

# The imprint of China's first emperor on the distant realm of eastern Shandong

Gary M. Feinman<sup>a,1</sup>, Linda M. Nicholas<sup>a</sup>, and Fang Hui<sup>b</sup>

<sup>a</sup>Department of Anthropology, The Field Museum, Chicago, IL 60605; and <sup>b</sup>School of History and Culture, Shandong University, Jinan 250100, China

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**Imperial expansion is recurrent in human history. For early empires, such as in ancient China, this process generally is known from texts that glorify and present the perspective of victors. The legacy of the Qin king, Shihuangdi, who first unified China in 221 BC, remains vital, but we have few details about the consequences of his distant conquests or how they changed the path of local histories. We integrate documentary accounts with the findings of a systematic regional survey of archaeological sites to provide a holistic context for this imperialistic episode and the changes that followed in coastal Shandong.**

archaeological survey | full-coverage settlement patterns | Langyatai | Qin and Han Empires | Shihuangdi

Imperial conquest and expansion are significant processes in human history (1–3). Globally, the formation of early empires has been transcribed largely from the vantage of capitals and kings through written texts. For example, the exploits of China's first emperor, Qin Shihuangdi, are richly documented in 2,000-year-old records of his conquests across eastern China (4, 5) (Fig. 1). The discovery of life-size terracotta soldiers that guard his tomb at Xianyang (his capital) in central China (6) has generated worldwide attention. To understand imperialism more holistically, as well as the diverse historical outcomes of political expansion in conquered realms, researchers must look beyond texts commissioned by victors. Here we juxtapose written accounts of Shihuangdi with archaeological settlement patterns gained through systematic, regional survey to probe the legacy of the first (Qin) unification of China (*ca.* 221 BC) in coastal Shandong Province, more than 1,000 km east of the emperor's capital. We integrate archaeological and textual information to examine the long-term imprint of imperialism on a conquered realm, illustrating the contribution of archaeological research even for an era described amply in written records (7–10).

In unifying China, Shihuangdi's last conquest was the Qi state, which included a large part of what is now Shandong Province (11). In 219 BC, the emperor visited Langya Mountain on the southeastern Shandong coast (5). This distinctive seaside peak lies near the northern limit of a series of coastal basins, where we, as members of an international team since 1995, have collected systematic archaeological settlement pattern information over a 1,665-km<sup>2</sup> area (12–14).

We first review textual information relevant to this episode of imperialism in southeastern Shandong, outlining the records before the emperor's visit to Langya. We then discuss systematic archaeological survey and the relevant findings from the settlement pattern research in coastal Shandong. Despite voluminous historical records for much of this period (15, 16), the parallel consideration of archaeological evidence (e.g., ref 10) allows us both to corroborate and to amplify the written accounts.

## The Documentary Record and Southeastern Shandong

Southeastern Shandong is rarely mentioned in historical records for the late Neolithic and early Bronze Age (*ca.* 3000–1046 BC), and the area generally is regarded as having been peripheral to centers of power to the west, in Henan, the traditional heartland of Chinese civilization (7, 17). Before 1995 archaeologists knew

of several large Longshan-period (2600–1900 BC) settlements on the southeastern coast of Shandong, but there was no basis for understanding their relations with the historically documented early core states (e.g., Xia, Shang) or their antecedents (17).

After the decline of the Shang state, the Western Zhou dynasty came to power in 1046 BC and began military campaigns in Shandong against the Dongyi, a generic term for diverse “eastern peoples” (18, p. 307). In ancient texts, *yi* (“barbarians”) refers to people who lived in “outer” regions (19, 20). After gaining a foothold in western Shandong, state officials made incursions into eastern Shandong, attempting to establish dependent polities and control access to marine resources, such as salt. Texts mention the Zhou king's personal involvement in campaigns on Shandong's northern coast, and the Zhou state likely gained control over much of northern and northeastern Shandong (18, p. 313). Some areas, however, remained hostile. One of these areas likely was the southeastern Shandong coast, which is set off from the rest of the province by high craggy mountains and is not mentioned in texts of that time.

The latter part of the Zhou dynasty, Eastern Zhou (*ca.* 771–221 BC), was marked by almost constant warfare as the Western Zhou state disintegrated and smaller states vied for power. The Qi state that had developed earlier in western Shandong expanded into eastern Shandong (19, 21) and conflicted with the Ju state, thought to have been established by the native Yi people (22). Although peripheral states like Qi and Ju were smaller than the previous Western Zhou polity, they consolidated governmental control over the areas they ruled (19). In 246 BC, the Qin, another subordinate state to the west, began a major expansion that culminated with the unification of China in 221 BC (11).

After defeating political rivals and declaring himself emperor, Shihuangdi expanded state control over large areas of eastern China, including southeastern Shandong (e.g., ref. 23). Although Shihuangdi's reign was short (221–210 BC), the governmental bureaucracy he established remained largely in place during the succeeding Han Empire (206 BC to AD 220) (24, 25). Salt and iron were the two most important commodities controlled by the Han state (26, p. 44; 27, p. 156), and the Han established sea salt and iron administrative district centers on the southeastern Shandong coast (23, 28, 29).

