save the trapped Spaniards, the Virgin had blinded the neo-Incas with ashes and extinguished the flames. It was said that the apostle Saint James had also appeared, galloping across the sky on his white horse and brandishing his sword at Manco Inca's warriors.

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In April 1537, Diego de Almagro returned to Cuzco, while Francisco Pizarro remained on the coast. Almagro was returning from Chile, where he had been searching for riches to match those the conquistadores had found in Cuzco. He had launched his expedition under the terms of the Royal Warrant of 1534, which decreed that the conquered territory be divided between Almagro and Pizarro. The order divided the Inca state into New Castile and New Toledo, with New Castile going to Francisco Pizarro and New Toledo to Diego de Almagro. The dividing line, however, remained imprecise, and the two men both claimed Cuzco as their own. After his unsuccessful Chile expedition, Almagro took control of Cuzco and jailed Hernando and Gonzalo Pizarro.
Three months after his takeover of Cuzco, Almagro sent Rodrigo Orgóñez (or Orgoños, according to Juan José Vega (2000)) against Manco Inca, who withdrew from Ollantaytambo to Amaybamba.

Rodrigo Orgóñez managed to defeat Manco Inca at Amaybamba, and the latter made the decision to retreat to a less accessible region. He crossed the Urubamba River via the Choquechaca or Chuquichaca [Tshuqit-shaka] bridge, near what is today the village of Chaullay, and advanced as far as Vitcos (or Uiticus, which was also the name once given to the Vilcabamba River). The prolonged neo-Inca resistance in the Vilcabamba mountains had begun, and it would not end until 1572.

In Vitcos, Manco Inca settled in the so-called Palace of the Inca, situated, according to the chronicles, at Choquepalta or Choquepalpa (Choquepata?), which the author prefers to call the Inca's Residence, no more than two kilometers from the shrine at Vitcos dedicated to the Water God. Of this temple only part of the foundations remains, but the spectacular carved white rock (Yuracrumi or Ñustais-pana) can still be seen. The shrine of the Water God was located alongside extensive terracing, forming part of the agricultural sector of Vitcos. This complex is close to the village of Huancacalle and was occupied by Manco Inca, but not built by him. It was established under the rule of the Inca state, along with other administrative, ritual and production centers in the Vilcabamba region.

It was in Vitcos that Manco Inca was ambushed by Rodrigo Orgóñez during a ritual celebration. He escaped by crossing the Pampaconas pass and, in search of a refuge even more remote and inaccessible than Vitcos, he may have headed for the area now known as Espiritu pampa, unless he made for Patibamba (Del Valle, 2005). It was here, or somewhere nearby, that he built the neo-Inca settlement known as Vilcabamba. If the city was indeed sited at Espiritu pampa, it would have been built in the foothills of the Amazonian Andes, some 1400 meters above sea level. Although this environment was alien to the highland dwelling neo-Incas, accustomed as they were to living at altitudes in excess of 3000 meters, the remote tropical forest eventually proved a wise choice.

The settlement founded by Manco Inca was known by the Spanish chroniclers as "Old Vilcabamba". This name distinguishes the settlement from the town of the same name, founded in 1572 by the Spanish at the headwaters of the Vilcabamba-Vitcos River after the defeat of the

Vilcabamba Incas. Its full name was San Francisco de la Victoria de Vilcabamba, although it is more commonly known as Vilcabamba.

