RECENT RESEARCH ON EMERGENT COMPLEXITY IN CAMBODIA'S MEKONG

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ABSTRACT

The Mekong delta housed some of the earliest complex polities in Southeast Asia during the early historic period (and 400 BC-AD 500). Key transformations that occurred during this transition to history are discussed in the context of the Mekong Delta. Previous scholars have commonly assumed that the Cambodian site of Angkor Borei in Takeo Province was a capital of an early complex polity known as "Funan". This article presents preliminary results of field investigations (mapping, reconnaissance, excavations, geoarchaeology) at the site of Angkor Borei by the Lower Mekong Archaeological Project. It also discusses some implications of these findings for understanding emergent complexity in Mainland Southeast Asia.

Cambodia's remarkable cultural heritage is best embodied in the spectacular monuments of Angkor Wat. Yet Angkor Wat represents only the endpoint in a deep historical record, and the origins of Khmer civilization may lie to the south, in the Mekong delta. Southern Cambodia contains a rich yet poorly understood record of early historic period occupation, from *c.* 500 BC-*c.* AD 500. Archaeological research in the last two decades suggests that the Mekong delta experienced extensive settlement and human land-use that predated the Angkorian period, or before *c.* AD 802 (e.g., Dao Linh Côn 1998; Ha Van Tan 1986; Lê Xuân Diêm *et al.* 1995; Manguin 1998; Stark 1998; Stark *et al.* 1999; Trinh Thi Hoà 1996; Vo Si Khai 1998).

The early historic period straddled two critical junctures in Mainland Southeast Asia (see also Stark and Allen 1998; Wright 1998). The mid-first millennium BC marks the transition to an "Iron Age" and all the shifts that accompanied such technological change (e.g., Bayard 1992; Higham 1989a:190, 1996a, 1996b, 1998; White and Pigott 1996). A second transition occurred in the later centuries BC with the shift to the early historic period (Bellina 1998; Glover 1998); changes during this time set the stage for the emergence of the region's first centralized polities. Historians and art historians have identified the endpoint of the early historic period *c.* AD 500/600, when we see the emergence of statuary, writing, and a more complex political organization that may have been integrated through religious ideology (Brown 1996; Coedès 1968; Vickery 1998). Chinese travelers to the region (and quite likely to the Mekong delta) in the 3rd and 6th centuries AD described a polity of Funan that contained many trappings of the ancient state: nucleated population centers, political hierarchy, institutionalized religion, writing and perhaps even economic specialization (Coedès 1968; Pelliot 1903; Wheatley 1983).

Until recently, the only archaeological information available for the archaeology of the Mekong delta derived from Louis Malleret's 1940s excavations at the site of Oc Eo in Vietnam (Ha Van Tan 1986; Malleret 1959, 1960, 1962). Malleret's work there suggested that this settlement served as a coastal entrepôt for the kingdom of Funan during the second through to the sixth centuries AD. In the half-century since Malleret's fieldwork, Vietnamese archaeologists have uncovered dozens of "Oc Eo Culture" sites (i.e., sites occupied in the first half of the first millennium AD) throughout southern Vietnam. Yet we know practically nothing about this period and polity in Cambodia's Mekong delta.

Since 1996, the Lower Mekong Archaeological Project (LOMAP) has undertaken research in and around the ancient site of Angkor Borei (Takeo Province) in southern Cambodia (Figure 1). Historians and archaeologists have recognized Angkor Borei as an important historical site for several reasons. As early as 1911, the French were drawn to a small hill immediately south of Angkor Borei that contains two pre-Angkorian temples, Phnom Da and Asram Maharosei. These temples once contained abundant statuary that

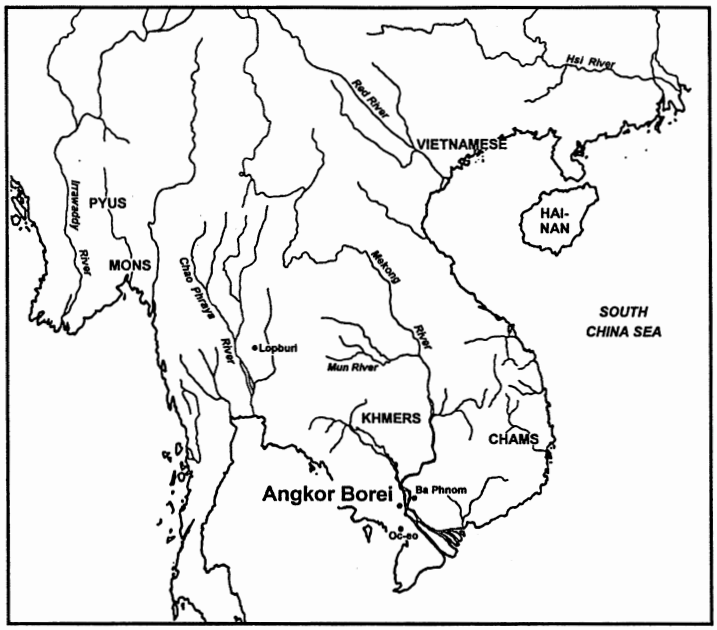

Figure 1: Location of Angkor Borei in the Mekong delta (adapted from Hall 1985, with permission of author).

suggested early Indic influence and the importance of the Mekong delta area for pre-Angkorian Khmer civilization (Parmentier 1927:117). The archaeological site of Angkor Borei has also produced the earliest Khmer inscription (dated to AD 611), as well as brick architecture, statuary and assorted valuables including precious metals and gems (Coedès 1931, 1954; Jacob 1979; Pelliot 1903; Stark *et al.* 1999). The French believed that Angkor Borei was one of the first capitals of the Funan described by the Chinese (Pelliot 1903), and that powerful elites ruled the region until some point during the 7th century AD when the center of power shifted to the north: for a recent review of these matters, see Vickery 1998.

A variety of data sources available now – Chinese historical accounts, inscriptions, local oral traditions, and archaeological materials – suggest that Angkor Borei included a unique mixture of ritual, economic and political activity. Understanding the developmental history of Cambodia's Mekong Delta requires that we first gain a comparative perspective on political developments across Mainland Southeast Asia after *c.* 500 BC. This paper then discusses preliminary results of archaeological field investigations in and around Angkor Borei. The paper concludes by discussing state formation in Mainland Southeast Asia to explore some reasons why Angkor Borei, and the Mekong delta in general, underwent dramatic organizational changes after the mid-first millennium AD.

Background: Mainland Southeast Asia at c. *500 BC*

While Cambodia's archaeological sequence remains relatively unknown for the period 500 BC-AD 1, research elsewhere in Mainland Southeast Asia has yielded trends associated with state formation during this time (e.g., Bronson 1979, Glover 1990a, 1990b; Glover and Yamagata 1995; Higham 1998; Stargardt 1990; Vallibhotama 1986, 1992; Welch 1989). Site reports and literature reviews on moated settlements in other areas of Southeast Asia (especially in Thailand) have proliferated in the last two decades (see summaries of this literature in Aung-Thwin 1982-83; Brown 1996; Higham 1989a, 1989b; and Vallibhotama 1986). Recent archaeological research documents an unbroken record of occupation in central and northeastern Thailand, central Vietnam, and central Burma during the early historic period, from the early first millennium BC to the mid-first millennium AD.

What we see throughout Southeast Asia during this time are several structural similarities in archaeological sites. The first involves settlement morphology. Most major drainage systems contain ancient moated settlements with multiple and diverse precincts. These sites are commonly fortified, and often have ramparts that may have been used for wooden palisades. Settlements established later in time may be surrounded by lateritic stone walls (Higham 1989a:209; Moore 1988) or fired brick walls in central Burma (e.g., Stargardt 1990) and in the Mekong delta (Lê Xuân Diêm *et al.* 1995). These settlements commonly contain multiple reservoirs, which are often found immediately outside the settlement's walls. Where regional studies have been undertaken, large moated settlements commonly developed into primary centers surrounded by a collection of smaller settlements (Higham 1989a:233).

Thus, a recurrent settlement pattern exists from one end of Mainland Southeast Asia to the other:

1. the appearance of moated, fortified settlements associated with water control features;
2. the development of a settlement pattern with a primary center and its surrounding satellite settlements;
3. the establishment of settlements at ecotones; and
4. the recovery of a similar range of non-local goods (such as ceramics, metals, and glass) whose origin may lie in South Asia.

