# CHANGE IN THE LANDSCAPE OF FIRST MILLENIUM AD MYANMAR

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'The pond disappears when the water is gone'

## MAN AND THE ENVIRONMENT

Environmental change was as much part of the ancient landscape as it is of the present. The landscape, however, is often described as a static 'other' beneath our feet rather than the world which is all around us.[2] In cataloging the rivers and streams where sites and artefacts of first millennium AD Myanmar are located, we draw attention in this paper to the constant alteration to both built and natural elements. Our understanding of these sites and the cultures from which they emerged is distorted, for by and large only a small portion of the country's river system has been systematically surveyed. Nonetheless, eloquent testimony of human response to environmental inconstancy remains in most regions of Myanmar.

Traces of this relationship can be seen in the 'archaeological scars' which are part of today's landscape.[3] Aung Myint, who coined this term, likened it to the process of scar tissue forming over to a deep cut when large quantities of soil are displaced adjacent to natural and manmade features such as *in-gyi* or seasonal lakes and walls made of earth, laterite and brick.[4] We refer often to such features, but also to smaller signs, from stone implements to terracotta urns and tiles. After an overview of the multiple water networks along which sites and artefacts have been recorded, we detail a range of changes, beginning in Lower Myanmar and ending at Tagaung. We devote the final section of the paper to this site, to highlight the use of the natural setting as well as the fresh scope offered by artefacts for understanding patterns of interaction during the first millennium AD.

## ARCHAEOLOGICAL EXPLORATION

Much of the Myanmar landmass drains into the Ayeyarwaddy basin. The Ayeyarwaddy and tributaries and other river systems have in most cases formed north-south valleys between similarly oriented ranges.[5] Archaeological exploration, however, has focused on a few major sites along the Middle Ayeyarwaddy recorded in traditional chronicles.

We map out not one, but fifteen valleys where first millennium AD artefacts have been recorded. We show boundaries of these on the accompanying map but in reality, the rivers, valleys and the peoples that occupied them all changed. The ecologies differ greatly, from the high rainfall of the southern coast to the arid central plains. Walls mark certain locales where peoples settled but at others it is only an accumulation of artefacts near a current village that identifies them as 'ancient sites'. Although diverse, all are keyed off a body of water, be it a river (*myit*), stream (*chaung*), seasonal lake or pond (*in-gyi*). As we pointed out above, this simple description does not imply constancy. Quite the contrary, as water bodies fluctuated radically from rainy to dry months, shifting within the confines of the local topography. Man's impact on these features likewise varied in relation the many different groups

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[1] A summary of the Table at the end of this paper was originally presented at the Burma Studies Conference, Singapore, July 2006 by T. Tan. Elizabeth Moore is with the Department of Art and Archaeology, SOAS, University of London; em4@soas.ac.uk. U Win Maung (Tampawaddy) is a traditional architect, Tampawaddy, Myanmar. The authors would like to thank the anonymous referees for their useful comments and suggestions.

[2] Gell 1998: 17; Ingold 1995:40

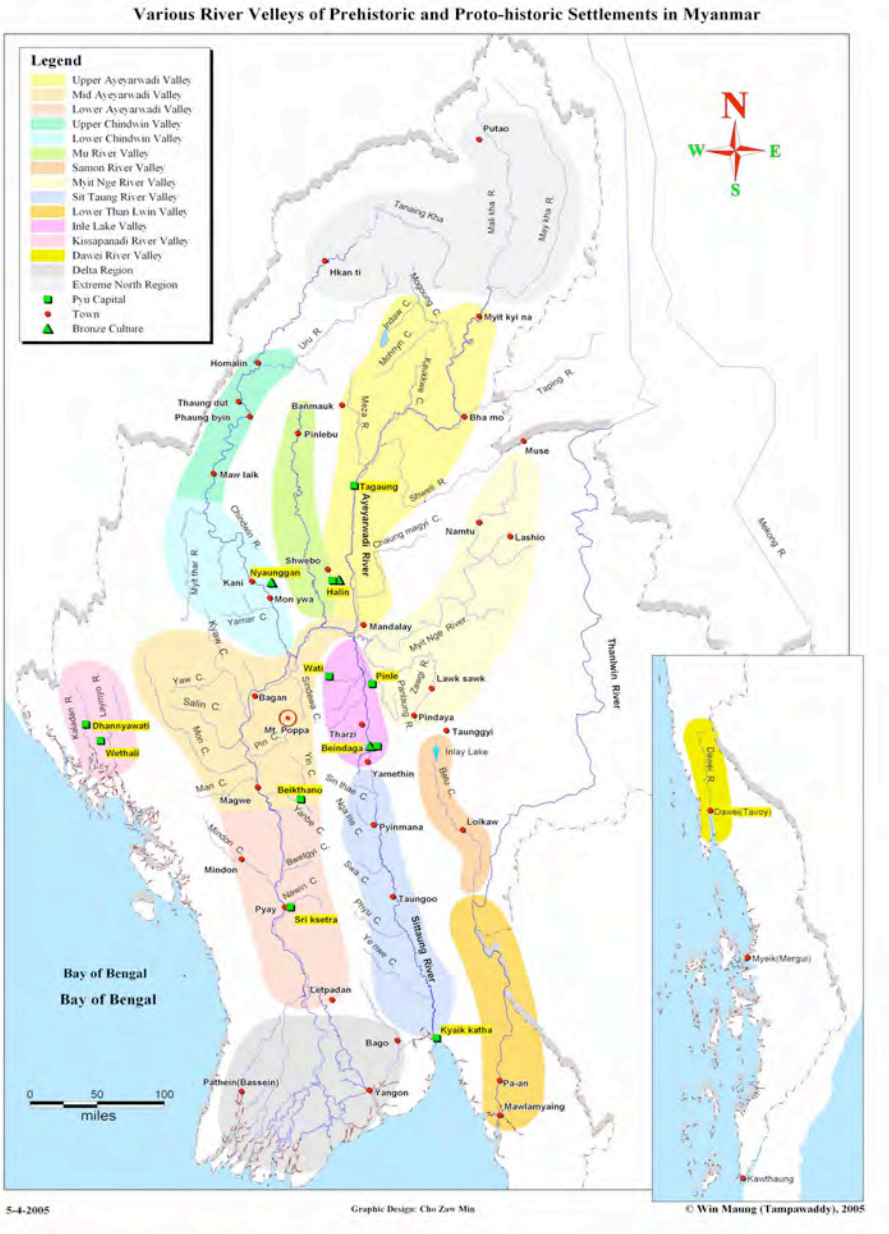
[3] Moore and Aung Myint 1991, 1993

[4] Aung Myint 1998, Moore and Aung Myint 1991, 1993

[5] One notable exception, and thus absent in our profile, is the Upper Thanlwin (Salween) where swift and deep gorges have cut into the Shan Plateau but no valley has formed.

moving across and settling in the valley regions. Thus the valley landscapes were fluid, defined conceptually and physically in relation to a host of changes, natural elements and population changes, many of which continue today.

Fig. 1 Map 1 Valley Civilizations of Myanmar




| Valley region | Degrees (n) x (e) |
|---|---|
| Upper Ayeyarwaddy | 22-28 x 96-98 |
| Middle Ayeyarwaddy | 20-22 x 94-97 |
| Lower Ayeyarwaddy | 16-20 x 94-97 |
| Upper Chindwin | 23-26 x 94-95 |
| Lower Chindwin | 21-23 x 94-95 |
| Mu | 22-24 x 95-96 |
| Samon | 19-22 x 95-97 |
| Myit Nge (Dotawaddy) | 22-23 x 96-98 |
| Sittaung | 17-20 x 96-97 |
| Lower Thanlwin | 17-19 x 97-98 |
| Inle (Inlay) Lake | 21 x 97 |
| Kissapanadi (Kaladan) | 20-21 x 92-93 |
| Dawei | 15-15 x 98 |
| Delta rivers and canals | 16 x 96-97 |
| Extreme North (Me Hka and Mali Hka) | 25-28 x 96-97 |

## RIVERS AND STREAMS

There are four major river valleys of Myanmar, all in need of further archaeological survey: the Ayeyarwaddy (1130km), Chindwin (644 km), Thanlwin (241 km south of the Shan Plateau) and Sittaung (322 km). The principal middle-sized rivers are the Myittha, Mu, Samon, Dotawaddy (Myit Nge), Panlaung, Zawgyi and Dawei. Notable among the streams or *Chaung* are the Mone, Man,Yin, Pin, Hsin TeWa, Hsin The, Bilu, Shweli and Tapein. Many small streams enter like veins into larger rivers flowing from north to south, their courses determined by the local topography. These streams and many others not usually discussed in relation to first millennium AD walled centers played a significant economic role, the effects of which are visible in the varied artefacts from each region.

*Chaung* valleys benefited not only trade and agriculture but also exploitation of natural ore, stone and clays. A range of pottery and other artefacts, for instance, have been gathered along the Kyaw, Salin, Mon and Man of the Middle Ayeyarwaddy coming down from western Chin uplands to the Ayeyarwaddy. Further east, silver coins and terracotta roof tiles, to which we return below, have been recorded along the Belu (Bilu, Nampilu) Chaung. This stream drains Inle Lake to the south towards Loikaw with rice cultivation noted in the early 20th century both along some of the lake banks and with the aid of drainage channels, along the Belu. South of Loikaw, the stream fades away into the limestone formation where it is thought to drain into the Thanlwin.[6] These areas, west of the Middle Ayeyarwaddy and Inle-Bilu on the east, illustrate the importance of seeing places such as Bagan and Magwe or Taunggyi and Loikaw as points within the more amorphous and changeable framework of side or *chaung* valleys.[7]

In Lower Myanmar, river-coast interaction either replaced or accompanied stream-river relationships. Particularly in eastern Delta and mouth of the Sittaung and Thanlwin, the exploitation of laterite, a reddish-yellow precipitate, is a defining element in understanding manmade changes.[8] This is particularly the case in the distribution of walled sites in the Sittaung-Thalwin region, one traditionally associated with the arrival of Buddhist teachings during the late first millennium BC. In this area, the effects of a variable moisture cycle, erosion and a high water table relative to the substratum have fostered a series of remnant lateritic rises several centimeters to a meter in depth. Laterite is soft when dug, but hardens on exposure to make a durable construction material. While comparable archaeological documentation is not yet available for Lower Myanmar, at Iron Age walled sites in Northeast Thailand, laterite has been highlighted in relation to the increasing availability of iron implements in the early centuries AD.[9]

Around the walled site of Kyaikkatha, with silver coins and terracotta plaques dated to *circa* the 7th to 9th century AD, laterite areas on the northeast are regularly used for construction material. Digging has also unearthed a number of polished stone implements but no excavation of this part of the site has yet been carried out. The eastern wall of Kyaikkatha contains a series of undated laterite cells (Mu-hsoe-ma-gu) associated in local legend with a Khmer princess pining after the local prince who founded the site. To the southeast at Kaw Bein, near Kyaikto, underground networks of tunnels are seen, possibly part of earlier military fortifications. A similar 'key-hole' feature is found at the centre of the walled site of Zothoke, south of Kelasa Mountain. Trenches such as these would have perhaps provided cover for attacking troops and also during longer sieges, in a manner not unlike later times: after the British victory at Yangon in 1824, some ten kilometers of trenches were documented from Kemmedine to Poojadown.[10] With these few examples of the close relationship of archaeological sites to the terrain, we return below to our tabulation of the main features in the water drainage pattern.

