new lines of evidence. First, Sergio Herrera’s neutron activation sourcing studies pinpoint the source of widely traded decorated pottery with “X complex” motifs (Grove 1989a) in the San Lorenzo region (Herrera et al. 1998, 1999; Blomster, Neff, and Glascock 2005), which perhaps hints at the ideological origins of these motifs. Second, the early sunken patio at San Lorenzo, emulated in later architecture in both the highlands and lowlands, indicates that something more complex than the sharing of pottery motifs and a restricted trade in portable objects was happening in the highlands during the Early Preclassic period. Exactly how and why cosmological and perhaps sociopolitical concepts were transmitted and assimilated into architecture remain to be clarified by future research. However, these data suggest that the dismissal of a profound early coastal influence on highland development must be evaluated once again.

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A Land That Tastes of Water

ANN CYPHERS AND JUDITH ZURITA-NOGUERA

Water set the basic rhythms of Olmec life. Beyond its role as a vital resource, water conditioned and helped shape human settlement, and its use and management reflect social differences. The importance of water in the heartland (fig. 2.1) is well illustrated by the titles of publications by eminent Olmec scholars, such as “Finding Jewels of Jade in a Mexican Swamp” (Stirling and Stirling 1942). Alfonso Caso (1965:12) once called the region the “Mesopotamia of the Americas.” Indeed, Enrique Cárdenas wrote poetically of the essence of the vast riverine plains, home of the Olmec capitals: “Centro y movimiento de la región, el río Coatzacoalcos lo llena todo. Arborescente, radicular, serpiente misma, corre como vértebra estructural por un país donde el ámbito natural sabe a agua” [Center and movement of the region, the Coatzacoalcos river fills all. Forested, radicular, itself a serpent, it runs as a spinal column through a land that tastes of water] (1986:14, our translation).

Environmental descriptions recognizing the overwhelming presence of water in the Gulf lowlands of the Mexican states of southern Veracruz and western Tabasco sometimes create an impression of a uniform environment. For example, Bernal states, “The Olmec rivers run through flat jungle land, and their flooding, except in small areas, is more harmful than profitable in a society which cannot control these avalanches of water. Thus not only the swamps but the savannas . . . are useless to a rather primitive agriculture” (1969:20). However, the great diversity in this humid, tropical region, previously thought insufficient to sustain the development of civilization, was a superlative asset to the Olmec. Their adaptation, shaped in many ways by water, enabled them to achieve and sustain social complexity in a unique manner.

We will attempt to discern aspects of their early regional adaptation and integration by examining environmental and settlement informa-
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Fig. 2.1 The location of Olmec sites in relation to rivers and other geographical features. The numbers refer to the following sites:

1. San Lorenzo
2. Loma del Zapote
3. Estero Rabón
4. El Remolino
5. Teneochtitlan
6. Ixhuatlan
7. Arroyo Sonso
8. Emilio Carranza
9. Chiquipixta
10. La Oaxaquena
11. Las Limas
12. El Manati
13. La Merced
14. Laguna de los Cerros
15. Cuatotolapan
16. Cruz del Milagro

17. La Isla
18. El Cardonal
19. Loma de la Piedra
20. Llano del Jicaro
21. Los Mangos
22. Zapotitlan
23. Pajapan
24. La Venta
25. Tres Zapotes
26. El Marquesillo
27. Santa María Uxpanapa (Antonio Plaza)
28. Los Soldados
29. Ahuatepec
30. Ojo de Agua
31. El Nuevo Órgano
32. Piedra Labrada

Monumentation in conjunction with the distribution of specific kinds of stone monuments. Given the spottiness of regional archaeological coverage, our review can only point out preliminary indicators of diachronic processes and mechanisms. The starting point for our analysis is settlement studies conducted by the San Lorenzo Teneochtitlan Archaeological Project (Borst 2001; Cyphers and Borstein n.d.; Symonds, Cyphers, and Lunagómez 2002) in combination with geomorphological studies (Ortiz Pérez and Cyphers 1997) that show the relationship of site location to extinct waterways and other natural features. The Early Preclassic (1500–800 BC) settlement patterns around San Lorenzo first are examined in relation to environment and subsistence, followed by the settlement hierarchy framed in terms of transportation and communication lines and the occurrence of stone monuments. These sections illustrate essential patterns and principles that subsequently will be traced over a wider area.

