

**BUILDING MATERIALS AND STRUCTURAL  
FOUNDATIONS IN THE BUJANG VALLEY AND  
COMPARISONS WITH FOUR REGIONAL  
SETTLEMENTS**

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by

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## GLOSSARY

Acephalous	Mixed
Ad hoc	Done when necessary
Ambiguous	Open to interpretation
Apocryphal	Statement of doubtful authenticity
Argumentum ex silentio	Argument based on the failure of written text to mention something
Arikamedu Rouletted Ware	Type of ancient ceramic from Arikamedu, India
Autochthonous	Local or indigenous
Bali-pitha	A pedestal where food offerings are made in a Hindu temple
Basement	Floors of a building that are below ground level
Brickbats	Fragments of brick
Bukit	Malay word for hill
Candi	Javanese temple
Chattra	Parasol or umbrella
Coeval	Contemporary
Conjecture	Open to interpretation
Copious	Plentiful or abundant
Corpus	Collection of written texts
En bloc	Collectively
En masse	Together
Exponential	Becoming more and more rapid
Equivocal	Open to more than one meaning
Fluvial	Caused by actions of a river

Frieze	A horizontal band of sculpted decoration
Garbhagriha	Inner sanctum of a Hindu temple
Gunung	Malay word for mountain
Imbided	Absorbed
In situ	At that particular location
Interregnum	A period between two events
Ko	Thai word for island
Lacuna	An unfilled space or a gap
Ladang	Malay word for plantation
Lingam	A phallic object symbolising the Hindu God, Siva
Lintel	A horizontal support above a door or window
Maenam	Thai word for river
Malleable	Easily shaped
Mandapa	Pillared outdoor hall of a Hindu temple
Mausoleum	An elaborate building housing a tomb
Meru	Balinese temple
Nominal	Very small
Pedestal	The base of a statue, obelisk or column
Percolated	Filtered
Peripatetic	Given to movement
Pile-dwellings	Stilt houses
Plaster	A mixture of sand, cement, lime and water use in construction
Plinth	A heavy base supporting a statue or column
Postulate	Proposed

Prefabricate	Manufacturing a material into something suitable for construction
Promulgated	Promote or make widely known
Quadrant	Each of four quarters of a circle
Sedimentation	The process of being deposited as sediment
Shear strength	Strength of a material or component against the type of yield or structural failure when the material or component fails in shear
Simultaneous	At the same time
Snanadroni	An ablution slab with a beak in a Hindu temple
Spasmodic	Done in brief, irregular bursts
Sporadic	Occuring at irregular intervals
Status quo	The existing state of affairs
Stucco	Fine plaster used for coating wall surfaces
Stupa	A dome shaped building erected as a Buddhist shrine
Sungai	Malay word for river or stream
Superficial	Existing or occurring on the surface
Surmised	Supposing something is true without evidence to confirm it
Temple deposits	Offerings buried under a temple
Terminus ante quem	Latest possible date for an occurrence
Vestiges	Traces of a ruined structure
Vimana-mandapa	A temple consisting of a vimana and a mandapa
Wattle and daub	A material consisting of a network of interwoven sticks and twigs covered with mud or clay
Yoni	A female reproductive organ representing the Goddess Shakti, worshipped in a Hindu temple

**BAHAN BINAAN DAN SUBSTRUKTUR BANGUNAN DI LEMBAH  
BUJANG DAN PERBANDINGAN DENGAN EMPAT PETEMPATAN  
SERANTAU**

**ABSTRAK**

Tesis ini bertujuan mengkaji bahan binaan dan substruktur bangunan di Lembah Bujang dari 400-1400 M. Lembah Bujang merupakan petempatan proto-sejarah yang memainkan peranan penting dalam perdagangan antarabangsa. Lapan bahan binaan (batu pasir, granit, tanah liat, laterit, batu kerikil, tanah, kayu dan buluh) telah dikaji. Tujuan kajian ini adalah untuk memahami dinamik industri pembinaan dengan mengkaji bahan binaan dan dasar bangunan. Kajian ini juga bertujuan mengkaji peralihan teknologi di antara Lembah Bujang dan empat petempatan pesisiran pantai dari tempoh yang sama untuk menentukan kewujudan gaya pembinaan yang serupa di rantau ini. Data untuk kajian ini diperolehi menerusi kajian lapangan dan juga kajian bahan bertulis termasuk sejarah-sejarah lama Kedah dan juga laporan arkeologi. Kebanyakan data di dalam tesis ini diperolehi daripada bahan bertulis kerana kebanyakan tapak tidak wujud lagi. Kebanyakan bahan binaan kekal digunakan sehingga kurun ke-15 M sahaja dan tidak digunakan selepas kawasan Lembah Bujang berhenti berfungsi sebagai kawasan perdagangan antarabangsa. Kesemua bahan binaan yang dikaji boleh didapati di kawasan Lembah Bujang. Penggunaan batu pasir yang terhad mencadangkan bahawa bahan tersebut mungkin diimport walaupun batu pasir boleh didapati di kawasan kajian. Terdapat dua jenis kawasan memproses bahan binaan, yang pertama memproses bahan binaan untuk struktur yang terdapat di kawasan tersebut sahaja dan yang kedua memproses bahan binaan sebelum menghantar ke tapak binaan. Pemprosesan bahan binaan dilakukan secara kecil sahaja. Oleh kerana terdapat perbezaan antara jenis substruktur

bangunan di Lembah Bujang dan Yarang, Takuapa, Batujaya serta Cibuaya, maka boleh dikatakan bahawa tidak terdapat persamaan di dalam gaya pembinaan dari kawasan selatan Thailand sehingga Jawa, berasaskan dasar bangunan sahaja. Ini menunjukkan bahawa hanya terdapat pertukaran teknologi pembinaan yang terhad antara petempatan yang dikaji.

