

Communities of the past: A new view of the old walls and hydraulic system at Sriksetra, Myanmar (Burma)

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 (with an introduction by Michael Aung-Thwin)

New data from an archaeological survey of Sriksetra suggests that this important site is set for a major reinterpretation. The city functioned over a much longer period than was previously believed. There are many more buildings than had been previously recorded. Some of the city walls and moats, once considered to have been military fortifications, prove to be part of a multifunctional and evolving system of hydraulic management.

The community of interpretation that makes up Myanmar's archaeologists is small. Prior to independence, there were few scientific studies in Myanmar by trained professionals who specifically targeted human settlements. Most finds were by-products of geological research related to the search for oil by geologists. But at least in one case, a professional pre-historian accompanied one of these expeditions, which resulted in preliminary conclusions of a 'Paleolithic' and a 'Neolithic' culture in Myanmar called the *anyathian* (from *anya* or upper Myanmar). This kind of naming stone cultures with local geographic and cultural terms is not new and is found throughout the world, and did not necessarily imply that these stone cultures were related to the current inhabitants.

During the height of the colonial period, most of the 'archaeological' research conducted consisted of surface finds by colonial administrators and / or scholars assisted by their native *protégés*, virtually none of whom, as far as I can tell, was trained, as archaeologists are trained today. Subsequently, the independence period produced only three (perhaps more) Burmese who were trained as archaeologists: U Myint Aung in Allahabad, India; U Nyunt Han, at the University of Pennsylvania in the US; and U Aung Thaw at the University of New Delhi. They, in turn, trained several others within

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Myanmar. They focused mainly on the early urban period of Myanmar's history that we have come to call the Pyu, dated approximately between the second century BC and the ninth century AD.

Recent decades have added a handful of foreigners trained in archaeology conducting research in, or about Myanmar, who have also focused on this 'Pyu' period. Three of these scholars have published important works in English: Bob Hudson, Elizabeth Moore, and Janice Stargardt, while one, Shah Alam Zaini, is a Ph.D. student in the process of completing his degree.

During the past several years, cooperative research and / or shared information amongst domestic and foreign archaeologists have uncovered bronze, copper, and iron artefacts. They are thought either to have belonged to the Pyu or preceded them. If these metal cultures were, in fact, part of the Pyu culture, the latter period will have to be pushed back to about the seventh or eighth century BC, which means that 'cultural continuity' between the Pyu and Burmese culture will also have to be dated earlier.

Although these finds have implications for the notion of Myanmar in terms of their continuity, one cannot find that issue being raised by this small 'community of interpretation'. Their work simply assumed 'Myanmar' to be the geo-political and cultural context in which the pre-historical material is placed. One of the reasons the notion of Myanmar was simply not a compelling priority to them is that archaeological work in Myanmar is a daunting task just in itself, so that simply extracting evidence scientifically and properly required the utmost attention. Another is that such issues as 'the notion of Myanmar' is a kind of question far more important to post-modern concerns than to the kinds of issues important in archaeology; so it received little or no attention.

That is not to say that Myanmar archaeologists assumed that the stone and metal cultures and the urban settlements in which they appeared belonged to the current inhabitants of the land, although that these cultures 'belonged' to the geographic entity known as Myanmar was not questioned either. Indeed, that even the Paleolithic and Neolithic cultures were called *anyathian* suggests a local lineage for those cultures, since the word is not only a geographic but a cultural-historical term related to the Burmese speakers. What was being (perhaps inadvertently) implied, then, was that those cultures were in fact the ancestors of Burmese speakers, even though the first evidence we have on the latter shows their initial appearance to be no earlier than the ninth to tenth centuries AD. Thus, there appears to have been a general tendency to associate place with culture.

At least there was never any question that any of these artefacts (stone as well as metal) belonged to any cultures outside the current boundaries of Myanmar. Part of the reason is that the archaeological work done was not that extensive in scope and scale and more or less confined to the 'heartland' of what became *Mranma Pran*, nor when it was outside that region, was most of it conducted in contested cultural areas that might have raised contentious issues.

Moreover, because the Pyu people, although considered Tibeto-Burman speakers, have never been considered Burmese, there has been little insinuation that the millennium prior to approximately the ninth century AD was that of the Burmese speakers. Thus, unlike many areas of the world where archaeology has become (or has

been co-opted to become) part of a nationalist agenda on the one hand, or on the other, such an agenda has been so vehemently opposed to become an anti-nationalist agenda that is equally dogmatic, there simply is not enough evidence to support either cause in Myanmar.

The acceptance amongst virtually all Myanmar scholars of the so-called Pyu period as a distinct one from that of the Burmese speakers may have defused much of what otherwise might have become more contentious. The statements of isolated officials, who have claimed what could be construed as ‘nationalistic’, have simply been ignored by both domestic and foreign scholarship, in Burmese as well as in English.

Yet, the significance of the archaeological research that has been conducted during the past half century has been very important to our current understanding of the country’s early history. In other words, whereas ‘the notion of Myanmar’ has not affected the archaeological work done, the archaeological work done has the potential to affect ‘the notion of Myanmar’.¹

Sriksetra as early Myanmar

Sriksetra (E 95.288798° N 18.81066°) is in Myanmar, the country known until 1889 as Burma (Figure 1). Located a few kilometres east of the Ayeyarwady (Irrawaddy) River, where the central dry zone borders the Ayeyarwady delta, it is the largest individual brick-walled archaeological site in Southeast Asia. The walls enclose an area of 14.3 square kilometres, more than twice as much as any of the other enclosed settlements of Myanmar’s first millennium CE early urban system. The development of this system by indigenous proto-states involved the adoption of Indic architectural, cultural and religious elements.² Sriksetra’s built environment includes earthen embankments and water control channels, brick water control channels and wells, brick-bounded platforms topped by ritual structures, and at least 277 brick buildings, predominantly religious monuments. Most of the buildings exist today only as mounds of debris.

Sriksetra, a Sanskrit word meaning ‘noble field’, is so called because it fits descriptions in early Chinese documents of a city of that name, although there is no direct inscriptional evidence.³ The inhabitants of the early urban system on the central plain of the Ayeyarwady are known to scholars as the Pyu, though this is not what they called themselves.⁴ The ruins of Sriksetra have yielded stone and bronze sculptures identifiable with Indic religions, silver coins stamped with auspicious symbols,

1 This introduction was written by Michael Aung-Thwin.

2 Janice Stargardt, *The ancient Pyu of Burma: Early Pyu cities in a man-made landscape* (Cambridge: PACSEA, 1990); Bob Hudson, ‘The origins of Bagan’ (Ph.D. diss., University of Sydney, 2004), <http://hdl.handle.net/2123/638>, last accessed 4 Dec. 2007, pp. 118–53; Bob Hudson, ‘A Pyu homeland in the Samon Valley: A new theory of the origins of Myanmar’s early urban system’, in *Myanmar historical commission conference proceedings*, vol. 2 (Yangon: Ministry of Education, Union of Myanmar, 2005); Elizabeth Moore, *Early landscapes of Myanmar* (Bangkok: River Books, 2007), pp. 129–49.

3 Gordon Harrington Luce, *Phases of pre-Pagan Burma*, 2 vols. (Oxford: Oxford University Press, 1985), vol. 1, p. 48; Robert Brown, ‘Pyu art: Looking east and west’, *Orientalism* 32, 4 (2001): 35.

4 Michael Aung-Thwin, *The mists of Rāmañña: The legend that was lower Burma* (University of Hawai’i Press, 2005), pp. 14–15.

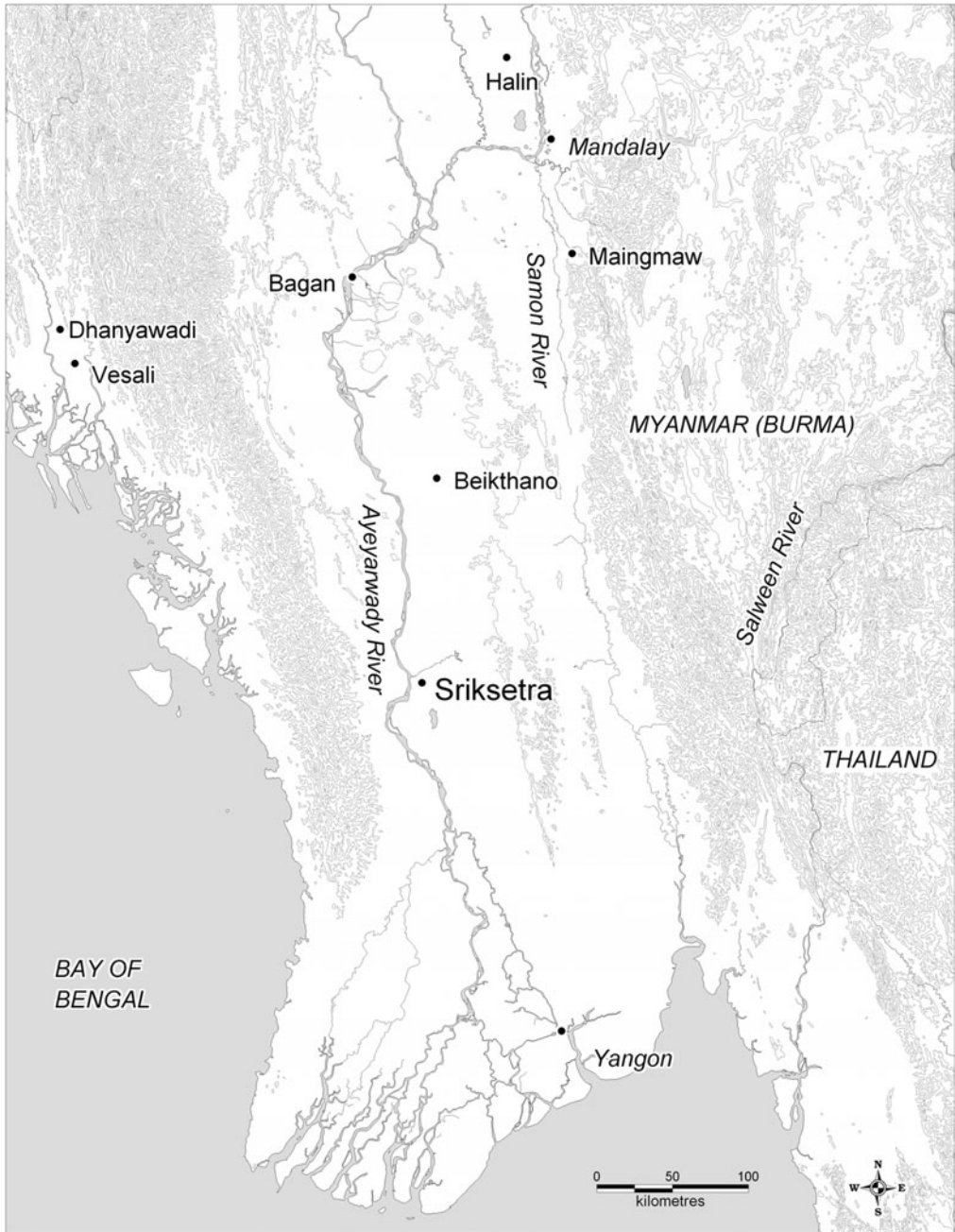


Figure 1. Location map of Sriksetra and major early urban walled sites Dhanyawadi, Vesali, Halin, Maingmaw and Beikthano