## Shihuangdi, Langya, and the Documents

In *Shiji* (“The Grand Scribe's Records”), Sima Qian (5), an official Han historian who wrote *ca.* 100 BC, recounts Shihuangdi's journeys across the former Qi state, visiting ritually significant mountains, including Langya, that spanned his new eastern conquest (30, 31). Langya is one of seven locations where the emperor commissioned the installation of inscribed stelae that proclaimed his rule and extolled the virtue of the Qin (30, 32, 33).

The emperor is reported to have been “so delighted” after his ascent of Langya Mountain that he stayed 3 months and ordered

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<sup>1</sup>To whom correspondence should be addressed. E-mail: gfeinman@fieldmuseum.org.

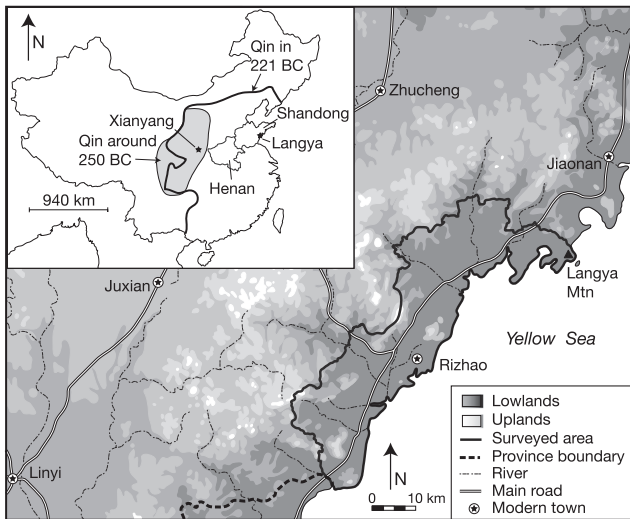


Fig. 1. China, showing location of the Qin capital at Xianyang, expansion of the Qin state, and the surveyed region in southeastern Shandong Province.

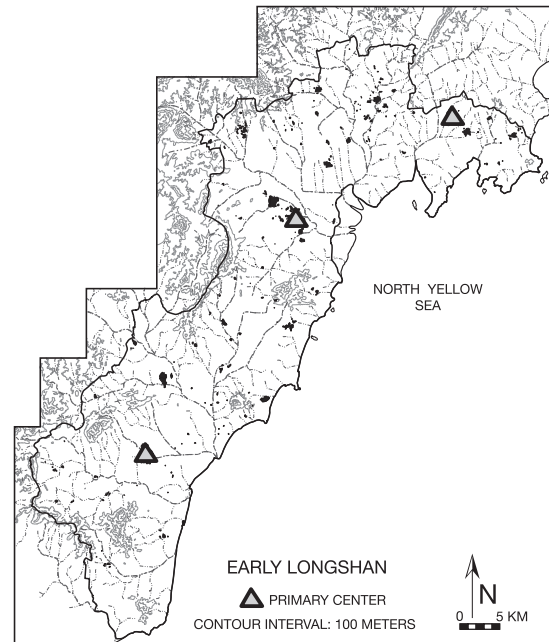


Fig. 2. Early Longshan settlement pattern.

30,000 households to colonize the area, with the promise that new immigrants would be free from tax and labor obligations for 12 years (4; 5, p. 47). According to historical records, the average Han-period household had five people (27, p. 48; 34; 35, p. 115), thus as many as 150,000 people may have been moved. The documents are silent on whether the emperor's orders were met and exactly where the immigrants settled. The largest modern town near the coastal mountain is Langyatai, which translates as "double jade platform," and traditionally the ancient settlement was thought to be nearby.

When Shihuangdi unified China, he ordered the use of a single official "clerkly script" to regularize communication (36, 37). He also began construction of a network of roads to bind his realm physically and to facilitate the movement of officials, troops, and commerce (35, p. 55). One road traverses the eastern Shandong coast, passing through the Langya area. Between the end of Zhou and the beginning of Han, there was significant imperial intrusion into the southeastern Shandong coast, but the documents are relatively silent about the long-term local effects of this episode of Qin expansion.

Before our survey, little was known about the specific history of the Langya area. How densely settled was this landscape before the emperor visited? Were the emperor's orders to move 30,000 families heeded, where did these people settle, and how was this decree tied to the incorporation of the coastal area into the Qin Empire? Can we detect the emperor's footprint in coastal southeastern Shandong, and how did his imprint endure? Before addressing these questions, we provide a brief review of regional survey.

### Systematic Archaeological Survey

Settlement pattern studies, or systematic regional surveys, gained research prominence during the mid-twentieth century (38). In the heartlands of many early civilizations, such as Mesopotamia (39), Greece (40), and Mexico (41–44), archaeological survey has revolutionized what we know about the past by providing broad-brush views of the long sweep of history that cannot be obtained from ancient texts or the excavation of single sites. Two prominent archaeologists consider full-coverage survey to be "the single most critical theoretical or methodological innovation in archaeology since World War II" (45, p. 14).

