

From the Iron Age to early cities at Sri Ksetra and Beikthano, Myanmar

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This article traces the evolutionary record of urbanism at two sites in Myanmar: their transition from late prehistory in c. second to first century BCE to proto-urban and fully urban development at Sri Ksetra and Beikthano by the mid-first millennium CE. The Pyu cities are remarkable because of their spatial continuity, for their early achievements in water control, iron production, ritual and domestic ceramics, brick monumental architecture, rich funerary culture, literacy and adoption of Buddhism on both elite and popular levels. Though the radiocarbon dates for Pyu urbanism are at present earlier, they share many features with other urbanising societies in mainland Southeast Asia, where new chronologies are emerging for social and economic complexity at Dvaravati, Pre-Angkorian and Co Loa sites. The article provides new and specific evidence on the dates and types of contacts between the Pyu, India, and other areas of Southeast Asia to interrogate the meaning of Indianisation in Southeast Asia.

In archaeology, one is unlikely to find the beginnings of anything; the high rates of the destruction of evidence mean that phenomena must first become widespread before evidence is likely to survive. This is particularly true in regions like Southeast Asia, where the strong cultural preference for ‘living’ (organic) materials means that much evidence of the past will have vanished within one or two lifetimes. Nonetheless, archaeology recovers types of information about ancient individuals and

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communities that no other discipline does. This is especially relevant to the period of transition from late prehistory to the early, highly complex urbanising societies that are the focus of this volume.

This article discusses evidence on crucial transitions from the Late Iron Age to early urbanism at Sri Ksetra and Beikthano in Myanmar. In view of recent critiques of ethnic identities in the first millennium in Myanmar,¹ I set out here what I mean by the term ‘Pyu’.

Who were the Pyu?

It is the most widely used name, especially but not only in Myanmar, for an ancient people, culture and language, who left traces in the Dry Zone of Myanmar from the last centuries BCE to c.1300 CE. The Chinese term ‘Piao’ in the Tang records is related. Gordon Luce mentions indications in Pagan (Bagan) records that they called themselves the Tircul, but in his own studies he often refers to them as the Pyu.² I use the term for a population group with important shared characteristics and some local variations. The shared characteristics are: funerary customs involving multiple, sometimes massed, cremated burials in urns mainly made of terracotta, but occasionally of stone and rarely of bronze. Continuity of terracotta urn types has been traced at Beikthano from c. first century BCE to seventh century CE.³

Major inscriptions on stone in the Pyu language survive at Sri Ksetra, Halin, near Pinle (Hmainmaw), and Bagan. The earliest surviving evidence of Pyu literacy belongs to the period between the third–fourth and fifth–sixth centuries CE.⁴ The oldest surviving examples of Pali in the world were inscribed on treasures on gold and silver in the Khin Ba relic chamber at Sri Ksetra. The Pyu were among the earliest people in Southeast Asia to adopt and adapt Indic scripts to record their non-Indic, tonal language — an achievement which involved inventing tonal markers. Evidently their initial contacts with Indian writings were earlier. Pyu-language inscriptions from the fifth–sixth to twelfth–thirteenth century CE,⁵ reveal that they spoke a four-tone language belonging to the Tibeto-Burman group, to which the Myanmar language also belongs. The prehistory of the Pyu probably involved slow movements from western Yunnan, where people speaking related languages still live, into Myanmar. Whether this involved movement first into the Samon River Valley and then into the Ayeyarwadi (Irrawaddy) River Valley is possible but still conjectural.⁶ Clearly in

1 See Michael Aung-Thwin, *The mists of Ramanna: The legend that was Lower Burma* (Honolulu: University of Hawai'i Press, 2005); Elizabeth Moore, ‘Place and space in early Burma: A new look at “Pyu culture”’, *Journal of the Siam Society* 97 (2009): 101–28.

2 Gordon H. Luce, *Phases of pre-Pagan Burma: Languages and history* (Oxford: Oxford University Press, 1986), vol. 1, pp. 47–76; vol. 2, chart M and plate 7.

3 Janice Stargardt, *The Ancient Pyu of Burma, vol. 1: Early Pyu cities in a man-made landscape* (Cambridge: Publications on Ancient Civilization in Southeast Asia; Singapore: ISEAS, 1990), pp. 212–17.

4 A clay seal inscribed in Prakrit from Beikthano, dated 3rd–4th century CE by K.R. Norman; the Sri Ksetra golden Pali text, silver reliquary and stone urns inscribed in Prakrit, Pali and Pyu, dated 4th–6th century CE by Harry Falk and Ingo Strauch.

5 Luce, *Phases of pre-Pagan Burma*, vol. 1, pp. 67, 75.

6 Elizabeth Moore and Pauk Pauk, ‘Nyang-gan: A preliminary note in a Bronze Age cemetery near Mandalay, Myanmar (Burma)’, in *The archaeology of Myanma Pyay (Burma)*, ed. Miriam T. Stark and Michael A. Aung-thwin, special issue, *Asian Perspectives* 40, 1 (2001): 35–47; Bob Hudson, ‘The

Fig. 1 - Colour online, B/W in print



Figure 1. Satellite image showing the Pyu area of settlement with the location of Beikthano and Sri Ksetra. (Google image, annotated by Janice Stargardt)

late prehistory, the Pyu had resided for a considerable time in Beikthano, in the Yin River Valley, and at Sri Ksetra, in the Nawin River Valley, because their proven skills of water control depended on a profound knowledge of the conditions in each locality.

The Pyu shared a form of urbanism on a range of scales — from vast walled spaces with one side enclosed by a water tank (as at Sri Ksetra and Beikthano), or a tank just outside the walls (as at Halin, Pinle and Wadi); a homogeneous form of irrigation technology integrated into these settlements with adaptations to suit each specific environment; a high-grade silver coinage with a *srivatsa* symbol on one side and either a rising sun or a *bhadhrapitha* symbol on the other.⁷ In short, there is no evidence of population change in these two cities, which endured for most of the first millennium (their late phase will only be briefly mentioned in relation to the contraction of the water system and adjustments to the walls at Sri Ksetra).

By the time the first durable structures survived at Beikthano and Sri Ksetra (*c.* first century BCE), it can be assumed that there were significant preceding stages when dwellings, and very likely ritual buildings, were constructed in non-durable organic materials like wood and thatch. Of the many Late Iron Age villages that probably existed in the Ayeyarwadi Valley in the last centuries BCE, one may ask what attracted settlers to Beikthano and Sri Ksetra, and what conferred on them a degree of continuity and

origins of Bagan: The archaeological landscape of Upper Burma to AD 1300' (Ph.D. diss., University of Sydney, 2004), abstract and pp. 93–5.

⁷ Dietrich Mahlo, *The early coins of Myanmar/Burma: Messengers from the past —Pyu, Mon and Candras of Arakan (first millennium AD)* (Bangkok: White Lotus, 2012), pp. 33–59; Than Htun (Dedaye), *Auspicious symbols and ancient coins of Myanmar* (Kelana Jaya, Malaysia: Ava House, 2007), pp. 81–93; Pyu coins are found in hoards in Thailand, Cambodia and Vietnam.

complexity greater than their neighbours? Three common factors emerge, which relate to late prehistoric and early historic settlement patterns elsewhere in mainland Southeast Asia: proximity to a great river, but protection from it; success in controlling water in small perennial streams during the rainy and dry seasons; and abundant, easily extracted iron ore deposits.⁸ Trade was probably also significant, but has left no direct material traces at Beikthano or Sri Ksetra in the last centuries BCE.

Water control and early urbanism at Beikthano and Sri Ksetra

What does urbanism mean, and what distinguished an urbanising settlement from a village? Most fundamental is evidence of a considerable economic and social complexity, e.g. the existence of specialised craft groups and non-food producers, made possible by food security and surplus, either locally sourced or from elsewhere; the emergence of socioeconomic inequalities, leading to hierarchical relationships and evidence of large-scale coordinated activities (such as the construction of monuments, walls and irrigation works); and the urbanising community as a central place within its area. Fortifications and other structures in durable materials are not essential to the claims of a community to be urbanising if it possessed the other characteristics. Writing is not in this list, as surviving material evidence of writing is likely to belong to periods considerably later than the appearance of the fundamental changes outlined above,⁹ and later than the appearance of writing itself on ephemeral materials like palm leaf, cloth and wood.

Pyu cities retained some aspects of a cluster of villages throughout their long history: despite impressive brick walls, defile gateways¹⁰ and brick monuments, their urban terrain was dispersed and highly unevenly exploited. Sri Ksetra contained fields, irrigation canals, water tanks and iron-working sites, as well as monuments, markets (and elusive habitation areas¹¹) both inside and outside the walls.¹² I applied the term ‘cities of extended format’¹³ to this characteristic form of Pyu urbanism. They are at present the earliest dated examples in Southeast Asia, but this dispersed, uneven-density type of urban space can be recognised elsewhere from c. the mid-first millennium CE onwards — e.g. at Rakhine, Dvaravati,¹⁴ Bagan and Angkorian urban sites.¹⁵

8 See articles by Higham; Heng; and O’Reilly and Shewan, this vol.

9 See the present debate on the re-dating of Dvaravati (based until now on surviving inscriptions and art styles), evaluated in Ian Glover, ‘The Dvaravati gap — linking prehistory and history in early Thailand’, *Bulletin of the Indo-Pacific Prehistory Association* 30 (2010): 79–86.

10 Formed by two brick walls curving into the interior of the walled area c.60 or more metres long, forcing all traffic into a narrow, easily defended defile with wooden gates.

11 The first Pyu habitation site was discovered and partly excavated at Sri Ksetra in Jan.–Feb. 2015: Janice Stargardt et al., ‘Early urban archaeology in Southeast Asia: The first evidence for a Pyu habitation site at Sri Ksetra, Myanmar’, <http://journal.antiquity.ac.uk/projgall/stargardt348>, pp. 9–13.

