Bruno Adler compiled astonishing accounts of spatial reckoning and ephemeral mapping by indigenous South Americans, yet he could describe only four ethnographic examples of maps, none of them from the central Andes (fig. 6.1). Adler concluded that native South Americans did not normally inscribe their remarkable spatial knowledge on permanent media. ¹

Although informal mapping (the analogical expression or performance of spatial knowledge) may well be a human universal, it has been argued that formal mapmaking (the inscription of spatial knowledge) tends to arise as a discourse function only within highly organized, bureaucratic societies. The conditions necessary for formal mapmaking include "the demands of agriculture, private property, long-distance trade, militarism, tribute relations, and other attributes of redistributive economies." ² If this is true, then we should expect central Andean peoples to have an ancient mapmaking tradition. Native Andean peoples have practiced intensive agriculture for several millennia, including irrigation terracing and sophisticated raised fields, at a scale rarely equaled elsewhere in the premodern world. ³ Militarism has also been rampant in the Andes for millennia. Furthermore, there is evidence of regular long-distance trade in precious and staple goods between the Pacific coast, the highlands, and the Amazon dating from the late preceramic period (ca. 2500–1800 B.C.; see fig. 6.2). ⁴ Last, the collection and redistribution of agricultural products and other goods, as well as labor obligations for the construction of monumental architecture or for the service of elite personages, have existed since the beginning of the early horizon (ca. 900–200 B.C.). ⁵

Yet the term "map" is nearly nonexistent in modern archaeological, art historical, and ethnographic analyses of ancient central Andean artifacts and art—except metaphorically—and even then it is extremely rare. ⁶ Perhaps such individual elements of an organized bureaucracy were not sufficiently articulated in the early through middle horizons (ca. 900 B.C.–A.D. 1000) to foster a mapmaking tradition. But in 1532 the Inkas governed about 7.5 million people over some of the most rugged terrain on earth. They controlled a road network of well over twenty-three thousand kilometers, collected and redistributed astonishing volumes of staple wealth and prestige goods, and organized labor for public works at a scale unprecedented in the New World. ⁷

Were maps simply not collected by colonial administrators, even though other artifacts of the Inka bureau-

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I am extremely grateful to Benjamin S. Orlove, Frank Salomon, Carolyn Dean, Karl S. Zimmerer, Clark Erickson, and especially William M. Denevan for reading and commenting on earlier drafts of this chapter. I also want to thank R. Tom Zuidema, Dan Shea, Michelle Szabo, and Margo Kleinfeld for their suggestions.


6. One notable exception is William Harris Isbell, "The Prehistoric Ground Drawings of Peru," Scientific American 239, no. 4 (1978): 140–53, esp. 150 and 153. Isbell classifies the Nazca lines as a giant ground map that conveys significant information about the workings of Nasca society. (On Nazca/Nasca, see note 75.)

We will not recognize Andean maps until we attempt to see them through Andean eyes. The content and structure of any map—including Western ones—is determined not only by what is in the environment, but also by social organization, cultural convention, and human perception.

Important Andean precepts include the welding of people and landscape in the concept of an ayllu; the organization of signs and other representations into radial forms, parallel strips, and gridlike geometric structures; the cultural importance of huacas and parajes; animal-body-landscape metaphors; and the performative aspects of map reading as reflected in mapping rites.

In trying to answer this question, I will demonstrate that from early horizon through Inka times (ca. 900 B.C.–A.D. 1532) Andean peoples made spatial and landscape representations that functioned as maps. Before examining the chronological development of mapmaking in the archaeological record, we need to establish Andean conceptions of space, geographic relations, and rules of representation from archaeology, ethnography, and history.

**Andean Conceptions of Space and Geographic Relations: Past and Present**

We will not recognize Andean maps until we attempt to see them through Andean eyes. The content and structure of any map—including Western ones—is determined not only by what is in the environment, but also by social organization, cultural convention, and human perception.

Important Andean precepts include the welding of people and landscape in the concept of an ayllu; the organization of signs and other representations into radial forms, parallel strips, and gridlike geometric structures; the cultural importance of huacas and parajes; animal-body-landscape metaphors; and the performative aspects of map reading as reflected in mapping rites. Each precept is

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8. The Inkas had a special temple, Poquen Cancha or House of the Sun, that contained picture boards (tablas) depicting the life of each Inka ruler, details of conquered lands, and illustrations of Inka rites and fables. José de Acosta suggested that Inka paintings (pinturas) and khipus were the conduit for important historical information and substituted for writing and letters, which the Inkas lacked. However, no pre-Columbian picture boards or paintings are known to survive. See Cristóbal de Molina, **Fábulas y mitos de los Incas**, ed. Henrique Urbano and Pierre Duviols (Madrid: Historia 16, 1989), 49-50, and José de Acosta, **Historia natural y moral de las Indias**, 2 vols. (Madrid: Ramón Angles, 1894), esp. 2:165-66.


grounded in social discourse, often related to the usufruct to land and water. Furthermore, these rules are grounded in two essential Andean connections between the organization of societies and nature.

The first of these connections is terrestrial and is rooted in the contrasting life zones across the Andes (fig. 6.3). The spatial organization of Andean political economies is closely tied to the specific configuration of bioclimatic life zones, since each zone has a unique set of resources and different production potential. Central Andean peoples developed reciprocal relationships with other communities in different vertical and horizontal zones. Such an arrangement maximized access to various resources and production zones and minimized risk. This economic arrangement has been inspired by the works of John V. Murra. See especially his “El ‘control vertical’ de un máximo de pisos ecológicos en la economía de las sociedades andinas,” in Visita de la provincia de León de Huánuco en 1562: Inigo Ortiz de Zúñiga, visitador, 2 vols., ed. John V. Murra (Huánuco, Peru: Universidad Nacional Hermilio Valdizán, 1967–72), 2:427–76, and “An Aymara

Traditional Cartography in the Americas

FIG. 6.3. TOPOGRAPHY AND SPACE. Topography and other factors create distinctive sets of bioclimatic life zones in the Andes. Life zones change dramatically with altitude and across east-west and north-south transects at the same elevation. The spatial organization of Andean cultural beliefs and subsistence economies reflects the differentiated landscape. This diagram shows a cross section through the Cordillera Real and the valley of the La Paz River.

organization of the landscape is termed “complementarity,” which is the simultaneous control of several geographically dispersed ecological tiers by a single ethnic or sociopolitical group. The scale and form of complementarity vary according to geography and history, ranging from a single lineage’s landholdings at different elevations within the same valley to the control of distant mountain valleys and lowland areas by the kings of city-states. In both cases complementarity was, and is, maintained through formalized relationships based on reciprocity, redistribution, shared labor obligations, and kinship.

The second essential connection is between Andean systems of spatial reckoning and the movement of the heavenly bodies. For example, in the absence of a bright star near the celestial south pole, Quechua peoples and their ancestors organized the sky by reference to the Milky Way, called Mayu or the “celestial river,” and its apparent cruciform rotations. In a twenty-four-hour period, the Milky Way forms two intersecting intercardinal axes that divide the heavens into quarters (fig. 6.4). Since the plane of the Milky Way is inclined in relation to the earth’s axis, the stars of one quarter will rise as those of the opposite quarter set as the earth rotates. Astronomical phenomena can be tracked with respect to these quarters, which create a systematic means for the spatial and temporal reckoning of the world and its natural and social rhythms (fig. 6.5). This principle is central to pre-Columbian spatial reckoning. The diagonal opposition mirrors the inferred marriage and residence rules for the Inka settlement of the Cuzco Valley. The quartered circle is a form often replicated in the urban design of the Andean cosmopolis.

AYLLU: LINKING TERRITORY TO SOCIETY

The welding of people and landscape is at the heart of the concept of an ayllu, the fundamental social and territorial unit of the central Andes. Precise definitions of an ayllu will vary with social and ecological circumstances. Furthermore, the role of the ayllu as a local kin group con-


Kingdom in 1567,” Ethnohistory 15 (1968): 115–51, esp. 121–27. The terms “verticality,” which stresses the altitudinal dimension of complementarity, and “archipelago,” which stresses the horizontal dimension of complementarity, are often found in this older literature.


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Equated with a quadripartite division, as in Tawatinsuyu (land of the four parts), the Inkas’ term for their empire.

FIG. 6.5. THE MILKY WAY’S APPARENT SEASONAL ROTATION. In addition to the Milky Way’s nightly rotation, over the course of a year it again divides the heavens into quarters. First appearing in the evening sky during the dry season, the Milky Way (Mayu) stretches from the northeast to the southwest. During the rainy season, its early evening orientation is from the southeast to the northwest. These seasonal rotations find correlates in terrestrial, social, and cosmological organization.


FIG. 6.4. THE QUARTERED CIRCLE AND THE APPARENT MOVEMENT OF THE MILKY WAY. The quartered circle is an image of social and spatial order in many Andean societies and is probably inspired by the apparent nightly rotation of the Milky Way. Celestial movements also mimic the organization of terrestrial space for the modern-day Quechua peoples of Misminay. The Inkas structured their spatial and social environment in a similar fashion, as evinced by the quadripartite division of Inka society into suyus.


trolling territory is also historically conditioned.17 At a minimum, ayllus are distinguishable sociopolitical groups whose membership is based on some combination of landholding arrangements; shared labor responsibilities for the maintenance of community infrastructure such as roads, civic-ceremonial architecture, or irrigation canals; the sponsorship of religious festivals; and some type of formalized kinship relations, perhaps reflected in marriage and residence rules or real or fictive descent from an ancestor.18

The size of a geographic area synonymous with an aylu varies with cultural and ecological circumstances. Ayllus are often grouped into larger sociopolitical entities such as suyus and moieties.19 A suyu is a part of a whole; a moiety is one of two units into which a community is divided based on bilateral descent. Suyus may be equated with a quadripartite division, as in Tawatinsuyu (land of the four parts), the Inkas’ term for their empire.


Moieties are a dual division of society and space, and such divisions are ancient in the Andes. The late preceramic period (ca. 3000-2000 B.C.) sites of Río Seco, La Galgada, and Kotosh all have twin platform mounds, an architectural manifestation of dual social and territorial organization. Principles of dual and quadripartite organization are also evident in carved gourds found at the preceramic period site of Huaca Prieta.

**RADIAL AND PARALLEL STRUCTURE**

Two geometric structures for landholdings, radial organization and parallel strips, are forms inspired by nature and the heavens (fig. 6.6). As we have seen, the quartered circle references the apparent movement of the Milky Way and the spatial configuration of bioclimatic life zones, respectively. The organization of icons, symbols, motifs, and pictorial narratives into radial or parallel geometric structures can thus signify a geographic relation in Andean spatial thought. Grids are a conceptual subcategory of parallel strips. See, for example, figure 6.10 below.

![Diagram of Radial and Parallel Structures](image)

**FIG. 6.6. THE GRAPHIC STRUCTURING OF ANDEAN SPATIAL THOUGHT.** Two geometric structures signify social and territorial space in traditional Andean societies, as reflected in the large-scale organization of household usufruct to land and water: radial and parallel strips. They are both ultimately inspired by nature, that is, by the movement of the Milky Way and the spatial configuration of bioclimatic life zones, respectively. The organization of icons, symbols, motifs, and pictorial narratives into radial or parallel geometric structures can thus signify a geographic relation in Andean spatial thought. Grids are a conceptual subcategory of parallel strips. See, for example, figure 6.10 below.

Andean landholdings are also organized into parallel rectangular strips. Figure 6.9 illustrates an eighteenth-century copy of a sixteenth-century sketch map of native canals and landholdings ordered by the Spaniard Gregorio Gonzalez de Cuenca, who recorded native land and water rights as a basis for Spanish colonial administration during his inspection tour (**visita**) of north coast valleys. Each tertiary canal in figure 6.9 bears the name of the **parcialidad** or **ayllu** responsible for canal upkeep. Both field size and the area in standing crops were measured with respect to small feeder canals, as reflected in the sixteenth-century **visita** landholding entry “five ditches [canals] of maize.” Although **parcialidades** were organized into larger sociopolitical groups, the evidence suggests that equating canals with territory arose at the local level. However, parallel strips of landholdings may also reflect bureaucratic decisions, as exemplified by the Inka resettlement of the Cochabamba Valley (central Bolivia), where fourteen thousand Indians were grouped into **suyus** and assigned parallel strips of land that cut across the Rocha River.