Systematic regional surveys have been implemented in China only recently (12, 14, 46–49). As in other world areas, their

findings have begun to modify our understanding of the ancient Chinese past and the variations in historical patterns of change from region to region (17).

A principal objective of archaeological regional survey is to map changes in settlement patterns across space and time to provide long-term, regional histories of shifting settlement and demography. In southeastern Shandong, we systematically traversed the landscape looking for traces of past settlements, which include pottery fragments, stone tools, exposed pits or layers of ancient cultural deposits, and, less frequently, the remnants of architectural features such as tombs, walls, and platforms (12–14). Such archaeological materials, but especially the pottery, carry temporal information that helps date ancient sites (e.g., refs. 50, 51). The surface distributions of all archaeological materials are located on 1:10,000 topographic maps. This recorded information provides the basic settlement pattern—the sizes and distribution of sites—for each archaeological phase under investigation.

### Ancient Settlement Patterns in Southeastern Shandong

During the survey of two coastal basins in southeastern Shandong (Fig. 1), we recorded thousands of settlements dating between the early Neolithic and Han period (5300 BC to AD 220). Most of these sites were previously unrecorded, and a very high percentage will never be investigated further because of the fast pace of modern development.

Although we recorded earlier settlements, the first significant occupation of the area occurred during the early Longshan period (ca. 2600–2400 BC). Three large sites (all larger than 1.5 km<sup>2</sup>) were at the center of demographic clusters, each encompassing a hierarchical array of smaller and mid-sized settlements and separated from the adjacent cluster by areas of sparse occupation (Fig. 2). Based on the density and pattern of settlement, each cluster appears to have been a hierarchically organized polity (14). This emergence of complex polities on the Shandong coast was seemingly independent of developments to the west, indicating that states developed in more than one region of China during the late Neolithic (ca. 3000–2000 BC) (17).

After Longshan, there was an episode of demographic decline in the region (14). By the Western Zhou period (1046–771 BC),

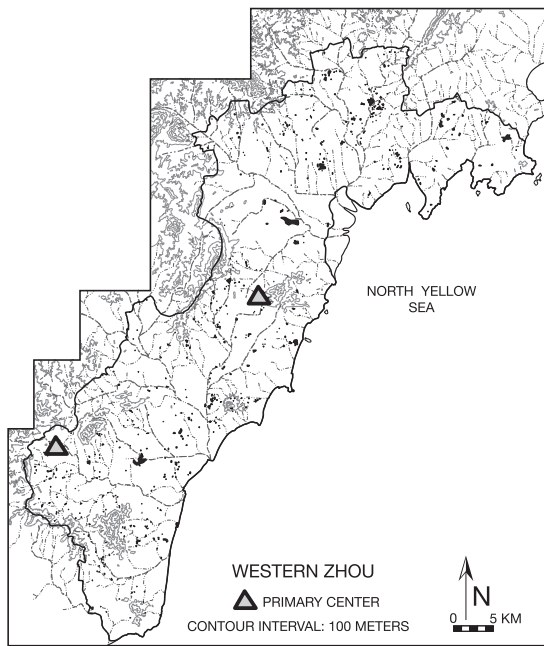


Fig. 3. Western Zhou settlement pattern.

the earlier Longshan-era centers were smaller than they had been. New centers emerged to rival them, and many settlements were more defensively situated (Fig. 3). Given the abundance of archaeological sites from that time, the silence of the texts likely reflects the inability of the Western Zhou state to penetrate or control the area consistently.

Political relations among communities were relatively unstable until the subsequent Eastern Zhou period (771–221 BC), when significant demographic growth occurred (Fig. 4) in conjunction with a decrease in the number of settlements in defensible locations. The southeastern Shandong coast likely had increased

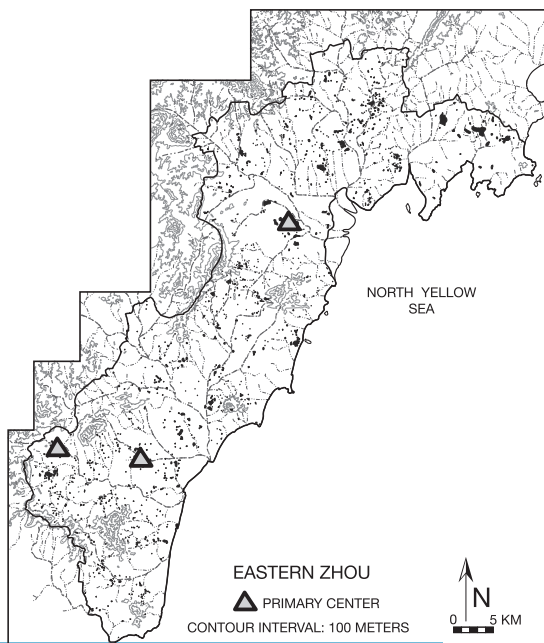


Fig. 4. Eastern Zhou settlement pattern.

interaction with neighboring powerful states and, by the end of this period, had ceded its local autonomy to larger historically known polities, first the Ju and then the Qi.