Buddhist scriptural extracts carved on stone or embossed on metal, reliquaries, intaglios, gold jewellery, beads, earthenware votaries, and cremation urns of stone, bronze and earthenware.⁵

Chronology

The currently accepted chronological range for Sriksetra can be challenged and extended at both ends. The Burmese chronicles date the city to between 443 BCE, or 101 years after the death of Buddha, and the second century CE.⁶ While there is popular and political support for this mytho-religious account, the scholarly consensus reached over the past 30 years or so, based on art history and palaeography, is that the city functioned between the fifth and ninth centuries CE.⁷ The early date in this range has been supported by a stone relief now in the National Museum in Yangon. The relief is considered to be the oldest artefact in the city (Figure 2). On one side of this stone are three hefty males who hold a club and standards bearing what appear to be a *garuda* (mythical bird) and a *cakra* (wheel). On the basis of this image, John Guy has attributed the stone, which he calls a ‘warrior stela’, to the fifth century CE.⁸

This dating might be revised backward. A guardian figure at Sanchi in India with similar physiognomy, posture, clothing and ornamentation to the ‘warriors’ has been attributed to the first century CE.⁹ These elements are also seen in a first-century CE panel at Amaravati.¹⁰ The other side of the stone provides further indications of an earlier date. It features a throne under a decorative canopy, flanked by two women. They stand in what today in Southeast Asia is a posture of respect: the free hand touches the elbow of the active arm, which reaches to support or touch the throne. The throne, which could be taken either as an aniconic representation of Buddha or as a

5 Thiripyanchi U Mya, *Votive tablets of Burma (in Burmese)*, 2 vols. (Ministry of Union Culture, 1961); Aung Thaw, *Historical sites in Burma* (Rangoon: Ministry of Union Culture, 1972); Myint Aung, ‘Some Pyu signet rings’, *Working People’s Daily*, 20 Feb. 1981; Luce, *Phases of pre-pagan Burma*; Sein Maung U, ‘Ancient Sriksetra’, in *Myanmar Ancient Cities (in Burmese)* (Yangon: Ministry of Information, News and Periodicals Enterprise, 1993); Sheila Hoey Middleton, *Intaglios, cameos, rings, and related objects from Burma and Java: The White Collection and a further small private collection* (Oxford: Archaeopress, 2005).

6 ASI, *Annual Report of the Archaeological Survey of India* (Delhi: Manager of Publications, 1910), p. 113; and Pe Maung Tin and G. H. Luce, *The Glass Palace Chronicle of the kings of Burma* (London: Oxford University Press, H. Milford, 1923).

7 Aung Thaw, *Historical sites in Burma*, p. 16; Janice Stargardt, ‘The great silver reliquary from Sri Ksetra: The oldest Buddhist art in Burma and one of the world’s oldest Pali inscriptions’, in *Fruits of inspiration: Studies in honour of Professor J. G. de Casparis*, ed. Marijke Klokke and Karel Rvaan Kooij (Groningen: Royal Netherlands Academy of Arts and Sciences, Egbert Forstern, Gonda Indological Studies, 2001).

8 John Guy, ‘A warrior-ruler stela from Sri Ksetra, Pyu, Burma’, *Journal of the Siam Society*, 85, 1, 2 (1997); John Guy, ‘The art of the Pyu and Mon’, in *The art of Burma: New studies*, ed. Stadtner (Mumbai: Marg Publications, 1999).

9 Julia Shaw, ‘Naga sculptures in Sanchi’s archaeological landscape: Buddhism, Vaisnavism, and local agricultural cults in central India, first century BCE to fifth century CE’, *Artibus Asiae*, 64, 1 (2004): fig. 5.

10 Robert Knox, *Amaravati: Buddhist sculpture from the Great Stupa* (London: British Museum Press, 1992), pp. 106–7.



Figure 2. The ‘throne stone’ or ‘warrior stelae’ (height 1.2 metres), showing both faces plus decorated side

signifier of a Buddhist site,¹¹ has stylistic similarities with thrones at second-century BCE–third-century CE Amaravati.¹² We suggest that it is appropriate to refer to this artefact as the ‘throne stone’.

The stone was found in the geographical centre of the walled area of the city, after being exposed by the digging of a well 70 metres north of a complex conventionally called the palace, in what is probably a vestigial water channel (for this and other locations mentioned in the text, see Figures 3, 4 and 6). A more detailed analysis and dating of the throne stone is a topic for a separate paper.¹³ For now, it suggests the possibility of both craft and ritual activity at Sriksetra well before the fifth century CE.

Inscriptions from stone burial urns provide firm dates for the *Vikrama* dynasty during the late seventh and early eighth centuries CE.¹⁴ Robert Brown suggests that the bulk of the city’s religious art is similar to Dvaravati materials of the same period.¹⁵ At Sriksetra, this seems to have been a time of sufficient economic surplus to fund the enshrinement of dozens of ritual items at Khin Ba, the only relic chamber ever found intact.¹⁶ The received wisdom on the fate of Sriksetra is that it came to a sudden end

11 S. L. Huntington, ‘Early Buddhist art and the theory of aniconism’, *Art Journal*, 49, 4 (1990).

12 Jeannine Auboyer, *Le Trône et son symbolisme dans l’Inde ancienne* (Paris: Presses Universitaires de France, 1949), pp. 24–32.

13 Pamela Gutman and Bob Hudson, ‘Religion or royalty? A new look at Sriksetra’s earliest Buddhist megalith’, in preparation.

14 Hudson, ‘The origins of Bagan’, pp. 139–42.

15 Brown, ‘Pyu art: Looking east and west’.

16 ASI 1927; Stargardt, ‘The great silver reliquary from Sri Ksetra: The oldest Buddhist art in Burma and one of the world’s oldest Pali inscriptions’.

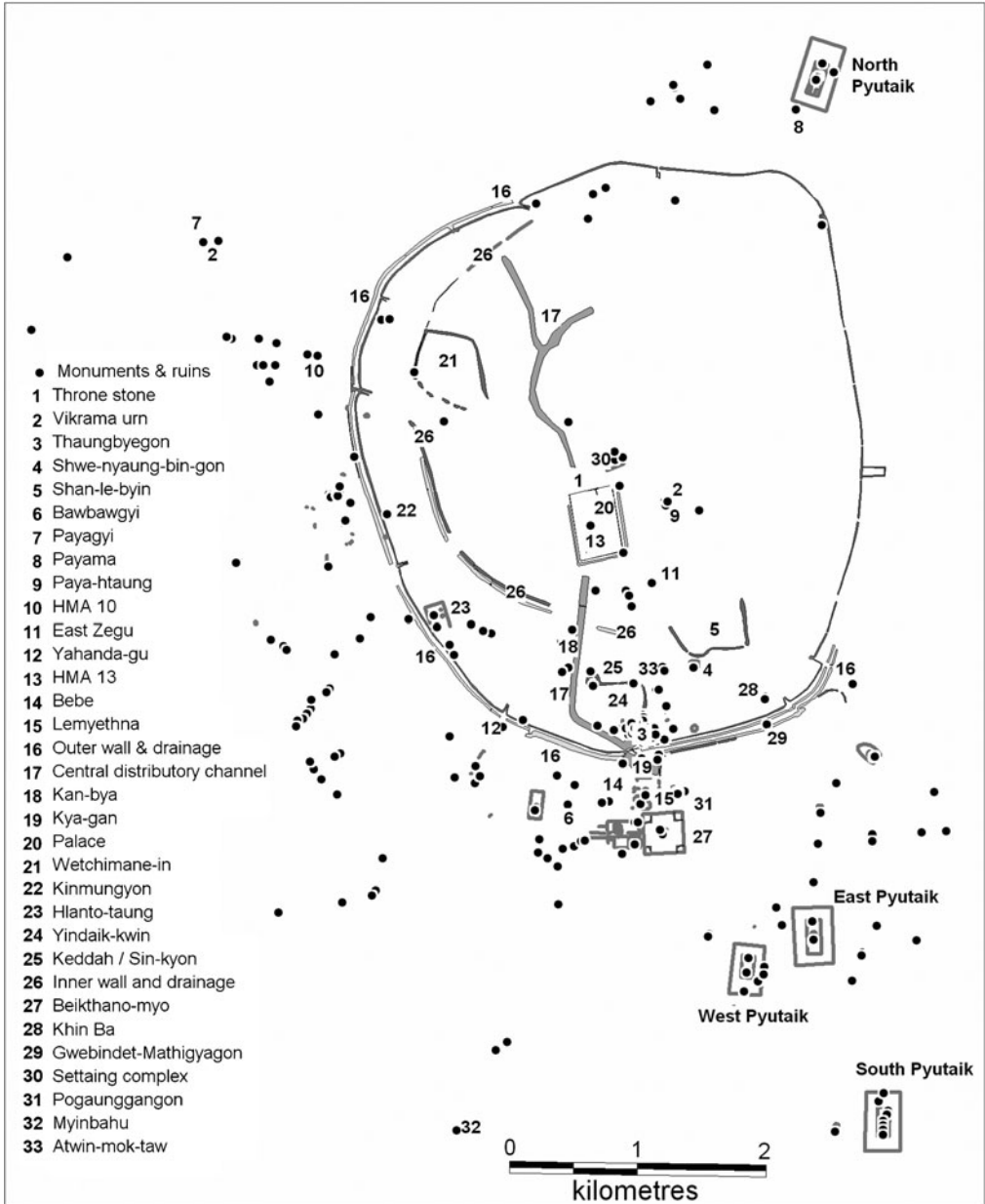


Figure 3. Structures and locations mentioned in the text

with the rest of the Pyu civilisation due to the depredations of Nanchao in the early ninth century¹⁷ or at the very least, that the city began to decline in this period, to be replaced as an imperial centre in the eleventh century by Bagan.¹⁸ Indigenous