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[6] Dobby 1950: 156

[7] Scott 1901: 385, Stargardt 1990:45

[8] San Win 1986

[9] Higham and Thosarat 1998: 135

[10] Charney 2004: 98; San Win has recorded further tunnels at Natkyizeik (Bawgabangu, Khalun, Muppalin) *circa* 3.2km north of Kyaikkatha; Hpaya-tataung (Kyaik-lane); Kawkadut (Zothoke) and Mayangon (Thaton) (Pers.comm. 04-06)







Fig. 2a-c Laterite cells Mu-hsoe-ma-gu, Kyaikkatha; Zothoke 'keyhole' , Kaw Bein tunnels (right)

LOWER MYANMAR

There are at least three significant regions in the southeast part of the central basin and the peninsula needing further study. First, in the Sittaung valley there is the Pyuu Chaung, Myo Chaung, Bago Myit and Ye Nwe Chaung. Second, along the Lower Thanlwin are the Belu Chaung and the junction of the Yun Salin Chaung and watercourses such as the Bilin River further south. The area includes Taungnoo south to Ye, with the southern coastal areas little explored. North of Ye, in the present day Mon State, is the first millennium AD walled site of Thaton. There are other first millennium AD walled settlements such as Winka and Ayetthema around Mt. Kelasa, Donwun to the east of the Bilin, and more sites in Mudon south of Mottama. In Tanintharyi Division, Neolithic tools and walled sites are found along the Dawei and Tanintharyi Rivers. Given the evidence for early occupation to the south near Krabi, exploration of the coastal caves is also merited.

All the water bodies in this region experience tremendous variation between the dry (November-April) and the rainy months (May-October). This includes rivers as well as the ponds 'that disappear when the water is gone' in the proverb cited at the start of this paper. Water levels change quickly during the monsoon periods, with regular warnings issued on sudden rises of 2-4 meters. The effect of this flood pattern can be seen in the meandering course of the rivers and in major alterations along rivers, streams and creeks.

Some of these are recent, with a major shift for example, along the Lower Sittaung in the early 20th century AD.[11] In 1911, the Sittaung cut across a long bend northwest of Kyaikto to make a new channel. This brought erosion on the eastern Kyaikto area and additional sedimentation on the Bago side.[12] Smaller river courses were also affected, so for example, just west of Kelasa Mountain at Winka great amounts of sand have been deposited in the Theh-phyuu-chaung, or 'white sand stream'.[13] This has brought a combination of erosion and deposition to both banks of the outlet. As a result of changes such as these, the first millennium AD walled sites of Sittaung and Kyaikkatha, for example, are now directly on the river and the Gulf of Muttama but Kelasa and Thaton are further inland than was probably the case two thousand years ago.

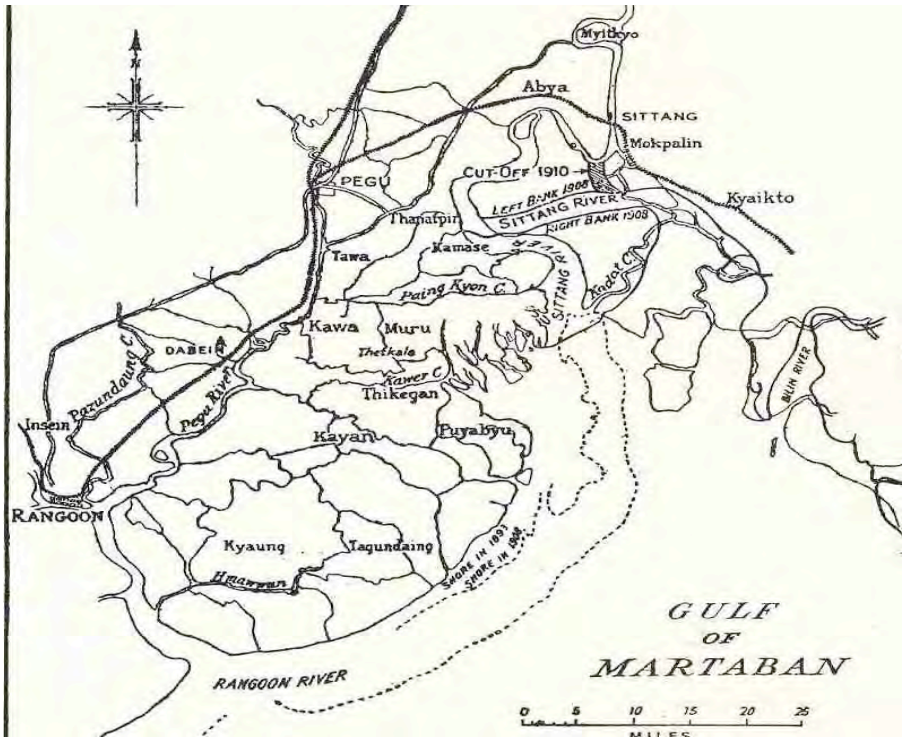



Fig 3a Map of the 1911 Sittaung change (After Chhibber 1933)

[11] San Win 2005

[12] Chhibber 1933:32

[13] San Win 1986

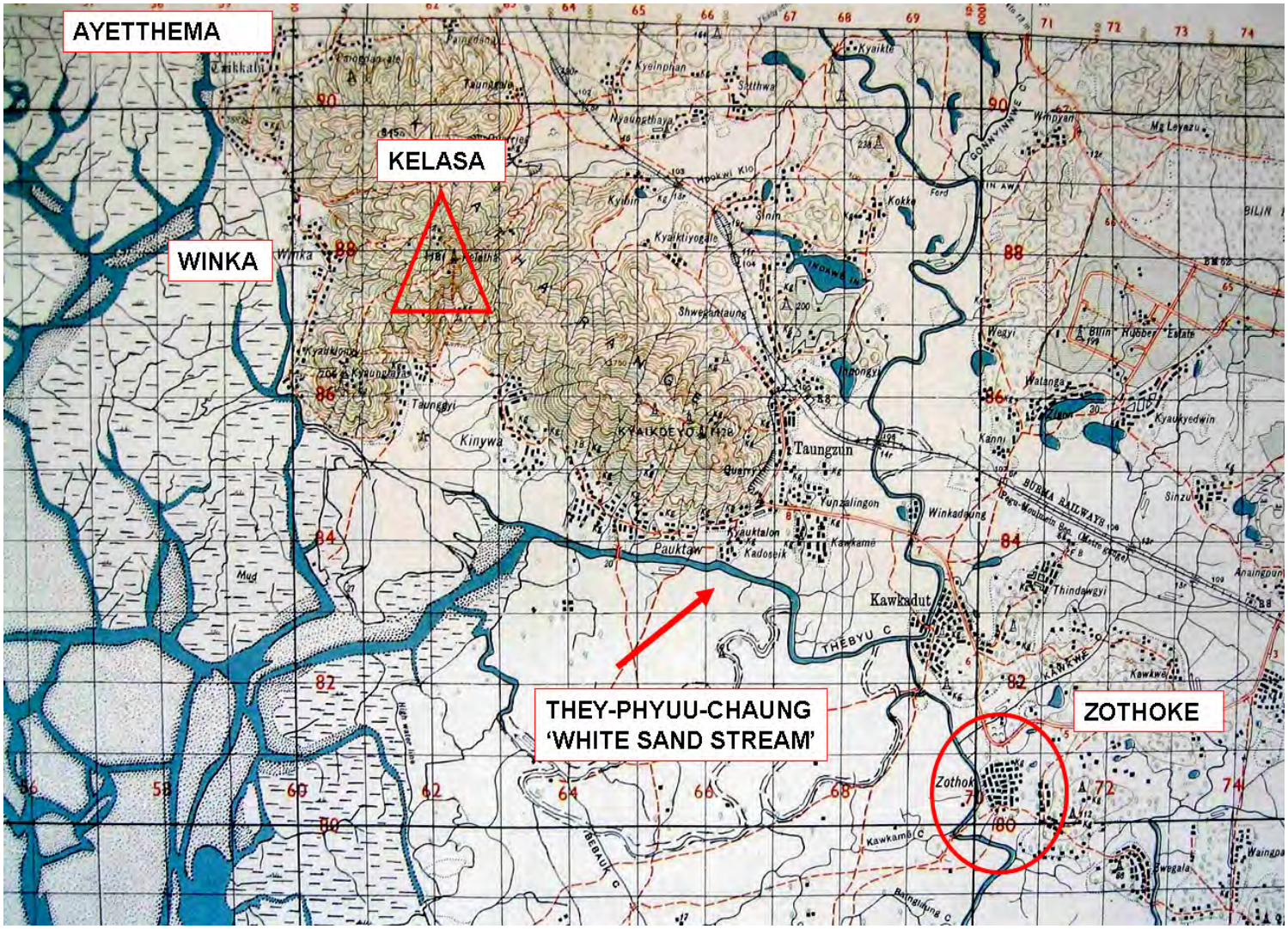



Figure 3b Stream changes in the Kelasa region (After One Inch Map Series, 1944 Third Edition 94G4)

Change can also be seen further south of the Bilin River around walled sites such as Donwun, Mayangon and Hsinbyukyn near Thaton. In contrast to developments in the arid regions of Upper Myanmar, the focus in the south is control of excess water. For instance, the inauguration new Mayangon Sluice Gate, with 15 valves each measuring 1.8 by 3.6 metres will reclaim 10,000 acres of wetland.[14] Documentation of these sites and others by San Win and his team has led to finds of a number of stone tools and rings as well as incised blackwares supporting a profile of Iron Age to mid-first millennium AD habitation in the lowlands lying between Thaton and the Bilin egress into the Gulf of Muttama.[15] The meandering of not only the river but smaller west flowing canals characterizes this low 'no-man's land'. Thaton faces the coast on the west but on the east it butts against the Martaban Range along a fault line stretching south past Zingyaik peak to Paung. The terrain contrast in this region was made stronger during the colonial period with the construction of the railway along this edge running past Thaton seen on the map below.

[14] *New Light of Myanmar*, 29.05.06

[15] The wave-like and criss-cross design on the pottery is similar to pieces from Sanpannagon (16.15n x 97.20e) some 20km southwest of Thaton (San Win 1986: 167, 182, fig 15). In Thailand, similar sherds are seen at Ban Ku Muang, Amphoe Inburi, Changwat Singburi (Indrawooth 1985: 53, figs 17-21). The blackware has been noted at Taungthaman as well as sites in Thailand (Stargardt 1990: 22-23).