Eastern Zhou was followed by the very short reign of Shihuangdi, which in spite of its brevity, laid the administrative foundation that continued into the subsequent Han era. In southeastern Shandong, there are no diagnostic artifacts easily recovered for the short span of the Qin reign, so we must treat Qin and Han together as one archaeological period (221 BC–220 AD). Nevertheless, by contrasting the Eastern Zhou and Han periods, we can gauge the changes initiated by Shihuangdi's conquest. From the outset of our survey, it was evident that there was a dramatic transition during Han (Fig. 5). The population that we recorded for Han was much higher and spatially more widespread than it had been at any earlier time. There were no empty zones between the large Han centers (1.5–3.0 km<sup>2</sup>) that were evenly spaced across the landscape (14). Clearly the significant changes in the nature of political administration established by Shihuangdi affected the distribution and size of settlements across the region. Not until we surveyed the Langya area during 2008, however, did we recognize how significant was the first emperor's footprint.

### Ancient Langyatai

Langya Mountain and the modern town of Langyatai are located close to the coast at the northern edge of our study area. As we surveyed around the modern town, we encountered continuously dense scatters of ancient pottery, especially of the Qin-Han period (Fig. 6). At times, hundreds of Han ceramic roof tiles were visible in small clearings. In all, the dispersal of ceramics, exposed cultural layers, and other Qin-Han surface remains extended over an area of 24 km<sup>2</sup>, almost an order of magnitude larger than any other Han settlement in the coastal basins of southeastern Shandong (Fig. 5). The ancient Qin-Han settlement spreads across the lands of more than 25 modern towns and villages.

Although most of the surface pottery at Langyatai is Qin-Han, we did identify areas with earlier Longshan- and Zhou-period ceramics. The first significant occupation of the Langya area occurred in Early Longshan (Fig. 2). This site was not as large as

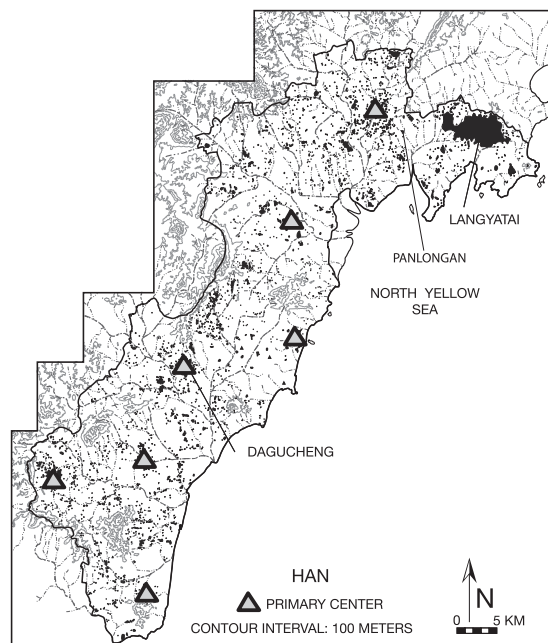


Fig. 5. Han settlement pattern.