17 G. H. Luce, 'The ancient Pyu', *Journal of the Burma Research Society*, 27, 3 (1937).

18 Aung Thaw, *Historical sites in Burma*, p. 16.

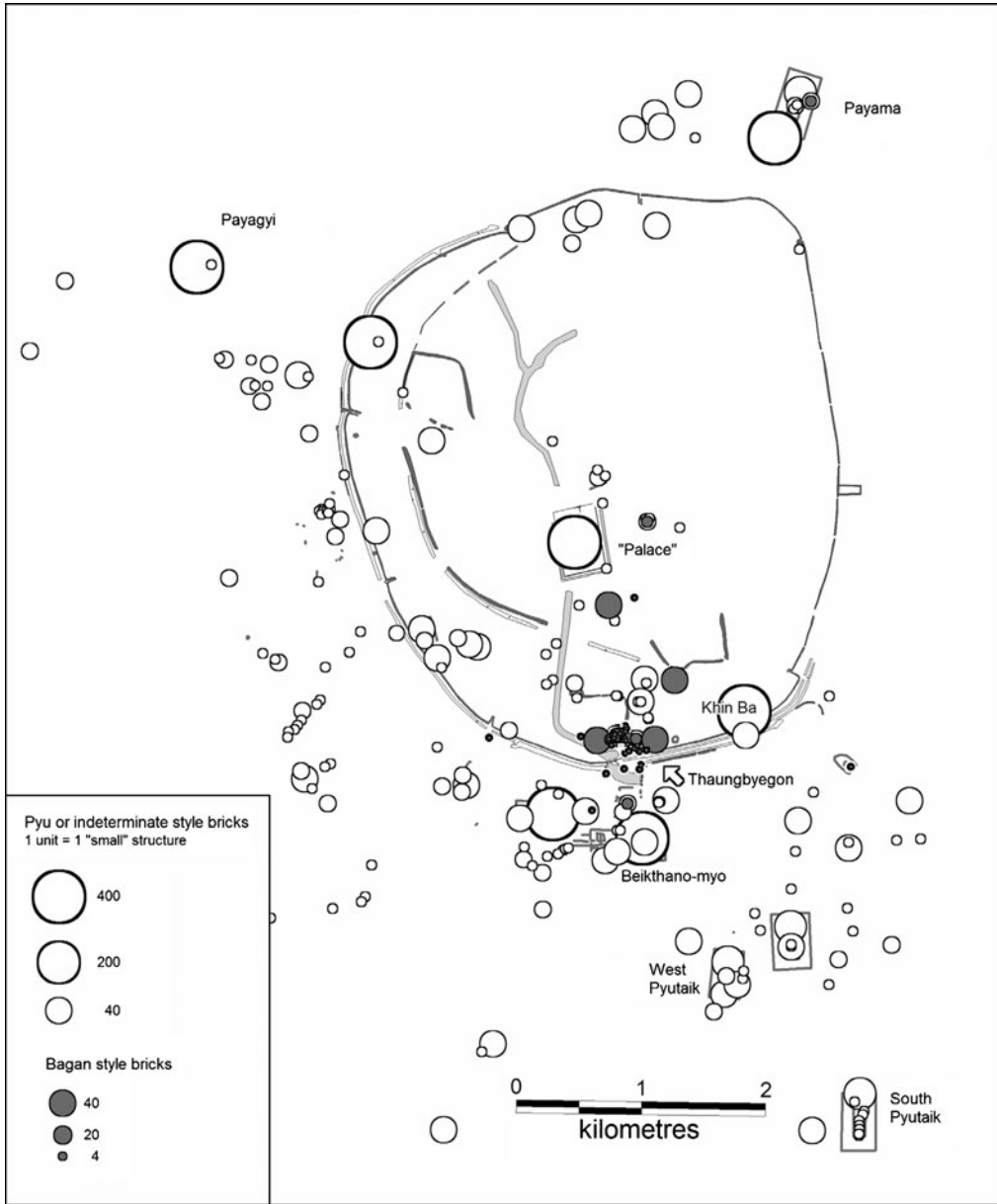


Figure 4. Resources allocated to construction of monuments, shown in their spatial context

historiography provides strong support for the notion that Sriksetra ‘fell’ in the ninth century. In chronicles compiled in the later part of the second millennium CE, royal cities, whose role is to preserve Buddhist teachings and relics, are considered to have

lifespans in accordance with various prophecies. The various chronicles almost invariably allocate 500 years to Sriksetra.¹⁹

The notion of a sudden end relies on a misconception. Indigenous and European scholars of Myanmar have subscribed to a 'sequence of capitals' paradigm, in which one capital had to fall before another came to prominence.²⁰ This notion is in keeping with the Buddhist sense of impermanence, while for colonial-era Europeans schooled on Gibbon's late eighteenth-century work, *Decline and fall of the Roman Empire*, the decline and fall of the Pyu required no great leap of the imagination. Gordon Hannington Luce suggested that Sriksetra, which he believed had lasted no more than a 100 years or so, from the Vikramas in the late seventh century to a period of Pyu links with China in the early ninth century, was replaced as the Pyu capital by Halin, which in due course fell to Nanchao.²¹ However, overlapping radiocarbon date ranges of 480 years for Beikthano and Halin²² suggest that the geo-politically separate but culturally linked Pyu centres coexisted in Upper Myanmar for centuries. An incursion by Nanchao against one of these centres may have affected that centre, but it was not necessarily the trigger for systemic collapse, as there was no centralised Pyu system to fall.²³ If the fall of Sriksetra is a construct and not a historical fact, then the supposedly 'lost' centuries between the putative end of Sriksetra and the undisputed spread of Bagan hegemony are only imagined to be lost.²⁴ When the Bagan Empire expanded in the eleventh to thirteenth centuries, the Pyu sites, including the walled cities, were going concerns with efficient irrigated rice production,²⁵ prime targets for a new mode of management. There are buildings or inscriptions of the Bagan period at Halin and Beikthano.²⁶ But it is at Sriksetra where the evidence of occupation after the supposed decline and fall of the city is strongest. In the footsteps of Zaini²⁷ our survey has so far identified 65 ruins with what we define as Bagan-type bricks, out of a total of 277 buildings. These are generally small buildings, and while they represent 23 per cent of the total number of known structures, they should also be viewed in terms of the volume of resources committed to their construction. A formula based on building volumes at Bagan²⁸ estimates the volume of bricks in buildings defined as small, medium, large and very large according to the maximum dimension of their ground plan. A small monument with a ground plan of up to 12 metres is taken as one unit

19 Alexey Kirichenko, 'Living with the future: Succession of royal cities preserving Sasana and its influence on the history of Myanmar and Myanmar historical writing', in *Myanmar historical commission golden jubilee conference proceedings* (Yangon: Ministry of Education, Union of Myanmar, 2005).

20 Hudson, 'The origins of Bagan', pp. 23–43.

21 Luce, *Phases of pre-Pagan Burma*, 1: pp. 47–9.

22 Aung Thaw, *Report on the excavations at Beikthano* (Rangoon: Revolutionary Government of the Union of Burma, Ministry of Union Culture, 1968); Myint Aung, 'The excavations at Halin', *Journal of the Burma Research Society*, 53, 2 (1970); Hudson, 'The origins of Bagan', p. 136.

23 Hudson, 'The origins of Bagan', pp. 182–7.

24 *Ibid.*, pp. 148–53.

25 Michael Aung-Thwin, *Irrigation in the heartland of Burma: Foundations of the pre-colonial Burmese state* (DeKalb: Northern Illinois University, Center for Southeast Asian Studies, 1990), occasional paper no. 15.

26 Hudson, 'The origins of Bagan', pp. 118–81.

27 Shah Alam Mohamed Zaini, 'Recent research at the Pyu settlement of Sriksetra' (paper presented at the Burma Studies Conference, Gothenburg, Sweden, 2002).

28 Bob Hudson, Nyein Lwin and Win Maung (Tanpawady), 'The origins of Bagan; new dates and old inhabitants', *Asian Perspectives*, 40, 1 (2001).

TABLE 1:
Buildings and the resources used in their construction

Item	Total number surveyed	Resources used, equivalent number of 'small' structures	Proportion of resources allocated to construction
All buildings	277	5,765	
Buildings with Pyu or indeterminate brick, outside wall	161	3,655	63%
Buildings with Pyu or indeterminate brick, inside wall	51	1,837	32%
Buildings with Bagan brick outside city wall, including hinterland	11	25	1%
Buildings with Bagan brick, inside city wall	54	248	4%

of resource allocation. According to this formula, 5 per cent of the volume of bricks used in the construction of monuments throughout the life time of the city involves Bagan-style material. Many of the Bagan-brick structures are clustered on or near Thauungbyegon, a hill over which the south wall of the city passes (Table 1 and Figure 4).

Bricks at Bagan are characteristically smaller than bricks at the Pyu sites (as averaged from direct measurements of samples: Pyu 44 x 23 x 7 cm; Bagan 36 x 18 x 4 cm) and are likely to be tempered with sand rather than with rice husks. At Thauungbyegon, our survey found two Bagan-style bricks bearing the Pyu letters *ra* or *raa*, *dha*, *ka* or *ki*, and *ski* or *ske*.²⁹ This suggests technological continuity, with bricks made using new methods identified by the makers in the same way as the old-style bricks had been marked. It suggests an adaptation by the population of Sriksetra to the realities of empire rather than the reoccupation by Bagan of an abandoned site. There is no information about anyone who might have occupied a leadership role at Sriksetra during the period between the Vikramas at the turn of the eighth century and the appearance of King Anawratha of Bagan in the mid-eleventh century. Votive tablets bearing Anawratha's name have been found enshrined in the Bawbawgyi pagoda.³⁰ Burmese chronicles compiled centuries after Anawratha had approvingly portrayed him as destroyer of the city,³¹ but we suggest that a more direct explanation of the votive deposit is that an expanding kingdom was marking its territory in a ritual

29 Ahmad Hasan Dani, *Indian palaeography* (Oxford: Oxford University Press, 1963), pp. 243–7 and Plate 22; U Tha Myat, *Pyu Reader* (Rangoon: U Hla Din, The National Printing Works, 1963).