# **BUILDING MATERIALS AND STRUCTURAL FOUNDATIONS IN THE BUJANG VALLEY AND COMPARISONS WITH FOUR REGIONAL SETTLEMENTS**

## **ABSTRACT**

This thesis explores building materials and foundations in the Bujang Valley throughout the millennium from 400-1400 CE. The Bujang Valley consists of several loosely related proto-historic settlements that played an important role in international trade. Eight building materials (sandstone, granite, clay, laterite, pebbles, earth, wood and bamboo) are analysed. The aim of this study is to understand the dynamics of the construction industry via the study of the building materials used and the foundations of structures. It also aims to trace the spread of technologies between the Bujang Valley and four coastal settlements of the same period in order to determine whether a homogeneous style of construction existed in the region. The data for this research was collected via field trips and the study of literary sources including old histories of Kedah and archaeology reports. The bulk of the data for this research was taken from literary sources, since most of the sites are no longer extant. All of the permanent building materials were used until the 15<sup>th</sup> century CE and stopped once the Bujang Valley area ceased to be an international trading hub. Every building material studied was available in Bujang Valley. However, the limited use of sandstone suggests that sandstone items may have been imported even though sandstone was also available locally. There were two types of processing centres, the first of which processed material for structures on site while the second type may have processed material before sending it to the building site. Most of the processing of building material was on a small-scale. Due to differences in the types of structural foundations in the Bujang Valley and in Yarang, Takuapa, Batujaya and Cibuaya, it can be argued that there was

no homogeneity in the architecture of structures from southern Thailand to Java based on foundations of structures, suggesting limited transfer of technologies between the settlements studied.



## **CHAPTER ONE INTRODUCTION**

The study of ancient structures and their methods of construction is one of many avenues utilised by archaeologists to understand past cultures of populations and consequently the history and background of any given area. This type of study is especially relevant to Southeast Asia. Throughout the first millennium CE and for a substantial part of the next, this region received a profusion of cultural and religious influence from neighbouring lands that helped mould its history and collective identity. These cumulative influences eventually reached full fluorescence in an era broadly defined as the Classical Period which, according to Miksic and Geok (2017) lasted from 600 CE to 1400 CE. This era represents a golden age for Southeast Asian architecture. During this period some of these exotic traits manifested in the architecture of Southeast Asia. This chapter briefly illustrates some of these characteristics and underlines the importance of this study which covers the Bujang Valley, an archaeological area in north-western Peninsular Malaysia. The parameters and objectives of this research are also outlined in this chapter.

### **1.1 Background and significance of study**

The study of building materials and construction in Southeast Asia during the Classical period of her history covers a very wide scope. At present, Southeast Asia contains 11 political entities whose pre-colonial architecture has diverse antecedents and which duly progressed along different trajectories (Miksic & Geok, 2017). This is primarily due to influences from areas further afield in the past, especially South Asia

and the complex geography of the region which in certain locations has facilitated the development of synthesised cultures with foreign input while allowing for totally autochthonous developments to continue unhindered in other parts. The countries of mainland Southeast Asia are Buddhist and were strongly influenced by India in the initial phases of their proto-history (Lall, 2014). On the other hand, the archipelagic countries were also heavily impacted by Indian culture initially but eventually came under the pale of Islam from the 13<sup>th</sup> century CE onwards. Located on the periphery of Southeast Asia and more distant from the major trade routes through the region, the areas that constitute modern-day Timor Leste and the Philippines were largely sidelined from developments taking place in more strategic regions of Southeast Asia during the so called Classical Period. Being Christian in their colonial period, the art and architecture of these countries were influenced by Portugal and Spain respectively (Ooi, 2004; Minahan, 2012). Vietnam, being Buddhist like her immediate neighbours also imbibed Sinic traits, although Indian influences were prevalent in the south at an earlier period (Lall, 2014). It is important to note that the more insular parts of Southeast Asia such as the highlands of Laos and the eastern islands of Indonesia have remained largely unmarked by foreign influence (Miksic & Geok, 2017).

The history of Southeast Asia in this period is hard to study mainly due to the scarcity of local records. It is fortunate in this aspect that records from regions beyond Southeast Asia exist to throw some light on the history of the region during this era. However, the problem does not stop here as these records are vague, linguistically diverse, sporadic and originate from different geographical locations, offering conflicting opinions on most of the places mentioned, leaving latter day historians to ruminate over the precise location of most of these ancient political entities. To

summarise, there is little uniformity in the history of Southeast Asia and there is no ancient indigenous parent civilisation such as the Mesopotamian Civilisation in the Middle East, the Indus Valley Civilisation that covered large parts of India, Pakistan and Afghanistan or the Hwang Ho Civilisation in China that may have provided a base for homogeneity in the architecture of Southeast Asia. The closest to an indigenous civilisation in Southeast Asia is the Ban Chiang culture in Thailand which emerged around 2100 BCE but has preserved little in view of structural remains but is sufficient to suggest that pockets of highly sophisticated societies had already sprung up in the northern part of mainland Southeast Asia which were contemporaneous with more renowned civilisations in other parts of Asia (Schauffler, 1976; White & Hamilton, 2009).

All these reasons make it easier to understand why the study of early Southeast Asian architecture is beset with complexity. Foreign input and local innovation has led to the development of multiple types of construction technologies and architectural styles using varied building materials throughout the length and breadth of Southeast Asia. Nonetheless, not many studies have attempted to encompass the subject of construction and architecture in its entirety although studies that solely deal with individual political entities such as Champa, Angkor and Majapahit exist. Among many other scholars, James Fergusson (1891 and 1899) and Daigoro Chihara (1996) a century later, had both attempted to map out the various architectural styles of Southeast Asia in their respective tomes on the subject. More recently, the subject of construction has been touched upon by Jacques Dumarçay (2005) in his book “Construction Techniques in South and Southeast Asia – A History” as well as in many other publications throughout his career. The scope of his topic is

voluminous but is synthesised by Dumarçay in 91 written pages. Such a short thesis cannot do justice to a subject that encompasses a large and complicated framework without compromising some degree of detail. A study like this can only be taken apart piecemeal. At locations such as Angkor and Borobudur, the study of architectural styles has been made easier by the preservation of the upper parts of the structures. However, at locations such as the Bujang Valley, Yarang, Takuapa, Batujaya and Cibuaya, a very different type of architecture exists, where much of the upper parts of the structures were built using perishable materials. Currently, most of these buildings can only be traced by their foundations.