For a long time, Old Vilcabamba was sought by scholars and explorers. Antonio Raimondi thought it might have been Choquequirao, but his hypothesis has since been dismissed. Hiram Bingham (1914, 1949) received information placing Old Vilcabamba in the area known as Espiritu pampa-Concebidayoc. He writes: "Don Pedro Duque [and] two of his informants indicated that a place called Concebidayoc (Espiritupampa) was a possible location for Vilcabamba the Old. Don Pedro told us that in 1902 López Torres, who had traveled extensively in the mountains in search of rubber, said he had discovered the ruins of an Inca city (in Espiritupampa-Concebidayoc)". But on visiting the site, Bingham failed to appreciate the full scale of the ruins, hidden as they were under thick vegetation, and in 1915 he decided that this could not be the location of Old Vilcabamba. Later, Gene Savoy (1964, 1970) was guided to Espiritu pampa by Cuzco-born Antonio Santander, who was convinced that the ruins were those of Old Vilcabamba. Santander estimated that the site covered an area of some 30 or 40 square kilometers. Bingham, like Savoy, identified roof tiles at Espiritu pampa. Because tiles had been introduced by the Spanish, Bingham reasoned that the settlement had been built by the Incas after the European invasion of Peru.

Later exploration from 1998 to 2005 by Santiago del Valle Chousa (2005), to the west of the present-day village of Pampaconas, has led to the claim that Old Vilcabamba was not sited at Espiritu pampa, but rather in the area of Patibamba, on the northern slopes of Mount Choquezafra (5164 meters), which is the principal sacred mountain, or *apu*, in the region and dominates the nearby valley of the Pampaconas River, a tributary of the Apurímac, forty kilometers to the southeast of Espiritu pampa.

Hernando Pizarro was freed by Diego de Almagro, but soon turned on his erstwhile captor. The ensuing civil war ended with the Battle of Las Salinas in April 1538 and the defeat of the Almagro faction. It was during this period that Francisco Pizarro sent a Spanish force to Cuzco, reinforced with native auxiliaries, in the hope that his brothers would be able to capture or kill Manco Inca. Francisco Pizarro himself arrived in Cuzco shortly after the battle at Las Salinas.

The force sent by Pizarro in pursuit of Manco Inca was destroyed at the Battle of Orongoy in December 1538. After this victory, Manco Inca continued the struggle from different parts of the Vilcabamba region, and several references have survived to sorties made by the neo-Inca leader beyond his Vilcabamba stronghold. His strategy was to maintain a guerrilla campaign against the Spanish, ambushing their caravans on the road between Cuzco and Lima, particularly along the left bank of the Apurímac River, between Cuzco and San Juan de la Frontera de Guamanga (Ayacucho). Although it is located on the very edge of the Vilcabamba region, Manco Inca's troops appear to have occupied the ruins known today as Choquequirao, in order to facilitate their attacks on the Spanish. This site was mentioned by Cosme Bueno (c. 1786) and Pablo José Oricain (1790), but the first description of the ruins was made by Eugenio de Lavandais (1834). In 1909 the city was explored by Hiram Bingham (1910), who dismissed Antonio Raimondi's theory (1874-1913) that the site was that of Vilcabamba. In 1986, Roberto Samanez excavated at Choquequirao, producing a detailed plan of the ruins which served as the basis for the restoration work carried out in 1998 and continued intensively in subsequent years, with the support of Eliane Karp de Toledo and under the auspices of the Franco-Peruvian Debt Exchange Fund (Karp de Toledo, 2004a; Lumbreras & Wust, 2002). This vast complex stands above the right bank of the Apurímac, surrounded by mountains. The architecture at Choquequirao clearly dates from the Inca imperial period, but it seems almost certain that Manco Inca and his neo-Incas would have been drawn to its strategic location and occupied the site at some point.

Determined to put an end to neo-Inca ambushes, particularly in the vicinity of Limatambo, Curahuasi, Abancay and Andahuaylas, Francisco Pizarro sent his brother Gonzalo to Vilcabamba, the focus of hostilities against Manco Inca. In the many skirmishes that followed, the Spanish emerged victorious. But the neo-Incas reorganized and counter-attacked again and again. One of those confrontations may have taken place at Incahuaracana [Inkawara-kana], near Puquiura, or perhaps at the Inca's Residence in Vitcos. Although Gonzalo's troops emerged victorious, they were unable to capture Manco Inca. However, Cura Ocllo, Manco Inca's first wife, together with other members of his family, was taken prisoner. After again failing to capture Manco Inca, Gonzalo returned to Cuzco with his prisoners. According to witnesses, including Pedro Pizarro, to

protect herself against her captor's advances, Cura Ocllo smeared her body with feces. On the road to Cuzco, she was condemned to death. Regarding the suffering of Cura Ocllo, Pedro Pizarro (1571) has this to say: "Márquez was commanded to kill this woman of Manco Inca, and she was tied to a post and some Cañaris shot her with arrows until she died […]. The Spanish who were there said that this Indian never said a word as she died from the arrows shot into her".