30 ASI 1908: 41–2; Luce, *Phases of pre-Pagan Burma*, 1: 54.

31 Pe Maung Tin and Luce, *The Glass Palace Chronicle of the kings of Burma*, pp. 86–7.

context. Stadtner³² suggests that temples at Sriksetra such as the Bebe and the Lemyethna, previously viewed as Pyu prototypes of Bagan buildings,³³ are more likely to be versions of Bagan buildings, built during the Bagan period, and decorated with Pyu artworks relocated from older sites. Original brick sizes in the few buildings that survive reasonably intact are difficult to determine due to extensive reconstruction, conservation and repair. Dating these structures relies more on architecture and art history. The re-enshrinement of Pyu religious images in structures identifiable with imperial authority, like the deposition of votives by Anawratha, might be read as shrewd people-management by the Bagan government. There is no historical record of how the descendants of the Vikrama dynasty or the inheritors of their leadership role responded to the expansion of Bagan. Participation by the local elite in the rituals and monument construction programmes of their common religion, marriage alliances and perhaps lobbying for positions in the provincial administration would have been a sensible choice.

The *Shwe-nyaung-bin-gon*, south of the Shan-le-byin banded field, is a structure directly indicative of a later Bagan period architectural presence.³⁴ In plan, this monument³⁵ has close counterparts at Bagan in the thirteenth century.³⁶ Archaeology Department photographs (Figure 5) show that niches with foliated arches that were excavated in the 1920s, and since destroyed, also have counterparts in thirteenth-century Bagan.³⁷

According to the UNESCO inventory, monument construction at Bagan expanded from 44 in the eleventh century and 215 in the twelfth century to at least 2,076 in the thirteenth century.³⁸ The figure of 2,076 is understated, as a recent reconstruction programme has unearthed several hundred previously unrecorded thirteenth century buildings.³⁹ Several sites along the Ayeyarwady between Bagan and Sriksetra also reflect the thirteenth-century expansion of monument construction.⁴⁰ The likeliest period for the construction of most of the small Bagan-style buildings at Sriksetra, like in the

32 Donald M. Stadtner, 'The art of Burma', in *Art of Southeast Asia*, ed. Bernard Wooding (New York: Harry N. Abrams, 1998).

33 Philip S. Rawson, *The art of Southeast Asia: Cambodia, Vietnam, Thailand, Laos, Burma, Java, Bali* (New York: F. A. Praeger, 1967), pp. 169–70; Aung Thaw, *Historical sites in Burma*, p. 20.

34 ASI 1928: 133.

35 Luce, *Phases of pre-pagan Burma*, vol. 2, plate 25b; Sein Maung U, 'Ancient Sriksetra', p. 123, fig 6.

36 Pierre Pichard, *Inventory of monuments at Pagan* (Kiscadale: EFEO UNESCO): vol. 2, 1993, monuments 378 and 482.

37 *Ibid.*, vol. 2, monument 450k.

38 *Ibid.*; Hudson, 'The origins of Bagan'.

39 Department of Archaeology, *Bagan ancient mounds as original monuments: Record of reconstruction and renovation* (in Burmese) (Yangon: Ministry of Culture, 2001); Department of Archaeology, *Inventory record of conservation of monuments at Bagan*, vol. 1 (in Burmese) (Yangon: Ministry of Culture, 1999); Department of Archaeology, *Inventory record of conservation of monuments at Bagan*, vol. 2 (in Burmese) (Yangon: Ministry of Culture, 2000); Department of Archaeology, *Inventory record of conservation of monuments at Bagan*, vol. 3 (in Burmese) (Yangon: Ministry of Culture, 2002); Department of Archaeology, *Inventory record of conservation of monuments at Bagan*, vol. 4 (in Burmese) (Yangon: Ministry of Culture, 2003); Bob Hudson, 'The merits of rebuilding Bagan', *Orientalism* 31, 5 (2000).

40 *Pagan Newsletter* (UNESCO / Department of Archaeology, Pagan, 1986); Hudson, 'The origins of Bagan', p. 144.



Figure 5. Bagan-style niches at Shwe-nyaung-bin-gon. This previously unpublished photograph was found in the artwork folder for the 1928 *Archaeological Survey of India Report*. Human figures at top right of picture indicate scale.

other areas under Bagan hegemony, is the thirteenth century, the first time economic, social and religious circumstances permitted such a broad expansion of the donor base.⁴¹ Before this period, we should expect a regular, elite-sponsored construction programme involving fewer buildings.

There is one relevant inscriptional date for the thirteenth century. A list of lands donated for religious purposes, recorded in Burmese in CE 1273 on the Tawyamingyaung pagoda stone in Pyay includes a mention of the Nawin River, which flows past the north side of Sriksetra.⁴² Pyay, formerly called Prome, today stretches from the west wall of Sriksetra to the Ayeyarwady. The only dates from direct analysis of materials come from earthenware potsherds examined by thermoluminescence in the 1970s. The techniques used in the pioneering days of thermoluminescence are open to critical review, and a corpus of only two scientific dates is merely a hint of what may come from further absolute dating. On face value, a CE 710 date for a sherd excavated at HMA 13, a structure within the palace complex, suggests that the complex might date to, or before, CE 710. Similarly, a date of CE 1410 for a sherd at HMA 10, a

41 Hudson, 'The origins of Bagan', pp.117–218.

42 G. H. Luce and Pe Maung Tin, *Inscriptions of Burma* (London: Oxford University Press, H. Milford, 1934), plate 242; G. H. Luce, 'Lower Burma placenames in old Burmese', c. 1958, The Luce Collection Series 2, Folder 14, Box 15, National Library of Australia, Canberra.

rectangular complex outside the western wall which contained castellated burial urns, suggests that occupation preceded the pottery.⁴³

The timescale over which building activity at Sriksetra took place can be extended. There is a need to reassess data that may have been constrained to conform to an incorrect timescale, based in part on an erroneous narrative of rise, decline and fall. The process of reinterpretation will involve a reappraisal of the approaches taken previously to acquire and analyse information about the site, a re-evaluation of the existing data in a broader chronological context, and the integration of new information from survey and excavation.

Approaches to the built environment

Artefact collection and architectural restoration, 1906–1939

Archaeological work began at Sriksetra a century ago. General Léon De Beylie, who had fought pirates on the Red River and ended up as commander of the French forces in the colony of Cochin China, devoted ‘generously large sums of money’ to antiquarian studies. With the cooperation of Director of Archaeology Taw Sein Ko, he employed 50 workers at ‘Old Prome’ in the dry season of 1906–07. De Beylie’s task involved clearing away overgrowth and debris rather than formal archaeological excavation. His focus was on architecture and artworks. He collected terracotta votary tablets, and noted that some of the buildings he visited had been tunnelled into, which suggested that their relic chambers had long since been robbed. He published the earliest known plan of the city, showing a single surrounding wall which he described as ‘ancient fortifications’.⁴⁴ Taw Sein Ko continued the investigations, recording prominent ancient, restored and modern pagodas. He noted that, according to the Burmese chronicles, the ‘circuit wall’ had 32 large and 23 small gates.⁴⁵ The Archaeology Department restored such ruined structures as were sufficiently intact: the Bawbawgyi, Payagyi and Payama stupas, and the Paya-htaung, East Zegu, Yahanda-gu, Bebe and Lemyethna temples (Figure 3).

In the decades that followed, there was a lot of digging. This was largely the work of the epigrapher Charles Duroiselle, superintendent of the Archaeological Survey for most of the inter-war period. Between 1912 and 1940 at least 120 mounds were excavated. The acquisition of sculptures, statues and inscriptions was recorded in the annual reports of the *Archaeological Survey of Burma*⁴⁶ and the *Archaeological Survey of India*.⁴⁷ Mounds that failed to yield artefacts were dismissed as ‘not interesting’. Locational and structural characteristics of the sites excavated were of little concern. While Duroiselle cannot be blamed for focusing on his own interests, it might be noted that in England during this period Mortimer Wheeler was developing an archaeological

43 Hudson, ‘The origins of Bagan’, pp. 282–3.

44 General L. De Beylie, *Prome et Samara* (Paris: Publications de la Societe Francaise des Fouilles Archeologiques, 1907); General L. De Beylie, *L’Architecture Hindoue en Extreme-Orientse* (Paris: Ernest Leroux, Editeur, 1907); Chas. Duroiselle, ‘General De Beylie’, *Journal of the Burma Research Society*, 1, 1 (1911).

45 ASI 1910, Plate 46; ASB, *Report of the Superintendent, Archaeological survey of Burma* (Rangoon: Office of the Superintendent, Government Printing, 1910:13).

46 *Archaeological Survey of Burma, 1913, 1915, 1924, 1925, 1926, 1938, 1940, 1941.*

47 ASI 1912, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1935.

methodology that involved careful excavation and rigorous, inclusive record keeping. Word of this progress in the discipline seems not to have reached Myanmar until after the Second World War, when a new generation of Burmese archaeologists undertook training with the Wheeler-restructured Archaeological Survey of India.

Systematising excavation, aerial photography and extra walls, 1948–present

By the 1950s, a notion had arisen that the city had multiple walls. This can be pinpointed to the geographer Daw Thin Kyi who proposed that the city had two extra walls to the southeast. She opined that these were for defence against unspecified enemies.⁴⁸ The alleged multiple walls and their implied military function remain the received wisdom,⁴⁹ reflected as recently as 2007 in a city plan on display in the Sriksetra museum. However, we shall argue that these structures are actually the sides of a pair of drainage channels (Figure 6).

From the 1960s, Burmese archaeologists excavated or re-excavated several dozen sites at Sriksetra, paying particular attention to any structures they found. Details of these excavations were recorded in day-books, which are unpublished but have been made available to one of the authors (Bob Hudson). In 2007, the notebooks, an incomplete series suffering insect damage, were kept by the Field School of Archaeology, within the walls of Sriksetra, where there were plans to preserve them digitally. Some of the later excavations appear in individual departmental reports, which are often circulated as photocopies to interested parties.⁵⁰ Data from the post-1964 excavations has contributed to several studies in Burmese.⁵¹

The heritage structures at Sriksetra are managed by a small branch of the Archaeology Department. The main tasks of these officers are maintenance of buildings, such as the Bawbawgyi pagoda which needed substantial repairs in 2006–2007 following rain damage, and operating the on-site Hmawza museum. Since the Field School opened in 2005, with a teaching staff that includes several graduates of the Archaeological Survey of India, there has been a renewed emphasis on research and excavation.