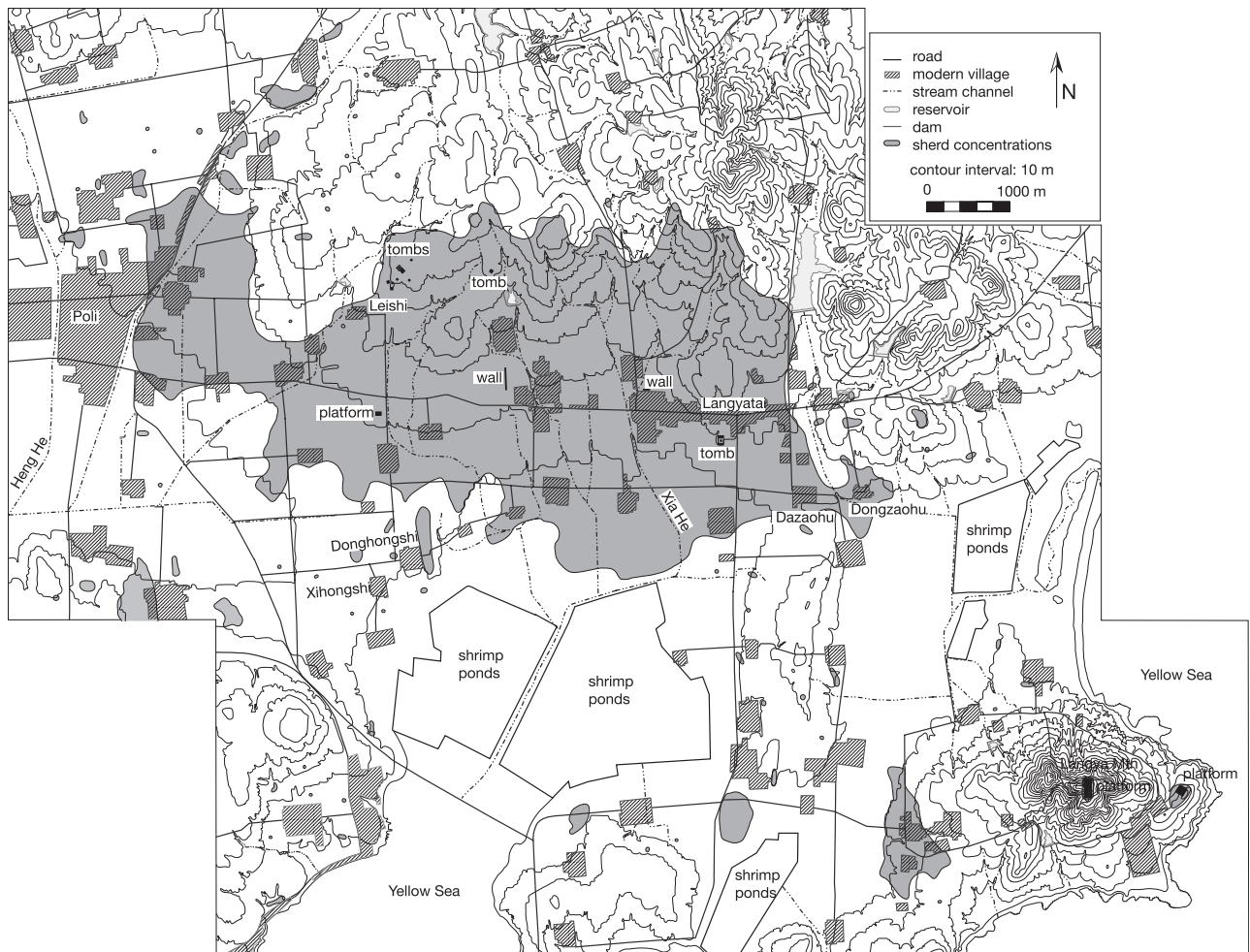


Fig. 6. Han-period Langyatai and Langya Mountain.

the other two Early Longshan centers located farther south, and it was greatly reduced in size, as was the population of the entire Langya area, during the subsequent millennium. Population grew in the Langya area during the Zhou period but only at a rate on par with growth in the rest of the coastal basins. Although several large Eastern Zhou sites, ranging from 24 to 120 ha, were established in the area that later was incorporated into the large Qin-Han center, no dominant center emerged (Fig. 4). Nevertheless, expansion during the Eastern Zhou period indicates a growing significance of the area, perhaps associated with the ritual role of Langya Mountain and the importance of salt.

The massive Han-era settlement includes a previously known precinct of large rammed-earth Han tombs at Leishi (52, p. 112); of the original nine tombs only six are visible today (three were lost to plowing). This precinct is the most monumental tomb complex in the entire region. There are few other architectural remnants of the ancient city. Two Han wall segments preserved within the site's boundaries are likely part of a wall that enclosed the central precinct of the city (e.g., refs. 53, 54).

The ancient population center did not extend all of the way to Langya Mountain, 3 km to the southeast, where a huge multilevel platform was constructed at the top of the peak. The platform consists of several tiers of rammed earth, with corners sustained by walls of cut stone blocks or bricks. Based on remnants visible in three places, the platform was at least 200 × 80 m at its base and rose more than 40 m in height. No ceramics earlier than Han are associated with the platform. Even though the mountain had

ritual significance during earlier Eastern Zhou times, the construction of the platform evidently did not take place until the emperor's visit.

Downslope, on a low rise at the base of the mountain overlooking the coast, are the remains of another large rammed-earth platform (Fig. 7). Although only part of this platform is intact



Fig. 7. Remnants of the massive rammed-earth platform on the lower, eastern slopes of Langya Mountain.

today, the remnants stand 20 m high, and the base measured at least 100 × 100 m. The platform was constructed on top of a natural ridge, raising and extending it, and was composed of fine compacted sediments of different colors. Eastern Zhou sherds in the fill indicate that the Qin-Han platform was built at a location that had an earlier use. A partially preserved carved stela on the eastern side of the platform includes the recognizable character *tian* (heaven). The similarity of this massive earthwork in scale and structure to the platform beneath the ruler's palace in Xianyang (fig. 77 in ref. 55) provides another clue that this coastal platform was built at the time of the first emperor.

Visible in the platform's profile is a horizontal line of six iron pipes (spaced ≈30 cm apart) that had been hammered into the natural bedrock to serve as a supporting skeleton for the rammed earth (Fig. 8). In large Han platforms elsewhere, wooden posts were used to sustain the massive weight of the earth (56), and there is no other published record of iron pipes being used for this purpose.