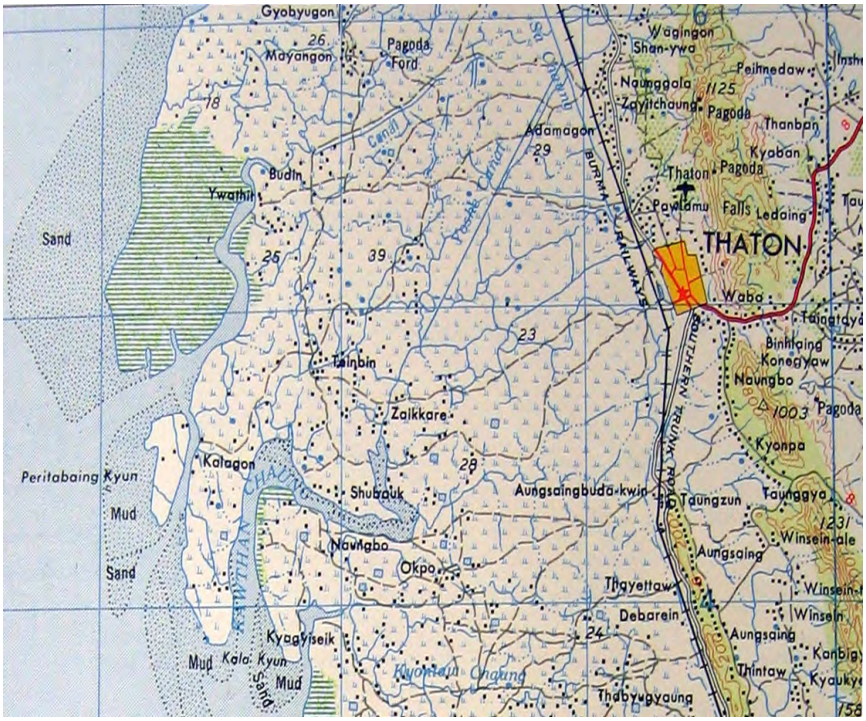





Fig. 4a-c Mayangon stone ring (outer diameter 10.5 cm)[16]; location (circled) 1:250,000 map; stone implements (length, top to bottom S8 15.5 cm, S1 13 cm, S5 10.2 cm)

Due to the danger of flood, and in Lower Myanmar inundation from the sea, first millennium AD sites are rarely located directly on the coast or on the banks of major rivers or streams. Smaller and more easily controlled water-courses or *in-aing*, a range of ponds and lakes made suitable for fishing by putting up weirs, and where damming and bailing out of water is regularly carried out, were commonly tapped. Sites such as Taungthaman-*in* on the

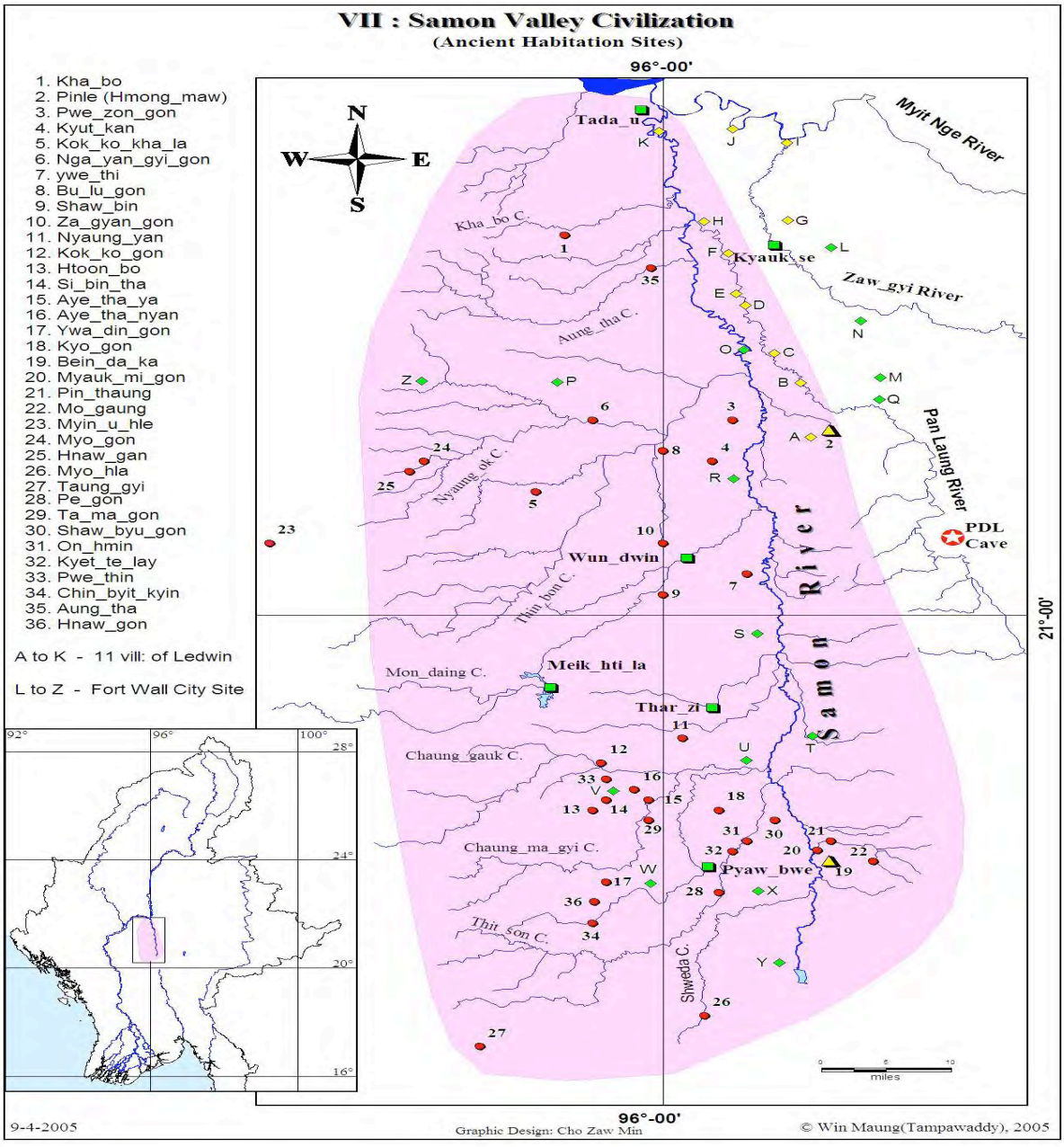
[16] Five rings or sections of rings, four made from slate and one from a fine-grained quartzite were found. In addition, more than a hundred stone tools were recorded including adze/axes, scrapers and sickles made from fine-grained and epidote quartzite, slate, microgranite, sandstone (greywackes), fine-grained sandstone, indurated mudstone, siltstone and rhyolite porphyry (Courtesy U San Win 04.06, Moore and San Win 2007).

northern tip of the Samon exploited these locales at least as early as the Neolithic, with expanded cultivation on its shores not only increasing agricultural surplus but as has been noted elsewhere in Southeast Asia, attracting a host of new insects, birds and small mammals to the area.[17]

## SAMON: DESICCATION AND RESOURCES

A different pattern of environmental change, one of desiccation rather than water control is seen along the Samon valley due north of the Sittaung. The Samon is short (161 km) and unlike other rivers, flows from south to north. The region is sparsely settled with villages along small streams flowing down from the west into the river, and others aligned along the ore-rich foothills of the Shan Plateau. From the late 1970's, Maung Maung Tin (Mahaweiza) began to study the Samon region to the south of Mandalay. This included the townships of Kyaukse, Thazi, Pyawbwe, Yamethin and many others forming a line along the Samon at the foot of the Shan Plateau.

Figure 5 Samon Valley site map




[17] Higham 1998:67

Kyaukse, on the northeast edge of the Samon valley, occupies a prime place in Myanmar history as a centre of 9th to 13th century AD Bagan rice production. Despite the general presumption that cultivation in this area supported first millennium AD walled sites, little 20th century AD archaeological investigation was conducted on the region's prehistoric cultivation. A few bronze celts had been collected from the Shan Plateau by Morris and others in the colonial period.[18] Although Aung Thaw did support prehistoric excavations at Taungthaman and Shwezayan, work south of Mandalay in the Samon was limited to excavations at Badi-gon near Beinnaka, mentioned again below. In the late 1970's, Maung Maung Tin began to follow up reports of new finds and a picture of the 'Samon valley' civilization emerged.[19] Among the artefacts were a number not recorded before, such as *kye doke* or bronze packets, a variety of bronze axes and vessels, and a range of bronze ornaments thought to have been used on coffins, including 'mother-goddess' figures and floral ornaments. The high-copper, and in some instances with a measurable silver content, of the few bronzes that have been analyzed indicates a range of trade contacts oriented towards the mineral resources of the north and northeast along the edge of the Shan Plateau.[20]