Revising and integrating the data

We have already made a case for a reassessment of Sriksetra's timeframe. This will involve a reassessment of the modification of the landscape over time, the management of the space, and the placement of structures for practical or ritual purposes. A project to reinterpret Sriksetra requires data in three areas: (1) a reconnaissance of the

48 Daw Thin Kyi, 'The early capitals of Burma', *New Burma Weekly* [microform], 24 Jan. 1959.

49 Kan Hla, 'Ancient cities in Burma', *Journal of the Society of Architectural Historians*, 38, 2 (1979); Luce, *Phases of pre-pagan Burma*, vol. 1, p. 52; Sein Maung U, 'Ancient Sriksetra', p. 113; Janice Stargardt, 'City of the wheel, city of the ancestors: Spatial symbolism in a Pyu royal city', *Indo-Asiatische Zeitschrift* 6 / 7 (2003): 147–8.

50 For example, Nai Win, Kyaw Myo Win, and Thant Zaw Oo, 'The ancient city of Sriksetra, report on excavation work, Mound no. 35, 1998–99 (in Burmese)', 1999.

51 Sein Maung U, 'Ancient Sriksetra'; *Yin-kyay-hmu Sar-saung: 'Special bulletin of culture'*, (in Burmese), ed. Kyi Aung (Yangon: Ministry of Culture, 2005); Nyunt Han *et al.*, 'Ancient cities before the Christian era: New archaeological evidence from Tagaung, Halin, Beikthano, Maingmaw and Sriksetra (in Burmese)', Ancient Myanmar Cities Conference, UHRC, Yangon, 19–20 Jan. 2006.

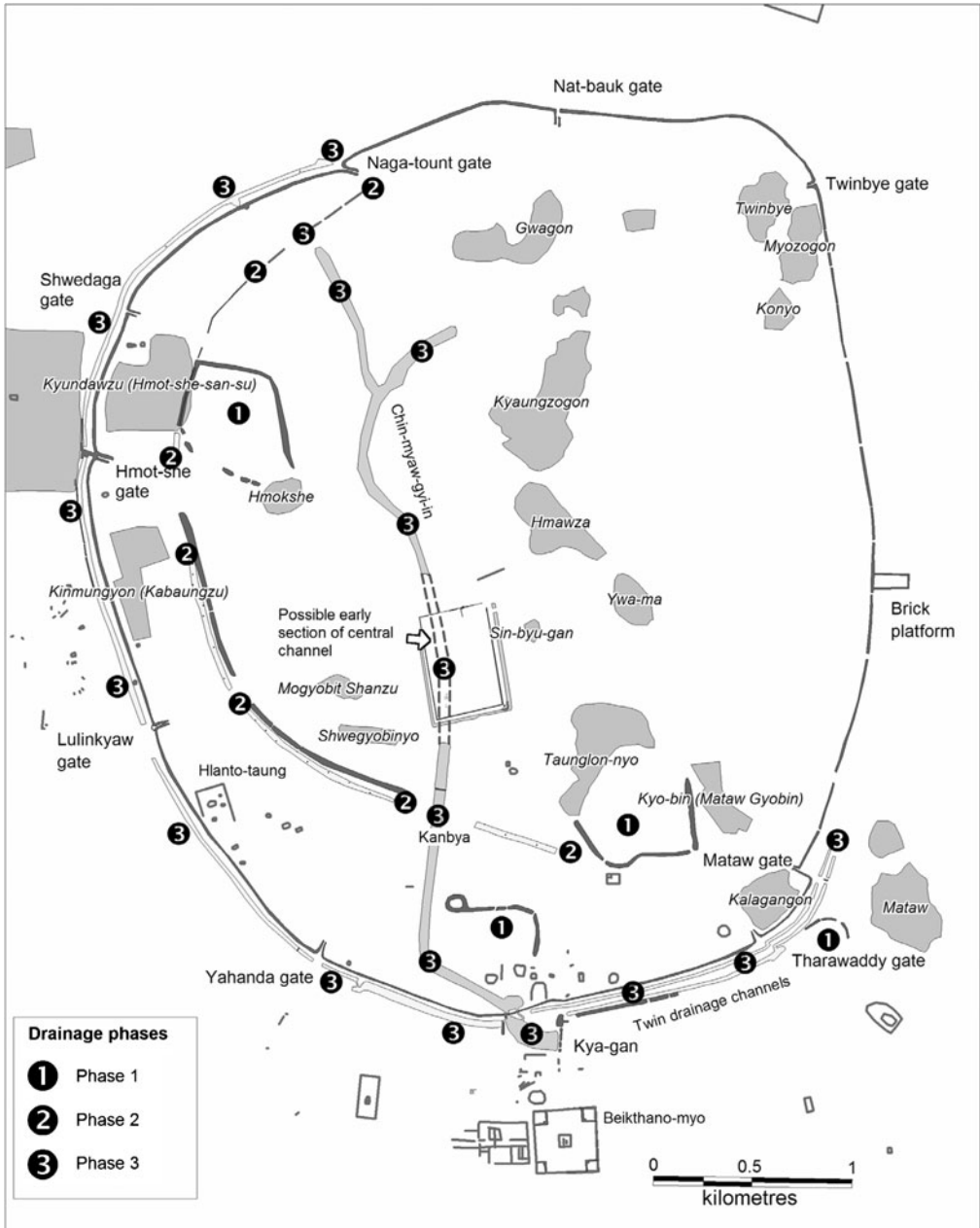


Figure 6. Walls, gates, drainage channels, Pyu drainage phases and modern villages

hydraulic system and walls, the built environment around which the culture existed and developed; (2) a survey of the monuments; and (3) a revised chronology of the walls, hydraulic system and monuments that will integrate art history and inscriptional or scientifically determined dates.

The survey of monuments should be substantially completed (by Bob Hudson and colleagues at the Field School) by 2009, in the sense that there will be a published record of the dimensions, form and location of all surviving ruins that are visible above the ground, or have been discovered so far through excavation. This survey will include buildings that have been recorded in the past but have now disappeared, often because their bricks were deliberately removed for the construction of ovens to boil palm sugar, for kilns for making charcoal, to line wells, for paving or as ballast for railways or roads. Needless to say, the list will remain open-ended.

The introduction of more absolute dates into the scheme of periodisation is a longer-term prospect. Bones from burials at Sriksetra have suffered the same fate as bones from other sites in Myanmar: the datable collagen in the bone has usually been leached away by moisture in the ground and the samples are not viable. No samples of charcoal or old wood have so far been acquired from excavations. An experimental programme of accelerator mass spectrometry radiocarbon dating⁵² using rice husks physically extracted under a microscope from crushed bricks was established by Bob Hudson at the University of Sydney in 2006. It is likely to take several years to accumulate enough statistically meaningful date ranges. The first phase of the project, a reconnaissance of the hydraulic system and the city walls, is now complete, and can provide a physical context for examining the monumental, cultural and chronological elements.

Survey: Walls and hydraulics

The outer wall and drainage channels

On the western and southern sides of Sriksetra, across sloping ground that drains to the northeast, there is a solid brick wall, more than 3 metres thick and up to about 10 metres high in parts. The wall curves inward in places to form corridor entranceways that narrow to a few metres wide. Outside the wall, at a distance of 25 metres to 30 metres, is a drainage channel which runs parallel to the wall for 8 kilometres. The sides of the channel are formed by brick baulks that in some places are over 2 metres thick. Our survey has recorded 41 examples of baulks exposed by agriculture or erosion on the outer side of the channel and 26 examples on the inner side. Ancient Chinese chroniclers reported an unnamed Pyu 'capital' whose 'moat' was lined with brick.⁵³ Sriksetra is the only Pyu city where this feature has so far been found. Four wells seen in the bed of the channel in 2007 revealed brick debris. A brick floor more than 1 square metre could be seen in one of these wells. This hints that the bottom of the channel may also have been brick-lined, but further evidence is needed before this can be confidently asserted. The channel is characteristically 20 metres wide. It broadens to 40 metres between the Yahanda gate and Kya-gan (lotus lake), outside the south wall. Twin channels east of Kya-gan, which appear to have collected water flowing in from the south and from Kya-gan, are each 15 metres wide. Water flows to the north and south along the channel system from an area near Lu-lin-kyaw (young man) gate. Measurement with an altimeter shows that this section is 20 metres higher

52 Q Hua *et al.*, 'Small-mass AMS radiocarbon analysis at ANTARES', *Nuclear instruments and methods in Physics research B*, 223–4 (2004).

53 Luce, 'The ancient Pyu', p. 250.

than the exit points near the Naga-tount and Mataw gates (Figure 6). When the water comes, it comes quickly. Local farmers say that after heavy rain there is a rush of water of the order of 40 centimetres deep in the channel near the Naga-tount gate. For one or two hours the flow is strong enough to knock people over if they try to wade through.

A brick wall runs along the north side of the city. Its original height and width are difficult to ascertain as it has been modified for use as a sealed, two-lane road. Along the eastern side of the city is a brick wall that is lower and narrower than the other walls. There are gaps of up to 30 metres wide in this wall, which sits on low ground that is flooded during the June–October rainy season. A rectangular brick platform, 70 metres wide, projects 180 metres eastwards outside this wall. Two different irrigation strategies are applied at Sriksetra. On the more sloping western side of the city, rice paddies are watered by rainfall. On the eastern side, rice is grown as the floodwaters retreat. In the November–May dry season, crops of flowers and vegetables are irrigated from wells. Some wells are lined with brick, others are lined with bamboo frames, and some are unlined. Modern wells tend to be circular. Old wells and tanks exposed by erosion or the digging of new wells are square, and lined with brick. Some old wells and tanks have been repaired and put back into operation. There has been a considerable expansion of agriculture at Sriksetra since the Second World War. G. H. Luce walked through jungle in 1937 to visit ruins that now sit among cultivated fields.⁵⁴

The central channel

On the south side of the city, the channel from the western side feeds into Kya-gan, an area laid out today with paddy fields which fill with water in the rainy season. It is bounded on the east and west by earth banks which contain old bricks (indicating that the banks are artificial), on the south by a natural slope, and on the north by the city wall which rises to follow the slope of a hill known as *Thaung-bye-gon* (thousand pagoda mound). Two gaps in the city wall link the Kya-gan with a 40-metre-wide channel that runs through Sriksetra from south to north. One of these gaps is at the modern ground level, and about 14 metres wide. Southwest of this gap is a mound of earth that might be the remnants of a dam that could have sat across this opening. A narrower gap is cut 50 metres further east through a slope of *Thaung-bye-gon*. We suggest that this contained a structure for controlling flow from the Kya-gan into the south-north channel.