The names of modern villages in the Langya area provide evidence of economic activities that may have been important in the past. For example, *zaohu* means "salt making," and two modern coastal villages, Dongzaohu and Dazaohu, are within the limits of ancient Langyatai. One of the largest Eastern Zhou sites in the Langya area was located near these two towns, and its proximity to salt sources may have been a factor that motivated the emperor to order households to the area.

The emperor's footprint also can be seen in the broader coastal region, where seven large, evenly spaced Han centers were clearly part of Langyatai's administrative zone. One of those, Dagucheng, is thought to be a named center of Han county government (Haiqu) for sea-salt administration (57). The recovery of bamboo slips (official state records) from a large tomb excavated at Dagucheng (58) supports that interpretation. The names of other modern towns offer clues to the past. For example, one small village west of Langyatai is Panlongan, which translates as "coiling dragon temple." Nearby is a small Han site. A Chinese expression, "where the dragon coils and the tiger crouches," refers to a place of strategic importance. The scatter of Han sherds and roof tiles at Panlongan may be what remains of an important stop on the ancient road that passed through the coastal area (map 5 in ref. 35).

### The Demographic History of Langyatai

Our archaeological findings support the documentary account of a massive resettlement to the coast ordered by Shihuangdi. We do not know where the immigrants originated, but they came from beyond the two coastal basins we surveyed. Total settled (site) area in these basins during Eastern Zhou was 2,720 ha, just slightly larger than Han-period Langyatai (2,400 ha). At the same time, leaving out Langya, the settled area in the rest of the

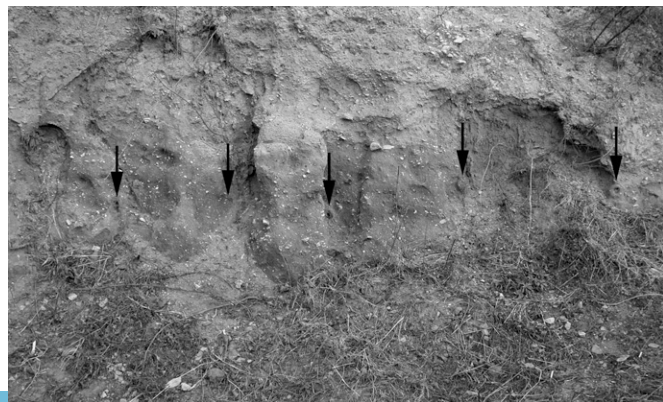


Fig. 8. Row of iron pipes hammered into base of the rammed-earth platform.

region almost doubled between Eastern Zhou (2,332 ha) and Han (4,467 ha). Demographic growth occurred throughout this coastal area between Eastern Zhou and Han (as well as during Han) and not just at Langyatai.

With this historical and regional perspective, the expansion of Langya during Qin-Han is highly anomalous compared with demographic patterns in the rest of the region and cannot be explained by local factors alone. Langya's growth was the consequence of in-migration, corroborating textual accounts. To assess this issue, we examined the relationship between archaeological findings and documents. Survey archaeologists working in many world regions have devised methods to estimate temporal and spatial trends in population, largely as a function of settlement size (39, 44, 59). Of course, the metrics for such estimates generate population figures that are rough at best, with settlement density coefficients varying from region to region.

In a previous work we drew on present-day rural population densities in the coastal area of southeastern Shandong along with documents that provide total Han-period populations for Langya Province to arrive at an estimated range of 50–72 people per hectare of settlement for southeastern Shandong (29) (Table 1). Using that density range, we calculate the Han-period population at Langyatai as 120,000–170,000, a span that encompasses the estimate of 150,000 immigrants drawn from historical documents. Applying the same density figures to the earlier Eastern Zhou settlement at Langyatai and adding those figures to the number of immigrants yields a total estimated population of 167,000–175,000 for Qin-Han period Langyatai. That number matches the upper figure derived from the archaeological survey. The extremely close correspondence between the population estimates drawn independently from historical documents and from archaeological survey strongly supports the demographic information on Langyatai in the texts and also illustrates the potential of systematic archaeological survey to yield regional demographic histories, even in the absence of written sources.

### Conclusions

By juxtaposing archaeological survey findings with documentary accounts, we have confirmed the location and size of ancient Langyatai and also have placed this episode of military conquest in a broader time, space, and economic context. When Shihuangdi mandated the movement of 30,000 households, he acted neither on simple delight nor even because of the ritual significance of Langya Mountain. Rather he established a provincial capital in eastern Shandong, a base both to consolidate the region and to monitor sea trade. The rich salt sources provided additional incentive. Our findings also indicate that the emperor did not order the migration merely to fill in an uninhabited coastal zone (cf. ref. 4). The area had been populated for millennia, and the new inhabitants served to reorient affiliations and loyalties in the region while being a source of labor for the new capital.