The neo-Inca assaults on the roads between Cuzco and Ayacucho continued unabated after Gonzalo Pizarro withdrew from the Vilcabamba region. In fact, the fighting became more intense and continued until 1539. Through this strategy, Manco Inca's followers were able to raid the Spanish and at the same time furnish themselves with supplies, even taking captured cattle and sheep into the Vilcabamba region. It is therefore unsurprising that the neo-Incas were breeding European cattle and sheep as early as the mid-16th century, as confirmed by the chronicler Baltazar Ocampo Conejeros (c.1611), one of the eyewitnesses to the events in Vilcabamba.

In 1545, Manco Inca was assassinated by Diego Méndez, a Spaniard who, some years earlier, together with other defeated Almagrists after the Battle of Las Salinas in 1538, had sought refuge with the neo-Incas of Vilcabamba. Enraged by the death of their leader, the neo-Incas pursued the escaping Spaniards, capturing and beheading them all. Manco Inca, who took several days to die, lived to see the head of his assassin. The skulls of the executed Spaniards were still displayed at Vitcos as late as 1565, according to Diego Rodríguez de Figueroa (1565), who saw them on his way to negotiate with Titu Cusi Yupanqui, on the orders of Juan de Matienzo.

Manco Inca was succeeded by his son Sayri Tupac, who continued the guerrilla campaign against the Spanish until 1558, when he agreed to leave Vilcabamba. He went to Cuzco and from there to Lima, where he was granted an audience with the Viceroy Andrés Hurtado de Mendoza. Returning to Cuzco, he was given a large estate in the fertile Yucay valley as a reward for having abandoned Vilcabamba. He was also granted other privileges. For example, and despite having been baptized, he was allowed to marry his sister Cusi Huarcay, thereby continuing the tradition of incest institutionalized by the ruling dynasty of the Inca state. The remains of Sayri Tupac's

palace can still be seen in Yucay, restored by Arminda Gibaja. Three years after installing himself in Yucay, Sayri Tupac died from suspected poisoning.

After Sayri Tupac yielded to the Spanish, his brother Titu Cusi Yupanqui took over as leader of the neo-Incas of Vilcabamba. He proved an able guerrilla leader and attacks against Spanish travelers between Cuzco and Ayacucho intensified. Acting on instructions received from the Spanish crown, the Viceroy Diego López de Zúñiga, the Count of Nieva, dispatched ambassadors bearing gifts to negotiate with Titu Cusi Yupanqui.

With López de Zúñiga's death in 1564, Lope García de Castro became viceroy, and he would govern until 1569. The new viceroy held the neo-Incas of Vilcabamba responsible for attacks on the Chiriguanos and Charcas, as well as against the natives of Chile, and to these allegations he added charges of conspiracy against the chieftains of Jauja.

In April 1565, Titu Cusi Yupanqui allowed Diego Rodríguez Figueroa, who was acting under the orders of Juan de Matienzo, to enter the Vilcabamba region for a parley. A few weeks after this interview, Matienzo himself met with Titu Cusi Yupanqui at the Chuquichaca bridge. The meeting did not achieve Matienzo's objective of pacifying Vilcabamba (Lohmann, 1941; Regalado de Hurtado, 1997). Nevertheless, during the rule of Lope García de Castro, in 1568, Titu Cusi Yupanqui did allow priests to enter the region under his control. He even allowed himself to be baptized in a ceremony held at Puquiura (Regalado, 1997) or, according to Edmundo Guillén (1994), in Ragalla or Layangalla, between the Lucma and Pampaconas rivers, which may correspond to the modern village of Huancacalle. At his baptism, Titu Cusi Yupanqui received the name Diego de Castro. Modern scholars suspect Titu Cusi Yupanqui of merely wishing to appear Christian (Regalado, 1997). Shortly afterwards, also in 1568, the friar Marcos García was sent by the Spaniards to instruct Titu Cusi in the Christian faith.