The south-north channel is today blocked by an earth bank that has turned a section of it into a reservoir, the *Kan-bya*. North of the reservoir, the channel runs to the southern edge of the palace. While there is no direct evidence as to whether the role of this 300 x 500 metre walled and moated complex was administrative or religious, we accept the term ‘palace’ to identify it. Excavations by the Archaeology Department in 1968–71, 1991–92 and 1998 revealed brick lines, roof tiles and a zig-zag entranceway in the north wall. Spoil heaps from the excavations are seen outside the north and east walls. Mounds of debris inside the complex are witness to the work of treasure hunters who gained access to the site in 1988. This was a time of political unrest during which, according to former treasure hunters, the police and local authorities ‘stayed at home’,

54 *Ibid.*, p. 245.

leaving historic sites unsupervised. Treasure hunting continues today on private land around Sriksetra.

Contemporary drainage runs around both sides of the palace before turning east. North of the palace, a channel known as the Chin-myaw-gyi-in (placenta lake) continues in the same line as the Kan-bya channel. These bodies of water may originally have been contiguous, with the palace complex constructed after the central channel ceased to function as an integrated unit. The Chin-myaw-gyi-in feeds paddies to either side of Gwagon, a village that was occupied in Pyu times. Gwagon sits on elevated ground which, as treasure hunters have revealed, is dense with occupation debris: earthenware potsherds and spindle whorls, and miniscule amounts of gold, which is the key target of the diggers.

The inner drainage channel

About 400 metres east of the main wall, and generally parallel to it, the remains of a wall and channel extend over more than 5 kilometres (Figures 6 and 7).

An elongated mound of brick debris rises up to a metre above ground level along the western bank of a bunded field known as the Wetchimane-in. On the northwest corner of Wetchimane-in the base of this wall, described by its excavator as an 'interior stockade', was found to be 2 metres wide.⁵⁵ Brick foundations were also seen, according to local monks, when a pagoda was constructed on the southwestern end of the bund a few years ago. Distinct brick lines can be seen over a distance of 400 metres to the north of the Wetchimane-in, exposed by a bullock track. There are less-well-defined remnants of brick for another 700 metres, up to a railway embankment that was built in the 1990s but never used. Brick mounds along the same alignment, northeast of the embankment, hint at a further extension.

South of Wetchimane-in is an earth bank, 2 metres high and up to 20 metres wide, which extends more than 2 kilometres to the southeast. A brick line can be seen extending 5 metres across the mound. Excavation could determine whether this is part of a wall. On the mound's upslope side is a 20-metre-wide channel. Vestiges of this channel extend as far as the Shan-le-byin, another bunded field system in the southeast of the city, although its original flow has been interrupted by what we will suggest is the later central channel (Figures 6, 7 and 8).

Suggested sequence of development: Structure and hydraulics

A construction sequence related to agriculture and drainage can be derived from the archaeological remains. An understanding of this sequence should explain how the inhabitants of the city tried to modify and improve their vital hydraulic environment, and consequently how the drainage system might relate to the city's overall development. The fields on the east side of the city are flooded each year. While this flooding is more controlled since the damming of the Nawin River, farmers still call these fields *pinle* (the ocean). The inundation would have allowed the early inhabitants to engage in flood-retreat rice agriculture, as do the farmers today. In a move that

55 ASB 1964: 15 and plate 27.

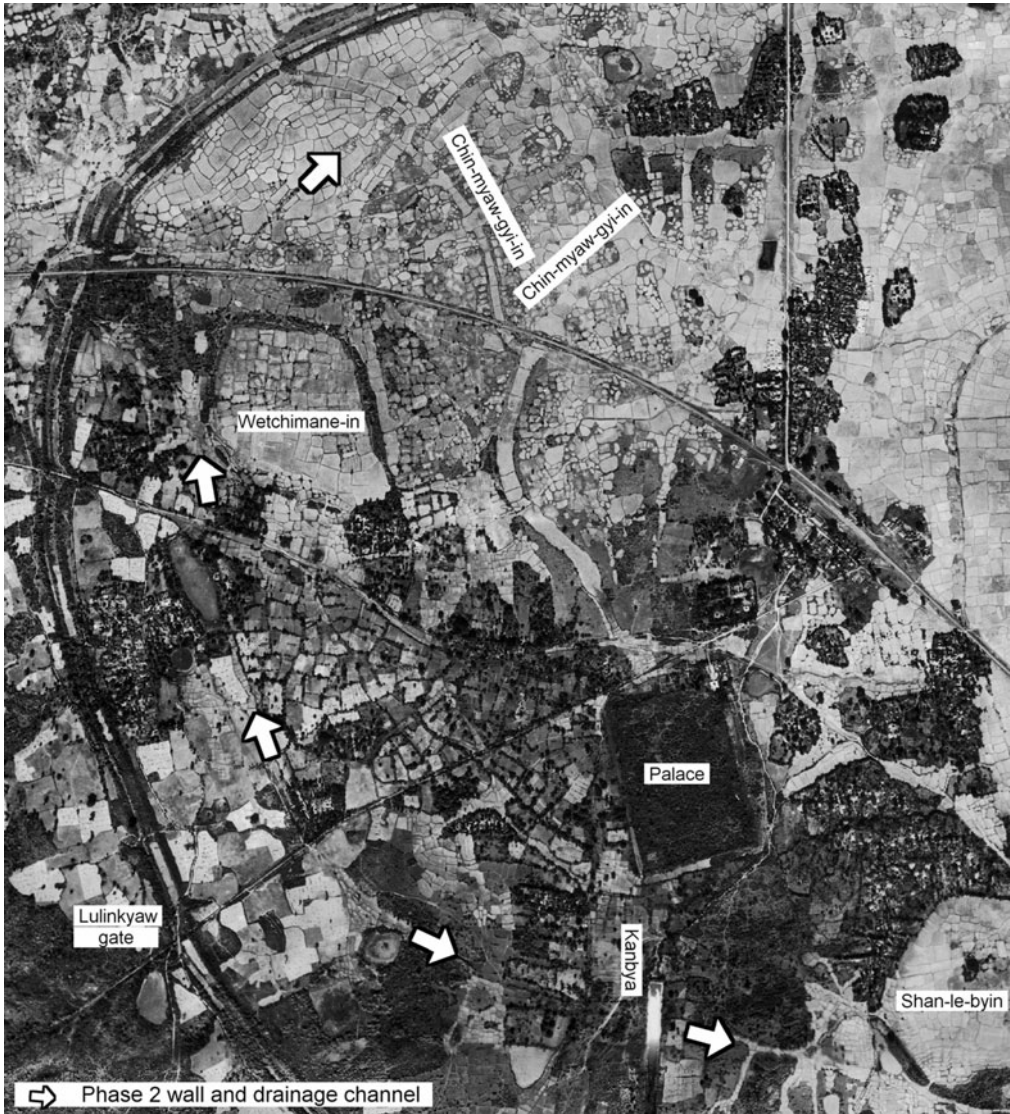


Figure 7. The Phase 2 inner drainage system as seen in the 1953 aerial photographs. The Phase 3 Kanbya / Chin-myaw-gyi-in channel cuts through Phase 2, and is in turn occluded by the palace complex

would have increased the area of land with a secure water supply, three areas above the level of the inundation were enclosed by large earth banks. These are the so-called 'bunded fields' Wetchimane-in, Shan-le-byin and Yindaik-kwin. There is a fourth, unnamed bunded field northwest of Mataw village. No habitation debris can be detected on the surface of these fields, or in a tank in the centre of Shan-le-byin. Agricultural activity tends to bring such debris to the surface, and in its absence, we can