12 Janice Stargardt, Gabriel Amable and Bernard Devereux, ‘Irrigation is forever: A study of post-destruction movement of water across the ancient site of Sri Ksetra, Central Burma’, in *Satellite remote sensing: A new tool for archaeology*, ed. Rosa Lasaponara and Nicola Masini (Dordrecht: Springer, 2012), pp. 247–67.

13 *The Ancient Pyu of Burma*, vol. 1, pp. 343–5.

14 On the uneven density of urban exploitation in Dvaravati sites, see Matthew D. Gallon, ‘Monuments and identity at the Dvaravati town of Kamphaeng Saen’, in *Before Siam: Essays in art and archaeology*, ed. Nicolas Revire and Stephen A. Murphy (Bangkok: River Books; Siam Society, 2014), pp. 330–51.

15 Roland Fletcher, ‘Low density cities’, keynote speech, IPPA Conference, Siem Reap, Jan. 2014.

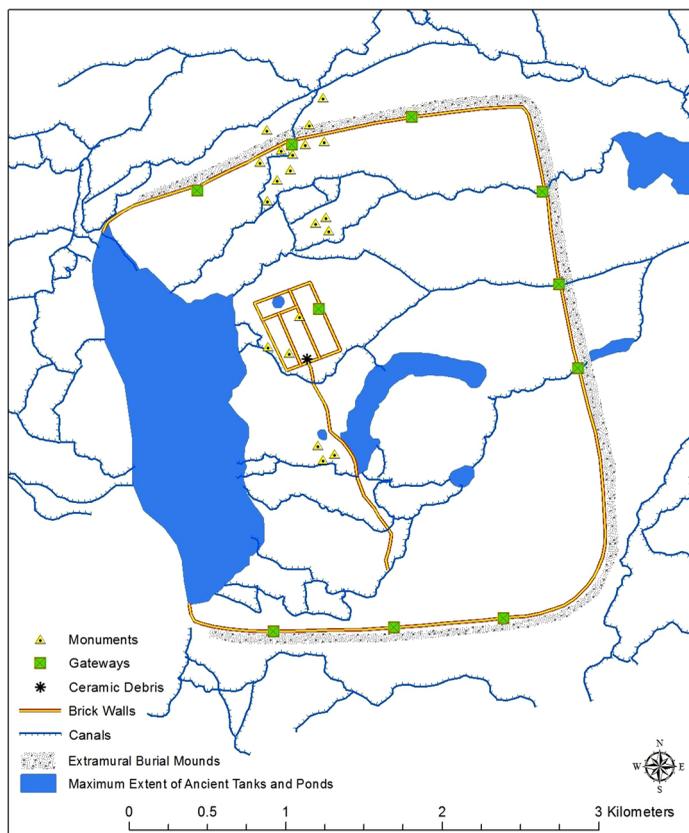


Figure 2. Map of Beikthano and its irrigation works (maximum extent) (© Gabriel Amable and Janice Stargardt)

The integration of water control and urban development is conspicuous at Beikthano, Sri Ksetra, as well as at other Pyu sites that fall outside the scope of this article.

At Beikthano¹⁶ the settlement was located just upstream from the convergence, from the southwest and northeast respectively, of four perennial but highly seasonal streams draining the Yin Valley.¹⁷ The site is approximately 15 km east of the Ayeyarwadi and separated from it by dry lands through which the Yin flows. Whereas all other settlements in the Yin Valley as far east as Taungdwingyi had access to only one or, rarely, two streams, the water resources in the Beikthano locality were superior and probably critical for its early development, in an environment where the average annual rainfall (870 mm) makes the cultivation of rainfed traditional rice unstable.

16 Coordinates, 20° 00'17.81"N x 95° 22'35.16"E.

17 Stargardt, *The Ancient Pyu*, Beikthano, p. 47, pl. 9 and fig. 12; *ibid.*, Sri Ksetra, p. 50, pl. 11 and fig. 14.

Sri Ksetra¹⁸ is only 5.8 km east of the Ayeyarwadi River, but sheltered from it by the Myinbahu Ranges (maximum altitude 164 m above mean sea level [amsl]). Here the Pyu mastered three more difficult slope factors than at Beikthano: a very steep slope from the ranges descending from an average of c.140 m to 63 m amsl over the short distance of only c.2.5 km from the west and southwest of the site; a much more gradual slope from the northeast where the Nawin River flowed westwards to join the Ayeyarwadi at Pyay (Prome); and a gentle slope towards the southeast outside the eastern side of the ancient city. The Nawin River passed close to the north side of the future walled area of Sri Ksetra and through an easily defensible gap in the Myinbahu Ranges. Though Sri Ksetra benefits from more rain than Beikthano, with an annual average of 1200 mm, this is still not enough to support rainfed traditional rice. The city gradually developed the largest and most intensive of the Pyu irrigation systems.

River diversions and rain capture through weirs, canals, moats, ponds and storage tanks were practised in both Beikthano and Sri Ksetra, and were so accurately inserted into their local environments that parts of them still function some 2,500 years later.¹⁹ It can be assumed that experiments with water control accompanied early settlement in Sri Ksetra, to protect habitation areas and burial terraces from the effects of the powerful run-off from the Myinbahu Ranges during and after the annual rains from June to September, and to store water for use thereafter (figs. 3, 4a and 4b). The environment around Sri Ksetra is saturated immediately after the rains (fig. 4a), but much of the water has run away four months later (fig. 4b), except where it is still collected in ancient irrigation works, often at a sub-surface level.

Figure 3 (Phase 1) shows the beginning of those works in a single trench running in a curve across the southwestern/western slope of the site at c.50 m amsl, with a storage tank at each end of the trench, and an earthen rampart on its downslope side (probably made from the earth dug out of the trench).²⁰ I consider them to be the oldest traceable elements in Pyu hydraulic development (fig. 3, Phases 1–3). This early trench was aligned to trap some of the run-off, divert it away from the settlement, and store some in the two tanks for dry season use. These early works must have developed through trial and error, probably from c. the fourth or third to first centuries BCE.²¹ In the same period, a short distance to the north, increasing quantities of water were being diverted by simple weirs out of the Nawin into canals and ponds for rice cultivation after the end of the rainy season.²² There were no doubt other works too small to identify, but these skills in water control enabled the Iron Age Pyu communities settled here to cross the vitally important thresholds of food security and food surplus which accompanied the transition to urbanising societies in low rainfall areas.

18 Coordinates, 18° 48'32.19"N x 95° 17'12.25"E.

19 Stargardt et al., 'Irrigation is forever', pp. 247–67.

20 Stargardt, *The Ancient Pyu*, pl. 11, fig. 14, Canal A1, South Tank and North Tank identified by present author; earthen wall excavated by U Myint Aung 1968; Bob Hudson and U Nyein Lwin, field survey 2010–11.

21 Note similar chronology in Paul Bishop, David C.W. Sanderson and Miriam T. Stark, 'OSL and radiocarbon dating of a Pre-Angkorian canal in the Mekong Delta, southern Cambodia', *Journal of Archaeological Science* 31, 3 (2004): 319–36.

22 Stargardt, *The Ancient Pyu*, p. 50.

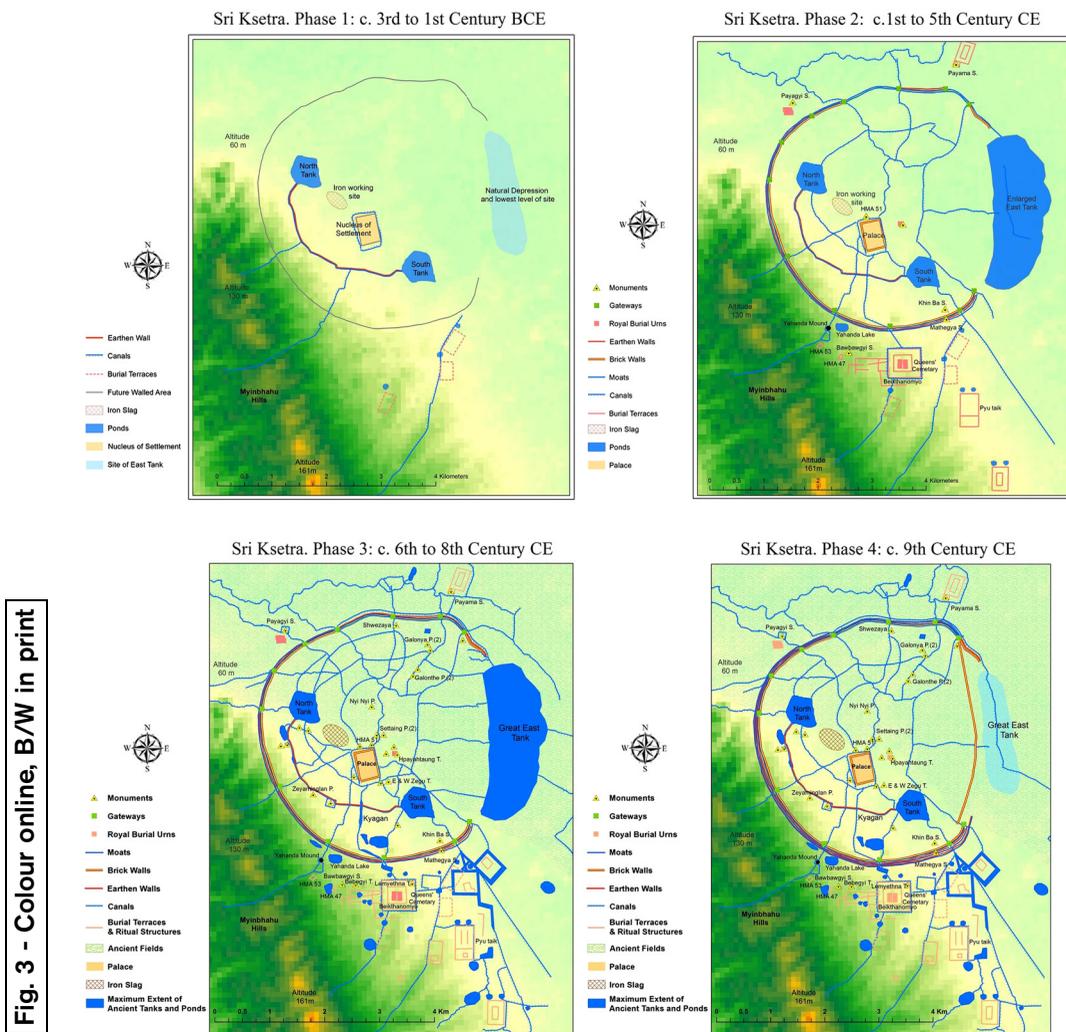


Fig. 3 - Colour online, B/W in print

Figure 3. Sri Ksetra and the four phases of its irrigation works (© Janice Stargardt & Gabriel Amable, Univ of Cambridge)

