

The Origins of Bagan.

The archaeological landscape of Upper Burma
to AD 1300.



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**A thesis submitted in fulfilment of requirements for admission to the degree
of Doctor of Philosophy.**

Statement.

This thesis contains no material which has been used in any other submission to any university or institution for the award of any other degree or diploma. The research involved no human or animal experimentation. To the best of my knowledge the thesis contains no material previously published or written by another person except where due reference is made in the text. Any joint research related to any material in this thesis is explained and acknowledged in the foreword and in the body of the text.

.....

Abstract.

The archaeological landscape of Upper Burma from the middle of the first millennium BC to the Bagan period in the 13th-14th century AD is a landscape of continuity. Finds of polished stone and bronze artifacts suggest the existence of early metal-using cultures in the Chindwin and Samon River Valleys, and along parts of the Ayeyarwady plain. Increasing technological and settlement complexity in the Samon Valley suggests that a distinctive culture whose agricultural and trade success can be read in the archaeological record of the Late Prehistoric period developed there. The appearance of the early urban “Pyu” system of walled central places during the early first millennium AD seems to have involved a spread of agricultural and management skills and population from the Samon. The leaders of the urban centres adopted Indic symbols and Sanskrit modes of kingship to enhance and extend their authority. The early urban system was subject over time to a range of stresses including siltation of water systems, external disruption and social changes as Buddhist notions of leadership eclipsed Brahmanical ones. The archaeological evidence indicates that a settlement was forming at Bagan during the last centuries of the first millennium AD. By the mid 11th century Bagan began to dominate Upper Burma, and the region began a transition from a system of largely autonomous city states to a centralised kingdom. Inscriptions of the 11th to 13th centuries indicate that as the Bagan Empire expanded it subsumed the agricultural lands that had been developed by the Pyu.

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Charts and electronic data CD-ROM.

A sleeve inside the back cover of this volume contains a CD-ROM and seven charts. On the CD, the folder called **Databases** contains two text files that can be opened in any mapping program such as MapInfo or ArcGIS, or in a spreadsheet program such as Excel.

bagan.txt is based on *Inventory of Monuments at Pagan* (Pichard 1992-2002) with extra data and modifications (as outlined in Chapter 7). **myanmar.txt** is the complete *Myanmar Archaeological Settlement Database*.

Chart 1 Early Urban sites, walled sites, and the proposed Pyu homeland.

Chart 2 The extent of the Bagan Empire in relation to the Early Urban sites.

Chart 3 Otein Taung: section and samples of excavation material, eastern mound.

Chart 4 Otein Taung: section and samples of excavation material, western mound.

Chart 5 Archaeological excavations within the walled city at Bagan.

Chart 6 The 2003 excavation at “Old Bagan”, site plan.

Chart 7 Bagan up to the 14th century AD.

Foreword.

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This study grew out of a GIS (Geographical Information Systems) spatial analysis project, for which Pierre Pichard of L’Ecole Française d’Extrême-Orient generously provided some then-unpublished data from the *Inventory of Monuments at Pagan*, which effectively made all the archaeological data from this monumental work available for study. M. Pichard also kindly sent copies of his UNESCO survey maps, and back issues of the *Pagan Newsletter*, which had previously been unavailable in Australia.

In Myanmar, my thanks go to U Nyunt Han, Director General of Archaeology, and to U Aung Kyaing, Assistant Director-General for Upper Myanmar, based at Bagan, for their continuing encouragement of my research. This has included permission to initiate and conduct excavations in conjunction with local colleagues, to photograph artifacts in the Bagan museum and to use an archaeology department office for storage and analysis of artifacts. Their hospitality and professional courtesy is greatly appreciated. My longtime partner in fieldwork and academic publication, U Nyein Lwin, contributed from his background both as an anthropologist and an archaeologist to these investigations. My digital site plans for the excavations at Yon Hlut Kyun, Otein Taung, Zi-o, Bagan 2003 and Letpanywa were compiled with the aid of his field drawings. My other major collaborator, both in print and in field survey, U “Tanpawady” Win Maung, gave unstinting access to his collection of site data, to his field notes, and to his private collection of artifacts. He arranged field trips and provided drawings of coins, bricks and other materials. The generosity of Win Maung to fellow scholars and his enthusiasm for all aspects of research into early Myanmar is well known in his own country (Khin Maung Nyunt 2002: 226) and is a byword among Burma scholars around the world. Terrence Tan was an active participant in some of the field trips, and provided much information in his specialist field of early jewellery. U Nyo Win, the curator at Halin, opened his home to our study group, and U Tin Thaung of Pyawbwe was an equally generous host during our survey of Pyawbwe township. I have benefited from personal discussions with two of the greats of Myanmar archaeology, U Myint Aung and U Aung Myint. Thanks also to Daw Khin Hla Han, U San Win, U Sein Myint and other members of the Universities Historical Research Centre in Yangon.