A year later, in 1569, the Augustinian friar Diego de Ortiz entered Vilcabamba to provide assistance to Marcos García. Soon afterwards, in Pampaconas in 1570, Titu Cusi Yupanqui finished dictating his celebrated *Ynstrucción*, begun in 1568, which was published by Luis Millones

in 1985 (Titu Cusi Yupanqui, 1570) and analyzed by Liliana Regalado (1981). In the writing and translation of his *Ynstrucción*, Titu Cusi Yupanqui was assisted by Marcos García and the *mestizo* Martín Pando, who acted as the Inca's secretary; according to Edmundo Guillén (1994), these events took place in San Salvador de Vilcabamba. Titu Cusi Yupanqui took a dislike to the friar Marcos García, who insisted that he adopt Christian ways and stop worshipping his traditional idols, as well as abandoning other customs that went against the teachings of the Church. This grudge would have been exacerbated still further when Marcos García proceeded to exorcize and burn Ñustaispana, the most important shrine in the Vilcabamba region, an act which he undertook with the assistance of the friar Diego de Ortiz (Calancha, 1638). This shrine, as we have already mentioned, is located in Vitcos, at Rosaspata / Chuquipalta (Chuquipata or Chuquipanpa?), near Puquiura. Such behavior would certainly have incensed Titu Cusi Yupanqui and contributed in no small measure to his decision to expel Marcos García from Vilcabamba.

Sometime in mid-1571, Titu Cusi Yupanqui died at Puquiura from an unspecified disease. The neo-Incas called upon Friar Diego de Ortiz to bring him back to life, for he had said that his all-powerful god was capable of resurrecting the dead. When he showed himself unable to resuscitate the deceased Inca, the friar was tortured to death. Diego Ortiz is venerated as Peru's first Christian martyr. On the death of Titu Cusi Yupanqui in 1571, the government of Vilcabamba fell to Tupac Amaru, another of Manco Inca's sons (now known as Tupac Amaru I, to distinguish him from Tupac Amaru II, who two hundred years later would lead an uprising against the abuses suffered by the indigenous people of Peru).

The viceroy Francisco Toledo traveled from Lima to Cuzco in 1571, determined to end once and for all the existence of the "state" of Vilcabamba. After initial failure, he commissioned Tilano Anaya to journey to Vilcabamba as his ambassador, carrying letters for Tupac Amaru. The Inca refused to negotiate with Anaya, and the neo-Incas guarding the Choquechaca bridge, the "gateway" to Vilcabamba, killed the ambassador. Toledo's response was immediate: he declared war on Tupac Amaru. The viceroy commissioned Martín Hurtado de Arbieto to enter Vilcabamba at the head of a battalion of Spanish troops and warriors from the Cañari and Chachapoyan ethnic

groups, whose alliances with the Spanish have been addressed by the historian Waldemar Espinosa (1967).

Martín Hurtado de Arbieto and his troops repaired the bridge at Chuquichaca and entered the Vilcabamba region, defeating the neo-Incas at Cayaochaca, according to Edmundo Guillén (1994) and an original document cited by John Hemming (1970).

Anxious to kill or capture Tupac Amaru, the Spanish continued their advance. They occupied the Pampaconas area, around the upper reaches of the river of the same name. Leaving Pampaconas and heading for the forests of the Amazon, they advanced as far as the city of Old Vilcabamba, passing first through the village of Marcanay, just 10 kilometers from their objective. They finally occupied the city founded by Manco Inca on July 14th 1572.