The massive southwestern and western walls of Sri Ksetra, built of fired brick with a brick-lined moat, initiated a second phase in water control. They ran approximately parallel to the curving trench, but c.550 m closer to the Myinbahu Range along the 63–0 m amsl contour, and now employed the great East Tank as the main storage and distribution area (fig. 3, Phase 2). They represented works of water control and storage on a greatly increased scale and solidity, but they clearly grew out of the same localised knowledge embodied in the original trench, embankment and smaller storage tanks, which still existed as a backup system. The early stages of the brick western wall and moats were probably begun between the first century BCE and the first and second century CE as related activities, but both were rebuilt, improved

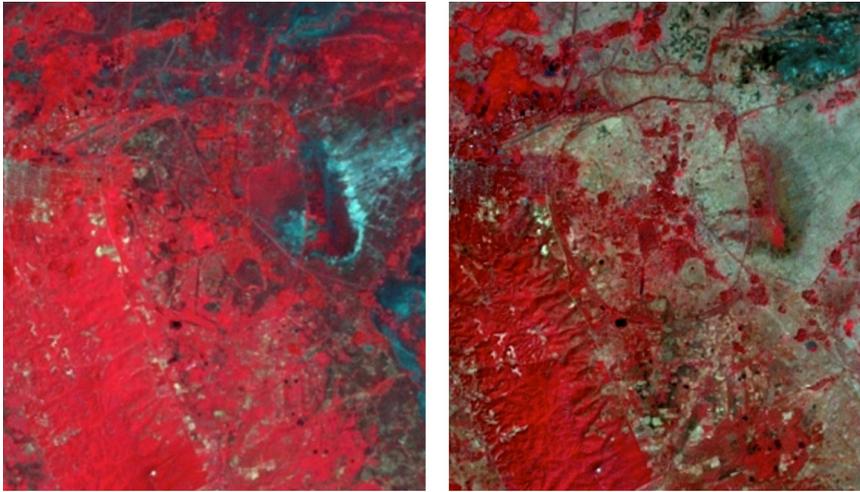


Figure 4. 4a (left), Satellite image showing the generally saturated environment at Sri Ksetra, September 2002; 4b (right), Satellite image showing differentiated wet and dry land at Sri Ksetra, January 2003 (© Gabriel Amable and Janice Stargardt)

and extended many times over the centuries thereafter during the long life of the city.²³

The burning of a wooden gate in one defile gateway in the East Wall at Beikthano has been radiocarbon dated to 210 ± 30 CE, and another to 325 ± 25 CE.²⁴ I date Phase 2 of the wall and moat-building at Sri Ksetra to the period from c. the first century BCE to the sixth century CE; Phase 3, to the sixth to eighth century; and Phase 4 to the ninth century. As Phases 1–3 were long continuous processes of experimental construction and reconstruction, these dates are not meant to represent sharply distinct phases. Fig 3, Phase 3 shows the maximum extent of both the brick fortifications and irrigation at Sri Ksetra, while Phase 4 is a short late phase of contraction of the water system and adjustments to the walls. All four phases and their chronological associations will be discussed further below.

Pyu funerary culture at Beikthano and Sri Ksetra: From prehistory to early urbanism

The first brick buildings

There is limited evidence that Beikthano was settled in a pre-urban, Iron Age phase. Inside what later became the fortified palace-citadel area, an exceptional concentration of late prehistoric potsherds was found during excavations ‘extending into the ground below the last course’ (lowest course of brick). This was first interpreted as

23 For a contrasting view of a shorter period of wall-building, see Bob Hudson, ‘A thousand years before Pagan: Radiocarbon dates and Myanmar’s ancient cities’, (3rd version), paper presented at Conference on Early Myanmar and its global connections, Pagan, Feb. 2012), and his map, fig. 21; <http://sydney.academia.edu/BobHudson> (last accessed 15 May 2014).

24 Ibid.

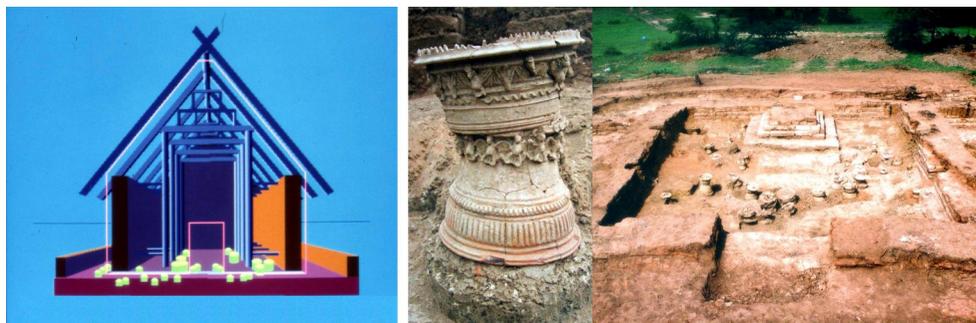


Figure 5. 5a (left), Wood-and-brick halls at Beikthano with multiple cremation burials in urns (elevation above 2m conjectural) (© Janice Stargardt and Gabriel Amable); 5b (right), Mainly brick monuments at Beikthano with multiple cremation burials in urns (© Archaeology Department of Myanmar)

infill,²⁵ but subsequently interpreted as ceramic debris from an unusually prosperous late prehistoric settlement on the site of the future palace-citadel (fig. 2, ceramic debris).²⁶

More abundant evidence on the development of economic and cultural complexity at Beikthano is provided by three huge pillared halls built of wood and brick (KKG9, 10 and 11). KKG9's external brick walls measured 25.2 m long x 14.7 m wide x 1.27 thick. The maximum height to the top of the gable roof is estimated at 10 m, and of the brick walls at 8 m (fig. 5a). The dimensions of KKG10 were not recorded as it was left only partly excavated in order to concentrate on KKG9, which partly covered it. KKG11's brick walls were similar to KKG9, at 26.4 m long by 14.4 m wide and c.1.27 thick, with a similar estimated maximum height. Each hall incorporated an immense volume of bricks, estimated at 805 cu. m each.

C14 dates based on two samples of young charred wood from KKG9 (side braces) were obtained in 1969. Calibrated, they extended from 196 BCE to 246 CE, and 105 BCE to 305 CE.²⁷ KKG10 was older than KKG9, with a similar structure and cultural content. Calibrated C14 samples from KKG11 were dated at 90 to 535 CE and 150 to 600 CE.²⁸ This spread of dates is frustrating, but they become more useful viewed with more recent AMS dating below.²⁹

The Beikthano wood-and-brick halls were built with a rectangular external wall of large bricks with a single entrance on the short axis. KKG9 and 10 were orientated north-south, while KKG11 faced east-west. The internal structure of each of these halls, identifiable only by significant cavities and charred remains, consisted originally of four pairs of wooden columns, each over 60 cm in diameter, with smaller wooden

25 Aung Thaw, *Report on the excavations at Beikthano* (Rangoon: Ministry of Union Culture, 1968), p. 9.

26 Stargardt, *The Ancient Pyu*, pp. 159–60.

27 *Ibid.*, p. 408, table 14; cf. Hudson, 'A thousand years', dates slightly recalculated in fig. 20 as 190 BCE–260 CE and 100 BCE–390 CE.

28 *Ibid.*, dates recalculated as 80–550 CE and 210–600 CE.

29 Hudson, 'A thousand years'.

side braces slotted into the brickwork about 1 m above the rammed earth floor.³⁰ The now largely absent interior elements in wood originally carried the considerable weight of the superstructure. Roof beams and roof must have been in wood and thatch, as no tiles were found. This accounts for the large volume of iron nails, hinges and brackets found in each hall.

Iron in Myanmar predated its prolific appearance in these early Pyu structures (first century BCE). It was found in *c.* fifth century BCE at the Iron Age site of Taungthaman, in the middle Ayeyarwadi Valley in crude form,³¹ and ‘prior to the 4th century BC’ at Ywa Htin in the Samon Valley.³² The origins of iron-working in Myanmar — indigenous development or imported technology — have yet to be clarified. In India it is much more ancient; in Thailand, it appears at a similar date to Myanmar (Higham, this vol.).

The three halls at Beikthano have a multiple significance: they preserve rare evidence of a period of technical transition: from the type of all-wooden pillared houses and halls central to vernacular Southeast Asian architecture, to the mainly brick monuments of early urbanism. They provide important insights into Pyu funerary culture, and they illuminate the levels of social and economic complexity reached at Beikthano. They incorporated an array of resources, ranging from large and small straight trees for the columns, beams and side-braces, to large quantities of iron artefacts, a variety of terracotta urns, to the huge volume of bricks. These resources must have been matched by the social skills to mobilise the raw materials and coordinate their production and use by the specialised builders and potters involved in these projects.³³ The halls also provide evidence of a powerful belief system in the elaborate provisions for the dead — who should be buried together, in what type of urn, in what location inside or outside each monument and excluding others from being added to each assemblage. The criteria given above for an urbanising society point to the significance of such features. They indicate the existence of such processes at Sri Ksetra and Beikthano over the broad period described by the radio-carbon dates.