Next, monolithic stone thrones provide the basis for further considerations of hierarchy around San Lorenzo. Then, by pinpointing isolated occurrences of stone sculpture, the locational principles operative around San Lorenzo are suggested to be applicable to a larger area, and a number of alternative explanations for this widespread distribution are considered.

Although criticized as an inadequate marker of sociopolitical importance (Grove et al. 1993), stone monuments often are the yardstick by which the relative importance of Olmec sites is measured. In accord with Symonds, Cyphers, and Lunagómez (2002), the number and type of monuments constitute essential knowledge for understanding the Olmec, often characterized as America’s first civilization (Coe 1968). There is little doubt in our minds that stone monument frequency indicates relative site importance in the settlement hierarchy (e.g., 129 at San Lorenzo, 15 at Loma del Zapote, 8 at Estero Rabón, 5 at Teneochtitlan, and 2 at El Remolino). By gathering together the information on settlement location in some explored and other relatively unexplored portions of the Gulf Coast, we relate the spatial distribution of certain types of stone sculpture to the scale and levels of sociopolitical integration.

Using their profound understanding of the natural landscape, the Olmec structured settlement distribution for subsistence purposes, transportation, and communication. Their particular framework for managing the natural and human environment appears particularly conducive to encouraging social cohesion and economic and political integration.
Water, Land, and Subsistence

Systematic and intensive survey coverage in the Olmec world (fig. 2.1) is uneven, yet extant studies (e.g., Borstein 2001; Cyphers and Alonso 1999; Cyphers and Borstein n.d.; Lunagómez 1999; Rust and Sharer 1988; Sisson 1976; Symonds, Cyphers, and Lunagómez 2002; von Nagy 1997) show that the dynamic behavior of the great deltaic plains is key to understanding how this particular environment conditioned ancient behaviors (see Jiménez 1990; von Nagy 1997; Ortiz Pérez and Cyphers 1997; West, Psuty, and Thom 1969). The following summary, based on Symonds, Cyphers, and Lunagómez (2002), shows how settlement development and subsistence were influenced by these characteristics in the San Lorenzo region.

By 1200 BC San Lorenzo had become a 20-hectare village located on an island vantage point circumscribed by river courses and vast alluvial plains (Ortiz Pérez and Cyphers 1997). The other twenty-nine permanent sites in the 400-square-kilometer survey area show a preference for elevated ground emerging from the seasonally flooded bottomlands, especially the large promontories and slightly elevated spots near fluvial courses. Clearly, there was an interest in strategic places near river confluences and crossings. Of the 105 sites, 76 may have been seasonal occupations. At this time the low population level, estimated at 426–1,017 people, and the relative abundance of cultivable lands and aquatic resources precluded severe competition, a situation that would change after 1000 BC.

Despite poor botanical macroremain preservation in these early phases (prior to 1200 BC), preliminary phytolith analyses identify maize and/or other wild edible grasses (Zurita-Noguera 1997). The settlement pattern suggests the use of two terrains, the high ground above the flood line for swidden cultivation and the low floodplains for recession agriculture. Maize cultivation also was possible on point-bar formations and ancient levees rising above normal flood line and adjacent to scars of ancient river channels (Ortiz Pérez and Cyphers 1997).

Six campsites in the floodplains likely are related to seasonal subsistence collecting, and the location of another sixteen campsites on all other types of terrain above flood level is a pattern typical of regions characterized by the swidden fallow-cultivation cycle. The low campsite frequency indicates that swidden agricultural input in the subsistence regime was considerably less than that of floodplain strategies.

Prior to 1200 BC alluvial plain exploitation for subsistence activities was accomplished from the vantage points of fifty-four islotes. These low, artificial earthen bases were built near river courses to take advantage of the slightly higher levee elevation. They protected the structures on their upper surface from increasing water levels and provided shelter for the people exploiting the natural resources of the floodplains. Symonds, Cyphers, and Lunagómez (2002) conservatively propose islotes as seasonal occupations. The creation of forty-seven islotes just north of San Lorenzo established rights to special spots in the island’s floodplains as part of what appears to be a planned subsistence strategy designed to intensively exploit a specialized econiche for fishing, hunting, collecting, and recession agriculture.