As the Spaniards advanced, Tupac Amaru managed to escape yet again, together with his womenfolk and closest followers. Captain Martín de Loyola (Martín Oñaz García de Loyola), on the orders of Martín Hurtado de Arbieto, pursued the Inca relentlessly. He finally caught up with his quarry in the forests of the Amazon, moments before he was due to board a raft and disappear into the Amazon basin. Shortly after the capture of Tupac Amaru, the Spanish, to commemorate their triumph, founded the city of San Francisco de la Victoria de Vilcabamba, in the Vilcabamba or Vitcos valley. With the capture of Tupac Amaru, Old Vilcabamba was abandoned. In 1572, in recognition of his service, Martín Hurtado de Arbieto was named “governor, captain general and justice” of the Vilcabamba region.

With Loyola carrying the Punchao idol confiscated from him, Tupac Amaru was conveyed to Cuzco. This scene is captured in a drawing by Guaman Poma (c. 1600). Through the intervention of Toledo and by way of reward, Martín de Loyola was married to the wealthy and much coveted Beatriz Clara Coya, Tupac Amaru’s niece and the only daughter of Sayri Tupac (Rostworowski, 1970; Temple, 1950). Tupac Amaru was beheaded in Cuzco in September 1572, after being baptized and christened Felipe. With the death of this direct descendant of the Inca sovereigns,

the Vilcabamba dynasty was extinguished forever, together with Manco Inca's dream of driving the Spanish from Peru and restoring the Inca state.

Appendix D

The Inca state and Machu Picchu: historical context

It is the author's contention that Machu Picchu was an important component of an Inca state project to extend their agricultural frontiers into areas of the Amazonian Andes, situated between 2000 and 3000 meters above sea level, close to Cuzco, and high above the banks of the Vilcanota-Urubamba River.

Judging by its architectural style, together with the artifacts found at the site and historical evidence, Machu Picchu can be placed in the Historic Inca period, between 1438 and 1532, when the Spanish arrived in Peru. The Inca state spread from its capital, Cuzco, in a process of rapid expansion during which the Incas conquered the many nations already occupying the Andean region and the coastal belt, venturing far beyond the frontiers of present-day Peru. All of these nations had been fighting among themselves since time immemorial, including the Incas.

According to the myths surrounding the origin of the Inca ethnic group, the ancestors of the sovereigns of the Inca state were said to have emerged from the womb of the Earth Goddess, or Pachamama, via caves symbolizing her vagina and located at Tamputoco [Tamputoqo], before migrating as far as the Cuzco valley. Like the other nations who inhabited the territory of the Inca state, the Incas were the heirs to an ancestral Peruvian civilization dating back some 4000 years. Early cultures left behind architecture of monumental proportions like that found at Caral/Chupacigarro. This early civilization continued to develop, and by the first millennium BC it had produced the Chavín /Cupisnique culture, the foundation for the subsequent development of all ancient Peruvian, or Andean, cultures. In the first half of the first millennium AD, the Paracas-Nazca and Moche cultures emerged on the coast, with their unrivaled achievements in weaving and pottery. At the same time, on the shores of Lake Titicaca, Tiahuanaco culture

developed, characterized by its ambitious architecture and gigantic sculptures like the Sun Gate, which was carved from a single block of stone and decorated with magical-religious figures. By the second half of the first millennium AD, Tiahuanaco culture had spread throughout southern Peru and northern Chile. It reached the site of present-day Ayacucho, where it incorporated new characteristics and expanded over a large area, occupying parts of the coast and the highlands in what is today central and southern Peru. This expansionist culture centered around Ayacucho is known as Wari, or Tiahuanaco-Huari, recalling its roots in Tiahuanaco. During the first centuries of the second millennium AD, the Tiahuanaco-Huari state, with its center at Huari (Ayacucho), and Tiahuanaco, in the Titicaca basin, began to wane, with the re-emergence throughout their territories of ethnic identities that managed to emancipate themselves and restore their ancient traditions and forms of government. However, in their turn, these emancipated nations developed their own aspirations, hoping to enlarge their territories by conquering those of their neighbors. Eventually one of these nations, the Incas, would emerge triumphant and incorporate the others into a centrally governed Inca state.