The notion that critical points of the irrigation or agricultural system may have a territorial function is corroborated by the early seventeenth-century native chronicler Felipe Guamán Poma de Ayala in his fifteen-hundred-page illustrated letter to the king of Spain. In his drawing of the planting season (fig. 6.10), a stone-lined spring or reservoir (**estanque**) is adjacent to a grid pattern of agricultural fields (**chakras**). The shallow ditches present dur-


community that made the map is not interested in creating a scaled representation or a temporal sequence of events. Rather, we can infer from it that the mapmakers want to show the unchanging topological relation between village territories and the Lake Titicaca reed beds. Natural and cultural features often constitute village boundaries in the Andes, and the water channels perform this function in figure 6.11. The three streams divide the landholdings of several communities into strips of contiguous territory.

Modern Quechua- and Aymara-speaking peoples who inhabit the western shores of Lake Titicaca use maps in their negotiations with government officials over the control of highly productive lacustrine reed beds. Benjamin Orlove has analyzed a number of these maps, which he refers to as “state maps” and “peasant maps.” Although each map differs in its cultural assemblage, all the peasant maps in his sample blend Western and Andean representational precepts (fig. 6.11). The Andean community that made the map is not interested in creating a scaled representation or a temporal sequence of events. Rather, we can infer from it that the mapmakers want to show the unchanging topological relation between village territories and the Lake Titicaca reed beds. Natural and cultural features often constitute village boundaries in the Andes, and the water channels perform this function in figure 6.11. The three streams divide the landholdings of several communities into strips of contiguous territory.


perpendicular to the shore of Lake Titicaca. This non-scaled representation is, in effect, a statement of political parity and equal access to the reed resource by each community. Like the other native maps produced during the reed conflict, figure 6.11 affirms that each village controls a specific territory and that together the communities control the region.\footnote{Orlove, “Mapping Reeds,” 25–27. Government representatives consider the peasant maps crude imitations of state ones, probably because the peasant maps cannot be combined to form a unified, scaled, bird’s-eye view of the area.}

Central Andean peoples graphically represent the partitioning of society and territory on a medium not often considered by the cartographic historian—ceramics. Modern pottery from Quinua, central Peru, reflects the distribution of household landholdings and ayllu residence patterns in the organization of design bands and motifs (fig. 6.12). Quinua territory consists of resource zones at several elevations along an eastern slope in the central Ayacucho basin. The community is divided into two moieties based on the irrigation system, which acts as an administrative boundary between Quinua’s two barrios. The arrangement of design bands on ceramics reflects the structural principles that organize the environmental and social spaces of the community. Vertical, stacked designs...
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FIG. 6.11. MAP OF THE SHORE OF LAKE TITICACA, PUNO, PERU. Modern Aymara and Quechua maps, such as this one from Lake Titicaca, often combine Western and native cartographic precepts. This map, from the files of the Peruvian National Forestry Center (CENFOR), was part of a claim made by peasant communities regarding the control of reed beds. Following Western convention, rivers and the Lake Titicaca shoreline are illustrated in plan view, water is separated from land by a line, the map is drawn on a rectangular piece of paper, and the text is in Spanish. Vernacular features reflect resource zones, while designs divided by a vertical strip reflect social divisions. Other ecological, cultural, and symbolic spaces are represented in design and organization, decorative motifs, and vessel shape. 28

THE ROLE OF SACRED HUACAS AND PARAJES

Map content obviously reflects landscape components deemed culturally important by mapmakers and map users. Two significant cultural elements in the central Andes are huacas and parajes.

Huaca is a broad term designating a sacred thing. Mountains, springs, trees, river junctions, boulders, mummies, and artifacts can all be huacas. The significance of huacas to Andean spatial representation goes well beyond the simple observation that showing a tree or boulder on a map may signify more than its physical location. Powerful huacas, those deemed responsible for the current order of things, had elaborate social and political institutions built around them. 29 Hydrology, political structure, religion, and territory are all intertwined in the concept of the huaca. When the Inkas resettled the Cuzco Valley, they reassigned the rights and duties for more than three hundred huacas, many of them associated with water, in order to legitimize the new world order. 30

According to Cristóbal de Molina, among the painted boards at Poquen Cancha was a pictorial narrative of the mythical origin of the Inkas. This myth essentially states that at Tiwanaku the creator deity made clay likenesses of all indigenous peoples and decorated them according to the garments and hairstyles peculiar to each group. The creator also gave each group its languages, songs, and foods. When the creator finished shaping and painting the human lumps of clay, clay likenesses of one man and woman from each group passed underground and re-emerged at the exact places and landscape features that


the creator had assigned to them. This version of the Inka origin myth outlines the welding of landscape and society that is at the heart of the *ayllu* as well as the geographic significance of *huacas* in commemorating mythohistorical beginnings and explaining the current configuration of things. "Because they issued forth from these places and began to multiply, and had the beginning of their lineage from them, they made *huacas* and places of worship in remembrance of their beginnings. Each nation wears the costume with which they dressed their *huacas* of origin. Thus, the *huacas* they use and worship are all of different forms." 31 Individual *huacas* are of cartographic significance, since they represent the place of origin for a particular Inka lineage and also identified territorial apportionments by their mythological associations and links to specific administrative districts. 32

Oral traditions detailing the history of *huacas*, such as the Huarochiri Manuscript from central Peru, are exegeses of landscape. The cultural importance of *huacas* is such that, in the case of the Huarochiri Manuscript, modern researchers have generated maps using *huaca* names recorded four hundred years ago. 33 *Huacas* often are personified in Andean oral traditions detailing the mythicized histories of landscape formation and the founding of an *ayllu* lineage. Such ancestor *huacas* are more than cosmological signifiers or potential objects on an Andean map. They are part of a social discourse because they legitimize territorial apportionments by rights of lineage. 34 More than four millennia ago, the Chinchoros of northern Chile and the central Peruvian Palomans established the enduring Andean tradition of social formations based on the veneration of tangible common ancestors. 35

The representation of a *huaca* on a textile produced by modern Quechua-speaking peoples from the Q’ero Valley, department of Cuzco, Peru, utilizes geographic and temporal motifs (figs. 6.13 and 6.14). The incarnation of the ancestor *huaca* Inkarri, the first Inka, is depicted along with *k’iragey puntas* (literally “toothlike points”)—a motif that represents mountain peaks that function as the natural boundary markers identifying Q’ero territory. 36 The textile map is a pictorial narrative of Inkarri’s role in shaping the Q’ero landscape.

The Q’ero *pallay* maps time onto space by using shadow to represent the direction of sunlight. 37 The quartered diamond circumscribed into a rectangular frame,
Q'ero peoples identify a specific valley by the type of mountain peaks that enclose it. The sawtooth motif (k'iraqey puntas) represents the mountains that enclose the Q'ero Valley. Subtle changes in the shape and size of the motif may signify specific mountain attributes. The figure standing with arms upstretched and lowered is the incarnation of the ancestor huaca Inkarri, while the central axis represents a natural or cultural boundary between villages such as the Q'ero River.

A textile illustrating the spatial relation of landholdings and land features is the two-color Qheswa pallay in figure 6.16. It is woven with the tawa t'ika qocha motif composed of a quartered diamond that is separated into two halves by a sonqocha line. Like other examples of dual spatial organization in Andean societies, the partitioning of the diamond is a general reference to the ideal division of social and territorial space. The tawa t'ika qocha motif is also outlined in red and white rectangles, called órgano, which are aligned repetitively (fig. 6.17). According to Silverman-Proust, the órgano weave signifies a series of square furrows that form individual agricultural plots. In short, the individual diamonds on the Qheswa pallay are organized into a grid representing agricultural landholdings. Although the idea is speculative, the altitudinal locations of the household's agricultural fields may be signified by multicolored bands (listas) that border the órgano motif. Listas signify a color classification scheme for agricultural products. For example, a yellow stripe signifies yellow maize or yellow potatoes, a red stripe signifies red maize or red potatoes. Because particular crops have an optimal altitudinal life zone, the number and sequence of listas may symbolize the altitude of landholdings.

Andean peoples often name a particular resource zone (paraje) after some local physical feature, such as a spring, a place where a certain plant grows, a rock outcrop, or an animal habitat. The names of these zones should not be conceptualized as clearly bounded areas. Although parajes denote a specific area, the locales have diffuse boundaries between them. The mapping signifies the sun. One method is to note the change in shadow length projected onto a mountain.

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called tawa inti qocha, is one of several inti motifs that indicate sunrise, sunset, the sun at the zenith (noon), or the sun at the antizentith (midnight), depending on the weaver's purpose (fig. 6.15).38

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FIG. 6.15. Q’ERO PALLAY WITH INTI MOTIFS. This Q’ero textile incorporates four inti motifs that represent sunrise (inti lloqsimushan), sunset (inti chinkapushan), sun at noon (hatun inti), and sun at midnight (tawa inti qocha), depending upon the weaver’s use of different yarn color and pattern combinations. Quechua women incorporate these motifs into their textiles according to the time of day they wish to portray, represented by the amount of sunlight available and shadow used.


The significance of parajes is that the representation of a single feature on a map may in fact be interpreted by Andeans as standing for a larger area. An example of the concept of parajes is the multicolored listas of figure 6.16, on which the color signifies a particular crop and its altitudinal growing zone. 42

LANDSCAPE METAPHORS

Several art historians and anthropologists have noted the importance of metaphor in the art of pre-Columbian Andean societies like the Nasca. 43 The body-landscape metaphor was certainly used in Inka times. 44 Modern-day ethnographers have also noted the central Andean use of animal-landscape and human body-landscape metaphors in wayfinding and during mapping rites.

The greater Kaata community, in the department of La Paz, Bolivia, consists of Aymara and Quechua speakers who have personalized the landscape in terms of the human body. For example, the highland Roop and Green Lakes are the left and right eyes, mountain slopes are the chest (kinre), and the Huruku and Ayllu Rivers are the left and right legs. Individual communities are known by anthropological Association, Pittsburgh, 19 November 1966). Cobo, *Inca Religion and Customs*, 183 (note 25), notes that all Andean toponyms are compound signifiers of some attribute unique to the location. For a specific example, see Karl S. Zimmerer, “Transforming Coquepata Wetlands: Landscapes of Knowledge and Practice in Andean Agriculture,” in *Irrigation at High Altitudes: The Social Organization of Water Control Systems in the Andes*, ed. William P. Mitchell and David Guillet (Arlington, Va.: Society for Latin American Anthropology, American Anthropological Association, 1993), 115–40, esp. 122–23.


FIG. 6.18. LANDHOOLDING AMULET FROM THE DEPARTMENT OF LA PAZ, BOLIVIA. This amulet depicts a specific village plaza with a realistic rendering of various buildings and a church (identifiable by an inscribed cross on the exterior wall). Seven llamas appear on each side of the village square, probably representing the livestock held by the ayllus composing the two village moieties. This type of amulet is usually used in animal increase rites. A magician constructs a ceremonial mesa (tabletop shrine)—literally an ephemeral map representing the larger valley and an imagined spirit world—from the carved stone amulet and other ritual items, then directs spiritual forces to the locale signified by the amulet and the livestock it is associated with.