In the field, I would like to acknowledge the contributions of Tessa Boermah and Emma Hetherington who spent part of the February-March 1999 excavation season at Yon Hlut Kyun. Don Tindale, Ted Robinson and Jordan Robinson worked on my excavations in February-March 2000. Phillippa Weaver worked on excavation and recording of data at Otein Taung in December-January 2000-2001. Ma Onhmar Aung of the Bagan Museum drew the potsherd samples on Charts 3 and 4, assisted by Ma Shwe Shwe Win and Phillippa Weaver. U Thaug Lwin, of Bagan, provided Burmese to English translations of several previously untranslated documents, including the *parabaik* that appears in the appendix. Other translations, either in full or in precis, of Burmese language documents including archaeological reports and pagoda histories, were provided by Nyein Lwin and Win Maung. The field archaeology would not have been possible without my core crew of excavators, U San Ke, U Nyunt Aung, U Kan Myint, Bo Kyin, Aung-Naing, Shwe-oo and Myint-oo. Special thanks goes to archaeology department officers and other local informants at sites including Bagan and its hinterland, Salay, Shinbinsakjou, Letpanchibaw, Pakhangyi, Mandalay, Amarapura, Sagaing, Twante, Pindaya, Beikthano, Sriksetra (Thayekittaya), Halin, Allagappa, Maingmaw and the Samon and Panlaung Valley areas where much of the original data for this thesis was collected. Abbots and monks, museum staff, antique dealers, village elders, amateur antiquarians, farmers and “treasure-hunters” all enthusiastically shared information and ideas.

Roland Fletcher’s commitment of time, energy and ideas as supervisor of my thesis at the University of Sydney was both inspiring and challenging. It is significant that after digressions on my part that I have been assured often tend to accompany the early stages of a thesis, the thrust of the research came firmly back within the framework of study that Roland had initially suggested. Co-supervisor Mike Barbetti provided advice on the interpretation of radiocarbon dates, suggested essential research directions, and was constantly encouraging. The computer component has been aided greatly by advice from Ian Johnson and Andrew Wilson of the Archaeological Computing Laboratory/Spatial Science Innovation Unit. Formal seminar presentations of my research design to the Archaeology Department at the University of Sydney brought a wealth of useful suggestions, and I have benefited from informal discussions with Penelope Allison, Alison Betts, John Clegg and fellow postgraduates. Pamela Gutman has been a regular source of information, encouragement and proposals for avenues of research, and has supplied copies of aerial photographs of Bagan and the other major urban sites for stereoscopic analysis. She also kindly authorised my use in this thesis of unpublished thermoluminescence dates she had commissioned for a past project (see Appendix, page 281). David Price of the University of Wollongong supplied the thermoluminescence data from his laboratory files.

Access to resources has been greatly helped by the staff at Fisher Library at the University of Sydney, notably the team at the inter-library loans department, and also the staff at the library of the Archaeology Department in Yangon. Inch-to-the-mile maps supplied by the University of Western Australia were invaluable. I have had the benefit of regular correspondence and a field trip to Arakan with Michael Aung-Thwin, of the University of Hawai’i. I am particularly grateful to him for providing a manuscript copy of his forthcoming book, *The Mists of Ramanna*, which has been a vital theoretical source. Shah Alam Mohammed Zaini, who has been researching early Sriksetra, has been a regular correspondent, a source of data and ideas and a participant in field trips to the Bagan hinterland. I have also had the benefit of exchanging and comparing site data with Ernelle Berliet, a fellow PhD candidate working on early Myanmar urbanism. Dietrich Mahlo shared his extensive knowledge of coins as we undertook field trips together to Maingmaw and some of the more obscure corners of Bagan. Janice Stargardt, Don Stadtner, Elizabeth Moore and Guy Lubeigt have regularly exchanged ideas with me by e-mail and at conferences. During the final stages of thesis preparation, Elizabeth Moore kindly read and commented in detail on a draft

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Field survey, excavations and database construction.