KKG9 at Beikthano provides the earliest dates so far for bricks and brick construction in Southeast Asia as a whole.³⁴ The size of the bricks is also significant: $c.50 \times 25 \times 7.5$ cm (or a mathematical ratio of *c.*1: 0.5: 0.15). These dimensions are

30 Aung Thaw, *Excavations at Beikthano*; Stargardt, *The Ancient Pyu*, pp. 177–90, for details on the construction and use of these halls.

31 *Ibid.*, p. 29 (TL tests made at the Oxford Laboratory of Archaeological Science for me in 1988 on behalf of the Archaeology Department of Burma).

32 Jean-Pierre Pautreau et al., *Ywa Htin: Iron Age burials in the Samon Valley, Upper Burma* (Paris: Mission Archéologique Française au Myanmar, 2007), p. 89; Ni Ni Khet, ‘Les Objets en fer protohistoriques de Haute-Birmanie réalisation d’un corpus classement typologique approches morphologiques et technologiques Volumes I et II’ (Ph.D. diss., Université de Rennes I, 2008); Ni Ni Khet, ‘The study of iron artefacts from recent excavated prehistoric sites in Samon Valley and the innovative study of archaeometallurgical analysis of iron artefacts’, *Journal of the Myanmar Academy of Arts and Science* 8, 8 (2010): 279–97.

33 Janice Stargardt, ‘Urbanisation before Indianisation at Beikthano, Central Burma’, in *Southeast Asian Archaeology 1994: Proceedings of the Conference of the European Association of Southeast Asian Archeologists*, ed. Pierre-Yves Manguin (Hull: Centre for South-East Asian Studies, 1998), pp. 126–38.

34 See, however, dates of ceramics at ‘Pre-Dvaravati’ or ‘Dvaravati’ sites in Glover, ‘The Dvaravati gap’, esp. figs. 1 and 2; Saritpong Khunsong, Phasook Indrawooth and Surapol Natapintu, ‘Excavation of a

close, almost certainly not by chance, to the norms of the bricks of the Asokan period at Pataliputra which became a widely adopted standard in India from the mid-third century BCE, onwards. Bricks of this type were in use in the early Buddhist sites of the Deccan and Andhra from the late-third to early-second centuries BCE. The production of Asokan-type bricks at Beikthano and Sri Ksetra reflects technical contacts with India at some time in the period indicated by the C14 dates above. AMS dates presented below suggest the time spread to be c. the first century BCE to first century CE. Technical contacts with India are much clearer, earlier and easier to identify in this period than cultural.³⁵

In all three of Beikthano's pillared halls, the cultural contents were the same: only urns with calcined human bones, ash and earth. Large ones were grouped around pillar bases, small plain ones near doorways and along walls. All were then covered with earth and compacted, which simultaneously shattered the urns but held them in place.³⁶ The urns lend themselves to ranking in terms of size, decoration and location inside and outside the halls: forty at KKG9, about six only inside the hall at KKG10, including some of the finest, and thirteen at KKG11.³⁷ The presence of three similar halls at Beikthano, representing large material investments, indicates that funerary rituals already occupied a central position in Pyu culture in the transition from late prehistory to early urbanism.

Excavations at Sri Ksetra were resumed in 1992 and at Beikthano in 1995.³⁸ Work done from then until 2011 at both sites has confirmed the significance of early funerary assemblages by revealing many additional examples. Many of the terracotta burial urns excavated since 1995 were typologically related to those at KKG9, 10 and 11, but a minority were more elaborate, with appliqué and rouletted decorations not found previously at Beikthano or other Pyu sites (fig. 5b, inset). Terracotta urn assemblages were installed in still greater numbers in the mainly brick monuments described below.³⁹ The largest number found so far in a single monument of this type at Beikthano is 103.

The mainly brick monuments, e.g. BTO20, 28, 30, 31, 32, 33, and 34, with their remarkable urn assemblages, mark an architectural development from the three earlier, transitional wood-and-brick pillared halls. Figure 5b shows that the mainly-brick monuments of Beikthano were substantial, and also built with the very large bricks of the earliest Pyu brick structures. They sometimes comprised a main chamber surrounded by several smaller brick-built chambers. Monuments of this type still

pre-Dvāravatī site at Hor-Ek in ancient Nakhon Pathom', *Journal of the Siam Society* 99 (2011): 150–71; Murphy, this vol.

35 See Bérenice Bellina and Ian C. Glover, 'The archaeology of early contact with India and the Mediterranean world, from the fourth century BC to the fourth century AD', in *Southeast Asia: From prehistory to history*, ed. Ian C. Glover and Peter Bellwood (London: RoutledgeCurzon, 2004), pp. 68–88.

36 Aung Thaw, *Excavations at Beikthano*, pp. 20–21.

37 Ibid., pp. 20–22; Stargardt, *The Ancient Pyu*, pp. 177–90; Stargardt, 'Urbanisation', pp. 132–7.

38 By U Kyaw Oo Lwin, now Director-General, Department of Archaeology; the site prefix was changed from KKG to BTO. See U Kyaw Myo Win, 'Beikthano excavations history', Department of Archaeology, internal report; U Win Kyaing, 'Beikthano monuments inventory', Department of Archaeology internal report, 10 May 2013. Departmental officers excavating at Beikthano since 1995: U Kyaw Oo Lwin, U Thein Lwin, U Kyaw Myo Win, U Myo Lwin Kyaw, U Win Kyaing and U Than Zaw Oo.

39 Thein Lwin, 'Excavations at Beikthano', PowerPoint report, Nay Pyi Daw, Department of Archaeology and Museums, Ministry of Culture 2007, 2009–10, courtesy of U Thein Lwin, Deputy Director-General, Department of Archaeology.

contained some wooden elements. [Figure 5b](#) reveals two embrasures per wall and one in each of four corners, where much thinner, dressed wooden pillars originally stood embedded in the brick walls. Their purpose was probably to provide secure connections with the wooden roof beams, rather than to support their weight, as was the case in the wood-and-brick halls. They show that the Beikthano builders were now confident that the brick walls could support the roof without a central framework of great timber pillars occupying the interior space of the monument, but had not yet solved the problem of how to attach the wooden roof beams to the brick walls.

This evidence reveals how the mastery of brick-building techniques came slowly to Pyu craftsmen during the period from the last centuries BCE to the first centuries CE. The two phases of early brick monuments at Beikthano prove that the Pyu builders were familiar with the techniques of wooden architecture, but progressing in their control of a relatively new material — brick. BTO32, one of the mainly-brick structures with some of the most elaborate terracotta urns, has provided an AMS C14 date calibrated to 60–220 CE⁴⁰ ([fig. 5b](#) shows BTO20a, a similar monument and urn assemblage).⁴¹ Not only are the monuments of this type better dated by AMS than their predecessors, to a time between the mid-first and early third century CE, but they also clarify the wide spread of the C14 dates from the preceding phase of wood-and-brick halls, suggesting that *c.* first century BCE to early first century CE is probably the most relevant part of their development.

The cultural contents of the mainly brick monuments remained the same: cremated human remains, earth and ash in terracotta urns, without any Indic religious artefacts. These monuments of Beikthano confirm all the urbanising implications already identified, namely the existence of a complex, highly productive society and economy capable of major projects. While Indic religious artefacts are absent, Indic ceramic technology can be seen in the complicated appliquéd and rouletted designs on a minority of the funerary ceramics. Such artefacts provide glimpses of a society whose hierarchical differences were reflected in its arrangements for the dead.

Examples of wood-and-brick pillared halls with multiple cremated urn burials have also been found at Sri Ksetra; at sites numbered HMA9, 10, 11, 22, among others excavated in the 1960s and early 1970s for which I have not seen detailed reports.⁴² Some of their dimensions resemble their counterparts at Beikthano, *c.* 25 m by 14 m. Together with the better documented and dated wood-and-brick and mainly-brick halls at Beikthano, they form the earliest surviving monumental Pyu architecture.

In particular, these groups of buildings document stages of architectural development taking place in parallel at both sites from the second–first century BCE to the first–second century CE, from late prehistoric all-wood architecture to wood-and-brick, and then to mainly-brick ritual structures. The largest pillared hall of the wood-and-brick type was HL9 at Halin.⁴³ While Pyu monumental architecture

40 Hudson, ‘A thousand years’, [fig. 2](#).

41 Coordinates N20.019, E95.318, excavated by U Thein Lwin in 2003.

42 Data summaries in *Nomination dossier*, annexe IV.

43 Myint Aung, ‘The excavations at Halin’, *Journal of the Burma Research Society* 53, 2 (1970): 55–64, and Myint Aung, *Research on ancient Hanlin* (Rangoon: Private pub., 2010), [fig. 16](#). In Burmese with English summary, kindly presented by U Myint Aung.

underwent important transitions, their funerary contents reveal continuity of funerary culture and some technical developments in pottery decoration.

In spite of the evidence of technical influences from India in the use of brick of Asokan norms, ceramic techniques and possibly iron technology, none of these early monuments at Beikthano or Sri Ksetra reveals traces of Indic *religious* influences, unless the practice of cremation burial itself is judged to be one. As this is widely thought to be the case by Myanmar archaeologists, it requires careful consideration. Inhumation burials predominate at the Bronze and Iron Age sites of Myanmar: in the Samon Valley, at the Iron Age site of Taungthaman in the middle Ayeyarwadi Valley, and also in Stone Age levels at Halin in the Mu Valley.⁴⁴ They continue as a minority practice together with cremation burials in urns into the historic period at Halin. So far, only one inhumation burial has been reported in or near Sri Ksetra among thousands of cremated urn burials there,⁴⁵ and at Beikthano they are also rare. Out of an estimated total of over six hundred cremated urn burials excavated so far at Beikthano, only two primary inhumation burials and three secondary burials have been reported. Uncremated infant burials in terracotta urns were common in the Iron Age Ywa Htin cemetery in the Samon Valley.⁴⁶ Archaeological surveys in 1903–04, however, noted isolated prehistoric clusters of cremated urn burials ('Pyu sepulchres'),⁴⁷ in Yamethin district, Meiktila division 'two-and-a-half miles from the Nyaunglun Railway Station'.⁴⁸ Thus one can conclude that several different burial traditions coexisted in late prehistoric Myanmar.