This thesis focusses on building materials and the foundations of structures, which is especially important given the ruination suffered by the portions of the structures above ground level at all five locations studied. The importance of this study lies in the fact that there are many ancient constructions of mixed organic and non-organic building materials in this region of the world that are prone to deterioration and are lacking an upper portion, the presence of which can only be traced by their foundations, which are usually built of non-organic materials and are consequently less prone to deterioration. It is hoped that this thesis will come in handy by contributing to this study from a local or regional context. To date there is no known study that encompasses all the various types of building materials and structural foundations in the Bujang Valley although papers summarily describing building materials for individual sites do exist. Most studies on construction in the Bujang Valley focus on the use of non-organic materials such as clay bricks, laterite, granite, sandstone, earth and pebbles but rarely touch on the subject of construction using organic materials such as bamboo and wood which is often referred to in local historical sources. All

these materials are studied *en bloc* in this thesis. The study of the use of perishable materials and structural foundations are both novelties of this thesis. This thesis adopts a two-pronged approach to the study of building materials; via historical sources and archaeology. This work is intended to be part of a jigsaw that has already been totally or partially completed in many other parts of Southeast Asia. However due to the historical, political and cultural complexities of this region, the results of this particular study cannot be taken to constitute a microcosm of what may have occurred throughout the greater part of Southeast Asia. This thesis will compare building materials and structural foundations in the Bujang Valley with four coastal or riverine settlements which are Yarang and Takuapa in Thailand, Batujaya and Cibuaya in Indonesia. This study takes a purely qualitative approach.

## **1.2 Defining the Bujang Valley**

The term Bujang Valley was first coined by a team of archaeologists from the Malaysian Museums Department in the 1970s to describe the area covered by an ancient colony or civilisation comprising the northern portion of Seberang Prai in Pulau Pinang and central Kedah (Nik Hassan Shuhaimi, 2008). The name was chosen due to the prevailing view at the time that the main settlement of this political entity was situated at Pengkalan Bujang, near Sungai Bujang. With the discovery of a protohistoric settlement of comparable antiquity at Sungai Mas village near the Sungai Muda in 1980, this term has become geographically inaccurate, but remains popular for convenience. The Bujang Valley was originally defined as having Bukit Choras and Cherok Tok Kun as its northern and southern limits respectively. It is essential to clarify that the term “Bujang Valley” is not an official name for any region

or district in Malaysia, and as such, does not have a fixed political boundary. Neither is it a toponym. Instead, it is a generic term and within limits can be redefined by any researcher for their own convenience. This fluidity will be made use of when defining the Bujang Valley for this research. For instance Jane Allen (1988) in her seminal thesis on the Bujang Valley defined the limits of her study area from Gunung Jerai southwards to Sungai Muda. The Bujang Valley consists of concentrated settlements at Pengkalan Bujang, Sungai Mas, Kampung Sireh and Tambang Simpor (Allen, 1988).

### **1.3 Archaeology and literature on the Bujang Valley**

At an unspecified time between 1821 and 1834, a manuscript entitled *Hikayat Merong Mahawangsa*, narrating the ancient history of Kedah passed into the hands of the British from the exiled Sultan of Kedah, Sultan Ahmad Tajuddin (Mozzafari-Falarti, 2009). This ruler had fled his domain with thousands of his subjects due to an invasion in 1821 by Kedah's northern neighbour and constant aggressor, Siam. Penang, which had been a British trading post since 1786 provided a safe haven from Siamese aggression and seemed the logical destination for the stricken monarch. The Siamese, wary of offending the British and having achieved their objective of conquering the state with minimal effort, thought it wise not to pursue the fleeing king into British territory.

Sometime in the aforementioned period, this manuscript found its way into the hands of a certain James Low, possibly even from the hand of the Sultan himself. Low, besides being a member of the British ruling aristocracy in Penang, was also an

intrepid historian and geographer. He took an immediate interest in the manuscript. This interest set Low off on a hunt for the ancient kingdom that was mentioned in the manuscript, believing it to be located in the region immediately beyond the northern border of Province Wellesley, which at the time formed the upper periphery of British territory on the Malay Peninsula. By the end of the 1840s, he had made various discoveries on the slopes of “Mountain Jerrei” which he believed were remnants of the ancient kingdom referred to in the annals. At a later period, more discoveries were made in regions to the north of Gunung Jerai, at Bukit Choras and also within the boundaries of British territory at Cheruk Tok Kun. Ironically, after almost two centuries and numerous excavations later, Low’s discoveries still mark the northernmost and southernmost extent of the Bujang Valley, as all the discoveries since have been made between Cheruk Tok Kun in the south and Bukit Choras in the north, primarily in the region between Gunung Jerai and Sungai Muda. His contributions marked the beginning of archaeology in Kedah. Low would eventually become the first person to translate the aforesaid manuscript into English, which he proceeded to publish in the *Journal of the Indian Archipelago and Eastern Asia*. He aptly named it the *Keddah Annals* (Low, 1849b). Today, it remains one of the few local sources on the history of early Kedah. However, its antiquity and legitimacy as a historical document has always been debated by local and foreign scholars alike.

Since this pioneering period many archaeologists have conducted excavations, more intensively since the 1930s. As a result many new sites have been discovered. It is important to note that most of the discoveries between Low’s era and the 1930s were purely accidental. Finds from this period include the chance discovery of structural remnants atop Gunung Jerai in 1894 made by Lefroy and Irby while on a

surveying expedition as well as discoveries made at Ladang Sungai Batu by estate labourers in the 1920s (Irby, 1905; Lefroy, 1905; Evans, 1927). I. H. N. Evans was alerted to the findings at Ladang Sungai Batu and he conducted the first detailed studies in the Sungai Batu area. Apart from studying the Sungai Batu sites, Evans also made interpretations on earlier discoveries by Low, Irby and Lefroy and also studied the remains atop Gunung Jerai. Prior to the 1930s, most archaeological discoveries were handled by people ill-equipped for such work. Archaeology in this era was also largely spasmodic and done in an *ad hoc* way. However, by the 1930s, the paradigm had shifted completely and the fieldwork was conducted in a more organised manner by professional archaeologists. As a result, the bulk of discoveries have been made during this era, especially by the husband and wife team of Quaritch and Dorothy Wales, who located and catalogued numerous sites in a more systematic attempt to categorise the antiquities found in the area. By 1940, 30 sites had been discovered and demarcated numerally (Quaritch-Wales & Dorothy Wales, 1940). The onset of the Second World War to British Malaya temporarily halted their progress. The couple would go on to discover a further four sites almost immediately after the war (Quaritch-Wales & Dorothy Wales, 1947).

