

**A Mobile Phone? Yes, I Want One! A Royal
City? Yes, I Want One! How International
Technology Met Local Demand in the
Construction of Myanmar's First Cities, 1800
Years Ago.**



Bob Hudson

[*Abstract*]

In the modern world, we can share information and new products as quickly as an email can be sent, or a parcel can be loaded onto an aircraft. But the brick-walled urban centres that sprung up in Myanmar around 150 CE suggest that ancient people could be just as excited about new information and products, even though the transmission of data and cultural objects followed a different path. These huge resource-intensive cities, inspired by the walled cities of India, were not built in sequence, as has been generally assumed, but in the same period. Once the Royal City arrived, the chiefly families of early First Millennium Upper Myanmar just *had* to have one.

Keywords: Myanmar, Burma, archaeology, urbanism.

An adviser to UNESCO and the Myanmar Ministry of Culture on the successful 2014 Pyu Cities World Heritage bid; an associate of the Archaeology Department, University of Sydney, Australia; an Open Society Foundations Visiting Fellow at Yangon University, Myanmar, and a visiting lecturer at the Field School of Archaeology at Pyay, Myanmar. bob.hudson@sydney.edu.au

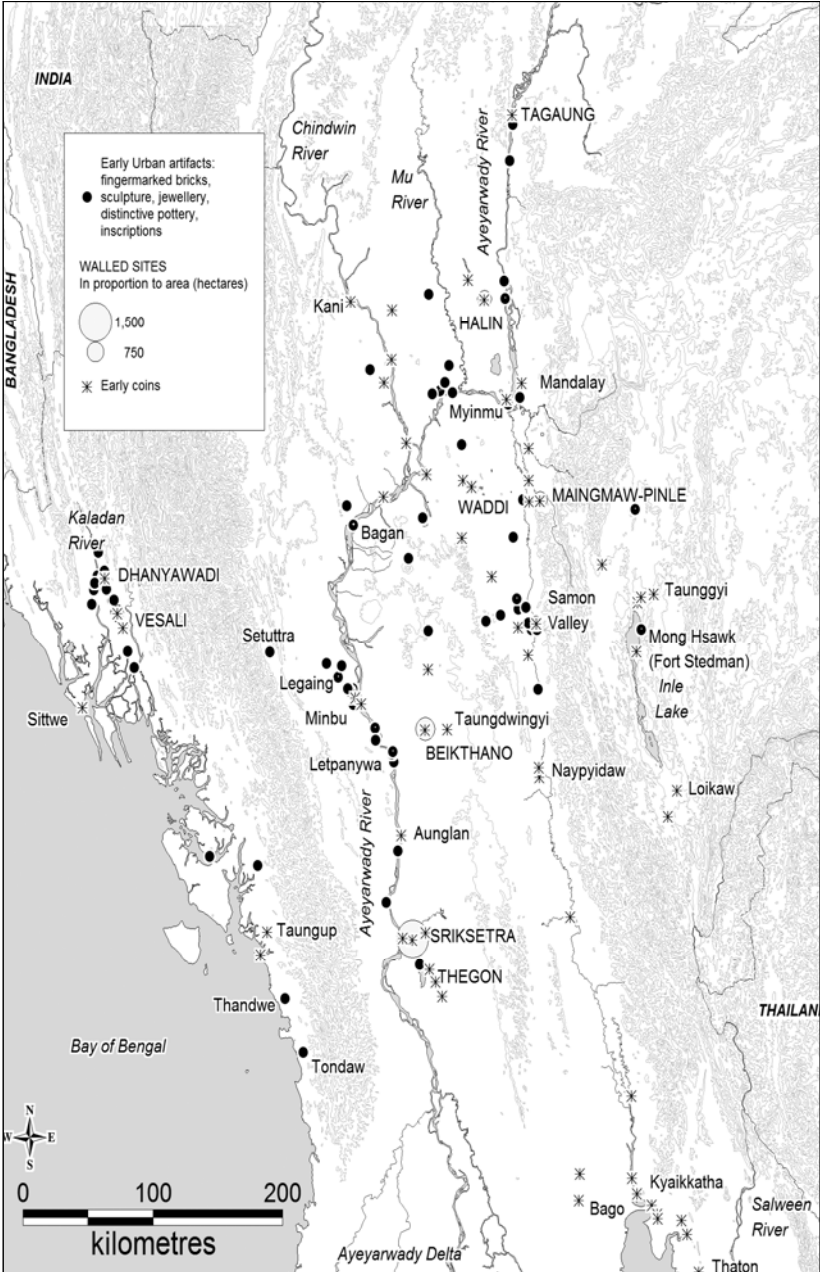


Figure 1. Upper Myanmar: Early Urban centres and finds of Early Urban artifacts.

I. Introduction

Early in the First Millennium CE, an expanding Iron Age population and new technologies and socio-political concepts coincided with the appearance of brick-walled cities in Upper Myanmar's Ayeyarwady valley, and on the Kaladan floodplain on Myanmar's west coast, in what is now Rakhine (Arakan) state (Figure 1). The nomination in 1996 of three of the walled cities to the United Nations Educational Cultural and Scientific Organisation (UNESCO) World Heritage Tentative List stated that Beikthano, Halin and Sriksetra "were built from the 1st to 9th centuries AD" (Department of Archaeology 1996). This reflected the academic consensus at the time, and remains what we might call the popular view, as presented, for example, on Wikipedia (Wikipedia 2014).