The islotes, the hydrologic cycle of the plains, and the material assemblage provide important clues to the complexity of early lowland riverine subsistence strategies. The northern alluvial plain is today drier and less fertile than in the past, in part due to a modern road built upon a dike-like construction that dates to the late 1980s. As little as twenty-five years ago, during flooding it would convert to a veritable sea, and the renewing force of the floods brought in sediments and large quantities of fauna to the plain. Upon recession of the water the soil fertility was renovated, and fish and turtles trapped in depressed portions could be easily harvested. The seasonal variation in water levels affects the availability, types, and quantities of fish, turtles, shellfish, and waterfowl, which could have been effectively exploited from the islotes. The subsistence importance of several aquatic protein resources lies in their potential as food reserves. For example, turtles can be held in captivity for months. Also, even though the preservation of animal protein by salting and drying is not feasible in the humid tropics, smoking is effective.

The location of islotes also was optimal for agriculture in the low floodplains. With the onset of the hot dry months of the year (starting in March), the gradual drying of portions of the floodplain left highly fertile, humic soils where recession agricultural techniques could be practiced. Today in Tabasco this type of agriculture, called the marceño cycle, continues to be practiced (Mariaca Méndez 1996). Regarding ancient crop scheduling, it is important to note that the timing of the maize harvest in the floodplains is coincident with the preparations for maize cultivation on high ground during the rainy season, which begins in June.

The settlement study shows that in the next phase, between 1200 and 800 BC, the regional center of San Lorenzo dominated six other types of permanent sites, complemented by two kinds of seasonal sites. Mean population development accelerated at San Lorenzo, eventually reaching its maximum of fifty-five hundred people. The remaining population within the survey area, more than eight thousand people, was distributed among the other ninety-eight permanent communities. The largest popu-
lation concentration was on the San Lorenzo island, with nearly eleven thousand residents (including San Lorenzo).

Throughout the study region swidden campsites more than doubled in frequency, from twenty-two in the previous phase to forty-six, with clear clustering around permanent villages. An accompanying increase in large hamlets may reflect fissioning and the growth of daughter communities. At the same time, isolates increased in number to eighty-one, but their frequency decreased with regard to permanent sites. These simultaneous trends may indicate that upland swidden agriculture gained in importance even as wetland cultivation and aquatic resource exploitation continued.²

Settlement in the wetlands appears to have focused on recession maize agriculture and wild resource collecting, especially aquatic fauna. In contrast to the higher areas (which were progressively deforested), the alluvial plains generally were not as susceptible to overexploitation due to the renovating hydrologic cycle. In times of persistent drought the varied products of the swampy plains could provide important subsistence relief.

The perennial floral and faunal products of the plains constituted important food reserves for agriculturalists planting high-risk crops with low productivity, such as maize. With regard to aquatic protein resources, we know that fish in Olmec times were much larger than those caught today (B. Zuñiga, personal communication, 2003), so that modern productivity is not useful for comparison due to the effects of overexploitation and river contamination. Faunal identifications show a heavy reliance on aquatic protein sources (Wing 1980; Zuñiga n.d.). Uniquely designed hearths found on the isolates (Symonds, Cyphers, and Lunagómez 2002:43; Vega 1999) seem appropriate for smoking fish, which will preserve for about thirty days. Further data are required to determine if the scale of their procurement could have exceeded local needs such that their exportation, particularly to the neighboring uplands, could have constituted a potential base for economic development.

Root crops have been proposed as possible early Olmec mainstays (Coe and Diehl 1980, 2:84–85, 144). If a manioc diet is not supplemented by animal protein, however, certain dietary deficiencies will develop (Lathrap 1970:49). Throughout most of the area the abundance of animal protein would have precluded such problems. Interestingly, early microbotanical evidence for manioc recently has been identified near La Venta (Pope et al. 2001). One root crop, known as malanga (Xanthosoma violaceum), grows well in humid, permeable terrain such as depressions, slopes, and ravines near permanent water sources but not in water-logged areas. Requiring drier ground for its cultivation is manioc (Manihot sp.); its staggered planting can insure year-round availability and in-ground storage. These requirements indicate that the Olmec of San Lorenzo would not have produced root crops in the adjacent floodplains but may have done so in the higher areas.

As population rapidly grew from 1200 to 800 BC, the progressive reduction of cultivable high ground on the island probably diminished the availability of local foodstuffs. Maize production necessarily would have been concentrated mostly on the floodplains and levees. We would expect an increasing tendency for infeld garden plots, particularly appropriate for root crops, which generally are appreciated for their high yield, perennial availability, and in-ground storage potential. Recent phytolith identifications of manioc in habitation areas of San Lorenzo (Judith Zurita and Irwin Rovner, personal communication, 2000) may support this idea.