Research in the 1950s and 1960s was dominated primarily by historians and archaeologists based at the University of Malaya and was mainly focused on re-interpreting the discoveries made by Quaritch and Dorothy Wales. During this period, further discoveries were made. Among the archaeologists from this era include K. G. Tregonning, A. Lamb, B. A. V. Peacock and M. Sullivan (Mokhtar *et al.*, 2011). Since Malaysia achieved her independence in 1957, most of the archaeological fieldwork has been taken up by academicians based in local universities, primarily Universiti



Malaya and Universiti Kebangsaan Malaysia. More recently, Universiti Sains Malaysia has been involved in these studies as well. Most of the research during this era focused on the interpretation of artefacts from previously excavated sites, as opposed to the discovery of new sites. Most of these excavations and interpretations were done by Leong Sau Heng, Adi Taha, Nik Hassan Shuhaimi and Al-Rashid (Mokhtar *et al.*, 2011). A major geo-archaeological survey was undertaken from 1979 to 1980 and as a result, more sites were mapped out, bringing the total tally of sites to 87 (Figure 1.1), not including sites found south of Sungai Muda (Allen, 1988). Further research was conducted in the 1990s by Kamaruddin Zakaria, M. Jacq-Hergoualch and Supian Sabtu. By 2006, the inventory of sites discovered in the Bujang Valley remained at 87, excluding those found in Seberang Prai and there was a general consensus among academicians that this settlement did not date beyond the 4<sup>th</sup> century AD. In 2007, a major discovery took place at Sungai Batu, when a total of 97 mounds were discovered by Mokhtar Saidin while he and his team were conducting geo-archaeological surveys in the area (Mokhtar *et al.*, 2011). Almost a decade later, more than half of the sites have been excavated and a picture is gradually emerging of a settlement that concentrated primarily on mining, smelting and export of iron. Recent excavations in another part of the Bujang Valley by Zuliskandar Ramli has unveiled more temples at Bukit Kechil and Kampung Bharu in the region abutting Sungai Muda (Zuliskandar & Nik Hassan Shuhaimi, 2013e; Zuliskandar, 2016). Since Sungai Batu is still being studied and many sites have not been excavated yet, it will be omitted from this thesis together with the recently discovered temples at Bukit Kechil and Kampung Bharu.

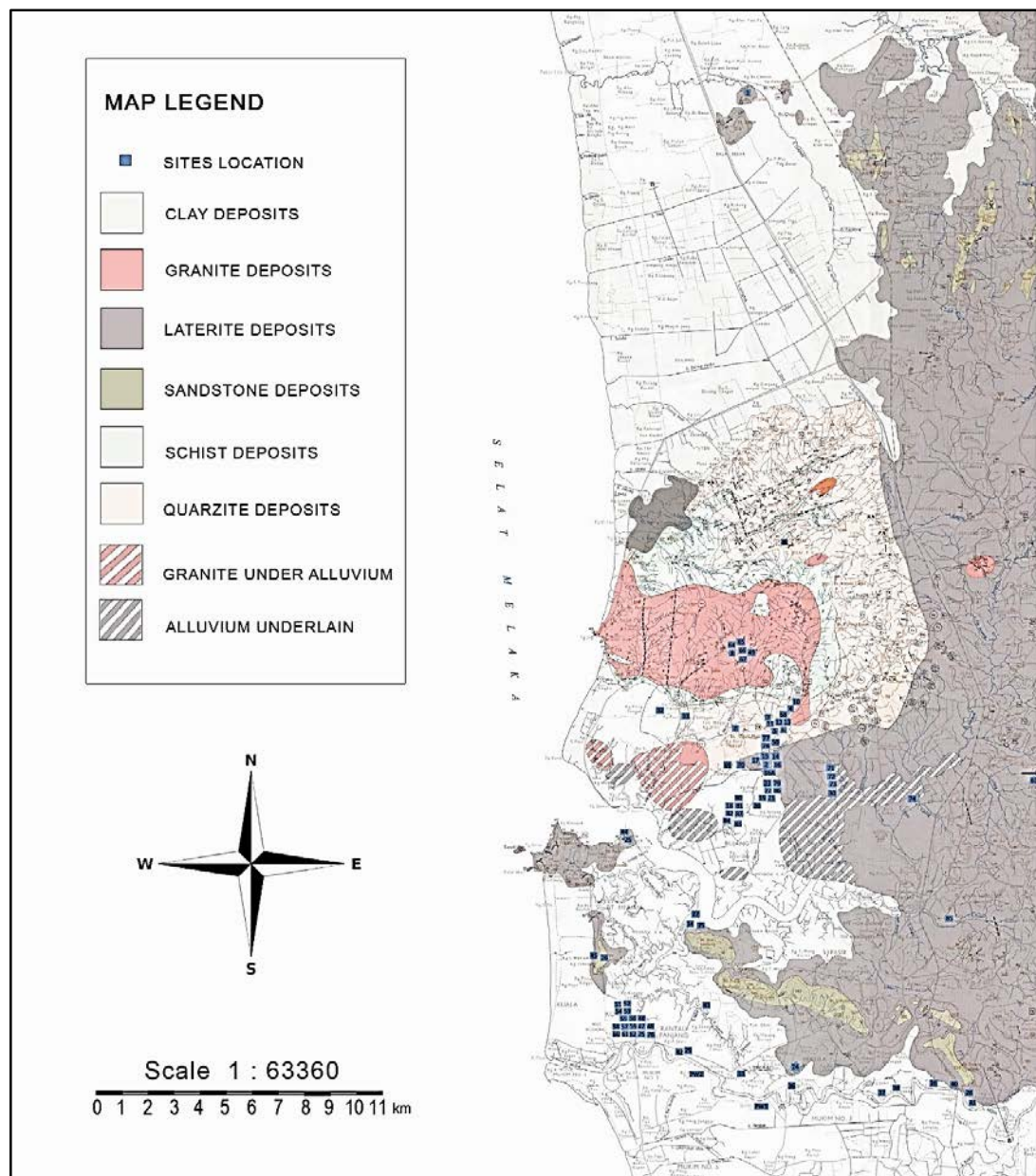


Figure 1.1: Location of archaeological sites in the Bujang Valley (Source: Directorate of National Mapping Malaysia, 1972; Allen, 1988).