It is not in doubt that Myanmar's walled settlements were occupied during the First Millennium CE. There is an extensive literature that looks at their structure and contents (Aung Thaw 1972; Gutman 1976; Luce 1985; Stargardt 1990; Aung Thaw, Myint Aung *et al.* 1993; Aung Myint 1998, 1999; Gutman 2001; Nai Pan Hla 2011; Moore 2012). This paper presents a new hypothesis on the chronology of the cities, proposing that while monument construction and cultural activities occurred over many centuries, wall construction took place over a limited period of time, around the 1st to 3rd centuries CE. This burst of activity was an expression of power and authority by independent local leaders who were influenced by Indic notions of merit accumulated from past lives, and consequently of the worthiness of rulers to rule, and to live in appropriately worthy surroundings.

Such rulers may have been encouraged by descriptions of fortified cities in Indian texts such as the *Ramayana* or the Buddhist *Milindapanha* (Schlingloff 2013: 11-16), or in handbooks of royal governance that were eventually compiled as the *Arthashastra*: "in the absence of forts, the treasury is to the enemy, for it seems that for those who own forts, there is no destruction" (Shamasastri 1915: 469). Perhaps traders or travelling monks had brought stories of the 60 or more enclosed urban settlements that were operational throughout the Indian

subcontinent by the early centuries CE, cities which "for ordinary inhabitants, as well as for elites, provided economic security at all times and physical security when needed" (Smith 2006: 119-123).

Further examples of the value of enclosed settlements in the 1st to 3rd century CE period came from China, where wealthy landowners responded to weakening central control by building fortresses across the country (Elv in 1973: 33-34). The news of this new style of living reached people in Myanmar who were well used to incorporating aspects of neighbouring cultures.

II. Archaeological Background

Around 70,000 years ago, modern *homo sapiens* followed the coast of South and Southeast Asia from Africa to eventually reach Australia. On the way, some of these explorer-settlers moved up the river valleys, leaving genetic traces in the modern populations of places such as India and Myanmar (Oppenheimer 2004, 2012). In Myanmar, the focus of our story, they left stone tools as evidence of their movement across the landscape (de Terra, Movius *et al.* 1943). The hunter-gatherer lifestyle (Moore 2007, Chapter 2) eventually merged or coexisted with agriculture (Bellwood 2005). By 4,500 years ago, people living at Halin, which much later became one of the walled cities, were making incised earthenware, a class of pottery identified with Southeast Asian agriculturalists (Hudson and Nyein Lwin 2012). From this period we begin to get a glimpse of individuals, not just of their tools and pottery. At Halin the people who were adding agriculture to their survival strategy buried their dead in a systematic way.

While a grave is a specific kind of cultural deposit, it is not merely a window on death rituals. It can be, as we often kindly say today at funerals, a celebration of life. In the graves at Halin, we see evidence of characteristics we can recognise in modern societies, such as the ownership of beautiful, useful or significant objects, and social differentiation.

III. Deer, Snake and Cowrie Headdress: Social Status in a Stone-age Cemetery

The residents of an ancient village, site HL 30 at Halin, accumulated more than a metre of potsherds and ash during their period of residence. They were probably unaware that the skeletons of at least 37 people had been directly below them. In the walls of excavation trenches, we detect the outline of postholes the villagers had dug to support their houses, but none of the holes seem to have reached the burials below. We can see two consistent elements of human behaviour in these archaeological strata. In digging the post holes 30 or 40 centimetres down, nobody went to any more trouble than they needed to. And in throwing away their rubbish, the same principle applied. At the upper habitation level of HL 30, the debris of daily life accumulated. But ancient villages in Myanmar, as distinct from cemeteries, leave behind relatively little cultural information. Modern villagers who go hunting for treasure in these old sites will often talk of the "poor man's layer" they have to dig through to find the earlier "rich man's layer". This is the case at HL 30. It is in the earlier level, the Neolithic cemetery, that we begin to read some individual stories.

We know from charcoal just above the cemetery that the burials date to a period some time before 1070 to 1240 BCE (OZM353 2935±30 BP). Some skeletons wear bone or stone bracelets. Some are accompanied by a polished stone adze. Three of the burials are strongly differentiated. One person was buried with a set of deer antlers. One had a snake skeleton between the legs, too neatly placed to be accidental. Could they be indicators of hunting prowess, or perhaps even nicknames or titles acquired through that prowess: the Provider of Deer Meat, the Conqueror of Snakes?

A third skeleton has an accumulation of cowrie shells at the top of the head, probably a headdress. Cowries were a common trade item in prehistoric times. These marine shells must have travelled a minimum of 400 kilometres from the Indian Ocean to reach Halin. At the feet of this skeleton is a

painted pot containing two half-shells from a freshwater bivalve shellfish (Figure 2). Every skeleton in the cemetery, however poorly supplied otherwise with grave goods, was accompanied by a bivalve shell. The community shared a belief related to the shells that was significant enough to make them part of every funeral. These are not just local traditions. In a Neolithic cemetery at Ban Non Wat in Thailand, a body was entombed with cowrie earrings, while others were accompanied by painted pots and bivalve shells (Higham 2014: 112-117), indicating that trade goods such as cowries, and behaviours such as the use of a pot and bivalves in a funeral ritual, travelled long distances. Examples of the pot and bivalve shell combination were also found in a burial at NyaungGon, in Myanmar's Samon Valley, which dates perhaps to the 4th century BCE, suggesting that this tradition was as long-lived as it was widespread (Pautreau, Coupey *et al.* 2010: 146).