Water, Transportation, and Hierarchy

Land travel in the immediate San Lorenzo area is mandated in large part by geography. The high ground bisecting the island location of the capital and the low linked promontories to the northeast afford the only waterfree sections in the ample floodplains in the immediate area. The natural characteristics of the broad plains of the lower Coatzacoalcos drainage, crossed by numerous navigable river courses and dotted by strands of higher ground, lent itself to the development of a transportation system that helped structure the relationship between the capital and its hinterland. Necessary for the efficient movement of goods and people was the management of transportation and communication routes, particularly locations at fluvial confluences, fording points, passes, and the intersection of land and water routes (fig. 2.2). Notably, at the most important locations secondary centers and stone monuments echo the settlement hierarchy.

The San Lorenzo island was geographically favored by its central position in a semiradial system of converging river tributaries. Located on the island's highest ground, San Lorenzo boasts 129 stone monuments whose size varies from colossal to small. Large sites, also with stone monuments, sit on high ground at the northern tip of the island: El Remolino is characterized by two large stone columns, and Tenochtitlan has five medium-size stone sculptures (Coe and Diehl 1980; Stirling 1955).

At the southern tip of the island Loma del Zapote, a secondary center guarding the north bank of the pass cutting through the high grounds, is
Zapote and Las Camelias were in the perfect position to control water and land passage (see fig. 2.2).

Off the island and to the southwest of San Lorenzo, another secondary center, Estero Rabón, grew at another key upriver confluence (Borstein 2001; Cyphers and Borstein n.d.; Symonds, Cyphers, and Lunagómez 2002), that of the ancient Rabón with the Juile River, which in turn joined the Tatagapa drainage that circumvented the San Lorenzo island on the west (see fig. 2.2). Among its eight stone monuments a small throne, nearly identical in some ways to the one at Loma del Zapote, almost seems to be a metaphor for secondary political position.

The role of these sites in transportation routes is indicated by their key geographical and locational features. The absence of land-based transportation works should not eliminate their consideration as loci for societal integration. With regard to road works, it has been shown that a constant relationship does not necessarily exist between political complexity and increased technological elaboration of roads, yet, importantly, the characteristics of a road system do provide minimum standards for political organization (Hassig 1991:24; cf. Earle 1991:15). By the same token, we believe that naturally endowed circuits also may have the same effect on regional transportation organization.

Transportation networks designed according to natural fluvial and terrestrial pathways may be one basis for political and economic development (see Hassig 1985:211–19), as appears to be the case in the deltaic plain of the lower Coatzaocoalcos River, where the nature of the topography and of the hydrology conditions settlement by leaving little alternative for the location of communication routes. The selective layout of planned routes is suggested by the patterning of key site locations at fluvial intersections and the causeways.

**Stone Icons and Hierarchy**

Following the interpretations of numerous authors (e.g., Bernal 1969; Clark and Pérez 1994; Coe 1965b, 1968, 1972; Coe and Diehl 1980; de la Fuente 1981; Drucker 1952; Furst 1968; Grove 1970, 1973; Joralemon 1971; Taube 1996), the meaning of Olmec stone sculptures clearly is not monolithic but rather is diverse. Likewise, their functions vary, with some placed as political emblems in strategic sites in the settlement system. The Olmec frequently incorporated water ideology into political messages (see Grove 1970, 1973).

Thrones are an icon of rulership, as demonstrated by Grove (1970, 1973), and their distribution in the San Lorenzo hinterland is noticeably
restricted. On the basis of the sculptural style of the two small thrones, LZ-2 and ER-8, and the chronological study of the two secondary centers where they were found, Loma del Zapote and Estero Rabón, we consider these monuments to be largely contemporary in San Lorenzo’s apogee phase (1200–800 BC). Their spatial occurrence, mirroring the settlement hierarchy (fig. 2.3), suggests they may have functioned as important politico-administrative emblems (Cyphers 2004; see Cyphers et al., this volume).

Thrones in general share a basic form, although size varies considerably, with large thrones found only at regional centers. The emblematic nature of throne size is further highlighted by other legitimizing symbols. According to Grove (1970, 1973), the right to rule is verified by two elements: (1) the “jaguar monster” (or earth monster), represented on the upper ledge; and (2) the divine ancestor, emerging from the mythical ori-

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gin cave on the front of the throne. However, since these elements do not coexist on all thrones, their meanings must differ slightly. The correlation between these stone monuments and settlement hierarchy in the San Lorenzo hinterland provides insight into the differential significance of the elements defined by Grove.