Ng (1979) noted previously that many of these systems are found in areas with ideal conditions for irrigation rice agriculture, such as fertile soils, suitable topographic relief, and potable water. No convincing evidence that early historic period populations used wet-rice cultivation techniques exists; this lack of information is compounded by the current lack of consensus regarding what kinds of archaeological and palynological evidence reflect intensive

rice cultivation in the archaeological record of Mainland Southeast Asia (for recent discussions, see Kealhofer 1996 and Penny *et al.* 1996).

Whether trends in the archaeological record of the first millennium BC reflect qualitative changes in sociopolitical organization that are commonly associated with state formation has been debated for some time (for reviews, see Higham 1989a:239; Hutterer 1982; Vickery 1998:51). It is possible that polities or *mandalas* emerged in river valleys from central Vietnam to Burma during this time (Higham 1989a:239). Despite our current lack of knowledge about southern Cambodia, preliminary field investigations suggest that the Mekong delta underwent similar organizational changes between *c.* 500 BC and AD 500. As Ng (1979: Map 3) noted, parts of the delta contain the proper combination of soils and potable water to sustain sizeable wet-rice farming populations. Angkor Borei is in one of Cambodia's most productive rice farming regions today (Fox and Ledgerwood 1999), and may have been an ideal location in the past as well.

The Transition to History in the Mekong Delta

In most areas of the world, the transition to history is associated with the appearance of writing. Indigenous writing systems first appeared in the early seventh century AD in southern Cambodia (K. 557 and K. 600 in Jenner 1980); see also Coedès 1931, 1954), and complex polities or *mandalas* emerged several centuries earlier. We know the earliest polities of the Mekong delta through documentary evidence, and particularly through Chinese accounts and oral traditions (Gaudes 1993; Jacob 1979; Jacques 1979; Ledgerwood 1996; Stark 1998; Vickery 1986, 1994). Chinese dignitaries in the third century AD described a Kingdom of Funan which reputedly contained multiple urban centers (Coedès 1968; Colless 1972-73; Pelliot 1903). Scholars continue to debate the precise location of Funan (e.g., Colless 1972-73; Loofs-Wissowa 1968-69; Vickery 1998:45), and our archaeological research project examines the possibility that Angkor Borei was an administrative centre of this polity.

Several French art historians, archaeologists and geographers visited Angkor Borei to acquire collections for Cambodia's newly established National Museum during the first half of the twentieth century (e.g., Boisselier 1966; Parmentier 1927, 1933). Although a town of approximately 6000 inhabitants sits directly on top of the archaeological site today, archaeological features are still visible as collapsed rubble mounds and water control features. As one example, portions of the ancient moat are now used for farming. French geographer Etienne Aymonier (1900-03) described architectural features of the site (in particular a wall), while others collected statuary from the site and vicinity for museum collections.

More recently, Angkor Borei has yielded a rich variety of archaeological materials for looters and archaeologists. Through their daily activities in the village, local people have accumulated a variety of beads (stone, glass, gold), stone palettes, sculptural fragments, carved stone zoomorphic figures and plaster heads of people. Villagers have also recovered complete and nearly complete earthenware ceramic vessels that were probably interred with the dead (Figure 2). Since most Angkor Borei artefacts ultimately circulate through the illicit antiquities trade, information regarding their provenance and context is lost.

No systematic archaeological field research has been undertaken previously in Cambodia's Mekong delta, and war and civil strife restricted Vietnamese research on the early historic period on their parts of the Mekong delta between the 1950s through 1970s. Changing research priorities after the mid 1970s allowed Vietnamese archaeologists to resume their work in the region, extending

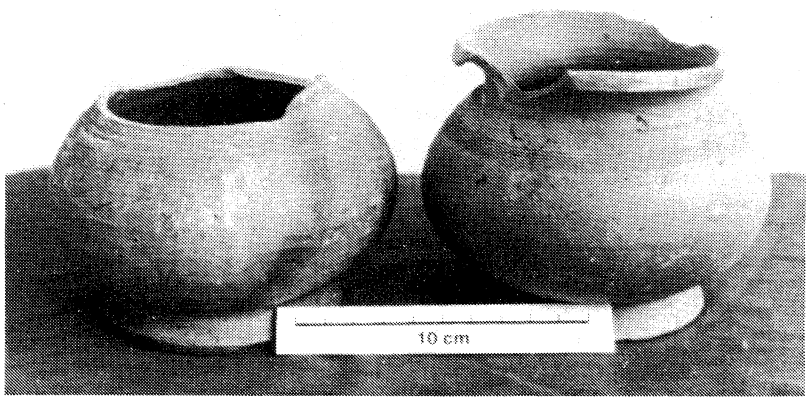

Figure 2: Examples of earthenware ceramics recovered from Angkor Borei by villagers. Vessels recovered during the 1999 excavations at Wat Komnou by the Lower Mekong Archaeological Project are similar in shape and technology to these vessels.

research that Louis Malleret began in the 1940s (Malleret 1959, 1960, 1962). Much of what we know about early historic period archaeology in the region to date thus derives from the Vietnamese side of the delta (e.g., Dao Linh Côn 1998; Ha Van Tan 1986; Lê Xuân Diêm *et al.* 1995; Trinh Thi Hoà 1996; Vo Si Khai 1998).

Louis Malleret's research in the Trans-Bassac area and at the site of Oc Eo produced a wealth of evidence for international maritime trade in semiprecious stone beads, high-tin bronze artefacts, Rouletted Ware, Roman coins, intaglios and glass beads (Malleret 1959, 1960, 1962). A decade earlier, using aerial photographs, Pierre Paris (1931, 1941) identified possible canals between Oc Eo and Angkor Borei. Since the 1970s, Vietnamese archaeologists have worked steadily in the delta on sites from the Oc Eo Culture (e.g., Ha Van Tan 1986). Several geographers (Lind 1981; Ng 1979; van Liere 1980) have interpreted aerial photographs of the region to study early historic settlement and economy. This growing body of research suggests that large settlements were founded throughout much of the Mekong delta by the first millennium AD.

After decades of political instability, archaeological research has resumed recently in Cambodia. Prehistorians and historical archaeologists are now actively engaged in field investigations throughout the country (e.g., Kojo and Pheng 1997, 1998; Stark *et al.* 1999), and most current energies focus on understanding settlement patterns, architecture and kiln sites from the Angkorian period in the northwestern portion of Cambodia (e.g., Aoyagi *et al.* 1998; Bruguier 1998; Engelhardt 1996; Moore and Freeman 1998; Pottier 1998; Tsuda 1998-99). Field investigations at Angkor Borei by LOMAP have begun to reveal the complex stratigraphy and history of this ancient settlement southern Cambodia.

THE LOWER MEKONG ARCHAEOLOGICAL PROJECT

LOMAP was initiated in 1996 through the University of Hawaii (UH) and the Royal University of Fine Arts (RUFA) as part of the broader UH/East-West Center/RUFA Cambodia program (Griffin *et al.* 1996). LOMAP focuses on the development of sociopolitical complexity in this region during the early historic period, *c.* 500 BC-AD 500 (Stark 1998). The first phase of this long-term program involved preliminary research in 1996, and the second phase involves intensive field investigations in 1999 and the year 2000. Four objectives guide LOMAP fieldwork:

1. documentation of the site's layout and the range of its archaeological features;
2. evaluation of the integrity of subsurface materials and description of the site's stratigraphy;
3. collection of samples for dating portions of the archaeological site; and
4. reconstructing the hydrology and natural environment of the early historic period in this region.

We accomplished these objectives through a combined program of field research and training.

LOMAP's first archaeological field season at Angkor Borei took place in 1996. LOMAP selected Angkor Borei for archaeological investigation for several reasons:

1. the site contains the earliest dated Khmer inscription (AD 611) in Southeast Asia;
2. historians commonly associate Angkor Borei with the inland capital of the Funan polity; and
3. as mentioned, previous research suggests that a series of canals linked Angkor Borei to Oc Eo. In this scenario, Angkor Borei was one inland capital of Funan, which also included the port city of Oc Eo (southern Vietnam).

The LOMAP used a variety of field methods in its preliminary research phase: surface survey and mapping, test excavations, auger sampling and coring, and trenching with a mechanical backhoe. Most of the 1996 fieldwork focused on systematic test excavations to illuminate aspects of site stratigraphy and chronology, while the 1999 field season investigated an early cemetery and began a paleoenvironmental research program. Preliminary results from each of the two field seasons are discussed in the following section.