Figure 2. Painted pot with bivalve shells, Halin, HL 30, Neolithic cemetery

IV. Jewellery and Feasting in Bronze Age Halin

By the time the bronze age came to Halin, from around the 11th century BCE going on regional comparisons (Higham 2014: 137), we begin to see some major social differences in grave goods, and a new tradition, the provision of large quantities of food. In excavation HL 29 (these Halin excavations are so far unpublished, and my data comes directly from working on the sites with my Myanmar colleagues) we often see a rectangular outline in the soil, suggesting coffins that have long since rotted away. Each cavity contained between a dozen and thirty or more pots, which we assume had been filled with food, perhaps the remains of a funeral feast for the mourners, or supplies for the afterlife. The quantity of food used in the funeral ritual suggests that these people were capable of producing a surplus well beyond their daily needs.

Many skeletons here wear polished stone rings on their arms. There are a few bronze axeheads and spearheads. The bivalve shell and pot combination is seen again. A bowl with perforated pillars inside is a type found across Myanmar which has been classified as alcohol distillation equipment (Win Maung 2003). Two of the 48 excavated burials feature substantial personal ornamentation: arms loaded with bone or shell rings and bronze bracelets, layers of tiny perforated shells that seem to have been used to decorate cloth as modern people might use sequins, cowries, and beads made from semi-precious stones (Figure 3).



Figure 3. Bronze Age wealth, Halin HL 29: shells, stone beads, bracelets.

Charles Higham has suggested, on the basis of similar excavations in Thailand, that "the desirability of owning and displaying bronzes contributed significantly to the rise of social elites" (Higham 2014: 194). While the bronzes we excavate are coated with green copper oxide, in their original state, perhaps regularly polished by their proud owners, they would have shone like gold.

V. The Iron Age Turning Point

Iron appears in Southeast Asia from the 5th century BCE, on the current evidence (Higham 2014: 197), and the few available Iron Age radiocarbon dates from Myanmar bear this out (Pautreau 2007 87-90; Pryce, Coupey *et al.* 2013). Economic growth and consequent expansion of trade is reflected in Myanmar in grave goods such as stone beads, glass, and bronzes (Lankton, Dussubieix *et al.* 2006; Moore 2007: 85-127; Pautreau, Coupey *et al.* 2010). Between 300 BCE and 300 CE, trade linked the broader area of Southeast Asia with India and China, new political and religious ideas spread along with trade items, village communities grew into large centres, and agriculture intensified. Iron, rice and trade were integral to state formation (Higham 2014: 271-348). Upper Myanmar was a participant in these changes.

VI. Basic Principle of Leadership: Take Care of the Followers

A potent symbol appears in Myanmar from around 200 BCE. This is a bead in the shape of a crouching feline, usually made from the semi-precious stone carnelian, perforated to wear on a cord. The form seems to be modelled on the bronze tally tiger of the Qin Emperor of China (Cheng and Cheng 1993: 193), but with a local variant: the tiger is usually carrying a baby tiger in its mouth (Figure 4).



Figure 4. The Qin Emperor's bronze tiger (above) and a Samon Valley version in carnelian. Detail (right) shows the baby tiger carried in the mouth.

This modification of a regional symbol of power is an indication of the way information was passing down the trade routes of the time. We might also read into it something about the nature of leadership. Around 300 examples of these beads have been found, mainly in the Samon Valley, the area I have proposed previously as a key source of population expansion in the Early Urban period. Ambitious local leaders moved from the Samon region where centuries-old village chiefdoms had no room to expand, to found settlements inspired by new ideas and technology from India (Hudson 2005b).

VII. The Construction of the Cities

In India's Early Historic period, from the 3rd century BCE to the 4th century CE, there were more than 60 walled cities, whose inhabitants grew grain, and domesticated animals such as sheep and cattle. Key architectural features were ramparts with associated ditches, towers and gates (Yule and Böhler 2004; Deloche 2007: 3-47; Yule 2008a, 2008b; Schlingloff 2013). Politically, these were "regional dynasties with shifting allegiances that resulted in restructured power balances nearly every

generation" (Smith 2006: 100). There was no need for a "state level of political organization, only an initial impetus for settlement, some level of highly visible labour investment, and a sustainable social network" (Smith 2003: 273).

In Myanmar the indigenous population, expanding demographically and economically, adopted some of these social and architectural characteristics. A defining feature of this cultural change is the construction of settlements enclosed by brick walls, with entry controlled by corridor gates that curved inward into the city, frequently with rooms or alcoves in the gates that suggest permanent administrative functions (Aung Myint 1998). The adaptations from India were highly selective. Walled settlements in India were usually less than two square kilometres (Schlingloff 2013: 49), while in Myanmar, the areas were up to 14 square kilometres, suggesting low density occupation that probably included agriculture within the walls. Due to a fortunate act of violence we have a convincing group of radiocarbon dates for wall construction at one of the Myanmar settlements, Halin.