FIG. 6.17. EXPLANATION OF THE QHESWA PALLAY (FIG. 6.16). A set of central horizontal bands likely represents a landscape feature, such as a road or river, separating the landholdings of two ayllus or moieties, and the tawa t'ika qocha motif encodes additional geographic information. Silverman-Proust identifies the alternating colored rectangles with a dot in the middle as a nawi motif, which means “hole for planting,” and identifies the alternating red and white rectangles as órgano or agricultural fields. The altitude of the fields is referenced by the listas that frame the diamond-shaped tawa t'ika qocha motif. Silverman-Proust notes that the number and color of listas that frame the motif vary with the location of textile production.

their position within the metaphorical mountain body and are often assigned ritual tasks according to their locations.45

MAPPING RITES AND EPHEMERAL MAPS

Various central Andean rituals, which may be called “mapping rites,” require an ephemeral map of a specific landscape in order to achieve their goal. There are two general types of mapping rites. One is associated with religious mapping, which uses ephemeral maps to locate or influence preterhuman and extramundane forces or direct them to a locale. Participants in a religious mapping rite arrange amulets representing landscape features and landholdings with respect to an object that acts as a portal to the spirit world—often a huaca. The mesa (an arrangement of power objects) is often laid out on a portable tabletop or a blanket.46 The second type of mapping rite outlines the apportionment of territory and social responsibilities within a community.

Aymara “magicians” of Chucuito, Peru, use amulets to represent the livestock holdings of a particular community during animal increase rituals and other fertility rites (for a similar Bolivian example, see fig. 6.18). Only the magician may own a stone amulet representing a social unit and its worldly possessions, since the artifact influences and directs the patron spirits of the household. The magician arranges amulets and other artifacts representing a single household's corral and animals on a sacred cloth and then identifies and locates the nature spirits responsible for pastoral or agricultural fertility and directs their blessings toward the family's landholdings.47

47. Harry Tschopik, “The Aymara of Chucuito, Peru,” Anthropo-
Although a general cosmographic symbolism permeates all religious mapping rites, many such rites reference a specific landscape. For example, the aforementioned Kaata community also constructs a specific *mesa* representing Mount Kaata during the Feast of the Dead, and on that *mesa* it symbolizes Mount Aqhamani during a lineage rite.

The Quechua-speaking village of Pacariqtambo, in the Paruro region of Cuzco, has ten *ayllus*, each belonging to one of two moieties. Every *ayllu* is responsible for sponsoring a religious festival between the harvest and planting seasons and for pledging labor to maintain community infrastructure. The main event during one of these festivals is the procession of the honored saint through the churchyard and plaza. Villagers inscribe nine parallel strips of territory, called *chhiutas*, on the churchyard and plaza (fig. 6.19). Eight *chhiutas* are swept and maintained by the four oldest *ayllus* from each moiety. The ninth *chhiuta* is maintained by a neighboring village, Qoipa, a short distance south of Pacariqtambo. The Qoipa *chhiuta* is on the south end of the plaza, suggesting that the *chhiutas* are locationally sequenced according to the contiguous landholdings of each *ayllu*. *Chhiutas* have flexible boundaries and configurations that must be renegotiated before each religious festival and that reflect the changing landholdings and social responsibilities of each *ayllu*. Sweeping the *chhiutas* thus symbolizes the responsibility of each *ayllu* to maintain a portion of community infrastructure. The procession of Pacariqtambo’s patron saint through the churchyard and plaza sanctifies the mapping rite that legitimizes the apportionment of territory and social responsibilities within the community. *Chhiuta*-like representations have archaeological manifestations in ancient architecture, and the variation in the size and number of parallel strips reflects the unique geographical and historical circumstances of the site setting.

Mapping rite amulets are often found at the many pre-Columbian cosmopolises in the Andes (fig. 6.24 below, for example). Cosmopolises are sites that replicate an idealized vision of the earth and cosmos through design alignments and architecture. Mapping rites become a form of sacred technology when performed within an Andean cosmopolis or *huaca* shrine, since the architecture is designed to change elements of the earth and cosmos by representing them.

**ROCK ART**

Rock art as a whole is generally multireferential and cannot simply be “read” by modern viewers. I am unaware of any systematic excavation of Andean rock art sites, and thus context as well as dating remains a major problem in interpreting images. There are nevertheless strong formal similarities between some rock art images and pre-Columbian artifacts. Although stylistic analyses and image content strongly suggest that many reported examples of rock art are pre-Columbian, such appraisals only establish a terminus post quem.

Antonio Núñez Jiménez’s monumental catalog of Peruvian rock art contains many examples of images that may be maps, although he does not always label them as such. Some of the images use natural or cultural features to separate and frame adjacent places and events, both real and imagined. In landscape scenes cultural and human figures are nearly always portrayed in profile or at a low angle. Geographic space is usually depicted from above, as shown in the probable plan view depictions of river drainages and quebradas. There are several references to probable journeys in Núñez Jiménez’s compilation, some of which may use dots and lines to connect places or events both real and imagined. Celestial objects are occasionally rendered with respect to horizon features. Several images are reminiscent of spatial themes discussed earlier, including landscape-animal-body metaphors and the possible use of rectangular blocks to represent households and landholdings.

Figure 6.20, from Salta in the Andean part of Argentina, is one of eleven petroglyphs identified by Ercilia Navamuel as purportedly illustrating the locations of villages, corrals, agricultural landholdings, streams and quebradas, mountains, and springs. Several of the villages depicted in the rock art are apparently known archaeological sites today. In addition, some petroglyphs are of interest because they have been said to illustrate the solar path, a calendar, and possible landscape features on the same stone.

A CHRONOLOGICAL PERSPECTIVE ON ANDEAN MAPMAKING IN THE ARCHAEOLOGICAL RECORD

This section traces, by analogy and in chronological order, the cultural and geometric precepts outlined above in the Andean archaeological record. There are many pitfalls in historical and ethnographic analogy. Andean cultural change was often driven by conquest and subjugation, not only by the Spaniards, but also by the Incas and earlier city-state empires. Spatial and landscape representations will likely change with every conquest. The probability of a disjunction between an archaeologically defined culture, based on artifact assemblages, and a social group defined by cultural and biological reproduction increases dramatically over time. Analogies also tend to homogenize a culture’s historical variation, thus obscuring the very basis of cultural evolution.

THE OLD TEMPLE AT CHAVIN DE HUÁNTAR

Chavín de Huántar was the major religious center for the Chavín culture (ca. 900–200 B.C.). Although ancient Andeans extensively modified Chavín de Huántar through time, the original architectural complex, called the Old Temple, can be distinguished. Like other Peruvian ceremonial centers, the Old Temple, a U-shaped pyramidal platform mound surrounding a lower circular courtyard, is thought to have had a geomantic function. In addition, thousands of ceramics found in the temple’s Gallery of the Offerings may have been part of mapping rites. It has been suggested that some of these pieces, perhaps made in distant villages and possibly representing their myths and huacas, were used in ritual offerings.

Unlike its architectural predecessors, the Old Temple opens not toward the headwaters of the local river but rather opposite Huantásan, the highest peak in the Cordillera Blanca. Huantásan is one of the sources for the nearby Mosna and Wacheksta Rivers and is also the incarnation of a huaca worshiped in Inka and colonial times. Studies by Urton and Aveni note that the build-

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Great Caiman of the Water and Underworld

Central axis

Great Caiman of the Sky

Harpy eagle (Attendant of the Sun)

Feline-snake (stylized as spondylus)

Jaguar (intermediary between worlds)

Celestial dragon (Hyades)

Foolish Lunar Younger Brother (Moon)

Canoe with Twins

Clenched jaw as spine (Milky Way)

Manioc as penis

Gourd as womb

Sky rope

Wise Solar Elder Brother (Sun)

Tuber

Chili peppers

Water

Spring

Tuber

Sky

Autumn

Seed

ings are not laid out according to the cardinal directions but are oriented more than thirteen degrees clockwise of due east—possibly related to celestial phenomena. The Old Temple alignments symbolically unite Huantasan, a source of the temple waters, with the path of the Pleiades, a celestial harbinger of the rainy season.

There are several subterranean passageways, called galleries, within the Old Temple. The most important is the cruciform Lanzón Gallery, at the center of the U. The gallery contains an east-facing granite shaft, 5.5 meters tall, carved with an anthropomorphic figure—the Lanzón, Chavin de Huantar's supreme deity. The shaft was an integral part of the building structure. It protrudes into a second cruciform chamber above, and its base is set deep into the floor, signifying the Lauzon deity's role as an axis mundi unifying heavens, earth, and Underworld.

In addition to the Lanzón, one other sculpture is exceptional in its form and considered particularly sacred—the Tello Obelisk (fig. 6.21). Like the Lauzon, and unlike any other sculptures in the Old Temple, it is a carved granite shaft that also acts as an axis mundi. The carving has been interpreted as two highly stylized caimans separated by a thick central axis, each one an aspect of the Great Caiman. The caiman is generally known as the master of fishes, a reference to its pivotal role in fish reproduction and the ecology of the Amazonian backwaters. Donald Ward Lathrap takes the importance of the caiman even further. He argues that it represents the entire cosmos and

FIG. 6.21. DRAWING AND INTERPRETATION OF THE TELLO OBELOK FROM THE OLD TEMPLE COMPLEX OF CHAVIN DE HUANTAR, 600–500 B.C. The relief sculpture on the Tello Obelisk, a prismatic granite shaft about 2.5 X 0.3 meters, is a cainicic world tree that depicts the sun and the waning moon at opposite sides of the heavens, as they appear at twilight, and fuses terrestrial symbolism with celestial ordinations. The two highly stylized caimans to the left (Great Caiman of the Water and Underworld) and right (Great Caiman of the Sky) of the obelisk's central axis depict cosmographical, celestial, and terrestrial elements. The geometric organization is similar to the inferred social and territorial organization of Chavin de Huantar, even though many of the plants and animals illustrated are from exotic locations, such as the Amazonian harpy eagle and manioc plant or the Ecuadorian spondylus shell. A stylized canoe on the clenched jaw as spine of each caiman represents the celestial canoe that carried the Twins across the Milky Way in various Amazonian myths. Other mythological incarnations include the sun, moon, and constellations.


59. The rugged terrain towering above Chavin de Huantar does not favor horizon astronomy. It is more probable that astronomical observations were made on nearby summit sites such as Pooqoq and Huapiaq. See Reinhard, “Chavin and Tiahuanaco,” 401 (note 57).

is the most important cosmological symbol in nuclear America.\(^{61}\)

Each caiman on the Tello Obelisk contains figure panels depicting fused plant, animal, and character elements in profile.\(^{62}\) Life forms and geographic features abstracted from the realms of water, earth, and sky are organized into associative relationships.\(^{63}\) Left of the central axis is the Great Caiman of the Water and Underworld, associated with spring, tubers, and vegetatively reproduced plants. Right of the central axis is the Great Caiman of the Sky, associated with autumn and seed plants.\(^{64}\) Together the caimans signify dualisms, such as animal-plant, wild-domestic, and above-below.\(^{65}\) The bilateral symmetry of the Tello Obelisk mirrors the dual territorial and social organization of Chavín de Huántar inferred from the archaeological record.

Characters from celestial myths are depicted on the obelisk, illustrating a fundamental astrobiological tenet—heavenly movements are correlated with life cycles on earth. The Wise Solar Elder Brother holds a sky rope to ascend to the heavens, symbolized by the clenched jaw as spine motif that represents the Milky Way. The harpy eagle, also known as the Attendant of the Sun, acts as a guide. A stylized canoe carries the mythical Twins across the Milky Way and toward the Foolish Lunar Younger Brother, who loses his legs to the celestial dragon (the Hyades) as the Pleiades watch.\(^{66}\) In sum, the Tello Obelisk is a cosmographical map, a pictorial narrative of mythitized histories and ethnoecology, and a visual attempt to integrate exotic information within the everyday geometric structures of Chavín life.