Results from the 1996 Field Season

Three objectives guided the 1996 fieldwork, which we have reported in greater detail in our preliminary report (Stark *et al.* 1999). Documenting the site's shape and the range of its archaeological features was a primary goal, as was evaluating the integrity of subsurface materials and describing the site's stratigraphy. The project's preliminary site map suggests that the ancient site of Angkor Borei is at least 300 hectares in area, the city's wall encircles a D-shaped elevated area (Figure 3), and the wall's perimeter is approximately 6 km. Local topography may constrain the site's location and shape. The mapping crew also identified more than 151 features throughout the walled area of Angkor Borei, including more than 100 water features (e.g., reservoirs, small pools, and natural ponds of various sizes). Ancient water storage features at the site are commonly associated with mounds of collapsed brick architecture, but we cannot currently assign dates to most of these rubble mounds or to their presumably associated water features.

Project members also identified features found beyond the city's wall, particularly to the south of the city, that were constructed and used at some point in Angkor Borei's occupational history. These features include water storage facilities that are directly associated with the ancient settlement, including possible moats and reservoirs. An inner

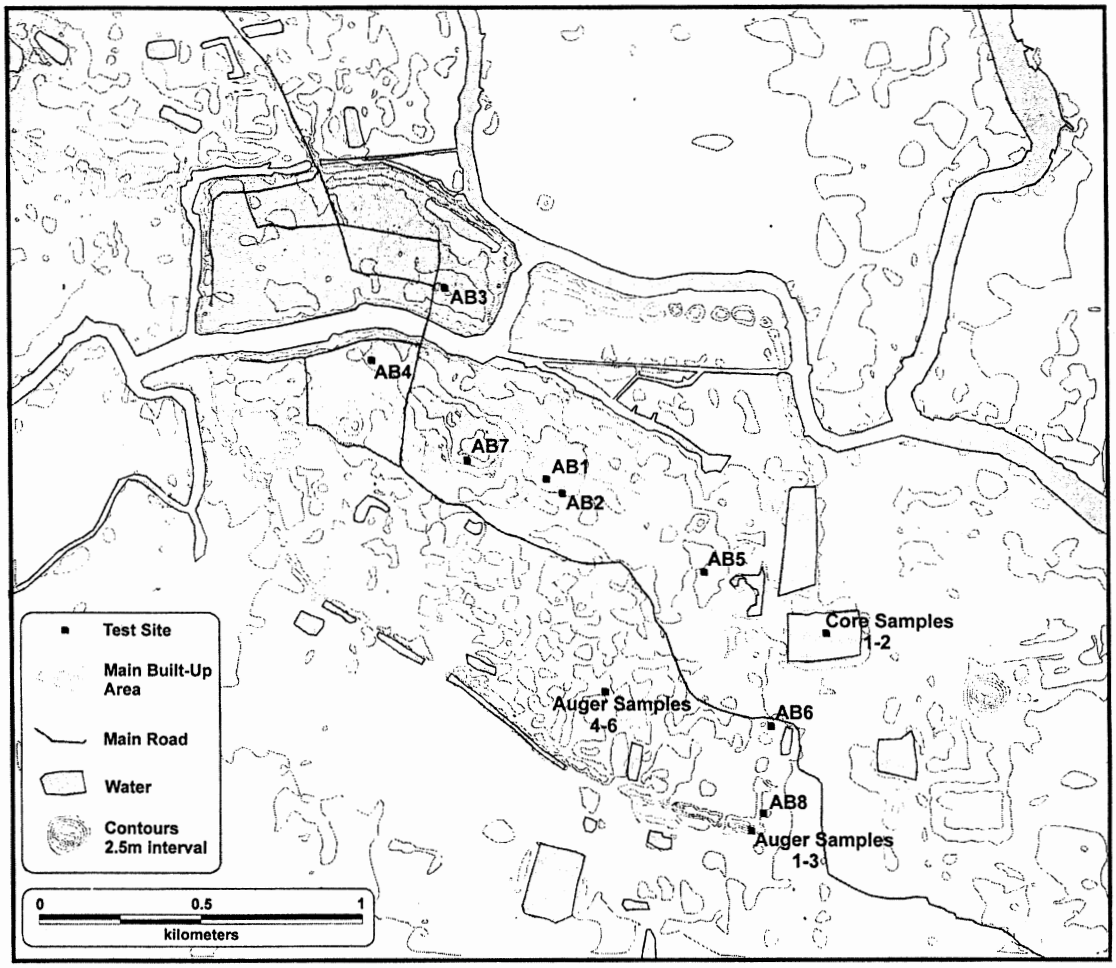

Figure 3: Contour map of Angkor Borei. Excavation and coring loci from the LOMAP field seasons are indicated by squares. Note: contour map elevations are relative, and assume that floodwaters in the 1992 Finnmap aerial photographs are uniformly 2 m above sea level. Provision of surveyed control points in the Angkor Borei area, which do not yet exist, will be necessary to obtain absolute elevations for this map. (Photograph courtesy of John Shearer, Anne Dunlap and Jane Drummond [Department of Geography and Topographic Sciences, University of Glasgow].)

moat parallels portions of the city wall today, and averages 22 m in width. Sections of the outer moat are still visible along the site's eastern and southern boundaries, and it is possible that western portions of this feature have been incorporated into a north-south running canal that leaves the site in a southwesterly direction. Work is now underway to date these apparent moats, which may have been constructed in conjunction with the earthen embankment and subsequent brick wall around Angkor Borei.

We also examined two areas of the site using 1 x 2 m excavation units to obtain radiocarbon samples to build a ceramic sequence. Results of our radiocarbon dating suggest that populations settled Angkor Borei *c.* 400 BC or 500-600 years earlier than the Chinese documentary accounts of the area (Stark *et al.* 1999).

Brick masonry features have been noted across the Mekong delta, and Vietnamese archaeologists have documented substantial variability in the form and function of brick monuments associated with the Oc Eo Culture (e.g., Dao Linh Côn 1998; Ha Van Tan 1986; Vo Si Khai 1998). More than 30 brick masonry rubble mounds have been identified at Angkor Borei; they vary in size and some features may include multiple rubble mounds. Villagers have sunk deep shafts into the middle of most brick rubble mounds at Angkor Borei, exposing the architectural detail. Doing so often produces precious goods from each mound's core: villagers reported that they have found and sold gold leaf, silver objects and crystal amulets in the local market and to visitors.

Crew members also uncovered portions of one collapsed brick structure in the south central portion of the site (AB-5), which is found near five other mounds. Villagers once mined the structure we investigated bricks; the feature, therefore, was incomplete. However, removing vegetation and overburden from the mound revealed a rectangular brick platform that is at least 10 m wide (SW-NE) and 19 m long (NW-SE). Luminescence dating of a brick from this feature proved inconclusive: the sample's thermoluminescence (TL) and optically stimulated luminescence (OSL) dates produced inconsistent results, perhaps because the bricks had not been sufficiently fired at the time of manufacture to produce a strong signal (Feathers 1997).

Vietnamese archaeologists have dated brick structures associated with the Oc Eo Culture from the 1st-10th centuries AD. Most of these Oc Eo Culture sites date to the 4th-6th centuries AD. Field investigations by Manguin (EFEO) and Vo Si Khai (Center for Archaeology/Institute of Social Sciences, Ho Chi Minh City [CA-ISS]) have focused on architectural features in and around Oc Eo since 1998. Results of this EFEO/CA-ISS research will strengthen our understanding of the age and function of brick features in the southern Mekong delta (see also Manguin 1998).

The 1996 excavations recovered more than 37,000 sherds for analysis. Earthenware ceramics predominate the ceramic assemblage, but villagers also have recovered small collections of stoneware and glazed wares from the site. Ceramic forms recovered from LOMAP surface collections and excavations include culinary ware, serving ware, industrial ceramics, and possibly ritual vessels. Other artefacts recovered through surface surveys and excavations include glass beads, flaked stone, metal artefacts and ancient industrial byproducts, such as slag.