VIII. Halin

An attack on the city and the burning of at least five of its gates (Figure 5), which were not repaired or used again, was not fortunate for the inhabitants, of course, but it was valuable to archaeology. The burnt timber was preserved as charcoal. Wood buried under the ground in a monsoon climate will rot away to become part of the soil, but carbon pieces can last many centuries. While the charcoal from Halin does not tell us when the attack on the city took place, it does tell us the age of the wood at the time when trees were cut down and used to build the city gates. On the assumption that the brick walls and gates were built simultaneously with the wooden doors and superstructure, the radiocarbon dates show a construction period between 120 and 250 CE (Hudson 2012).

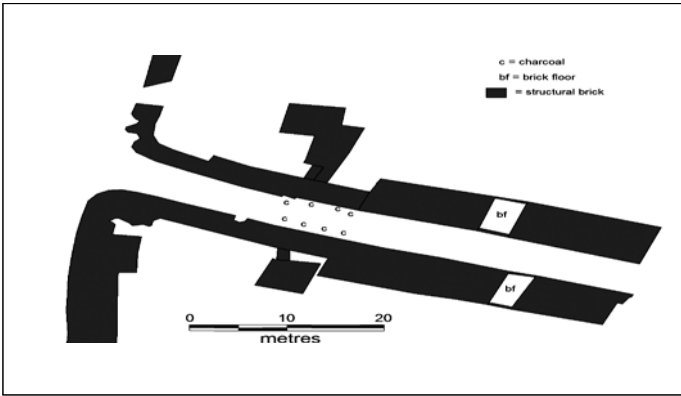


Figure 5. Plan: brick corridor gate at Halin, HL 33, excavated in 2011. Charcoal is from the destruction of the wooden gate and gatehouse at some unknown time.

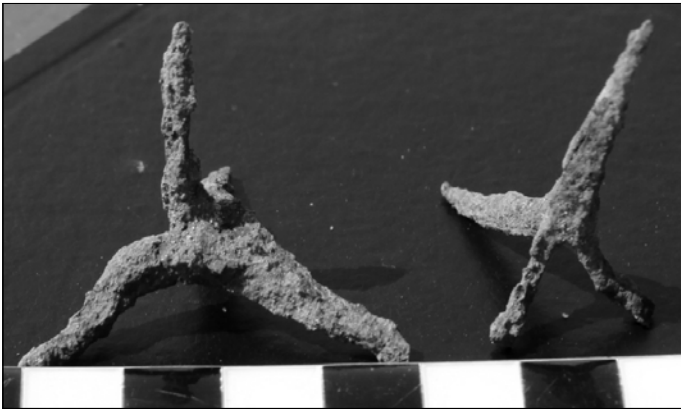


Figure 6. Caltrops excavated at gate HL 31, Halin, 2010. Scale in centimetres.

Caltrops (Figure 6) were found during recent excavations at Halin. These four-sided iron spikes, which always have one part pointing upward to penetrate the feet of humans or animals, were known to the ancient Romans and were also found at the walled city of Sisulpalgarh in India, at a level dated to the period 200-350 CE (Khan 2003: 126-127). We have no way of knowing whether they were placed at Halin by the defenders or

the attackers.

Early bricks in Myanmar are often marked with finger strokes, put on while the clay is still wet. These markings were also used in India and Thailand (Moore 2007: 134). Among more than 500 marked bricks recovered from the debris of three gates excavated at Halin since 2010, 2% bear what may be Indian letters or numbers (Figure 7).

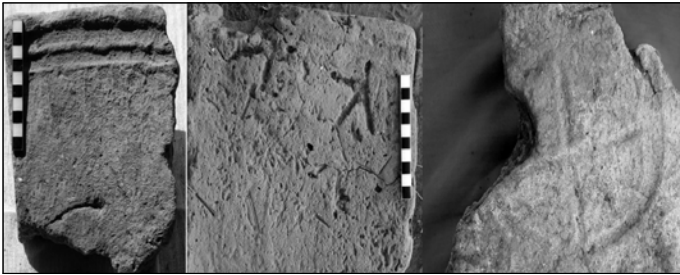


Figure 7. Bricks from the 120-250 CE gates at Halin. Fingermarks (left), letter *a* (centre), number 90 (right).

Among the clearest examples, one appears to be incised with the Brahmi vowel *a* which was used in India around the first Century CE (Dani 1963: 37). Another brick is marked in fingerstrokes with the 2nd century CE symbol for the number 90 (Smith, David Eugene and Karpinski 1911). This is further evidence that India was the source of inspiration for the construction of the city. The presence of letters and numbers on bricks from a context dated between the 1st and 3rd centuries also suggests that literacy in Myanmar can be dated back at least to this period.

IX. Beikthano

While the dating of the construction of Halin is convincing, we need to consider circumstantial evidence for the origin of the walls at the other cities. At Beikthano, a brick building, BTO 32,

containing cremation urns and located outside the city walls, has charcoal from a fire dated to between 60 and 220 CE. The layer of ash is in just one part of the building. It is too widespread for a kitchen fireplace, but too contained to be debris from a destructive building fire. The likeliest prospect is that the ash and charcoal was from cremations. Burial urns are also found in the building. The 60-220 CE period is when the building was functioning. This for now is the earliest absolute date range for the city. Beikthano was also operational at the same time as Halin became operational (Hudson 2012). A painted cremation urn excavated at this site shows the continued use at Beikthano of a symbol used as coffin decoration (Moore 2007: 109) in Iron Age burials in the Samon valley (Figure 8). They may have adopted new ideas, but they did not necessarily throw the old ones away.