The Qin Empire was short-lived, but after the emperor's mandated migration Langyatai expanded and became the principal

Table 1. Population estimates for Langyatai

Based on archaeological survey data	
Population range per hectare:	50–72
Size of Han-period site in hectares:	2,400
Estimated Han population at Langyatai:	120,000–172,800
Size of earlier Eastern Zhou population:	17,400–25,000
Based on historical documents	
Average size of Han-era household:	5
Households that immigrated to Langyatai:	30,000
Estimated population of immigrants:	150,000
Total Han population estimate for Langyatai:	167,400–175,000

center on the southeastern Shandong coast for several centuries. Incorporation into the Qin and Han Empires had dramatic effects on both the local economy and the settlement history of this coastal basin. Although the impact of these changes was greatest in the northern part of the surveyed area around Langyatai, the establishment of a new governmental bureaucracy and an integrated system of roads led to changes in the distribution and size of settlements across the region and the emergence of a lattice of evenly spaced centers during the later Han era. Significant demographic growth across the region reflects the shifts in economy, administration, and communication that followed Shihuangdi's conquest.

Archaeological survey not only provides the broad sweep of history but also amplifies textual understandings of specific historical processes and events, such as the emperor's visits to the Shandong coast. We now have a more holistic perspective on this imperial episode and its regional consequences. Even when written documents exist, archaeology yields new and complementary knowledge of the past. Given its millennial record of states and empires, scholarship on ancient China can only be enhanced by

more regional archaeological surveys. At the same time, the global study of historically known eras would gain balance if the generally top-down narratives from documents were supplemented with the often bottom-up vantages derived from settlement studies and other archaeological approaches.