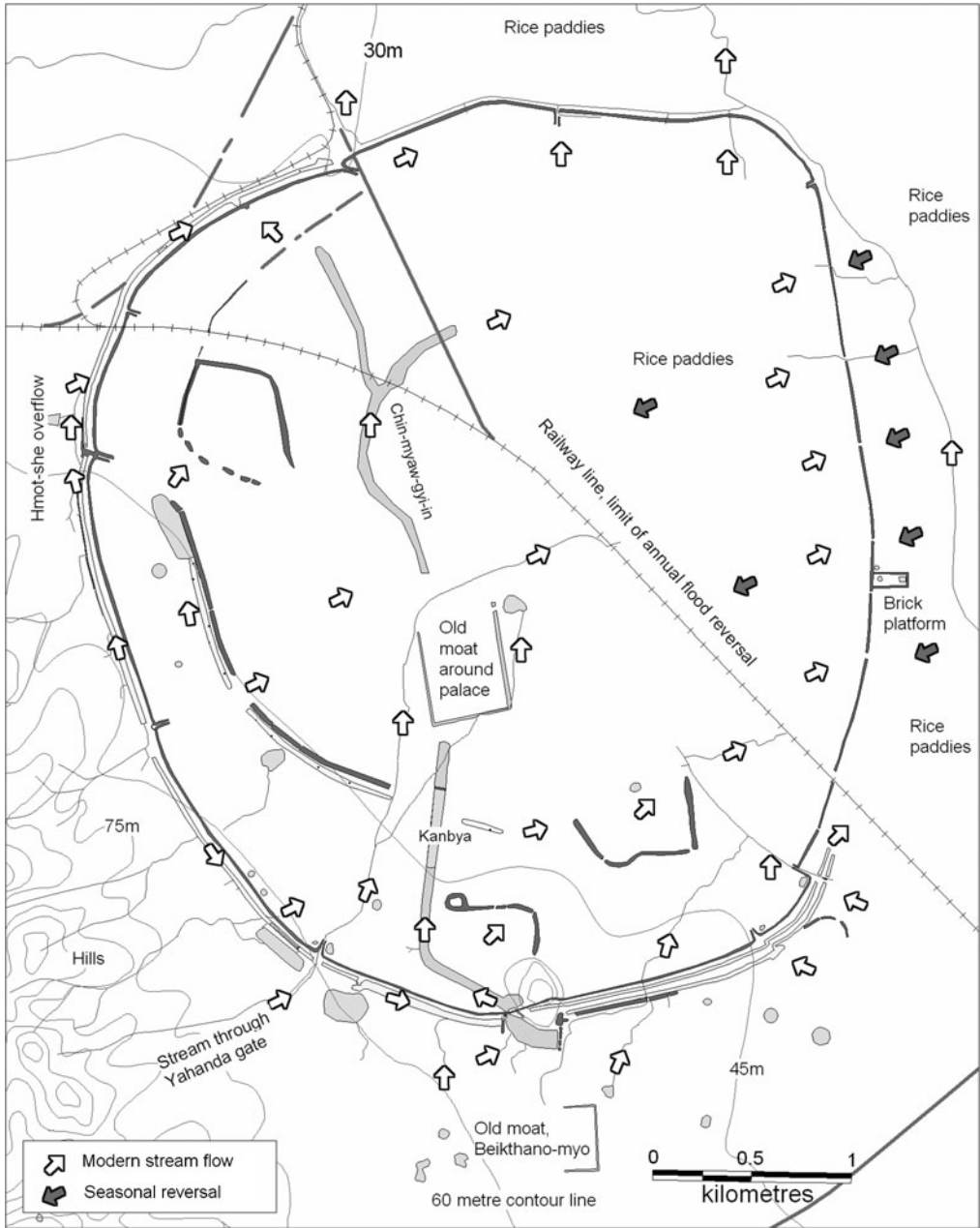


Figure 8. Contemporary stream flow at Sriksetra

play down the possibility that the earth banks might have been settlement enclosures. Their intended function remains unclear. They may have been a means of growing a late season crop as the water ponding in the bunds soaked away.

There are ruins of Pyu buildings on the banks of Yindaik-kwin⁵⁶ and Shan-le-byin.⁵⁷ The bunds must therefore be older than the ruins. The brick wall which forms part of the inner drainage system runs along the western mound of the Wetchimane-in, and still projects above the bund. One function of the inner drainage system may have been to increase the supply of water to Wechhimane-in and Shan-le-byin. The Kanbya / Chin-myaw-gyi-in channel cuts through the inner drainage channel, and so must post-date it (Figures 6, 7 and 8). We hypothesise that the other earth bunds, being structurally similar, date to the same period, and that this period is earlier than the drainage systems. This hypothesis could be tested by excavation, absolute dating and palynological analysis of sediments.

The people of Sriksetra built two drainage systems, seemingly in sequence, to divert the annual monsoon runoff from hills that lie to the west and southwest of the city, and redirect the water to low ground in the northwest and southeast. The smaller, inner drainage channel seems to have been built first, since the south-eastern part of this channel is cut by the Kan-bya tank, and the brick line north of the Wetchimane-in appears to have been largely washed away by the Chin-myaw-gyi-in. It is not clear why the inner system was superseded by the outer drainage system. The needs and capabilities of an expanding population may have seen the more substantial outer drainage channels built further west and upslope.

These drainage systems were presumably built to protect something important enough to the community to warrant the expenditure of human and financial resources, most likely monumental structures. The centroid of the monuments may have been at the focal point of both wall systems, the area now occupied by Kyaungzogon and Hmawza villages and the Settaing and Nyi-nyi pagodas (Figures 3 and 6). These pagodas sit on platforms containing Pyu bricks, although both have been restored in modern times. In 2005, the survey team recorded structural brick exposed by treasure hunters at a depth of 2.5 metres in the compound of the Settaing. The illegal digging was halted and the pits were filled in. This find suggests that the buildings now visible on the surface may not be the earliest, or the only, structures in the area. The Settaing compound, variously known as Settaing Thein Kyaung or Kyaukka Thein, has two groups of stone Buddhist triads which stand where they were first discovered, their bases more than a metre below present ground level.⁵⁸

The outer drainage system is still in place, and although it is blocked or broken in parts, and heavily silted, sections of it still carry water after heavy rain. From a high point near the Lulinkyaw gate, water would have run north to a discharge point outside the Naga-tount gate, and south into Kya-gan and through the south wall into the south-north channel. This channel is about 40 metres wide, roughly double that of the channels to the west, presumably because its shallower slope kept the velocity of the water lower than down the western channels. The double channel outside the southeast wall seems to have taken the overflow from Kyagan plus water from the south, around a walled and moated complex known as Beikthano-myo (Vishnu town), and drained it

56 ASI 1928–29:105–6.

57 ASB 1939: 11–13; Luce, *Phases of pre-pagan Burma*, 1: pp. 46–7.

58 ASI 1910: 120; De Beylie, *Prome et Samara*, pp. 82–4 and figs. 56–7; Luce, *Phases of pre-pagan Burma*, 1, p. 129 and 2: plate 12.

to the east. Two channels would have been needed to take both flows, particularly as the slope of the ground to the east is shallower than coming from the west. The southernmost of these channels changes direction to go around the Gwebindwet-Mathigyagon stupa, which sits on the bank between the two channels. The stupa is therefore likely to be older than the second channel, which may have been added to improve drainage.

The outer drainage channels runs outside the west and south walls of Sriksetra for 8 kilometres. The 1:200 average gradient indicates that the function of this channel was to remove water, not to hold it. Wells dug in the bottom of the channels characteristically show an upper level of alluvial topsoil, which may be a metre deep, with perhaps 80 centimetres of sand mixed with gravel underneath, the larger gravel pieces near the bottom. Along two sections, on the west bank of the channel near Kimmungyon village, and on the south bank of the outer channel east of the Kya-gan, mounds of soil that are raised higher than the other channel banks nearby suggest that the silt may have been cleared out on one or more occasions. Without cleaning, the channel's drainage function would have been reduced by the sand and gravel that was deposited. The progressively finer sediment towards the surface indicates that the flow was rapid when the drains were functioning as designed but became sluggish as the soil accumulated. It appears that once the south-north channel silted up, the flow was reduced to the extent that the palace complex could be built right across the old channel, and water flowing north was diverted into a brick-lined moat around the complex. We suggest that the siltation that we now see resulted from a lack of maintenance, perhaps after the drains were no longer important components of infrastructure. Dating the stratigraphy at key locations should thus throw light on the history of this system.

New approaches to structure and function

The walls and channels bear witness to a sequence of activities by the inhabitants of the city to modify and control their environment. The chronology will remain unclear until more absolute dates are obtained, but this sequence provides a framework within which the use of the landscape for economic and ritual activities can be tracked over time.

Bunds and drainage channels

Our 'landscape engineering' explanation begins at the scale of the city's internal water storage and drainage system. The early earth bunds might represent Phase 1 (Figure 6), the independent activity of several neighbouring communities. Monica Smith, in a study of the development of urban centres in South Asia's third century BC to fourth century CE Early Historic period, speaks of projects at this technological level as involving 'single-event coordination that did not represent the imposition of a permanent leadership'. Phase 2 at Sriksetra, the 5.5 km inner channel and associated brick wall, followed by the more extensive outer drainage channel and south-north channel, Phase 3, could then be seen in Smith's terms of early state formation, characterised by 'monumental, labour-intensive architecture that is used for a variety of purposes simultaneously'. The significance of this construction is not what was being built, or the motivation for building it, whatever that may have been, but the fact

that it was a centrally managed communal effort involving a substantial contribution of resources.⁵⁹ There is no documented motivation for construction at the time. Stargardt, who accurately portrays the Pyu as skilled micro-managers of water resources,⁶⁰ has proposed that internal channels (including the Phase 2 drainage channel) visible in aerial photos of Sriksetra may have been deliberately laid out to flow in an auspicious clockwise direction, as part of a leadership-initiated scheme to claim responsibility for the supply of water to the inhabitants.⁶¹ It is reasonable to suspect that in any hierarchical culture, the leaders might be happy to take responsibility for beneficial occurrences, and in an early state where religion was highly significant, they might initiate projects that link social benefit and cosmological motivation. However, in the case of the drainage at Sriksetra, field reconnaissance indicates that construction according to such a cosmological plan does not stand up. The contour lines⁶² and the 2005–07 survey data show that the internal drainage of the city is essentially from southwest to northeast, except for the northwest corner of the city where water flowing along the western arm of the Chin-myaw-gyi-in channel is turned northwest by a low north-south ridge on which Gwagon village sits (Figure 6 and 8). On the basis of landform, drainage remains the simplest explanation for the Phase 2 and 3 channels.

Moats

Two structures at Sriksetra appear to have had moats, bodies of water held permanently outside the walls of the buildings (Figure 8). It is important to distinguish between these and the drainage channels. Excavations in 1968–69 on the southeast corner of the ‘palace’ unearthed brick baulks that could still be seen in 2007, lining the moat that surrounds the west, south and east sides. Wells have exposed outer brick baulks at a distance that would make this moat 10 metres wide. Field survey also shows that there are brick baulks 7 metres apart on the sides of a moat outside Beikthano-myō. The short run of these moats, no more than 500 metres on any side, and their imperceptible slope, suggest that they should have held permanent still water.

The Burmese chronicles describe Sriksetra as having the ‘things needful for a city’, such as gates, moats and towers,⁶³ while early Indian documents include moats in their descriptions of ‘ideal’ cities.⁶⁴ There is no argument that the construction of rectangular brick-lined moats around the palace and Beikthano-myō may have been within an architectural scheme in which a moat was a cosmologically prescribed element. The existence of moats around the temples at Angkor or later walled cities such as Toungoo in Myanmar or Chiangmai in Thailand can reasonably be linked to the cosmological importance of surrounding a significant site with a permanent body

59 Monica L. Smith, ‘Early walled cities of the Indian Subcontinent as “Small Worlds”,’ in *The social construction of ancient cities*, ed. Monica L. Smith (Smithsonian Books, 2003), pp. 278–9.

60 Janice Stargardt, *The ancient Pyu of Burma: Early Pyu cities in a man-made landscape* (Cambridge: PACSEA, 1990).

61 Stargardt, ‘City of the wheel, city of the ancestors’.

62 Prome and Thayetmyo Districts One-Inch Map, 85 N/5, 2nd edn, 1944.

63 Pe Maung Tin and Luce, *The Glass Palace Chronicle of the kings of Burma*, p. 14.

64 Ananda K. Coomaraswamy, ‘Early Indian architecture: Parts 1 & 2’, *Eastern Art, An Annual*, 2 (1930); T. Bhattacharya, *The canons of Indian art or a study on Vastu-Vidya* (Calcutta: K. L. Mukhopadhyay, 1963), p. 69.

of water. But on the wider scale at Sriksetra, the construction of the Phase 2 and 3 walls and drainage channels probably had a purely practical purpose, the modification of the landscape to prevent erosion, protect important buildings and regularise the water supply.