This final phase of Pre-Hispanic Peruvian civilization was ruled by a dynasty of thirteen sovereigns, or Incas [Inykas]: from Manco Capac [Manko Qhapaq], its mythical founder, to Atahualpa [Atawailpa], who was executed by the Spanish in 1533.

The expansion from Cuzco that led to the creation of the Inca state began in 1438 under the rule of Pachacutec, the ninth sovereign of the Inca dynasty. With him ends the phase known as Inca Legendary, and the Inca Historic phase begins. Pachacutec enlarged the city of Cuzco, the administrative and religious capital of the Inca state said to have been founded by the mythical Manco Capac. Pachacutec and Tupac Inca Yupanqui [Thupaq Inyka Iupanki)] who succeeded him, incorporated by diplomacy or force the nations that would comprise the Inca state, nations already linked by a common ancestral cultural tradition. Tupac Inca Yupanqui was succeeded by Huayna Capac, whose long political career stretched from 1493 until his death in 1525. The enormous expansion of the Inca state under his predecessor sealed Huayna Capac's fate: he was destined to deal with continual uprisings by the nations under Inca rule. He fought hard to

maintain the empire, ruthlessly punishing rebels. Uprisings in what is now Ecuador led Huayna Capac to establish the northern limit of his territory, by annexing the Gulf of Guayaquil, northern Ecuador and the territory of the Chachapoyas. It is thought that his death was caused by smallpox, which spread rapidly through the Americas following the arrival of the Spanish in the Caribbean. His mummified remains were transported from Quito to Cuzco. Huayna Capac fathered hundreds of children, two of whom disputed the throne: Huascar and Atahualpa (1525-1532). When the ensuing fratricidal war seemed finally to be drawing to a close in Atahualpa's favor, the Spanish invaders, captained by Francisco Pizarro, captured the Inca at Cajamarca. Months later, in 1533, he was executed. It is thought that Atahualpa, while a prisoner in Cajamarca and concerned that Huascar might ally himself with the Spanish, secretly ordered that he be killed on his way to Cuzco to meet the Spanish. These events marked the end of the Inca state, and opened the way to the westernization of Peru.

When the Spanish arrived, they found an Inca state divided into four *suyos*, or quarters. Tahuantinsuyo [Tawantinsuio], or "the land of the four regions", extended 4000 kilometers from north to south along the Pacific coast and the Andes mountains; that is, from southern Colombia to the north of Chile and north-western Argentina, including parts of highland Bolivia and Ecuador. From Cuzco, roads led to the four great regions of the state: Chinchaysuyo [Tshintshaisuio], Collasuyo [Qoiliasuio], Contisuyo [Kuntisuio] and Antisuyo [Antisuio]. In total, the road network covered some 23,000 kilometers.

The state's building programs were carried out under the *mita* system (*mitmaq*), a mandatory labor tax organized on a rota basis. The general population was also subjected to another form of taxation, consisting of the handing over to the state of two thirds of the harvest from every family smallholding. This produce went to the nobility and the priesthood, and the surplus was stored for distribution in years of food shortage, a regular occurrence due to the El Niño phenomenon, the effects of which can be drastic in this part of the world. The administration of taxes and of the state in general was recorded on *quipus* [khipu], a unique system composed of colored and knotted cords.

In order to better organize the payment of tribute, the population was grouped into units of five, ten, one hundred, a thousand and ten thousand individuals. At the head of these groups was a state official. Labor was also divided according to age. Work was mandatory and seen as a virtue. There was no currency and all precious metals belonged to the state and were used to make emblematic objects for use in religious practices and to adorn the elite. Only very special services were rewarded with precious metals. Splendid weavings and even women might also be given as gifts. There was no concept of inheritance, and each generation had to build their own home and clothe themselves. Each sovereign was buried with all his belongings, as well as his wives and closest servants (Araníbar, 1970). This custom can be traced back some three thousand years; without it the treasure-filled tombs of Sipán would never have existed.