Small numbers of monastic cremation burials in urns were found in stupa foundations at Nagarjunakonda in Andhra.⁴⁹ The practice of monastic cremation burials inside small stupa-shaped monuments continues up to the present in both Myanmar and Thailand, but these are always single burials or, rarely, of a few individuals. While the Pyu practice of cremated urn burial may possibly have been prompted or strengthened by early contact with Indic Buddhism, neither the urn types, nor the numbers forming the groups buried in and around a single Pyu monument, nor the monuments themselves bears any resemblance to those in early Buddhist India. These factors, taken together with the C14 dates from Beikthano obtained from two phases of funerary monuments without Indic artefacts, suggest that Pyu cremation and multiple urn burial predate their adoption of Buddhism. We shall see below, however, that the Pyu tradition of cremated urn burial continued, integrated into Buddhist traditions, from c. the middle to late first millennium CE. Examples of human burials have recently also been reported from early Buddhist sites in Thailand.⁵⁰

44 Pautreau et al., *Ywa Htin*, pp. 30–34; Myint Aung, 'The excavations at Halin', and *Research on ancient Hanlin*; Hudson, 'A thousand years', pp. 3–4.

45 U Win Kyaing, Principal of the Field School of Archaeology, Sri Ksetra, pers. comm., 2013.

46 Pautreau et al., *Ywa Htin*, pp. 30–34.

47 Probably originally buried inside late prehistoric all-wooden ritual structures.

48 *Report on archaeological work in Burma 1903–04* (Rangoon: Government Printing, 1904), p. 5.

49 A.H. Longhurst, *The Buddhist antiquities of Nāgārjunakoṇḍā, Madras Presidency*, Memoirs of the Archaeological Survey of India 54 (Delhi: Manager of Publications, 1938); Stargardt, *The Ancient Pyu*, pp. 203–4.

50 Pimchanok Pongkasetkan and Stephen A. Murphy, 'Transitions from late prehistoric to Dvaravati period funerary practices: New evidence from Dong Mae Nong Muang', in *Crossing borders: Selected papers from the 13th International Conference of the European Association of Southeast Asian Archaeologists*, vol. 1, ed. Mai Lin Tjoa-Bonatz, Andreas Reinecke and Dominik Bonatz (Singapore:

Multiple and sometimes massed cremation burials in urns are found in huge numbers at Beikthano and Sri Ksetra in both pre-Buddhist *and* Buddhist contexts. They were installed in groups inside the specifically funerary wood-and-brick, and mainly-brick halls at Beikthano and Sri Ksetra; many hundreds (occasionally thousands⁵¹) were installed in each of the stepped burial terraces at Sri Ksetra, examined below, and they also surrounded almost every stupa-shaped monument at both Beikthano and Sri Ksetra in significant numbers.⁵² Whether one accepts that cremation burial itself was a Pyu prehistoric practice that continued into urban contexts, or considers it might possibly originate with, or have been strengthened by, their early contacts with Buddhist India, it is clear that the way the Pyu practised it had no precedent in India. Grouped cremation burials were central to late first millennium BCE Pyu funerary culture, were carried forward into the historic era and integrated into the Pyu forms of Buddhism throughout the first millennium CE.

Burial terraces are a particular feature of funerary culture at Sri Ksetra, which have not, so far, been found at other Pyu sites. Nine were known prior to 2012, but surface surveys are finding many more, extending 10 km south of the city walls as far as Thegon, and north of the city walls for *c.* another 10 km.⁵³ Figures 3 (Phases 1–3), and 4b indicate that there were at least nine major burial terraces outside the southern city walls, adjacent to and south of the Bawbawgyi, Bebe and Lemyethna Buddhist monuments (including the complex at Beikthanomyo, or the ‘Queens’ cemetery’).⁵⁴ There is also a major burial terrace outside the northeast city walls, adjoining the Payama Stupa, and outside the northwest walls a royal burial terrace once adjoined the Payaygi Stupa.⁵⁵

These burial terraces possess affinities with the great pillared halls. They were constructed alone and in combination with other structures of brick, wood and rammed earth in large complexes known as *Pyu taiks* or *daiks*. The character of these other structures is not always identifiable, possibly for monastic or other undefined rituals, but the primary function of the burial terraces is clear: they contained hundreds or even thousands of cremated urn burials.⁵⁶ Terraces varied in size; some were relatively compact, measuring *c.*30 by 60 m, but some were surrounded by brick walls enclosing spaces almost as large as the central palace area (575 by 375 m).

Burial terraces were formed by placing terracotta urns, containing cremated human remains, ash and earth, in rows or groups on the natural surface, then covering them with compacted earth onto which further urns were deposited. These

NUS Press, 2012), pp. 75–89; Wesley Clarke, ‘The skeletons of Phong Tuek: Human remains in Dvaravati ritual contexts’, in Revire and Murphy, *Before Siam*, pp. 310–29; and Murphy, this vol.

51 Charles Duroiselle, *Archaeological survey of Burma, Annual Report of the Superintendent 1923–4* (Rangoon: Office of Government Printer, 1925), pp. 25–7, excavations at the Yahandakan village mound.

52 E.g., BTO5, a Beikthano stupa was surrounded by 73 urn burials, excavated by U Kyaw Oo Lwin in 1995–6; reported by U Kyaw Myo Win, and cited by U Win Kyaing.

53 U Win Kyaing, pers. comm., June 2013, Jan. 2015, Sri Ksetra; site visits by author Jan.–Feb. 2015. Burial terraces shown in figs. 3 (Phases 1–3), and 4b, are based on data from U Thein Lwin, U Win Kyaing, and the aerial and satellite imagery (Gabriel Amable and author).

54 U Thein Lwin, then Principal of the Field School of Archaeology, noted ‘complicated *Pyu Taiks* around the Queens’ cemetery’, pers. comm., Sri Ksetra, 2008.

55 The sites of HMA8, 14 and 52 near Payama Stupa, and the find-site of four royal stone urns at Payaygi Stupa, respectively.

56 Duroiselle, *Annual report 1923–4*, pp. 27–8; *Nomination dossier*, annexe IV.

Fig. 6 - Colour online, B/W in print



Figure 6. (Clockwise from top left), 6a, Buddhist clay sealings, c. 5th–6th century style found in burial terrace HMA47 at Sri Ksetra (© Archaeology Department of Myanmar [ADM]); 6b, Bull clay sealing, standing, with bells on collar and long-stemmed lotus [?] in mouth, found in burial terrace HMA47 at Sri Ksetra (© ADM); 6c, The largest stone burial urn, with royal genealogy, from Sri Ksetra 1992–93 (© ADM); 6d, Burial terrace HMA53 at Sri Ksetra with 350 massed urn burials; conserved without the brick pavement that originally covered at least part of the upper surface (© Janice Stargardt, 2013)

processes were continued to form a series of two, three, or rarely four, diminishing rectangles making a stepped terrace. The steps were sometimes faced with bricks, and the flat upper platforms were made either of unpaved rammed earth or covered with a solid surface (fig. 6d). A large terrace undoubtedly took a considerable time to complete. Two C14 dates are currently available for burial terraces at Sri Ksetra: HMA47 and 53, locations shown on fig. 3, Phase 2. Both dates belong to c. the mid-first millennium CE,⁵⁷ but the archaeological associations of these dates are unclear. The HMA47 carbon sample came from a large charred pillar with a diameter of c.30 cm. Thus one must consider the problem of old wood; the date from HMA53 is based on ash and carbon from the uppermost level of this burial terrace — datable materials from its lower levels have yet to be obtained. The very large burial terrace just inside the Yahanda Gate, excavated by Charles Duroiselle in 1923, contained no Indic

57 Hudson, 'A thousand years', fig. 20: HMA47, AMS date 420–570 CE and HMA53, 530–650 CE.

religious offerings among the thousand terracotta urns with cremated human remains which he lifted nor it seems, among the thousands he left in situ among scattered iron fragments.⁵⁸ This example raises the possibility that Sri Ksetra's burial terraces are pre-Buddhist in origin, and may belong — with the wood-and-brick, and mainly-brick halls of Sri Ksetra and Beikthano — to the oldest surviving phases of Pyu ritual architecture and funerary culture. Burial terraces at Sri Ksetra certainly have a very long history, as is visible in the area outside the southern walls of the city where some are so old that their traces on the satellite images are almost obliterated; later burial terraces and canals cut across and are built partly over earlier ones (cf. fig. 3, Phases 1, 2 and 3, and fig. 4b).