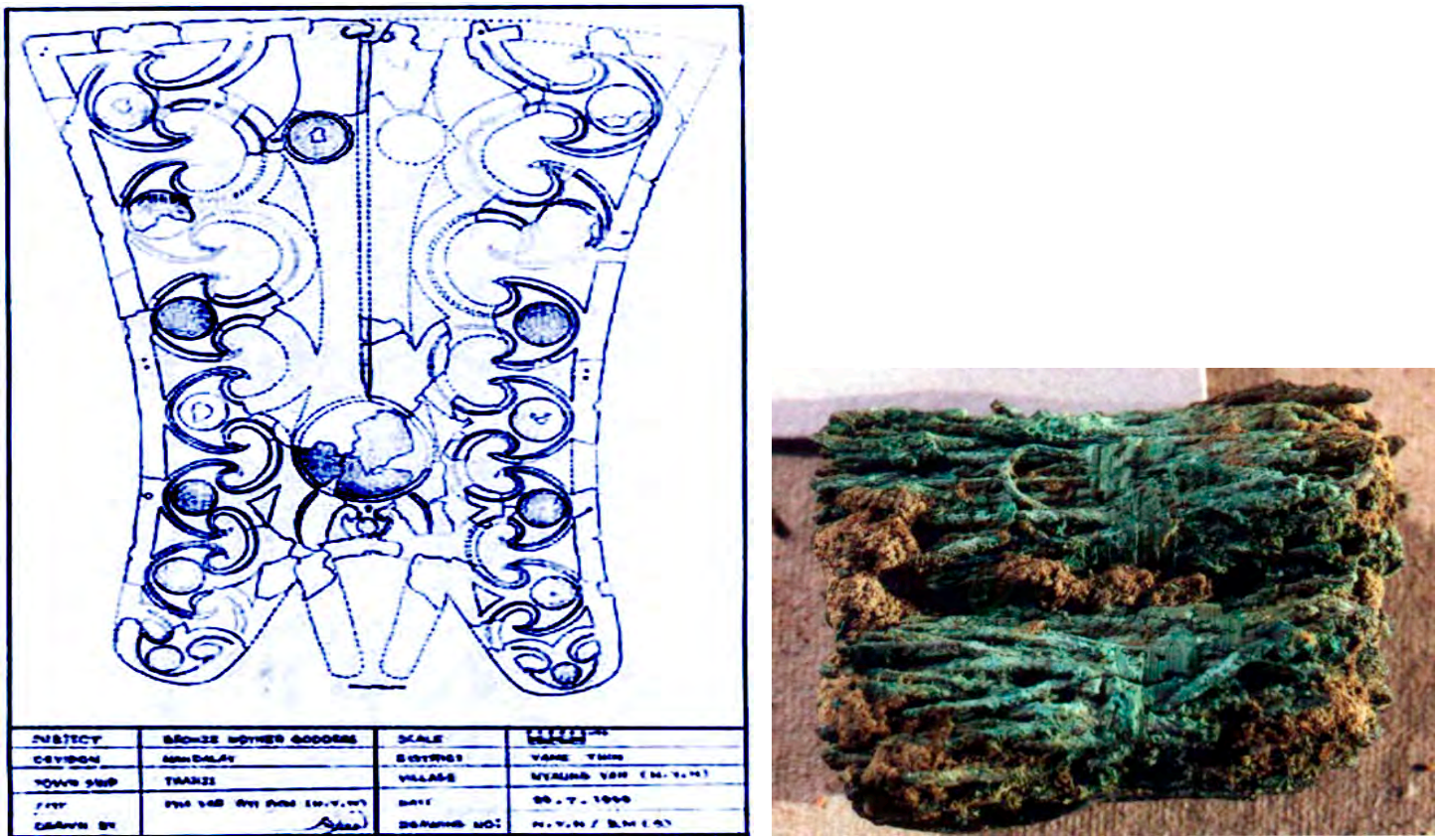


Fig 6a-b Drawing of 'Mother-goddess' from Nyaungyan (80 cm) and *Kye doke* (*circa* 6 cm) from Shaw Bin; Drawing and artefacts, Win Maung (Tampawaddy) collection

The Samon is arid today, with new irrigation projects over the last twenty years beginning to counter the 20th century desiccation and subsequent pattern of crop failure. The construction related to these projects and subsequent excavations have brought to light varied bronze and iron artifacts in a region seemingly ill-suited to support such prosperity. Many major first millennium AD cultures, however, have arisen in apparently marginal ecological niches, with the main explanation centering on resource control. Water excess is generally more difficult to harness than too little water, with an area's other advantages often more than compensating for a dearth of water. These pluses include several factors where the Samon scores well - proximity to trade routes and major ore sources plus small-scale localized resources. On the first, the Samon is adjacent to major routes leading to the Shan Plateau and Yunnan on the east and the Chindwin and regions beyond on the west. These offered trading opportunities and ores. Among the small-scale resources, semi-precious stones are foremost, with one of the most attractive objects of

[18] E.g. Morris 1933

[19] Win Maung 2003.

[20] Pautreau et al. 2005, 2006

the Samon culture being highly polished beads made of carnelian, fossil wood, agate and other stones. Glass making also appears to have been abundant, with beads, discs and rings recorded. In the late 1970's, Aung Myint's work with aerial photos and his discovery of Maingmaw unfortunately also prompted bead digging in the area. Sadly, 'bead-fever' is still adding to the non-systematic excavation of many grave sites.[21] Since 2001, however, a French team working on cooperation with the Department of Archaeology has carried out excavations at Hnaw Kan, Ywa Htin Kon, Myo Hla, Ohn Min and Htan Ta Pin.[22] Other survey and excavations monitored by the Department of Archaeology and interested scholars have somewhat diminished the looters but given the growing prosperity of the Samon and the richness of the finds, more research is needed.

The most significant of the Samon centers, where one site is called 'Badi-gon' or 'bead mound', may have been around Beinnaka, in Pyawbwe Township, Mandalay Division.[23] Chronicles state that the name Beinnaka is derived from the last king of Tagaung, a lineage of mythical origins tied into the rise of Sriksetra and then Bagan. Survey and excavation around Beinnaka, however, has yielded not only proto-historic and Bagan period artefacts but also an earlier wall along with stone and bronze implements. There are more than 60 villages forming a radial array around Beinnaka with a similar record of habitation. All are particularly rich in bronze-iron artefacts and in many cases the silver coins and other artefacts associated with first millennium Pyu peoples.[24] At Wadi, a circular walled site, silver coins, finger-marked bricks and elephant beads have recorded, with the nearby village of Payagyi in recent years having been a centre for the manufacture of 'Chin beads' made from the abundant fossil wood in the area.

Sites of other periods are also seen in the Samon, the most well known being the 11 *Ledwin* or ricefields of Kyaukse (A to K).[25] One of the authors has additionally documented fifteen 'Fort Wall City Sites' (L to Z) where the wall at least appears to date to the post-Bagan era.[26] In contrast to the clustering of Samon bronze-iron sites in the southern part of the valley, the 11 *Ledwin* are in the northern part of the Samon, along the Panlaung and Zawgyi. These two rivers run parallel to the Samon but flow down from the Shan foothills. To the north of the Zawgyi is the Myit Nge (Dotawaddy), coming down from the Yunnan border at Muse to enter the Ayeyarwaddy east of Mandalay. This juncture marks a new array of valleys and sites. Some, such as Halin (Hanlin), also have yielded abundant bronze-iron implements like those of the Samon. Artefacts in others, however, such as the Upper Ayeyarwaddy Valleys and the Chindwin, are distinct.

## CHINDWIN VALLEY CULTURES

The Tanaing-kha and many other streams enter into the upper reaches of the Chindwin (Than La Waddy) valley. This valley as a whole can be divided into two sectors of *circa* 241 km: the Uru Chaung from Upper Homalin to Kalehwa, and the Myittha River to the junction with the Ayeyarwaddy. Included in this region are Myingyan and Pakkokku. Given the importance of the Chindwin and the abundant Neolithic and Bronze Age artefacts from areas such as Nyaunggan, Budalin in the Lower Chindwin, this area is a priority for further research. Opposite Budalin, on the other bank of the Chindwin, Salingyi area has a rich variety of rock and ore sources. Volcanic craters on both

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[21] Moore and Aung Myint 1993

[22] Pautreau et al. 2006

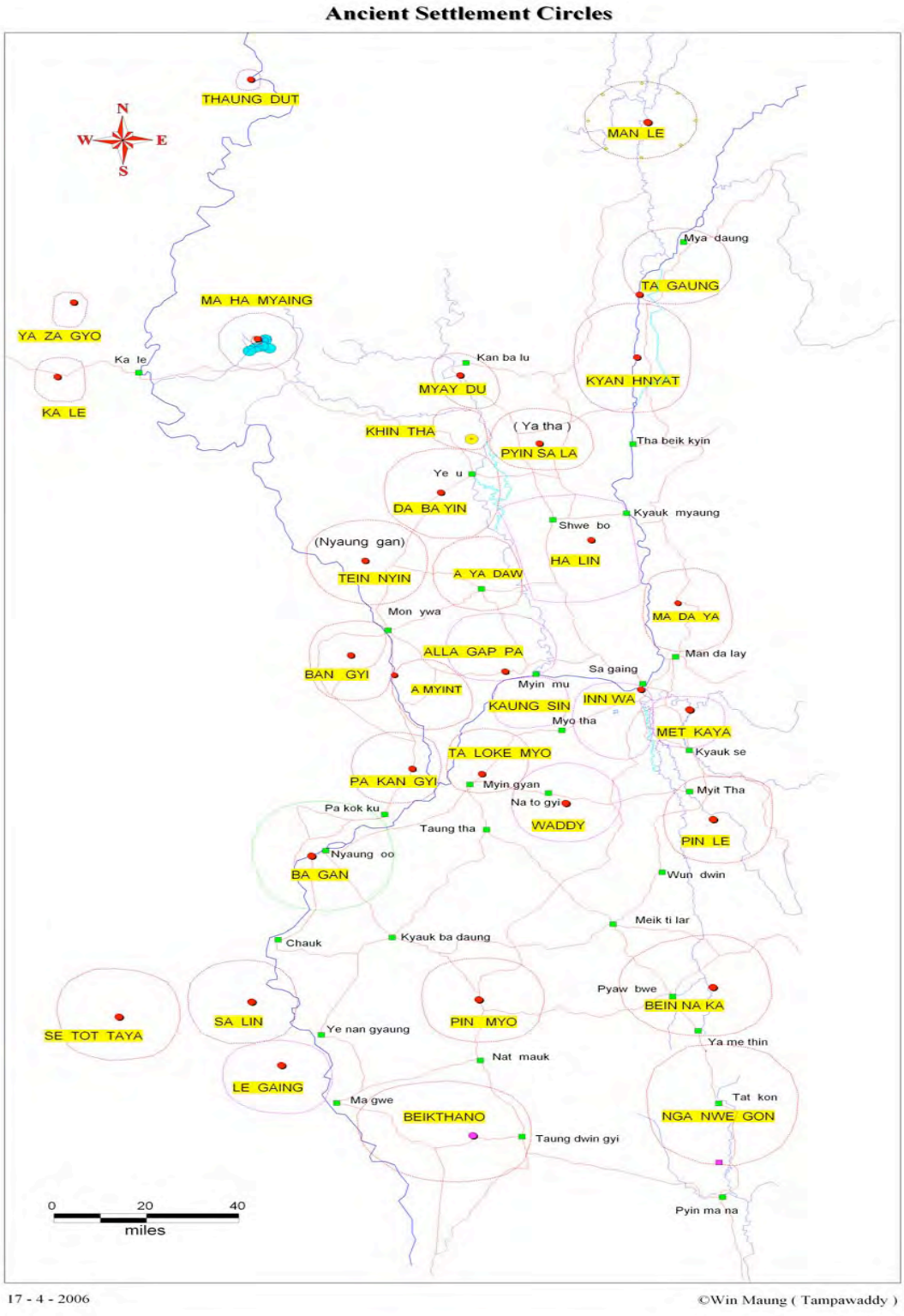
[23] Win Maung 2001

[24] The relationship of the Samon and Pyu-associated sites remains an open question. Elizabeth Moore tends towards a pattern of disruption and possibly new intrusive elements, while Bob Hudson (2004) has hypothesised that the Samon sites were the precursor region for the Pyu cities. Win Maung (Tampawaddy) has aptly noted that until further excavation has been carried out that it is like the blind men feeling the elephant – all suggestions may be possible.

[25] In the A to K order they are labelled on the map, the *Ledwin* sites are Pinle (Myodwin), Pyinmana, Myittha, Ywamone-gyi, Myingondaing, Panan, Thindaung-gyi, Tamoak, Hmek-kha-ya (Mekkaya), Tabet-ka and Khan-luu.