The throne from the secondary center of Loma del Zapote, LZ-2, in the San Lorenzo settlement system, is worthy of note insofar as it lacks the representation of the divine ancestor in the cave. In its stead two dwarfs are shown in high relief on the flat frontal face of the piece. It does, however, show abstract earth monster motifs on the ledge. We believe that the lack of co-occurrence of the two elements in this piece indicates that earth monster motifs were used as a symbol of office (along with the size and shape of the throne). The absence of the divine descent elements may indicate that the Loma del Zapote ruler could not presume sacred ancestry, as did the maximum rulers of the capital, and may have been designated by the capital and/or occupied the throne by right of marriage.

The throne from Estero Rabón, ER-8 (unfortunately missing the lower portion), may have been a twin to LZ-2, since its ledge dimensions vary only by a few centimeters and it shows identical jaguar monster symbolism. The similarity in size, coupled with the shared symbolism, of LZ-2 and ER-8 points to certain status equivalence between the rulers of two secondary sites, each located at a key river junction.

Based on the pattern around San Lorenzo, the heads of lesser Early Preclassic centers possessed appropriate icons of rulership, the small- to medium-size thrones that symbolize their hierarchical position in the region. When such thrones lack the iconography that refers to the principle of divine descent (sacred ancestor), we suggest that corresponding secondary rulers pertain to subordinate lineages. In other thrones representations of the divine ancestor allude to the ruler’s royal heritage and membership in the maximal lineage. A particularly clear example is the tiny throne, Monument 5, from Laguna de los Cerros (see fig. 2.3), in which the sacred ancestor is nearly identical to the one on San Lorenzo’s Monument 14 (Cyphers n.d.d).

Therefore, it seems that thrones not only epitomize the formalization of genealogical relationships into political office but also show that genealogical distance determined the degree of access to the supernatural. On the basis of the above throne-site correlations, we propose that political ideology in the San Lorenzo region served to confirm, control, and expand the capital’s jurisdiction across a vast and difficult water-laden terrain by institutionalizing the office of ruler at key secondary sites. Such
positions, formalized in sacred stone, reinforced the settlement hierarchy in a possible attempt to reduce the lesser centers’ self-sufficiency, increase their dependency, and hence buttress the political administration.

Stone Monument Distribution

When we examine monument distribution across the Olmec region, our knowledge is, without a doubt, uneven due to the lack of systematic coverage of vast areas, site overburden, and looting. Even as we are conscious that post-Olmec factors may have affected the ancient spatial pattern of small and medium-size monuments such that the actual distribution may be skewed, we believe that such effects are less likely with regard to larger pieces. The utilization of monument distribution as an initial point of departure should not be deterred, because these objects were not casual cultural manifestations but rather constitute indicators of ancient behaviors and deliberately placed social symbols.

Here we specifically examine Early Preclassic sites located outside the core hinterland of major capitals that have one or two stone monuments (but lack thrones) that could possibly date as early as 1000–800 BC, based on their style and/or relevant settlement data. Because of the lack of archaeological work at most of these places, their temporal placement and other characteristics inhibit their firm inclusion in specific sociopolitical systems.

Turning our attention to these finds, we observe that the location of each site (see fig. 2.1) seems to obey principles similar to those observed around San Lorenzo. Contrasting with the nucleation of secondary and tertiary sites at river confluences around San Lorenzo is a seemingly dispersed distribution of nodal communities, each with at least one monument. Nevertheless, when this distribution is examined closely, the judicious location of each site at a favorable position for land and/or water transport points to the integration of a fluvial and terrestrial communication web that varied in shape and extent through time.1

This statement is supported by the following sites, which lack thrones but contain other stone sculpture. These were important communities placed at island locations, river confluences, and curves in terrestrial and fluvial transportation networks in the southern Gulf Coast region:

- Santa María Uxpanapa, origin of the Wrestler sculpture (Corona Núñez 1962), is located on Capoacan Island close to the west bank of the Uxpanapa River. Early-twentieth-century maps show that even in later times it served as a principal river stop and portage point.

- Monument 60 in the La Venta catalog, a small feline sculpture, was discovered on the outskirts of Ixhuatlán (de la Fuente 1973:108), a town strategically located near the confluence of the Coatzacoalcos, Uxpanapa, and San Antonio rivers. It is similar to Monuments 7 and 10 from Loma del Zapote (Cyphers 1994, 2004).

- From Ahuatepec, in the immediate San Lorenzo area (Cyphers 1992), comes a small feline that is similar to San Lorenzo Monument 120 (Cyphers n.d.a).