In common with their predecessors, from whom they inherited much of their knowledge, the Incas were preeminent farmers. They built terracing to convert arid slopes into fertile fields. On the coast, valleys were irrigated on what was often an enormous scale. One project, the La Cumbre canal, was 105 kilometers long. The Incas also inherited the knowledge required to grow an enormous variety of crops, including maize (*Zea mays*), potatoes (*Solanum tuberosum*) and other tubers. They also herded llamas (*Lama glama*) and alpacas (*Lama pacos*), members of the camelid family first domesticated 7000 years ago and still used for transport, food and wool.

The Inca state continued the religious ideas developed some four thousand years earlier, at the dawn of Peruvian civilization, beliefs that were inextricably linked to agricultural production and the unpredictable climatic conditions prevalent in the region, and which affected food production. This continuity is apparent in the sacred images used to decorate textiles and ceramics, and in myths and rituals perpetuated to this day, such as the offering known as an "*alcance*" (a Spanish term alluding to the idea of reaching out) made to sacred mountains, and the "*pagos*" ("payments") offered to the earth. At the head of the pantheon of gods there stood a divine couple, upon whom the success of the harvest depended. They were the Water God and the Earth Goddess.

In the Inca period the Water God was known by a variety of names. It would appear that the Sun was perceived as the personification of the Water God, however incongruous that may seem. This supreme deity was seen as a demonic being that controlled the weather, altering conditions at will. This is apparent from depictions found in the art of the Andes, particularly in the Chavín and Moche cultures, where he is shown with menacing fangs and as an executioner thirsty for human sacrifice.

This god would only show his benevolent side in return for the rituals and sacrifices it was imagined he required (Kauffmann Doig, 1996a, 2001a, 2003b). He was offered seashells, llama fetuses or llama fat, as well as children in years of famine when the rains failed or frosts devastated crops. His most commonly reproduced emblem was the crest of a wave motif. The Earth Goddess, or Pachamama, remained the provider of all sustenance as long as she was adequately fertilized by the rains her consort the Water God let fall upon her.

The state was exclusively responsible for ensuring that moral codes were not transgressed, including theft and laziness, as well as for determining the punishment for any offense. Andean deities were “gods of sustenance”. The Water God dwelled in the high peaks, known as *apus*, which are still worshipped today. Religious festivities and days reserved for rest and rejoicing occurred on a monthly basis, in accordance with the cycles of the agricultural calendar. The creator god Viracocha (*wira* = fat and *kotsha* = water) seems to have been another manifestation of the Water God. The foam formed by waves on the seashore was seen as the water’s fat, or vital essence.

Belief in an afterlife in a realm much like the earthly world spawned complex theologies and the development of elaborate burial rituals and tombs, such as the *chullpas* [tshuilipas] of Sillustani. The remains of the deceased were mummified, for it was believed that life beyond the grave was dependent upon adequate conservation of the corpse.

Inca society was divided into two social classes: the nobility and the people. Except in the case of a very few individuals who distinguished themselves in warfare, any change in status was

impossible. Several myths underpinned the belief that the people and the nobility were created unequal by divine will. The nobility was composed of the sovereign, his closest relatives, those members of the high nobility from the provinces incorporated into the Inca state, and the priesthood. The sovereign, or Inca, wore emblems expressing his semi-divine status and was carried on a litter amid great ceremony. The common masses of the Inca state were composed of a peasant class. They paid tribute in the form of foodstuffs, which were stored for use when crops failed due to unfavorable weather conditions. In addition, specialist workers such as artists and artisans, engineers, architects or state officials consumed a portion of the surplus not destined for storage. The tax paying masses enjoyed a form of welfare state which issued them with products and services and exempted the elderly and infirm from service to the state. Unlike the nobility, commoners were permitted to take just one wife and could not marry a close relative. The sovereign, on the other hand, traditionally married a sister and kept innumerable concubines. Adultery was punishable, on occasion even by death. Punishments for other offences varied, depending on whether the offender was a nobleman or a commoner. The *yanaconas* [ianakuna] were a hereditary class of virtual slaves. Education beyond the family home was reserved for young nobles.