[26] As we indicate in brackets, some of these appear to be fortresses linked to other sites: Myin-saing (14th to 15th century AD), Hpwar-bet-san (Pinle fort), Myaung-hla (Pinle fort), Pauk-myaing (Pinle-Wadi fort), Pyin Si (Pinle fort), Saw Hla (Ywa Khaing Gyi) (Pinle fort), In-gan (Pinle fort), Sagara (Anawrahta 11th century AD), Hlaing Det (Maingmaw fortress), Nyaungyan Magyi (Anawrahta 11th century AD), Yin-daw (Beinnaka fort), Yanaung (Beinnaka fort), Wadi II (Beinnaka fort), Yamethin (Beinnaka fort) and Wadi (Payagyi).

banks offered additional sources of stone and copper. Megalithic remains are abundant in the Lower Chindwin, with studies of Chin use of large stones in village founding pointing to the potential of ethno-archaeological research in this area.[27] To the east of the Chindwin, running parallel to it and the Ayeyarwaddy, is the Mu valley stretching from Three Mountains (Taung Thone Lone) to just south of Halin. As we noted earlier, the rich bronze-iron finds we dicussed in relation to the Samon are also abundant at Halin. Recent excavations south of the Shwegyigyi site have yielded cultural deposits of more than nine metres, with finds seen as diagnostic of both the Samon and Chindwin bronzes. In the map of Ancient Settlement Circles below, it can be seen that the conjectured domain of Halin extends from the Mu to the Ayeyarwaddy.[28]




[27] Sakhong 2003:25

[28] Win Maung (Tampawaddy) based on a manuscript of the *Myo ywa nehbeh thamaing*.

## UPPER AYEYARWADDY VALLEYS

The course of the Ayeyarwaddy can be divided into three sectors, each *circa* 322 km in length. The Upper Ayeyarwaddy (*Anya*) starts at the Mehkha and Malika River junction north of Myitkina and ends in Letpandan Township, going from Myitsone to Mandalay. Streams (*Chaung)* and rivers (*Myit)* meriting particular archaeological attention along the Upper Ayeyarwaddy include the Moe Kaung Chaung, Tapein Myit, Shweli Myit and Chaung Ma Kyi Chaung (Mattaya). For example, bronze-iron age artefacts including Heger I type bronze drums are found at the villages of Hsin Bo, Hti Kyaing, Yan Bo, Ma Bein, Tagaung and Mattaya. These are described by Calo' as being within the 'Dian sphere of influence', where the earliest bronzes date to *circa* 700 BC but the most well known are *circa* 400 BC to 100 AD.[29] In addition, many 'later' groups not yet documented archaeologically inhabit the Upper Myanmar Mehkha-Malikha valleys. These include Tibeto-Burman speaking peoples such as Marhu, Azi, Lashi, Rawan and Phun. The many fluctuating groups this mixture implies are sketched out the Ancient Settlement Circles map.

To the east of the Upper Ayeyarwaddy is Muse Township just west of the Thanwlin where it crosses the border with China. There are many other rivers and streams in this area, notably the Shweli coming from southern Yunnan down to Bhamo. In Northern Shan State, given the absence of a valley, there is a break until the many streams come together at the Dotawaddy (Myit Nge) area and down to the Ayeyarwaddy around Mandalay. To the southeast is Inle Lake, of interest both for its ancient history and the mixture of 'ethnic groups' presently occupying the area. Aung Thwin has effectively argued that perceptions were more of place than ethnicity but such perceptions persist particularly in relation to first millennium AD 'groups' such as the Pyu, Mon, Thet and Khadu.[30] To this geographical orientation can be added the Kanyan and Sakyaw, groups that Luce linked to Karen language-speaking peoples but whose names in the *Za-bu-kon-cha* simply refer to their dwelling along the bank and along the water.[31]

The Middle Ayeyarwaddy begins at Mandalay and ends south of Magwe at the Yin valley near Beikthano. There are eight notable streams along this sector: Hsindehwa Chaung, Chaung Ma Kyi Chaung, Yaw and Kyaw Chaung, Salin Chaung, Mon Chaung, Man Chaung, Pin Chaung and Yin Chaung. In the northern part of the Middle Ayeyarwaddy, documentation is needed of the streams around the Popa crater where the topography has been greatly altered. Finds further south along this sector include those at Beikthano (Vishnu), as well as abundant stone, bronze, iron artefacts. The Lower Ayeyarwaddy (*Khe*) begins from the Yin and goes south to near the town of Letpandan. There are four major streams flowing into this sector: Pani Chaung, Mindon Chaung, Bwet Chaung and Nawin Chaung. The region includes Sriksetra and continuous occupation at sites near Hsin-baung-weh to Letpan village. While there has been excavation at Bagan and the walled sites associated with presumed Pyu-speaking peoples, there are also many sites with bronze-iron artefacts needing study.

We turn in the second half of this paper to a more detailed look at the continual need for change evident in the first millennium AD walled sites of the Upper Ayeyarwaddy. After considering the question of when the walled perimeters were 'finished', and the varied defensive roles the walls may have filled, we return to the environment in surveying the breadth of manmade interactions in the landscape of Tagaung.

## WALLS: RESPONDING TO CHANGE

At the first millennium AD walled sites of Tagaung, Halin, Pinle (Maingmaw), Beikthano and Sriksetra, artefacts from non-walled contexts parallel those excavated within the walls. The clear demarcation sometimes inferred from the walled enclosures is additionally blurred by structures built immediately inside and outside the walls. The placement and various forms of these suggest that apparently 'complete' enclosures in fact record on-going construction. The buildings and walls reflect constant efforts to cope with the change as trees were felled, rains failed, ponds dried up, and rivers and streams shifted course. This profile differs from those put forward for Sriksetra with, for instance, completion of concentric gravity-controlled water circulation. If indeed the roughly circular pattern of the present day watercourses was all in place some 1500 years ago, one rationale suggested was to main-

[29] Calo' 2007

[30] Aung Thwin 2005

[31] U Win Maung (Tampawaddy) from *Za-bu-kon-cha* manuscript

tain physical links with ancestral remains.[32] The fractured lines of inheritance noted by Tun Aung Chain in the royal stone urn inscriptions from Sriksetra, however, indicate that new lineages appeared often.[33] Perhaps more data will one day verify a symbolic wheel, but at present, the proposal self-admittedly suggests a model that may or may not have been distinguished by the inhabitants of Sriksetra. Where it is most useful, however, is in highlighting the micro-topography of the site and in considering alternative explanations for land use not sitting easily within empirical framework of land use.

It is not only at Sriksetra where variable natural water courses are seen inside the walls, and in all cases, we cannot be certain that the present hydrology is that of earlier periods. For instance at Halin, if in reality the walls seen today were all in place, it is doubtful whether the Halin Chaung ran across the centre of the ancient city in the first millennium AD. In addition, the water flow of the surrounding area substantially changed with colonial-period canal constructions. At Beikthano, the Yanbe and Yin Chaung flanking the site on the north and south probably attracted Neolithic habitation, but the streams within its walls and the large *in-gyi* on its western flank show evidence of considerable and constant alteration. At Maingmaw today, the Nat Hlyeh Chaung runs through the centre of the site, and periodic survey of the site and surrounds have recorded extensive change even over the last thirty years.[34]

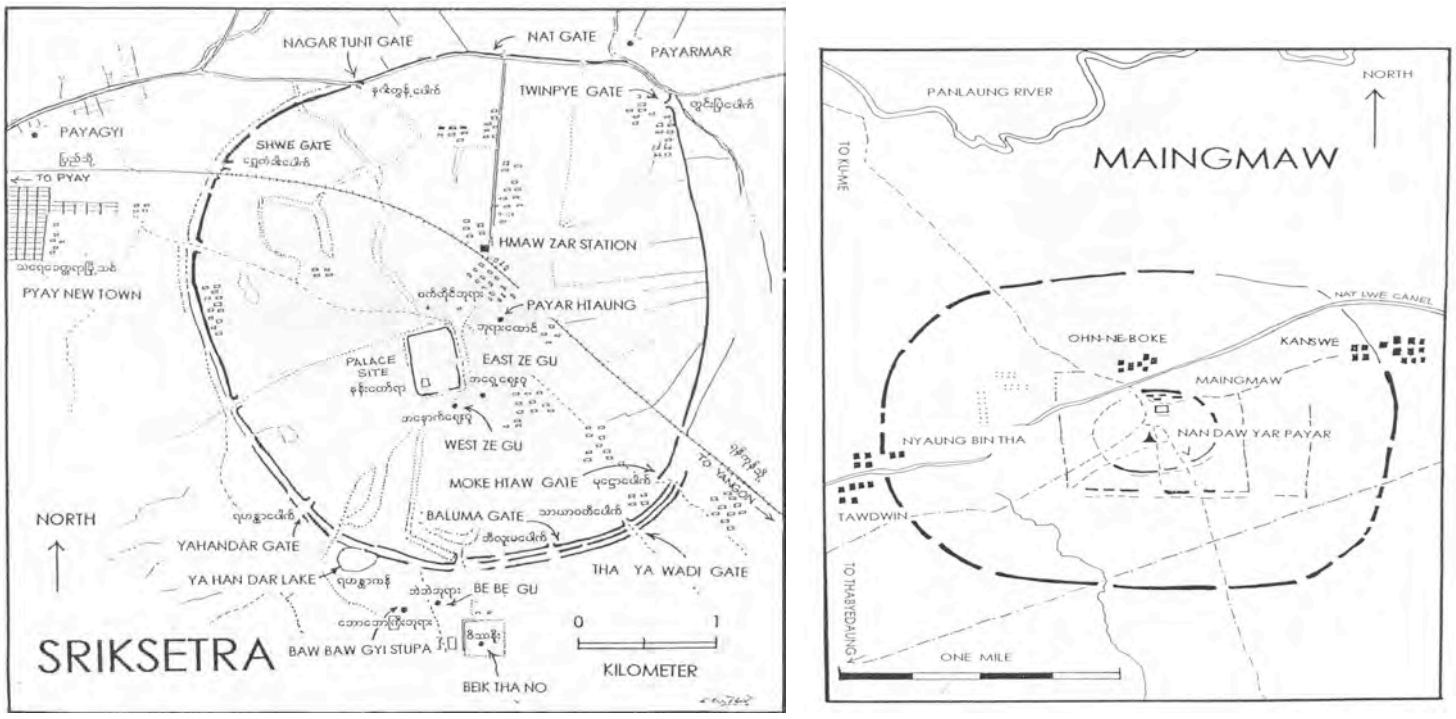



Fig.8a-b Plans of Sriksetra and Maingmaw (after U Aung Myint)