Figure 8. An earthenware cremation urn from Beikthano, 60-220 CE, repeats the motif of a Samon Valley coffin decoration (insert).

X. Sriksetra

he earliest radiocarbon date for Sriksetrais for the period 50-200 CE, from charcoal at the lower level of a deposit of iron slag in the centre of the city. We can suggest that the city was operational in this period. Sriksetra went through several construction phases. An inner wall was overwhelmed by annual

flooding from nearby hills and an eight-kilometre wall and brick-lined drainage channel was built. This channel was also eventually overcome by siltation, and in two places, we can still see the remains of later brick entranceways built on top of silt-filled corridor gates (Hudson 2007; Hudson and Lustig 2008 ; Hudson 2012). The majority of artworks from the early urban period come from Sriksetra.

XI. Maingmaw-Pinle.

The dual name of this site is used because when it was revealed to be an ancient city in the 1970s it was known as Maingmaw, after a village within the walls. More recently, archaeologists have called it Pinle, after a nearby fortress of the 11th-13th century Bagan period. Like Sriksetra, it has two clear phases of wall construction. A circular wall inside has been enclosed by a larger oblong wall (Sein Maung Oo 1981; Nyunt Han, Aung Kyaing *et al.* 2006). Several buildings have recently been excavated outside the east wall. They share decorative elements with buildings at Beikthano and Sriksetra. The outer wall also has a corridor gate. The city area is under intensive rice production, which makes a search for any possible underground structures difficult. Maingmaw-Pinle would be an ideal candidate for investigation via airborne laser scanning (Lidar) technology (Daukantas 2014).

XII. Dhanyawadi and Vesali

These walled sites on Myanmar's west coast, in the floodplain of the Kaladan River, have been dated on the basis of artifacts found in the cities, and in the region generally, to the 4th to 8th centuries CE (Gutman 1976, 2001; Singer 2008; Shwe Zan 2010). The Royal City hypothesis does not argue against the attribution of artworks, inscriptions and coins to this period. It suggests that the brick walls and corridor gates (Hudson 2005a) might belong to a separate period, the 1st to 3rd century, when the three

largest cities on the central plains, Halin, Beikthano and Sriksetra, were also operational.

XIII. Other Walled Sites: Tagaung, Waddi and Thegon

Tagaung has three walls, each abutting the Ayeyarwady River. Distinctive local cremation and pottery traditions set Tagaung apart from the sites described above (Moore 2008). A radiocarbon date range of 710-940 CE (OZH969 120030 BP) for a cremation burial confirms activity in the early urban period, but based on the available evidence Tagaung does not have an archaeological claim to the Royal City period.

Waddi, a circular walled site west of Maingmaw-Pinle, has fingermarked bricks, stone beads and early coins, thus it comes within the Royal City purview. Thegon, south of Sriksetra, has a similar assemblage, though it is largely covered by modern villages (Aung Myint 1999: 49-63 & 89-97). So far there has been little archaeological investigation of either.

XIV. If the Walls Were Built at the Same Time, What Happened Next?

If we consider that the walls with corridor gates were built in the proposed 1st to 3rd century Royal Cities period, we have an explanation as to why so many buildings at Beikthano, Maingmaw-Pinle and Sriksetra were constructed outside the city walls, and why so many artifacts and inscriptions on the west coast (including the Sanskrit *ye dhamma hetu* formula, which was often a dedicatory element of a Buddhist monument) are found a long way away from the walled cities. The need to live within city walls had become less pressing.

Each city had a central elite complex. The followers would have lived and probably kept animals and grown crops within the outer wall, as indicated by habitation remains at Sriksetra

that date between 680-890 CE (Hudson 2012). Contrary forces would have pulled at the population. There would have been a need for more space, due to a combination of internal population growth and the inevitable attraction of new followers to the economic and physical security of the urban site. Inertia, due to the resources already invested, would have continued to hold people to their ancestral home. But subsequent generations of the leadership, as well as the followers, would have been less dedicated than the founders to staying within the enclosure. The walled city, as a physical representation of the power of the leaders, was replaced as a focal point for the society by religious monuments. Many were built in or near the walled cities, but as a monument was significant because of the relics it enshrined, it could be built anywhere (Hudson 2004: 148-153).

This was no great challenge to the leaders. They simply changed their method of expressing their dominance over the populace by becoming the principal donors of religious buildings. Sri Prabhvarma did so at Sriksetra. We know this from his KhinBa pagoda, whose relic chamber survived into the 20th century (Duroiselle 1927). The aristocrats of Bagan did the same in the better recorded 11th to 13th century empire period (Ma Tin Win 2009).