Apart from the recently discovered settlement at Sungai Batu, most of the ruins found in the Bujang Valley generally comprise of Hindu and Buddhist temples, although some of the ruins have also been identified as secular buildings (Jacq-Hergoualch, 2002). Due to the dilapidated condition of the ruins, and further compounded by evidence of pillage noticed by the earliest archaeologists that may have damaged the structures further, it is difficult to come to finite conclusions about

the identity of most of the buildings found. It is believed that the bulk of the buildings were religious in nature and were constructed between the 4<sup>th</sup> and 15<sup>th</sup> century CE. Most of these ruins and the history of archaeological investigations in the Bujang Valley will be detailed in the following chapter.

During its zenith, this ancient settlement was known to the world beyond by many names. Its fame attracted multitudes from faraway lands to trade and possibly settle. It was known as Kataha in the Sanskrit language of northern and central India, Kadaram in south Indian vernacular, Chieh Cha to the Chinese and as Kalah by the Arabs, among many other names (Wheatley, 1961). In later periods, the Portuguese called the area Quedah and the British initially called it Keddah, phonetically the closest variant of its current name (Allen, 1988). Many records exist from various parts of Asia and Europe that deal with this area which will be dealt with individually in the next chapter. The only sources that are contemporary with the apogee of the Bujang Valley are Indian, Chinese and Middle Eastern (including Central Asia) sources. Pertaining to constructions, only Arab records are descriptive on the types of structures found. In later periods, there are three local sources that outline the history of the area. One of these sources is the aforementioned Hikayat Merong Mahawangsa (Kedah Annals), while the other two are the Salasilah atau Tarikh Kerajaan Kedah and the Al-Tarikh Salasilah Negeri Kedah. The two latter sources were written at the beginning of the 20<sup>th</sup> century (Mozzafari-Falarti, 2009). European records describing Kedah exists from around the 16<sup>th</sup> century when the Portuguese began to make inroads into Southeast Asia. At an even more recent period, British explorers began to visit Kedah regularly due to its proximity to colonial Penang and these visitors are responsible for information on Kedah in the late 18<sup>th</sup> and early 19<sup>th</sup> century. By the colonial era, the

halcyon period of the Bujang Valley had passed and the remnants of the protohistoric settlements in the Bujang Valley were crumbling into oblivion as nearby areas such as Kuala Kedah and Kuala Muda developed into new centres of commerce. The archaeology and literature on the Bujang Valley will be delved into in greater detail in Chapter Two.

#### **1.4 Research aim**

The general aim of this thesis is to understand the dynamics of the construction industry (building materials and foundations) in the Bujang Valley from 400 to 1400 CE. It also seeks to trace the movement of construction technologies between settlements in the Bujang Valley and four other ancient settlements by studying the various types, periodisation, similarities and differences in the use of building materials and foundations in the Bujang Valley and these four selected settlements which are Yarang and Takuapa in southern Thailand, Batujaya and Cibuaya in Indonesia. Each type of material employs a specific technology to be utilised for construction, for example sandstone requires carving, clay bricks require shaping and firing at high temperatures, while laterite requires cutting and shaping. Another aim of this thesis is to study the possibility for the existence of a homogenous construction method stretching from southern Thailand to northern Java from 400 to 1400 CE.

#### **1.5 Research objectives**

Understanding the construction industry within the Bujang Valley requires determining various parameters such as the timeframes, the possible locations of

processing centres and the understanding of relationships between the sources of building materials and the location of structures themselves. On the other hand, studying the relationship between the use of building materials in the Bujang Valley and in the remaining four settlements requires an understanding of timeframes of structures in the Bujang Valley and in the remaining four settlements, as well as making a comparison between the usages of the building materials. The study of foundations entails a similar study to that of building materials in all five localities studied in this thesis. To this effect, six objectives have been outlined. They are as follows:-

- 1) To determine the most likely timeframes for the usage of each of the eight building materials studied in the Bujang Valley.
- 2) To compare the usage of the eight building materials in the Bujang Valley to Yarang and Takuapa in Thailand as well as to Batujaya and Cibuaya in Indonesia and to determine the spread of building technologies.
- 3) To determine the sources of the eight building materials used in the Bujang Valley.
- 4) To identify possible locations of building material processing centres in the Bujang Valley.
- 5) To ascertain similarities and differences among the foundation layers of the structures of the Bujang Valley and their implications in understanding the nature of the construction industry in the Bujang Valley.
- 6) To ascertain the similarities and differences between the foundation layers of the structures of the Bujang Valley and those at Yarang, Takuapa, Batujaya and Cibuaya and their implications on the transfer of construction technologies between the Bujang Valley and Yarang, Takuapa, Batujaya and Cibuaya.

## **1.6 Research methodology**

The data for this thesis was collected via two methods, field trips and literary sources. Field trips were arranged to various sites in the Bujang Valley, as well to various other parts of Kedah, Perlis and Thailand. Sites were located using maps by previous archaeologists and were then visited. When necessary, a guide was employed. Observations were made and in some cases, tabulated. In other locations, observations were made to gain a good understanding of the location and sites. Given the poor state of preservation of some of the sites and that most of the sites are no longer extant, the bulk of the data for this thesis was gained via the use of literary sources.

Literary data was collected via the study of written sources which included publications and maps. Most written material used are from past work done by archaeologists on the Bujang Valley. Details of sites in Yarang and Takuapa in Thailand were sourced from field visits as well as from publications by archaeologists who had worked in these areas while those of Batujaya and Cibuaya was gained purely from publications. The collection of data will be explained in greater detail in Chapter Three.