PARACAS TEXTILES AND ARTIFACTS

The Paracas cultural tradition spanned a minimum of nine hundred years (700 B.C.—A.D. 100) in the major river valleys around the Paracas Peninsula, south Peruvian coast. Some early Paracas textiles and artifacts clearly reference Chavín art, although differences exist in media, function, technique, and iconography.\(^{67}\)

Paracas is famous for its beautiful textiles, which commonly depict plants and animals from specific habitats.\(^{68}\) For ancient Paracas, predators may have functioned as parajes, that is, as a means of categorizing loosely defined landscape zones. Plant and animal images may have acted as visual metaphors for ecological zones in Paracas iconography. This may also help explain the preponderance of human figures in animal and plant costumes that dominate Paracas textile imagery. Anne Paul speculates that Paracas leaders wore these textiles during rituals that linked natural features to the social and cosmic order.\(^{49}\)

Julio Tello examined the Paracas polychrome mantle (fig. 6.22), a textile looted from the Necrópolis of Cerro Colorado on the Paracas Peninsula. He interpreted the unusually varied imagery of this textile as a calendar and noted that the same individual costumed dancers appear in isolation on other Paracas textiles.\(^{70}\) This mantle may commemorate a calendrically timed mapping rite among Paracas ayllus or other social groups that legitimized the territorial division of sunken gardens or shallow valleys suitable for cultivation along the arid coast (mahamaes). The four columns of geometric blocks with a central severed-head motif are fundamental to this interpretation, which expresses bonds to locality through descent.\(^{71}\)

6.11. Trophy headtaking in South American cultures such as the Nasca appears to affirm social and territorial status. See Helaine Silverman,
Thirty-two lineages are grouped into four rows. Each row corresponds to large-scale social and territorial divisions within the core Paracas culture area. The four major Paracas mahamaes—along the Pisco, Cañete, Chincha, and upper Ica Rivers—are the probable corresponding landscape divisions. As with the chhiutas rite, the public proclamation of corporate responsibility for community infrastructure reinforces the ayllu as a social group and as a territory. Ritual impersonators, wearing masks and full ceremonial regalia, stand at the plaza’s periphery. Other geographic relations may be signified by animal and plant elements on the dancers’ costumes.

A worldwide cosmological theme is the passage of the soul through a maze situated between this world and the hereafter. A carved gourd, found in a Paracas tomb along with other artifacts necessary in the afterlife, illustrates three souls (heads) within a spiritual labyrinth (fig. 6.23). One soul appears in two positions, signifying that the bold lines and geometric symbols are pathways and imagined landscape symbols. At the bottom of the severed head are the same paired geometric lines as appear below the severed heads in figure 6.22, suggesting a link between blood and social and territorial spaces. The spirit world can be difficult to navigate without the proper tools or instruction, and a spirit map could be part of this preparation.

According to Julio Tello and Mejía Xesspe, figure 6.24 is a faithful reproduction of living quarters at the village site of Arena Blanca. It is also a partial representation of a desert paraje. The lower part of the vessel depicts the interiors of different houses, and the upper part depicts the exterior of an apartment compound. This ceremonial vessel ostensibly portrays the household concern with practical and spiritual matters, the latter signified by spirit masks hanging on the house walls. Each mask has subtle stylistic variations, suggesting that they differentiate households.


73. For a description of the tomb’s contents, see Julio C. Tello, Paracas, vol. 2, with Toribio Mejía Xesspe, Cavernas y necrópolis (Lima: Universidad Nacional Mayor de San Marcos, 1979), 133–46.

74. Tello and Xesspe, Cavernas y necrópolis, 259.
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FIG. 6.23. PARACAS SPIRIT MAP ON A CARVED GOURD. This gourd was found in a tomb containing ceremonial and utilitarian artifacts necessary for life in the afterworld. The labyrinthine paths and three severed head as soul figures illustrated might have helped the soul navigate in the spirit world. From Julio C. Tello, Paracas, vol. 2, with Toribio Mejía Xesspe, Cavernas y necrópolis (Lima: Universidad Nacional Mayor de San Marcos, 1979), 145 (fig. 23). By permission of the Universidad Nacional Mayor de San Marcos, Fondo Editorial, Lima, Peru.

NAZCA LINES AND NASCA CERAMICS

During the second century A.D. the center of power in Peru shifted southward from the Paracas Peninsula to the desiccated Nazca plain. Although there are artistic and ideological continuities between the Paracas and Nasca cultural traditions (ca. 700 B.C.-A.D. 200 and 200 B.C.-A.D. 600), one cannot say that the latter is entirely derived from the former.75

Nazca is world renowned for a number of large ground drawings, or geoglyphs, known as the Nazca lines. They cover about two hundred square kilometers of the elevated dry plain (pampa) near the coast and between the Ingenio and Nazca Rivers. Constructing geoglyphs involves removing dark, desert-patinated stones to reveal the underlying light-colored deposits. Some Nazca geoglyphs are made with nonoverlapping lines, as if one drew a figure without ever lifting pen from paper. Other geoglyphs have a dense maze of overlapping and confusing intersections. Although proposals have been made, no consistent unit of measure common to all geoglyphs has been discovered.76 Modern analysis indicates that relatively simple surveying methods, utilizing wooden stakes, uniform lengths of string, and a good eye, are more than adequate to produce Nazca line geometry.77

The most famous Nazca geoglyphs are those shaped like plants, animals, costumed performers, or geometric figures. However, the most common ground drawings, thought to have been made later, are straight lines, and many are connected to form sets of radial lines emanating from a central point.78 These geoglyphs are perhaps the earliest expression of radial landscape organization


77. Evan Hadingham, Lines to the Mountain Gods: Nazca and the Mysteries of Peru (New York: Random House, 1988), 135–40. Archaeology supports such surveying techniques: a radiocarbon date of 525 ± 80 A.D. was obtained from a wooden stake pounded into the terminus of a Nazca line, and a textile over 160 feet long, with threads of varying lengths, was uncovered beneath a temple mound at Cahuachi. See William Duncan Strong, Paracas, Nazca, and Tiwanacoid Cultural Relationships in South Coastal Peru (Salt Lake City: Society for American Archaeology, 1957), esp. 14–16 and 46 (table 4).

78. Anthony F. Aveni’s introduction to The Lines of Nazca, ed. An-
A statistical examination of the radial line a system of lines emanating from a central point.

The most common type of Nazca geoglyph is the ray center, a system of lines emanating from a central point. An obvious manifestation of radial organization, the emanating lines are usually perpendicular to topographic contours controlling overland flow. Ray center lines often connect to other ray centers, and some of the lines are not straight but bent. Very few ray centers exhibit astronomical alignments beyond that expected by chance.

By permission of the Servicio Aerofotográfico Nacional, Lima, Peru (0–17123, del 22-6-65).

FIG. 6.25. RAY CENTER GEOGLYPH FROM THE NAZCA PAMPA. The most common type of Nazca geoglyph is the ray center, a system of lines emanating from a central point. An obvious manifestation of radial organization, the emanating lines are most often aligned with water sources and are usually perpendicular to topographic contours controlling overland flow. Ray center lines often connect to other ray centers, and some of the lines are not straight but bent. Very few ray centers exhibit astronomical alignments beyond that expected by chance.

Sixty-two ray centers have been identified, along with more than 750 member lines. Most of the ray centers are on small natural promontories on the border of the pampa, and all ray centers are on the banks of major rivers or tributaries or at the base of the last hill descending out to the pampa, resulting in the hypothesis that they are connected in some way to water and irrigation. In addition, the radial lines frequently connect to other line centers, distant hills, and other topographic features that affect the overland flow of water (such as bends in rivers or dunes overlooking the banks of rivers).

A few Nazca geoglyphs exhibit astronomical alignments, for example, the Pleiades, the sun at the zenith, and α and β Centauri. Many celestial objects, including these, have a specific temporal relation to subsistence systems such as the seasonal return of montane meltwaters to Nazca rivers and canals, or the return of fish to nearshore environments. Although astronomical alignments were championed as an early explanation for Nazca line layout, subsequent studies have shown that only a few geoglyphs exhibit them.

The Nazca lines certainly commemorate cosmographical concepts, but ritual performance seems necessary for the geoglyphs to fully convey a geographic understanding of the Nazca world. A number of ray center lines point to Cahuachi, which is the largest ceremonial center in the region and as such may have been a pilgrimage center and focus for ceremonial activities related to agriculture and water. Archaeological reconnaissance indicates that the geoglyphs may have been processional routes, because cairns, offerings, and piles of broken decorative pottery are clustered along them. The lines were certainly walkable, and in addition to ritual pilgrimage, it has been speculated that they may have simply been used as roads across the pampa.

Gary Urton postulates a system of maintenance for the radial geoglyphs analogous to the ritual sweeping of chhiutas in Pacaritambo described above. In his scheme, Nasca sociopolitical organization corresponds to terrestrial and celestial knowledge. The Nazca lines certainly commemorate cosmographical concepts, but ritual performance seems necessary for the geoglyphs to fully convey a geographic understanding of the Nazca world. A number of ray center lines point to Cahuachi, which is the largest ceremonial center in the region and as such may have been a pilgrimage center and focus for ceremonial activities related to agriculture and water.
territorial landscape divisions. Individual geoglyphs are maintained through a rotating and reciprocal system of kin-based labor obligations similar to the Inka *mit'a* system (a labor tax that included periodic personal service for state-sponsored agriculture and other activities). The Nazca lines thus may represent a concrete division of territory into social spaces, a graphic manifestation of the *ayllu* as a social group and as a territory. This may explain why younger geoglyphs often truncate older ones, since expressing social and ecological conditions at the time of construction was more important than preserving the image for successive generations.

The large size and orthographic perspective of the Nazca ground drawings have inspired many controversial interpretations. It is likely that Nazca geoglyphs were designed, in part, to attract preterhuman and extramundane forces and direct their blessings of water and fertility toward the landholdings of particular *ayllus*. In this sense the Nazca lines are maps for Andean gods. Another consideration in their use and construction is the part pure artistic expression may have played. Although the complexity and size of these land sculptures do not point toward a single, definitive explanation for their construction and use, it is clear that the Nazca lines will continue to capture our imagination.

Cultural themes are also encoded in Nasca pottery. The design on an unusual ceramic vessel (fig. 6.26) has been interpreted by Anne Peters as resembling *lomas* pastures (fog-supported coastal vegetation), with a mountainlike appearance of undulating snakes. She further suggests that the floating camelids resemble the llama "dark cloud" constellation in the Milky Way.

Figure 6.27 illustrates a class of Nasca pots alternatively called “chieftain” or “*figura mitológica*” vessels. The vessel depicts a specific individual with gaping eyes and a sewn mouth, wearing gold funerary ornaments like those found in south coast mummy bundles. This chieftain possibly represents a mummy bundle, and its careful funerary preparation suggests it is an ancestor *huaca*. Zuidema details symbolic associations between the *figura mitológica* and agriculture, and he notes that native chroniclers described cosmological concepts encoded on these vessels nearly a millennium after they were made. The vessel may represent specific *ayllu* landholdings. Ancient Nasca peoples claiming real or fictive descent from the ancestor *huaca* depicted in figure 6.27 legitimized their access to specific irrigated lands.

The ancient Nasca peoples constructed an elaborate hydraulic system of underground canals called *puquios*, which made agriculture possible on the arid south coast. *Puquios* are shown in figure 6.27 by the linear “streamer” that connects the arms with a leg, then disappears under the leg, and finally reemerges above the rectangular grid of severed heads at the bottom of the vessel. The grid of severed heads probably represents agricultural fields, since severed heads are linked to agricultural offerings and since Andean peoples express their relation to terri-

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91. Tello and Xesspe, *Cavernas y necrópolis*, 464 (fig. 125) (note 73).
FIG. 6.27. NASCA CERAMIC CHIEFTAIN VESSEL, SOUTH COAST OF PERU. The so-called Nasca chieftain vessels depict different individuals wearing funeral attire, hence each vessel represents a specific mummy bundle ancestor huaca. All Nasca chieftain vessels have the same structure, but they differ markedly in artistic detail. The head, shoulders, and legs of ceramic Nasca chieftains protrude from their vessels, corresponding to Andean anatomical metaphors for the landscape: the head is the summit, the shoulders are the central slopes, and the lower hips signify the coastal plain where mountain rivers diverge. The legs have the sinuous shape of rivers and are dwarfed by the head, just as Andean summits tower over meandering drainage systems. This same sculptural technique is used to depict realistic hillocks on other Nasca vessels. Height of the original: 74.5 cm; widest diameter: 42.9 cm. Photograph courtesy of the Instituto Nacional de Cultura, Museo Nacional de Arqueología, Antropología e Historia del Perú, Lima (C-54196).