Preliminary study of the Angkor Borei ceramics suggests a dynamic technological tradition (Stark 2000). The earliest assemblage (i.e., the 5th-2nd centuries BC) contains burnished and incised, cord-marked, or smoothed ceramics. Ceramics from the site's second phase of occupation (i.e., 1st century BC-*c.* 3rd century AD) exhibit multiple forms of surface treatment (cord-marking, smoothing, burnishing) and decoration (painting *vs* incising). Some later ceramics exhibit evidence of wheel manufacture, although additional research is necessary to determine the kind of wheel (slow *vs* fast wheel) and the manufacturing techniques. Ceramic materials and technology from Angkor Borei's third phase (i.e., post-AD 300) contrast markedly with earlier assemblages. The third phase witnessed changes in raw material use (and the adoption of a fine-tempered clay), the introduction of new vessel forms (particularly the *kendi/kundika*, or spouted vessels) and innovations in surface treatments (like slip and paint) to different methods of construction (hand-built *vs* wheel made techniques).

Report on the 1999 Field Season

LOMAP continued its field investigations at Angkor Borei in 1999 through excavations and geoarchaeological studies. Goals for the 1999 field season concentrated on exposing portions of an early historic cemetery in the center of Angkor Borei, and on launching a paleoenvironmental research program in collaboration with Dr. Paul Bishop from the University of Glasgow. Archaeologists (faculty, students, and recent graduates) from the University of Hawai'i (UH) and the Royal University of Fine Arts in Phnom Penh (RUFA) worked together January to March 1999. Research focused on three important loci at the site:

1. the centrally located mound upon which Wat Komnou sits today;
2. the ancient city wall; and
3. the ancient water features, which are primarily moats and reservoirs (Figure 3).

LOMAP crew members excavated a 2 x 3 m pit on the southern slope of the mound on which Wat Komnou is found. This mound is located in the central area of the ancient settlement, making it a likely spot for a residential area, and the mound is also the highest point in the walled site. Interviews with villagers suggested that ancient brick structures stood on its summit as recently as the 1930s, and were used over the last six decades for building material. In June 1998, villagers removing earth from the southern edge of the Wat Komnou mound accidentally uncovered human bones and associated artefacts. Interviews with the workmen suggest that they exposed at least eleven before district officials halted their work. Some burials were extended, while flexed burials were most common; villagers also reported finding some agglomerations of ash and bone fragments that might represent cremations.

Archaeological excavations during the 1999 field season immediately up slope from this damaged area reached *c.* 4 m below the present surface of the mound, and recovered partial skeletons of no fewer than 18 individuals. Most burials were inhumations, with a small number of possible secondary burials (bundles of human bones), and grave goods generally included either pig skulls, globular earthenware jars, or both. Many of these globular jars have ring bases and a burnished red slip, and these features distinguish them from other ceramics in the Angkor Borei assemblage. Small numbers of glass beads were recovered directly with the burials, although the overlying matrix contained hundreds of stray beads. On a relative chronological basis (using the 1996 stratigraphy as a guide), these burials may be assigned to the early historic period (and perhaps no earlier than the 1st century AD), but we await radiocarbon assays to refine the dating of this cemetery. This cemetery is one focus of the next field season's research, since Angkor

Borei has now yielded the first early historic cemetery of inhumations for archaeological research in Cambodia.

Another portion of the 1999 fieldwork involved geo-archaeological investigations of the ancient city wall and of associated water control features. Archaeologists documented and excavated a section of the earthen and brick masonry-capped wall that surrounds Angkor Borei (Figure 3). To minimize additional damage to the wall, work concentrated in the southeastern portion of the site where a farmer had previously cut a trench to drain his fields. We expanded the existing wall cut to study the wall construction sequence, and then excavated a 1 x 2 m trench below the surface of the cut to study the pattern of earthen mounding. Additional work (and chronometric samples) are needed to clarify the nature of wall construction, but our investigations to date suggest a multi-staged wall construction sequence that may have originated, first, with an earthen embankment that surrounded the settlement.

Dr. Bishop also initiated a series of geomorphological studies of hydraulic features in and around Angkor Borei. Some research effort focused on identifying and interpreting paleochannels and possible ancient canal remnants around Angkor Borei to evaluate Paris's (1931, 1941) claims that various canals radiated southward from Angkor Borei and that one terminated at Oc Eo; aerial interpretation is currently in progress. Another major task involved coring the large rectangular *baray* (or reservoir) along the site's eastern border (Figure 3), and samples from the core have been submitted for analysis. We are hopeful that basal ages from the core will provide some indication of when the *baray* was constructed; this information will fill yet another gap in our understanding of the site's developmental chronology.

MAJOR ARCHAEOLOGICAL FINDINGS

Refinements in Chronology: from the Site to the Region

Stratigraphic excavations at Angkor Borei have begun to produce chronometric information that helps us to bracket the beginning of the site's occupational sequence. Our earliest dates for the site come from the 1996 test excavations, where dates from the interface with sterile soil in two of these units produced beginning dates in the 5th and 4th centuries BC (Stark 1998; Stark *et al.* 1999). Several inscriptions on granite and schist slabs have recently been uncovered and await translation. Coedès (1931, 1954) previously dated two inscriptions from Angkor Borei (K. 557 and K. 600 [Jenner 1980]) to the early seventh century.

Stone sculptures were recovered during the 1996 bulldozing of one of Angkor Borei's brick monuments, which supplement a sizeable extant collection of pre-Angkorian images from the site that are now housed at the National Museum in Phnom Penh. Art historians working on pre-Angkor statuary now date these works of art (and particularly mitred Vishnu figures) to various points during the 7th century AD (e.g., Brown pers. comm. 1999; Dalsheimer and Manguin 1998; Dowling 1999). TL dating of a low-fired brick from a recently bulldozed brick masonry structure at Angkor Borei produced a 10th century date (Feathers 1997). Some of these brick monuments likely housed sculptural images; if construction of the monuments and sculptures coincided, then perhaps population at Angkor Borei peaked in the 6th and 7th centuries AD and subsided – but did not cease – for several centuries after that.

Research to date provides suggestions, if not conclusions, about the timing and nature of settlement at Angkor Borei. Although the basal layers of units excavated in 1996 suggest that the settlement was first occupied by the 4th century BC, little is known about the timing of construction activities for the embankment, wall and moat that surround the site. As noted previously, the shape of Angkor Borei as a site conforms to the area's natural topography, rather than to a symmetrical plan. In northeast Thailand, Moore (1988) distinguishes between earlier moated settlements (first appearing *c.* 1000 BC) that were constrained by topography, and later moated settlements (first appearing after *c.* AD 500) that are more variable in shape in northeast Thailand. Angkor Borei more closely resembles the first millennium BC pattern in northeast Thailand than it does the later pattern of "territorial" sites. Interestingly, the Oc Eo site plan suggests a symmetrical plan that resembles the later (i.e., post-AD 500) pattern that Moore identifies on the Khorat Plateau. We need more work to determine whether moated sites in the Mekong delta also evolved from "water harvesting" or "naturally moated" sites to "territorial" (or "non-topographically controlled") sites through time.

These data and comparisons provide two competing hypotheses for explaining the developmental history of Angkor Borei during the early historic period. The first hypothesis assumes that Angkor Borei was founded in the mid-first millennium BC as a small settlement of dry-season flood-recession rice farmers, and that this settlement grew through time into a large regional center with all its trappings (i.e., monumental architecture, large populations, craft specialists). A second and alternative hypothesis maintains that a large population founded the settlement initially in the mid-first millennium BC – perhaps using irrigation farming techniques – and that the various features we now see across the site were all developed as part of a long-range integrated plan. These competing models have substantial implications for understanding the scale and tempo of political development in the region, and must be tested with additional research.

Chronometric findings from Angkor Borei also contribute to our broader knowledge of developments during the early

historic period in the Mekong delta. This set of radiocarbon dates suggests, tentatively, that Angkor Borei was established no later than the 4th century BC, which makes it a contemporary of better-known sites in central Thailand (such as Chansen and Ban Don Ta Phet) and in Vietnam (particularly the Oc Eo and Oc Eo Culture sites). The settlement of Angkor Borei in the mid-first millennium BC corresponds to what may be the first period of Southeast Asia's contact with South Asia (e.g., Bellina 1998).