Archaeological surveys and excavations at Sri Ksetra in the 1920s, 1930s and 1960s noted abundant traces of nails and sometimes broken tiles on these burial terraces, thus indicating that, at least sometimes, they originally possessed a superstructure in wood, sometimes tiled, of which only the basal terraces often remain.⁵⁹ The affinities of the Sri Ksetra burial terraces with the wood-and-brick halls of Beikthano and Sri Ksetra, emerge more clearly from the fact that at least some of them had large wooden pillars and a roof.⁶⁰

Buddhist and Hindu artefacts do occur in some burial terraces, for instance, in the two dated terraces mentioned above: HMA53 is a three-stepped burial terrace containing at least 350 cremated burials⁶¹ grouped in terracotta urns of several types and sizes (fig. 6d). Buddhist clay sealings (votive tablets) and one mould were found in this terrace (location details unavailable).⁶² Burial terrace HMA47 contained Buddhist clay sealings dating stylistically to the fifth–sixth century CE (fig. 6a; location details unavailable). The stylistic dates seem to correlate quite well with the latter's AMS C14 dates of 420–570 CE, but the problems of old wood and association have been noted. HMA47 also contained a beautifully designed clay sealing depicting a standing bull in profile (fig. 6b).⁶³ No comparable artefact has been recorded from India or elsewhere in Southeast Asia.⁶⁴ The plaque is thus of great rarity: standing bulls appear on coins of Sri Lanka, and the Pandya and Pallava of South India, but never holding something in their mouths.⁶⁵ Recumbent bulls are more common as symbols on coins and sealings than standing ones, but there is one example of a standing bull from the Saivite Cave 29 at Ellora, dating from c. the early seventh century CE, wearing a collar with bells behind the hump, but not carrying anything in his mouth.⁶⁶

58 Duroiselle, *Annual report 1923–4*.

59 Duroiselle, *ibid.*, pp. 26–7; *Nomination dossier*, annexe IV, Sein Maung Oo, 1966–7 HMA8, and pers. comm., 2013.

60 Janice Stargardt, 'City of the wheel, city of the ancestors: Spatial symbolism in a Pyu royal city', *Indo-asiatische Zeitschrift* 6–7 (2002/03): 163–6, fig. 7.

61 As excavations have not reached the original ground level, the total number of burials is at present unknown; data courtesy of U Win Kyaing, Sri Ksetra, 2013.

62 *Nomination dossier*, annexe IV, Naing Win 2011–12, HMA53.

63 Courtesy of U Win Kyaing, 2014.

64 Joe Cribb, pers. comm., 26 Nov. 2014; Prof. Osmund Bopeararchchi, 27 Nov. 2014.

65 Cribb, *ibid.*

66 Photograph supplied by Prof. Bopeararchchi.

The context of this sealing has to be kept in mind: it was deposited among a Pyu funerary assemblage in which Buddhist offerings predominated, as they did in other localities of c. the mid-first millennium CE at Sri Ksetra discussed below. Many scholars have noted that Pyu silver coins and the numerous intaglio stone ring seals of this period found in and near Sri Ksetra bear Hindu motifs: conch, rising sun, *srivatsa*, wheel, trident, *vajra*.⁶⁷ More recently, the pool of sacred symbolism is seen as not strictly divided between Hindus and Buddhists, but rather as shared by them in the first millennium.⁶⁸ The Pyu had many contacts with Andhra where, for instance, the kings of Nagarjunakonda carried out great Vedic royal rituals like the *asvamedha* sacrifice, while their royal mothers, wives, sisters and daughters — and possibly they themselves — were generous patrons of Buddhism. Among the Pyu, the presence of this possibly Saivite bull symbol among early Buddhist sealings suggests the existence of an holistic tradition in which the Hindu gods were worshipped as protectors of the Buddha. Such holistic approaches are further indicated by the merging of Indic religious symbols with the indigenous Pyu rituals of groups of cremated urn burials.

These two dated burial terraces of Sri Ksetra, in spite of the problems of the associations of their AMS dates, represent a very important cultural benchmark. They document the merging of the Pyu tradition of massed cremation burials with religious devotions of Indic inspiration. Both terraces provide approximate objective dates indicating that around the mid-first millennium CE, such devotions existed *on a popular level* at Sri Ksetra, in contrast to the approximately contemporary treasures of the Khin Ba relic chamber, which was an elite (probably royal) foundation.⁶⁹ These two burial terraces at Sri Ksetra show that religions of Indic inspiration had become widespread among the population of Sri Ksetra, but without effacing their pre-existing funerary traditions. Further research on the burial terraces and *Pyu taiks* of Sri Ksetra is needed to provide more evidence on the stages and dates of such significant changes in Pyu funerary culture, and its fusion with Indic religious devotions. A small number of stone Visnu statues have also been found at Sri Ksetra (now in the Hmawza site museum), but they appear to belong to the second half of the first millennium.

67 Mahlo, *Coins of Myanmar*; Sheila Hoey Middleton, *Intaglios, cameos, rings and related objects from Burma and Java: The White Collection and a further small private collection*, British Archaeological Reports, International Series 1405 (Oxford: Archaeopress, 2005), p. 9; Than Htun (Dedaye), *Auspicious symbols*.

68 See Revire, this vol., for a comprehensive reassessment of the validity of sectarian attributions; also the papers presented by Joe Cribb, Wannaporn Rienjang (organiser), Kurt Behrendt, Elizabeth Errington, Pia Brancaccio, Robert Bracey and Janice Stargardt at the *Symposium on the Bimaran Reliquary*, Ancient India and Iran Trust, Cambridge, 11–12 Sept. 2015.

69 Charles Duroiselle, 'Excavations at Hmawza', *Archaeological Survey of India, Annual Report 1926–7*, pp. 171–83, pl. 42; Nihar-Ranjan Ray, 'Early traces of Buddhism in Burma', *Journal of the Greater India Society* 6 (1939): 47–9; Luce, *Phases of pre-Pagan Burma*, vol. 1, pp. 48–9; vol. 2, pls. 28–34; 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 Prof. J.G. de Casparis*, ed. Marijke Klokke and Karel van Kooij (Groningen: Egbert Forsten, 2001), pp. 487–517; U Thein Lwin, U Win Kyaing and Janice Stargardt, 'The Pyu civilization of Myanmar and the city of Sri Ksetra', in *Lost kingdoms: Hindu-Buddhist sculpture of Southeast Asia*, ed. John Guy (New York: Metropolitan Museum of Art; New Haven: Yale University Press, 2014), pp. 63–8; Janice Stargardt, 'The great silver reliquary of Sri Ksetra; where early Buddhist iconography and epigraphy meet', in *Relics and relic worship in the early Buddhism of India and Burma*, ed. Janice Stargardt (forthcoming).

The stone burial urns of Sri Ksetra: The Vikramas

Another important elaboration of Pyu funerary urn culture — this time for the elite — took place at Sri Ksetra around the middle of the first millennium, with the creation of large urns formed out of a stone block, externally shaped into a soberly decorated cylindrical stone jar with flat base (fig. 6c). A recessed flange was carefully carved around the upper edge, over which a flat circular stone lid was fitted. The interior was hollowed out to form a cylindrical interior space. Four such stone urns were found and excavated in 1912 in the old burial terrace already listed, 70 m south of the Payagyi Stupa, outside the northwest walls of the city. They are between 75 cm and 1 m high, with a circumference of about 1.5 m and carry a one-line inscription mainly in Pyu. One has a longer inscription on its base.⁷⁰ A single urn (the largest so far), was found in 1992–93 inside the city walls to the east of the palace.⁷¹ The inscriptions on all these five urns at Sri Ksetra show, from the names of Sanskrit origin assimilated into the Pyu language, that they were for royal burials.

The inscribed stone urns of Sri Ksetra open up areas for epigraphic and historical research which lie beyond the scope of this article. It is, however, of great significance to the themes treated here to note that these urn inscriptions afford the first direct evidence of people who styled themselves kings, using Indic names and titles with an historic resonance in their contemporary world. They may have been the rulers and patrons of many early Buddhist works at Sri Ksetra in the same period — the fifth–sixth century CE — including the elite Khin Ba relic chamber. They enjoyed sufficient wealth to command the production of these huge stone urns to preserve their cremated remains, and to commission the expert scribes who preserved their names and some key dates.

Distinguished work has been done on these Pyu stone-urn inscriptions,⁷² but it has not previously been noted that on all five urns — and especially the last — the palaeography was highly developed. The inscriptions were expertly carved into hard stone surfaces, showing great regularity and elegance of letter sizes, and exactly even spacing between letters and lines (fig. 6c). They represent, not the beginning of Pyu literacy — as has repeatedly been stated — but rather a developed stage of it in their own language, datable on palaeographical style to c. the fifth or sixth centuries.⁷³

70 *Archaeological survey of Burma: Annual report of the Superintendent* (Rangoon: Government Printing Office, 1912), pp. 7, 11–12; Luce, *Phases of pre-Pagan Burma*, vol. 1, pp. 44–5; vol. 2, pls. 5–8, for royal urns except the last.

71 By U Kyaw Oo Lwin.

72 C.O. Blagden, ‘The “Pyu” inscriptions’, *Epigraphia Indica* 12 (1913–14), repr. *Journal of the Burma Research Society* 7, 1 (1917): 37–44; Robert Shaffer, ‘Further analysis of the “Pyu” inscriptions’, *Harvard Journal of Asiatic Studies* 7, 4 (1942–3): 313–66; Tha Myat, *A Pyu reader* (in Burmese) (Rangoon: National Printing Works, 1963); Luce, *Phases of pre-Pagan Burma* (vol. 2) chart M, ‘Tircul (Pyu) Inscriptions’; San Win, ‘Dating the Phaya Htaung’, *Indo-asiatische Zeitschrift* 4/5 (2000–01): 120–25; Tun Aung Chain, ‘The kings of the Hpyahtaung Urn inscription’, *Myanmar Historical Research Journal* 2 (2003): 1–14, repr. in *Selected writings of Tun Aung Chain* (Yangon: Myanmar Historical Commission, 2004), pp. 18–32. A new phase of research began in late 2014 directed by Nathan Hill, in association with the present author, under the ERC Project 609823: ‘Beyond boundaries: Religion, region, language and the state’ (first P.I. Dr Michael Willis).

73 San Win, ‘Dating the Phaya Htaung’: 123, fourth–fifth century; Ingo Strauch, fifth–sixth century, pers. comm., Cambridge, Mar. 2014.