MOCHE CERAMICS

The Moche culture flourished on the north coast of Peru from about A.D. 1 to 700, overlapping the late terminal and classic Nasca traditions on the south coast. Moche art is renowned for its realism, and ceramic landscape models are common. Most Moche portrayals of people and animals, except those on polychrome wall murals, are between five and twenty centimeters high. Sculpted landscape elements usually conform to their natural relative sizes, although people, artifacts, and animals may be greatly exaggerated to emphasize a message. Particular floral and faunal attributes may also be magnified and often appear in isolation on ritual attire. Moche artists depict plants and animals in profile on decorated pottery. The exception is freshwater plant blossoms and non-mammals, several associated with water (e.g., crab, octopus, ray, spider), which are rendered in plan view.

Two Moche landscape vessels (figs. 6.28 and 6.29) conform to the artistic principles outlined above. Mountains and pinnate drainage systems consisting of irrigation canals and rivers are often modeled in Moche ceramics, and many activities depicted in mountain scenes seem to have ritual or symbolic significance. The landscape setting in figure 6.28 shows a single set of high-elevation mountains—possibly the bioclimatic puna zone. In figure 6.29 the higher set of mountains may also represent the puna, while the lower set represents the comparatively warm, low-elevation yungas zone, and the warrior's house is thus situated between the two biomes. Mountain worship is clearly present among the Moche peoples, and specific peaks are associated with particular deities and geographic agents. Many Moche ceramics show deities, often differentiated by their headaddresses, emerging from mountain caves or attending various montane sacrificial rites.

Ceramic house models are common in Moche contexts. Diverse types of architecture are represented in

94. Severed heads have many purposes and symbolic associations in Nasca society, not all of them related to lineage or warfare. Browne, Silverman, and Garcia distinguish between trophy and ritual heads when analyzing a Nasca cache of severed heads and suggest they may have also functioned to affirm territorial and resource claims through associations with ancestry and kinship. See David M. Browne, Helaine Silverman, and Rubén García, “A Cache of Forty-eight Nasca Trophy Heads from Cerro Carapo, Peru,” Latin American Antiquity 4 (1993): 274–94, esp. 277 and 290–91. Silverman, Cahuachi (note 71), specifically links severed heads, ancestors, and territory.


96. For a summary on the Moche use of scale, relative size, and perspective, see Christopher B. Donnan, Moche Art of Peru: Pre-Columbian Symbolic Communication, rev. ed. (Los Angeles: Museum of Cultural History, University of California, Los Angeles, 1978), 29–33.


98. Donnan, Moche Art of Peru, 144.

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FIG. 6.28. CERAMIC MOCHE LANDSCAPE VESSEL WITH ANDEAN FOX. This vessel is formed into an Andean fox that stands over mountains of comparable height and a single drainage system. The single set of mountains references high elevation mountains (puna). The Andean fox may be a visual incarnation of a toponym or the fox (atoq) dark cloud constellation.

Height of the original: ca. 21 cm. Boyer Fund, Logan Museum of Anthropology, Beloit College, Beloit, Wisconsin (cat. no. 7229). Photograph courtesy of William Gustav Gartner.

FIG. 6.29. CERAMIC MOCHE LANDSCAPE VESSEL SHOWING HOUSE AND SHIELD. An exaggerated house and warrior's shield, separated from the rest of the scene by a block of color, are shown between two sets of comparably sized mountains on this Moche vessel. A road connects the warrior's house with the lower set of mountains. Valleys with two pinnate drainage systems represent two primary canals, with lateral lines representing secondary parts of the irrigation system.

By permission of Christopher B. Donnan, Los Angeles, California.

these models: open structures with simple sloping roofs or overlapping gabled roofs, and closed composite structures with various forms of roof decoration, including crenelated forms and war clubs. Although such structures have not yet been confirmed by archaeological excavation, most other images represented by Moche art are based on artifacts that have been found. There is some evidence that such structures may have sat atop specific pyramid mounds, which may reflect their symbolic and ritual importance. Just as Moche vessels depicting architectural structures may have been used in rituals, models depicting architectural compounds (maquetas) may have also served as amulets in mapping rites.

Moche house models also depict spatial relations and territorial apportionment through parallel strip motifs. According to George Kubler, the vertically stacked color bands in figure 6.30 represent pyramidal terraces and platforms. The vessel itself probably depicts a typical Moche-style house group.

TIWANAKU

Tiwanku is near the shores of Lake Titicaca, Bolivia, the highest large lake in the Andes. Taypikala, the civic-

100. Donnan, Moche Art of Peru, 79–83 (note 96).
101. Architectural maquetas are plan view, scaled representations of the load-bearing walls of individual rooms and structures. See, for example, Cristóbal Campana, La cultura mochica (Lima: Consejo Nacional de Ciencia y Tecnología, 1994), 29.
ceremonial core of Tiwanaku culture (ca. A.D. 300–1100), was an architectural manifestation of the earth and cosmos. Surrounded by a moat, Taypikala evokes the image of the sacred island later immortalized in an Inka creation myth. Its monumental architecture is aligned with prominent landscape features and the sunrise at the equinoxes. Akapana, one of the two great pyramid mounds in Taypikala, has surface and subterranean water canals that mimic the unusual hydrology of the Quimsachta range. Since the upper terrace fill of Akapana contains distinctive blue-green pebbles from a Quimsachta mountain, the likeness was surely intentional. As the center of a cosmopolis, Taypikala embodied the perceived order of the universe. It was considered to be a point of cosmic convergence that extended to the social and territorial organization of the Tiwanaku realm.

Ethnohistorical research provides important insights into how ancient Tiwanaku may have represented geo-

graphic relations. Thérèse Bouysse-Cassagne has outlined sixteenth-century spatial concepts for Aymara chiefdoms around Lake Titicaca. The spatial organization of Aymara culture and territory was built around a system of double dualisms (fig. 6.31). Urco and uma were spatial divisions of the regional sociopolitical landscape. Alaa and manca signified the social and territorial divisions for low-elevation valleys near the Pacific and Amazon, respectively. The concept of urco also encompassed categories such as west, high, dry, high-elevation pastoralism, celestial, male, and perhaps the tuber. Uma embodied such concepts as east, low, wet, maize agriculture, Underworld, female, and low-elevation plants and animals.

The integration of chiefdoms at the Amazon or Pacific coast periphery with those around Lake Titicaca at the center fostered a multiethnic form of complementarity governed by the concepts of urco and uma. Two lords, one from each moiety, ruled the kingdom of Lupaqa, a well-documented sixteenth-century Titicaca chiefdom often used as a sociopolitical model for the region. Lupaqa’s moieties comprised multiethnic ayllus that ensured comparable access to resources and labor for all corporate groups. Ethnic tensions no doubt arose in such a complex sociopolitical landscape, but they were mediated by rituals in a symbolic space called taypi, or “place in the middle.” Lake Titicaca was taypi in the fragmented sociopolitical landscape of the sixteenth century. During the middle horizon, taypi was Tiwanaku.

The Bennett Stela stood in the semi subterranean temple at Tiwanaku, probably facing due west toward the Ponce Stela, another monolith aligned with the Bennett Stela along the solar path. This architectural complex also contained an eclectic assemblage of stone statues arranged in subsidiary positions around the Bennett Stela. Most of these statues were foreign to Tiwanaku.

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104. Kolata, Tiwanaku, 8–10, 96–98, 108–9, and 111–17, and Reinhard, “Chavin and Tiahuanaco,” 415 (note 57). Both Kolata and Reinhard attach significance to the summit of Akapana as one of the few places where one can see the pilgrimage points and weather shrines of Lake Titicaca and the nearly 6,500 meter-high crest of Mount Illimani.


110. Kolata, Tiwanaku, 135, and Carlos Ponce Sanginés, Descripción
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FIG. 6.31. AYMARA CONCEPTIONS OF SPACE. Historical and archaeological studies of Aymara kingdoms surrounding Lake Titicaca demonstrate a social and territorial organization based on “double dualisms,” a geometric structure replicated in the iconographic organization of the Bennett Stela (see fig. 6.32). The axis of taypi (Lake Titicaca) separates the realms of urco from uma and alaa from manca.


and represented captured huacas and emblems of distant ethnic groups. Unfortunately, their original spatial arrangement will never be known; however, there are suggestions that they were topologically arranged around the Bennett Stela in a maplike display of Tiwanaku’s power and its conquests.

Two types of geometric organization on the Bennett Stela reflect Aymara conceptions of space (fig. 6.32). A horizontal procession of figure panels occurs at the top of the spine (headband) and another on top of the waistband. A vertical stack of figure panels occurs at the base of the spine. Horizontal strips of figure panels fuse symbols associated with pastoralism and agriculture, the cornerstones of the Tiwanaku subsistence economy. Each horizontal strip also has representative elements associated with high-elevation settings (urco), such as llamas, and low-elevation tropical biomes (uma), such as parrots. The two horizontal bands containing uma and urco referents are consistent with Aymara spatial dualism. The...

FIG. 6.32. INTERPRETATION OF THE BENNETT STELA AS A COSMOGRAM. The Bennett Stela is a graphic representation of space and time as perceived and controlled by the Tiwanaku peoples. At the bottom of the spine is a representation of the agricultural weather deity who resides at taypi, the precursor of the Inka deity Viracocha. The deity’s outstretched arms support two figures, one with tropical parrots signifying umasuyu on the right and another with llama heads symbolizing urcosuyu on the left. The role of taypi in mediating Tiwanaku social and territorial organization is represented by the spine, which organizes the thirty figures and other symbolic elements into the double dualisms of urco and uma, alaa and manca.


111. On the importance of huaca capture during Inka times, see Cobo, Inca Religion and Customs, 47, and idem, History of the Inca Empire, 187–88 and 191 (both note 25).


symmetrical nature of this horizontal imagery illustrates the parity of power between two moieties.

According to Zuidema, the Bennett Stela’s lower wrap has 177 circles, representing the number of days in six lunar (synodic) months. The thirty engraved figures signify the days in a solar month. He also interprets the cultivated and wild plants growing from the llamas as a symbol for the seasonal land rotation between pastoralists and agriculturalists. People with distinct headdresses, capes, and staffs—probably symbolizing the multiethnic groups composing the Tiwanaku state—meander across the shoulders and chest of the stela. The spatial symbolism and layout of the Bennett Stela suggest that the spine is taypi, or the place in the middle, probably Taypikala, and that it served to fuse social and cosmic divisions manifested spatially by the figures and symbolic elements as a hierarchical and harmonious whole.

Numerous house models have been found at Tiwanaku, probably amulets used in mapping rites performed within Taypikala. A variety of stone houses and whistles were recovered in and around Kalasasaya, another structural complex at Tiwanaku (fig. 6.33). The formal variability in carved cornices and doorways suggests that models like the one in figure 6.33 may represent houses from different regions. Stone house models would have been arranged around some referent during mapping rites to represent a particular locale. Similarly, according to the symbolism of the Bennett Stela, calendrical rites detailed seasonal access to land. Other rites might have called on the power of Puma Punka, one of the twin pyramids at Tiwanaku, to focus the blessings of supernatural forces and direct them to the locale signified by the house model arrangement.

Tiwanaku’s influence reached well beyond the Titycaca basin to Moquegua, Peru. Recent excavations at the Omo site have uncovered a ceremonial structure consisting of three courts and what appears to be a stone scale model of the temple’s upper court (fig. 6.34). Tiwanaku architectural features such as stairways, terraces, sunken courts, and platforms are in evidence at the site. This supports Goldstein’s thesis that the Omo site was an administrative satellite of Tiwanaku.