Radiocarbon dates from the 1996 excavations suggest that the site's occupational sequence continues throughout the first half of the first millennium AD. These later radiocarbon dates support some historical accounts that describe major centers in the Chao Phraya Valley, along the Vietnamese coast, and inland in the Mekong delta for this period (Hall 1985; Wheatley 1983). The fact that published radiocarbon dates of brick monuments on the Vietnamese side of the delta tend to cluster in the 4th-6th centuries AD (Vo Si Khai 1998:213) may suggest that the Oc Eo region was occupied later in time than either the Angkor Borei region or the Vam Co river basin in southern Vietnam (e.g., Bui Phat Diem *et al.* 1997; Dao Linh Côn 1998). Puzzling, too, is the dearth of inscriptional evidence from Vietnam's side of the delta in comparison with Cambodia (see Vickery 1998:maps 2 and 3).

We also have reasons to believe that occupation continued unabated at Angkor Borei until the 10th-12th centuries, with a hiatus in statuary construction between the 8th-9th centuries (see also Dowling 1999). This 8th-9th century hiatus may characterize much of western Southeast Asia, including Sumatra (P.-Y. Manguin pers. comm. 1999). The possibility that this break in artistic traditions reflects abandonment of Angkor Borei seems unlikely for archaeological reasons: archaeological and art historical evidence that includes, but is not limited to, statuary, inscriptions, and the Phnom Da temple, suggests continuing use of the area during the 10th-12th centuries.

If the earliest inscriptions in the delta were connected with temple building, as happened later in central and northwestern Cambodia, then perhaps brick temple construction began in the early seventh century in connection with the first dated Khmer inscriptions. Whether earlier religious structures consisted of perishable materials (like timber) and were succeeded by brick structures, remains unknown. The recovery of preserved wooden architectural fragments in the Vam Co River basin (Bui Phat Diem *et al.* 1997) and elsewhere in southern Vietnam (Pham Duc Manh 1997) offers hope that future work might identify these earliest structures.

Archaeological data thus suggest that Angkor Borei has a very deep settlement history and that the settlement was neither founded nor abandoned in response to the rise and fall of political fortunes throughout the Lower Mekong region.

Angkor Borei and the Emergence of Early Historic States in the Mekong Delta

Archaeological and art historical research now provides the abundant evidence for the emergence of complex polities between 500 BC and AD 500 along the coasts and river valleys of Mainland Southeast Asia (e.g., Brown 1996; Higham 1989a:239, 1996a, 1996b). Until recently, archaeology has played a subordinate role, compared with epigraphy and art history, in interpreting social and political transformations that occurred during the early historic period (see also Miksic 1995:55). Whereas historians and art historians have frequently emphasized an abrupt leap to political complexity that occurred during this time (e.g., Coedès 1968; Hall 1985; *cf.* Wolters 1982), archaeologists see much continuity from the prehistoric to historic periods (e.g., Higham 1989a:190; White and Pigott 1996). The development of hierarchical political institutions, economic specialization and class-based society over more than a millennium contributed to early state formation in various parts of Southeast Asia (e.g., Allen 1998; Christie 1995; Higham 1989a:306; Miksic 1990; Reynolds 1995; Wheatley 1975, 1983; Wolters 1982). The nature and timing of these changes varied from one river valley or delta to the next, but most populated regions of Mainland Southeast Asia witnessed the emergence of complex polities by the mid-first millennium AD.

Debate continues over the nature and impact of South Asia on early state formation in Southeast Asia (e.g., Allen 1998; Brown 1996; Glover 1996; Mabbett 1977a, b; Ray 1996; Reynolds 1995; Smith 1999; Vickery 1998:51). Perhaps contact consisted of two phases (following Bellina 1998; Bronson 1979; and Glover 1998): a first phase of intermittent contact during the first millennium BC, when South Asian goods moved through regional networks across Southeast Asia, and a second phase of sustained interaction in the first millennium AD.

Some scholars (e.g., Ray 1989, 1994, 1996), believe that the first maritime contact during the mid-first millennium BC arose through private entrepreneurial ventures by Indian landowners. This initial long-distance trade linked Indian ports to each other, and the whole coast was integrated economically by the second century BC. Punch-marked silver coins originated during the fifth century BC in northern India, and their circulation in Southeast Asian areas continued until the third century AD (Cribb 1981; Wicks 1992:114, 156). Although evidence for mercantile trade within India is convincing, scholars continue to disagree about whether Indian traders traveled to Southeast Asia, or whether Southeast Asians were the primary traders in the network (e.g., Manguin 1996; Smith 1999; Vickery 1998). In either

case, this network introduced non-local goods, particularly coins, into the settlements of Southeast Asia.

A crucial turning point in India-Southeast Asia maritime commerce occurred when the Roman emperor Augustus established the *Pax Romanica* in 58 BC. Indian traders then sailed into the Red Sea and supplied the Mediterranean markets. Indian traders were drawn to Southeast Asia where they acquired tin that was necessary to mint bronze coins (see also Bronson 1992; Glover 1990b). Metal currency also appears throughout portions of Mainland Southeast Asia during this time; abundant coins are reported from the vicinity of Oc Eo, although with little secure stratigraphic provenience. This currency in the Mekong Delta resembled contemporary coinage from Chandravalli, Karnataka and an identical type found between the Krishna and Godavari rivers of southern India (Ray 1989:52).

Whatever the nature of the earliest contact between South and Southeast Asia, historical and archaeological research has also yielded substantial information regarding the maritime trade network that linked Southeast Asia to its western neighbor by the mid-first millennium AD (e.g., Bellina 1998; Glover 1990b, 1996, 1998; Manguin 1993; Ray 1989, 1994). This maritime trade network involved nucleated settlements along the coasts of Mainland Southeast Asia, and those found along major drainage systems. Elements of this South – Southeast Asia trade network may have incorporated coastal Southeast Asian communities as early as the first century AD, and it seems possible that some late prehistoric sites explored by archaeologists formed the basis for these historically described settlements. Although it is the Chinese who described these extensive trade networks, compositional studies have traced some of these goods to northern and southern Indian production sources (e.g., Basa *et al.* 1991). The lack of large-scale compositional studies of utilitarian *vs* exotic artefacts from these sites, however, precludes us from evaluating the relative scale, and thus importance, of such long-distance exchange to these early coastal settlements.

Whether these polities in Mainland Southeast Asia were true states by the first millennium AD continues to be debated vigorously in Southeast Asian archaeology (e.g., Bronson 1979; Christie 1995:237; Higham 1989a:239; Miksic 1990:93; Vickery 1998:321). If complex polities in Mainland Southeast Asia are reflected materially as inscriptions, statuary and monumental architecture (following Bronson 1979:36), then recent archaeological evidence from the Mekong delta suggests a cultural and political fluorescence no sooner than the 4th century AD. Control over trade might have been one catalyst for political developments in the deltas and coasts of the mainland after the 5th century AD (e.g., Christie 1995:277; Hall 1982, 1985:48). Available evidence suggests the establishment of societies with an ascribed social hierarchy and some degree of supra-community integration (e.g., Vickery 1998:307), perhaps as competing polities, that archaeologists associate with "intermediate societies" (following Arnold 1996).

Archaeologists and historians differ in how they have interpreted these changes (Stark and Allen 1998). By focusing on the documentary record, historians have concentrated on the hierarchical nature of these polities and on abrupt changes associated with external contact (e.g., Hall 1985; Vickery 1998; Wheatley 1975, 1983). Archaeologists have concentrated instead on the origins, structure and motivations of such systems in various parts of Southeast Asia before the advent of writing (e.g., Christie 1995; Higham 1989a, 1989b, 1998; Hutterer 1982; Kennedy 1977; Miksic 1995). Archaeologists who use a political economy model and work in coastal regions (e.g., Bacus 1996; Junker 1993, 1998) contend that the power of coastal elites lay in their ability to control the production and distribution of goods that circulated in an international maritime network. Others emphasize a World Systems approach (e.g., Glover 1990b, 1996, 1998), and ecological evolutionary models provide another framework for viewing the transition to history in the Philippines (e.g., Gunn 1996).