The largest stone urn⁷⁴ (fig. 6c), has a circumference of over 2 m. It was found embedded in the centre of a brick-built stupa near the Hpayahaung temple. Its beautifully carved five-line inscription in Pyu contains 1,127 letters of which 1,050 are still clearly legible.⁷⁵ There are Sanskrit royal names, other titles,⁷⁶ and some Pyu numbers. Among the six names, four end in *-Vikrama Vam*,⁷⁷ an epithet meaning the valiant or heroic. Three were already known from the urns inscribed with a single line, but this inscription may establish their place in a genealogical sequence.⁷⁸ A fifth–sixth century dating hypothesis finds some support in the palaeographic style.⁷⁹ All five urn inscriptions, though at present not fully understood,⁸⁰ have the potential to provide the earliest written information to date on a dynasty in Sri Ksetra c. fourth–sixth century. It is relevant too, to the theme of this article, that the *Vikrama* kings at Sri Ksetra, with their Indianised names or titles nonetheless adhered to Pyu traditions of cremation and burial in urns associated with Buddhist monuments.

Early urban features at Sri Ksetra — iron, walls and water

Iron

At Sri Ksetra, the earliest C14 dates currently available are associated with a large iron-working locality called Tabet-ywa 120 m northwest of the future palace area, c.2 m deep and covering an area of c.1.4 ha (fig. 3).⁸¹ Carbonised fragments of slag, from a low level in the heap, have provided a calibrated AMS date of 50–200 CE.⁸² Again, this spread of dates is wide, but it does point to proto-urban or early urban levels of complex socioeconomic activities at Sri Ksetra by c.first–second century CE. They also agree with the AMS dates for the mainly-brick monuments with multiple urn burials at Beikthano. Current research has revealed abundant evidence of a high volume of iron-working in and around Sri Ksetra, including along the crest of the Myinbahu Range. Nearby, many accessible ore seams have also been identified and so far 84 single-use iron furnaces have been plotted⁸³ where ore was heated to a temperature adequate to make sponge iron, then possibly cold-hammered and forged into specialised artefacts.⁸⁴

74 *Nomination dossier*, annexe IV; Kyaw Oo Lwin 1992–3, HMA 31; San Win, ‘Dating the Phaya Htaung’; Tun Aung Chain, ‘The kings of the Hpayahaung Urn inscription’.

75 San Win, ‘Dating the Phaya Htaung’: 120.

76 Tun Aung Chain, ‘The kings of the Hpayahaung Urn inscription’: 20–21.

77 This epithet is not a common suffix among royal dynasties of India and Southeast Asia of the first millennium CE, contrary to the view expressed in: *Buddhist art of Myanmar*, ed. Sylvia Fraser-Lu and Donald M. Stadtner (New York and New Haven: Asia Society and Yale University Press, 2015), though that appears to have been its function here. *-Varman* was widely used in India, Burma and Cambodia as a royal suffix c. the mid-first millennium CE; but Chandragupta II was styled *Vikramaditya*.

78 San Win argues for a Gupta connection in ‘Dating the Phaya Htaung’: 123.

79 Tha Myat, *A Pyu reader*, pp. 16–17, gives two other examples of ‘Gupta-Pyu’ from Sri Ksetra which he dates to the fifth century.

80 San Win, ‘Dating the Phaya Htaung’: 120; there is not, as yet, consensus about the exact meaning of the numbers after names, or the era to which the numbers refer.

81 *Nomination dossier*, annexe IV, SL08, and author’s field visit, Oct. 2014, with U Win Kyaing.

82 Sampled by Hudson and dates provided in, ‘A thousand years’, p. 6.

83 U Win Kyaing and Dr Than Htike, then head of the iron furnaces project, Sri Ksetra Field School of Archaeology, pers. comms., 2013; *Nomination dossier*, annexe IV, SL 07, SL 11.

84 Dr Ni Ni Khet, pers. comm., Sri Ksetra, 2013.

The Pyu use of iron suggests that it possessed more than utilitarian values for them: huge iron spikes, c.75–100 cm long, have been exposed in gateways and were driven into the earth near the corners of brick structures (e.g. the southwest corner of the palace walls). They have been found scattered over the burial terraces and on the slopes of the Myinbahu Range among the remains of small stupas with multiple cremated urn burials.⁸⁵ In all these cases, they appear to assure defence against supernatural as well as human enemies.

Walls and water at Sri Ksetra

It was suggested above that the brick walls at Beikthano and Sri Ksetra represent a long, cumulative activity of building and rebuilding, starting around the first century BCE, extending over many centuries and consuming huge volumes of fired bricks. In many respects, the study of the walls⁸⁶ is also the study of the evolving urban character of these two sites. Furthermore, I propose that wall-building and rebuilding was one part of a dual process whose other part consisted of the construction, repair and extension of combined water storage and irrigation works, and that the exigencies of water control originally determined the course of the walls. Later modifications included a degree of cosmological symbolism.⁸⁷ The cumulative nature of wall-building is demonstrated by changes in dimensions, alignments and materials.⁸⁸ At Sri Ksetra it is particularly clear that the outer city walls and walls around burial terraces⁸⁹ and the palace area were linked with water movements along canals and moats.⁹⁰

The outer walls of the Pyu cities enclosed vast spaces: at Sri Ksetra c.1,847 ha, at Beikthano c.900 ha and at Halin c.500 ha, and at all three sites there were extensive extramural developments as well. These facts alone make it probable that the walls resulted from protracted building works. The outer walls at Sri Ksetra are particularly impressive; parts of the brick western wall, vital in protecting the city from the powerful floodwaters, still stand to a height of 4 to 6 m in places and vary in thickness between 2 and over 5 m. This brick wall was duplicated by at least one outer earthen wall at some date to strengthen resistance to the water running downslope from the Myinbahu Range.⁹¹ Variations in wall height, thickness, duplication and even triplication⁹² are also evidence of long processes of construction and repair. The v-shaped bottom of the brick-lined moat between the two western walls was 5.1 m below the

85 Luce, *Phases of pre-Pagan Burma*, vol. 2, pl. 9, d, e, f; *Nomination dossier, annexe IV*, SA 26 and SA 30.

86 See Elizabeth Moore, *Early landscapes of Myanmar* (Bangkok: River Books, 2007), pp. 129–227, on walls at early Pyu and Mon sites.

87 Stargardt, 'City of the wheel, city of the ancestors'.

88 At Beikthano, parts of the North Wall and all of the East Wall were built, firstly of clay ramparts and secondly of brick on top of the clay (2.5 m high), coordinates N20° 164 E95° 371; see also [fig. 2](#) here and for Sri Ksetra [fig. 3](#) here, Phases 1–4.

89 Duroiselle, *Annual report 1923–4*, trench and walls along the Queens' cemetery.

90 Stargardt, *The Ancient Pyu*, pl. 11, fig. 14; Stargardt et al., 'Irrigation is forever', pp. 251–3 and figs. 11.3–4; [fig. 3](#) here, especially Phases 2 and 3.

91 *Nomination dossier*, annexe IV, U Myint Aung 1963–4, HMA4; U Thein Lwin, excavations across the western walls and moat at N18°49'/E95°16', pers. comm., Sri Ksetra, 2007–8; U Kyaw Myo Win's excavations at the Lulinkyaw gate, Jan. 2015.

92 See [fig. 3](#), Phase 3 for duplication along the western walls and triplication in the southeast corner of city; [fig. 7a](#) for close-up satellite image of this triplication.

present ground level.⁹³ This moat followed the walls for at least 8 km⁹⁴ and continued around the city, possibly without brick linings for at least 27 km, not counting the duplications and triplications. The brick facings and moat depth show that the western side had to be strengthened to resist the powerful seasonal flows (fig. 4a).

Colonial studies of traditional irrigation in Myanmar were impressed by their technology, noting the way farmers allowed water to indicate where it could flow and then both followed and directed that flow through their canals and walls or embankments; they also noted the skill shown in reducing the erosive forces of water by conducting it along curving routes.⁹⁵ Both these techniques were employed effectively in Sri Ksetra's water-and-wall-building system. The first brick walls, running along the 63–0 m contour on the southwestern and western sides of Sri Ksetra, were probably in part as old as other Pyu experiments with brick, c. first century BCE to first–second century CE (fig. 3, Phase 2). Like the Phase 1 trench and earthen rampart, they traced a curved alignment, and were hence better able to withstand the water pressures than a straight surface at right angles to the direction of flow, and also to reduce water erosion more effectively.

The western walls of Sri Ksetra and the western moat were then gradually extended downslope towards the northeast, following a generally curving route until they reached the 33 m amsl contour on the northern side. There they encountered the second prevailing slope from the northeast, which obliged the builders to curve both walls and moats towards the east and southeast, exploiting slight downward slopes from 34–33 m amsl near the northern corner to 32–31 m amsl at the northeast corner of the site. Just around that corner, the great walls stopped, because the water flowed unguided southwards into the lowest level of the site, the depression occupied by the great East Tank (fig. 3, Phases 2 and 3, figs. 4a and 4b). A shorter movement of water has been traced from the southwestern corner of the site, where water entering the moats flowed along a curved but shorter route downslope along the southeastern edge of the city and into the East Tank. We shall see below, how the heavy water pressures along this shorter route necessitated the construction of additional channels for water control and harvest (cf. fig. 7a). From Phase 2 to Phase 3 the East Tank filled the gap between the northeast and southeast walled corners of the site at c.31 m amsl. It too provides further evidence of the protracted, linked nature of wall, moat and tank building at Sri Ksetra. The East Tank also released water seasonally into the irrigated, low-lying fields towards the southeast and south of the city. Thus the alignments of the walls and the shape of the walled city were determined by the water in the moats of Sri Ksetra, which flowed mainly in a circular manner, reflecting with great accuracy the several slopes acting on it.⁹⁶

93 Established by the excavations of U Kyaw Myo Win.

94 *Nomination dossier*, annexe IV, SL10, Hydrological engineering; *ibid.*, surface and satellite surveys of Gabriel Amable and present author.