At Sriksetra, the majority of cremation burials are outside the walls, and indeed more resources were used outside the walls than inside them for monument construction during the life of the city (Hudson 2007; Hudson and Lustig 2008). More of the Dhanyawadi period artworks on display in the museum at Dhanyawadi were found in the hinterland of the city than within the walls, according to my reading of the museum acquisition records. Some of these pieces came from Selagiri Hill, on the Kaladan River, a spot advantageous to trade. They have been dated to the 6th or 7th century (Gutman 2001: 49-52). The Royal City hypothesis suggests there is no need to relate them to the construction period of the walled site, nine kilometres away.

A map of archaeological finds from the early urban period (Figure 1) shows that they are spread up and down the river

systems. They do not cluster around the walled cities, as you might expect if the cities functioned as "central places" in the manner proposed for the earth-embankment sites in Central Thailand in the same period (Mudar 1999). In Upper Myanmar, there are three areas which have an accumulation of "early urban" materials, such as distinctive "Pyu" gold jewellery, stamped Buddhist votaries and fingermarked bricks, but they have no brick walls. These are Myinmu and Minbu, on the Ayeyarwady River, and the Samon Valley (Figure 1). We should expect these artifacts to date after the period of wall construction, when the urge to surround a settlement with walls had dissipated. Local chiefs may well have continued to appropriate Indian political and religious notions to enforce their position as leader, but these notions no longer included the construction of a royal city. At Myinmu someone left behind a magnificent gold *makhara* bracelet, which is now in the National Museum in Yangon (Figure 9). This might have been just as much a symbol of wealth and authority in its time and place as the ownership of a walled city had been in the 1st to 3rd millennium.



Figure 9. Gold *makhara* (mythical animal) bracelet from Myinmu. Width 9 cms.

G.H Luce suggested that on the basis of Buddhist and Vaishnavite artworks, Sriksetra had been founded in the 7th century (Luce 1985: 48-52). The Royal City hypothesis, informed by radiocarbon dates that were not available to Luce, has the

city functioning centuries earlier than this. This does not mean artworks must necessarily be redated, but there is now a broader chronological range to set them in, and this may help resolve some anomalies. One significant find at Sriksetra, a stone with warriors holding symbols of Vishnu and devotees guarding an aniconic Buddhist throne, may go back to the time of the construction of the city (Gutman and Hudson 2014, in press).

XV. Summary

The ancient people of Myanmar were as interested in new ideas and objects as modern people are, and made similar economic decisions. If we like it, need it and can afford it, we will try to acquire it. Exotic goods were traded long before the Iron Age, in a society where burial inclusions suggest that some people were much wealthier than others. The example of a mobile phone today was contrasted with the example of an Indian fortified city in the early First Millennium as something that people quickly and simultaneously found out about, liked the idea, and saw a benefit in allocating resources to it. In the case of the walled city, the followers gained economic and physical security, while the leaders who instigated construction reinforced their position in the social hierarchy.

Once built, the cities followed individual trajectories depending on local circumstances. Halin was eventually attacked and its gates, so significant to its founders, were put permanently out of commission (Myint Aung 1970; Hudson 2012). Charcoal that dates to a range between 380 and 540 CE was found under the debris of two of the gates at Beikthano (Hudson 2012), suggesting that the city lasted at the very least until after this period. Clay stamps and intaglios at Sriksetra suggest continuing contact with India and beyond (Middleton and Wilkins 2005). Silver coins were made using Indian-derived and indigenous symbols by some, but not all, of the walled cities, and perhaps by other instigators. Thousands of examples have been found. Coins suggest the operation of local minting authorities between

the 4th and 9th centuries (Than Htun 2007; Mahlo 2012).

XVI. Testing the Theory.

A hypothesis is only valuable if it can be tested; otherwise it is merely an opinion. The periodisation of walls other than those at Halin could be directly helped by radiocarbon dating, but the ancients did not always light a fire where it would do the most good for future archaeologists. The sun-dried bricks used in the early Myanmar cities were not heated enough to date by thermoluminescence. Further excavation of walls and gates, and perhaps advances in dating technology, might provide some more direct evidence of the age of the walls.

The weight of archaeological evidence for cultural continuity amid selective adaptation of concepts or technologies that have come down the trade routes, not just in Myanmar but across Southeast Asia, as Higham (2014: 271-277) has pointed out, means that we can cast aside the once-popular idea that a new ethnic group came to Myanmar from "somewhere else" and began building cities. This is not to say that individual travellers might not have had an influence on the indigenous people who had always been so open to anything new that might bring them a benefit. Great value could have come from monks "accompanying traders and bringing in objects of power and protection, such as relics and images as well as a literary tradition in the forms of magical chants in sacred languages and also written texts" (Swearer 2013: 120). Are there new ways to reconcile Chinese and Indian historical sources and Buddhist literary traditions to illuminate the process of information transfer in Myanmar's 1st to 3rd century period?

An immediate way to test the Royal City hypothesis is to apply a "what if" scenario. If the walls of the ancient cities are assumed to have been built in the 1st to 3rd century CE period, does the data from history, archaeology, numismatics, art history, palaeography and other disciplines that can be applied to the study of life in First Millennium CE Myanmar make more sense or less?

Acknowledgements

Thanks as always to the Myanmar Department of Archaeology and its Director General, Kyaw Oo Lwin, for cooperation and collaboration. Radiocarbon dates are courtesy of a grant via the University of Sydney from AINSE, the Australian Institute of Nuclear Science and Engineering. Thanks also to Tampawady Win Maung, Kyaw Myo Win, Pamela Gutman, Dietrich Mahlo, Michael Aung-Thwin, Win Kyaing, Arlo Griffiths, Ernelle Berliet and Thein Lwin.