These models, while highly useful in explaining developments in some coastal areas, provide a poor fit for Mekong delta developments after 500 BC. The scale and geographic complexity of Mainland Southeast Asian polities is larger than most polities of Insular Southeast Asia. The Mekong delta also lacks the ecological variability that is key to previously proposed dendritic models used to explain developments in the Malay Peninsula, Sumatra and parts of the Philippines (e.g., Bronson 1977; Christie 1990). Whereas coastal regions that are the settings for this model contain multiple ecological settings and topographic variability, the Mekong delta is a vast alluvial plain that is occasionally punctuated by low-lying hills. Trade relationships that unite lowland and upland populations in coastal regions, and that form the foundation of elite prestige economies, must have stretched hundreds of kilometres in the delta to link lowland-upland resources, be they human or material. Long-distance trade between unrelated polities, as Higham (1989a:235 *et passim*) has proposed previously, may have moved goods from various inland regions down into the delta along one of several major river routes.

Not only are these coastal models inadequate to explain the establishment and growth of regional systems in the early historic period. Archaeological research in Southeast Asia now requires revisions of previous models of "Indianisation" from the Indian point of view (compare Ray 1989, 1994 with Smith 1999) and from the Southeast Asian perspective (compare Ha Van Tan 1986 with Hall 1985). Chronometric dates from Angkor Borei also require us to

rethink previous developmental models for the Mekong delta, in which external contact stimulated indigenous change. Local populations evidently occupied the delta for centuries before Indian contact; now the relevant questions concern the timing, nature and geographic extent of contact rather than simply the impact.

CONCLUSIONS

Collaborative international research through the Lower Mekong Archaeological Project has already produced insights on the timing and nature of the early historic period in southern Cambodia. Concurrent research by EFEO/CA-ISS in the Oc Eo region promises to change our perspectives on another part of the delta further to the south. The vast scale of ancient settlement and sociopolitical organization in the Mekong delta warrants long-term research that integrates archaeological, documentary and art historical data. So too does the massive rate of vandalism and looting at sites on both sides of the delta (see also Trinh Thi Hoà 1996:123). What is already clear from two seasons research at Angkor Borei is the enormous research potential for this region, which archaeologists have long avoided for political and historical reasons.

Many studies are necessary before we can begin to understand the process and structure of early state formation in the Mekong delta between 500 BC and AD 500. The highest priority is the construction of reliable ceramic chronologies for developing regional sequences. Equally important is research on the occupational histories and morphology of primary settlements on both sides of the delta. We need detailed architectural studies for sites that date to the latter end of the period, documentation and dating of the canal networks that ostensibly linked settlements to each other, compositional studies that track the movement of goods throughout the region, and paleoenvironmental reconstruction. We look forward to participating in these archaeological projects with our many colleagues. Findings from the Mekong delta are certain to change our understanding of early state formation in Mainland Southeast Asia.

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REFERENCES

Allen, J. 1998. History, archaeology, and the question of foreign control in early historic-period peninsular Malaysia. *International Journal of Historical Archaeology* 2(4):261-90.

Aoyagi, Y., T. Sasaki, M. Masako and E. Miyata. 1998. Investigation of Tani Kiln site Group, Angkor, 6-18 August 1996. *Renaissance Culturelle Du Cambodge* 15.

Arnold, J.E. (ed.). 1996. Understanding the evolution of intermediate societies. In *Emergent Complexity: The Evolution of Intermediate Societies*. Madison: *International Monographs in Prehistory Archaeological Series* 9, University of Wisconsin.

Aung-Thwin, M. 1982-83. Burma before Pagan: The status of archaeology today. *Asian Perspectives* 25(2):1-22.

Aymonier, E. 1900-03. *Le Cambodge*. 3 vols. Paris: Ernest Leroux.

Bacus, E.A. 1996. Political economy and interaction among late prehistoric polities in the central Philippines: current research in the Dumaguete-Bacong area of southeastern Negros. *Bulletin of the Indo-Pacific Prehistory Association* 14:226-41.

Basa, K.K., I. Glover and J. Henderson. 1991. The relationship between early Southeast Asian and Indian glass. *Bulletin Indo-Pacific Prehistory Association* 10:366-85.

Bayard, D. 1992. Models, scenarios, variables and suppositions: Approaches to the rise of social complexity in Mainland Southeast Asia, 700 BC-AD 500. In I. Glover, P. Suchitta and J. Villiers (eds), *Early Metallurgy, Trade and Urban Centres in Thailand and Southeast Asia*, pp. 13-38. Bangkok: White Lotus.

Bellina, B. 1998. La fomation des réseaux d'échanges reliant l'Asie du Sud et l'Asie du Sud-Est à travers le matériel archéologique (VI^{e} siècle av. J.-C. B VI^{e} siècle ap. J.-C.) Le cas de la Thaïlande

et al Péninsule Malaise. *Journal of the Siam Society* 86 (Parts 1 and 2):89-105.

Boisselier, J. 1966. *Asie du Sud-Est. Tome I, Le Cambodge,* Tome I. Paris: A.J. Picard et C^ie^.

Briggs, L.P. 1951. The ancient Khmer empire. *Transactions of the American Philosophical Society* N.S. Vol. 41, Part 1.

Bronson, B. 1977. Exchange at the upstream and downstream ends: Notes toward a functional model of the coastal state in Southeast Asia. In K.L. Hutterer (ed.), *Economic Exchange and Social Interaction in Southeast Asia: Perspectives from Prehistory, History, and Ethnography*, pp. 39-52. Ann Arbor: Center for South and Southeast Asian Studies, *Michigan Papers on South and Southeast Asia No.* 13, University of Michigan.

Bronson, B. 1979. The late prehistory and early history of central Thailand with special reference to Chansen. In R. B. Smith and W. Watson (eds), *Early South East Asia*, pp. 315-36. New York: Oxford University Press.

Bronson, B. 1992. Patterns in the early Southeast Asian metals trade. In I. Glover, P. Suchitt and J. Villiers (eds), *Early Metallurgy, Trade and Urban Centres in Thailand and Southeast Asia*, pp. 63-114. Bangkok: White Lotus Books.

Brown, R.L. 1996. *The Dvaravati Wheels of the Law and the Indianization of South East Asia.* Leiden, New York and Köln: E.J. Brill.

Bruguier, B. 1998. L'organisation spatiale des sanctuaires Khmers; plan axé ou concentrique? In P.-Y. Manguin (ed.), *Southeast Asian Archaeology 1994: Proceedings of the 5th International Conference of the European Association of Southeast Asian Archaeologists*, Volume 1, pp. 173-8. Hull: Centre for Southeast Asian Studies, University of Hull.

Bui Phat Diem, Vuong Thu Hon and M. Nishimura. 1997. Research achievements of the archaeology before 'Oc Eo Culture' in the Lower Vam Co river basin, southern part of Vietnam. *Journal of Southeast Asian Archaeology* 17(6):72-7.

Christie, J.W. 1990. Trade and state formation in the Malay Peninsula and Sumatra, 300 BC-AD 700. In J. Kathirithamby-Wells and J. Villiers (eds), *The Southeast Asian Port and Polity: Rise and Demise*, pp. 39-60. Singapore: Singapore University Press, National University of Singapore.

Christie, J.W. 1995. State formation in early maritime Southeast Asia: A consideration of the theories and the data. *Bijdragen Tot De Taal-, Land -en Volkenkunde* 151(2):235-88.

Coedès, G. 1931. Deux inscriptions Sanskrites de Founan. *Bulletin de l'École française d'Extrême Orient* 31:1-23.

Coedès, G. 1954. *Inscriptions du Cambodge.* Paris: École française de l'Extrême Orient.

Coedès, G. 1968. *The Indianized States of Southeast Asia.* W. F. Vella (ed.). Translated by S.B. Cowing. Honolulu: University of Hawaii Press.

Colless, B.E. 1972-3. The Ancient Bnam empire: Fu-nan and Po-nan. *The Journal of the Oriental Society of Australia* 9 (1 and 2):21-31.

Cribb, J. 1981 The Date of the Symbolic Coins of Burma and Thailand ... a re-examination of the Evidence. *Seaby Coin and Medal Bulletin* 75:224-6.

Dalsheimer, N. and P.-Y. Manguin. 1998. Visnu mitrés et réseaux marchands en Asie du Sud-Est: nouvelles données archéologiques sur le I^er^, millénaire ap. J.-C. *Bulletin de L'École française d'Extrême Orient* 85:87-123.

Dao Linh Côn. 1998. The Oc Eo burial group recently excavated at Go Thap (Dong Thap Province, Viêt Nam). In P.-Y. Manguin (ed.), *Southeast Asian Archaeology 1994: Proceedings of the 5th International Conference of the European Association of Southeast Asian Archaeologists*, Volume 1, pp. 111-7. Hull: Centre for Southeast Asian Studies, University of Hull.