At Sriksetra as well, the advantages of settlement south of the Nawin Chaung and north of a series of *in-gyi* at the foot of an upland zone on the southwest probably prompted village-based cultivation long before walls began to be built. However, the narrow wall on the east of Sriksetra appears to have been erected as a quite separate undertaking, perhaps in response to changes in the large *in-gyi* bordering its eastern face.[35] An additional and significant factor may have been warfare, with water bodies an important element in siege fortifications. Stockades, for instance, could only be built on the inner edge of a moat, with palisades and redoubts constructed to make use of rivers, moats and marshland. In the dry season, moats could be home to bamboo stakes and thorny bushes, the latter as effective as barbed wire.[36] Daw Thin Gyi long ago highlighted the defensive character of Sriksetra's multiple

[32] Stargardt 2002: 154-156, 165

[33] Tun Aung Chain 2003

[34] Ito 2000

[35] Stargardt 1990:86

[36] Charney 2004:92

walls and forts. Although not all scholars concur, three walls and moats, some 30 metres in width have been noted on the south and west "where danger threatens over the low ridge".[37]

Some walls were made of bricks, others were earthen ramparts or laterite blocks, and in Lower Myanmar, stone was also used. For example at Kelasa, a line of stone fortifications reaching from the village of Winka and up over the peak of Mya Thabeik has been recorded. This pattern continued in later centuries, with the walls of Bago at the end of the 17th century AD reportedly made of stacked, unmortared iron-stone walls some three metres in height.[38] These structures were augmented with perishable materials, at times timber fortifications and at others formidable barriers created by thorny bushes and bamboo hedges. When combined, a barrier could be massive. For example, a Cham fortification with a six meter high brick base was surmounted by a three meter brick palisade and topped by wooden walls to a total of twenty-four meters.[39]

None of these defences of course remain standing at Halin, Sriksetra, Kyaikkatha or Winka but it is important to consider the dimensions that these may well have reached. In addition, all of these activities would have altered the local ecology, from felling of trees to providing new habitats with the planting of hedges. A similar nesting is seen at Bagan and Tagaung, both with seasonal cycles of cultivation and resource use of zones located east and south of the walled site.[40] As these patterns continue today, dating completion of built features such as walls and dikes is as problematic as the cases we discussed above. In addition, the location of both Bagan and Tagaung on the Ayeyarwaddy can be related to wider patterns of regional exchange.

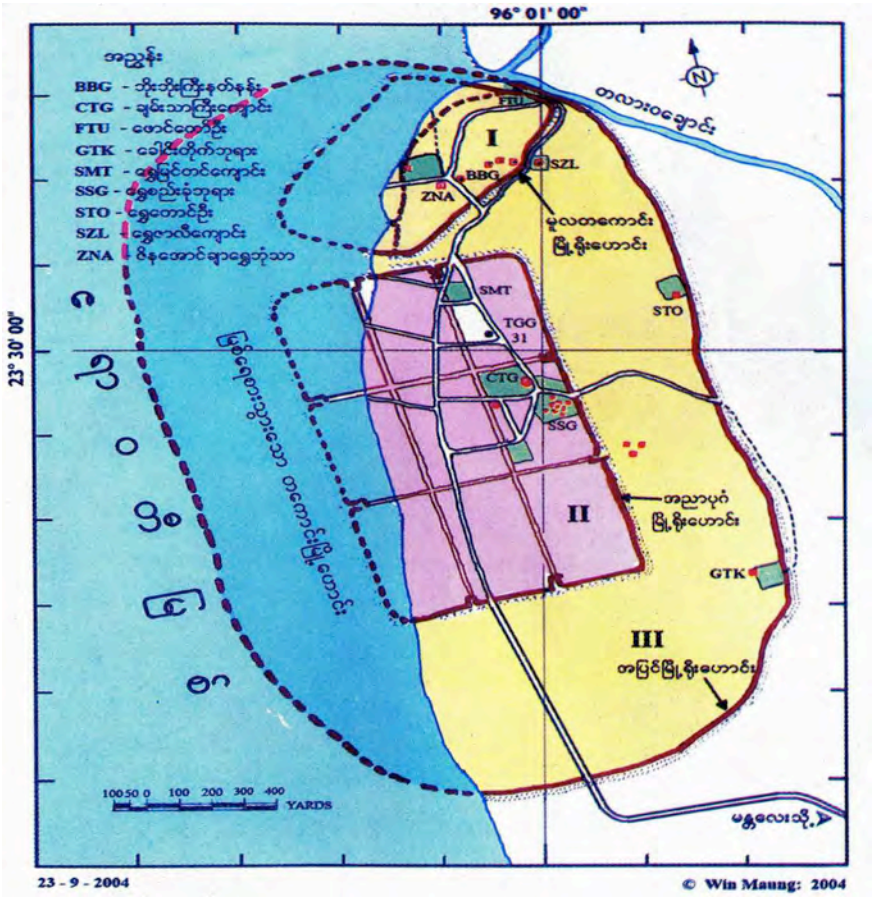



Fig. 9a Tagaung's 9-quadrants (Scale in yards, conjectured layout by Win Maung (Tampawaddy))

[37] Aung Myint 1998: 67,68, Thin Gyi 1965

[38] Dijk 2004: 1,38 cited in Charney 2004: 79 ftn.17; San Win 2005. The sedimentary iron-stone has a lower iron content than haematite.

[39] Charney 2004: 80

[40] E. g. Bagan's reliance on Kyaukse, Popa, Tuyin Taung and Minbu and Tagaung's on the low-lying land of the 'Old Ayeyarwaddy', Mogok, Thaung Hwet Taung, and cultivation areas to the south around Hsin Hynat village

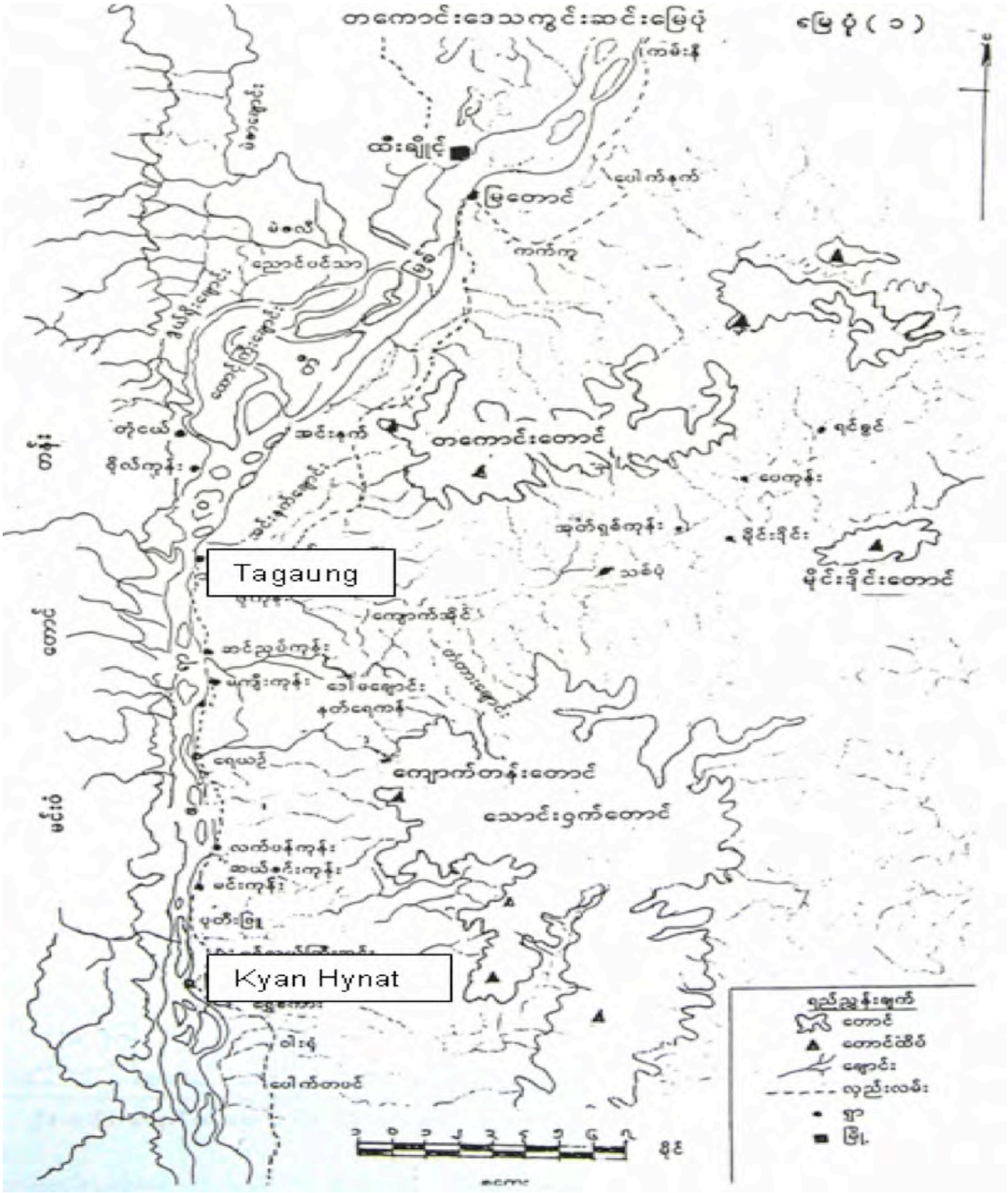



Fig 9b sketch of Tagaung-Kyan Hynat topography (Scale in miles, after San Win 1997)

## TAGAUNG

The lack of a western wall at Tagaung has been attributed to a number of factors. The most debated of these is a westward movement of the Ayeyarwaddy in the geologically recent past from the bed of the 'Old Ayeyarwaddy' east of the present site to that of the Meza Chaung.[41] Working within this premise, one of the present authors has suggested that not only the location but also the layout may have conformed to a tradition that first millennium AD walled cities associated with Pyu-speaking groups had nine quadrants.[42] There are today three walled areas at Tagaung: Wall 1 (19 hectares) around a low hillock on the north, Wall 2 (62 hectares) known as Anya Bagan and Wall 3 (204 hectares) which encloses the other two walls. All three, however, are missing the western wall. When the nine quadrants are plotted to form an oval-shaped city plan, site TG31, excavated in 2003-2004, falls in the northeast quadrant of the old city. As the finds from TG31 and Hsin Hynat to the south support our note above of links beyond Myanmar, in this case to Yunnan, we will return to TG31 and Hsin Hynat. First, however, we discuss Bagan and the natural resources of Tagaung that together with its location ensured continued patronage from its founding to the present. [43]