The research for this thesis began in 1998, after I had completed my B. A. (Honours) thesis which was essentially an analysis of the data from the *Inventory of Monuments at Pagan* (Pichard 1992-2002) using maps, aerial photographs, and field survey. This had involved using MapInfo, a computer-based GIS (Geographical Information Systems) method of creating analytical tools, including maps or graphs, from a relational database. During field trips I initiated the excavation of three sites in conjunction with colleagues from the Archaeology Department at Bagan, and was invited to participate in a fourth excavation. These were

- Yon Hlut Kyun, which resulted in the discovery of a rectangular brick compound and associated structural ruins in the eastern hinterland of Bagan (Hudson & Nyein Lwin 1999; Hudson, Nyein Lwin & Win Maung 2002; Hudson 2003b),
- Otein Taung, where a pottery production site within the Bagan monument zone was characterised and dated, and identified as having been active from the 9th century AD (Hudson, Nyein Lwin & Win Maung 2001), and
- Zi-o, where a furnace for producing bloom iron in an area that contained the remains of hundreds of furnaces was identified and studied structurally.
- In 2003, I was invited by the Bagan Archaeology Department to join in the excavation of a complex of structures within the walled centre of Bagan. My role included the production and analysis of a digital plan, and artifact analysis. The latter two excavations, hitherto unpublished, are dealt with in this thesis.

As my interest in the broader issues of the origins of Bagan grew, and I began to explore the notion that the history of the city was interwoven with earlier urban sites, some of which showed evidence of continuity from Late Prehistoric predecessors (Hudson 2001b, 2003c; Gutman & Hudson 2004), I visited the major Pyu sites of Halin, Maingmaw (Mongmao), Beikthano and Sriksetra, and a number of pre-urban cemetery sites in the Samon Valley, as well as conducting field surveys in the hinterland of Bagan, the Panlaung Valley, western Shan State and the lower Mu/Chindwin area. The major research tool for work in the macro scale, looking at sites within the Upper Burma region, and into neighbouring areas where appropriate, is an archaeological settlement database (Hudson 2001a, 2002), while the database used in my BA (Hons) thesis (Hudson 1997) has been

refined and expanded for analytical work at Bagan (see Electronic Data CD-ROM). Database compilation is discussed in detail in Appendix 1 (page 266).

Terminology.

There is no intention in this thesis either to use terminology that supports any political ideology, or conversely, to offend adherents of particular views on usage, although there is always the risk that in trying to please all, one ends up pleasing none. Myanmar and Burma, the country's current and historical names, are generally used here relative to references in which the terms appear, as are all names that refer to documentary sources. Recent changes to placenames in Myanmar, which reflect an old tradition of multiple naming, renaming (Maung 1956) or duplicate naming, perhaps in Pali or Sanskrit as well as indigenous languages (ASB 1917 p.35), are dealt with by initially quoting both (or several) names, but relying in the main on the names that are most familiar from academic literature and/or maps. Some recently changed names that have become common international currency will be used in their new form. Bagan will generally be used instead of Pagan. The Burmese letter used to spell this word appears to transliterate more as a *B* than a *P*, and it is useful to distinguish the placename from the English word "pagan". Similarly, using Yangon for Rangoon reflects the phonetic shift from *r* to *y* that is seen in a number of Burmese words. The shift from *Mranma* to *Myanma* is another instance.

Calendrical systems.