- The site of Arroyo Sonso, located 15 kilometers due west from Las Choapas, was first reported by Nomland (1932:591), who states that its stone figure was recovered close to the bifurcated head of the stream of the same name (which unites with the Uxpanapa River west of the town called La Concepción). It is stylistically similar to Monument 37 from San Lorenzo (González Lauck 1991).

- Near Emilio Carranza (formerly called Salinas), a small feline statue was found by local people (Cyphers 2004). This site is located at the southern head of an ancient island once surrounded by the Coatzapa, Otapan, and Coatzacoalcos rivers. It is stylistically comparable to Monument 120 from San Lorenzo (Cyphers n.d.a).

- From the area of Jalitipan de Morelos, a seated male figure was reported from the Arroyo Chiquipixta (Cyphers and López 1996), a stream whose hydrology has been altered by extensive modern sulfur mining.

- Upriver from San Lorenzo and about 9 kilometers north of La Oaxaqueña there is a massive basalt dish with grooves and cup-shaped depressions at Ojo de Agua, a site located on a plateau near a stream that empties into the Coatzacoalcos River (Cobean n.d.).

- From Los Soldados, adjacent to Las Choapas, there is a seated transformation figure (de la Fuente 1973:161–62). Although exact details of its original location are unknown, this bitumen-rich area, upriver from La Venta, is adjacent to the Tancochapa River on a bridge of elevated ground between the Tonalá system and the Uxpanapa River.

- Cuautitalolapan Viejo, located on a major curve of the San Juan River, was an important site between 1000 and 800 BC (Cyphers and Borstein n.d.). Its large seated male figure was retrieved from the river (Medellín Zenil 1971; de la Fuente 1973:129).

- Cruz del Milagro, located on the divide between the San Juan and Coatzacoalcos drainages and overlooking the former, with its unbroken, medium-size seated male figure, also was an important early village (Borstein 2001; Cyphers and Borstein n.d.).

- Loma de la Piedra, overlooking the Cuitláuza River, has a large decapitated human torso (Grove et al. 1993).
• Zapotitlán, located next to the river of the same name where it drains into the Gulf of Mexico, rendered a decapitated human figure (Medellín Zenil 1971).  
• Piedra Labrada is located next to the Tecuanapan River close to its outlet in the Gulf of Mexico that was reported by Alfonso Medellín Zenil (1960) and later investigated by Marco Antonio Reyes López. It has several Olmec monuments whose style appears to be early (Roberto Lunágoz, personal communication, 2003).  
• La Isla, located at the junction of the Amayo and Hueyapan rivers, has a nearly complete transformation figure (Grove 1994:223).  
• El Nuevo Órgano, located south of Laguna de los Cerros, has a hollow stone anthropomorphic sculpture (Delgado 1997).  
• Tres Zapotes has at least one anthropomorphic monument that may be considered Early Preclassic, Monument M (Stirling 1943:23). The site is located beside the Arroyo Hueyapan a few kilometers upriver from its junction with the San Juan River.

Our review of these sites shows that most are located at key positions in the fluvial and terrestrial communication web. The majority are naturalistic human figures, followed by supernatural felines and transformation figures. Their thematic variability suggests the operation of several mechanisms, as illustrated by previous interpretations of transformation figures as “kings in transformation” (Clark 1997:223) and as evidence of state shamanism (Reilly 1989), as well as the reading of isolated human figures as “lesser kings” and “princes” of dependent centers (Clark and Pérez 1994:266).

We believe the spatial distribution of large transformation figures, at least 1.3 meters tall, points to a selective rural participation in Reilly’s shamanic cult. Unfortunately, the distribution of isolated supernatural feline sculptures is probably skewed due to their small size, which regrettably facilitates removal and sale.

Given the previous analysis of thrones, it is clear that we differ somewhat from Clark and Pérez on the interpretation of “lesser kings” and “princes” from human figures. Because the information on site type is scant, correlation between the size of these pieces and site magnitude is an interesting hypothesis remaining to be tested (see fig. 2.1 and table 2.1). We suspect that their degree of adornment and size will be shown to relate to the position of their respective sites in the settlement system, as illustrated by the pieces from villages of Cuautotolapan and Cruz del Milagro (Borstein 2001; Cyphers and Borstein n.d.). Greater size (taller than 1.3 meters), sometimes associated with more body adornments, may indicate that their respective sites played more prestigious regional roles. Consequently, we would consider other alternative interpretations of such monuments, including their use as icons of rural authorities or local lineage heads and in certain types of cults.