## **1.7 Research scope**

For the requirement of this research, the Bujang Valley shall be defined as the area delineated by Cherok Tok Kun in the south and Bukit Choras in the north, with an east-west axis from Jeniang to the Straits of Malacca (Figure 1.2). This area is selected with the aim of encompassing all the archaeological discoveries made in the

area. Special attention will be paid to the region between the Sungai Muda and Sungai Merbok as almost all the sites found are within the vicinity of these two rivers. Ninety sites will be studied from an archaeological perspective while other sites that have not left tangible remains will be studied from literary sources. The scope of this work is not purely confined to archaeological data but types of constructions postulated to exist in ancient Malay texts will also be studied. This research spans the millennium from 400 CE to 1400 CE which covers the growth, floruit and decline of the Bujang Valley settlements as well as the other four ancient settlements studied. More importantly it incorporates the period of construction for all the settlements and sites studied in this research. This thesis is limited to only eight types of material, six of which are inorganic. These six materials are granite, sandstone, laterite, clay bricks, pebbles, earth while the remaining two are wood and bamboo. The criteria for the selection of these building materials is that they were present in at least five of the structures found in the Bujang Valley. Other building materials such as schist, slate, iron nails were used as well but have not been discussed since the deposits of these materials were not available in any maps and also since these materials were rarely used. Since this study focusses primarily on the Bujang Valley, building materials that were used at the other four settlements studied but not present in the Bujang Valley was also omitted. For the purpose of this thesis, the word foundation can be described as “the lowest division of a building-its substructure constructed partly or wholly below the surface of the ground” (Ching, 2008). As such, only structural elements below ground level are considered as the foundation for the structure. On the other hand, the study of building materials will encompass building materials found in any part of the structure. Building material and foundation comparison will be limited to four ancient settlements which are Yarang and Takuapa in Thailand as well as Batujaya and

Cibuaya in Indonesia (Figure 1.3).

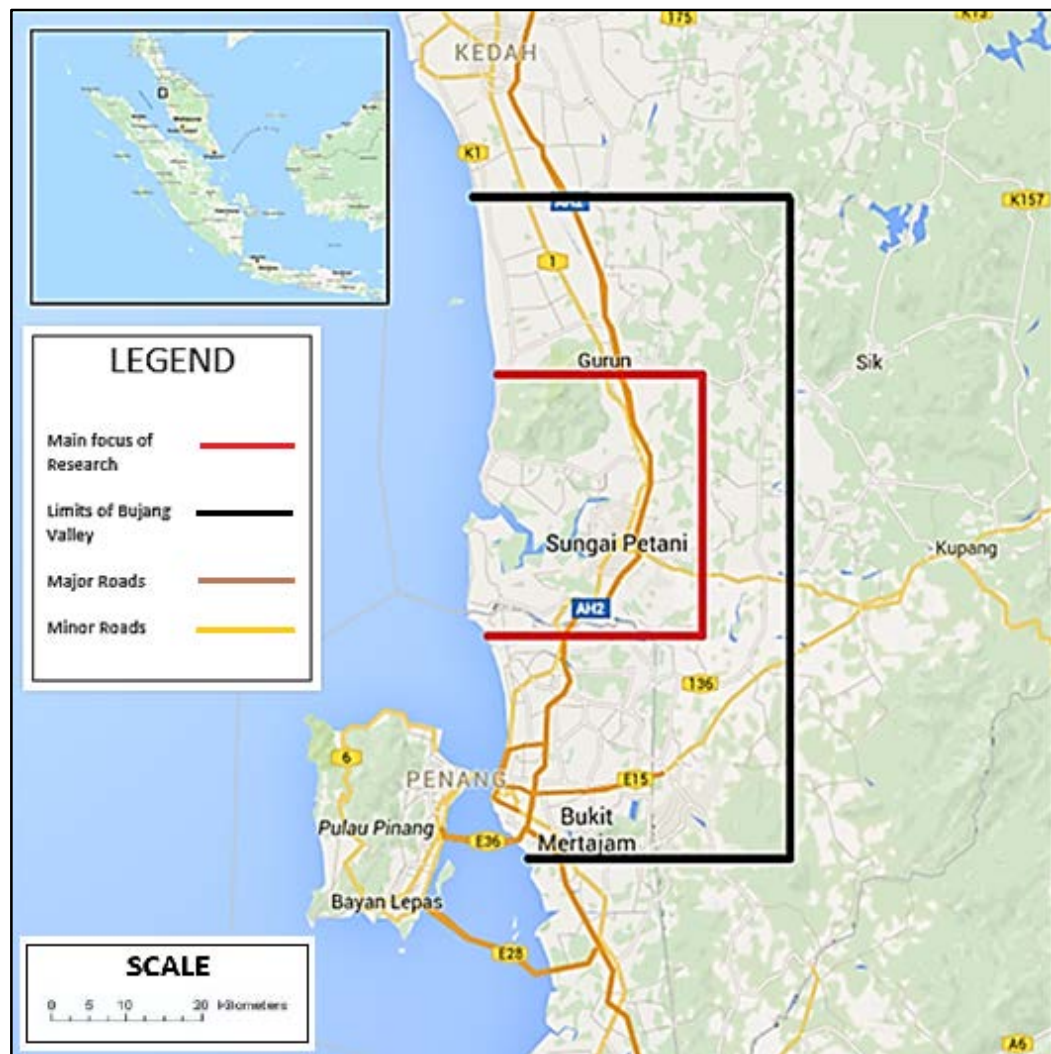


Figure 1.2: The area defined as the Bujang Valley for the purposes of this research is shown within the black lines on the map. The area delineated by the red lines will be given special attention. The small map shows the location of the Bujang Valley within Southeast Asia (Source: Google Maps, 2017a).

These four settlements have been selected due to their proximity and similarities in construction with the Bujang Valley. These similarities are apparent as the structures at all five settlements no longer have well preserved upper portions and they lack walls and roofs. These four entities have been referred to as “settlements” in this thesis since it would be difficult to define whether Batujaya and Cibuaya were



ever ports like the Bujang Valley settlements, Yarang and Takuapa. The word “port” was defined by Muller (1999) as “a harbour or haven where ships may anchor, or a harbour area with marine terminal facilities for transferring cargo or passengers between ships and land transportation”. It is not stated whether Batujaya or Cibuaya ever played such a role. Takuapa was almost certainly a port, given the high number of foreign items found there, similar to the Bujang Valley settlements (Chaisuwan & Naiyawat, 2009). Michel Jacq-Hergoulach (2002) lists Yarang to be a port as well.