Tagaung and Bagan are closer to the Ayeyarwaddy than Halin, Maingmaw, Waddi or Beikthano.[44] While the west wall of both is currently the Ayeyarwaddy, each may once have been farther from the bank and the threat of flood. At Bagan, Daw Thin Gyi concluded from aerial photographs that the west wall has been gradually lost to the Ayeyarwaddy through erosion and flood.[45] A jutting out of the river at the village of Myit Khe ('lower portion') north of Bagan also supports its gradual eastward shift. Beyond this, however, comparison weakens, for Bagan's setting may have obviated the need for fortification on the immediate east while the ecology and location of Tagaung may have required it. The site's strategic position on the Yunnan frontier is evident in the array of Tagaung artefacts attributed to its use by the 11th century AD Anawrahta as part of his east flank fortification.[46] Ores may additionally explain Anawrahta's interest in Tagaung, with silver continuing in use at Bagan for land and slave purchases.[47] Tagaung afforded access to the silver mines of Bawdwin and Yadanatheingyi at Namtu in around Mogok. It is also via Mogok and the Shweli and Taping (Tabein) rising in the uplands that Tagaung linked to Yunnan via Muse and Bhamo.[48] Other resources including jade, copper and iron were reachable by the Meza and Uru watercourses to the north and northwest.[49]

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[41] Chit San Win 2004; Win Maung 2005

[42] Drawn by Win Maung (Tampawaddy) based on accounts in the *Myo ywa nehbeh thamaing*

[43] Chronicles date the founding of Bagan to Abhiraja prior to the time of the Buddha Gotama. Repeated excavations before the TG31 had yielded Bagan period artefacts, with evidence of earlier habitation restricted to surface finds. The TG31 excavations yielded material commonly attributed to the pre-Bagan (pre 9th century AD) period from stratigraphic contexts, 1.8 meters below a schoolyard ground level and perhaps at least three below the earlier mound reported by villagers. However, no radiocarbon dates were obtained. One result, from *circa* one meter below ground level at the site of the new museum, was associated with a burial urn and a gourd-shaped goglet. The AMS date (OZH 969) obtained was 1200 plus/minus 30 BP, which is 770-900 AD at 87.7 % probability (OxCal). The test was carried out by the Australian Nuclear Science and Technology Organisation and provided to the authors courtesy of Bob Hudson.

[44] Sriksetra, linked in chronicles with Tagaung and Bagan, ranks next.

[45] Thin Kyi 1965

[46] Ernelle Berliet recently completed a field-check of thirty-three of the forts in Upper Myanmar, presented as *Territorial planning in Burma during the Pagan period (1044-1287), the foundation of an empire,* Euraseaa 11th International Conference, Bougon France, September 2006

[47] Tun Aung Chain 2005: 4, 8

[48] As we noted above, this pattern is repeated further south with Samon-Halin access to and from Yunnan via the Dotawaddy (Dutthawaddy, Myit-Nge), a route that also provided access to copper and gold on the edge of the Shan Plateau.

[49] Hudson 2004: 57, Figure 5, Resources and Distribution

Other watercourses are seen on the east, a critical area in our interpretation above of Tagaung's 'missing' western wall.[50] One is a series of remnant streams on low-lying land east of the walled area, all aligned east to west, linking the present and suggested past courses of the Ayeyarwaddy. Another is the site's location on a fault-related linear sector of the Ayeyarwaddy bounded on the west by the Minwun Range (391m). Other elements are the prevalence of earthquakes, most recently in 2000 and 1989, and erosion and deposition along the river and feeder streams. Rainfall is also relatively high at Tagaung, some 1176 mm per annum versus 870 mm at nearby Halin. This in part relates to the higher elevation of Mogok whose timber, elephants and mineral resources were shipped down to jetties at Tagaung, Hsin Hynat just south of Tagaung and Kyan Hynat 30 km further south. Sedimentation along the Ayeyarwaddy may have affected preservation of the west wall, but also has had benefits, including gold washing.[51] This practice is also seen at the sandbars around Ton Ngeh, 10 km north of Tagaung.[52]

Tagaung additionally profited from the seasonal lakes (*ingyi*) and swamp lands located along the remnant streams east of the site. Each is used for particular crops, with fields varying from edible oils to rice and coriander. Winter rice or *mayin* is grown on the edges of shallow pools on the shelf between the Ayeyarwaddy and the *Indaing* forest on Thaung Hwet Taung ('the mountain of the 10,000 hidden') to the southeast.[53] Fowl such as pheasants, partridge, toucans, pelicans and *Saurus* cranes live around *in-gyi* and the tall swamp grass areas, while numerous fish are found in the *in-gyi* and Telawa Chaung bordering the walled site on the north. Tigers, elephants, banteng (*Saing*) and gaur were once common along the Shweli, with various types of deer around Tagaung. [54] One reason the seasonal pools and lakes are vital is that the water flowing down from Thaung Hwet Taung is high in sulphur and not potable. Other natural resources are seen on the mountain to the northeast, the Tagaung Taung or *In-net* ('*black*-in'). These include some mined at present, such as manganese, source of the black waters, and others exploited in the past, notably *Kyauk Sein* a green chalcedony used for polished stone beads.

Fig. 10a-c Tagaung pit TG31 (Courtesy Chit San Win)



[50] Ashin Pandita (U Min Han), pers.comm. 30.03.06

[51] Tun Aung Chain 2005:9

[52] Win Maung (Tampawaddy) has documented three stone walls around the Ton Ngeh hill, the purported founding site of the legendary Abhiraja. During survey at Ton Ngeh, San Win recorded one section of a ceremonial stone ring of a type found at Halin. The reconstructed ring would have measured *circa* 14 cm in diameter with an inner hole of 5 cm and 1 cm thick on the inner rim. The find is of note in that to date, many of the bronze artefacts such as *kye doke* or 'bronze packets' that are typical in the Samon-Halin sphere have not been recovered at Tagaung. However, ongoing excavation at Tagaung may change this profile (San Win 1997).

[53] Scott 1961 (Reprint): 51. The traditional location where the blacksmith Maung Tin Deh and his sister were burned by the king of Tagaung, the northwest part of Thaung Hwet Taung, is perhaps linked to the rich iron resources of this mountain.

[54] San Win, pers.comm. August 2006, Scott 1961: 13-14. Deer included Sambur (*Rusa Artistolis*), Barking deer (*Cervulus Aureus*) and Thamin (*Panola Eldi)*.

Fig. 10b Pot 14 cluster TG31 (Courtesy Chit San Win)



Fig. 10c TG31 layers (Courtesy Chit San Win)



Fig. 11a-c Crescent and round tiles, Hsin Hynat SNK1 (Courtesy Chit San Win)



## STAMPED POTS, URNS AND ROOF TILES

The TG31 excavations mentioned earlier recorded finger-marked bricks under the lowest of three levels of urns and pots. Over eighty vessels were recorded, arranged in clusters, generally with several simple egg-shaped urns with lids surrounded by other pottery. All the clusters are slightly different, but the contents of only three vessels checked. One of these, pot 14, contained a complete skeleton and had a bronze lid below the terracotta one. Twenty-five vessels were stamped in single or double rows on the shoulder, motifs including floral and geometric designs as well as zoomorphic depictions such as birds and a human figure flanked by an elephant and a bull. Other finds were shells, copper and bronze bells, bracelets, rings, lids, swords and a spoon; iron bracelets, brackets and rivets; and gold and silver artefacts. There were also beads made of terracotta, bone and various semi-precious stones with drum and cylinder shapes.[55]

South of TG31 near the Shwezigon and Leh-myet-hna stupas within Wall 2, many votive tablets attributed to Anawrahta have been unearthed. A further group of fifty round tablets have been found, many 1.5 metres below ground level.[56] The tablets are 4-6 cm in diameter, many with thumb prints on the reverse. All depict a single figure of the Buddha in *Bhumisparsa* mudra but are divided into three groups according to the surrounding motifs: tablets with an oval halo, *takeh* or throne back and up to eight stupas; tablets where the surround is filled with the *gamon,* an aromatic tuber of the ginger (*Kaempferia*) family known for its medicinal properties; and those with two small stupas and two enclosing lines, the outer marked by *beindu* dots.[57]

Fig.12a-c Votive tablets from Tagaung



Other stamped vessels similar to those from TG31, terracotta roof tiles and end-pieces and finger-marked bricks have been documented at Hsin Hnyat Kon, 3.5 km south of Tagaung's outer wall.[58] In 2000, the Department

[55] Chit San Win 2005

[56] Pandita Nanda (Tagaung), pers.comm. July 2006

[57] Pandita Nanda (Tagaung) 2006; One tablet of the second type is illustrated in U Mya, dated to the 11th century AD (1960: Vol.1: p. 50, Pl. 67) although the *in situ* finds by Pandita Nanda, the image of the Buddha and the surrounding motifs may indicate an earlier date.

[58] Chit San Win 2004. The name of the site literally means the place where the elephants are clamped.The Hsin Hynat (SNK1) and TG31 finds appear linked, although more excavation is needed to clarify this as SNK1 unearthed an aboveground structure and TG31 was below ground level.

of Archaeology carried out excavation of one of a number of mounds at Hsin Hynat (SNK1). An outer (14 metre square) and inner (6 meter square) brick structure was unearthed. The tiles, with textile impressions on the convex side, were of two types, tentatively called Type A and B by Win Maung (Tampawaddy). Type A tiles were slightly curved roughly quarter sections, while Type B tiles were semi-circular with a smaller diameter. There were likewise two types of end-pieces: crescent with a slightly curved top and round. The crescent-shaped pieces are *circa* 15-20 cm height and 21-26 cm width and 1-1.5 cm. They are divided into two sections by a central vertical band, each with a tri-lobed festoon in the middle.[59] Each triangular side is bordered by a series of small raised dots, in many cases twenty-seven, totalling fifty-four.[60] The circular end-pieces (*circa* 13-20 cm in diameter) have a deeply inset face into a rim (*circa* 1-3 cm wide). These are often thicker than the triangular pieces, *circa* 1-4.5 cm. They bear sun-like rays, usually 10-15, in one case with five thicker lotus shaped designs and ten narrower rays tipped with circular raised dots arrayed around a central raised circular spot.