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1. Sinopoli CM (1994) The archaeology of empires. *Annu Rev Anthropol* 23:159–180.
2. Sinopoli CM (2001) *Archaeology at the Millennium*, eds Feinman GM, Price TD (Kluwer/Plenum, New York), pp 439–471.
3. Turchin P (2009) A theory for formation of large empires. *Journal of Global History* 4: 191–217.
4. Bodde D (1986) *The Cambridge History of China*, eds Twitchett D, Loewe M (Cambridge Univ Press, Cambridge, UK), Vol 1, pp 20–102.
5. Sima Q (1993) *Records of the Grand Historian*, rev ed, trans Watson B (Columbia Univ Press, New York), Vol 1: Qin Dynasty, pp 35–84.
6. Portal J, ed (2007) *The First Emperor* (British Museum Press, London).
7. Falkenhausen LV (1993) On the historiographical orientation of Chinese archaeology. *Antiquity* 67:839–849.
8. Feinman GM (1997) Thoughts on new approaches to combining the archaeological and historical records. *J Archaeol Method Theory* 4:367–377.
9. Knapp AB (1992) *Archaeology, Annales, and Ethnohistory*, ed Knapp AB (Cambridge Univ Press, Cambridge, UK), pp 1–21.
10. Smith ME (1992) *Archaeology, Annales, and Ethnohistory*, ed Knapp AB (Cambridge Univ Press, Cambridge, UK), pp 51–74.
11. Yates RD (2007) *The First Emperor*, ed Portal J (British Museum Press, London), pp 31–57.
12. Fang H, et al. (2010) *Systematic Regional Survey Report and Settlement Pattern Studies in SE Shandong* (in Chinese) (Wenwu Press, Beijing), in press.
13. Underhill AP, et al. (2002) Regional survey and the development of complex societies in southeastern Shandong, China. *Antiquity* 76:745–755.
14. Underhill AP, et al. (2008) Changes in regional settlement patterns and the development of complex societies in southeastern Shandong, China. *J Anthropol Archaeol* 27:1–29.
15. Loewe M, Shaughnessy EL, eds (1999) *The Cambridge History of Ancient China* (Cambridge Univ Press, Cambridge, UK).
16. Twitchett D, Loewe M, eds (1986) *The Cambridge History of China* (Cambridge Univ Press, Cambridge, UK), Vol 1.
17. Liu L (2009) State emergence in early China. *Annu Rev Anthropol* 38:217–232.
18. Li F (2006) *Landscape and Power in Early China* (Cambridge Univ Press, Cambridge, UK).
19. Hsu C (1999) *The Cambridge History of Ancient China*, eds Loewe M, Shaughnessy EL (Cambridge Univ Press, Cambridge, UK), pp 545–586.
20. Liu L, Chen X (2001) Settlement archaeology and the study of social complexity in China. *Rev Archaeol* 22:4–22.
21. Lewis ME (1999) *The Cambridge History of Ancient China*, eds Loewe M, Shaughnessy EL (Cambridge Univ Press, Cambridge, UK), pp 587–650.
22. Chen P (1969) *Study on States and Their Rank, Family Name and Existing Period in the Spring and Autumn* (Changda Press, Taipei) (in Chinese).
23. Ban G (1962) *The Han Histories: Geographic Annals* (Zhonghua Shu Ju, Beijing) (in Chinese).
24. Kiser E, Cai Y (2003) War and bureaucratization in Qin China: Exploring an anomalous case. *Am Sociol Rev* 68:511–539.
25. Loewe M (2007) *The First Emperor*, ed Portal J (British Museum Press, London), pp 60–79.
26. Liu L, Chen X (2003) *State Formation in Early China* (Duckworth, London).
27. Loewe M (2006) *The Government of the Qin and Han Empires* (Hackett, Indianapolis).
28. Bai Y (2005) *Archaeological Study on Iron Works before 3rd Century AD in China* (Science Press, Beijing) (in Chinese).
29. Fang H, Feinman G, Underhill A, Nicholas L (2004) Settlement pattern survey in the Rizhao area: A preliminary effort to consider Han and pre-Han demography. *Indo-Pacific Prehistory Association Bulletin* 24:79–82.
30. Kern M (2007) *The First Emperor*, ed Portal J (British Museum Press, London), pp 105–113.
31. Sima Q (1993) *Records of the Grand Historian*, rev ed, trans Watson B (Columbia Univ Press, New York) Vol. 2: Han Dynasty.
32. Kern M (2000) *The Stele Inscriptions of Ch'in Shih-huang* (American Oriental Society, New Haven, CT).
33. Rong G (1935) A study on stone inscriptions of Emperor Qinshihuang. *Yanjing Xuebao* 17:125–171.
34. Durand JD (1960) The population statistics of China, AD 2-1953. *Popul Studies (Lond)* 13:209–256.
35. Lewis ME (2007) *The Early Chinese Empires* (Harvard Univ Press, Cambridge, MA).
36. Barnard N (1978) *Ancient China: Studies in Early Civilization*, eds Roy DT, Tsien T (Chinese Univ Press, Hong Kong), pp 181–213.
37. Yates RD (2001) *Empires*, eds Alcock SE, D'Alroy TN, Morrison KD, Sinopoli CM (Cambridge Univ Press, Cambridge, UK), pp 351–368.
38. Willey GR (1953) *Prehistoric Settlement Patterns in the Virú Valley, Peru* (Smithsonian Inst, Washington, DC).
39. Adams RM (1981) *Heartland of Cities* (Univ Chicago Press, Chicago).
40. Alcock S (1994) *Classical Greece*, ed Morris I (Cambridge Univ Press, Cambridge, UK), pp 171–190.
41. Blanton RE (1978) *Monte Albán* (Academic, New York).
42. Kowalewski SA (2008) Regional settlement pattern studies. *J Archaeol Res* 16: 225–285.
43. Kowalewski SA, Feinman GM, Finsten L, Blanton RE, Nicholas LM (1989) *Monte Albán's Hinterland, Part II* (Mus Anthropol, Univ Michigan, Ann Arbor).
44. Sanders WT, Parsons JR, Santley RS (1979) *The Basin of Mexico* (Academic, New York).
45. Sabloff JA, Ashmore W (2001) *Archaeology at the Millennium*, eds Feinman GM, Price TD (Kluwer/Plenum, New York), pp 11–32.
46. Linduff K, Drennan R, Shelach G (2004) Early complex societies in NE China: The Chifeng international collaborative archaeological research project. *J Field Archaeol* 29:45–73.
47. Liu L, Chen X, Lee Y, Wright H, Rosen A (2004) Settlement patterns and development of social complexity in the Yiluo region, north China. *J Field Archaeol* 29:75–100.
48. Shelach G (1997) A settlement pattern study in northeast China: Results and potential contributions of Western theory and methods to Chinese archaeology. *Antiquity* 71: 114–127.
49. Zhouyuan Archaeol Team (2005) Report of the archaeological survey in 2002 in the Qixing River valley at Zhouyuan, Shaanxi. *Kaogu Xuebao* 4:449–484 (in Chinese).
50. Wang Q (2002) *A Research into the Burials of the Zhou Dynasty in Haidai Region* (Shandong University Press, Jinan) (in Chinese).
51. Zheng T (2003) A preliminary study of the pottery unearthed from Han tombs in Shandong. *Kaogu Xuebao* 3:317–347 (in Chinese).
52. Guojia Wenwuju (2007) *Cultural Relics Atlas of China* (Map Press of China, Beijing) (in Chinese).
53. Shen C (2003) *The Social Construction of Ancient Cities*, ed Smith ML (Smithsonian Inst. Press, Washington, DC), pp 290–311.
54. Wang T (1999) *Exploring China's Past*, Whitfield R, Wang T (trans. eds.) (Saffron Books, London), pp 111–121.
55. Kinoshita H (2007) *The First Emperor*, ed Portal J (British Museum Press, London), pp 83–93.
56. Zheng T, Hu C, Ma Q (2006) *Annals of Archaeology and Culture of Han Dynasty*, eds Bai Y, et al. (Qilu Press, Jinan), pp 103–112 (in Chinese).
57. Yang S, Wang S (2005) A brief study of the history of Haiqu county during the Han dynasty in Rizhao, Shandong. *Dongnan Wenhua* 6:35–38 (in Chinese).
58. National Bureau of Cultural Relics (2002) *Major Archaeological Discoveries in China in 2002* (Wenwu Press, Beijing) (in Chinese).
59. Hassan F (1981) *Demographic Archaeology* (Academic, New York).