Arthur Posnansky believed the Tiwanaku people used a surveying device to align their civic-ceremonial archi-
Lines of sight

FIG. 6.35. PROPOSED TIWANAKU SURVEY INSTRUMENTS. Arthur Posnansky suggested that Tiwanaku surveyors used a device to lay out their capital city and to align civic-ceremonial architecture with the heavens. According to his speculative scheme, a pedestal is leveled by means of a water-filled container. Surveyors then anchored the appropriate length diopter into a drilled plate on top of the pedestal to obtain a line of sight.


A second type of surveying device may also have middle horizon origins. The Chimú kingdom and its capital of Chan Chan were fifteenth-century rivals to the Inkas. However, their rise to power began in the tenth century. About A.D. 1000, the Chimús constructed the longest intervallvalley irrigation canal in the New World. An unusual ceramic bowl found in the Virú Valley may have functioned as a surveying device for this and other public works projects. According to Charles Ortloff, instru-


ments that calibrated distance using a leveling bowl filled with water, sighting tube, and staff could have been used to construct the Chicama-Moche canal (fig. 6.37).
Although Ortloff's interpretation is speculative, staffs marked at regular intervals are common in middle horizon iconography and lend tangential support to his interpretation.  

INKA MAPMAKING

The writings of Spanish chroniclers intimate a well-developed and highly abstract system of mapping and mapmaking in Inka culture (ca. 1438–1532). The classic works often cited by Andean historians include the writings of the missionaries Bernabé Cobo (1580–1657) and Cristóbal de Molina (1494–1578); the government officials Juan Polo de Ondegardo (d. 1575) and Pedro Sarmiento de Gamboa (1532–1608?); and the conquistadores Pedro de Cieza de León (1518–60) and Juan de Betanzos (d. 1576), who married into an Inka royal family shortly after the conquest.  

This rich corpus of historical works is sometimes criticized for ethnocentric dis-
tortions and omissions, indiscriminate borrowing, and historical inconsistencies. We also have the serendipitous survival of manuscripts by two native Andean writers, Felipe Guaman Poma de Ayala and Juan de Santa Cruz Pachacuti Yamqui Salcamayhua, who wrote less than a century after the conquest. These works have the advantage of a native perspective, but they often shift tenses and mix Spanish with native languages and are thus difficult to interpret.

Perhaps the best-known chronicler is Garcilaso de la Vega (1539–1616), who was of mixed European and native descent. Although Garcilaso provides the most detail on Inka life, his writings suffer from internal inconsistencies, and his statements cannot always be corroborated by other evidence.

Native residents of Muina, a village five leagues south of Cuzco, constructed an ephemeral map of the Cuzco Valley for the Spaniard Damían de la Bandera, a census inspector from the royal chancery in Lima. Garcilaso apparently accompanied Bandera, and he described the map as follows:

I saw the model of Cuzco and part of the surrounding area in clay, pebbles, and sticks. It was done to scale with the squares, large and small; the streets, broad and narrow; the districts and houses, even the most obscure; and the three streams that flow through the city, marvelously executed. The countryside with high hills and low flats and ravines, rivers and streams with their twists and turns were all wonderfully rendered, and the best cosmographer in the world could not have done it better.

Garcilaso is prone to exaggeration. Yet Betanzos notes that the Spanish often relied on the geographic knowledge of Inka officials after the conquest. And as this chapter illustrates, ethnohistorical, ethnographic, and archaeological records all suggest that ephemeral maps—often created as part of a mapping rite rather than prompted by a European official—were widespread throughout the central Andes.

There are pitfalls in using historical documents, as illustrated by a debate concerning the urban plan of Cuzco and the role of puma imagery and metaphor. Some believe the layout of the central part of Cuzco has the shape of a giant puma. Betanzos and Sarmiento invoke the symbol of the lion (puma) when describing Cuzco. The toponym for the major river junction in Cuzco, Pumap Chupan, means “puma tail.” Zuidema argues that the puma is a symbol of the Inka body politic and a metaphor for Inka settlement of the Cuzco Valley. He also suggests that native toponyms incorporating puma anatomy are often associated with springs, rivers, and irrigation canals because of the animal’s symbolic association with water. Still others suggest that Cuzco’s relation to puma symbolism was inspired by sixteenth- and seventeenth-century European cartographic convention. This controversy demonstrates the many possible interpretations of historical information and the varied perspectives that may influence its compilation.

### THE INKA CEQUE SYSTEM

The ninth Inka king, Pachacuti Inka Yupanque (1391–1473?), planned Cuzco’s layout with figures of clay (maquetas), personally surveyed territorial apportionments, and designed Coricancha, the Inka Temple of the Sun. He is also credited with establishing the Inka ceque system, a set of forty-one sighting lines that radiated outward from Coricancha and organized the Inka system of huacas.

[He] outlined the city and had clay models made just as he planned to have it built. . . . [and] with his own hands, along with the rest of the lords of the city, had a cord brought; indicated and measured with the cord the lots and houses that were to be made and their foundations and structures. . . .

When the city was finished and made to perfection, Inca Yupanque ordered all the lords of Cuzco and the rest of its inhabitants to meet at a certain open field. After they assembled, he ordered that there be brought there the sketch of the city and the clay painting that


129. R. Tom Zuidema, “The Lion in the City: Royal Symbols of Transition in Cuzco,” Journal of Latin American Lore 9 (1983): 39–100, esp. 40–42 and 78–87. The Inkas equated the puma with the hydrologic cycle, since its sinuous tail mimics river bends while its reddish brown coat recalls the color of the sediment-laden river waters around Cuzco during the rainy season.

130. As exemplified, for example, by Nicolaas Visscher’s 1633 map titled Leo Hollandicus, sixteenth- and seventeenth-century European maps often stylized the political boundaries of a country as an animal. Monica Barnes and Daniel J. Siva, “El puma de Cuzco: ¿Plano de la ciudad Ynga o noción europea?” Revista Andina 11 (1993): 79–102.
he had ordered made. With this in front of him, he assigned the houses and lots already built.\footnote{131}

Certain families, lineages, and social classes were assigned to particular locales. Lineages were also assigned ritual responsibilities related to the upkeep of huacas and calendrical festivities. Pachacuti Inka Yupanque, in carefully welding society and territory within the Inka capital, essentially assumed the role of the Inka creator deity Viracocha in what could be viewed as a dramatic reenactment of the huaca origin myth.\footnote{132} Careful spatial reckoning of the landscape, ritual mapping, and mapmaking clearly were critical undertakings in both events.

Ceque organization was driven by territorial apportionment, topography, astronomy, and cultural history to points on and sometimes beyond the local horizon.\footnote{133} Water sources and Cuzco Valley hydrology account for the placement of most ceque lines and more than one-third of the huaca locations.\footnote{134} As elsewhere, canals and rivers in the Cuzco Valley often formed the territorial boundaries between sociopolitical groups. The land apportioned to each Cuzco Valley ayllu was reckoned with respect to canals and rivers and was surveyed with uniformly cut ropes.\footnote{135} Mountain passes and Inka roads were also important in anchoring the ceque system.\footnote{136} Few ceques exhibited astronomical alignments. However, certain ceques [non-Inka]. Suyus in turn were grouped into hanan (upper) and hurin (lower) Cuzco. The map on the left illustrates the area defined by all forty-one ceques, although certain ceques extended to the edge of the Inka empire.


\footnote{132. Molina, Fabulas y mitos, 58–134 (note 8).}

\footnote{133. R. Tom Zuidema, “Catachillay: The Role of the Pleiades and of the Southern Cross and α and β Centauri in the Calendar of the Incas,” in Ethnoastronomy and Archaeoastronomy in the American Tropics, ed. Anthony F. Aveni and Gary Urton (New York: New York Academy of Sciences, 1982), 203–29, esp. 204–11. Certain ceques are aligned with the rising and setting of celestial objects, although the only observations made from Coricancha were the December solstice sunset and the helical rising of the Pleiades. Ceques are also aligned with topographic features such as mountain passes and points of historical interest. For example, one ceque extends from Cuzco to Huanacauri to Vilcanota and finally to the ruins of Tiwanaku nearly three hundred kilometers away. These sites are all related to the birth of the sun in Inka origin myths. Not surprisingly, this ceque was an important pilgrimage route.}


\footnote{135. Examples of using ropes to measure space are recounted by Betanzos, Narrative of the Incas, 45 and 55 (note 123).}

\footnote{136. Zuidema, “Catachillay,” 206 (fig. 2) (note 133), and Rowe, “Shrines of Ancient Cuzco,” 3–4 (note 131).}
Inkas assigned these ritual responsibilities to particular ayllus and social groups. Ceques also constituted social and kinship boundaries.137

The ceque system, as presented above, is not without its critics. Some believe that the ceques are not straight, but zigzag across the landscape. It may, however, have been the cultural context that determined whether the Inkas viewed the ceque as a straight line (as a mental mapping or sighting line for two or more huacas sometimes on different ceques) or as an irregular line (as a ritual pathway that linked every huaca on a single ceque line).138 Questions of astronomical precision and the function of ceques in calendrical organization have led to better exchanges between various Andeanists.139 Finally, a few believe the ceque system is so complicated that it could not have adequately satisfied the purposes stated above.140 Nevertheless, the formulation and analysis of the ceque system, especially by Zuidema and Sherbondy, are far more compelling than the counterarguments of their critics. The importance of the ceque system to the history of Andean spatial representation is well articulated by Zuidema: "The visibility of all the ceques from one center meant that a person located in the Temple of the Sun had before him 'an open book.' The ceques organized space as a map and made the inspection of and reflection upon it as possible as if the person were seeing an actual map."141 Similarities between the ceque system and the Nazca ray centers include radial organization, ritual function, and the likely role of both structures in conceptually aligning important water sources.142

HUACAS IN THE CEQUE SYSTEM: CARVED LANDSCAPE MODELS AND MAPPING RITES

Some huacas in the ceque system were models of specific locations, especially stones and boulders that came from, or resembled, distant places.143 One huaca, for example, consisted of "three stones in representation of the Pachayachchic, Inti Illapa, and Punchau," all mountains associated with Viracocha in Inka creation myths. On the road of Antisuyu, one of the main boundaries of Cuzco and the Inka empire, one shrine was "shaped like the hill of Huanacauri" and was moved to the end of the road to


138. Molina, Fábulas y mitos, 127 (note 8), intimates that the ceques were straight lines for particular rites only. This implies that for other rites they zigzagged. For more on the linear irregularities of the ceque lines, see Susan A. Niles, Callachacas: Style and Status in an Inca Community (Iowa City: University of Iowa Press, 1987); Brian S. Bauer and David S. P. Dearborn, Astronomy and Empire in the Ancient Andes: The Cultural Origins of Inca Sky Watching (Austin: University of Texas Press, 1995), esp. 93–94, 97–98, and 130–33; and Brian S. Bauer, Hyslop, Inka Settlement Planning, 102–28 (note 16).
La Paccha elemento cultural pan-andino

Piedra

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of many carved stone landscapes found in the department of Cuzco. Miniature agricultural terraces, grooves representing rivers and irrigation canals, paths, gates, architectural platforms, and altars are found on the stone, suggesting it is a model of a real region. The built landscape is covered with fanciful creatures including monkeys, pumas, camelids, snakes, frogs, lizards, and crabs armed with arrows. The animals may represent geographic information in several possible ways: signifying toponyms or parajes; illustrating myths that are location specific; and representing boundaries. From Enrico Guidoni and Roberto Magni, The Andes (New York: Grosset and Dunlap, 1977), 127.

serve as a directional guide. On the road of Collasuyu, another hill-shaped huaca contained a mapleike arrangement of “many idols of all four suyus.”