| Table 2.1 Descriptive Information on the Stone Monuments Mentioned in the Text |
|---------------------------------|---------|----------|---------------|----------------|
| Site                           | Monument number | Sculpture height | General description | Monument condition |
| Santa María                    | Uxpanapa     | 1         | 0.66 seated human | complete         |
| Cruz del Milagro               | 1            | 1.30 seated human | complete         |
| Cuautotolapan                  | 1            | 1.51 seated human | complete         |
| Loma de la Piedra              | 1            | 1.58* seated human | decapitation complete |
| Chiquipista                    | 1            | 0.54 seated human | complete         |
| El Cardonal                    | 1            | 1.65* seated human on pedestal | complete |
| Zapotitlán                     | 1            | 1.30* standing human | decapitation complete |
| Ixhuatlan                      | La Venta     | 1         | 0.60 supernatural feline | complete |
| Emilio Carranza                | Monument 60  | 1         | 0.37 supernatural feline | complete |
| Ahuatepec                      | 1            | 0.23 supernatural feline | complete         |
| Arroyo Sonso                   | 1            | 1.30* transformation figure | partial decapitation |
| Los Soldados                   | 1            | 1.35* transformation figure | partial decapitation |
| La Isla                        | A            | 1         | 1.50* transformation figure | complete |
| La Isla                        | B            | 1         | 1.50* transformation figure | decapitation |
| Tres Zapotes                   | M            | 1         | 1.20 seated human | complete |
| El Nuevo Órgano                | 1            | 0.37 hollow anthropomorphic disk | complete |
| Ojo de Agua                    | 1            | 1.70 (diameter) | grooves          |

* The height of incomplete pieces was estimated using the same 2.3 head-to-body ratio observed in whole sculptures.
Through the analysis of Early Preclassic settlement patterns and sculpture we infer a preliminary regional panorama in which social, religious, and political activities and alliances included varied kinds and levels of aristocratic participation. Royal lineages at primary centers dominated lesser aristocratic lineages in secondary centers, and distant rural nobility was tied into the hierarchy via diverse mechanisms adapted to their particular social spheres. As such, regional organization appears to have involved the transformation and institutionalization of social and genealogical distance as political hierarchy. Our reconstruction suggests a political administration that formalized a conical clanlike structure in which official aristocratic genealogy is ritually celebrated (Friedman and Rowlands 1977; Kirchhoff 1955) within a spatially restricted prestige system intimately related to hierarchical social forms.

Given that it has been proposed that monumental sculpture was used to create versatile commemorative scenes in the San Lorenzo region during the Early Preclassic (Cyphers 1993, 1994), we suggest that low-level rural sites during that time may have participated in periodical and centralized ritual activities by including their monuments, which perhaps represented legendary and revered figures, in the ceremonies. Such ritual participation could create and maintain certain identities and increase social and religious integration by promoting the lateral unification of a poorly developed distant hinterland into the belief system. Also, along with the development of transportation systems, organized activities of this nature could forge pathways for dependency relationships, trade, and social interaction. In this way, difficulties in sociopolitical integration and in the movement of people and goods, affected at all times by the hydrologic cycle, could have been offset in the vast deltaic plains and more rugged uplands.

Whereas Early Preclassic settlement and sculpture can be conceived as social, political, and religious manifestations of territorial integration on the Gulf Coast, during the subsequent Middle Preclassic period (800–400 BC) isolated stone figures diminish and are replaced by stelae in different strategic locations on the Gulf Coast and in more distant places (Clark and Pye 2000; Grove 1987:436). This stylistic and distributional change seems to mark a concern with formalizing distant elite exchange relationships.

We have seen that the river systems in the great deltaic plains around San Lorenzo contained specific traits that influenced and shaped the growth of settlement hierarchies, specifically in the networked fluvial courses. Island locations, circumscribed by natural barriers such as rivers and vast floodplains, tended to attract population in areas of high resource concentration. River flow imposed directionality on the movement of people and goods. Secondary and tertiary settlements were strategically established at narrow straits and river confluences to manage and control downriver traffic, link to terrestrial routes, and capture upriver goods. These communities often were purposefully marked by stone monuments that called attention to the importance of the site and its leader. In the lower Coatzacoalcos drainage the administrative hierarchy established at key transportation points involved a political hierarchy of local rulers backed by principles of divine legitimation similar to those enjoyed by the maximum authorities of the regional center at San Lorenzo. The dendritic and semiradial shape of the fluvial network acted as a broad funnel that channeled water, people, and goods to the downriver apex of the system. By taking advantage of the natural landscape, the Olmec designed spatial patterns of settlement along these lines in order to propagate interrelationships and interactions in social, economic, and political frameworks.