References

- Aung Myint. 1998. Site Characteristics of Pyu and Pagan ruins. *A Comparative Study of the Dry Areas in Southeast Asia: International Seminar*, Kyoto, Japan.
- _____. 1999. *Kaung Kin Dhat Pon Myar Hma Myanmar Rhay Haung Myotaw Myar (Ancient Myanmar Cities in Aerial Photos, in Burmese)*. Yangon: Yaungzin Press.
- Aung Thaw. 1972. *Historical Sites in Burma*. Rangoon, Ministry of Union Culture.
- Aung Thaw, Myint Aung, Sein Maung Oo and Than Shwe. 1993. *Ancient Myanmar Cities (in Burmese)*. Yangon: Ministry of Information, News and Periodicals Enterprise.
- Bellwood, Peter. 2005. *First Farmers: the Origins of Agricultural Societies*. Oxford: Blackwell Publishing.
- Cheng, Changxin and Ruixiu Cheng 1993. *Gu tong qi jian ding*. Beijing: Beijing gong yi mei shu chu ban she.
- Dani, A.H. 1963. *Indian Palaeography*. Oxford: Oxford University Press.
- Daukantas, Patricia. 2014. Adding a New Dimension: Lidar and Archaeology. *Optics and Photonics News*, 25(1): 32-39.
- de Terra, Hellmut, Hallam L. Movius, Jr., Edwin H. Colbert and J. Bequaert. 1943. Research on Early Man in Burma, with Supplementary Reports upon the Pleistocene Vertebrates and Mollusks of the Region, and Pleistocene Geology and Early Man in Java. *Transactions of the American*

- Philosophical Society*, 32(3): 263-464.
- Deloche, Jean. 2007. *Studies on Fortification in India*. Institut Francais de Pondicherry, Ecole Française d'Extreme Orient.
- Department of Archaeology. 1996 UNESCO World Heritage Tentative List Nomination: Pyu Cities: Beikthano-Myo, Halin, Tharay-Khit-taya (Sri Ksetra). DOI: <http://whc.unesco.org/en/tentativelists/820/>
- Duroiselle, Charles. 1927. Excavations at Hmawza. *Annual Report of the Archaeological Survey of India*. Delhi: Manager of Publications. 171-183.
- Elvin, Mark. 1973. *The Pattern of the Chinese Past*. London: Eyre Methuen.
- Gutman, Pamela. 1976. Ancient Arakan, with special reference to its cultural history between the 5th and 11th centuries. PhD Thesis. Canberra, Australian National University.
- _____. 2001. *Burma's Lost Kingdoms: Splendours of Arakan*. Bangkok: Orchid Press.
- Gutman, Pamela and Bob Hudson. 2014 in press. A First Century Stele from Sriksetra. *Bulletin de l'École Française d'Extreme-Orient*.
- Higham, Charles. 2014. *Early Mainland Southeast Asia: from First Humans to Angkor*. Bangkok: River Books.
- Hudson, Bob. 2004. The Origins of Bagan. PhD Thesis, University of Sydney <http://hdl.handle.net/2123/638>.
- _____. 2005a. Ancient geography and recent archaeology: Dhanyawadi, Vesali and Mrauk-u. "The Forgotten History of Arakan" conference. Chulalongkorn University, Bangkok.
- _____. 2005b. A Pyu Homeland in the Samon Valley: a new theory of the origins of Myanmar's early urban system. *Myanmar Historical Commission Conference Proceedings, Volume 2*. Yangon: Ministry of Education, Union of Myanmar. 2: 59-79.
- _____. 2007. Sriksetra Survey Map 2005-2007. *SOAS Bulletin of Burma Research*, 5(1-2).
- _____. 2012. A thousand years before Bagan: radiocarbon dates and Myanmar's ancient Pyu cities (Revision 3). *Early Myanmar and its Global Connections Conference*. Bagan,

- Myanmar, February 2012.
- Hudson, Bob and Terry Lustig. 2008. Communities of the past: A new view of the old walls and hydraulic system at Sriksetra, Myanmar (Burma) *Journal of Southeast Asian Studies*, 39(2): 269-296.
- Hudson, Bob and Nyein Lwin. 2012. Earthenware from a firing site in Myanmar (Burma) dates to more than 4,500 years ago. *Bulletin of the Indo-Pacific Prehistory Association*, 32: 19-22.
- Khan, Mostafizur Rahman. 2003. *Roots and Migration: People of Ancient Eastern India and Bangladesh*. Dacca: Jingshaphul.
- Lankton, James W, Laure Dussubieix and Bernard Gratuze. 2006. Glass from Khao Sam Kaeo: transferred technology for an early Southeast Asian exchange network. *Bulletin de l'Ecole française d'Extreme-Orient*, 93: 317-351.
- Luce, G. H. 1985. *Phases of Pre-Pagan Burma*. Oxford: Oxford University Press.
- Ma Tin Win. 2009. *The Great Donors of Bagan and Their Religious Monuments*. Yangon: Nant Chit Kyi Sapay.
- Mahlo, Dietrich. 2012. *The Early Coins of Myanmar (Burma)*. Chonburi: White Lotus Press.
- Middleton, S. H. and R. Wilkins. 2005. *Intaglios, Cameos, Rings, and Related Objects from Burma and Java: The White Collection and a Further Small Private Collection*. Oxford: Archaeopress.
- Moore, Elizabeth. 2007. *Early Landscapes of Myanmar*. Bangkok, River Books.
- _____. 2008. Myanmar archaeology: Tagaung and 'Pyu'. *From Homo Erectus to the living traditions. Papers from the 11th International Conference of the European Association of Southeast Asian Archaeologists, Bougon, France 25-30 September 2006*. eds J.-P. Pautreau, A. S. Coupey, V. Zeitoun and E. Rambault. Chiang Mai, Siam Ratana: 183-192.
- _____. 2012. *The Pyu landscape, collected articles*. Nay Pyi Taw: Department of Archaeology, National Museum and Library.
- Mudar, Karen M. 1999. How Many Dvaravati Kingdoms?