Huacas were placed at critical points in the sacred geography of the Cuzco Valley and functioned as geographic referents and as portals to the other world during mapping rites. Beneath the huaca shrine in one of Guamán Poma’s illustrations are amulets representing prominent mountains and their spirits arranged as an ephemeral map of the Cuzco Valley (fig. 6.39). Topa Inka, the tenth Inka king, reflecting the Andean belief that specific mountains control the weather, asks the mountain spirits, “Who among you is saying, ‘Let it not rain, let it freeze, let it hail?’ Speak immediately.” The anticipated response requires an accurate spatial arrangement of the models. This implies that they represent local geography; the location of individual mountains must be understood.

The Inkas also carved boulders into landscape summaries, some of which were huacas. The most famous carved boulder is the Sayhuite Stone, on top of a terraced hill near Curahausi, about 190 kilometers from Cuzco. The Sayhuite Stone is purportedly a representation of the immediate river valley (fig. 6.40). Local canals, terraces, buildings, a plaza, roads, fountains or springs, and a possible reference to another carved boulder known as the Rumiwuasi Stone are all present.

Animal representatives from the realms of water, earth, and sky—such as amphibians, sea creatures, felines, and birds—are also shown, possibly signifying their role in water rituals or representing parajes or toponyms. Depictions on the stone of crabs carrying weapons also appear on Moche ceramic vessels and may represent the Inka appropriation of ancient myth on the north coast. Felines are often found adjacent to river and canal junctions on the Sayhuite Stone. This may refer to the Inka practice of placing puma skins at such junctions to act as territorial markers.

The Q’iniku (Kenko) Stone (fig. 6.41) is also near Cuzco and is said to commemorate the burial of the Inka ruler Inka Yupanque. Near the base of the Q’iniku Stone is a model of an unidentified royal sanctuary. The steps and grooves most likely represent the terracing and irrigation system of the Inkas, and in this sense it resembles the Sayhuite Stone.

The Piedra Cansada is another carved boulder mentioned by a number of early chroniclers. Also known as the Tired Stone because it came to rest at this location after a long journey, the Piedra Cansada was a huaca in the ceque system. Situated just north of Saqsahuaman, the boulder references both this great Inka fortress and the nearby irrigation and terracing system. Although it lacks the animism of the Sayhuite Stone and contains a number of geometric shapes that have yet to be deciphered, ethnohistoric accounts indicate that the Tired Stone is related to a royal ayllu of hanan (upper) Cuzco.

THE INKA ROAD SYSTEM

Although the primary purpose of the Inka road system was transport, it was also a conceptual device for Andean

FIG. 6.40. THE SAYHUITÉ STONE. The Sayhuite Stone is one of many carved stone landscapes found in the department of Cuzco. Miniature agricultural terraces, grooves representing rivers and irrigation canals, paths, gates, architectural platforms, and altars are found on the stone, suggesting it is a model of a real region. The built landscape is covered with fanciful creatures including monkeys, pumas, camelids, snakes, frogs, lizards, and crabs armed with arrows. The animals may represent geographic information in several possible ways: signifying toponyms or parajes; illustrating myths that are location specific; and representing boundaries. From Enrico Guidoni and Roberto Magni, The Andes (New York: Grosset and Dunlap, 1977), 127.

144. Rowe, “Shrines of Ancient Cuzco,” 21 (shrine Ch-4:8), 35 (shrine An-4:7), and 41 (shrine Co-2:2) (note 131).
149. Zuidema, “Lion in the City,” 95 (note 129).
cultural geography and an organizational reference for Andean spatial divisions. Four main roads connected the four corners of the empire, acted as territorial boundaries between the four suyus, and served as divisions for ceque enumeration. 154

Figure 6.42 illustrates an Inka road official on the road from Cuzco to the Pacific coast. Guaman Poma states that there were “specialized ones who measured and set measurements and marks by every road within the quarters.” 155 Stone markers were placed at a surveyed distance of one to one and one-half Spanish leagues, a length standardized across the empire by the eighth emperor Viracocha Inka (accession to throne A.D. 1400). 156 Such markers were used as territorial boundaries in regions adjacent to Inka roads. 157

THE KHIPU

Khipus (quipus) are knotted-string devices based on the hierarchical organization of data through a decimal system whereby information is positioned according to ones, tens, and hundreds. 158 The oldest khipus found date from

156. Hyslop, Inka Road System, 296–97 (note 7). Standardized measurements were relational for the Inkas. For example, the tupu is the amount of land area a childless couple needs to subsist depending on the productivity of the land. (The word tupu is used in other contexts to express distance.) Since the land’s productivity varied, the size of the measurement varied, even though the definition was the same. Why road distances varied is uncertain. However, travel distances are often related in temporal terms today; for example, point A is four hours’ walk from point B. Such temporal measurements—if a walk is four or five hours long, for instance—will also vary depending on the nature of the terrain, one’s speed, and other factors.
157. Betanzos, Narrative of the Incas, 110 and 120 (note 123); Cobo, History of the Inca Empire, 211 (note 25); Cieza de León, Incas of Pedro de Cieza de León, 137, 140, and 306 (note 123); and Sarmiento de Gamboa, Historia de los Incas, 193 (note 123) all discuss the road as a boundary marker.
158. Knotted cords have a worldwide distribution and are also prevalent throughout the native Americas. Most of the archaeologically recovered khipus come from elite graves and therefore do not represent the full range of khipu function. See Cyrus Lawrence Day, Quipus and
Inka administrators conceived of their domain through roads and described the location of peoples and places with respect to the Inka highway. As shown above, stone monuments along the highway marked critical points in the Inka road system and referenced the "tupu," a standardized measure of one to one and one-half leagues.

Size of the original: ca. 18 × 12 cm. Photograph courtesy of the Royal Library, Copenhagen (Nueva crónica y buen gobierno, fol. 354).

the middle horizon and probably evolved from conceptions of space, time, and recordkeeping in the early intermediate period (ca. 200 B.C.-A.D. 600). Guaman Poma refers to accounting, treasury, messenger, and astrological (astronomical) khipu secretaries. The khipu is so unlike European forms of representation that Guaman Poma identifies the first illustrated khipu in his work with a sign with the word "carta" written on it—a man holds in his right hand both a khipu and the placard (the only artifact in his folio to be labeled in this manner) (fig. 6.43). In Spanish, carta refers to a letter, document, chart, or map. Chroniclers wrote that khipus were artifacts that recorded historical events, census and tribute information, ceremonial rites and laws, calendrical information, and geographical narratives, and that they also served as maps.

Khipus are composed of a primary cord and a set of attached secondary strings or pendants (fig. 6.44). Any number of subsidiary strings can be attached to the pendant. Knots were usually tied on the pendant and subsidiary strings at regularly spaced positions reflecting a decimal organization. Color, thread type and weave, knot directionality, and other variables are also potentially important in interpreting khipus.

Early research stressed the number and hierarchical arrangement of strings as well as the positional sequence of knots—variables that are of primary interest. Khipu knots frequently occur in discrete clusters and represent the number of units in decimal placeholder categories. Pendant strings were often tied together by a knotted cord.
that summed up the value of each string in its group. More complex knots elevated the scale of enumeration to four, five, and even six figures, while an absence of knots meant zero. Some khipus lacked a summary cord but had numerical values relevant to solar years, the movements of Jupiter and Mercury, and possibly other celestial movements critical to an agricultural calendar. Henry Wassén compiled historical accounts suggesting that specialized Inka secretaries used khipus in conjunction with other media organized decimally, such as the abacal maize tablet (yupana) in figure 6.45.

Similarities between the khipu and the Inka ceque system have been noted by several scholars. A khipu map of the ceque system certainly existed at one time—Cristóbal de Molina states that he learned the toponyms, locations, and calendrical associations assigned to each of Cuzco’s 328 huacas from a khipu secretary (khipuca-mayo). Matienzo wrote that the Spanish chronicler Polo de Ondegardo learned of Cuzco’s huacas from khipus. Unfortunately, the khipu map of the ceque system has been lost, and neither Molina nor Matienzo provides enough detail to reconstruct this khipu map in its entirety. However, it is clear that the Inkas imposed the radial principles and functions of the ceque system throughout their empire.

The khipu illustrated in figure 6.44 may be a map of the landscape organization imposed on the Ica Valley of southern Peru. According to Zuidema, there are sixty-six pendant cords separated into seven groups. The first group contains six pendants; each one may have represented one of the six ayllus that lived at Ica during contact times. The Inka agricultural calendar assigned place-specific rituals to social groups during the interim between the first and second zenith passages of the sun. This period is latitude dependent. At the latitude of the Ica Valley (14.5°S), there are 104 days between the two zenith passages. This is the total sum recorded by the knots on the third, fourth, and fifth pendants. It is no coincidence that some yupanas have also been identified as architectural maquetas, perhaps signifying a geographically specific use for them. See Carlos Radicati di Primeglio, “Tablemos de escaques en el antiguo Perú,” and Hugo Pereyra Sánchez, “La yupana, complemento operacional del khipu,” both in Quipu y yupana: Colección de escritos, ed. Carol Mackey et al. (Lima: Consejo Nacional de Ciencia y Tecnología, 1990), 121-123 and 128 (note 8).


165. Henry Wassén, “El antiguo abaco peruano según el manuscrito de Guaman Poma,” Etnologiska Studier 11 (1940): 1-30; idem, “The Ancient Peruvian Abacus,” in Origin of the Indian Civilizations in South America, ed. Erland Nordenskiöld, Comparative Ethnographical Studies, vol. 9 (1931; reprinted New York: AMS Press, 1979), 189-205; and Ortloff, “Surveying and Hydraulic Engineering,” 70-72 (note 121). Yupanas have been found throughout the central Andes, and several calculation methods have been attributed to them. It may be significant that some yupanas have also been identified as architectural maquetas, perhaps signifying a geographically specific use for them.


167. Molina, Fabulas y mitos, 122-23 and 128 (note 8).


incidence that the pendants are consecutive, since they signify the topological order of ayllus belonging to the moiety responsible for interzenith calendrical rituals. The total value recorded in the knots of pendants six, one, and two equals 178—one unit more than the number of days in six synodic lunar months. This signifies the calendrical responsibilities of the other moiety plus a calendrical correction factor. One may read these pendants as a topological sequence when the khipu is laid out flat.

Martti Pärssinen has proposed a second kind of khipu map, one not related to the Inka calendar or the ceque system. According to Pärssinen's hypothesis, geographic information can be numerically encoded on a khipu. Chroniclers note that every main town of an Inka province had an assigned number. A colonial document describes the tour of conquered provinces by Topa Inka between 1485 and 1489. This tour may be based on a native narration from a khipu, because the document consistently lists the location, event, and persons accompanying Topa Inka in that order—just as khipus always retain the same order of hierarchical categories.

As illustrated in figure 6.46, the sentence, “He conquered the province of the Paltas and then the valley of Pacasmayo” can be mapped on a khipu. Since provincial capitals are identified by numbers, the two subsidiary strands on the khipu's right side could record the number twenty-two for Palta and twenty-one for Chan Chan. The Pacasmayo Valley is not a provincial capital, but both the place-name and its location can still be recorded on the khipu by phonetically recording the Quechua syllables Pa-cas-mayo. Each subsidiary string could represent a category, such as “cultivated plants.” A numerical value on that string would represent a particular item such as potatoes (papa). The word papa would then be linked phonetically with other words on the khipu to create a toponym. The Pacasmayo Valley is between Palta and Chan Chan, as signified by the joining of the Pacas-


173. John V. Murea, Formaciones economicas y politicas del mundo andino (Lima: Instituto de Estudios Peruanos, 1975), 243–54, describes a 1561 ledger recording transactions in goods between Europeans and the Inkas. The types of categories and the sequence of items within those categories remain consistent with relatively few exceptions.
design blocks repeat at irregular intervals, with individual blocks probably representing specific sociopolitical groups. **Tocapu** iconography appears to express political and cosmological information. Guaman Poma frequently illustrates tunics, mantles, and waistbands that display **tocapu** designs (see the waistband in fig. 6.39, for example) throughout his letter to the king of Spain. Important personages wear garments with **tocapu** designs during ceque festivals and rituals at **huacas**.