Dates for early Burma derive from several calendars, and all have been converted here to years BC or AD. Original dates may come from:

- The Buddhist or *sasana* (religion) calendar, which starts in 544 BC, the year in which Buddha is believed to have died.
- The **Saka** calendar of Gandhara, which starts in AD 78. This is called the *dodorasa* era in Myanmar, a mnemonic for 622, the number of years deducted in the *sasana* year 624 to introduce the new era, which for astrological/numerological reasons meant the era began in the year 2.
- The calendar of the North Indian **Gupta** dynastic era (c. AD 319-550), beginning in AD 319.
- The Burmese **Myanmar Era** calendar which starts in AD 638. This is known as the *khachapanca* era, a mnemonic for 560, as it was supposedly introduced by eliminating 560 years from the Saka era in AD 640 so the new era would begin, as had the *dodorasa*, in the year 2 (ASB 1911: 16, 1915: 20; Maung Hla 1923: 84).

There is also what some Burmese sources call the "short" era, commencing in 798 of the Myanmar Era, or AD 1436, which was used as a mode of reckoning in the 15th and 16th centuries. This has recently been dubbed the "Mohnyin Era", which refers to a traditional story surrounding the adoption of the calendar (Eade 1995: 17). The English translators of the *Glass Palace Chronicle* (see page 24) at times used the term "short era", somewhat confusingly, for what appears to be the Saka (Gandhara) calendar. They describe the founding of the first royal residence near Bagan as occurring "in the year 29, Short Era", or AD 107 (Pe Maung Tin & Luce 1923: 28). The calendric eras commencing in AD 78 and AD 638 were used in Thailand, where they were known as the Mahasakaraja (Greater Era) and the Culasakaraja (Lesser Era) respectively (Wyatt 1976: 113). Culasakaraja is abbreviated to "sak" in "virtually all inscriptions of Pagan" (Aung-Thwin 2004

Chapter 8). The Gandharan Saka era remained standard in the Cambodian record, and is still in use in Sri Lanka where, for example, the program for the AD 2003 Kandy Esala Perahera festival was dated 2547 Buddhist Era and 1925 Saka Era (Neranjana Priyadharshana Dullewa Wijeyeratne 2003). The Mahasakaraja (Gandhara) calendar was effectively replaced in Burma and Thailand after the adoption of the Myanmar-Culasakaraja era. The south-east Asian calendrical system was a powerful and effective tool for recording historical events and predicting seasonal or astronomical cycles, and has at times provided valuable information on days and dates in inscriptions (Eade 1994: 1-19; Than Tun 2003a). The Myanmar calendar was part of a regional system of calendars for which Indian or Indianised astronomer/astrologers have generally been given the credit (Soni 1955: 58-70).

Radiocarbon dating conventions.

Radiocarbon dates, in which the base year of 1950 is taken as “present”, are quoted as “years BP ± error”, and then converted to a calibrated (cal) range of years AD (or BC) using current calibration data. The calibration program used is *OxCal* 3.9 (Bronk Ramsey 1995, 2001, 2002) and the calibration data is from INTCAL 98 (Stuiver, Reimer, Bard *et al.* 1998). Radiocarbon dates from Myanmar, including those for my own samples, have been recalibrated for this thesis using current calibration data, but the original laboratory dates and references are also provided.

Technical notes.

This thesis was produced using Microsoft Office 2003, the bibliographical program Endnote 7, and the GIS program MapInfo 7 on computers using Windows XP Professional. The location of archaeological sites is given in decimal longitude and latitude, the conventional form for GIS. Longitude and latitude of sites mentioned in the text is provided in an appendix (page 271) and in files on the accompanying CD-ROM. Sites at Bagan are located on the metric survey grid that was established for the *Inventories of Monuments at Pagan* (Pichard 1992-2002). Buildings at Bagan are described by their traditional names with transliterated English spellings according to the *Inventories*, and the *Inventories* number is given in parentheses. All measurements are metric unless specifically quoting imperial or traditional measurements from early documents. Photographs and drawings use a centimetre scale. Larger views may be shown against a one-metre ruler or a metric ranging post. All illustrations, maps and photographs are by the author unless credited otherwise.

Title page credits.

The three repoussé bronze artifacts on the title page, from left to right, are a Late Prehistoric coffin decoration from the Samon Valley (now in the Win Maung collection), a figure from the Pyu-era Khin Ba reliquary at Sriksetra (from Luce 1985) and a gilded Buddhist votary plaque of the Bagan period (now in the Bagan museum).