Figure 1.3: The locations of the Bujang Valley, Yarang, Takuapa, Batujaya and Cibuaya in relation to each other (Source: Google Maps, 2017b).

These settlements have been selected for specific reasons. Yarang has been selected due to its location on the opposite coast to the Bujang Valley with which it was connected via riverine routes. Takuapa is located on the same stretch of coast as the Bujang Valley, albeit a few hundred kilometres to the north. Sailors from north-eastern India and Myanmar may have sailed to Takuapa before reaching the Bujang Valley. Batujaya and Cibuaya are also settlements with similar types of structures as those found in the Bujang Valley. Ships approaching Batujaya and Cibuaya from India or the Middle East would have had to pass the Bujang Valley first, suggesting possible linkages between the Bujang Valley and the two Javanese settlements. Ideally, a settlement in Sumatra would have been preferable because of its proximity to the Bujang Valley, but there is no evidence of coastal settlements with sufficient structures to be compared to the Bujang Valley in Sumatran settlements such as Kota Cina and Barus (Miksic, 2000; Perret & Surachman, 2015). At Kota Cina, only simple rectilinear walls have been discovered, while at Barus, the discovery of bricks indicate the remains of structures. None of the structures that may have existed at these locations are sufficiently preserved to allow comparisons to be made with the Bujang Valley. The basis for the selection of the four settlements is that they contain structures that played similar functions to those found in the Bujang Valley, and that these settlements contain structures that are relatively well preserved compared to those in Sumatra.

## **CHAPTER TWO LITERATURE REVIEW**

This literature review is divided into four sections. First, a general description of the Bujang Valley is provided. Early literature on Kedah and past archaeological work on the Bujang Valley are then reviewed. The settlements of Yarang and Takuapa in Thailand as well as Cibuaya and Batujaya in Indonesia are also briefly explained here.

### **2.1 The Bujang Valley**

The Bujang Valley settlements are the southernmost of a chain of ports straddling the upper part of the Malay Peninsula (Jacq-Hergoualch, 2002). Its function as a cluster of ports has never been disputed by scholars and its location at the northern inlet of the Straits of Malacca and at a narrow section of the Malay Peninsula allowed it to have a free hand in trade passing through the Straits of Malacca as well as a share in commerce passing over the Peninsula from the Andaman Sea to the South China Sea via riverine routes. Due to its location at a central point on the Malay Peninsula, the Bujang Valley may have been an important node for the transmission of Indic culture to other parts of Southeast Asia. This is reflected in the monuments which strongly suggest South Asian influence (Allen, 1988; Jacq-Hergoualch, 2002). Unfortunately due to centuries of neglect, shoddy construction methods as well as possible iconoclasm, most of these monuments are in a bad state of preservation, impounding attempts to study them.

Notwithstanding the unpretentious appearance of its monuments, the importance of the Bujang Valley in the context of Southeast Asian history must not be underestimated. It has been established that the Bujang Valley protohistoric settlements grew within a milieu of burgeoning trade networks that were already well established by the opening centuries of the Common Era (Jacq-Hergoualch, 2002). Its period of prominence lasted from around the 4<sup>th</sup> to the 15<sup>th</sup> century. Its location at the northern entrance to the Straits of Malacca made it well positioned as a stopover for ships travelling through the Straits of Malacca from regions to the west such as India and the Arab world to islands further south such as Sumatra and Java, or even areas further east and north such as Borneo, The Philippines and China (Jacq-Hergoualch, 2002). At certain periods of the year, the whole process occurred in reverse and traders, pilgrims and itinerants approaching from the east would have used the port for layover while travelling to areas further west.

Apart from its role as a sentinel watching over trade travelling through the Straits of Malacca, the Bujang Valley also played a pivotal role as one of many centres of overland trade between both coasts of the Malay Peninsula. This commercial network operated along the many river valleys of the Malay Peninsula and it has been suggested that the Bujang Valley and another settlement at Yarang, located in the Province of Pattani in Thailand on the opposite coast of the peninsula may have been connected via riverine routes that, although long abandoned, may still be traced today (Jacq-Hergoualch, 2002). The location of the Bujang Valley on the central portion of the Malay Peninsula allowed it to play both roles simultaneously, and it received a portion of the commerce destined for the islands of Indonesia to the south as well as for China and The Philippines to the east. This is reflected in the diverse origin of the

artefacts as recorded by Allen (1988) in her thesis on the early history of the Bujang Valley.

It is difficult to ascribe an accurate chronology or to come to any finite conclusion about the history of the Bujang Valley or to ascertain her political status. There are few confirmed historical markers to go by and most interpretations and opinions are relatively subjective and open to debate. This has led to the creation of several variegated arguments on this score. The evidence of exogenous artefacts is plentiful and sufficient to state that it was definitely a cluster of ports of some repute. Its mention in West Asian, Chinese and Indian texts give an indication that it was well known throughout most parts of Asia especially in coastal regions where seaborne trade was extensive (Wheatley, 1961). Pertaining to its form of governance, concrete conclusions cannot be made due to a lack of inscriptional evidence. Most of the inscriptions discovered display stanzas found in Buddhist texts in South Asian languages and scripts. It is not known whether the inscriptions found describe the religious affiliations of the local people or foreigners that came to trade, although the latter seems more logical. Similarly, it has been debated whether the temples discovered represented evidence of local religious practice or material remains of Indian worship. Evidence is also lacking on the type of governance in foreign records of the place. According to Allen (1988), the temples that can be found in localities throughout the Bujang Valley display fairly rudimentary architecture but exhibit Indian cultural affinities. Some of these elements may have originally been adopted in other parts of Southeast Asia but could have been eventually indigenised in those locations. Early work on archaeology is noted for a marked refusal by archaeologists to compare these findings with Javanese and Balinese prototypes, preferring instead to compare

with them Indian elements. On the other hand, more recent archaeological work display an antithetical interpretation to that of the preceding period. These dogmatic approaches are not helpful in describing the history of the Bujang Valley during this halcyon age.