The same natural conditions that helped shape complex development at San Lorenzo may have been related to its decline (beginning around 900 BC) insofar as the component parts of this top-heavy system were highly dispersed across the watery landscape with centrifugal tendencies that challenged social cohesion and integration. Other vulnerable aspects of the system included an underdeveloped outer hinterland, localized high population densities, subsistence problems on the San Lorenzo island, and the distance from the capital to nodal control points. Although the design of the socioreligious system created political, spiritual, and social ties with elites in the satellates, these mechanisms may have deteriorated at some point, since representations of weapons in monumental art, dated between 1000 and 800 BC, provide possible evidence for increasing conflict (Cyphers n.d.a) that could have been a consequence of multiple factors, including environmental and social problems, regional abandonment, and competition from other sites.

In the Olmec world regional mobility, which is related to all types of social and economic activity, was particularly restricted by the friction of distance. Transportation networks composed of linkages, flows, nodes, activity spheres, and hierarchical relationships were influenced by dis-
tance and the nature of the geography and, as such, became key components of the functional organization of the region. The systematic organization of the hinterland with regard to settlement location, distances, directionality, transportation efficiency, social relations, services, and population densities resulted in a complex horizontal and vertical nesting of various types of regional social and activity spheres.

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Water Management in Formative Period

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Water was a life-sustaining force in ancient Mexico, where pre-Hispanic peoples relied on water to sustain themselves, their societies, and their gods. The construction of such facilities involved the use of large-scale infrastructure, such as canals, dikes, check dams, and reservoirs. The construction of such facilities was socially (and ecologically) recursive, as the conquest of Tenochtitlan focused on the use of water for irrigation and the political economy (fig. 2).

In this chapter, we look at irrigation and the political economy (Hirth 1996) to discuss how stratification would have encouraged innovations and landscape modifications in light of recent investigations. Features in the Yautepec Valley of Mexico, for example, offer insights into the strategies of political integration as evident in the changing landscape of cultivation. The development of a system of irrigation and the production of a sacralized water management were important in the development of a regional identity.

Social Production, Agriculture, and Landscape

Following the completion of regional Basin of Mexico, Sanders, Parsons, and...
Chapter 2. A Land That Tastes of Water

1. All dates used here are uncalibrated.
2. Taube (1996) reaches a similar conclusion based on his identifications of maize iconography and its proliferation in the Middle Preclassic.
3. Grove et al. (1993) and Gillespie (2002:110) have suggested that certain isolated monuments served as boundary markers delimiting sacred or political space because they found no surface artifacts at the respective sites (i.e., Loma de la Piedra and El Cardonal). This suggestion is not applicable to all sites with monuments because artifacts are reported for the majority of the sites mentioned here. It should be remembered that the lack of surface ceramics at coastal sites is not an adequate indicator of site type because plowing is uncommon and dense secondary or grassland vegetation often covers them (von Nagy 1997; Symonds, Cyphers, and Lunagómez 2002).
4. Medellín Zenil (1971) reported this monument from the Soteapan municipality, but when Tatahuicapan de Juárez was declared a municipio libre in 1997, Zapotitlan was included in its territorial limits.
5. At the present time, no clear non-iconographic evidence for warfare, such as weapons, fortifications, indications of violent death, or other, has come to light.

Chapter 8. Copan Water Ritual and Management

1. The authors' individual research converges in this volume to bring archaeological and architectural remains and the ritual and iconographic evidence together. At a U Penn Maya Weekend in 1992 Fash gave a paper noting indications of water and cave imagery on stone carvings at Copan that led to questions regarding the hydraulic engineering designs built into the architecture and city planning and an analysis of the imagery as political system. Davis-Salazar spent several seasons investigating the archaeological remains of water management at the site and completed her doctoral thesis on the subject (Davis-Salazar 2001). Understanding how the functionality of the water-management system and its iconographic manifestations were manipulated by Copaneco rulers became central to both our studies.
2. The term ethnohydrology is used in Andean studies (Sherbondy 1992).
3. For example, the glyph deciphered as ik nab nal, meaning "black water lily place" or "black hole place" (Stomper 1996), on the northwestern corner of the council house perhaps refers to a reservoir such as the one in the Las Sepulturas sector.