sional staff at the National Museum, and at the Angkor Conservatory.

In conjunction with the classroom training, the UH/EWC conducted an archeology field training program in Cambodia during the summer of 1995. Training was conducted primarily at the "Funan" site of Angkor Borei. The dual purposes of the summer exercise were to train the Cambodian students in basic archeological field techniques such as excavation and mapping, and to plan future research and preservation. Cooperation with Cambodian authorities exceeded all expectations. The Minister of Culture and Fine Arts, the State Secretariat for Culture, the Governor of the Province of Takeo, and District officials approved the work and visited the operation, bringing national media coverage several times. Fortunately, the Dean of the Faculty of Archeology and Vice Rector of the University, Professor Chuch Phoeurn, spent considerable time at the site, working closely with the student trainees and acquainting the "novice foreigners" with the intricacies of Cambodian archeology.

Cultural resource management in Cambodia has tended to focus on preservation and restoration of the Ankorian period sites, dating from the founding of the Khmer empire in A.D. 802 through the sacking of the capital city by the Thais in A.D. 1432. During those centuries, the explosion of monumental public architecture construction saw temple building not only in the Siem Reap Province (the location of the Khmer capitals), but

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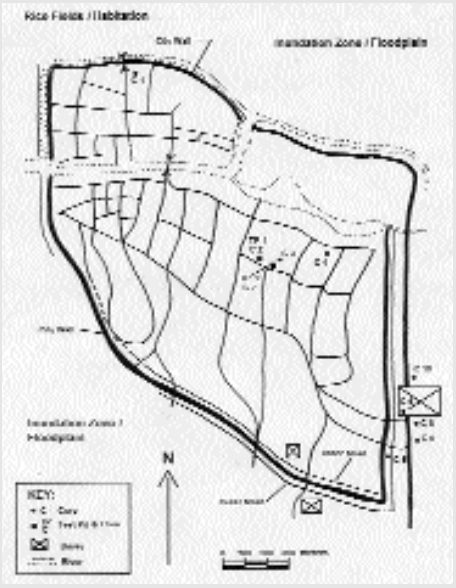
Angkor Borei

Chinese travellers to Funan in the mid-2nd century A.D., namely K'ang T'ai, reported that the "people of Funan 'live in walled cities, palaces, and houses'." Hall (1985) also notes that "populations lived in houses built on stilts within great earthen ramparts." Louis Malleret, a French archeologist who excavated at Oc-Eo, an early historic site in present-day Vietnam, discovered rectangular moats and ramparts around the town of Oc-Eo measures 3.0 x 1.5 kilometers (approximately 1.865 miles x .932 miles). Importantly, he described this Funanese site as lying behind five ramparts and four moats. Recent research at Angkor Borei also revealed the presence of both walls and moats around the city.

Angkor Borei is, for the most part, a moated settlement, surrounded by a wall that is approximately 6 kilometers (approximately 3.729 miles) long. The wall is composed of a brick foundation with packed earth over the top of the bricks. Sections of the wall profile that are visible due to erosion and modern road cuts through the wall revealed up to 18 layers or courses of large, stacked bricks. The wall itself varied in width between 10 and 20 meters (approximately 10.54 and 21.8 yards) wide and once rose 4-5 meters (approximately 4.37–5.46 yards) above the surrounding terrain. The wall does not completely enclose the ancient city as the Angkor Borei river runs through the middle from the west to the east. The rampart does continue on both sides of the river.

In some places, the city wall is level on top, the flatness intentionally created during original construction. The level character of the top of the wall has become more pronounced by transportation use and the wall's use as a habitational area over the centuries. The even surface creates ideal living areas for present-day occupants as their houses lie above the marshlands present on both sides of the wall. Local villagers now reside, in places, directly on the wall. It was observed that many of the bricks composing the wall were being used in the construction of new houses, garden plots, and small brick-lined water catchments near the dwellings.

Temporally, the construction of the wall may be dated through its similarity with other recognized Funanese walls such as those at Oc-Eo. Also, enclosed settlements were supposedly typical of Funan-period settlements. Thus, the wall was likely constructed between the 2nd and 5th centuries A.D. Several brick samples from the lower portion of the wall are currently being analyzed by thermoluminescence to obtain absolute dates of brick ages to infer wall construction episodes.