The use of the tiles and end-pieces may have been similar to that seen at Tra-kieu and Go Cam, central Vietnam. The Tra-kieu pieces differ, some for instance, decorated with large faces. Southworth has compared these to examples from southern China, suggesting a 3rd century date for tiles with faces. The tiles found at Go Cam were of two types, with quarter-section slightly curved tiles thought to have been put with the concave side facing up across lateral roofing beams and the narrower, half-cylindrical tiles placed with the concave side down to cover the gaps between the square tiles below. The finds are interpreted by Southworth in the context of raids of the Qin Emperor, Qin Shi Haungdi against southern 'barbarians' in 221 BC. After the fall of the Qin in 206 BC, there was continued fluctuatation between Chinese commanderies and local rule.[61] Tribute missions from Myanmar to the Emperor Wu (140-86 BC) were long ago proposed by Luce, ones bringing bright pearls, vitreous objects and rare stones.[62] Battles with the Chinese are traditionally thought to have been fought at Allakappa (Kosambi or locally Ywapugyi) sometimes located midway between Tagaung and Bagan.[63] In 225 AD, the Wei general Chu-ko-liang is said to have had bronze drums made to place in "torrents along the path of the savages [of areas including Yunnan], arranging them in such a way that the water, as it fell, struck them at regular intervals. The barbarians, thinking, they heard the watch-drums of a camp, dared not to approach". [64] To what degree we can extrapolate accounts such as these, indeed if are accurate, can be queried, but as with Vietnam and the Han expansion into the Dian region, an analogous context is plausible for Tagaung.[65]

A few other tiles have been noted elsewhere in Myanmar. For instance, crescent roof tiles have been found at Sriksetra near to Khin Mu Chon Kon where a terracotta tile with an equestrian figure had earlier been documented. This is similar to the Hsin Hynat pieces but rather than having a tri-lobed floral *pan-sweh* is filled with a curvilinear *kanok* or floral pattern.[66] Additional roof tiles have been noted at Tayoke Myo on the northwest side of Inle Lake. Other first millennium finds near the lake are seen at Bodhithat, including finger-marked bricks, silver coins and quartz beads. All are surface finds, without the large numbers of tiles found at Hsin Hynat-Tagaung. The Department of Archaeology has documented sections of roofing tiles in the north part of Halin.[67] It is not known whether these are the Tagaung curved type or a second, flatter type recorded in the upper layers of a sequence dating to the 9th to 14th century AD that have been excavated at Yon Hlut and Otein Taung at Bagan.[68]

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[59] Chit San Win 2004: 165-166

[60] Pandita Nanda (Tagaung), pers.comm. July 2006

[61] Southworth 2004: 214

[62] Luce 1924

[63] Hudson 2004:31, *Myo ywa nehbeh thamaing* N. D. Typewritten manuscript

[64] Luce 1924: 196 with Chu-ko-liang (181-234 AD). Tagaung is sometimes taken to mean 'drum ferry'.

[65] Kyaw Zin citing Luce 1924

[66] Chit San Win 2004: 172

[67] San Shwe, pers.comm. 04.09.06; noted by Myint Soe Aung, possibly in 1998-2000 during excavation of a gate (HL21) and two brick structures (HL22 and HL23) just inside the north wall.

[68] Hudson 2002: 16, Figure 2.7, 2004: 208

The Hsin Hnyat (SNK1) platform may have had a circular brick superstructure or alternatively, a wooden one with a terracotta roof. Based on 6th to 7th century AD corbelled brick structures with stepped roofs recorded in Cambodia, Win Maung (Tampawaddy) has suggested that the SNK1 structure may have born a two-tiered central wooden structure of uncertain ritual affiliation supporting a terracotta roof with the decorated end tiles. Other options are suggested by early Han two-storey halls which could be built around an earth core, with walls a combination of timber, pounded earth or mud brick.[69] The most common parallels made for the stupa-like buildings are to Taxila and Nagarjunakonda.[70] Wooden structures also existed at Beikthano and Halin but these are rectangular halls and roof tiles were not documented. Beikthano's four radiocarbon dates come from the wooden pillars of two such buildings. [71] Although an underlying structure was recorded at both sites, neither was fully excavated. At Halin a large rectangular hall also provided a radiocarbon date.[72]

Aung Thaw called these 'congregation building[s] for the performance of rituals connected with the secondary burial of urns', while San Shwe uses 'funeral homes' and suggested that they may have been for ordination or for habitation. Stargardt has labelled this type of structure 'pre-Buddhist' based on the pillared form of the building, the placement of urns around the base of the pillars and the use of cremation burials in Iron Age contexts in Southeast Asia.[73] At Nagarajunakonda and Amaravati, however, new Buddhist communities literally and figuratively built upon previous practice. It was thus customary to bury monks within stupa complexes and erect stupas for monks of the local community. [74] One of the authors has elsewhere suggested – which may also be relevant for Tagaung - that the term 'pre-Buddhist' defines a separation that was perhaps not the case.[75] However, the Chinese rather than Indian parallels for the architecture hint at varied links where the balance and chronology remains to be clarified.

In our view, Tagaung is best described as a string of sites along the Ayeyarwaddy, some of which are walled. The Tagaung region had ores and agricultural potential as well as abundant floral and faunal resources. As a port, the site and villages to the south were not only way stations for goods from other regions, but had a number of profitable local trade products. This natural setting is of particular importance in understanding complementary upland-lowland ecology that underlies Tagaung's economic longevity and perhaps its place in local histories. More recent finds suggest multiple routes for the transmission of style in the wake of both political and religious change.

## CONCLUSION

The precise date when the first walled communities were constructed in Myanmar remains open. Our aim here has not been to fix the moment but underline the process, for institutional settings and social forces - the 'habitus' - were in transition. The vital role of the landscape in this transformation is essential to see if we are to understand these changes. The process took place gradually, with parallel developments throughout the country. Migration was not only along the Ayeyarwaddy, but the Chindwin, Mu, Samon, Thanlwin and Sittaung. There is also every reason to think that the limestone caves of the eastern and southern regions were inhabited by at least the Neolithic. By the end of the first millennium BC and early centuries AD, one or another of the valley cultures came to dominate. We have highlighted the direct correspondence of these cultures to an unpredictable profile of rivers,

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[69] Thorp 1986: 361, 368-369

[70] Examples include Beikthano (KKG4, 6, 12, 14, 18, 24), Halin (HL5, 12, 14, 15) and Maingmaw (Pinle) (Nos 7 and 8), San Shwe 2006.

[71] KKG9 near to the *In-gyi* south of the palace-citadel with dates of 180 BC - 260 AD and 100 BC - 390 AD. KKG11 with two dates of 80 - 540 AD and 210-610 AD near the north wall.

[72] HL9, 11.4 x 36 m; NZ894. The date came from a charred wooden post 1.07 metres below ground level that calibrates to 560-780 AD (1370 ± 59). The structure had a brick platform with traces of 84 wooden pillars, each about 304 cm in circumference, set out in four parallel rows. Urns were recovered from both inside and outside the building.

[73] Aung Thaw 1968: 22, San Shwe 2006, Stargardt 1995: 171

[74] Schopen 1997: 193,375; 2004: 363

[75] Moore 2007, Stargardt 1990

streams, creeks, ponds and lakes, for such changes constantly informed reinterpretation of social and religious structures.

From streams at Halin to the Ayeyarwaddy at Tagaung and the arid Samon valley, we stress the diverse ecological modifications that have affected archaeological interpretation. Other equally varied examples are found along the Ayeyarwaddy and Chindwin, the Mu, Samon, Myit Nge (Dotawaddy), Sittaung, Lower Thanlwin and Dawei rivers. The landscape was one where desiccated ponds, meandering streams and new river courses were a matter of course. The unpredictability was normal and corresponding amendments were made to walls, weirs and stockades. Adjustments were never the same and were never completed. Rather than the world being an object of human interest, man dwelled *in* the world – a world not of *homoeostatic equilibrium* but an "active, perceptual engagement with components of the dwelt-in world, in the practical business of life."[76]

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[76] Ingold 1995: 40

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| Region | Valley | | From | Village 1 | Find 1 | To | Village 2 | Find 2 |
|---|---|---|---|---|---|---|---|---|
| I | **Upper Ayeyarwaddy** | 22-28 x 96-98 | Myitsone (Me Hka and Mali Hka) | Hsin Bo, south of Bhamo | Bronze drum | Mandalay | Yan Bo, East of Tagaung | solid bronze axe |
| II | **Mid Ayeyarwaddy** | 20-22 x 94-97 | Mandalay | Khabo; Yankin Hill (Yedaga guu-taung); Madaya; Taw Zu | Stone rings; Bronze drums (whole and fragments) | south of Magwe | Letpanchibaw; Letpanwa, Beikthano | Neolithic tool; bronze bracelet with faces and bronze image Buddha |
| III | **Lower Ayeyarwaddy** | 16-20 x 94-97 | Let Pan (south of Magwe) | Taungdwingyi | silver coins; polished beads | Letpandan | Sriksetra | Neolithic tools, gold Pali-inscribe plates |
| IV | **Upper Chindwin** | 23-26 x 94-95 | Upper Homalin | Homalin | Neolithic tools | Kalehwa (Junction Myittha River) | Kalehwa (wall) | Neolithic tools |
| V | **Lower Chindwin** | 21-23 x 94-95 | Myittha River | Nyaunggan | Neolithic and bronze tools | Myingyan | Myotha | 'megalithic' finds |
| VI | **Mu River** | 22-24 x 95-96 | Taung Thone Lone | Keba | Silver coins with narrow-base Bhadapitha and Rising Sun motifs seen at Maingmaw, Beinnaka, Pindaya | Myin Mu | Halin; Myin Mu | Neolithic, bronze (Halin); gold Makara bracelet (Myin Mu) |
| VII | **Samon River** | 19-22 x 95-97 | Yamethin | Myo Hla, 15 walled city sites; Louk Sauk | bronze-iron artefacts from 36 village sites | Tada U | 11 Ledwin o Kyaukse | *Kye doke*, 'mother-goddess'; blue glass rings |
| VIII | **Myit Nge (Dhotawaddy)** | 22-23 x 96-98 | Muse | Kyaukme region east of Mandalay | bronze axe, green quartz and red carnelian beads, bronze pottery | west of Inwa (Ava) | Taungthaman | Neolithic tools, iron |
| IX | **Sit Taung River** | 17-20 x 96-97 | Pyinmana | Tatkon | Kye Doke; polished stone beads | Gulf of Muttama (Martaban) | Kyaikkatha; Hpyuu | Neolithic tools, silver coins; bronze Buddha images |
| X | **Lower Than Lwin Muttama** | 17-19 x 97-98 | northern part of Pyinmana | Phyuu | bronze-iron artefacts | Mawlamyaing (Mottama) | Kelasa, Winka | Neolithic tools, terracotta plaques; zoomorphic beads |
| XI | **In Lay Lake and Bilu Chaung** | 21 x 97 | Taunggyi | Tayoke Myo and Bodhithat north side of Inle; Nam Pelu, Nam Paung on Bilu Chaung | Pyu' roof tiles; walled site, finger-marked bricks | Loikaw | Ramawadi south of Inle | quartz beads, silver coins |
| XII | **Kissapanadi (Kaladan) River** | 20-21 x 92-93 | Munhdaung, Kyaukdaw | Dhannyawadi | silver coins | Sittwe | silver coins | Wethali |
| XIII | **Dawei River** | 13-14 x 98 | Dawei | Thagara | Neolithic tools, bronze image Buddha | Thayetchaung | Neolithic tools | Thayetchaung |
| XIV | **Delta Region Kanbe, Twante** | 16 x 96-97 | Syriam | Kanbe, Twante | bronze image Buddha | Gulf of Muttama | Kyauktan, Padagyi | Laterite sculptures |
| XV | **Extreme North (Me Hka and Mali Hka)** | 25-28 x 96-97 | Moe kaung | | Neolithic tools | Myikyina | Beads, gold | Maru, Azi, Lashi, Rawan, Phun - later migrated tribes |