95 B.M. Samuelson, *Descriptive account of irrigation works — canal and tank systems — in Burma* (Calcutta: India Office Library and Records, Irrigation Dept., 1914); J.A. Stewart, 'Kyaukse irrigation: A sidelight on Burmese history', *Journal of the Burma Research Society* 11, I (1921): 1–4; Ralph Neild, H.F. Searle and J.A. Stewart, *Burma Gazetteer, Kyaukse District, vol. A* (Rangoon: Government Printing and Stationery, 1925), pp. 43–85.

96 Stargardt, 'City of the wheel', pp. 155–65 and fig. 7.



Fig. 7 - Colour online, B/W in print

Figure 7. 7a, Satellite image of the southeastern wall, gateway, moats and Mathegya Stupa at Sri Ksetra (Google image annotated by Janice Stargardt); 7b, Mathegya Stupa, fifth- sixth century. (© Janice Stargardt)

The first slope, from west/southwest to east/northeast was the most difficult because of the average difference of *c.* 80 m in height between the crest of the Myinbahu Range and the western edge of the city only *c.*2.3 km away, and then a further *c.*33–32 m

difference in height between the western edge of the city and the East Tank only 3 or 4 km distant. There was also the problem of the highly seasonal character of the water pressures (figs. 4a and 4b), which meant that from June to early November the water had to be conducted either right around the city into the East Tank to control its huge force and prevent erosion, or more directly into the East Tank from the southwest corner of the city; from early November until the rains began again in the following June, it could be admitted into the city, and allowed to flow towards the palace area. Thence it flowed either directly or indirectly into the East Tank, bringing water to most areas inside the city walls en route (fig. 3, Phase 3). There was thus a seasonal pulsation to the controlled direction of water flows: around the city from June to November and through the city November to June, fragments of which can still be seen functioning at ground-level and even more clearly from satellite imagery.

Until c. the eighth century, constant repairs led to improvements and, in places, to the duplications and even triplications in the moat-wall system just described (fig. 3, Phases 2 and 3, figs. 4b and 7a). The eastern side of Sri Ksetra where the great East Tank once lay is today still called *pinle* (the sea) by local inhabitants, despite the fact that the modern ground level has been extensively raised and recontoured by the modern Irrigation Department and no traces of the ancient irrigation tank can now be seen from the surface. Under the surface, however, it is still collecting water and affecting the harvests growing above.⁹⁷

The elaborate Pyu gateways probably developed between the first to second century CE onwards, as also indicated by the C14 dates on Sri Ksetra's and Beikthano's gateways.⁹⁸

Later wall- and moat-building at Sri Ksetra can be seen around the elegant stupa known as Mathegya or Gwebindet, c. sixth century CE (fig. 3, Phase 2, fig. 7). As fig. 7a, b shows, Mathegya stands today on a high mound which is a remnant of the ancient ground level at the time of its construction; Mathegya was left in place when an additional southeastern moat was excavated around it.⁹⁹ Still other walls and moats in this area carefully skirted around this substantial monument and must therefore have been built during or after c. sixth century to provide increased water harvesting and control in this corner of Sri Ksetra.¹⁰⁰ Figure 7a shows the cropmarks of two moats continuing northwards into the sediments of the former great East Tank; it also shows a defile gateway and the southern end of the East Wall, considered below.

In the east of the city there was another major change in the outer walls and hydraulic works at Sri Ksetra. That was the construction of a low, poor quality East Wall along the east side of the site, now often barely visible at ground level but clearly marked by a line of vegetation from the air (fig. 3, Phase 4; fig. 4b and fig. 7a). Since it was first mapped,¹⁰¹ the differences in quality and alignment of this wall

97 Figure 4b here, and Stargardt et al., 'Irrigation is forever'.

98 Hudson, 'A thousand years'.

99 Confirmed by surface survey, U Win Kyaing with the present author, June 2013; the status of the additional walls in this area — whether earthen or brick — has yet to be determined by excavation.

100 This was a particularly sensitive area where water was conducted along a curving but shorter route from the southwest into the East Tank. Fifteen urn burials surrounded this stupa.

101 Stargardt, 'City of the wheel', fig. 1, map of Sri Ksetra by the Archaeological Survey of Burma, compiled 1909–20.

have been a subject of discussion. Contrasting views continue.¹⁰² Hudson thinks it is one of the oldest parts of the Sri Ksetra fortifications, while I consider it to be the last, hastily built during a known dry phase in Southeast Asia (eighth to fourteenth century), when the East Tank apparently no longer received enough water to fill the gap between the massive walls on the northeast and southeast corners of the city.¹⁰³ The city must no longer have possessed the resources to build an East Wall to the same standards as the other walls. If the East Wall had existed in the early history of the city, it would have interfered with the operation of the great East Tank as collection and redistribution centre for the Sri Ksetra hydraulic system as a whole (fig. 3, Phases 2 and 3 and fig. 4b); secondly, if it had enclosed the eastern edge of the city throughout most of its long history, it would surely have been rebuilt to the same high standards as the rest of the outer walls?

Conclusion

Transitions from Late Iron Age to early urbanism

What insights do all these materials provide about the transition from pre- and proto-history to history at Sri Ksetra and Beikthano? In fact the two cities provide complementary evidence. Beikthano has provided a small but significant body of C14 dates based on charred remains in wood-and-brick and mainly brick monumental structures, containing large numbers of cremation burials in terracotta urns and no Indic religious materials. The problems of the wide spread of the calibrated C14 dates from the wood-and-brick halls are evident, but combined with the better-dated mainly brick monuments, a persuasive pattern of evidence emerges. It shows that between the first century BCE and the first century CE, Pyu society at Beikthano was economically complex and socially capable of carrying out large-scale construction projects for indigenous funerary rituals, involving several kinds of specialised production. The ways in which urns were grouped in and around the monuments, and the differences among them in size and decoration, indicate hierarchies among the living in Beikthano society, perpetuated among the dead.

At this time, the Pyu enjoyed technical contacts with India, as shown by the brick sizes, and pottery techniques, among others, but there is no evidence of Indic religious influence. The AMS dates show that mass brick production to a significant format went on at Beikthano in the first century BCE, and prolific iron production at Sri Ksetra in the first century CE. This was the period of significant transition at two proto-urban and early urban settlements growing continuously in scale and solidity of materials within particular spaces. The linked processes of wall-building and water control were created by communities with a mastery of other skills in iron-working, brick-making and ceramics, surrounded and supported by irrigated agriculture.

102 Hudson, 'A thousand years', fig. 21; Bob Hudson and Terry Lustig, 'Communities of the past: A new view of the old walls and hydraulic system at Sriksetra, Myanmar', *Journal of Southeast Asian Studies* 39, 3 (2008): 269–96.

103 Brendan Buckley et al., 'Climate as a contributing factor in the demise of Angkor, Cambodia', *Proceedings of the National Academy of Science* 107, 15 (2010): 7748–52; Janice Stargardt, 'Irrigation in South Thailand as a coping strategy against climate change: Past and present', in *Environment and climate change in South and Southeast Asia: How are local cultures coping?*, ed. Barbara Schuler (Leiden: Brill, 2014), pp. 105–37.

Problems remain concerning the AMS dates belonging to *c.* the mid-fifth to seventh centuries from the two burial terraces at Sri Ksetra. Data are not available on where the Buddhist sealings were found in the HMA53 terrace. Similarly, at HMA47, data are not available on where the Indic-style clay sealings were found among the multiple cremation urns of this burial terrace. AMS dates more clearly associated with early Buddhism at Sri Ksetra in the early fifth century became available in mid-2015.¹⁰⁴ At Beikthano at present, there is only stylistic and palaeographic evidence to date its Buddhist culture from *c.* the third or fourth century CE onwards. A programme of further dating of the extensive urn fields surrounding stupas at Beikthano is needed to explore and date the relations between Buddhism and Pyu funerary practice there.

Excavations and surveys at Sri Ksetra and Beikthano do, however, provide secure material evidence of the existence of two complex ancient societies, comprising farmers and irrigators, brick-makers and builders, potters, iron-miners and blacksmiths, stone masons and carvers, gold- and silversmiths, artists and architects, monks, scribes, scholars, administrators and rulers. What makes these two sites truly remarkable, in the contexts of the transition from prehistory to early historic archaeology in India and Southeast Asia, are their exceptionally well-defined urban spaces with persuasive evidence of continuous settlement over more than a millennium, in which distinct phases of technical development and cultural change have been traced.

Taking the dated evidence of Beikthano and Sri Ksetra together, the material traces of a highly complex Pyu funerary culture predate, by a considerable period, the traces of Buddhist and Hindu culture in Pyu monuments and art. But it is not certain how big this apparent gap really is, because of the fact that the processes of cultural contact with Indic (including Sinhalese) cultures would have taken place well before their surviving datable material traces. The evidence presented here leaves little doubt that Pyu society at Sri Ksetra and Beikthano had attained considerable levels of complexity by the first to second century CE. By the fourth and fifth centuries at Sri Ksetra, there were educated resident monks (some of whom were certainly Pyu), widely versed in a range of canonical Pali Buddhist texts, rulers with Sanskrit names or titles who disposed of the resources to endow major Buddhist works, supported by wider sections of the population who, by *c.* the mid-millennium had integrated Indic religions into their funerary culture. In those processes of change, the agency of already complex, urbanising Southeast Asian communities was of primary importance. Evidence of this is revealed both by presence and absence: in the presence of highly selective, creative assimilations of Indic influences, and by the striking absence of Indic prototypes with Southeast Asian copies. Cultural changes of this kind everywhere in Southeast Asia involved creative processes, leading to recognisably new artistic and architectural styles, new achievements in writing, literature and, as identified here among the Pyu, in the ways they understood and practised religions of Indic origin.

104 Stargardt et al., 'Early urban archaeology'.