Several sixteenth-century Spanish writers attest to the careful and exacting work that went into producing **tocapu**. They also note that **tocapu** abstractions were used with other graphic devices, and together they recorded social, historical, or other information. Zuidema suggests that because certain individual blocks are miniature representations of larger textiles, the irregular repetition of blocks could reflect a “horizontal concept . . . which might lead to a geographic pattern of the actual distribution of **huacas** and their social groups.” The arrangement of **tocapu** designs as grids also suggests some type of geographic relation—perhaps a listing of locations analogous to Mesoamerican cadastral maps.

**MAPS IN NATIVE MANUSCRIPTS**

Santa Cruz Pachacuti’s work about Peru’s ancient kings was completed in 1613. His style of writing and representation is very different from that of his Andean contemporary Guaman Poma. In Guaman Poma’s letter to the king of Spain, which was primarily a plea for kinder treatment of his people by colonial overlords, he adopted certain European conventions, such as the separation of imagery and text, for his presentation of Andean life to European audiences. Conversely, as illustrated in figures 6.47 and 6.48, Santa Cruz Pachacuti did not distinguish between text and image.

Figure 6.47 illustrates the house of Manco Capac, the semimythical Inka king who conquered the upper and lower kingdoms of the Cuzco Valley and founded the Inka dynasty at Pacariqtambo in the mid-thirteenth cen-

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**FIG. 6.46. THE KHIPU AS A MAP OF THE PACASMAYO VALLEY.** Martti Pärsisnien has suggested a method whereby the khipu could function as a map. The Inkas assigned numbers to all provincial capitals within the empire. Toponyms would consist of syllables derived from categories of production, culture-historical events, and many other possible geographic descriptors. Strands on the right side of the khipu indicate the category of provincial capitals. Numbers assigned to the capitals are represented by knots in the tens (Xs) and ones (dots) positions. The number twenty-two is the provincial number for Palta, and twenty-one stands for Chan Chan. Each strand on the left side would correspond to a general category of goods, such as “cultivated plants.” Specific items in each category would be recognized according to their assigned numbers. For instance, potato (papa) would be recognized by the number three on the “cultivated plants” strand. Place-names would be formed by joining the syllables of each item together phonetically, and the location of the place would be relative to the provincial capitals. Pacasmayo is between Palta and Chan Chan.


**PA-CAS-MAYO** 

**TOCAPU DESIGNS**

**Tocapu** designs are rectangles that contain abstract geometric designs and are often arranged as a grid. **Tocapu**
The figure portrays the welding of geographic location and ancestry that is the conceptual heart of the ayllu. In keeping with Andean modes of representation, the imagery stresses metaphorical associations over mimetic iconography, such as the trees for ancestry and the squares for geographical place. Manco Capac’s mimetic iconography, such as the trees for ancestry and social and territorial partitioning of Cuzco’s ceque system and the Inka empire. The dual organization of Cuzco’s moieties is symbolized by the left and right lower caves, dual descent through the silver and gold trees. The three classes of ayllus are represented by the division of each of the caves into three parts. Finally, the land of the four quarters is signified by the four corners of the diamond in the central square, which also defines a space in the middle, surely a reference to Cuzco.

Santa Cruz Pachacuti drew a profile view of one of Coricancha’s walls and used symbols and scenes to convey the meanings encoded in the temple’s architecture and its associated artifacts and civic-ceremonial rituals (figs. 6.48 and 6.49). The message of the map of Coricancha is clear—it is the focal point from which social and natural order emanates and an architectural codification fostering a spatial and temporal understanding of the Inka world. The cosmographic order of the Inkas expressed on the wall at Coricancha has been analyzed under several different, though not mutually exclusive, rubrics. These include the hydrologic cycle, gender parallelism, astronomy, and ritual. Guaman Poma’s account of Andean cities and towns includes a map of the Inka realm and the Spanish conquest combining Western and native cartographic precepts (fig. 6.50). His choice of map signs and organization is designed to illustrate parallels between Inka and European societies. For example, both the Inkas and the Spaniards had heraldic icons that welded landscape and lineage by their symbolism. The importance of heraldry to Guaman Poma is shown by the presence of a coat of arms in the first folio of his letter and throughout his petition. Another commonality is the organization of geographic relations by means of intersecting sets of lines, manifest in both the European system of longitude and latitude and the grid shown in figure 6.50.

Guaman Poma apparently believed that the grid, as well as the circle, was a universal form of spatial organization. His representation of the pontifical world demonstrates this point (fig. 6.51). The upper panel of the figure illustrates five towns and mountains, with the city of Cuzco labeled at the center. The lower panel shows Castilla (Spain) as a land of four parts organized around

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180. The Pacaritambo myth contains a wealth of information concerning specific places and geographic relations. Urton identifies Tampu T’oco with the archaeological site of Pumauru and believes that the modern town of Yariguí represents the mythical Haysquisro. In one version of the myth, ten sociopolitical groups follow Manco Capac from Tampu T’oco. Their names and houses are synonymous with the Inka classes that managed Cuzco’s irrigation districts. The Pacaritambo myth, and also the map of Manco Capac’s house, well illustrate the intertwining of myth and history that dominates Inka oral traditions and representations. Pacaritambo is also an important huaca in the Cuzco ceque system. See Gary Urton, History of a Myth: Pacaritambo and the Origin of the Inkas (Austin: University of Texas Press, 1990), 18–40; Zuidema, Inca Civilization, 10–22 (note 137); and Rowe, “Shrines of Ancient Cuzco,” 47 (shrine Co-6:7) (note 131).


Photograph courtesy of the Biblioteca Nacional, Madrid (MS. 3169, fol. 13v).

FIG. 6.48. THE TEMPLE OF CORICANCHA, 1613. Native chronicler Juan de Santa Cruz Pachacuti Yamqui Salcamayhua drew this profile view of one of Coricancha’s walls to illustrate how the Inkas spatially and socially ordered their environment. See figure 6.49.
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FIG. 6.49. THE SYMBOLISM OF THE WALL AT CORICANCHA (FIG. 6.48). Nine of the symbols and scenes identified in figure 6.48 are astronomical and include representations of the sun, moon, planets (the morning star and evening star), single stars, asterisms, and constellations. The Pillcomayo River (Pilcomayo?) flows from a representation of the pacha mama, or earth mother. The earth is shown as a disk, rotated to aid its identification, with mountains illustrated in profile. Above the Pillcomayo is a lightning bolt. At the base of the temple a man and woman stand above a grid representing the surface of the earth. To the right of the woman is a representation of water, or more likely a reservoir (estanque) for an irrigation system.

a powerful center just as the four Inka suyus are organized around Cuzco in figure 6.50. Two panels are stacked in a manner reminiscent of the dual division of Cuzco (see fig. 6.38 above). It is the Andean world that occupies the position of hanan Cuzco, the locus of power in Inka times. Perhaps this upper and lower ordering of Cuzco and Castilla symbolizes indigenous resistance to colonial rule.

CONCLUSION

Geography, history, social relations, kinship, astronomy, and mythology were all intertwined in Andean culture at the time of the Spanish conquest. Such cultural complexity, coupled with the enormous Inka administrative duties over a huge area, necessitated an accommodating and highly abstract system for charting real and imagined worlds. Yet the systematic expression of spatial knowledge was in place in the central Andes long before the Inkas. Since Chavín times, various manifestations of Andean cultures have been recognized: territorial access to land, resources, water, and agricultural landscapes; the redistribution and trade of precious and staple goods; militarism; labor obligations to elite personages; and the invoking of preterhuman and extramundane forces to influence the world order.

Researchers have only rarely broached the subject of maps in their analyses of Andean symbol systems and representations. Indeed, how does one recognize a map when the rules of graphic representation and the conception of geographic relations are so very different from the European experience? In this chapter modern ethnographic analogies have been used to develop possible themes of Andean spatial representation. The welding of society and landscape in the concept of the ayllu, the use of ancestors and huacas to legitimize the territorial order, the abstraction of landscape into a single object or sign, and the geometric structuring of geographic relations are all critical to understanding the role of spatial representation and landscape depiction in central Andean cultures.

The organization of signs and icons into radial, parallel strip, or gridlike geometries can structure the representation of geographic relations in Andean thought. These geometric structures are found in agricultural landholding patterns and are inspired by bioclimatic life zones and celestial movements. Parallel strips are the most common geometric structure found in Andean spatial representations. This structure has an early expression in the two caimans of the Tello Obelisk and some of its stacked figure panels. Other examples include the four parallel strips representing ayllu landholdings on the Paracas polychrome mantle and the two parallel strips of figure panels symbolizing elements of uma and urco on the Bennett Stela. The use of parallel strips to illustrate geographic relations is well documented in ethnography, as illustrated by the location of rivers and canals on modern peasant maps of the shores of Lake Titicaca, the vertical and horizontal design bands on Quinua ceramics, a Qheswa pallay textile signifying agricultural zones, and the differentiation of mountains from valleys and exterior from interior worlds on Q'ero pallay textiles. Parallel strips represent the sequential arrangement of ayllu landholdings in chhuitas mapping rites in Pacariqambo.

The grid forms a conceptual subcategory of parallel strips. An early archaeological manifestation of the grid is the block of severed heads as souls signifying agricultural landholdings on Nasca chieftain vessels. The grid is closely related to Inka decimal organization, as reflected in the abacal maize tablet (visible in figure 6.45) and in tocapi designs. Santa Cruz Pachacuti represents the surface of the earth as a grid in his drawing of the temple at Coricancha, and Guamán Poma's mappamundi demonstrates conceptual parallels between the European use of longitude and latitude and a grid.

The Nazca ray center geoglyphs are perhaps the earliest archaeological expression of radial landscape organization, although the Inka ceque system is the most fa-
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Map of the Inka Empire drawn by Felipe Guaman Poma de Ayala. Guaman Poma’s map of the Spanish conquest of the Inka empire incorporates both Inka modes of representation and Western cartographic conventions. The four quarters of the Inka empire (Antisuyu, Collasuyu, Condesuyu, and Chinchasuyu) are clearly labeled, reinforcing Inka spatial divisions. The intersecting parallel lines are an obvious—though misplaced—reference to the European system of longitude and latitude. Coats of arms lie adjacent to cities. At the bottom of the map are Spanish ships and the fanciful sea creatures so often depicted on sixteenth- and seventeenth-century European maps. Guaman Poma’s map serves as a link between these two cultures.

Size of the original: ca. 18 x 24 cm. Photograph courtesy of the Royal Library, Copenhagen (Nueva cronica y buen gobierno, fol. 983-84).

Monuments depicting geographic relations or objects may also have served as geographic referents during ancient mapping rites. Examples include the Tello Obelisk, the Bennett Stela, and huacas or carved stone landscapes in the Inka ceque system. House models and maquetas are common in the archaeological record and are perhaps analogous to Chuquito mapping amulets. Examples of mapping amulets include house models, landscape vessels, maquetas, and the mountain spirit amulets depicted in Topa Inka’s weather rite.

Since membership in an ayllu is often based on real or fictive descent, depicting ancestors is one important way of representing and thus legitimizing territorial access and landholdings. Ancestor imagery is strongly developed along the south coast of Peru, as reflected in the masks found on a Paracas vessel that differentiated households, the Paracas spirit map, and the severed head as soul motif representing ayllu landholdings. The cultural importance of ancestors is independent of political bureaucracy, as illustrated by the drawing of the house of Manco Capac and the depiction of Inkarrí on a modern Q’ero textile.

Representations of people and animals are often metaphors for the idealized landscape. Caimans represent the realms of earth and sky on the Tello Obelisk. Protrusions on the Nasca chieftain vessel correspond to Andean metaphors for topographic features affecting the flow of water, and carved boulders often depict animals, which may correspond to toponyms or specific resource zones.
Andean artifacts and representations are rarely analyzed as geographic representations or as symbolic manifestations of Andean spatial thought. The purpose of this chapter is to open the door to the possibility that this interpretation can shed light on the conceptions of geographic relations in Andean thought, presented in the context of Andean cultural ecology and cultural history.