Functionally, the wall may have served several purposes. First, as could be called "typical" of a Funan period city, the wall enclosed Angkor Borei, separating the city from the surrounding low-lying floodplain. Second, since Angkor Borei was a major trading center, residents could have efficiently controlled the flow of goods and merchants in and out of the city. Third, water control on the floodplain was necessary as the city lies in an inundation zone and could easily be flooded. Potentially, the river running through the middle of the city could have flooded residential areas, but this seems unlikely as the banks of the river are raised and residential units would lie well above the swollen river. Fourth, the wall served a defensive role as a fortification around the city. Finally, the city

into present day Thailand and Laos. Given the splendor of these sites, it is easy to justify a priority for their conservation. Scholars and preservationists from Japan and France, as well as those associated with the World Monuments Fund, are leading efforts to help Cambodians in this domain. The East-West Center/University of Hawai`i Cambodia anthropology and archeology program, however, in its contributions, looks outside the Siem Reap area and to times earlier than the Khmer empire.

Following the lead of Professor Chuch Phoeurn, the Hawai`i team is concentrating on the prehistory of Cambodia, on prehistoric sites, and on the southern portion of the country. In addition, the terrain along the banks of the Mekong River are appropriate for Hawai`i scholars and students to explore for sites. "Prehistory" is meant in this context as anything that is "pre-Angkorian," or that dates before the 9th century A.D. The survey is not limited to the Funan age (the first few centuries of the Christian era: the term "Funan" is from Chinese sources and may derive from the Khmer word *phnom*, which means mountain) and its sites of Angkor Borei and Ba Phnom, but may include examinations into the Iron and Bronze ages, the Neolithic, and the Paleolithic. The project has, and will, concentrate on the low southerly regions that are the upper reaches of the Mekong delta and happily transpires in a land and time where and when next to nothing is known.

wall may represent a ritual function that portrays the sector controlled by elites of the area and may also incorporate a representation of the Mandala, the Hindu universe.

Other important features on the landscape are moats. Much like the moats at Oc-Eo, a Funan site in southern Vietnam, yet larger, both an inner and outer moat run along the south, east, and west sides of the city. The inner and outer moats are separated by the city wall. The inner moat runs from the southeast corner of the wall to the west for 1.5 kilometers (approximately .932 miles) and is 22 meters (approximately 24 yards) wide. The outer moat runs from the southeast corner of the wall to the west and north for a distance of 3 kilometers (approximately 1.86 miles). This moat is also 22 meters (approximately 24.06 yards) wide, thus showing a formality in construction. At present, both moats are only 1.23 meters (approximately 4.03 feet) deep and are overgrown with mangrove taxa. More than likely, the moats were much deeper in the past but due to the intense movement of soil in the floodplain region, the moat probably filled rapidly. Analysis of soil samples taken by a Livingston corer in the moats should help determine the approximate original depths of the moats. Radiocarbon dates from the moat itself will aid in dating the stratigraphic layers as well as provide a complement to the soil analysis underway to identify building episodes by stratigraphic analysis. Finally, a network of moats several kilometers beyond the city was discovered. These will be investigated further in the 1996 field season.

A third category of important features documented last summer were barays or reservoirs. Previous residents of Angkor Borei created large water management systems, both to direct the immense amount of water on the floodplain during monsoon seasons and to store water for future use. The reservoirs were probably built mainly to store large amounts of water for the dry season, thus allowing residents to produce multiple rice crops throughout the year. Water from these reservoirs may have been circulated through canals, irrigation channels, and moats to allow for year-round rice production.

Several barays were discovered within the city wall, in less populated zones, while a larger reservoir was recorded just outside the city wall's eastern side (see map). The large baray was rectangular, measuring 200 meters (approximately 218.72 yards) due east-west by 100 meters (approximately 109.36 yards) north-south. A network of small barays was located during the latter part of the field season to the east of Angkor Borei. This network will be investigated during the 1996 field season and should give a more detailed picture of water management systems in and around Angkor Borei.

The population of early historic-period Angkor Borei transformed the difficult floodplain environmental conditions by constructing large walls, moats, barays, and employing an extensive canal system. These features were critical for Angkor Borei's agricultural production and for trade with other economic centers within the Funan domain. Future research involving continued survey and excavations at the early historic city will reveal more about the intensity of agricultural production with respect to its hydraulic systems, and will shed light on the important role that this city played in the development of early Southeast Asian polities.

References

Hall, Kenneth R. *Maritime Trade and State Development in Early Southeast Asia.* (University of Hawai`i Press, Honolulu, 1985).

Higham, Charles. *The Archaeology of Mainland Southeast Asia: From 10,000 B.C. to the Fall of Angkor.* (Cambridge, England: Cambridge University Press, 1989).

Malleret, Louis. *L'Archeologie du Delta du Mekong* (4 Vols.). (Ecole Francaise d'Extreme Orient: Paris, 1959-1963).

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