- Locational Analysis of First Millennium AD Moated Settlements in Central Thailand. *Journal of Anthropological Archaeology*, 18(1-28).
- Myint Aung. 1970. The excavations at Halin. *Journal of the Burma Research Society*, 53(2): 55-62.
- Nai Pan Hla. 2011. *Archaeological Aspects of Pyu, Mon, Myanmar*. Yangon: Loka Ahlinn Publishing House.
- Nyunt Han, Aung Kyaing, Chit San Win and Thein Lwin. 2006. Ancient Cities before the Christian Era: New Archaeological Evidence from Tagaung, Halin, Beikthano, Maingmaw and Sriksetra (in Burmese). *Ancient Myanmar Cities Conference*. UHRC, Yangon, January 19-20.
- Oppenheimer, Stephen. 2004. *Out of Eden: the Peopling of the World*. London, Robinson.
- _____. 2012. Out-of-Africa, the peopling of continents and islands: tracing uniparental gene trees across the map. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1590): 770-784.
- Pautreau, Jean-Pierre 2007 *Ywa Htin: Iron Age burials in the Samon Valley, Upper Burma*. Mission Archaeologique Francaise Au Myanmar.
- Pautreau, Jean-Pierre, Anne-Sophie Coupey and Aung Aung Kyaw. 2010. *Excavations in the Samon Valley: Iron Age Burials in Myanmar*. Mission Archaeologique Francaise Au Myanmar.
- Pryce, Thomas Oliver, Anne-Sophie Coupey, Aung Aung Kyaw, Laure Dussubieux, Aude Favereau, Leilani Lucas and Marie Perrin. 2013. The Mission Archéologique Française au Myanmar: past, present and future. *Antiquity* 87(338).
- Schlingloff, Dieter. 2013. *Fortified Cities of Ancient India*. London & New York: Anthem Press.
- Sein Maung Oo. 1981 Mongmao, a forgotten city (three part series) *The Working People's Daily* (Jan 21 & 23, Feb 3).
- Shamasastri, R. (trans). 1915. *Kautilya's Arthashastra*. Banglaore, Government Press.
- Shwe Zan 2010. *Wethali: the Land of Historic Finds*. Yangon: Hlaing Kyi Phyu Dhamma Vira Publishing House.
- Singer, Noel. 2008. *Vaishali and the Indianization of Arakan*. New

- Delhi: APH Publishing Corporation.
- Smith, David Eugene and Louis Charles Karpinski. 1911. *The Hindu-Arabic Numerals*. Boston & London: Ginn and Company.
- Smith, Monica. 2003. Early walled cities of the Indian Subcontinent as "Small Worlds". *The Social Construction of Ancient Cities*. Ed M. L. Smith. London & Washington, D.C.: Smithsonian Books.
- _____. 2006. The Archaeology of South Asian Cities. *Journal of Archaeological Research* 14(2): 97-142.
- Stargardt, Janice. 1990. *The Ancient Pyu of Burma: early Pyu cities in a man-made landscape*. Cambridge: PACSEA.
- Swearer, Donald. 2013. Buddhism in Southeast Asia. *The Religious Traditions of Asia: Religion, History, and Culture*. J. Kitagawa, ed. 119. London and New York: Routledge.
- Than Htun, Dedaye. 2007. *Auspicious Symbols and Ancient Coins of Myanmar*. Selangor, Malaysia: Ava House.
- Wikipedia. 2014. Pyu city-states. http://en.wikipedia.org/wiki/Pyu_city-states. (Accessed Jan 12, 2014).
- Win Maung, Tampawady. 2003. Ancient Distillery Pots. *Ceramic Traditions in Myanmar*. Yangon: SEAMEO Regional Centre for History and Tradition: 73-78.
- Yule, Paul. 2008a. Early forts in eastern India. *Antiquity*, 82(316).
- _____. 2008b. Early Historic Sites in Orissa. Monograph: Universität Heidelberg
- Yule, Paul and Wolfgang Böhler. 2004. Sisupalgarh: An Early Historic Fortress in Coastal Orissa and its Cousins. *Beiträge zur allgemeinen und vergleichenden Archäologie*, 24: 15-29.

Received: Apr. 13, 2014; Reviewed: June 9, 2014; Accepted: June 15, 2014