The location of the Bujang Valley offered many advantages. Most importantly, it was undoubtedly strategic. It is located on the south-eastern shore of the Andaman Sea, at the mouth of the Straits of Malacca and at the point where the Malay Peninsula narrows out from its more bulbous shape in the south towards the Isthmus of Kra. Here the peninsula is easier to cross since the mountains here are lower than in locations further south, where the Main Range towers over 2000 metres in certain areas (Jacq-Hergoualch, 2002). To the north, in what is now Thailand, the hills are even lower although Jacq-Hergoualch (1997) recognises that it does not make it any easier to cross since there were many obstacles such as rivers that were difficult to traverse going upstream, wild animals and thick vegetation. However, the ranges itself were still traversable albeit with difficulty along river valleys. In this area grew port settlements and coastal city states such as Yarang, Takuapa, Nakhon Si Thammarat and Chaiya that are of a comparable nature to the ports of the Bujang Valley, albeit better preserved and with more defined evidences of art and sculpture (Jacq-Hergoualch, 2002). This region was once postulated by Quaritch-Wales to be the main conduit for the spread of Indian culture to other parts of Southeast Asia (Quaritch-Wales, 1937).

The recent discovery of sites at Sungai Batu in 2007 show that previous research done on the Bujang Valley was by no means exhaustive, although a lot had already been lost due to neglect, apathy, agricultural activity and general development

of the area. This discovery of new sites at Sungai Batu as well as at Bukit Selambau and Jeniang along Sungai Muda is an indicator that there may be a lot more to be discovered by archaeologists. The discovery of sites at Jeniang, which is further upstream from other sites along Sungai Muda suggests that Sungai Muda seemed to have played a far more influential role than Sungai Merbok in the fortunes of the Bujang Valley protohistoric settlements. It has to be noted that the slopes around Gunung Jerai has yet to be explored by archaeologists. Areas to the north of the massif itself have also remained largely unexplored. To the south, areas between Sungai Muda and Sungai Prai remain virgin territory for archaeologists, although it may be too late for excavations, since this area has mostly been farmed over. Further research should focus on isolated hilltops near waterways along the entirety of coastal Kedah northwards towards Perlis. Small hillocks south of Sungai Muda all the way down to Kuala Selinsing also appear promising.

## **2.2 Literary sources**

Throughout her history, the ancient settlements of the Bujang Valley received a constant flow of visitors from various parts of Asia. Verbal accounts of these foreign traders percolated back to their land of origin where they were put to paper by scribes and scholars for perpetuity. Some of these sources throw light on these settlements in their heyday. Here, only sources that throw light on types of constructions will be highlighted.

Many ancient texts with diverse geographical origins describe protohistoric settlements that are believed to be located within the confines of the Bujang Valley

(Wheatley, 1961; Braddell, 1949). Unfortunately the sources of some of these works remain vague. These records indicate the ethnicities of traders that may have visited or temporarily inhabited the protohistoric Bujang Valley ports in their heyday. Many of these foreign texts were coeval with the settlements in the Bujang Valley and were probably written either by visitors to the Bujang Valley or by scribes and geographers who may have received second hand information from traders and itinerants. However, these texts only contain passing references to these settlements. There has yet to be found a detailed description of the Bujang Valley settlements from this period, which is perhaps unsurprising given the peripatetic nature of trading life.

The earliest texts mentioning the Bujang Valley are Indian and are believed to date as far back as the 2<sup>nd</sup> century CE (Wheatley, 1961). There also exist a corpus of texts and inscriptions describing the Bujang Valley up to the 11<sup>th</sup> century CE from various geographical localities within the Indian subcontinent itself (Braddell, 1949; Wheatley, 1961). The regular reference to the Bujang Valley in South Asian texts is unsurprising since it is generally accepted that the Bujang Valley ports were an important rendezvous for Indian traders with inscriptions of South Asian languages such as Sanskrit, Tamil and Pali written in Indian scripts such as Pallava, Tamil and Devanagari discovered in various parts of the Bujang Valley (Allen, 1988; Jacq-Hergoualch, 2002; Nasha, 2011). The earliest Chinese text describing the Bujang Valley dates from the late 7<sup>th</sup> century and is relevant for students studying the area's involvement in the geopolitics of the region at the time although it fails to describe more mundane details of the settlement itself such as the life of the occupants and their daily affairs.



It is from this very aspect that records from the Arab world come in useful. From around the 9<sup>th</sup> to the 15<sup>th</sup> century CE, various Middle Eastern and Central Asian texts describe Southeast Asia (Wheatley, 1961). Some of these texts make allusions to the Bujang Valley and are useful for this study. Western European sources describing Kedah are known to exist from about the 16<sup>th</sup> century onwards to the end of the colonial period (Winstedt, 1920; Winstedt, 1936; Mills, 1997). These sources, backed by dates and eyewitness accounts are very specific on observations made, were meticulously written and can be accepted as very reliable. Although these European sources belong to a period beyond the scope of this thesis and describe parts of Kedah beyond the study area, they are relevant to describe types of buildings that cannot be traced by archaeology and are essential to validate local records of the same era. Apart from foreign sources, local manuscripts detailing the history of Kedah also exist. A large number of these have not been translated from the native Jawi script with the exception of the Hikayat Merong Mahawangsa, Salasilah atau Tarikh Kerajaan Kedah and the Al-Tarikh Salasilah Negeri Kedah. Similar to European accounts, none of these texts are analogous with the period of the Bujang Valley but are useful in describing the nature of settlements during this period from a local perspective. The antiquity of the sources used to write these texts have never been determined satisfactorily. Apart from the Hikayat Merong Mahawangsa, the remaining two were written in the 20<sup>th</sup> century (Mozzafari-Falarti, 2009). These texts claim to describe the history of Kedah as far back as the 7<sup>th</sup> century CE. For this subchapter, discussions of both Chinese and Indian texts are omitted since they fail to describe the types of building materials and buildings found in the Bujang Valley during its zenith. Only three types of sources, which are local, West and Central Asian as well as European sources are relevant for discussion. This chapter will serve as a critique of the ancient writings on early Kedah,