In the realm of artistic expression, the Inca state inherited an ancient and rich Andean tradition. Images used to decorate textiles and ceramics evoke a world of magical-religious beliefs, inhabited by complex symbolic figures. The Inca state's greatest achievement, however, was its architecture, and Machu Picchu is perhaps the most eloquent example of the extraordinary level of skill attained by the Incas in the art of construction.

Glossary

Words in the language of the Incas (Quechua, or *Runasimi*) are translated or explained in the text. Therefore, the following glossary lists only those Quechua words most often repeated, or those which merit a more detailed explanation.[10]

Aclla [aqlia]

A young woman chosen to live in the *acllahuasi* (*huasi* / *wasi* = house), where she would weave fine textiles and remain in chastity.

Apu [apu]

An imposing peak considered sacred and therefore an object of reverence. See Water God.

Coca [koka]

Shrub (*Erythroxylon coca*), the leaves of which have been chewed by Andean people for centuries. Traditionally, coca is used in divination, to stave off tiredness during heavy manual work, and as an offering to supernatural powers. Unlike the leaf, which is chewed and then spat out once its nutrients and trace alkaloids have been absorbed, the drugs derived from coca leaves concentrate the alkaloid via harmful chemical agents, and are addictive.

Earth Goddess

Known to this day as Pachamama, the Earth Goddess is the feminine counterpart of the Water God and the source of all sustenance, for as long as the Water God continues to fertilize her by providing rain at the appropriate stage of the agricultural calendar.

Huayrana [wairana]

[10] With regard to how Quechua words should be written, we have opted for the generally accepted form (i.e., Inca and not Inka). However, in cases where universally recognized phonetic spellings, particularly in the case of archaeological sites, use k instead of c, or w instead of hu, we have adopted those usages.

A three-walled structure, open on the fourth side (from *huayra* = air or wind).

Inca [Inka]

This is the name applied to both the ethnic group based in the Cuzco valley and the sovereign who ruled over them. It may also be used as a synonym for the Inca state, and when referring to the population as a whole, as well as to the royal dynasty.

Inca Ñan [Inka-nian = road]

See Qhapaq Ñan.

Inca state

The state forged by the ethnic group known as the Incas, stretching from Ancasmayo in Colombia to Maule in Chile. All the ethnic groups incorporated into this state shared common traditions and were, to a degree, related.

Intihuatana (Intiwatana)

Translated as “the place where the Sun is tied down” and used to describe a type of altar.

Mitmac

Person or ethnic group transferred by order of the state from one area to another. The first chroniclers used the term “*mitmae*”.

Qhapaq Ñan

The network of Inca state highways (*Qhapaq* = royal; *ñan* = road) is said to have covered more than 23,000 kilometers.

Quechua [qetshwa]

The official language of the Inca state: Originally known as *Runasimi*, (literally, “the language of the people”). The name Quechua is also applied to the ecological niche composed of inter-Andean valleys between 2000 and 3000 meters above sea level.

Quero [qero]

A painted, wooden ceremonial cup manufactured since the 16th century by indigenous artisans. Their decoration mimics European art and features scenes illustrating the customs and spiritual beliefs of the people of the Andes. Examples made from gold or silver are known as *aquillas* [aquilias].

Quipu [qipu]

Mnemonic system based on colored, knotted cords used to record a broad range of information.

Tahuantinsuyo [Tawantinsuyu]

The name for the Inca state, composed as it was of four "directions" or "regions" ("*suyos*"). See also Inca state (*tawa* = four, *suio* = direction or region).

Ushnu

Throne or ceremonial platform.

Water God

The highest-ranking Andean deity, feared and worshipped because it was believed that it controlled the weather, Dr. Kauffmann Doig believes that it was personified in the form of Illapa, Pachacamac, the Apus, and even Inti (the sun god).

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