Dowling, N. 1999. A new date for the Phnom Da images and its implications for early Cambodia. *Asian Perspectives* 38(1): 51-61.

Engelhardt, R.A. 1996. New directions for archaeological research on the Angkor Plain: the use of remote sensing technology for research into ancient Khmer environmental engineering. *Bulletin of the Indo-Pacific Prehistory Association* 14:151-60.

Feathers, J. 1997. Luminescence dating of bricks from Cambodian temple sites. Report on file, Department of Anthropology, University of Hawaii.

Fox, J. and J. Ledgerwood. 1999. Dry-season flood-recession rice in the Mekong delta: two thousand years of sustainable agriculture? *Asian Perspectives* 38(1):37-50.

Gaudes, R. 1993. Kaundinya, Preah Thaong, and the 'Nagi Soma': Some aspects of a Cambodian legend. *Asian Folklore Studies* 52:333-58.

Glover, I.C. 1990a. Ban Don Ta Phet: the 1984-1985 excavation. In I.C. Glover and E. Glover (eds), *Southeast Asian Archaeology 1986: Proceedings of the First Conference of the Association of Southeast Asian Archaeologists in Western Europe*, pp. 139-84. Oxford: British Archaeological Reports, *International Series* 561.

Glover, I.C. 1990b. *Early Trade between India and Southeast Asia.* 2nd edition. Hull: Centre for South-East Asian Studies, University of Hull.

Glover, I.C. 1996. The Southern Silk Road: archaeological evidence for early trade between India and Southeast Asia. In A. Srisuchat (ed.), *Ancient Trades and Cultural Contacts in Southeast Asia*, pp. 57-94. Bangkok: Office of the National Culture Commission.

Glover, I.C. 1998. The role of India in the later prehistory of Southeast Asia. *Journal of Southeast Asian Archaeology* 18:21-49.

Glover, I.C. and M. Yamagata. 1995. The origins of Cham civilization: Indigenous Chinese and Indian influences in central Vietnam as revealed by excavations at Tra Kieu, Vietnam 1990 and 1993. In Yeung Chun-tong and B. Li Wai-ling (eds), *Conference Papers on Archaeology in Southeast Asia*, pp. 146-69. Hong Kong: University Museum and Art Gallery, University of Hong Kong.

Griffin, P.B., J. Ledgerwood and M.T. Stark. 1996. Education, and cultural resource management at Angkor Borei, Cambodia. *Cultural Resources Management* 19(3):37-41.

Gunn, M. 1996. Aggression and alliance: the impact of resource distribution on exchange strategies chosen by Prehispanic Philippine chiefs. *Bulletin of the Indo-Pacific Prehistory Association* 14:242-8.

Ha Van Tan. 1986. Oc Eo: Endogenous and exogenous elements. *Vietnam Social Sciences* 1-2 (7-8):91-101.

Hall, K.R. 1982. The 'Indianization' of Funan: An economic history of Southeast Asia's first State. *Journal of Southeast Asian Studies* XIII(1):81-106.

Hall, K.R. 1985. *Maritime Trade and State Development in Early Southeast Asia*. Honolulu: University of Hawai'i Press.

Higham, C. 1989a. *The Archaeology of Mainland Southeast Asia.* Cambridge: Cambridge University Press.

Higham, C. 1989b.The later prehistory of Mainland Southeast Asia. *Journal of World Prehistory* 3(3):235-82.

Higham, C. 1996a. *The Bronze Age of Southeast Asia.* Cambridge: Cambridge University Press.

Higham, C. 1996b. A review of archaeology in Mainland Southeast Asia. *Journal of Archaeological Research* 4(1):3-49.

Higham, C. 1998. The transition from prehistory to the historic period in the upper Mun valley. *International Journal of Historical Archaeology* 2(3):235-60.

Hutterer, K. 1982. Early Southeast Asia: Old wine in new skins? A review article. *Journal of Asian Studies* 41(3):559-70.

Jacob, J.M. 1979. Pre-Angkor Cambodia: evidence from the inscriptions in Khmer concerning the common people and the environment. In R.B. Smith and W. Watson (eds), *Early South East Asia: Essays in Archaeology, History, and Historical Geograph,y* pp. 406-26. New York: Oxford University Press.

Jacques, C. 1979. 'Funan,' 'Zhenla': The reality concealed by these Chinese views of Indochina. In R B. Smith and W. Watson (eds), *Early South East Asia: Essays in Archaeology, History, and Historical Geography*, pp. 371-9. New York: Oxford University Press.

Jenner, P.N. 1980. *A Chrestomathy of Pre-Angkorian Khmer. I. Dated Inscriptions from the Seventh and Eighth Centuries (AD 611-781).* Honolulu: Center for Southeast Asian Studies, *Southeast Asia Paper No.* 20, Part I, University of Hawai'i.

Junker, L. 1993. Craft goods specialization and prestige goods exchange in Philippine chiefdoms of the fifteenth and sixteenth centuries. *Asian Perspectives* 32(1):1-36.

Junker, L. 1998. Integrating history and archaeology in the study of contact period Philippine Chiefdoms. *International Journal of Historical Archaeology* 2(4):291-320.

Kealhofer, L. 1996. The human environment during the terminal Pleistocene and Holocene in northeastern Thailand: Preliminary phytolith evidence from Lake Kumphawapi. *Asian Perspectives* 35(2):229-54.

Kennedy, J. 1977. From Stage to Development in Prehistoric Thailand: An exploration of the origins of growth, exchange, and variability in Southeast Asia. In K.L. Hutterer (ed.), *Economic Exchange and Social Interaction in Southeast Asia: Perspectives from Prehistory, History and Ethnography*, pp. 23-38. Ann Arbor: Center for South and Southeast Asian Studies, *Michigan Papers on South and Southeast Asia No.* 13, University of Michigan.

Kojo, Y. and S. Pheng. 1997. A newly discovered circular earthwork in southeastern Cambodia. *Anthropological Science* 105(3):181-7.

Kojo, Y. and S. Pheng. 1998. A preliminary investigation of a circular earthwork at Krek, southeastern Cambodia. *Anthropological Science* 106 (3):229-44.

Lê Xuân Diêm, Dào Linh Côn and Vo Si Khai. 1995. *Van Hóa Óc Eo*. Nhà Xuât Ban Khoa Hoc Xã Hôi. Hanoi: Social Sciences Publishing House.

Ledgerwood, J. 1996. Myth/History and the study of Angkor Borei. Paper delivered at the Khmer Studies Conference, Monash University, Australia.

Lind, A. 1981. Applications of aircraft and satellite data for the study of archaeology and environment in the Mekong Delta, Vietnam. Ann Arbor: *Proceedings of the Fifteenth International Symposium on Remote Sensing of Environment.*

Loofs-Wissowa, H.H.E. 1968-69. Funanese cultural elements in the Lower Menam Basin. *Journal of the Oriental Society of Australia* 6 (1 and 2):5-9.

Mabbett, I.W. 1977a. The 'Indianization' of Southeast Asia: Reflections on the prehistoric sources. *Journal of Southeast Asian Studies* 8(1):1-14.

Mabbett, I.W 1977b. The 'Indianization' of Southeast Asia: Reflections on the historical sources. *Journal of Southeast Asian Studies* 8(2):143-61.

Malleret, L. 1959. *L'Archéologie du Delta du Mékong, Part 1. L'Exploration Archéologique et Les Fouilles d'Oc-Èo*. Paris: École française d'Extrême-Orient.

Malleret, L. 1960. *L'Archéologie du Delta du Mékong, Part 2. La Civilisation Matérielle d'Oc-Èo*. 2 vols. Paris: École française d'Extrême-Orient.

Malleret, L. 1962. *L'Archéologie du Delta du Mékong, Part 3. La Culture du Fou-Nan*. 2 vols. Paris: École française d'Extrême-Orient.

Manguin, P.-Y. 1993. Trading Ships of the South China Sea. *Journal of the Economic and Social History of the Orient* 6:253-80.

Manguin, P.-Y. 1996. Southeast Asian shipping in the Indian Ocean during the first millennium AD. In H. Ray and J.-F. Salles (eds), *Tradition and Archaeology: Early Maritime Contacts in the Indian Ocean*, pp. 181-98. New Delhi: Manohar.