Fortifications

We do not know what the builders of this system consciously intended to do. There may have been several stated reasons: civic pride, exclusion of 'out-groups', defence, or perhaps indeed an Indian-inspired cosmological explanation, that a 'proper' city must have walls, gates and moats. We have already suggested that on the basis of the archaeological evidence of structure, gradient and deposition, the physical function of the channels paralleling the walls was stormwater drainage. But what information can be read directly in the associated brick walls and gates that need not involve an unprovable assumption that they were a military structure? Elizabeth Moore⁶⁵ suggests that the fortifications were 'more an assertion of power than evidence of a need to retreat behind walls'. This 'assertion of power' can be seen in the light of Bruce Trigger's 'thermodynamic' explanation, of monumental architecture characteristic of early differentiated societies that exceeds practical needs in its extent, to impress all concerned with the power and importance of the builders.⁶⁶

The emphasis on the defensive elements of the city coincides with the end of the Second World War, during which Burma was invaded by Japan, then reinvaded by Britain, and with the early years of independence, which were marked by widespread unrest, banditry and fighting between ethnic and political groups. While it is understandable that war was on the minds of mid-twentieth-century scholars, only two classes of surviving artwork so much as suggest warlike activity. The 'throne stone' features a man with a club, although we have already suggested that this stela is a religious symbol. Several earthenware plaques found around the base of the Gwebindet-Mathigyagon stupa and in an unrecorded context at the Kinmungyon ritual complex feature a stylised image of a man on horseback waving a sword, an image duplicated on earthenware plaques at the Pyu settlement of Maingmaw.⁶⁷ But there are, unlike at Angkor, for example, no identifiable images of battle or subjection, and no boasts of triumph over enemies in an admittedly limited and only partially translated corpus of inscriptions or inscriptional fragments. Nor have there been any notable finds of weapons such as swords, spears or caltrops.

There is, however, evidence that the inhabitants of the non-human realm needed to be propitiated. Scriptural extracts were buried under at least three of the gates. Metre-long nails, too large to be functional, were driven between the bricks of the walls reflecting the use of 'protective' iron, which is well documented in archaeological and ethnographic contexts.⁶⁸ There is also what may have been meant to be a triply effective

65 Moore, *Early landscapes of Myanmar*, p. 175.

66 Bruce Trigger, 'Monumental architecture: A thermodynamic explanation of symbolic behaviour', *World Archaeology*, 22, 2 (1990).

67 Sein Maung U, 'Mongmao, a forgotten city', *The Working People's Daily*, 21 and 23 Jan. and 3 Feb. 1981.

68 Sein Maung U, 'Ancient Sriksetra', p. 115.



Figure 9. Female ogres (height 31 cm)

type of talisman. Two pairs of *bilu* and *biluma*, male and female ogres, now in the National Museum in Yangon, are classic guardian figures. They are made from ‘protective’ iron, and hold their hands in the gesture of *abhaya-mudra*, which signifies the dispelling of fear (Figure 9).

Gates

Farmers at Sriksetra describe and name most of the 30 or so existing openings in the walls of Sriksetra as gates. Only nine of these entrances, inward-turning brick corridors that are part of the structure of the walls (Figure 6), can be confidently associated with the Pyu period.⁶⁹ Three have been formally excavated. These are the Naga-tount or ‘wiggly dragon’, so named because it turns into the city at an acute angle, the Shwedaga and the Lu-lin-kyaw. A fourth gate, the Yahanda, has been partially exposed by a road that has been built through it. Outside the Yahanda gate an erosive stream has cut through the old brick channel baulks and the silt they contain, and water flows northward through the gate (Figure 8). As well as these entrances there are five more brick corridor gates that while unexcavated can be seen in satellite imagery and on the ground. The Tharawaddy gate is just west of Kalagangon village. The Mataw gate, east of Kalagangon, is named for the nearby Mataw village. This name in turn is derived from the belief that a pagoda in the village, the Shwe-mok-taw, is

69 For characteristics of Pyu gates, see Aung Myint, ‘Site characteristics of Pyu and Pagan ruins’ (paper presented at A Comparative Study of the Dry Areas in Southeast Asia: International Seminar, Kyoto, Japan, 14–16 Oct. 1998).

built over one of the 83,000 small pagodas said to have been constructed throughout the Buddhist world by the Indian emperor Asoka. The Twin-bye gate is on the northeast corner of the city. In the centre of the north wall, which is now used as a road; the two arms of a gate known as the Nat-bauk project into the city. The western arm forms a side road to Hmawza. A viaduct allows water to flow through the wall and under the main road. Between the Shwedaga and Lulinkyaw gates, on the western wall, is a unique structure called the Hmot-she gate (Figure 6). While this gate curves inward at the wall, in the Pyu fashion, it also extends across and completely blocks the drainage channel, with further brick arms outside and parallel to the channel. The channel upstream of this gate is filled with silt. Rainwater coming down the channel from the south spills out into what is now an outer suburb of the town of Pyay, flows around the gate structure, and back into the channel 300 metres to the north (Figure 8). The channel on the northern side of the Hmot-she is several metres lower than on the southern, upstream side. This gate may also have functioned as a bridge over the channel, until the openings underneath that allowed water to flow through became blocked due to siltation or collapse.

A path that cuts the top of the wall on the western slope of Thaugbyegon hill and a track that cuts completely through the wall on the hill's eastern slope have both at times been given the name Biluma gate,⁷⁰ but satellite and photogrammetric imagery as well as ground reconnaissance show no Pyu gate at either spot. While various openings in the main wall other than the Pyu gates function as cart-tracks, drains or access for a railway line that bisects the old city, some of the openings along the eastern wall are more difficult to characterise. This brick wall is narrower and lower than the walls around the rest of the city. A dozen openings bear traditional 'gate' names. Some are only a few metres wide and seem to be cart tracks or local drains. The wider gaps – up to 32 metres wide – allow floodwaters in and out during the rainy season. We suggest that this was their original function. In several places, the city walls and drainage channels have been breached, either deliberately, to irrigate fields within the old city area, or by erosion.

Monuments and artworks

If earlier buildings and artworks were located inside the city, and later buildings and artworks outside, we could paint a simple picture of an enclosed city that either outgrew its walls, or outgrew the need for walls. This does not seem to be the case. The location of built and portable artefacts in relation to the walls seems to have no relevance to their form, their function or, even given the sparse information we have about periodisation, their dating. Walled burial complexes known as Pyu-taik, topped with ritual structures and filled with earthenware cremation urns, are widespread outside the walls.⁷¹ However, there is also a major complex, Hlanto-taung, inside the western wall (Figure 6). It was previously recorded as a mound containing the ruin of a single building, but our survey in 2007 found that the site covers an area of 200 by 150

70 ASI 1910, Plate XLVI; Aung Myint, 'Site characteristics of Pyu and Pagan ruins', p. 23.

71 ASI 1909–1910: 123; Stargardt, *The ancient Pyu of Burma*, p. 93; Stargardt, 'The great silver reliquary from Sri Ksetra', p. 491.

metres, it is bounded by a brick wall (Figure 10) and it contains the ruins of at least four buildings.

Inscribed 'Vikrama' burial urns were found both inside the city walls, in a stupa east of the palace, and outside, near the Payaygi pagoda. The palace complex is in a fairly central position within the walls, but the city's other rectangular moated complex, Beikthano-myo, is outside. There are several large stupas that are still reasonably intact outside the walls, but the ruins of two equally large stupas, the Atwin-mok-taw and the Khin Ba, are inside (Figure 3). Megalithic Buddhist triads, bronzes and earthenware votaries are similarly found both inside and outside. A detailed cataloguing of the buildings and their contents in their spatial context is a first step. Buildings might generally be expected to stay put, although there is always a possibility that bricks may be recycled. Portable art is a complex issue. We noted above that several temples may be later than the sculptures they contain. Even in the case of large pieces, such as triads inside the walls of the Settaing complex, or sculptures of Buddhas, heavenly figures and devotees outside the walls at Pogaunggangon, the prospect that they may not have originated at these sites must be considered. Much larger stone pieces have been moved over considerable distances at sites such as Stonehenge and Easter Island. The answerable question on artefact finds is how a particular artefact



Figure 10. Boundary wall of Hlanto-taung ritual complex, exposed in the side of a well

might have functioned at the location such as a temple or relic chamber where it ended up.

An example of how individual sites may be re-surveyed and categorised can be provided by the Myinbahu (Figure 3), which De Beylie reported on, but did not visit.⁷² Pyu bricks form part of the platform of this large pagoda, which was modernised, that is to say, a casing in the contemporary Burmese conical shape was put over the earlier stupa, a few years before De Beylie's visit. In the 1930s, a clearing of the debris round the Myinbahu yielded hundreds of terracotta votives, a terracotta disc with Pyu symbols and a now untraceable bronze Buddha image with an inscription consisting of the opening phrase of the 'Buddhist creed', the *ye-dhamma*, in characters attributed to the CE 300–500 Gupta period.⁷³ If the epigraphic dating is accurate, if the image was part of an original reliquary deposit, and if the image was not an antique when it was enshrined, then the original building should date to CE 300–500. The present custodians of the site were unaware of this evidence of antiquity until our survey team visited and presented them with extracts from the *Archaeological survey of India* report. Today the Myinbahu is a centre for people who are serious about meditation: 'no lazy monks or lazy lay-people allowed on this mountain' says a sign in the dining hall.

Conclusion

New data can often answer old questions, but at Sriksetra, it is also a matter of replacing old questions with new ones. The drainage, walls and gates can no longer be seen as the result of a single event of construction with a single motive, but as a system evolving to meet changing community needs. The expanded periodisation of the city, with evidence of activity both earlier and later than conventionally believed, calls for a new and extended historical narrative that can reconcile the physical structure, the architecture, the art history and the inscriptional and other documentary evidence.

⁷² De Beylie, *Prome et Samara*; Duroiselle, 'General De Beylie'.

⁷³ ASI 1935: pp. 46–7 and plate 22.