Manguin, P.-Y. 1998. *Mission Archéologie du Delta du Mékong: Rapport sur la Campagne 1998.* Paris: École française d'Extrême Orient.

Miksic, J. 1990. Settlement patterns and sub-regions in Southeast Asian history. *Review of Indonesian and Malaysian Affairs* 24:86-144.

Miksic, J. 1995. Evolving archaeological perspectives on Southeast Asia, 1970-95. *Journal of Southeast Asian Studies* 26(1):46-62.

Moore, E. 1988. Notes on two types of moated settlement in Northeast Thailand. *Journal of the Siam Society* 76:275-87.

Moore, E. and A. Freeman 1998. Circular sites at Angkor: a radar scattering model. *Journal of the Siam Society* 85(1 and 2):107-19.

Ng, R.C.Y. 1979. The geographical habitat of historical settlements in Mainland Southeast Asia. In R B. Smith and W. Watson (eds), *Early South East Asia: Essays in Archaeology, History, and Historical Geography*, pp 262-71. New York: Oxford University Press.

Paris, P. 1931. Anciene canaux reconnus sur photographies aeriennes dans les provinces de Ta-Kev et de Chau-Doc. *Bulletin de l'École Française d'Extrême Orient* 31:221-4.

Paris, P. 1941. Notes et mélanges: ancienes canaux reconnus sur photographies aeriennes et les provinces de Ta-Keo, Chau-Doc, Long Xuyen et Rach-Gia. *Bulletin de l'École française d'Extrême Orient* 41:365-70.

Parmentier, M.H. 1927. *L'Art Khmer Primitif.* 2 vols. Paris: Librairie Nationale d'Art et d'Histoire.

Parmentier, M.H. 1933. L'art présumé du Fou-nan. *Bulletin de l'École Française d'Extrême Orient* 32:183-9.

Pelliot, P. 1903. Le Fou-nan. *Bulletin de l'École française de l'Extrême Orient* 3:248-303.

Penny, D., J. Grindrod and P. Bishop. 1996. Preliminary microfossil analysis of a lake sediment core: Nong Han Kumphawapi, Udon Thani, northeast Thailand. *Asian Perspectives* 35(2):209-28.

Pham Duc Manh. 1997. The Bung Bac archaeological site, southern Vietnam. *Journal of Southeast Asian Archaeology* 17(6):60-71.

Pottier, C. 1998. Élaboration d'une carte archéologique de la région d'Angkor: L'organisation du territoire Angkorien. In P.-Y. Manguin (ed.), *Southeast Asian Archaeology 1994: Proceedings of the 5th International Conference of the European Association of Southeast Asian Archaeologists*, Volume 1, pp. 179-94. Hull: Centre for Southeast Asian Studies, University of Hull.

Ray, H.P. 1989. Early maritime contacts between South and Southeast Asia. *Journal of Southeast Asian Studies* 10(1):42-54.

Ray, H.P. 1994. *The Winds of Change: Buddhism and the Maritime Links of Early South Asia.* Delhi, Bombay, Calcutta, Madras: Oxford University Press.

Ray, H.P. 1996. Early trans-oceanic contacts between India and Southeast Asia. In A. Srisuchat (ed.), *Ancient Trades and Cultural Contacts in Southeast Asia*, pp. 43-56. Bangkok: Office of the National Culture Commission.

Reynolds, C.J. 1995. A new look at old Southeast Asia. *Journal of Asian Studies* 54(2):419-46.

Smith, M.L. 1999. 'Indianization' from the Indian point of view: trade and cultural contacts with Southeast Asia in the Early First Millennium C.E. *Journal of Economic and Social History of the Orient* 42(1):1-26.

Stargardt, J. 1990. *The Ancient Pyu of Burma, Volume I: Early Pyu Cities in a Man-Made Landscape.* Singapore and Cambridge: PACSEA and Institute of Southeast Asian Studies.

Stark, M.T. 1998. The transition to history in the Mekong delta: a view from Cambodia. *International Journal of Historic Archaeology* 2(3):175-204.

Stark, M.T. 2000. Pre-Angkor earthenware ceramics from Cambodia's Mekong Delta. Udaya: Journal of Khmer Studies 1:69-90.

Stark, M.T. and J. Allen. 1998. The transition to history in Southeast Asia: An introduction. *International Journal of Historical Archaeology* 2(3):163-74.

Stark, M.T., P.B. Griffin, P. Chuch, J. Ledgerwood, M. Dega, C. Mortland, N. Dowling, J. Bayman, S. Bong, V. Tea, C. Chhan and K. Latinis. 1999. Results of the 1995-1996 field investigations at Angkor Borei, Cambodia. *Asian Perspectives* 38(1): 7-36.

Trinh Thi Hoà. 1996. Réflexions sur le vestiges de la culture d'Óc Eo. *Etudes Vietnamiennes* 50(120):111-23.

Tsuda, T. 1998-99. Khmer green glazed wares in the early period. *Toyo Toji Oriental Ceramics* 28:121-5.

Vallibhotama, S. 1986. Political and cultural continuities at Dvaravati sites. In D.G. Marr and C. Milner (eds), *Southeast Asia in the 9th to 14th Centuries*, pp. 229-38. Singapore and Canberra: Institute of Southeast Asian Studies and Research School of Pacific Studies, Australian National University.

Vallibhotama, S. 1992. Early urban centres in the Chao Phraya valley of central Thailand. In I. Glover, P. Suchitta and J. Villiers (eds), *Early Metallurgy, Trade and Urban Centres in Thailand and Southeast Asia*, pp. 123-9. Bangkok: White Lotus Books.

van Liere, W.J. 1980. Traditional water management in the lower Mekong basin. *World Archaeology* 11(3):265-80.

Vickery, M. 1986. Some remarks on early state formation in Cambodia. In D.G. Marr and A. Milner (eds), *Southeast Asia in the 9th to 14th Centuries*, pp. 95-115. Singapore and Canberra: Institute of Southeast Asian Studies and Research School of Pacific Studies, Australian National University.

Vickery, M. 1994. What and where was Chenla? In F. Bizot (ed.), *Récherches Nouvelles sur le Cambodge*, pp. 197-212. Paris: École française de l'Extrême Orient.

Vickery, M. 1998. *Society, Economics, and Politics in Pre-Angkor Cambodia: the 7th-8th Centuries.* Tokyo: The Centre for East Asian Cultural Studies for UNESCO, the Toyo Bunko.

Vo Si Khai. 1998. Plans architecturaux des ancients monuments du Delta du Mékong du 1er au 10^{e} siècles AD. In P.-Y. Manguin (ed.), *Southeast Asian Archaeology 1994: Proceedings of the 5th International Conference of the European Association of Southeast Asian Archaeologists*, Volume 1, pp. 207-14. Hull: Centre for Southeast Asian Studies, University of Hull.

Welch, D.J. 1989. Late prehistoric and early historic exchange patterns in the Phimai region, Thailand. *Journal of Southeast Asian Studies* 10(1):11-26.

Wheatley, P. 1975. Satyanrta in Suvarnadvipa: From reciprocity to redistribution in ancient Southeast Asia. In J.A. Sabloff and C.C. Lamberg-Karlovsky (eds), *Ancient Civilization and Trade*, pp. 227-38. Albuquerque: University of New Mexico Press.

Wheatley, P. 1983. *Nagara and Commandery: Origins of the Southeast Asian Urban Traditions*. Chicago: Department of Geography, Research Papers Nos. 207-8, University of Chicago.

White, J. and V. Pigott. 1996. From community craft to regional specialization: intensification of copper production in pre-state Thailand. In B. Wailes (ed.), *Craft Specialization and Social Evolution: In Memory of V. Gordon Childe*, pp. 151-75. Philadelphia: The University Museum of Archaeology and Anthropology, University of Pennsylvania.

Wicks, R.S. 1992. *Money, Markets, and Trade in Early Southeast Asia: The development of indigenous monetary systems to AD 1400*. Ithaca: Southeast Asia Program, Cornell University,

Wolters, O.W. 1982. *History, Culture, and Region in Southeast Asian Perspectives*. Singapore: Institute for Southeast Asian Studies.

Wright, H.T. 1998. Developing complex societies in Southeast Asia: Using archaeological and historical evidence. *International Journal of Historical Archaeology* 2(4):343-8.